

**Edentulousness and complete denture care in the Western Cape Province  
with specific reference to the need for and feasibility of establishing  
denturists as a new occupational category in the oral health care work  
force**

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**DECLARATION**

I hereby declare that this thesis entitled:

**Edentulousness and complete denture care in the Western Cape Province  
with specific reference to the need for establishing denturists as a new  
occupational category in the oral health care work force**

is my own work, and has not previously in its entirety or in part been submitted  
at any university for another degree by myself.

SIGNED

DATE

## **SUMMARY**

The provision of dentures has been a constant issue during the evolution of dentistry. Poor awareness and low value attached to oral health as well as lack of financial resources to afford care have led to rampant dental caries, a culture of extracting teeth, edentulousness and increasing demand for dentures. Most people cannot afford dentures provided by dentists in the private sector due to the high cost thereof. On the other hand, people do not have easy access to dentures in the public sector due to unavailability thereof, lack of resources or the low priority given to denture services.

Since the beginning of the century, dental technicians have been opposed to restrictive legislation, being 'enslaved' to dentists and have pleaded for an independent profession. The poor relationship that has existed between dentists and dental technicians for many decades has inspired dental technicians to develop their profession independently from that of the dentists. Dental technicians have frequently motivated the need for legalising denturism so that they can provide dentures directly to the public. This step would make dentures more affordable, accessible and eliminate the illicit provision of dentures.

The purpose of this study was to conduct a policy analysis to determine the need for and feasibility of establishing denturists (clinical dental technologists) as a new occupational category in the oral health care workforce. The hypothesis of

this study is that legalising denturism would be a more cost-effective way of providing dentures directly to the public.

Policy relevant data was collected by means of an socio-epidemiological survey of adults older than 20 years and all types of oral health care providers in the Western Cape Province. A pilot study and calibration of the examiner was conducted prior to the survey. During the main study a systematic re-examination of individuals was conducted to monitor the examiner consistency and respondent variability. A total of 1787 individuals were selected using a random multi-stage cluster sampling technique. Special measures were taken to ensure adequate representation of the demographic and socio-economic characteristics of the population in the Western Cape Province. The survey of adults involved a clinical examination and a structured interview. A survey was also conducted of all oral health care providers in the Western Cape Province. The data was individually checked for coding errors, processed on the mainframe computer of the University of Stellenbosch and statistically analysed using the SAS-programme. The sampling and statistical analysis of the data was conducted in collaboration with a senior statistician of the Department of Statistics, University of Stellenbosch. The demographic structure and characteristics of the study population was established from census data to establish whether the sample adequately represented the population, to facilitate the weighting of variables and to enable extrapolation of results to population data.

The socio-demographic characteristics of the sample compared favourably with that of the population in the census data. The sample was therefore considered as fairly representative of the population in the Western Cape Province.

The examiner and respondent consistency was moderate to substantial for all the variables studied and thus complied with the necessary scientific requirements.

The results of the study presented the following policy relevant information. The large mean number of decayed teeth in adult dentate subjects showed that dental caries remains to a large extent untreated in the coloured and black population whilst it is adequately cared for in the white population. Coloured dentate subjects had an average of ten 10 teeth missing in comparison with the 7 and 5 missing teeth in whites and blacks respectively. In the Western Cape Province 44 per cent of the overall sample were edentulous. The highest prevalence of edentulousness was observed amongst coloured (54,4%) and white (49,6%) individuals. Only 13,8 per cent of blacks were edentulous. Twenty per cent of edentulous coloureds had no dentures compared to the 5 per cent of blacks and 1 per cent of whites. Edentulousness increased significantly with decreasing socio-economic status ( $p < 0,0001$ ). Amongst coloureds only seven individuals 65 years and older had 21 or more functional teeth. More than 50 per cent of all black subjects still had 21 or more of their teeth remaining.

Adults generally placed a low value on retaining their teeth. Fifty four per cent (54%) of dentate subjects were very happy to get rid of their remaining teeth. Coloureds were at greatest risk of becoming edentulous due to the high rate of dental caries present and the relatively low value attached to retaining their teeth.

Most individuals (75%) stated that they visited a dentist only when they had a problem. Individuals that had a medical aid were more likely to be regular users of oral health services.

Twelve percent of the dentate population indicated that they intend having all their remaining teeth extracted. Almost all those who wanted a full clearance stated that they also intended getting dentures (91,7%). People in the lower socio-economic groups were more likely to extract their teeth compared to those in higher socio-economic groups. The greatest potential demand for extraction of all remaining teeth was found amongst coloured subjects (28,4%). More than half of all subjects (55,9%) believed that one was freed from many dental problems if one had dentures. Thirty five per cent (35%) of subjects interviewed agreed that losing teeth was the inevitable result of the ageing process.

Private dental services were available to 91,8 per cent and public dental services to 84 per cent of subjects in the Western Cape Province. Most subjects that were interviewed stated that services were easily accessible. Thirty four per cent (34%) of the total study population did not know whether public services were available and 16 per cent (16%) did not know whether private services were available. Individuals who were unaware of services were mostly the poor (47%), blacks (32%) and coloureds (16%).

Private dental practitioners provided 73 per cent of all dentures currently worn, whereas state dentists provided only 9 per cent and backdoor providers 14 per cent of dentures that people had. Coloureds mostly had dentures supplied by

backdoor providers (87,6%). 'Backdoor providers' had no formal clinical or dental technical experience.

Twenty eight per cent (28%) of subjects needed a complete set of dentures, 2 per cent a full upper or lower denture and about 11 per cent a partial denture. The perceived need for a complete set of dentures was slightly lower (24,8%) than the professionally assessed needs. The potential demand for a complete set of dentures on the other hand, was very low (8,9%). The potential demand for partial dentures was less than 1 per cent of the dentate population.

The majority of denture wearers (64,1%) were satisfied with their existing dentures. The functional and physical quality of dentures made by backdoor providers were overall of a poor quality compared to dentures made by dentists. People who had dentures made by backdoor providers showed twice as much dissatisfaction with their dentures compared to those that had dentures made by dentists. There was, however, no conclusive evidence indicating an increased risk of oral mucosal disorders in subjects wearing dentures made by backdoor providers.

Twenty one per cent (21%) of subjects wearing dentures stated that they intended having their old dentures replaced. The majority of subjects (42,5%) who wanted their dentures replaced chose a private dental practitioner as their provider of choice. Twenty eight per cent (28%) chose a state dentist and 10,5 per cent a 'backdoor provider'. Cost and availability of services were the primary factors that determined individuals' choice of provider.

The medical aid tariff for a complete set of dentures, laboratory fees included, was approximately R1500. Most adults (65,6%) could not afford more than R250 for a complete set of dentures. Only 1 per cent responded that they could afford dentures that cost over R1000. People who could least afford dentures were mostly coloureds (74,2%), blacks (84,3%) and the institutionalised elderly (80,2%).

Fifty seven per cent (57%) of individuals felt that dental technicians should be allowed to provide dentures directly to the public provided that they are adequately trained. Individuals that supported clinically trained dental technologists (denturists) believed that it would lower the cost of dentures (36,9%) and improve the quality of dentures (33,7%).

Priority setting is a fundamental process for resource allocation decisions because needs are unlimited and resources limited. Provision of dentures in public dental services is a low priority. Each state dentist is limited to providing only one complete set of dentures per month. Adult subjects that were interviewed rated denture services overall as a very low priority in relation to other social services, health services and oral health services. Most of the participants who rated dentures as a low priority (64%) stated that dentures were not essential and that one could live without it (37,9%). A large percentage of respondents (15,4%) also felt that people ought to take responsibility for looking after their own teeth. The majority of the population was in agreement that treatment of pain and sepsis and preventive care should receive the highest priority. Dentures did receive a higher priority rating amongst lower socio-

economic groups and in rural areas. Thirty five per cent (35%) of the subjects interviewed stated that dentures should receive some priority for funding because dentures were essential for mastication of food and lack of dentures could therefore affect one's health.

Dentists, dental technicians and oral hygienists were predominantly located in the Cape Metropolitan Health Region and were in private practice. Only two dental therapists were employed in public dental services in the Western Cape Province. Forty five per cent (45%) of dentists and 39 per cent (39%) of dental technicians stated that they were not busy enough in their practices. Dentists spent on average only 10,3 per cent of their practice time on removable prosthetics. In comparison dental technicians spend approximately 41,2 per cent of all their practice time on removable prosthetics. Dentists in private practice reported that clinical work involving removable prosthetics contributed to approximately 20 per cent of their gross monthly turnover. Dental technicians derived approximately 19,5 per cent of the gross monthly income from full dentures and 9,7 per cent from partial dentures. Most dentists (34,2%) and dental technicians (60,7%) placed greater preference on doing fixed prosthodontics (crown and bridge work). Only 5 per cent of dentists rated removable prosthodontics as their first preference. In comparison, 38 per cent of dental technicians preferred doing full dentures.

Remuneration was cited as the factor causing most dissatisfaction amongst all occupational categories. Dental therapists (50,9%) and dental technicians (48,9%) reported high levels of dissatisfaction with their opportunities for

professional development. The majority of dentists (66,2%) felt that they should be enabled to perform more specialised functions to improve the spectrum of services available (23,8%) and affordability of specialised services (16,6%) to the public. Twenty one per cent (21%) of dentists were in favour of extending the function of dental therapists primarily because this would increase the availability of dentures to the masses (58,8%) and would improve cost-effective utilisation of resources in the public sector (53,1%). The most common field cited by dental therapists, in which functions should be extended was denture care (85,7%).

The majority of dental technicians (65,2%) stated that there were too many dental technicians to meet all the denture demands in their community. Thirty seven per cent (37%) of dentists felt that there were adequate dentists available to meet the demands for dentures. Eighty five per cent (85%) of dental therapists felt that human resources were inadequate to provide for the dentures demanded in areas where they were providing services. The majority of oral health care providers stated that more dentists, dental therapists, oral hygienists and dental technicians should be utilised in the public sector and rural areas.

The majority of dental technicians reported having done denture repairs (84,3%), complete dentures (22,5%), relines or rebasing of dentures (22,5%) or partial dentures (18%) directly to patients who were referred to them by dentists during the past three years. The most common reason cited why dentists referred the patient directly to the dental technicians for treatment was because the dentists were unable to satisfy the patients' needs (62,7%) and because the dentists had

no time to attend to the patients' needs (21,6%). A large percentage of dental technicians (35,4%) had also provided complete dentures illegitimately directly to the public during the past three years mainly as a personal favour to a friend or family member.

Forty three per cent (43%) of dental technicians reported that they had to remake dentures at their own cost because the dentists had provided inadequate instructions. The majority of dental technicians (69,6%) also stated that they had been approached frequently during the past three years to provide services at a discounted rate in exchange for the dentists' continued support. Dental technicians stated that they preferred not to work as employees of dentists to prevent financial exploitation by the dentists (36,9%) and because they preferred practising independently (32,6%).

Almost all dental technicians (96,7%) supported the principle of establishing denturists as a new occupational category. Dental technicians believed that denturism would be more cost-effective utilisation of human resources (29,7%), increase the affordability of dentures (27,5%) and would improve the quality of dentures (13,2%). The majority of dental technicians also felt that clinically trained dental technologists should provide partial dentures directly to the public (83,7%). The majority of dentists (77,1%) were opposed to the principle that dental technicians should provide dentures directly to the public because this would encroach on their scope of practice (41,8%) and because dental technicians had inadequate knowledge and skills (40%). Approximately 16 per cent of dentists supported clinically trained dental technologists primarily

because they felt that this would make dentures more affordable to a broader spectrum of the population. Most dental therapists (82,8%) also felt that they should be trained to provide dentures directly to the public because there was a growing unmet demand for dentures in rural areas (34,4%). Seventeen per cent (17%) of dental therapists also felt that they had a professional obligation to replace teeth if they had to extract teeth.

Sixty eight per cent (68%) of dental technicians said that they would become denturists if denturism would become legalised. The majority of dental technicians (89,1%) strongly supported the principle that dental technicians receive clinical training before being allowed to practice as denturists.

Dental technicians estimated that they could provide dentures at approximately R500 directly to the public.

The following conclusions were made from the policy analysis and is only applicable to the Western Cape Province.

(i) Teeth are an essential requirement for speech and mastication and play an important role in preserving one's self-image and social interaction. Edentulousness without dentures may therefore compromise an individual's quality of life.

(ii) The research literature, both internationally and nationally, indicated that there is a decline in the rate of edentulousness and need for dentures. The results, however, point towards a continuation of the trend of extracting teeth, edentulousness and consistent demand for dentures, especially amongst the

coloured population group in the Western Cape. The high rate of indigence will increase the likelihood of people reverting to seeking dentures from 'backdoor providers'.

(iii) There is a need and demand for low cost dentures, especially amongst coloureds and elderly people. There is not a significant demand for dentures amongst black people in the Western Cape. The need and demand for partial dentures were extremely low.

(iv) Dental services are readily available to the majority of the population in the Western Cape Province. Only those who have a medical aid or adequate resources (25%) have access to denture services in the private sector. Access to dentures in the public sector is very limited because resource constraints allow each public health dentists to provide only one full set of dentures per month. Public Dental Health Services place a low priority on the provision of dentures. The elderly presented with most problems relating to availability and accessibility of dental services.

(v) Cost of dentures was the greatest barrier towards accessing denture care. There was also insufficient evidence to prove that clinical dental technologists will be able to reduce the cost of dentures to a significant level that will increase the accessibility of dentures in the Western Cape Province.

More than two thirds of the population (65%) could not afford more than R250 for a full upper and lower denture. Approximately 86 per cent of the population were unable to pay more than R500 for a full upper and lower denture. Only 13 per cent of the study population were able to pay more than R500 but less than

R1000 for a set of dentures. Dental technicians estimated that they could provide dentures directly to the public at a cost of approximately R500. This in effect means that clinical dental technologists have already excluded 86 per cent of people from their prospective market segment. The residual market segment on which denturists have to focus on are those people that are willing and able to pay between R500 and R1000 for a complete set of dentures (13%). Alternatively clinical dental technologists will have to compete with dentists to provide dentures to patients that have a medical aid. If clinical dental technologists reduced the recommended clinical fee by 50 per cent they would be able to provide a denture at a cost of approximately R1200. This reduction in fees would not justify the cost of implementing clinical dental technologists as a new occupational category.

(vi) Consumers and providers view dentures as a low priority relative to other services.

(vii) The perceived over-supply of dentists and dental technicians together with the depressed economy are currently major forces influencing the need for extending functions.

(viii) Illicit practice by dental technicians in the Western Cape Province was insignificant. However, unqualified persons or so-called 'backdoor providers' made most dentures that are provided illegitimately. Illegitimate 'backdoor providers' provided more dentures to the disadvantaged poor sector of the population than did the Public Dental Health Services.

People needing dentures have expressed the need for denture providers that meet the criteria of appropriate clinical training, quality care, professionalism and trust, accessibility and affordability.

(ix) The need for denturism has originated from the poor professional relationship between dentist and dental technician in the past. This situation has further deteriorated due to the oversupply of dentists and dental technicians and the dental technicians need for greater autonomy. Most dental technicians supported denturism whilst dentists strongly opposed it. The majority of the population supported denturism because they believed it would lower the cost and improve the quality of dentures.

(x) This study does not support the hypothesis that the introduction of clinical dental technologists (denturists) would be a cost-effective way of providing dentures.

The following policy recommendations were made for the Western Cape Province:

- (i) Efforts and resources should primarily be directed towards oral health promotion and disease prevention rather than extraction and replacement of teeth.
- (ii) Denture services should remain a low priority in the public sector.
- (iii) Denturists (Clinical Dental Technologists) should not be introduced as a new occupational category in the oral health care work force.

(iv) The functions of dental/oral therapists should be extended to include the provision of dentures so that denture services can be made more accessible to people needing dentures in under-served areas. Extended functions should be limited to the supply of full upper and lower dentures only.

(v) Including 'backdoor providers' in the present denture care delivery system, i.e. as clinical dental auxiliaries, without compromising standards of care, may be a window of opportunity that needs to be investigated rather than focusing resources and efforts on eliminating them from the system.

(vi) Any future legislation regarding the provision of dentures and extended functions should recognise the interests and well-being of the patient.

(vii) Patients should not under pretext be separated from the routine of surveillance and maintenance care that dentists provide.

(viii) Training institutions need to investigate the current and future demand for dentists and dental technicians and adjust the intake of students to prevent an over-supply.

(ix) Further studies need to be conducted to establish the need and demand for dental technicians; a cost estimation to determine a realistic value a a full set of dentures; and the influence of water fluoridation on the incidence of edentulousness.

## OPSOMMING

Die verskaffing van kunsgebite was 'n konstante geskilpunt gedurende die ontwikkeling van die tandheekkundige beroep. Swak mondigesondheidsbewustheid en die lae waarde wat mense heg aan mondigesondheid, ongereeide besoeke aan die tandarts, sowel as 'n gebrek aan finansiële hulpbronne om dienste te kan bekostig, het gelai to 'n hoë voorkoms van tandkaries, 'n kultuur van tandverwydering, tandloosheid en 'n toenemende aanvraag vir kunsgebite. Meeste mense kan nie kunsgebite wat private tandartse verskaf, beskostig nie. Eweneens het mense nie geradelik toegang tot kunsgebite in die openbare sektor nie aangesien die staat nie oor toereikende hulpbronne beskik om kunsgebit-dienste te verskaf nie en derhalwe 'n lae prioriteit plaas op die voorsiening van hierdie diens.

Sedert die begin van die huidige eeu was tandtegnici gekant teen wetgewing wat hulle verbied om kunsgebite direk aan die publiek te verskaf en hierdie reg uitsluitlik aan tandartse verleen. Die voortslepende swak verhouding wat vir baie dekades tussen die tandarts en tandtegnikus geheers het, het die tandtegniese beroep aangespoor om te veg vir onafhanklikheid sodat hulle kunsgebite direk aan die publiek kan verskaf. Tandtegnici wat gepleit het vir die wettiging van denturisme het aangevoer dat dit kunsgebite meer bekostigbaar en beskikbaar sou maak en dat dit die onwettige verskaffing van kunsgebite aan bande sou lê.

Die doel van hierdie studie was om 'n beleids-analitiese studie te onderneem ten einde te bepaal of die skepping van denturiste (kliniese tandtegnoloë) as 'n nuwe beroepskategorie in tandheelkunde haalbaar is. Die hipotese van die studie is dat denturisme 'n meer koste-effektiewe wyse is om kunsgebite direk aan die publiek in die Wes-Kaap Provinsie te verskaf.

Beleids-relevante inligting is versamel deur middel van 'n sosio-epidemiologiese opname van volwassenes ouer as 20 jaar en alle kategorieë mondigesondheidswerkers in die Wes-Kaap Provinsie. 'n Voorloper- en kalibrasie studie is vooraf uitgevoer. Gedurende die opname is 'n sistematiese herondersoek van individue ook uitgevoer om die ondersoeker-konsekwentheid en respondent variasie te monitor. 'n Totaal van 1787 individue was geselekteer deur gebruik te maak van 'n ewekansige, meer-stadium trossteekproefnemings tegniek. Spesiale maatreëls is met die steekproefneming getref om te verseker dat die demografiese en sosio-ekonomiese eienskappe van die studiebevolking goed verteenwoordig was in die steekproef. Die opname van volwassenes het 'n kliniese ondersoek en gestruktureerde onderhoud behels. Die data was afsonderlik nagegaan vir koderingsfoute en verwerk op die hoofraam rekenaar van die Universiteit van Stellenbosch. Die data is statisties ontleed deur van die SAS-program gebruik te maak. Die steekproefneming en statistiese ontleding van die data was uitgevoer in samewerking met 'n senior statistikus by die Departement van Statistiek, Universiteit van Stellenbosch. Die demografiese en sosio-ekonomiese profiel van die studiebevolking is verkry vanaf sensusdata wat ontleed is op die hoofraamrekenaar. Sensusdata is verkry om te bepaal of die

steekproef verteenwoordigend van die populasie was, om veranderlikes te weeg en om ekstrapolasie van die steekproefdata na die populasie uit te voer.

Die sosio-demografiese eienskappe van die steekproef het gunstig vergelyk met dié van die populasie in die sensusdata. Die steekproef kon dus as redelik verteenwoordigend van die populasie in die Wes-Kaap Provinsie beskryf word. Ondersoeker en respondent konsekwentheid was matig tot substansieël aanvaarbaar vir al die veranderlikes wat bestudeer was en het derhalwe aan die nodige wetenskaplike vereistes voldoen.

Die resultate van die sosio-epidemiologiese opnames het die volgende beleidsrelevante inligting uitgelig. Die hoë gemiddelde voorkoms van tandkaries by volwasse kleurling en swart persone dui aan dat tandkaries tot 'n groot mate onbehandeld is in hierdie bevolkingsgroepe terwyl dit toereikend by blankes behandeld is. Kleurlinge wat nog tande gehad het, het gemiddeld 10 tande afwesig gehad in vergelyking met 7 en 5 afwesige tande by blankes en swartes respektiewelik. Ongeveer 44 persent van die steekproef was tandloos gewees. Die hoogste voorkoms van tandloosheid het voorgekom by kleurlinge (54,4%) en blankes (49,6%). Slegs 13,8 persent van die swartes was tandloos. Twintig persent (20%) van tandlose kleurlinge het geen kunsgebitte gehad nie. In vergelyking hiermee het 5 persent van die tandlose swart en 1 persent van tandlose blanke individue, geen kunsgebitte gehad nie. Die voorkoms van tandloosheid het betekenisvol toegeneem met 'n afname in sosio-ekonomiese status van die bevolking ( $p < 0,00001$ ). Daar was 3,4 persent kleurlinge, 65-jaar en ouer, wat 21 en meer funksionele tande in die mond gehad het, terwyl 44

persent van alle swart individue, 65-jaar en ouer, nog 21 of meer funksionele tande in die mond gehad het.

Volwassenes het 'n relatiewe lae waarde op die behoud van hulle tande geplaas. Vier-en-vyftig persent (54%) van individue wat nog tande gehad het, het aangedui dat hulle graag van hulle oorblywende tande wou ontslae raak. In verhouding tot die ander bevolkingsgroepe het kleurlinge die grootste risiko getoon om tandloos te word vanweë die hoë voorkoms van tandkaries en die lae waarde wat hulle heg aan die behoud van hulle tande. Die meeste individue (75%) het 'n tandarts slegs besoek wanneer hulle 'n probleem gehad het. Individue met 'n mediese skema was meer daartoe geneig om gereelde gebruikers van mondigesondheidsdienste te wees. Twaalf persent (12%) van die bevolking wat nog tande in hulle mond gehad het, het aangedui dat hulle van voorneme was om al hulle oorblywende tande te laat verwyder. Feitlik alle individue wat hulle tande wou laat verwyder was ook van voorneme om kunsgebitte te kry (91,7%). Mense in die laer sosio-ekonomiese groepe was meer daartoe geneig om hulle tande te verwyder as individue in die hoër sosio-ekonomiese groepe. Die hoogste potensiële aanvraag vir die verwydering van alle oorblywende tande het by kleurlinge voorgekom (28,4%). Meer as die helfte van alle individue (55,9%) het geglo dat 'n mens ontslae is van baie tandprobleme as jy 'n kunsgebit het. Vyf-en-dertig persent (35%) van individue wat aan die studie deelgeneem het, glo dat die verlies van tande die uiteindelijke resultaat van die verouderingsproses is.

Privaat tandheelkundige dienste was beskikbaar aan 91,8 persent, en openbare tandheelkundige dienste aan 84 persent van die bevolking in die Wes-Kaap Provinsie. Meeste van die individue het te kenne gegee dat tandheelkundige dienste in die Wes-Kaap maklik toeganklik was. Vier en dertig persent (34%) van die studiebevolking het egter nie geweet of openbare dienste, en 16 persent het nie geweet of privaat dienste, in hulle omgewing beskikbaar was nie. Individue wat geen kennis gehad het oor die beskikbaarheid van die dienste in hulle omgewing nie was meestal arm (47%), swartes (32%) en kleurlinge (16%). Privaat tandartse het ongeveer 73 persent van kunsgebite wat tans gedra word, verskaf. Hierteenoor het die staat slegs ongeveer 9 persent en onwettige 'agterdeur verskaffers' ongeveer 14 persent van kunsgebite verskaf. Kleurlinge het meeste van die kunsgebite wat deur 'agterdeur verskaffers' verskaf was (87,6%) gedra. 'Agterdeur verskaffers' het geen formele kliniese of tandtegniese opleiding ontvang nie.

Agt-en-twintig persent (28%) van alle individue het 'n volledige stel kunsgebite en ongeveer 11 persent 'n gedeeltelike kunsgebit nodig. Die behoefte vir kunsgebite deur die individue (24,8%) was effens laer as die normatiewe behoefte wat klinies deur die ondersoeker bepaal was. Die potensiële vraag vir 'n volledige stel kunsgebite was egter veel laer (8,9%). Die potensiële vraag na gedeeltelike kunsgebite was minder as 1 persent van die bevolking wat nog tande in hulle mond gehad het. Die meerderheid van kunsgebitdraers (64,1%) was tevrede met hulle bestaande kunsgebite. Die funksionele en fisiese kwaliteit van kunsgebite wat deur 'agterdeur verskaffers' gemaak was, was baie swakker

as dié wat deur tandartse verskaf was. Mense wat kunstande gedra het wat deur 'agterdeur verskaffers' gemaak was, het ook groter ontevredenheid oor hulle kunsgebite uitgespreek as diegene wat kunstande gedra het wat deur tandartse voorsien was. Daar was egter geen afdoende bewyse wat daarop kon dui dat mense met kunsgebite wat deur 'agterdeur verskaffers' gemaak was 'n groter risiko het om mondslymvliesletsels of afwykings te ontwikkel nie.

Een-en-twintig persent (21%) van die persone wat kunsgebite dra, het gemeld dat hulle van plan was om hulle kunsgebite te vervang. Die meerderheid van mense wat hulle kunsgebite wou vervang, het aangedui dat 'n privaat tandarts hulle eerste keuse as verskaffer sou wees (42,5%). Agt-en-twintig persent (28%) het 'n staatstandarts as hulle verskaffer gekies en 10,5 persent verkies om hulle kunsgebite by 'n 'agterdeur verskaffer' te laat maak. Koste en beskikbaarheid van dienste was die primêre faktore wat die keuse van verskaffer bepaal het.

Die mediese skema tarief vir 'n volle boonste en onderste stel kunsgebite, laboratoriumgelde ingesluit, was ongeveer R1500. Die meeste volwassenes (65,5%) het gemeld dat hulle nie meer as R250 vir 'n volle stel kon bekostig nie. Slegs 1 persent van mense kon 'n kunsgebit bekostig wat meer as R1000 kos. Kleurlinge (74,2%), Swartes (84,3%) en geïnstitutionaliseerde bejaardes (80,2%) kon kunsgebite die minste bekostig. Sewe-en-vyftig persent (57%) van individue was van mening dat tandtegnici toegelaat behoort te word om kunsgebite direk aan die publiek te verskaf mits hulle toereikende opleiding daarvoor ontvang het.

Individue wat denturisme ondersteun het, glo dat dit die koste van kunsgebitte sal verlaag (36,9%) en die kwaliteit van kunsgebitte sal verbeter (33,7%).

Die rangskikking van prioriteite is 'n fundamentele proses by besluitneming rakende die toewysing van hulpbronne. Die verskaffing van kunsgebitte in openbare tandheelkundige dienste word as 'n baie lae prioriteit beskou vanweë die beperkte hulpbronne wat aangewend kan word vir die onbeperkte vraag na noodsaaklike en voorkomende mondgesondheidsdienste. Staatstandartse word tans beperk tot die verskaffing van een vol bo- en onderstel kunstande per maand. Volwassenes wat aan die studie deelgeneem het, het kunsgebitte as 'n lae prioriteit beskou in vergelyking met ander sosiale-, gesondheids- en mondgesondheidsdienste. Die meeste individue wat kunsgebitte as 'n lae prioriteit beskou het (64%), het gesê dat kunsgebitte nie noodsaaklik is nie en dat 'n mens daarsonder kan klaarkom (37,9%). 'n Groot persentasie respondente (15,4%) het ook die mening uitgespreek dat mense self groter verantwoordelikheid vir die gesondheid en behoud van hulle tande behoort te aanvaar. Die meerderheid het saamgestem dat die behandeling van pyn en sepsis en voorkomende sorg die hoogste prioriteit moet geniet. Kunsgebitte het wel 'n groter prioriteit geniet by die laer sosio-ekonomiese groepe en in landelike gebiede. Vyf-en-dertig persent (35%) van mense was van mening dat kunsgebitte wel 'n prioriteit moet geniet omdat kunsgebitte noodsaaklik is vir kouflunksie en dat afwesigheid daarvan 'n mens se gesondheid kan benadeel. In die Kaapse Metropolitaanse gesondheidsgebied praktiseer tandartse, tandtegnici en mondhygiëniste hoofsaaklik privaat. Slegs twee tandterapeute

praktiseer in die openbare dienste in die Wes-Kaap. Vyf-en-veertig persent (45%) van tandartse en 39 persent van tandtegnici het gemeld dat hulle nie besig genoeg in hulle praktyke was nie. Tandartse spandeer ongeveer 10,3 persent van hulle werkstyd op kunsgebitte. In teenstelling hiermee spandeer tandtegnici ongeveer 41,2 persent van hulle werkstyd op kunsgebitte. Beide tandartse en tandtegnici het gemeld dat kunsgebitte ongeveer 20 persent van hulle totale maandelikse omset uitmaak. Slegs 5 persent van tandartse het voorkeur gegee aan die maak van kunsgebitte. In teenstelling hiermee het 38 persent van tandtegnici voorkeur gegee aan die maak van kunsgebitte. Die meeste tandartse (34,2%) en tandtegnici (60,7%) het voorkeur gegee aan kroon- en brugwerk eerder as kunsgebitte omdat dit groter inkomstes genereer.

Vergoeding was die belangrikste faktor wat aanleiding gegee het tot ontevredenheid onder alle beroepskategorieë. Tandterapeute (96,7%) en tandtegnici (48,9%) het groot ontevredenheid uitgespreek oor 'n gebrek aan geleenthede vir professionele ontwikkeling in hulle onderskeie beroepe. Die meerderheid tandartse (66,2%) was ook van mening dat hulle in staat gestel moet word om meer gespesialiseerde funksies te verrig. As motivering hiervoor het hulle aangevoer dat dit 'n breër spektrum van dienste aan die gemeenskap beskikbaar sou stel (23,8%) en gespesialiseerde dienste meer bekostigbaar vir die publiek sou maak (16,6%). Een-en-twintig persent (21%) van tandartse was ten gunste daarvan dat die funksies van tandterapeute uitgebrei word omdat dit die beskikbaarheid van dienste aan agtergeblewe gemeenskappe sou uitbrei (58,8%) en dat dit meer koste-effektiewe benutting van menslike hulpbronne in

die openbare sektor tot gevolg sal hê (53,1%). Die meeste tandterapeute (85,7%) het die mening uitgespreek dat die verskaffing van kunsgebitte as deel van hulle funksies ingesluit behoort te word.

Die meerderheid van tandtegnici (65,2%) was van mening dat daar te veel tandtegnici was om die vraag na kunsgebitte te bevredig, terwyl sewe en dertig persent (37%) van tandartse die mening uitgespreek het dat die voorsiening van tandartse toereikend was om in die vraag na kunsgebitte te voorsien. Tandterapeute (85%) het die mening uitgespreek dat menslike hulpbronne totaal ontoereikend was ten opsigte van verskaffing van kunsgebitte in die areas waar hulle werkzaam was. Die meerderheid tandartse, tandterapeute, mondigiëniste en tandtegnici was van mening dat hulle onderskeie beroepskategorieë meer in die openbare sektor en veral landelike gebiede benut moet word.

Die meerderheid tandtegnici het gemeld dat hulle gedurende die afgelope drie jaar die volgende dienste direk aan pasiënte verskaf het wat na hulle verwys was deur 'n tandarts: herstel van kunsgebitte (84,3%), verskaffing van 'n vol bo- en onder stel kunsgebitte (22,5%); herbasing van kunsgebitte (22,5%); en verskaffing van gedeeltelike kunsgebitte (18%). Die mees algemene rede wat tandtegnici gegee het waarom tandartse hierdie pasiënte na hulle verwys het, was omdat die tandarts nie die behoeftes van die pasiënt kon bevredig nie (62,7%) en omdat die tandarts nie die tyd gehad het om self die pasiënt te behandel nie. 'n Groot persentasie tandtegnici (35,4%) het ook gemeld dat hulle oor die afgelope drie jaar kunsgebitte direk aan die publiek verskaf het, hoofsaaklik as 'n guns vir 'n vriend of familieid. Drie-en-veertig persent (43%) tandtegnici het gemeld dat

hulle kunsgebitte op eie koste moes oormak omdat die tandarts ontoereikende instruksies vir hulle verskaf het. Die meerderheid tandtegnici (69,6%) het ook gerapporteer dat hulle dikwels deur tandartse genader was om kunsgebitte teen 'n verminderde koste te voorsien om die tandarts se volgehoue ondersteuning te verseker. Tandtegnici het verkies om nie werknemers van tandartse te wees nie omdat hulle verkies om onafhanklik te praktiseer as kontrakteurs (32,6%) en omdat hulle finansiële uitbuiting deur die tandartse wou vermy (36,9%).

Feitlik alle tandtegnici (96,7%) ondersteun die beginsel dat denturiste as 'n nuwe beroepskategorie ingestel word en glo dat denturisme 'n meer koste-effektiewe benutting van menslike hulpbronne sal wees (29,7%), dit kunsgebitte meer bekostigbaar sal maak (27,5%) en dat dit die kwaliteit van kunsgebitte sal verbeter (13,2%). Die meerderheid van tandtegnici (83,7%) het ook die mening uitgespreek dat klinies opgeleide tandtegnici ook gedeeltelike kunsgebitte direk aan die publiek behoort te kan verskaf. Die meerderheid tandartse was gekant teen die instelling van denturiste aangesien dit hulle kliniese gebied sou verklein (77,1%) en was van mening dat tandtegnici nie oor toereikende kennis en vaardighede beskik om so 'n diens te verskaf nie. Ongeveer 16 persent van tandartse het die beginsel van klinies-opgeleide tandtegnici ondersteun omdat dit kunsgebitte meer bekostigbaar aan 'n breër spektrum van die gemeenskap sal maak. Meeste tandterapeute (82,8%) het gesê dat hulle ook opgelei behoort te word om kunsgebitte direk aan die publiek te verskaf omdat daar 'n groeiende vraag vir kunsgebit dienste in landelike gebiede is (34,4%). Sewentien persent (17%) van die tandterapeute het die mening uitgespreek dat hulle 'n

professionele verantwoordelikheid het om tande te vervang van pasiënte waarvan hulle tande verwyder het. Agt-en-sestig persent (68%) tandtegnici het gesê dat hulle 'n denturis sou word indien denturisme wettig sou word. Die meerderheid tandtegnici (89,1%) was sterk ten gunste daarvan dat hulle eers toepaslike kliniese opleiding moes ontvang alvorens hulle toegelaat word om te registreer en as denturis te kan praktiseer. Tandtegnici was van mening dat hulle 'n volledige stel kunsgebitte direk aan die publiek kon verskaf teen ongeveer R500.

Die volgende gevolgtrekkings kon uit die studie gemaak word en is slegs van toepassing op die Wes-Kaap Provinsie.

- (i) Tande is noodsaaklik vir spraak en die kouflunksie en speel 'n belangrike rol by die behoud van selfbeeld en sosiale interaksie met mense. Tandloosheid sonder kunsgebitte kan dus 'n mens se lewenskwaliteit kompromitteer.
- (ii) Internasionale en nasionale navorsingsliteratuur dui aan dat daar 'n dalende tendens is ten opsigte van die voorkoms van tandloosheid en die behoefte vir kunsgebitte. Die resultate van hierdie studie dui egter op 'n voortsetting van die tendens van ekstraksie van tande, tandloosheid en vraag na kunsgebitte, veral onder die kleurling gemeenskap in die Wes-Kaap. Die hoë voorkoms van armoede wat onder die kleurling gemeenskap bestaan sal die waarskynlikheid verhoog dat mense hoofsaaklik van 'agterdeur verskaffers' sal gebruik maak vir hulle kunsgebit dienste.

(iii) Daar is 'n behoefte vir en vraag na lae koste kunsgebitte, veral onder die kleurling gemeenskap en bejaarde mense. Daar was nie 'n betekenisvolle vraag na kunsgebitte by swart mense nie. Die behoefte vir en vraag na gedeeltelike kunsgebitte was baie laag.

(iv) Tandheelkundige dienste is geredelik beskikbaar vir die meerderheid van die bevolking in die Wes-Kaap. Slegs diegene wat 'n mediese fonds het of oor toereikende hulpbronne beskik (25%), het toegang tot kunsgebitte in die privaatsektor. Die toeganklikheid tot kunsgebitte in die openbare sektor is egter baie beperk omdat hulpbronbeperkings elke openbare tandarts slegs toelaat om een volledige stel kunsgebit per maand te lewer. Openbare tandheelkundige dienste plaas ook 'n lae prioriteit op die verskaffing van kunsgebitte.

Bejaardes het die grootste probleme met betrekking tot die beskikbaarheid en toeganklikheid tot kunsgebitdienste ondervind.

(v) Koste was die grootste struikelblok vir mense om kunsgebitte te bekom. Die studie kon geen bewys lewer dat kliniese tandtegnoloë die koste van kunsgebitte tot so 'n betekenisvolle vlak kon verlaag dat dit die toeganklikheid tot kunsgebitte in die Wes-Kaap sou verhoog nie.

Ongeveer twee derdes van die bevolking (65%) kon nie meer as R250 vir 'n vol bo- en onderstel kunsgebitte bekostig nie. Ongeveer 86 persent van die bevolking in die Wes-Kaap kon nie meer as R500 vir 'n bo- en onderstel kunsgebitte bekostig nie, terwyl 13 persent van die bevolking tussen R500 en R1000 vir 'n vol bo- en onderstel kunsgebitte kon bekostig.

Tandtegnici was van mening dat hulle kunsgebitte direk aan die publiek vir ongeveer R500 kon lewer. In effek beteken dit dat ongeveer 86 persent van die marksegment vir denturiste reeds uitgesluit is. Die residuele marksegment waarop kliniese tandtegnoloë derhalwe moet fokus is pasiënte wat tussen R500 en R1000 kan bekostig (13%). Alternatief sal denturiste met tandartse moet kompeteer om kunsgebitte aan pasiënte met mediese skemas te verskaf.

Indien kliniese tandtegnoloë die aanbevole kliniese tarief met 50 persent verminder, sal die koste waarteen hulle 'n kunsgebit kan lewer R1200 wees. Sodanige afname in tarief regverdig nie die implementering van kliniese tandtegnoloë as 'n nuwe beroepskategorie nie.

(vi) Verbruikers en verskaffers beskou kunsgebitte as 'n lae prioriteit relatief in verhouding tot ander dienste.

(vii) Die persepsie dat daar 'n oorvoorsiening van tandartse en tandtegnici is, tesame met 'n verswakte ekonomie, word tans as sterk motivering voorgehou vir die behoefte vir uitbreiding van funksies in die mondgesondheidsberoepe.

(viii) Onwettige lewering van kunsgebitte deur tandtegnici in die Wes-Kaap was nie betekenisvol nie. Ongekwalifiseerde persone, of sogenaamde 'agterdeur verskaffers', was die grootste onwettige verskaffers van kunsgebitte. 'Agterdeur verskaffers' het meer kunsgebitte aan die mindergegoede gemeenskap verskaf as wat die Openbare Gesondheidsdienste kon verskaf het.

Mense wat kunsgebitte benodig, het die behoefte uitgespreek dat kunsgebit verskaffers oor toepaslike kliniese opleiding moet beskik, kwaliteit sorg moet

lewer, professioneel en betroubaar moet wees, en dienste moet ook toeganklik en bekostigbaar wees.

(ix) Die behoefte vir die instelling van denturisme het oorspronklik ontstaan vanweë the swak professionele verhouding wat tussen die tandarts en die tandtegnikus geheers het. Hierdie situasie is verder vertroebel deur die oorvoorsiening van tandartse en tandtegnici asook die tandtegnikus se behoefte vir groter onafhanklikheid. Meeste tandtegnici ondersteun denturisme terwyl tandartse dit sterk veroordeel. Die meerderheid van die bevolking ondersteun egter denturisme omdat hulle van mening is dat dit die koste van kunsgebitte sal verminder en die kwaliteit van kunsgebitte sal verbeter.

(x) Die resultate van hierdie studie kon nie die hipotese bevestig dat die instelling van denturiste (kliniese tandtegnoloë) 'n koste-effektiewe wyse sal wees om kunsgebitte aan die publiek in die Wes-Kaap Provinsie te verskaf nie.

Die beleidsaanbevelings wat uit hierdie studie vir die Wes-Kaap gemaak word behels die volgende:

(i) Pogings en hulpbronne moet hoofsaaklik toegespits word op mondgesondheidsbevordering en siektevoorkoming eerder as die ekstraksie en vervanging van tande.

(ii) Kunsgebitte behoort 'n laer prioriteitstatus in die openbare sektor te geniet. Kunsgebitte moet nietemin aan geselekteerde gevalle in die openbare sektor verskaf te word mits toereikende hulpbronne daarvoor beskikbaar is.

- (iii) Denturiste (Kliniese Tandegnoloë) behoort nie as 'n nuwe beroepskategorie ingestel te word nie.
- (iv) Die funksies van tand-/mondterapeute moet uitgebrei word sodat dit die verskaffing van kunsgebitte insluit. Dit sal meebring dat kunsgebitte meer toeganklik sal wees vir mense wat kunsgebitte benodig in areas waar daar nie toereikende voorsiening van tandartse is nie. Uitgebreidê funksies moet beperk word tot die verskaffing van vol bo- en onderste gebitte.
- (v) Insluiting van 'agterdeur verskaffers' in die bestaande kunsgebit diensleweringstelsel is 'n unieke geleentheid wat eerder ondersoek moet word pleks daarvan om energie en hulpbronne te fokus op die eliminering daarvan.
- (vi) Enige toekomstige wetgewing rakende die verskaffing van kunsgebitte en uitbreiding van funksies moet die belange en welsyn van die pasiënt beskerm.
- (vii) Pasiënte moet onder geen omstandighede geskei word van die roetine toesighoudende en instandhoudende sorg wat deur 'n tandarts verskaf word nie.
- (viii) Opleidingsinrigtings moet ondersoek instel na die bestaande en toekomstige behoefte vir tandartse en tandtegnici en die inname van nuwe studente sodanig aanpas om oorvoorsiening te voorkom.
- (ix) Verdere studies behoort onderneem te word om die behoefte vir en vraag na tandtegnici te bepaal; 'n kosteberaming om 'n realistiese waarde vir 'n volle kunsgebit vas te stel; en om die invloed van waterfluoridasie op die insidensie van tandloosheid te ondersoek.

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**DEDICATION**

This work is dedicated to my wife

RETHA

and our children

RUDOLF AND DIVAN

who patiently supported and encouraged me to achieve this important milestone  
in my career

Information and data can never be understood in isolation from the context of ideas, which give them meaning. And it is these frames or modes ... which are crucial for any creative work; for without them, we have no question to ask.

- Martin Rein, **Social Science and Public Policy (1976)**

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## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1. Prosthetic oral health care's contribution towards oral health and quality of life**

Health is not merely the absence of disease. The World Health Organisation (1) has defined health as a state of physical, mental and social wellbeing. In recent years the definition of health has broadened to include aspects of comfort, quality of life and the ability to be a productive member of society (2). The impact of oral health disorders and disease on the quality of life has also in recent years received much attention. Most individuals generally consider a healthy dentition as a desirable component for functional and social wellbeing in a society. Prosthetic oral health care is generally indicated for tooth replacement to improve aesthetic needs, social functioning and ease of mastication. These factors are important aspects of oral and general health (3).

Edentulousness, lack of dentures or poorly fitting dentures may all compromise the quality of life (4, 5, 6, 7).

Edentulousness is a common condition in the adult population and its occurrence in people over 60 years of age has frequently been stated to be

the rule and not the exception (6, 7). Research has indicated that the ability to reduce the particle size of food decreases with the deterioration of the natural occlusion (8, 9, 10). Various studies have also indicated that food choices and the ability to chew food are severely compromised for those who are edentulous or who have poorly fitting dentures (11, 12, 13, 14, 15).

An inadequately functioning dentition resulting from ill-fitting dentures or lack of dentures may result in poor oral health (16). Thus restoring the mouth to optimal occlusion is generally considered a desirable and necessary state to ensure an acceptable level of oral well-being (free of discomfort and disease), functional well-being (speech and mastication), psychological well-being (self-esteem) and social well-being (social acceptance and interaction) (17, 18). Communicating clearly by speech, feeling comfortable in public preserving one's self-image and enhancing social interaction and social acceptability are functions that are valued as part of daily living and therefore play an important role in the individual's quality of life (19).

In view of the above mentioned, prosthetic oral health care can therefore be considered an essential component of a comprehensive primary oral health care service in any health care system.

## **1.2 Motivation and relevance of the study**

Disadvantaged individuals or socially deprived communities such as the indigent, the elderly and people living in rural areas either have no financial

means for obtaining oral health care or services are inaccessible or unavailable. Owing to inadequate and unequal distribution of human resources for health (20, 21, 22), the ever increasing demands for care within a system that is handicapped by financial constraints and the high costs involved with care (23, 24, 25), the oral health care system in South Africa can best be described as inadequate and unaffordable.

Restructuring and reform of health care systems and their varying ability to meet the growing demands of the population, within its economic constraints, has been the subject of intense contemporary debate, not least in the new South Africa.

Work force options for oral health, including denturism, have been part of a continuing debate during the past decade.

Viewed against the background of a new policy direction of providing services on a more equitable, accessible and affordable basis, a range of manpower conferences was held under the auspices of the Committee of Dental Deans. The aim of these conferences was to plan an appropriate oral health care work force for South Africa for the year 2020. One of the recommendations resulting from the above mentioned proceedings is that removable prosthodontics be added to the tasks of dental therapists, or alternatively, that consideration be given to establishing denturists<sup>1</sup> as a new occupational

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<sup>1</sup> A denturist is a highly skilled dental technician who has specifically been trained for the clinical aspects, as well as to design, make, produce, reproduce, construct, furnish, supply, alter or repair any prosthetic denture, including full dentures, removable dentures, repairs,

category, provided a demand is identified and a cost-effective service can be guaranteed (26).

Public health policies, which focus on establishing an appropriate oral health care work force that is able to meet the needs and demands of society, should not be guided by emotion but by a thorough understanding of relevant, valid and reliable information. Such understanding can only be achieved through critical analysis of relevant data obtained by means of socio-epidemiological methods.

Essential epidemiological information that is required includes the demography of the population, the dentition and denture status, utilisation and need for services as well as the attitudes and beliefs of the adult population and oral health care providers. Such information is essential because it forms the basis for policy decisions regarding the planning for dental and human resource programs.

No comprehensive study has ever been conducted on a regional basis in the Western Cape Province to provide such information. Although the National Oral Health Survey provides very important information on a national level its usefulness on a regional level, such as this study, is very limited because information on the elderly and rural populations were not included in the survey.

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reline and mouthguards, and for such purposes deals directly with the person for whom the prosthesis is intended (27).

### **1.3 The development and present status of the South African healthcare system**

Development and reform of healthcare systems and their ability to meet the growing demand of the population, within the economic constraints, has been the subject of intense contemporary debate, not least in the new South Africa. Work force options for oral health, including denturism, have been part of a continuing debate during the past decade.

Healthcare, like all other systems, is in a continuous process of development. To know what the future holds one must know and understand one's origins. The purpose of this chapter is therefore to provide the reader with a concise overview of how the healthcare system in South Africa and, in particular how the oral healthcare system emerged and developed to its current status.

Since the establishment of a permanent refreshment station at the Cape by the Dutch East India Company in 1652, two divergent medical or health cultures have developed. Firstly, the western model, which has played a dominant role and secondly, the traditional health care system, which has mainly been ignored and dismissed (28, 29). Western medicine was characterised by a professional-scientific orientation whilst the traditional tribal medicine was characterised by a magico-religious orientation to health, illness and care. These divergent health cultures remain a feature of South African health care to this day.

The emerging structural features of the South African health care system at unification in 1910 were characterised by (i) a physician- and hospital- centred care system with strong emphasis on curative care, (ii) heavy concentration in urban areas, (iii) racial differentiation, (iv) a mixed structure in which both private and public systems provided and financed care and (v) a distinctly fragmented structure lacking co-ordination and control (29).

The capitalistic political economy accentuating the principle of free-market health was already firmly established.

During the 80 years following unification, the health care system was able to cope with chronic /degenerative disease among the affluent, for whom care was provided by a health care system in specialised and super-specialised hospitals in which high technology had been introduced for diagnosis and management.

The 'irdependent homeland' system and a tricameral parliament with 14 Ministries of Health further fragmented the two-tier health care system. Major structural and functional disparities in the healthcare system developed that impacted on the different racial and gender groups. Furthermore, the urban/rural distribution of health practitioners and created a marked disparity between expenditure on preventive and curative services and the *per capita* expenditure on different population groups (29).

The rapid urbanisation of whites and the prevention of black urbanisation through pass laws and the creation of the 'homelands' aggravated the effects

of racial segregation on the growth and development of health services for the blacks (28, 29).

The private sector grew strongly under the influence of a system that tended towards capitalism and which emphasised the concept of self-reliance rather than social responsibility for the health care of all citizens (30).

Public sector growth took place under the influence of government-acknowledged responsibility for the old and the poor, the nationalisation of mission hospitals and the growth of academic training hospitals as a major component in the health care structure (30).

Healthcare was gradually upgraded, facilities and personnel increased, institutions diversified and numerous adaptations and amendments were made to health policy and legislation. Many inequalities and discrepancies in the healthcare system however, still exist.

Despite the above mentioned trend towards continuation and reinforcement of the pluralistic and racial characteristics of the South African healthcare system, some significant markers of fundamental change pointed towards the radical restructuring of the long prevailing system of healthcare in the opposite direction.

Van Rensburg (29) noted three significant markers of fundamental change during the past century. Firstly, the Gluckman Commission of Inquiry (31), which pleaded for a national health service (NHS) whereby the state assumes

ultimate legislative and financial responsibility for the provision of health services for all, on a basis of need instead of means.

Secondly, the 1955 Freedom Charter of the African National Congress (32), which proposed a socialist health system. The Charter stated that to achieve health the expression and will of the people should be met, i.e. community involvement in health matters.

The third marker of fundamental change in South African health care occurred since the middle 1980's. Various civic and professional organisations, such as the National Medical and Dental Association, the Progressive Primary Health Care Association and the South African Health Workers Congress pleaded for a more unified, national health service and a more socialised health care system that is capable of meeting a wider spectrum of needs within our society (29).

The basic features of the current health care system today are portrayed by Van Rensburg (29) as follows:

- (i) A dominant modern, Western, scientific and professional health care system.
- (ii) Curative and institutional health care is emphasised above and at the cost of primary, preventive and community health care.
- (iii) Colour segregation, apartheid and racial fragmentation still plays a central role.

- (iv) A pluralistic control, supply and financing of services in a complex private and public system.
- (v) Structural, financial and geographical fragmentation of the health care system.
- (vi) A rural-urban disparity with white urban privilege.

Van Rensburg (29) described two main categories of structural problems in the health care system as supply related and secondly, need and demand related. Supply-related problems included inadequate resources for health care, organisation of resources into a fragmented market place orientated system and a lack of clearly formulated health care policy. Van Rensburg (29) also stated that *"the shortages of resources originate and exist in South Africa as a result of limited financial means of the majority of the population, inadequate manpower, limited growth potential of means and manpower, drainage of manpower to other sectors and countries and the escalating demands of an exploding population growth which is in obvious imbalance with the ability of the country to meet such demands."*

Other functional problems included the maldistribution and ineffective utilisation of existing human and material resources that resulted from deficient management and organisation of health services and facilities.

Maldistribution, malutilisation, overlapping, duplication and wastage of human and material resources are features typical of a pluralistic (or free-market) health care system (33, 34).

Health service facilities and providers were increasingly concentrated in the urban areas. The rural areas, on the other hand had inadequate health care personnel and facilities. For the coloureds and, especially, the blacks, urbanisation proceeded much more slowly. The urbanised population groups - the whites and Asians - accordingly enjoyed the benefits of the urban-concentrated health services to a greater extent (29).

The nature and range of inequalities and discrepancies in the health care system are illustrated in more detail in various scientific (29, 35, 36) and political publications (31, 37, 38).

According to Van Rensburg (29), the problems with the South African health care system resulted from the deficiencies in planning, co-ordination and integration of services as a result of racial, control, functional and geographical fragmentation.

Racial discrimination, apartheid policies and market principles have played a key role in creating inequality, inaccessibility and unaffordability in the provision and distribution of services and facilities as well as injustice and discrimination in response to needs and demands for health care (29, 30).

South Africa, with its new political dispensation, is currently in a state of revolutionary change aimed at establishing equity on all levels of society. In line with these changes, all systems and services are being re-evaluated to determine whether they were still appropriate and adequate to meet the needs of the total population of the New South Africa.

Dentistry has also not lagged behind in the quest for fundamental change. Following various meetings and conferences since 1985 on an optimal oral health care workforce for South Africa, several major issues were identified that will be of decisive importance to the future of dentistry in South Africa (39). Children and basic care, which include primary prevention, minor restoration and relief of pain and sepsis, were identified as high priorities. It was also recommended that the number of dentists be reduced and auxiliaries be increased.

#### **1.4 Historical background to the development of dentistry and the dental laboratory craft**

In order to provide a background to the data contained in this study, a brief history of the emergence of dentistry and the dental technician profession, the legislation regulating the profession and the state of these professions in South Africa today, are presented. The history and development is well documented by The Dental Technicians Society of South Africa (40), Grobler (41) and Du Plessis and Malherbe (42). A brief summary is given of the most important incidents from these reviews.

##### **1.4.1 The early period of dentistry**

Prior to the nineteenth century dentistry was mainly practised by barber surgeons, medical practitioners, chemists and untrained people (41). These

practitioners had no scientific training and were mainly involved with the extraction of teeth.

Because medical practitioners, in addition to their medical calling practised dentistry in the early years as a craft, no mention was made of the dentist in the first legislation that was passed in 1807 to control medical practitioners.

The first Act that defined a dentist was Act 34 of 1891 of the Colony of the Cape of Good Hope. Various acts were subsequently passed during the late nineteenth century to make provision for the registration of dentists and by the turn of the century all four provinces, as previously known, had some form of legislation controlling a dental register (41).

Later the necessity obviously arose by those practising dentistry to fill the spaces caused by the extraction of teeth. Consequently the era of mechanical dentistry was initiated. The demand for expensive dentures grew as more teeth were extracted.

As his practice grew, the early dentist required assistance to help relieve the demand for artificial teeth. The dentists allowed men, who were not qualified, to make dentures in their laboratories. After some years of work the assistant, with the limited training, which he received from his employer, blossomed forth as a dentist or practised the craft of the dental mechanician.

Prior to 1900 legislation referred to a dentist, but did not differentiate between a surgical dentist and a mechanical dentist; neither did it mention dental mechanicians.

The next logical step in the development of the dental profession was the establishment of schools for the teaching of dentistry. Teaching was divided into two branches, namely the surgical or the conservation of natural teeth and the mechanical or the making of artificial teeth.

As the dental profession grew it diversified into many branches and specialities. To increase productivity dentists have opted for delegating certain tasks to auxiliary personnel. The first type of auxiliary to develop was the dental technician.

Initially, the laboratory craft grew up and remained in an adjunctive position to the dental profession for many years. Dentistry during its early years mainly consisted of extraction of teeth and their replacement with dentures (41). Extraction of teeth and replacement with dentures was generally considered as the normal sequence of events and the eventual result of dental disease. The dentist primarily worked alone and performed all the dental laboratory work himself.

As time went on, developments took place, which changed the type and method of practice. Restorative dental materials, techniques, anaesthetics and dental equipment gradually improved, bringing a new dimension to dental care. People increasingly developed an appreciation for the value of natural teeth and a desire to retain them as long as possible. These changes, along with an improved socio-economic situation, resulted in an increased demand for dental treatment. Dentists subsequently spent more time on restorative procedures, delegating laboratory procedures to other people who worked in

the dental office. This work was taken over by persons who were apprenticed, usually with a dentist, but increasingly with other technicians. Those conducting laboratory work were called dental technicians or dental mechanics (43).

A trend developed in which dental technicians established their own laboratory and solicited business from a number of dentists because their time was not fully utilised in the dental office. This trend subsequently led to the establishment of commercial dental laboratories. The idea of a central dental laboratory outside the dentist's office was conceived in 1854, but not until 1887 was the dental laboratory industry founded officially (43). Dentists increasingly began to delegate more laboratory procedures. Most dental laboratories remained fairly small, were in close relationship to the dentists and provided a personalised service, whilst others, developed assembly line procedures as the demand for their services increased (44). New employees were hired and trained on the job to whatever level of proficiency was required. There was no selection process, few training programs and no established standards (44).

People working in dental laboratories became accepted as dental technicians. Their degree of skill and ability varied greatly. Eventually two broad groups developed which were classified as dental laboratory owners and dental laboratory technicians or employees (44). Because the employees often earned very little, some dental technicians began to supplement their incomes

by working directly for the public in contravention of the laws regulating dentistry.

As the demand for their services increased, some began to work directly for the public. As the dental laboratory industry grew, those who made dentures only for dentists became known as dental technicians whilst those who made dentures directly for the public were referred to as dental mechanics.

During the early period of its development dentistry and its sphere of work were ill defined. A need was realised to have one uniform Act to regulate the activities of dental, medical and pharmaceutical practitioners. Various Bills were tabled and dropped in Parliament between 1910 and 1918, until in 1919 the Medical Practitioners and Dentists Registration Amendment Bill was promulgated as Act 21 of 1919 (545).

#### **1.4.2 The battle to eliminate the illicit provision of dentures**

There were various categories of people practising dentistry. Firstly, there were those who received formal education in dentistry in dental schools. Secondly, there were those who received in-service training from a dentist as part of a formal apprenticeship. Thirdly, there were dentists-assistants who did the work of a dentist under the control and supervision of a duly registered dentist. The latter were prosecuted when they did the same work privately. Lastly, there were also the "quacks" that had no training and no legal rights. Animosity existed between the various groups, which led to prosecution of

those who practised illegally. The majority of cases involved the supply of artificial dentures (42).

The definition applying to a dentist and dentistry were not clear; neither was the sphere of their work demarcated. Many persons carrying out illicit practices were in fact skilled dental mechanics commanding excellent salaries from dentists. They derived an additional income from their illicit work. Because they were difficult to replace, a blind eye was sometimes turned by the dentists (45).

Various Bills, aimed at curbing the illicit practice of dentistry, were unsuccessfully tabled in Parliament between 1910 and 1920.

After 1922 various Bills went to Parliament and were dropped by the House of Assembly or referred to a Select Committee for evidence. In a Select Committee hearing in 1923 evidence was presented for the case of "dental mechanics" by four persons not registered as dentists, but were practising "Mechanical dentistry", a term they preferred to use. (46). In their presentation they expressed their opposition to "enslaving the mechanic to the dentist" and pleaded for Mechanical Dentistry as an independent profession with its own register.

The Dental Association of South Africa was inaugurated on the 15th April 1922 and united its members in their battle against illicit practice.

The Medical, Dental and Pharmacy Bill was tabled for the last time in 1928 and promulgated as The Medical, Dental and Pharmacy Act of 1928 (Act

No.13 of 1928) (546). This Act was referred to as the “Magna Carta” of the dentists and its aim was to regulate the legitimate practice of dentistry in the Union of South Africa. The Act made provision to prosecute anybody infringing on whatever right of the dentist. It was hoped that the Act would stamp out illicit practice. However, the ‘*repair clause*’ was left out and the dental mechanician still had access to the public and was able to provide a repair service directly to the public.

Dental mechanics viewed Act No.13 of 1928 as a piece of oppressive legislation with the object of placing the dental mechanician in a position subservient to the dentist and the monopoly of the trade in the hands of the dentist.

Soon after the passing of the Medical, Dental and Pharmacy Act, dental mechanics presented their case for greater recognition and the establishment of an independent profession that would not be enslaved to the dentists.

Milton C Skinner (45), later chairman of the Transvaal Dental Mechanics Association said: “*We do not aspire to the status of the dental profession, but to a status which will give us the respect of the dental profession and enable us to work at our own evolution in dental mechanics.*”

During this time, dentists and dental mechanics were equally guilty of employing improperly trained apprentices and the illicit practice of dentistry.

Nowhere was the status of the dental mechanic clearly defined and there were no standards to regulate training.

On 20 October, 1928, the Medical Council, empowered by Section 32 of the Medical, Dental and Pharmacy Act, passed the controversial resolution "*that the Council open a register for dental mechanics and as soon as reasonably possible draw up rules under which they may carry on their calling.*"

The South African Dental Association and the South African Registered Dental Mechanics Association both approved of and advocated the principle of registration.

It was clear to both dentists and dental mechanics that setting up a register would be a positive step towards solving the problem of illicit practice. The concept received support and opposition from both camps.

For many years consensus on the status and field of work of the dental mechanic could not be reached. Dentists employed most of the dental mechanics. It was especially convenient for dentists in rural areas to have their own dental mechanic because postal and transport facilities were unreliable. The working environment of "dental mechanics" was poor, working hours were long and wages meagre (42). There was no formal apprenticeship and anybody could be employed and taught the craft. This legitimate employee had no legal status or protection and thus always felt threatened. Some "dental mechanics" escaped from this working environment and opened their own commercial laboratories from which they worked for various dentists on a piecework agreement. Each laboratory had its own

price-list for piecework, often dictated to them by the dentists. The lower the price of piecework, the higher the volume of work contracted by dentists. The latter situation caused an increase in the employment of half-trained "dental mechanics" (42). Half-trained dental mechanics also resorted to "quacking"<sup>2</sup>, often with materials pilfered from their employers (42). At this stage "dental mechanics" still had no legal status.

Dental Mechanics Societies all over the country were now in the process of constituting the South African Dental Mechanics Association with the object of bettering the conditions of dental mechanics in the Union of South Africa to organise and demarcate the work sphere of "dental mechanics". The South African Dental Mechanics Association (SADMA) was inaugurated in Pretoria on 2 December, 1929. Eight regional societies were present. SADMA could now act as a mouthpiece for legitimate dental mechanics.

The two major objectives of the South African Dental Mechanics Association were compulsory registration and the abolition of the illicit dental practitioner.

Round table conferences were held and resulted in the DASA formulating several proposed Bills. These Bills were never tabled in parliament because all parties concerned could never reach agreement. Some dental mechanics felt that the proposed Bills would restrict them too much and that the protection they offered to guarantee could never be enforced. Other

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<sup>2</sup> "Quacking" refers to the illegitimate provision of dentures directly for the public by someone

dental mechanics regarded their right to deal directly with the public as not negotiable. Another section of the craft believed that the Act should make provision for a 'prosthetic dentist' or a dental mechanic who offered all disciplines of prosthetic work directly to the public.

During the period between 1930 and 1945 the country suffered a severe economic depression, changes in government and was involved in the Second World War. Dentists whose practices had declined due to the depression no longer employed dental mechanics. In order to survive these unemployed mechanics turned to illicit practice. The economic situation made it easy for the illicit practitioner, also called "the dental pirate", to canvass for patients and his lower prices appealed to those under economic stress.

A vicious circle developed as those dentists who were deprived of work by the illicit practitioners worked in collusion with the unqualified and illicit dental mechanic. One of the consequences of illicit practice was the undercutting of fees by dentists. As this illicit practice of dentistry progressed, the relationship between the dentist and dental mechanic deteriorated.

Compulsory registration seemed to be the only way to stamp out illicit practice. If the Act were so amended to provide for compulsory registration, it could provide for the confiscation of the laboratories and surgeries belonging

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who has not received formal training to do so.

to illicit practitioners. A conviction under the Act would also mean the removal of the person's name from the Dental Mechanics Register.

In 1931 the Executive Committee of the South African Medical Council recommended that the rules for the examination and registration of dental mechanics be adopted and that arrangements be made for the examinations. The rules made by the South African Medical Council were published in the Government Gazette in July 1931.

*"Any person who has for five years prior to March 31, 1931 been engaged in the Union of South Africa in the work of dental mechanic, which work was his sole or principle occupation and produce a certificate to that effect to the Council from a registered dentist or from a registered dental mechanic to the profession; and on or before September 30, 1931 makes application to the council for registration as a dental mechanic; and produces evidence of good character to the satisfaction of the Council; and passes an examination to the satisfaction of the Council will, on payment of a fee of one pound be registered as a dental mechanic."*

This first register remained a voluntary register. If all dental mechanics responded to this first step, the way would be paved for compulsory registration.

Although viewed by most dental mechanics with grave suspicion, the register was the first step to help the dental mechanics escape from a deplorable set of working conditions, remuneration and training facilities.

Meanwhile it was becoming abundantly clear that the 1928 Act had certainly not stopped illicit practice. Dental Societies reported with concern that a number of registered dentists were making it possible for "quacks" to pursue their illegal activities. In an attempt to make headway the Department of Labour convened a conference of dentists and dental mechanics. The issues to be discussed on the agenda were the merits of voluntary versus compulsory registration, examinations, controlled apprenticeship, the regulation of working conditions and wages by means of the Industrial Conciliation Act and the structure of the Dental Mechanics Organisation in the Union of South Africa. The following resolution was adopted:

*"In view of the misunderstanding, even amounting to suspicion, with which the demands of the dental mechanics to organise are sometimes regarded by members of the dental profession and realising that the craft of dental mechanics is concerned solely with processes usually performed in dental workshops on inert matter in connection with the making of artificial dentures and suchlike, this conference wishes to place on record and unanimously to affirm that its efforts are directed to the improvement of the craft of dental mechanics and that there is no intention of encroaching in any way whatsoever upon the professional prerogatives of dentists." (46).*

It was clearly stated that the illicit mechanic posed a threat to the legitimate mechanic. Compulsory registration would eventually separate the illicit dental mechanic from the legitimate craftsman. It was thought that once

illicit practice had ceased, dentists would be able to pay higher wages to the legitimately registered dental mechanician.

It was reaffirmed that there should be only two types of person dealing with the making, repairing and supplying of dentures. Firstly, the dentists, dealing directly with the patient, as the supplier and secondly, the dental mechanician, who would be responsible to the dentist for carrying out the processes required of him in a workshop.

With regard to apprenticeship it was resolved that the Minister of Labour be requested to establish an apprenticeship committee in terms of Section 11 of the Apprenticeship Act. The Conference concluded that regulating wages and conditions of employment of dental mechanicians under the Industrial Conciliation Act was not the final solution to the problem.

At a special meeting of the South African Dental Association held on 4 January, 1933, a draft Bill called "*Bill to regulate the status of dental mechanicians*" (547) to give effect to the desire expressed for a compulsory register, was suggested. The general policy of the Bill was endorsed by the branches of the South African Dental Association (SADA), most branches of the South African Dental Mechanicians Association (SADMA), the South African Medical Council and the Department of Public Health. The Cape Society of Dental Mechanicians, however, opposed the Bill because it feared that if dental mechanicians fell under the Medical Council, they would never obtain relief regarding wages and working conditions.

The controversial examination for dental mechanics was held in October 1932 and 100 candidates passed and could now be registered on the voluntary register kept by the Medical Council. It was estimated that the 100 who had registered subsequent to the examination represented only one third of practising dental mechanics. The Medical Council held a further examination to satisfy the Minister that the majority of legitimate dental mechanics were registered before the 1932 Draft Bill could proceed. The Minister dropped the Bill because he was not prepared to consider it until the majority of reputable dental mechanics wanted the Bill. The new government shelved the Bill when the United South African Nationalist Party came into being.

In 1934 the Cape Peninsula Dental Surgeons and Dental Mechanics Joint Voluntary Board was formed. The Board's objectives were to bring the Cape's legitimate dental mechanics and dental traders (suppliers of denture teeth) into closer co-operation with dental surgeons to put an end to illegitimate inroads on the sphere of activities of the dental profession. Also it aimed to provide a means of enquiring into the affairs of salaried legitimate dental mechanics and legitimate piecework laboratories so that they could operate on a sound economic basis. The Board would compile a register with the names of registered dental surgeons, dental mechanics recognised by the Board, individuals performing dental mechanics' work but not recognised by the Board, individuals carrying out illicit practice and dental agencies supplying operative and prosthetic supplies.

The Board was also charged to enquire into and receive information regarding illicit practice and the irregular supplying of materials to individuals carrying out illicit practice and to take steps to end the latter where possible. An important task of the Board was to monitor irregular advertising by dental pirates and to enforce the withdrawal thereof.

The case for the suppression of illicit practices was presented to the Chief of Police. Various persons were convicted and fined. Those who practised illegally were prepared to pay fines repeatedly. If dental mechanics were registered and convicted, they would be taken off the register and it would be unlawful for them to possess unmounted teeth.

#### **1.4.3 “Treaty of Barter” - Professional and social upliftment of dental technicians**

To understand the need for control over the craft from the dental mechanics' point of view, one must first have an insight into the conditions in the craft during those turbulent years.

Apart from the few commercial dental laboratories that employed dental mechanics, dentists employed by far the majority of mechanics. The dentist had a dental mechanic employed on his premises working in a small backroom, often with no ventilation. These workshops seldom had adequate facilities. The distinct odour of the vulcanising process together with the steam involved in the fabrication of dentures made these “sweatshops” extremely unpleasant and unhealthy. Dental mechanics spent long hours

working under these conditions. They were frequently abused as cheap labour. It was easy to replace a demanding employee either with another mechanic or a layman who could be taught to do whatever facet of the procedures that were required in the workshops. There was no formal apprenticeship and anybody could be employed and taught. The legitimate employee always felt threatened and had no legal status or protection.

Poor lighting, space, working conditions and meagre wages created an environment that was not conducive to acceptable labour relations. Some dental mechanics escaped this working environment and opened their own commercial dental laboratories. They received work from various dentists and were paid on a piecework agreement. Each laboratory had its own price list for piecework. Prices were constantly dictated to the dental mechanics. The lower the price, the higher the volume of work they would receive. It became more profitable to the dentist to sub-contract his work to commercial laboratories. This led to an increase in the employment of inadequately trained dental mechanics by the commercial laboratories.

In March 1935 the Executive of the SADMA met the Secretary for Public Health, the President of the Dental Association and other dentists to discuss the demands made by the dental mechanics. Two new points were raised. Firstly, they wished to create a Dental Mechanics Board completely separate from the Medical Council, which would regulate all matters relating to dental mechanics. Secondly, they wanted to provide by law for standard rates of pay. The general feeling was that a Mechanics Board and fixed

rates of pay would compensate for the right to supply and repair artificial dentures.

A conference was held in Bloemfontein in October 1935 and the SADMA proposed the new draft Dental Mechanics Bill. The main object of the Bill would be to establish a Dental Mechanics Board. In so doing, the control of the Medical Council over dental mechanics would be abolished. The Board would have the power to open and maintain a register of dental mechanics who had fulfilled the requirements of the Board. It would determine minimum wages and a scale of minimum payment for piecework. The proposed Bill was very similar to the 1932 draft Bill with the addition of the Board and the determining of fees. At this time dental mechanics were not in any way protected to this extent by legislation.

The Second World War (1939-1945) had broken out and, because there were so many critical issues to be discussed in Parliament, the proposed Dental Mechanics Bill was shelved for the duration. During the ensuing years not much progress was made and the whole dental mechanics question lay dormant.

On 18 February, 1942, a Conciliation Board sat to consider the dispute between the South African Dental Mechanics Association (SADMA), at that time a registered trade union, and 30 dentists, cited as employers, over wages and piecework charges. The SADMA and the Dental Association of

South Africa (DASA) were each represented by four members. The Chief Inspector of Labour acted as chairman of the Conciliation Board and this mechanism became the basis for future negotiations between dental mechanics and dentists.

The dentists' representatives were able to convince the Chairman that they could not agree to the fixing of wages until the whole question of inter-relationships between dentists and dental mechanics was settled. The terms for further negotiations were the following: (i) That the Minister of Labour, in collaboration with the Minister of Public Health, be requested to call a round table conference of representatives of the parties concerned to consider the problems of the dental profession as a whole. (ii) That the dentists' representatives on the Board undertake to recommend to the DASA, in order to stabilise the relationship between dentists and dental mechanics. (iii) Lastly, that the SADMA prepare a full and complete statement of what it considered to be reasonable minimum wages and conditions of employment, prior to the proposed conference.

At a subsequent Federal Council meeting the DASA reaffirmed that the previous decision, that the proposed Dental Mechanics Bill, laying down the principle that no other person other than a dentist should deal with the public and the proposed agreement with dental mechanics regarding wages and working conditions, be invoked. The DASA resolved that if the Minister insisted on a wage agreement without supplementary legislation, the agreement that had been reached would not apply and it would be left to the

Executive to take such steps deemed necessary to protect the rights and interests of dentists.

The significance of this decision lies in the fact that, if a wage agreement had been reached in 1942, the Dental Mechanics Bill would not have reached the Statute Book.

The Secretary for Public Health called for a deputation from the DASA to discuss the relationship between dentists and dental mechanics. The following were the salient points agreed upon: (i) The DASA and the SADMA should interview the Minister of Labour in regard to the Bill, wages and working conditions. (ii) The Minister of Public Health said that, if an agreement were reached, he would be prepared, in principle, to introduce the Bill, already in draft form. (iii) When this was done the Minister of Labour would be asked to introduce the Bill dealing with the remuneration and working condition of dental mechanics.

The list of wages and piecework charges and working conditions was accepted, provided it came into operation concurrently with the promulgation of the Mechanics Bill.

The meeting between the Minister of Labour, the dentists and the dental mechanics was held on 17 December 1942. The Minister would support the Bill should he feel satisfied that proper machinery existed for the control of wages, conditions of employment and for dealing with the unemployment of qualified dental mechanics.

In an effort to expedite the passage of the Bill, the Executive Committee of the DASA formed a Central Bill Action Committee (CBAC) on 1 June 1944. The aim of the CBAC was to assist dental mechanics to organise their craft properly. The CBAC circulated memoranda to every dentist, dental mechanic and Member of Parliament, elucidating the principles underlying the Bill and indicating what benefits would accrue to the public, the dentist and the mechanic. The CBAC marketed the Dental Mechanics Bill as the most advanced piece of social security legislation yet put forward by the government. The CBAC advocated the Bill to be a health measure and a vital step in the interests of public health and because they wanted to improve the working conditions and the status of dental mechanics.

In 1944 Dr. RV Bird addressed the Pretoria Dental Mechanics Association where he admitted that dental mechanics had been exploited and abused in the past. He bartered the right of working directly with the public for a social security charter, formulated by the Central Bill Action Committee of DASA, which included: (i) guaranteed minimum wages, (ii) paid vacations, (iii) out of work insurance, (iv) sick benefits, (v) arrangements that controlled the entrance to the craft through proper apprenticeship, (vi) fixed minimum piece work charges for laboratory owners, (vii) legally controlled dental professional relations with dental mechanics and (viii) a pension fund for employees (47). The Central Bill Action Committee of the Dental Association of South Africa marketed the Dental Mechanics Bill as the most advanced piece of social legislation yet put forward by the Government at that time.

At all the meetings, throughout the Union of South Africa, where the CBAC addressed the dental mechanics, the speakers stressed the following:

- (i) The whole profession of organised dentistry in the Union would oppose to the limit any attempt to interfere with their rights,
- (ii) In principle (and in practice) the dental profession would have the full support of other professions in their stand for the maintenance of professional privileges and standards
- (iii) The universities, which were responsible for maintaining and building up the standards of the profession, would support the dentists all the way.
- (iv) In the near future, every health centre working under a National Health Scheme would have a dental department. These departments would serve the low income group
- (v) Those who hoped to establish relations and who were debating the necessity for cheap dentures, would come up against controlled dental services under government aegis and it was obvious that government controlled centres, with the full support of organised dentistry, would win.

In 1944 the Government decided not to proceed with the Bill. The CBAC resuscitated the Bill and moved down to Cape Town at the beginning of the following parliamentary session. The Dental Mechanics Bill was read in Parliament on 2 March 1945, for the first time. In his opening speech, the Minister of Welfare and Demobilisation, the Honourable Mr HG Lawrence

explained briefly the clauses of the Bill. He dealt with clause 16, the "repair clause" and noted that the loophole in the 1928 Medical, Dental and Pharmacy Act had to be closed and thus make it impossible for dental mechanics to have any contact with the public whatsoever. This made it clear that if this charter were granted, the dental mechanics would, in the interest of the profession as a whole, have to sacrifice their right to do repairs of dentures directly to the public.

The SADMA was dormant and the dental mechanics had no mouthpiece. A rival society, The Dental Technicians Society, was formed to protest against the proposed Bill. The Dental Technicians Society was strongly opposed to the format of the Dental Mechanics Bill. They called the Bill, sponsored by the DASA, "***The Dentists' Dream***". The Society, with limited funds available, drew up a document on "***Dentistry and the Public***" (40), that was submitted to members of parliament in an attempt to present the dental mechanics' views. The booklet explained the fears the dental mechanics had during the 17 years of negotiations and during their daily interaction with dentists.

The Dental Technicians Society regarded the Dental Mechanics Bill as oppressive and claimed that the Bill protected only the self-interest and financial gain of the dentist. Their arguments against the Bill were the following:

- (i) Representation on the Board was not equal and biased in favour of dentists.

(ii) The Labour Committee, whose function it was to establish satisfactory rates of wages and working conditions for technicians, would, like the Board, be controlled by the general body of dentists.

(iii) Dentists arrogated to themselves the position of employers without accepting the responsibility of providing employment.

(iv) The Labour Committee would also not be able to find employment for controlled by the general body of dentists. Those dental mechanics who would be left unemployed because of dentists that could not afford their increased wages. Dentists would find it cheaper to have their work done at piecework rates. As the ranks of the piecework swelled, the pernicious practice of price-cutting would increase.

(v) Dental mechanics would not be able to compete fairly with dentists who established company laboratories. Company laboratories would be refunding to the dentist, by way of dividends on his shares or by director's fees, profits from the making of dentures which would in effect be no less than a discount on the price of a denture.

The Dental Technicians Society of South Africa formulated another Bill called the Prosthetic Dentist's Bill that would be acceptable to them. This Bill was submitted to the Minister of Public Health on 30 September 1944. The Prosthetic Dentist's Bill, however, disappeared into oblivion.

The Dental Mechanics Bill passed the third and final reading on 5 June 1945 and the Dental Mechanics Act of 1945 (Act 30 of 1945) was

promulgated after 17 years of negotiations (548). This Bill closed the "repair clause" loophole in the 1928 Medical, Dental and Pharmacy Act and made it impossible for the dental mechanic to have any contact with the public whatsoever (47). In exchange for this right the dental mechanic contractors were given the right that their piece-rates, payable by the dentist, could also be fixed in a wage agreement. Rules were also included in wage agreements to compel dentists to pay the piece-rates before a stipulated date (47).

The aim of the Dental Mechanics Act of 1945 (Act 30 of 1945) was to put an end to malpractice within the ranks of dental mechanics and to organise its trade. The Dental Mechanics Act made provision for the establishment of a Dental Mechanics Board which would oversee the registration and control of the profession.

The significance of the Act was that anyone, who was not a qualified registered dentist, could not perform dental treatment. There was no interference with the work of the dental mechanic. Illicit practitioners would be prevented from encroaching on the terrain of the legitimate dental mechanic and the registered dentist. The Act made provision for conditions of employment, controlled wages and apprenticeship.

In terms of the Industrial Conciliation Act 36 of 1937 the dental mechanics' Labour Committee negotiated for wage and pension fund agreements. The wage agreement made provision for the minimum wages payable to employees, hours of work, overtime, annual leave, sick leave, termination of employment etc. These privileges were compulsory.

When the Dental Mechanics Act was passed, the dental mechanics' contractor<sup>3</sup> was given the right to include the dental mechanics' piece-rates, payable by the dentists, in all wage agreements. It also included such rules as were necessary to compel dentists to pay the piece-rates before a stipulated date. Variation from these piecework rates would now be an offence and undercutting would once and for all come to an end. A contractor could now generate an income based on the productivity of his laboratory and his own labour.

The Dental Mechanics Act of 1945 immediately uplifted the dental mechanics from a position in which they enjoyed no control or legal privileges and suffered exploitation to a well controlled craft where they enjoyed certain privileges which had not previously existed.

The craft of the dental mechanic was now legally defined and given due recognition. This Act was of historical importance as it was also seen as social legislation, which protected the public from unscrupulous "quacks" who had, in the past, taken advantage of the unsuspecting public.

#### **1.4.4 Deteriorating relations between dentists and dental mechanics on piece-work rates**

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<sup>3</sup> The dental mechanics contractor works for his own account for one or more dentists. He owns his own business and is dependent on the work that he receives from his clients, the dentists. He may employ other dental mechanics to assist him and as an employer is subject to the provisions set out in the wage agreement negotiated by the Dental

During the early 1950's a pension fund was negotiated between Dental Mechanician Employees, Contractors and Dentists on the Labour Committee. In 1951 the Federal Council of DASA passed a resolution instructing dentists on the Dental Mechanicians Labour Committee to do everything in their power to resist the proposed Provident Fund for dental mechanicians in so far as it affected the dental profession. A serious difference of opinion arose between the Federal Council and members of the dental profession on the Dental Mechanicians Board, which culminated in the resignation of these members from the Board.

This attempt from DASA to undermine the pension fund was seen as the first breach of contract. Dental mechanicians persisted in their demand for a pension fund. The matter was discussed at a Labour Committee meeting but the dispute between members prevented a unanimous conclusion. The matter was subsequently referred for arbitration where an agreement was eventually reached. A pension fund was established which an insurance company underwrote. Employers and employees jointly contributed to the fund.

The pension fund's contribution affected the profit margin of dental laboratories. The Labour Committee subsequently met to discuss the question of increasing the fixed minimum contractor charges. This was the start of a never-ending dispute between dentists and dental mechanician contractors over piecework rates.

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Mechanicians Labour Committee. His remuneration for the work done is on a piece-work

In 1961 the Registrar of the Dental Mechanics Board submitted a memorandum to the Board on certain obvious shortcomings of the Act. After full consideration by the Board and all three Associations concerned, it was unanimously agreed to recommend to the Minister the amendment of 14 Sections of the Act. The intentions of the proposed amendments were to facilitate and improve the execution of the Board's administrative duties, introduce training facilities for qualified dental mechanics, improve working conditions for dental mechanics and to increase penalties for persons found guilty of illicit actions.

The Minister did not amend the Act. The piecework fees question was still not resolved and the dentists saw the question as *ultra vires*.

The South African Master Dental Technicians' Association had been requesting amendments to the Dental Mechanics Act since 1965 in order to do away with existing disadvantages. Because of these requests, the Minister of Health instituted an inter-departmental inquiry that commenced in September 1966, known as the "Marr Committee".

In 1967 a Commission of Enquiry into Dental Services and the training of non-white dentists was appointed by Parliament. The Report was published under the chairmanship of Professor J van der Sandt de Villiers (549). The Commission recognised the problem as those g piecework charges. The Commission also reported that it was strange that the number of dental

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basis.

mechanicians on the registers of the Board remained almost constant between 405 and 427 members during the 17 years from 1948 to 1965 whilst during the same period, the number of registered dentists increased from 854 to 1380. In 1948 the dental mechanicians : dentist ratio was 1:2.1 and in 1965, 1:3.3. Most dental mechanicians (52,6%) were employed by dentists, 30,6 per cent by other dental mechanicians and 16,8 per cent were in other employment settings.

The Commission also reported that training was mostly done through apprenticeship. During 1965 a total of 75 apprentices was distributed as follows: 36 with dentists and 39 with dental laboratories. All apprentices did not receive a complete training in all aspects of the occupation. The Commission was of the opinion that the Mechanicians Board and other interested parties should investigate the possibility of introducing shorter and more intensive courses of training than the five years apprenticeship, with the view to the ultimate abolition of apprenticeship itself. According to the Commission the latter system of training was old fashioned and did not fit in with modern developments in regard to the training of auxiliary personnel in the broader framework of health services.

The recommendations of this committee were forwarded to the South African Masters Dental Technicians Association on the 16 July 1968.

A year after the report of the De Villiers Commission was published; the Marr Committee submitted its recommendations to the Department of Health (550).

The Marr Committee recommended that provision be made in the Dental Mechanicians Act for the establishment by the Minister of Health of a Contract Rates Committee whose function would be to determine the rates or basis or principles on which payment should be made for work given out by principals<sup>4</sup> to contractors<sup>5</sup>.

The South African Masters Dental Technicians Association sent the recommendations of the Marr Committee to the Minister of Health on 5 August 1968, requesting implementation thereof. The Minister did not see his way clear to implement these recommendations.

Contractors were caught in a dilemma. On the one hand employees' privileges were well protected under the provisions of the Act, whilst on the other hand, contractors had no control over manufacturing expenses.

Contractors could not increase their income, for no channel existed which could be followed to negotiate a higher piecework fee. Contractors had to rely on round table meetings between the DASA and the SA Master Dental Technicians Association to resolve the matter.

The contractor had no protection against exploitation by dentists who resisted demands for increased contract rates and also refused to negotiate with contractors. Following a long lasting battle between the DASA and the SA Master Dental Technicians Association to negotiate a settlement for

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<sup>4</sup> "Principal" means any dentist who gives out work in the dental mechanicians occupation on contract.

<sup>5</sup> "Contractor" means any person who accepts work on contract in the dental mechanicians occupation whether or not he supplies any or all the materials used in the execution of such work.

piecework rates, the issue was taken to arbitration before the Industrial Tribunal.

On 17 January 1969, an Industrial Tribunal laid down wages and other conditions of employment for employee technicians as well as piecework rates rendered by dental technician contractors to dentists. The Minister of Labour in a Government Notice subsequently published the award on the 23 May 1969 (551). DASA made an application to the Supreme Court for the deletion of all references to mechanics who were contractors to dentists and the rates payable to such contractors. The Supreme Court granted this application which was taken on appeal. The Appellate Division confirmed the decision on 28 May 1970. As a result of this judgement contractors no longer enjoyed the privilege of a legally controlled remuneration system for their work. The promises that were made by the DASA during the "Treaty of Barter" (Act 30 of 1945) were withdrawn and the most important aspect of the Charter which Act 30 of 1945 provided, was repealed. On both sides of the table it was realised that the Dental Mechanics Act (Act 30 of 1945) was outdated and that a new dispensation had to be formulated.

The dentists advocated a Bill that would incorporate the dental mechanic as a para-medical profession under the auspices of the SA Medical and Dental Council. Several meetings were held with the dental mechanics to gain support for their Para-medical Bill.

The proposed Bill was thoroughly discussed and debated. The two associations representing dental technicians at that stage, namely the SA Master Dental Technicians Association (laboratory owners) and the SA

Federal Council of Registered Dental Technologists (employees and contractors) both rejected the para-medical concept. The latter association was specially formed to address this issue.

The South African Master Dental Technicians Association rejected the Para-medical proposal for the following reasons:

- (i) The Marr Committee's recommendations had been ignored completely.
- (ii) The employee dental technician in becoming a member of the para-medical group would find himself deprived of the right to negotiate wages as at present.
- (iii) The dental technician did not necessarily want the right to trade directly with the public, although they recognised their dependence on the dental profession.

The SA Master Dental Technicians Association requested only an equitable reward based on the recommendations made by the Marr Committee. On the other hand, dental technicians that were employed wanted some ensurance that their privileges, which they enjoyed under the Dental Mechanics Act, could be safeguarded.

#### **1.4.5 Statutory regulation of training and determination of tariffs**

In the meantime, increasingly more problems occurred in the apprenticeship training system of dental mechanics. Some apprentices did not have sufficient training in all the aspects of their profession. Furthermore, it was difficult to control the quality of training.

In 1972 the Dental Mechanics Amendment Act No. 43 of 1972 was enacted by Parliament (552). The Bill made provision for the amendments to: (i) the definitions within the Act (ii) the constitution of the Board (iii) the levies payable to the Board (iv) the training of dental mechanics (v) registering of dental technician students (vi) empowerment of the Board to offer training courses (vii) appointment of inspectors (viii) the prohibiting of certain contracts (ix) the prohibiting of employment of certain persons for certain purposes (x) imposing of duties upon laboratory owners and (xi) provision for incidental matters.

After this amendment was passed a Technicon Training Course was introduced at the Pretoria College for Advanced Technical Training. The course offered involved three years of full time academic training followed by a year's training in the laboratory of a registered contractor and finally successful completion of the qualifying examination.

In 1977 the Human Sciences Research Council (HSRC) conducted research into the activities of and demand for dental technicians in the RSA (553). Based on these findings the HSRC stated that the provision of dental technicians should be based on a ratio between dentists and dental technicians of approximately 3,4: 1. They projected the total number of registered technicians in 1981 should fall between 850 and 890 and recommended to the Dental Mechanics Board that more training centres be established to meet the increasing demand for dental technicians. By 1978

technikon training for dental technicians was available at four centres in South Africa, namely Pretoria, Johannesburg, Cape Town and Durban.

On 14 September 1978, the Department of Health published a Bill with the aim of consolidating and amending laws relating to the profession of registered technicians and for providing for matters incidental thereto.

On 21 March 1979, The Dental Technicians Act (Act 19 of 1979) was promulgated (554). This Act entrenched all the original facets of the 1945 charter.

The Act made provision for the continued existence of the Dental Mechanicians Board as a juristic person, namely the South African Dental Technicians Council. The Bill also made provision for executive, education, service conditions, tariff and disciplinary committees.

The primary objectives of the SA Dental Technicians Council were to promote and control all aspects affecting the education and training of dental technicians, to promote good relationships between dentists and dental technicians and to advise or communicate to the Minister information on matters of public importance within the scope of this Act.

One of the most important aspects of this Act was that the Council had to appoint a Tariff Committee to investigate and determine the tariff of fees payable by a dentist to a dental technician contractor for work done.

The Dental Mechanics Board established by Section 2 of the Dental Mechanics Act of 1945 was to continue to exist as a juristic person but should, as from the commencement of that Act, be called the South African Dental Technicians Council.

The purpose of the Council was: (i) to assist in the promotion of dentistry; (ii) to control and to exercise authority in respect of all matters affecting the education and training of dental technicians and the exercising of the practices in the supplying, making, altering, or repairing of prosthetic appliances; (iii) to promote liaison between providers and the standard of the education and training and the manner of the exercise of the practice of dental technicians; (iv) to promote good relations between dentists and dental technicians and other supplementary dental health services personnel; (v) to advise the Minister on the matters falling within the scope of this Act; and (vi) to communicate to the Minister information on matters of public importance acquired by the Council in the course of the performance of its functions under this Act.

The Council was constituted by a balance of all parties who were concerned with the practice of dental technology in the Republic of South Africa, namely five dentists, five dental technicians and one layman.

The Dental Technicians Act also makes provision for the establishment of Executive, Educational, Service Conditions, Tariff and Disciplinary Committees.

In terms of Section 17 of the Dental Technicians Act, *“no person shall practise the profession of a dental technician or be educated or trained as a dental technician unless he is registered in terms of this Act as a dental technician or a student dental technician.”*

Section 20 of the Act provides for a register to be kept of every dental technician and every student dental technician, while sections 21 to 24 provide for powers given to the Council to refuse registration or deregistration and the determination of eligibility for registration.

Section 27 spells out that no person other than a dentist shall for gain: *“supply or undertake to supply any artificial denture or other dental appliance to any person for use by that person.”*

Section 29 provides that no person other than a dental technician contractor or a dentist may be the owner of a dental laboratory. In terms of subsection 4(c), supervision of a dental laboratory is restricted to a dentist, a previously registered dental technician or to a technician with at least three years experience in a dental laboratory. Section 30 of the Act provides for the registration of all dental laboratories.

Section 31 of the Act makes provision for the appointment of inspectors who will have the power to enter at any time any registered dental laboratory or any other premises where there is reasonable cause to believe that any act specially pertaining to the profession of a dental technician is being performed and may make such examination and enquiry as deemed necessary.

Section 32(1) provides that no dental technician may offer, or allow to, or accept from any dentist, discount on the tariff of fees determined under

Section 12(1) (b) of the Act. The Dental Technician may also not offer any commission or remuneration to a dentist.

In Chapter 4 of the Act the Council is given extensive disciplinary powers to control and administer effectively the provisions of the Act.

The South African Dental Technicians Council would now have the power to investigate and determine the conditions of employment of dental technician employees and the tariff of fees payable by a dentist for work done by a dental technician contractor. Dental technicians would now have a mechanism through which piecework rates could be determined and amended. Where the Labour Committee had previously failed, dental technicians now had, to a large extent, what the Marr Committee recommended.

Recently various problems have been identified with the Dental Technicians Act, 1979. A Committee of Inquiry was subsequently established to investigate the problems perceived within the Act. The Committee of Inquiry submitted its recommendations to the newly appointed SA Dental Technicians Council (October 1994) which decided to approach the Minister of Health to amend and update the act.

#### **1.4.6 Dental technicians through towards independent practice**

On 12 February, 1991, a Joint Denturism Ad-Hoc Committee of the South African Federation of Dental Technicians and the South African Dental

Laboratory Association submitted a report titled: "Denturism a new profession" (47) to the Director-General, of the then Department of National Health and Population Development.

In response to the above mentioned report, the Director-General expressed the view that the establishment of denturists as a new occupational category should receive consideration and recommended that the report and motivation be submitted to the South African Dental Technicians Council for evaluation. A Denturism Committee was subsequently established to investigate the need for denturists in South Africa. After various discussions and meetings with interest groups, the Denturism Committee concluded that the available information in the report of the Joint Ad-Hoc Committee was inadequate, too subjective and lacking scientific evidence to justify a decision. This present study was initiated as a recommendation from the Denturism Committee to fulfil the informational requirements for making a policy decision.

On 24 May 1996 the Dental Technicians Draft Amendment Bill was published for general information and comment (555). Some of the principal aims of the Dental Technicians Amendment Bill are to make provision for the recognition of the profession of dental technologists<sup>6</sup> and clinical dental technologists (denturist), to constitute a new SA Dental Technicians Council, to provide for

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<sup>6</sup> A dental technologist is a person who has completed a 4 year study to attain a bachelors degree at a Technikon. Such a person is entitled to register as a dental technologist. A dental technologists may employ and supervise dental technicians working for him.

the registration of dental laboratory assistants and the direct billing of patients' medical aid schemes by dental technicians<sup>7</sup> and dental technologists.

### **1.5 The historical development of denturism**

In 1951, the first association of dental technicians making and repairing dentures directly for the public was formed in Chicago, Illinois, in the United States (43). As these professional men grew in number, they looked for names that would adequately describe the nature of the work they were doing. In 1955 the name "denturist" was voted on (43). Today the majority of those involved in the profession of providing dentures directly for the public, except for dentists, have adopted the name "denturist".

Although denturists have been practising in Denmark since 1843, this was not the result of direct denturist legislation.

During the early twentieth century considerable initiative with respect to denturism had occurred in Australia. In 1919 the Tasmanian Dentists Act was the first Act to give denturists the right to take impressions and fit dentures directly for the public.

The Certified Dental Mechanics Act, passed by the Alberta Legislature in 1961, was the first legislation in the world dealing only with denturists (43). Since the Canadian denturists' movement of the late 1950's and early 1960's, the demand for legislation to license denturists to serve the public directly has increased in the USA. Denturists Associations have been organised in forty

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<sup>7</sup> A dental technician has to complete a 3 year study to obtain the National Diploma in Dental

states, whilst the National Denturists Association, with executive offices in Chicago, Illinois, maintains contact with the associations and individuals promoting denturism. The profession of denturism has grown since its recognition in Canada in 1961.

The complete history of the development of denturism is documented by Himmel (43) in "Denturists - Birth of a profession". The controversy over denturism has continued world-wide. Recently a resolution was submitted to the European Parliament that denturism should be permitted in all twelve European countries (43).

Denturism has been defined as "a movement of dental-laboratory technicians who are seeking to be licensed independently from dentists, so that they can directly serve the public" (48). Dental technicians who support independent licensure of their occupation is called denturists (49). The National Association of Denturists (USA) (50) define a denturist as "*the thoroughly-trained professional designer and maker of dental plates and related prosthetic devices who maintains direct association with the consumer. His training and experience include all the skills of the dental laboratory technician*".

Although the name "denturists" was adopted by the denturism profession in 1955, a variety of terminology is still used namely, dental mechanic (Canada and Iran), denture therapist (Canada), denturologist (Quebec), dental auxiliary

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Technology. Such a person is entitled to register as a dental technician.

(Colorado), dental prosthetist (Australia and Netherlands), clinical dental technician (New Zealand), clinical denturist (Denmark) and advanced dental technician (Finland).

On the other hand the American Dental Association (49) defines denturism as the “*unqualified as well as illegal practice of dentistry in any form on the public.*”

For the purposes of this study any person who is licensed for autonomous practice to make removable prostheses directly for the public will be referred to as a “denturist”.

The spread of denturism has been the subject of increased attention by the dental profession throughout the United States (49). Furthermore, the illegal fabrication of dentures by dental technicians directly for the public has been viewed by the dental profession as an ever-increasing problem.

In the USA, denturism has also been brought to the forefront because of the Federal Trade Commission conducting investigations to determine whether state dental practice acts restrict competition and result in higher prices for the consumer (51).

Over the past four decades, dental technicians and denturists have attempted to establish themselves separately and independently from the supervision of dentists (43, 47, 52, 53, 54, 55). Arguments given for supporting denturism include: (i) the consumers’ freedom of choice of provider, (ii) sophisticated quality care provided by the dentists is too restrictive for low-income groups, (iii) dentists do not have exclusive rights to learning, (iv) denturists receive

more training in the field of dentures than the dentists, (v) patients are satisfied with the quality of work they are receiving from denturists, (vi) dentists rely on the knowledge and skills of the dental technicians in the provision of dentures, (vii) denturists can provide dentures at a much lower cost than dentists, (viii) the dental profession has lost interest in prosthetics, (ix) denturists are highly motivated and interested in prosthetics, (x) dental technicians' need for greater status, respect and self-determination, (xi) efficient utilisation of human resources, (xii) to tighten control over illegal dentistry, (xiii) inadequate availability and access to denture services and (xiv) dental technicians are denied autonomy by the dental profession.

On the other hand, the dental profession world-wide has almost unanimously opposed attempts by dental technicians to perform functions reserved for dentists (44, 54, 56 - 76). Arguments against denturists include the following: (i) professional encroachment on the field of the dentists, (ii) denturists are inadequately trained to diagnose, prevent and treat disease and to manage complex biological problems in the oral environment, (iii) treatment modalities and dental technology has reached a stage of sophistication that requires advanced skills beyond those of the denturist, (iv) declining prevalence of edentulousness and need for dentures, (v) setting up of education and administrative facilities are too costly, (vi) the potential oversupply of the health workforce is already a threat to the viability of dental practice, (vii) denturism is economically not viable, (viii) denturism has no long-term career prospects, and (ix) fragmentation of care is not in the patients' best interests.

The Dental Association of South Africa has not yet defined an official policy standpoint towards denturism as a profession (77).

Various attempts to legalise denturism have also been made by dental technicians in South Africa. The development of dental legislation in South Africa was primarily aimed at preventing dental technicians from infringing on the rights or field of the dentists and to eliminate the practice of illicit dentistry.

The denturism controversy has not been restricted to dental profession organisations and government. Farmer and labour organisations and senior citizen advocates in the USA have also been involved in the debate on denturism (51). It is generally acknowledged that the denturism controversy is based on economics (57, 78, 79). Many people needing dentures are not particularly concerned with the physiological and anatomical aspects of denture construction but consider dentures as a commodity or product and their chief concern is the price they must pay. The elderly and the low-income groups in particular are demanding the legalisation of denturism to fulfil their unmet denture needs. Illegal provision of dentures generally exists in low-income areas where the dentist: population ratio is low and where edentulous individuals cannot afford to receive care from a dentist (51).

Problems pertaining to the status of dental technicians and their relationship to the dental profession and the public are world-wide. The dental profession is, to a considerable extent, responsible for the development of denturism. During the early 20th century dentists would seek laboratory services on the

basis of cost rather than quality. Dentists also frequently delegated duties to inadequately trained technicians or made unreasonable demands, rather than being concerned with the qualification, status and economic welfare of members of the dental laboratory craft.

According to the literature, there is no question that denturism has had a major effect on the prosthetic industry. The movement towards the legalisation of the independent practice of denturists seems likely to continue, since denturists are able to supply a much-needed service at a reduced cost without sacrificing quality.

Denturists throughout the world have preferred the option of licensing denturists and require that standards be set to uphold the quality of denture care. They are not in favour of illegal practice, nor practising under the supervision of neither a dentist nor patients obtaining a certificate of oral health prior to being treated by a denturist.

Denturists have shown that through perseverance and political lobbying they can gain public attention and support. As a result they have achieved their main goals of being recognised as a profession by the public, having control over their industry at a local level and providing an affordable quality service. Organised denturism will increasingly seek public approval and statutory recognition and extend the scope of its work through public relation tactics and legislative action. Denturism, however, continues to be practised illegally

world-wide and Dental Associations are determined to resist and eliminate this infringement.

Organised dentistry, on the other hand, has been opposed to the concept of denturism ever since the movement began. The general consensus within the dental profession is that the role of the dental technician is at its best when he or she works as a member of the oral health team, contributing his/her knowledge and skills for the benefit of the patient. The dental profession has opted to oppose denturism through educating the public about the advantages of having dentists provide prosthetic services.

## **1.6 International status of the denturist movement**

Denturism is practised world-wide in different forms and models. The type of model that is used is dependent on the culture and social values of each community, its specific needs, the attitude of organised dentistry and the legal system in that specific country.

### **1.6.1 Countries where denturism is legally recognised**

Denturism is legally recognised as a respected profession in fifteen countries namely Canada, United States of America, Australia, Denmark, Finland, Switzerland, Netherlands, Iran, Jordan, Mauritius, New Zealand, Poland, Spain, Pakistan and The Peoples Republic of China. The world situation regarding prosthetic oral health care providers is summarised in **Table 1**. Current statistics indicate that world-wide there are about fourteen to fifteen

thousand denturists practising in countries where denturism is legal. The number of practising denturists is relatively small in relation to population size and the number of dentists and dental technicians (**Table 1**).

### **Canada**

Denturists have become recognised by legislation in every jurisdiction in Canada except Prince Edward Island.

Canada has 13623 practising dentists, 2900 dental laboratory technicians and 2700 denturists who have to provide for the denture needs of a total population of approximately 26,2 million people (**80**). It is estimated that denturists provide approximately between 25 and 50 per cent of the full and partial denture needs of the population (**81**).

Currently, Canada stands as the acknowledged leader in the profession of denturism, particularly in the field of education of denturists, and in the area of continuing education (**82**). Recently, a new approach to standardising education of denturists has lead to the introduction of the International Denturists Education Center (IDEC) which aim is to facilitate training programs around the world (**82**).

The IDEC was founded in 1992 and delivers training and services under the direction of an international faculty of practising denturists and other members of the dental health care profession. Denturists' training, professional development and upgrading at the IDEC is developed and designed in collaboration with denturists' associations to meet the needs of the

international denturist community (83). The Center's mission is to support the international community of licensed denturists and denturist students through an innovative centre of learning that offers outstanding education, training, research and development and prepares graduates for providing quality care underscored by a sense of integrity, professionalism and consideration (83). The Center provides this training at the George Brown College in Toronto, Canada, through either distance, or on-site education, depending on individual needs and requirements.

Canada has five colleges of denturism, which provide training to denturists. The general requirements for admission to programs are high school graduation plus an Associate Degree or a minimum of two years University with a science background. Completion of a two year dental technicians course prior to enrolling for a denturism course is a prerequisite in Alberta, British Columbia and Saskatchewan (80, 81) (Table 2). Other provinces do not require initial training as a dental technician. Most denturist training programs are 3 years college (New Brunswick, Ontario, Quebec and Newfoundland) or a 2-year course plus a 2-year internship (Alberta, Manitoba, Saskatchewan and the Yukon). Course content may vary slightly between schools. Most curricula conform to the Canadian Denturist Baseline competency profile as prescribed and recommended by the Canadian Council of Denturist Educators and accepted by the National Council of Denturists Governing Bodies.

In Canada provincial governments govern matters of health and welfare. For this reason denturism has developed at a different pace throughout the various provinces of Canada. Dental technicians openly declared themselves to be denturists and in the majority of the regions it was a matter of legalising an existing profession, that was supported by the general public, rather than wholesale prosecutions.

In Manitoba, Ontario, Quebec, Saskatchewan and the Yukon, denturists are permitted to provide full and partial dentures (81). In most of Canada no supervision is required from a dentist. Only in Ontario and Quebec is the dentist's supervision is required only for partial dentures.

It is reported that denturists' fees in Canada are from 34 to 40 per cent lower than those paid to dentists, whether paid for by national insurance or privately (81). It is estimated that approximately 13 per cent of Canadian denturists' patients are referred by dentists (84). A summary of the legislative provision for denturists in Canada is given in Table 2.

### **United States of America**

The USA has 137 817 practising dentists, 20 000 dental laboratory technicians and some 197 denturists organised in 40 different states who have to provide for all the denture needs of a total population of approximately 245,9 million people (80) (Table 1). Laws allowing non-dentists to provide prosthetic care have been adopted in Arizona (1978), Colorado (1979), Idaho (1982), Maine (1977) and Oregon (1978) (85). The laws in Arizona, Colorado and Maine are amendments to dental practice acts and are

administered by state dental examining boards. Both Idaho and Oregon enacted their laws via public referendum (85).

Licensing requirements in Arizona, Maine, Idaho and Oregon represent a combination of prior experience, educational course work and examinations. Colorado, on the other hand, does not license, certify or register the dental auxiliaries who are permitted to provide complete denture care (85).

All but a handful of denturists in the other states have obtained their licenses or certificates by means of the grandfather process (86).

The legislative provision for denturists in the United States of America is summarised in **Table 3**.

In Arizona the denturist profession is governed by the Dental Practice Act 1978, amended in 1982. A denturist must work in the office of a licensed dentist under the dentist's supervision. The Arizona Revised Statutes require an applicant to hold a diploma in dental technology granted by a school accredited by the Board (86, 87). At present the Board recognises no school. In September of 1991, the Board approached three colleges in Arizona (Phoenix College, Northern Arizona University and Pima County Community College) about the possibility of offering a diploma in denture technology. Each responded negatively as the costs of initiating such a program would be prohibitive (87). Phoenix College provided a condensed 12-week in-service training program to 35 practising denturists to prepare them for their candidature for certification. This in-service education-training program was developed exclusively for those individuals who were to be requiring

certification according to the grandfather rule (87). A denturist may construct complete and partial dentures. In 1991 there were 17 active denturists with certificates (86). No new licenses were issued to denturists from July 1991 to June 1992 (87).

In Colorado, the Dental Practice Act of 1979 makes provision for dental auxiliaries, who are neither licensed nor certified, to perform intra-oral tasks necessary for the construction of full dentures. These auxiliaries require no formal qualifications but must work in the dentist's office under his or her supervision (86).

In Idaho the denturist profession is governed by the Practice of Dentistry Act of 1982. It is reported that although Idaho has 521 dentists, the 28 denturists provide approximately 50 per cent of the full denture needs of the population, without supervision (81). Denturists are not allowed to provide partial dentures (88). The denturists training involve four years. Denturists are required to take continuing education courses in specific related areas to maintain a license (88). In Idaho a grandfather clause has made provision for dental technicians to register as denturists for applicants prior to 4 January 1983 with 5 years practical experience (86).

In Maine the profession of denturists has been permitted since the legislature approval in 1977. Maine's law requires that applicants for licensure complete a two-year educational program accepted by the board. This legislation

makes provision for the construction and delivery of full dentures directly for the public under direct supervision of a dentist. The dental technician training has to be completed before the candidate is allowed to enrol for the two-year graduation course to become a denturist.

According to the American Dental Association (86) no licenses were issued prior to September 1991.

In the State of Montana denturism was initiated by voters in 1984 and authorised by legislature in 1985. Denturists are permitted to take X-rays and construct full and partial dentures directly for the public without supervision. No health certificate is required. A denturist qualifies by doing a two-year course plus a two-year internship. There is a grandfather provision for applicants with 5 years practical experience. Prior to September 1991, 13 licenses have been issued.

In Oregon denturists fall under the legislation that was passed in 1980, amended in 1981, after a public referendum in 1978. In November 1978, Oregonians voted to make that state the first in the United States to permit dental technicians to deal directly with the public, independent of the dentists' supervision (89).

The Oregon Board of Dentistry governs denturism. Denturists are allowed to provide full dentures directly for the public without supervision. A certificate of health is required for new patients and for immediate dentures unless the denturist has done extra studies apart from his two years education and two-year internship. Denturists are not permitted to provide partial dentures.

The Oregon Board of Dentistry has received several inquiries as to whether a denturist may place implant-supported dentures or bridges. It is the Board's position that removable full upper and lower appliances mean an appliance placed in a mouth which does not contain tooth structure or tooth replacements such as implants. Therefore, a denturist who places a denture attached to or placed upon tooth structure or implants is practising illegal dentistry (89). There were 120 active certified denturists in Oregon by 1992. Many Oregon dentists employ denturists in their practices (47).

In 1989 denturists asked for recognition from legislatures in Illinois, Indiana, Mississippi, New Jersey, North Dakota and Washington. None was passed. The major obstacle seems to be the lack of formal education programs (59). Only one denturist school is known to exist, namely the Oregon Denturist College in Milwaukie, Oregon. Several states have investigated the feasibility of creating community college programs but rejected the idea for economic reasons (59). According to the American Dental Association (59) the overwhelming majority of practising denturists was admitted to practice under the grandfather clauses which waive formal training. Maine, which has no grandfather clause, has no licensed denturists either.

On 1985 and 1987 there were attempts to enact denturism legislation in Nevada. To date these attempts have been unsuccessful (90). The Nevada Dental Association continues to oppose any attempts to legalise denturism in its state (90). Michigan has seen at least three separate attempts to establish denturism as a profession in the Legislature (91). According to Burke (91), the

fact that Michigan has so many dentists has destroyed the denturists' argument for better access.

### **Australia**

There are 6897 dentists, 2213 dental technicians and 607 denturists serving a total population of approximately 16,5 million (80) (Table 1). In Australia denturists are called Denture Prosthetists. The profession of denturism is legalised in all six states. This is one of the countries where the model was adapted to each state or province's needs and availability of manpower. Each state has its own legislation, which governs denturism independently from the other states. The legislative provision for denturism in Australia is summarised in Table 4. Denturists are permitted to conduct independent practice and no certificate of oral health is required prior to treating a patient (Table 4).

A denturist has to receive two qualifications before being allowed to practice as a denturist in Australia. After 4 years full-time training as a dental technician, a denturist qualifies by completing an additional two-year clinical course.

In 1975 legislation was introduced in New South Wales (N.S.W.) on political grounds (92). Their profession is governed by the Dental prosthetist and Dental Technicians Registration Act of 1975. Although the Dental Technicians Board has certified denturists since 1978, no formal training was available until 1981 (93). Although N.S.W. has 2542 dentists, it is estimated that the

360 denturists provide, without any supervision, 60 per cent of the full and partial denture needs of the population (81). It is reported that denturists fees are approximately 12 per cent lower than those charged by dentists who are on national health insurance and 32 per cent lower than dentists charging private tariffs (81). Partial dentures may also be provided by denturists in N.S.W.

On June 1990 the New South Wales Branch of the Australian Dental Association made a submission to the Dental Technicians Registration Board of New South Wales, detailing several amendments to the Act in respect of dental prosthetics. The major change requested was to allow the definition of dental prosthetics in Section 5 of the Act to exclude the insertion of any appliance, which functions as an occlusal splint, orthodontic appliance or implant. It is still unclear at this time whether the Government wishes to support these amendments (94).

In South Australia denturists are called Clinical Dental Technicians. Their profession is governed by the Dentists Act of 1984. Although South Australia has 600 dentists, it is reported that the 24 denturists provide for approximately 10 per cent of the full denture needs of the population in this state without supervision (94). The denturists' training consists of two stages. After serving a four year apprenticeship, a dental technician does a one year full-time course. Denturists' fees are on the average 20 per cent lower than dentists' fees (94).

In the State of Tasmania the denturist profession is governed by the Dental Act of 1982. The introduction of the original act in 1958 was influenced by the insufficient number of dentists and dental disease rampant at that time (93). Through a grandfather clause a number of technicians was registered. This only provided legal status but did not establish professional training requirements for the title accorded (93). In 1982 a formal course was established which attracted three students (93).

The 64 denturists in Tasmania provide approximately 60 per cent of the full and partial denture needs of the population without supervision. There is no information available giving a comparison between denturists' and dentists' fees (94).

In Western Australia denturists are called Denture prosthetist. Their profession is governed by the Denture prosthetist Act of 1987. Although Western Australia has 380 dentists, the 53 denturists provide approximately 45 per cent of the full denture needs of the population, without supervision. The denturists training involve two qualifications. First, the candidate has to complete four years of training to become a dental technician. A dental technician must then have five years experience in a laboratory before being allowed to enrol for the two-year denturism course. Denturists' fees are on the average 25 per cent lower than dentists' fees (81).

In 1972 legislation was introduced in Victoria on political grounds (92). In the state of Victoria the denturist is governed by the Dental Technicians Act of

1972. When the act was proclaimed an Advanced Board was set up which subsequently determined the standard for advanced dental technicians. It was not until 1979 that a formal course was initiated at the Royal Dental Hospital.

Although Victoria has 1200 dentists, the 170 denturists provide approximately 70 per cent of the full denture needs of the population in this state, without any supervision.

Denturists in the Australian Capital Territory (ACT) have been registered to deal directly with the public for full and partial dentures since 1988. Legislation relating to this registration is the Dental Technicians and Dental prosthetist Registration Ordinance 1988 (Act No. 85 of 1988). The number of registered denturists in the Australian Capital Territory on 30 June 1992 was 21 (95). There are 244 practising dentists, 66 dental laboratory technicians and 21 denturists who have to provide for the denture needs of a total population of approximately 275,000 people (95). The ACT Dental Board strongly opposed the right of denturists to provide partial dentures.

In Queensland an Act entitled The Dental Technicians and Dental Prosthetists Act was passed through parliament in 1991. By September 1992, all sections had not been proclaimed yet, making the practice of denturism still illegal at that stage (96). Under this Act, denturists will be permitted to provide full and partial dentures as well as mouthguards subject to an oral health certificate from a dentist or doctor (81).

Denturism is not legal in the Northern Territory. However, the state governments of Australia intend to introduce mutual recognition of the dental profession, which includes denturists. Such legislation will make denturism legal in the Northern Territory (97).

### **Denmark**

Denmark has 5100 practising dentists, 800 dental laboratory technicians and 550 denturists who have to provide for the denture needs of a total population of approximately 5,1 million (80) (Table 1).

Denmark was the first known country to permit denturism legally. In Denmark denturists are called Clinical Denturists. Their profession is governed by the Clinical Denturists Act No. 100 of 1979. The law was passed in order to control unsatisfactory practice by inadequately trained but legally "practising" technicians (98). Although Denmark has 5100 dentists, the 550 denturists provide approximately 70 per cent of the full and partial denture needs of the population (81). Supervision of a dentist is required only for first-time partial and immediate dentures and then only if the patient has not been to a dentist during the previous six months. The denturists training involve two qualifications. After 2½ years of full-time college training, a dental technician qualifies as a denturist by doing a further two year course (a total of 4½ years training) (Table 5). According to Schluter (98), only between 4 and 9 students per year applied for the course and it is understood that the course is no longer offered. Denturists' fees are on average 25 per cent lower than

dentists' fees (81). The Danish Act is widely held to be the best example covering denturism. A comparative analysis of the legislative provision for denturists in some countries is summarised in **Table 5**.

### **Finland**

Finland has 4225 dentists, 363 dental laboratory technicians and 420 denturists

Who have to provide for the denture needs of a total population of approximately 5 million people (80) (**Table 1**). In Finland denturists are called "Advanced Dental Technicians". Their profession is governed by the Act for Practising the Profession of Dental Technicians (Act No. 220 of 1964) and supervised by the National Board of Health. The denturist is under an obligation to keep records of the procedures he performs. Although Finland has 4225 dentists, the 420 denturists provide approximately 63 per cent of the full denture needs of the population without supervision (81, 99). Denturists provide complete denture services mainly to older, lower-income urban dwellers (100). All other denture related work is permitted in co-operation with a dentist. Dental technicians who have been registered for 5 years and have completed a further 6-month course prescribed by the National Health Board are given the standing of Advanced Dental Technician. In 1979, one out of every three dental technicians was licensed as an advanced dental technician (101). The denturists fees are on average 30 per cent lower than the dentist's fees (81).

The advanced dental technician may not produce dentures for a person under the age of 20, a person who, as a consequence of an operation or an injury, has had trauma which fundamentally changes the structure of his mouth or a person who has a disease or a developmental disorder in the oral region (10).

The legislative provisions for denturists in Finland are summarised in **Table 5**.

#### **Switzerland and Austria**

Switzerland has approximately 4000 practising dentists, 3000 dental laboratory technicians and 100 denturists who have to provide for the denture needs of a total population of approximately 6,7 million people (80). The legal status of the denturists varies from one Canton (province) to another. Cantons that permit denturism are Zurich, Schwyz, Nywalden, Basel and Appenzeil. In Switzerland denturists are called Dental Prosthetists. Their profession in the canton Zurich is governed by the Dental Prosthetists Act of 1961. Although Switzerland has 4000 practising dentists, the 100 denturists in Zurich provide approximately 50 per cent of the full and partial denture needs of the canton without supervision. An oral certificate from a dentist or medical practitioner has to be obtained before a patient can make use of the denturists services. The denturists training involve two qualifications. After four years full-time training to qualify as a laboratory technician a candidate requires a further two years to qualify as a denturist (6 years training) (**Table 5**). Denturists' fees are on the average 28 per cent lower than dentists' fees (81).

In the cantons of Nywalden and Schwyz denturism is practised under court order subject to training and examination in Zurich (81).

In Austria laboratory technicians licensed to treat patients, take impressions and fit dentures are called dentistien. They serve a 4-year apprenticeship followed by an examination (43).

### **Netherlands**

The Netherlands has 6000 practising dentists, 3500 dental laboratory technicians and 204 denturists who have to provide for the denture needs of a total population of approximately 14,7 million people (Table 1) (80).

Denturists are called Denture Prosthetists or in Dutch, "Tandprotheticus". Denturism became legal after the proclamation of the Denture Prosthetists Act (Act No 329) of 1989. This law opened up the health care field by lifting the general prohibition on unauthorised medical practice. Officially registered denturists are permitted to examine and supply patients with full dentures without any supervision. Since the introduction of this Act, 215 dental technicians have qualified as denturists.

The education of a denturist consists of 350 hours, one day per week over three years, preceded by five years part-time training as a dental technician (Table 5). An investigation into the functioning of Dutch denturists by the Medical Inspectorate of the Health Supervisory Service concluded that denturists ought to be recognised by dentists as specialists in the field of denture prosthesis (103). Denturists also state that there is a lack of co-operation from dentists. In the Netherlands the denturists are not in a position

to practice his profession to the full as a result of the absence of a reimbursement system for Dutch National Health patients and patients with a standard insurance package (104). This means that almost 60 per cent of the Dutch population will not receive reimbursement if a full set of dentures is fitted by a dentist (105).

### **Iran, Iraq and Jordan**

In Iran, Iraq and Jordan dentists are legally permitted to provide full and partial dentures as well as fixed partials, crowns and fillings directly for the public (43).

Iran has approximately 3500 practising dentists, 170 dental laboratory technicians and 2000 dentists who have to provide for the denture needs of a total population of approximately 50 million people (80) (Table 1). In Iran dentists are called Registered Dental Mechanics.

In Iraq a regulation was issued in July 1962 which make provision for dental mechanics to make crowns, bridges, dentures and extract teeth provided patients are not suffering from a blood or heart disease or any malignant growth (43).

### **New Zealand**

New Zealand has 1233 practising dentists and 368 dental laboratory technicians who have to provide for the denture needs of a total population of

approximately 3,3 million people (80) (Table 1). It is not known how many practising denturists there are in New Zealand (81). Denturists are called Clinical Dental Technicians. The supply of dentures directly to the public by Clinical Dental Technicians became legal in January 1989 when the Dental Act (Act No. 150 of 1988) came into force. Denturists are permitted to provide full and partial dentures. A certificate of oral health by a dentist is required before a partial denture can be provided. Qualifications for registration as a Clinical Dental Technician comprise three years training as a dental technician, followed by a further two year training course (5 years training) (Table 5).

### **Spain**

Spain has 9829 practising dentists and stomatologists and 15000 dental laboratory technicians who have to provide for all the denture needs of a total population of approximately 39 million people (80) (Table 1). Although the Dental Act of 1983 makes provision for denturism, it is not known how many denturists are practising. Denturists are permitted to provide full and partial dentures on prescription from a dentist or medical practitioner. There is no information available on the length of training required (81).

### **Portugal**

The situation regarding denturism in Portugal is generally unclear. The law governing paramedical professions passed in 1986, however, permits dental technicians to take impressions and fit partial and full dentures directly to a patient. The law is intended to apply to all technicians regardless of their

training, but is being strongly contested by the Portuguese Dental Association which has referred the matter to the EC Commission as being contrary to the Dental Directives (106). It appears that the only group taking advantage of the provisions made by the law are those who were practising denturism illegally beforehand.

### **Mauritius**

In Mauritius denturists are called Certified Dental Mechanics. They are legally permitted to provide full and partial dentures directly for the public (47).

### **1.6.2 Countries where denturism exists without legislation**

Denturism is practised illegally in Ireland, Iceland, Great Britain, Belgium, France and South Africa (47).

In Ireland the practice of denturism is currently not legal although certain dental craftsmen with questionable technical training and no clinical training have chosen to call themselves denturists (107). The Minister for Health recently asked the Dental Council to prepare for approval a draft scheme for the introduction of the grade of denturists under the country's Dentist Act of 1985. (108). The Dental Council is of the view that in a climate of both decreasing tooth loss and an increasing availability of dental manpower, it cannot recommend that a new professional grade of denturists should be established (107). The Dental Council considers that the new contract recently agreed between the Minister for Social Welfare and the Irish Dental

Association should help alleviate the problem of providing dentures to the lower income group and the elderly.

Slovakia currently has five denturists in active practice that is nearing retirement age. There is no formal organisation. For the last 27 years no permits have been issued to pursue this profession (109).

According to Act No. 29 of 1927 relating to the rights and duties of dentists in Norway, which has since been repealed, a small number of denturists had the right to fit and adjust removable dentures. Today, there is just a handful of denturists left providing services and the profession will disappear with the actual persons (110).

In Great Britain, dental technicians are allowed to do repairs on dentures as well as duplication of existing dentures directly for the public. A campaign for a Denturist Act that is being waged by the Association for Denture Prosthetists (ADP) is gaining widespread support and members of the public are increasingly obtaining new dentures from technicians despite the prohibition in the Dental Act of 1957 (47).

The dental technicians in France have stepped up their campaign for legalising denturism. The French Dental Association is determined to resist this infringement of their monopoly and has made Fr.Frs.8 million available to prevent the denturism law from being recognised. There are 16 denturists

practising illegally and the French Denturists Association has approximately 125 members (47).

Dental technicians in Belgium are not allowed to work directly for patients. Technicians, however, have been upgrading themselves by taking courses and examinations sponsored by a pro-denturist-type technician organisation in Belgium with the hope of presenting their qualifications for government examination should legislation change in the future (47, 93).

In Germany, legislation of 1914 permitted dental mechanics to work directly for the public. Due to the poor quality of denture care by these persons and public pressure for qualified personnel, legislation enacted in 1952 limited the practice of prosthetic dentistry to fully qualified dentists only (47, 93).

In South Africa, denturism was allowed until 1928 when a monopoly on the taking of oral impressions was granted to dentists by Parliament. Prior to the enactment of the Dental Mechanics Act of 1945, technicians were allowed to provide repairs directly for the public, provided no impression was needed. The monopoly was further entrenched by imposing further restrictions in the Dental Technicians Act. Denturism has been the goal of dental technicians in South Africa since 1928 (47). The first attempt to legalise denturism took place on 30 September 1944 when a proposed Bill was submitted to the Minister of Health. The Bill was never tabled in Parliament.

On 12 February 1991 a Joint Denturism Ad Hoc Committee of the South African Federation of Dental Technicians and the Dental Laboratory Association submitted a report titled "Denturism a new profession" to the Director General, Department of National Health and Population Development. The aim of this document was to motivate for the establishment of denturists as a new occupational category in South Africa (47).

#### **1.7 Purpose of the study, hypothesis and objectives**

The purpose of this study is to conduct a policy analysis regarding the provision of dentures with specific reference to the feasibility of legalising denturists as a new occupational category within the oral health care work force in the Western Cape.

The hypothesis of this study is that the introduction of denturists (clinical dental technologists) would be a cost-effective way of providing prosthetic oral health care, for those who need it, in the Western Cape.

To test the hypothesis and facilitate the policy analysis, policy relevant data was collected by means of an socio-epidemiological survey of adults and oral health care providers in the Western Cape Province.

The objectives of the socio-epidemiological survey of adults and prosthetic oral health care providers in the Western Cape Province was to obtain specific policy relevant information regarding:

- (i) The nature and extent of edentulousness and denture status.
- (ii) The characteristics of the population at risk.
- (iii) The dental status of adults and the relative value they place on oral health and retaining their teeth.
- (iv) The need and demands for dentures.
- (v) The utilisation of denture services and type of provider used.
- (vi) The characteristics, availability and affordability of prosthetic oral health services in the Western Cape Province.
- (vii) The relative priority placed by adults on prosthetic oral health care.
- (viii) The relative importance providers of dentures place on prosthetic services.
- (ix) The nature and scope of illicit practice in the Western Cape Province.
- (x) The publics' and providers attitudes and beliefs regarding the introduction of denturists as an alternative provider of prosthetic oral health care

The data will be used to synthesise policy relevant information which will be used as a basis or guide for making policy recommendations regarding the most appropriate and cost-effective course of action for the provision of dentures in the Western Cape Province.

## **CHAPTER TWO**

### **METHODOLOGY**

Policy analysis involves two processes: firstly, the scientific process of collecting policy relevant information and secondly, the intellectual or cognitive process involving the production of knowledge that will contribute to the resolution of a public problem (111).

#### **2.1 Policy analytical model**

The model used in this study for analysing the problem and making a decision is based on the principles for policy analysis (111) and ethical decision making (112) and summarised as follows:

- Collection of policy relevant data
- Description of policy relevant information
- Problem statement and definition
- Goals and objectives
- Identification of policy alternatives
- Considerations, consequences and constraints
- Ethical considerations
- Conclusions and policy recommendations

## **2.2 Collection of policy relevant data**

### **2.2.1 Demographic study of the adults population in the Western Cape Province**

The overall demographic structure and characteristics of the study population were established from census data off a magnetic tape obtained from the Central Statistical Service (117). This data was obtained for weighting of relevant variables, thus enabling results to be extrapolated to population data.

### **2.2.2 A socio-epidemiological study of adults in the Western Cape Province**

#### **2.2.2.1 Project organisation**

The study was organised and conducted in the following stages:

- (i) A review of the literature and planning;
  - (ii) Questionnaire development and sampling;
  - (iii) Pilot study and calibration exercises,
  - (iv) Socio-epidemiological survey of adults in the Western Cape Province;
  - (v) Analysis of the demographic structure of the Western Cape Province;
- and
- (vi) A survey of prosthetic oral health care providers in the Western Cape Province

Criteria, questionnaire wording and the examination procedure protocol were formulated in collaboration with a specialist in the Department of Prosthetic Dentistry, University of Stellenbosch.

The Ethical and Research Committees of the University of Stellenbosch approved the study protocol. Consent for conducting surveys in institutions was obtained from the necessary institutions.

#### **2.2.2.2 Pilot study**

A pilot study was conducted over four stages to test data collection forms and examination procedures in terms of acceptability, practicability and intelligibility of the socio-epidemiological survey. For each stage fifty individuals visiting the Faculty of Dentistry for treatment were approached for participation in the pilot study. The pilot study facilitated the identification of problems with data collection and examination procedures that could be rectified prior to commencement of the main study. Experience was also gleaned from epidemiologists who participated in the National Oral Health Survey to improve the logistical aspects of fieldwork and to obtain maximum co-operation with participants.

#### **2.2.2.3 Training and calibration of the examiner**

One examiner (the author) was trained and standardised for the diagnostic criteria of the dental status index (decayed-missing-filled-teeth or DMFT index), dentition status, denture status, oral mucosal disorders relating to

denture wearing, temporo-mandibular disorders, denture assessment and denture treatment needs.

A specialist in the Department of Community Dentistry calibrated the examiner on the DMFT index whilst a specialist in the Department of Prosthodontics calibrated the examiner on the denture related aspects.

The guidelines of the World Health Organisation (113) were used to standardise the diagnostic criteria for dental and prosthetic status and the measurement of prosthetic treatment needs.

Twenty (20) dentate individuals visiting the Faculty of Dentistry and fifty (50) denture wearing patients attending the Department of Prosthetic Dentistry at the University of Stellenbosch and the Hope Street Dental Clinic in Cape Town for care were asked to participate in the calibration exercise. Participants were examined twice by the examiner and the calibrators at different times and in varying sequence in order to determine intra-examiner consistency and the consistency of agreement with the expert calibrator to determine the reliability of each criterion.

For those criteria where examiner agreement was poor attempts were made to refine the definitions and to identify areas where examination technique could be improved before the main study.

During the main study a systematic re-examination of every twenty-fifth individual was conducted to monitor examiner consistency and respondent variability. The examiner consistency and respondent variability was

determined by means of the simple percentage agreement score and the kappa (k) statistic (114). The strength of agreement was determined according to the scale of Landis and Koch (115). Examiner consistency for all Likert scale questions was measured, using the Cramer's V correlation coefficient.

#### **2.2.2.4 Study region and population**

The Western Cape Province (**Fig. 1**) was chosen as the study area so that the results would be in line with the need for greater decentralisation and rationalisation of health care in South Africa (116).

The study population for the socio-epidemiological survey consisted of individuals older than 20 years in the Western Cape Province.

The overall demographic structure and characteristics of the study population were established from census data off a magnetic tape obtained from the Central Statistical Service (117). This data was obtained for weighting of relevant variables, thus enabling results to be extrapolated to population data.

#### **2.2.2.5 Sampling procedure**

The sampling procedure for the socio-epidemiological survey was designed in consultation with the Human Sciences Research Council and a Senior Statistics Consultant at the Department of Statistics, University of Stellenbosch.

A total of 1787 individuals older than 20 years were selected using a random multi-stage cluster sampling technique (**Fig.2**).

The Western Cape Province was divided into four sub-regions (**Fig.3**) (At the time of sampling the Western Cape had not yet been subdivided into health regions). Three magisterial districts were randomly drawn from each sub-region. Lwandle, a black township located in the Strand magisterial district was included in the study due to its close proximity to Nomzamo, which is located in the Somerset West magisterial district. Montagu was also included in sub-region C to allow for an additional rural black township (Zolani) to the study population.

For each magisterial district included in the sample a list of residential areas/suburbs/townships per population group was obtained from a local authority health officer or nurse who was requested to categorise each residential area into a high, middle or low socio-economic status. One residential area was then randomly selected from each socio-economic category for each population group residential area. Two sample sites were drawn for each residential area using random numbers and an ordinal ruler on residential area maps obtained from the local authorities (**Fig.4**). At least five households were visited at each sample site. All individuals aged 20 and above in every household were included in the study.

Additionally, a random convenience cluster sample of institutions for the elderly was drawn from a list of institutions obtained through the Department of Health to ensure that there was adequate representation for the elderly, the group that is most at risk for tooth loss and denture treatment needs. A day care centre for elderly blacks in Khayelitsha, situated in the Wynberg magisterial district, was included because there are no institutions for elderly

blacks in the Western Cape. Permission was obtained from the responsible authorities prior to visiting a home or the day care centre. Subjects who participated were drawn on a random basis from a list of residents. The maximum number of subjects that was logistically possible to handle on a specific day was seen.

#### **2.2.2.6 Terminology**

Caries was measured as present if a lesion on a pit or fissure or smooth surface had a detectable softened floor, undermined enamel or softened wall. A tooth with a temporary filling was also included in this category. On approximate surfaces the explorer had to enter a lesion to be recorded as present. Where doubt existed, caries was not recorded as present.

The term dentate is used for persons who have some natural teeth remaining, whilst edentulous refers to those who have none (113).

The number of missing teeth is clearly relevant to the prevalence of dental caries and should be recorded. For the purpose of this study a clear distinction should be made between a missing tooth and a tooth space. The category 'missing tooth' is mainly used in connection with DMF index (decayed, missing and filled teeth) (113). In relation to dentures, where aesthetics and function are of chief interest, it is the result of tooth loss, i.e. the remaining tooth space that is most relevant (118). The mean number of remaining teeth was calculated for the dentate subjects and the total

population. Teeth replaced by bridge pontics were included in the category of remaining teeth.

In the present study 'complete denture' is defined as a removable denture in the edentulous jaw regardless of its extent (119). Persons who wear dentures part of the day or on special occasions were categorised as edentulous with dentures. Denture wearing habits are defined separately.

#### **2.2.2.7 Data collection**

The study involved a clinical examination and a structured interview. One examiner conducted all the examinations and interviews during the survey period.

The dependent variables studied were dental and dentition status, edentulousness, denture status, prosthetic treatment needs, utilisation behaviour, attitudes and beliefs, priority placed on prosthetic oral health care and denture provider perceptions.

Interviews and examinations were carried out at the individual's place of residence or work. On arrival at a specific household the researcher identified and introduced himself, explained the purpose of the study and obtained consent to conduct an interview and oral examination.

All individuals above the age of 20 in each sampled household were interviewed and examined. Where possible, individuals not at home were seen at their workplace, during lunch at home, or after work hours. When an individual was unavailable, an additional household was sampled and an

individual selected in that household who was representative of the age and gender of the unavailable person.

Community health workers were obtained to act as mediators and translators for interviewing and examining sampled individuals in the black townships.

All measurements were recorded on a pre-coded form.

The examiner/interviewer introduced him on each house call. The family was told whom he represented and how they as participants had been chosen. The significance of the study and contribution participants were making was pointed out individually.

#### **2.2.2.8 Clinical examination**

Each participant was subjected to a clinical examination to establish their dentition, denture and oral mucosal status as well as their prosthetic treatment needs.

Clinical examinations were carried out using a plane mouth mirror and a sharp probe with artificial lighting provided by a Welch-Allyn penlight torch. Examination instruments were pre-packed in sterile packets for house visits. A plastic kidney dish covered with cellophane wrap was used for receiving dentures from the patient when removed from the mouth prior to clinical examination and for the return of used instruments. The researcher wore latex examination gloves for each patient to maintain cross infection control.

Dentures were examined both intra- and extra-orally to assess their functional and physical quality respectively. The dental information collected consisted of noting whether individuals were edentulous or not, whether they wore dentures and, if so, their denture wearing habits. The type of denture worn was recorded as a complete or removable partial denture in the maxillary or mandibular arch according to the criteria of the World Health Organisation (113).

The examination protocol for assessing denture status was conducted in five stages; (i) to establish denture wearing and the type and age of the denture worn and denture wearing habits (ii) extra-oral assessment of patient profile and speech with the dentures in the mouth (iii) intra-oral assessment to establish clinically the functional quality of the denture (iv) intra-oral examination of denture bearing tissues and oral mucosa and (v) extra-oral examination of the denture to establish the physical quality thereof.

At present there is no internationally agreed method for denture assessment during oral health surveys (120). For the purposes of this study intra-oral examination of dentures consisted of evaluating the following criteria: adequacy of lip support; profile with tooth contact (vertical or interocclusal reduction); resistance against vertical displacement (retention); stability; occlusal plane and centric occlusion. Operational definitions describing the indicators were partly derived from previous studies (121, 122).

Occlusion and vertical height are registered in those individuals who had complete dentures, were able to be seated in a chair and where

communication was possible. Occlusion was registered, as **satisfactory** if bilateral maximum intercuspal contact was present.

Retention was registered as **satisfactory** if the dentures showed resistance against being unseated by vertical pull by a probe placed between the central incisor teeth.

Stability was registered as **good** if the respondent said he / she could take a bite from an apple or **average** if he was only able to take a bite from a slice of bread. Stability was registered as **unsatisfactory** if the respondent said he / she could neither take a bite from either an apple or a slice of bread.

The occlusal plane was registered as **satisfactory** if teeth were not high in relation to the anterior lip-line and /or teeth of the upper denture were not hanging posterior or tilted left or right.

The patient was requested to place the dentures in a kidney dish for physical assessment thereof. The condition of dentures (denture defects) was assessed by measuring the presence or absence of (i) fractured teeth, (ii) attrition of teeth, (iii) fractured denture base, (iv) surface or internal porosity, (v) broken flanges, (vi) cracks, (vii) temporary lining materials, (viii) severe discoloration, (ix) calculus, (x) posterior border seal absent and (xi) posterior mandibular teeth placed lingual to the alveolar ridge. The operational definitions describing above-mentioned indicators were partly derived from previous investigations (121).

Denture bearing tissues were assessed for residual alveolar ridges and their shape, relationship of residual ridges, tissue resiliency, mandibular tori and clinically visible residual roots. The clinical appraisal of the denture bearing tissues was based on the criteria used by Kapur (123).

The examiner subjectively assessed all the clinical variables as follows:

**Favourable** conditions for dentures were defined as: (i) U-shaped with adequate alveolar ridge with definite vertical facial and/or lingual areas; (ii) V-shaped with well developed alveolar ridges; and **unfavourable** if the alveolar ridge was severely resorbed or where the ridge was completely or partially resorbed without vertical areas.

The resiliency of the denture bearing area was measured, as **favourable** if the tissues were firm and not displaceable by palpation; **fair** if tissues were slightly displaceable and **unfavourable** if flabby or easily displaceable by palpation. The denture bearing area was also clinically assessed for the presence of mandibular tori and clinically visible root fragments.

The oral mucosa and alveolar tissue were examined for the presence of any local disorders and to determine whether disorders were denture related. Conditions specifically sought were similar to those enumerated by Smith and Sheiham (124) namely, denture stomatitis, denture hyperplasia, angular cheilitis, epulis fissuratum, acute traumatic ulcer and leucoplakia. The diagnostic criteria used for mucosal inflammatory diseases and alveolar fibrosis are described by Newton (125), hyperplastic lesions by Manderson

and Ettinger (126) and Axell (127). Denture stomatitis was classified into three types (125). This study does not report on subepithelial disorders because no radiographs were taken to detect abnormalities.

Prior to the oral examination each participant was interviewed by means of a structured questionnaire.

#### **2.2.2.9 Interview**

The interviewer also explained the purpose of the study, method of selecting families, and the confidentiality of the interview to ensure that barriers to the interview in the respondent's mind would be overcome. The interview was conducted in an informal and relaxed atmosphere to avoid the impression that it was a cross-examination or a quiz and to create a relationship of confidence and understanding between interviewer and respondent. Each question with its items was listed on a separate card and given to the patient to study for a few minutes. The interviewer in the same order then presented the questions as they appeared on in the questionnaire. Questions that were misunderstood were repeated and clarified.

Individuals were interviewed to establish who recommended the extraction of teeth as well as their reason for losing their teeth or having them extracted, denture age and wearing habits, TMJ complaints and satisfaction with dentures.

Individuals who had dentures were asked about their denture wearing habits. The criteria for denture wearing included: **continuously**, day and night; **regularly** during daytime only; occasionally or **irregularly**, i.e. only used during meals or social occasions and **non-wearers**, if individuals were not able to wear their dentures at all.

Edentulous subjects without dentures were questioned to establish why they did not have dentures. Reasons were also attained as to why individuals could not wear their dentures.

Satisfaction (from a functional perspective) with dentures was measured by assessing denture wearer's perception about speaking ability, fit of dentures, facial support, comfort, chewing ability and overall satisfaction.

Appraisal of respondents' satisfaction with dentures was established by means of a questionnaire composed of descriptions of complaints most frequently mentioned in previous studies (128, 129). The questionnaire was of a closed question type and had pre-coded answers. Satisfaction with dentures was measured on a four point scale, namely **very satisfied** (no problems), **fairly satisfied** (occasional problems), **somewhat dissatisfied** (frequent problems) and **most dissatisfied** if dentures could not be worn.

All subjects were interviewed and examined for the presence of the following symptoms: pain (temporo-mandibular joint, facial muscles, headache or earache), subluxation or dislocation during masticatory function, deviation on opening and/or closing of the mandible, tenderness on palpation of either the

TMJ or facial muscles or TMJ noises. Palpable TMJ discrepancies were identified using bilateral light finger palpation over the lateral aspect of the joint capsule. Sounds were recorded as clicking when there were discrete popping sounds or crepitus.

Muscle tenderness was assessed by simultaneous bilateral palpation of the masticatory and facial muscles. The patient was instructed to differentiate pressure from pain. The assessment of temporo-mandibular dysfunction (TMJD) was based on a modified form of the clinical examination criteria recommended by Rise (121), Helkimo (130), Sakurai et al. (131), and Bibb et al. (132).

Subjects with one or more of the above mentioned symptoms were considered to have signs of TMJ dysfunction.

Subjects were both interviewed and examined so that the need for dentures or replacement thereof could be determined. The analysis of denture treatment need applied to full, partial, upper and lower dentures. The assessment of denture treatment need followed the assessment of the denture status. All existing dentures were clinically assessed for stability, retention, occlusion and vertical height.

Professionally assessed (normative) dental treatment needs were measured according to the criteria of the WHO (113). Normative or professionally determined denture treatment needs were rated while taking into account patient-perceived need, general health status and cognitive ability, and

whether technical improvement in the existing denture was possible considering the quality and anatomy of the supporting bone.

Denture treatment categories included: (1) no treatment needed, denture satisfactory in all parameters, (2) cleaning (hard and soft deposits not removable by rinsing) and polishing only, (3) adjustment and/or easing, (4) repair of a defect (fracture or a missing tooth) in an otherwise acceptable denture, (5) reline or rebase, (6) first denture needed, (7) replacement of existing denture, (8) extraction and denture, (9) referral to a specialist for denture need evaluation, (10) denture needed but not advised; and (11) extractions only but denture not advised if teeth were in a poor condition and the individual not interested in denture or care deemed futile due to physical or medical considerations. Each subject was placed in one of the above mentioned categories according to his or her prosthetic needs.

Adjustment, easing, or selective grinding were indicated where trauma, localized inflammation, ulceration or irritation hyperplasia were present in the presence of overextension or premature cuspal contacts. A denture reline was indicated where vertical height, occlusion and jaw relation was correct, but retention or stability was poor, or the patient was experiencing undue pain.

A need for a first denture was indicated if one or more of the following criteria were met; a subject was edentulous and needed a denture and no physical or medical contra-indications were present. The criteria for replacement of a

denture was based on those elaborated by Grabowski and Bertram (133) and Hoad-Reddick (134). Denture replacement was indicated when: -

(i) An edentulous patient had lost or broken his denture and wanted a new one (ii) the dentition was excessively reduced and needed reconstruction (iii) the denture was inadequate because of breakage or deformation (iv) the denture was not satisfactorily related to the underlying anatomical structures (v) the denture had incorrect vertical height and (vi) irritation or inflammation of the oral mucosa caused by the denture and not likely to respond to simple adjustment. The centric occlusion relationship was omitted as a criterion for replacement of a denture because patients are highly adaptive or tolerant to occlusal changes and because it was considered the single criterion that contributed most to the observed discrepancy between patient and professional perceived need (135).

Extractions and a denture were indicated when teeth were severely decayed and periodontally infected and the patient requested such care. A patient was indicated for referral when two or more of the following variables were present, namely the patient wanted a denture, was medically compromised, presented a complicated oral environment, was older than 65 and had worn a particular set of dentures for longer than 20 years. A denture needed but not advised was recorded when considered as futile care, i.e. would not improve the individual's quality of life due to old age or medical condition or if the patient was satisfied with his old denture or not interested in receiving a new denture. Extractions only without dentures were recorded when teeth were in

a badly decayed state and the patient emphatically stated that he or she was not interested in having a denture.

Perceived need was established by asking subjects whether they thought they needed any of the following denture services: cleaning and polishing, adjustment to relieve discomfort, repair of a fracture or missing tooth, partial upper or lower denture, full upper or lower denture or a complete set of denture.

Potential demand or intention to seek prosthetic care was determined by questioning the patient (136, 137, 138). Subjects who had perceived a prosthetic problem: "Do you intend visiting a dentist or dental clinic for treatment". Respondents were also asked to indicate what type of care they intended seeking for their perceived problem.

Dentate subjects were asked whether they intended having some or all of their remaining natural teeth extracted, the reason for their intention, and whether they intended having dentures made to replace extracted teeth. Individuals were also asked whether they intended seeking any of the following denture services within the next twelve months: cleaning and polishing, adjustment to relieve discomfort, repair of a fractured or missing tooth, partial upper or lower denture, full upper or lower denture or a complete denture. Those who had dentures were asked whether they intended having

their dentures replaced and by whom they intended having their new dentures made.

### **Utilisation of services**

Unmet prosthetic demands was established by asking each participant whether he/she experienced any problems in getting prosthetic treatment during the past 12 months. Subjects were also requested to specify the type of treatment he/she had a problem in getting, and to indicate the most important reason why he/she could not get the treatment needed.

Participants were asked how often they normally visited a dentist, when had they last made use of oral health care services and what type of care they had received during the past 12 months, as well as the treatment they had received when they had last visited a dentist. Individuals who had dentures were asked how many years ago they had received their first denture and how many dentures they had had in total up to date.

Participants were also asked what type of dental service provider they mainly used and to indicate the number of dental visits they had made during the past 12 months. Those individuals who had dentures were asked to indicate the type of provider from which they received their dentures. Participants were asked to name the most important factor, which motivated a visit to a dentist for treatment. Respondents who had not made use of oral health services

during the past 5 years were asked to indicate the primary reason for not doing so.

Individuals who had experienced problems in getting dental treatment from a dentist during the past 12 months were asked to specify the type of treatment, which they had problems in getting and to indicate the most important reason they perceived as a barrier for accessing care.

Ability to pay was measured by means of the participant's household income, method of payment for services and whether the participant had a medical aid. Indigence is measured according to the criteria set by the former Department of National Health and Population Development (139), namely a yearly household income below R9600.

### **Availability and accessibility of dental services**

Prior to data collection in a specific area, information was first acquired from the local authorities to ascertain the number of private and state dentists providing services in the sampled area. Provision was made in the structured questionnaire to note down the availability of dental services.

To test the knowledge on the availability of services, each participant was also asked whether there was a private or state health dentist in the area where he/she was resident and to state which type of dental service he or she primarily used (i.e. private, public etc.).

To assess the accessibility of services each participant was asked how easy it was for the particular individual to have physical access to a dentist or dental clinic. Participants were also asked to give an estimate of the distance to their nearest dentist or dental clinic.

#### **Attitudes and beliefs regarding prosthetic oral health care**

The attitudes, beliefs and values of participants regarding prosthetic oral health care and providers were also determined by means of questions based on a five point Likert scale indicating the response to the statement as “disagree strongly” (code 1), “disagree” (code 2), “undecided / not sure” (code 3), “agree” (code 4) and “agree strongly” (code 5).

Each subject was also asked to indicate whether denture services should only be provided by dentists and by no other auxiliary dental personnel and, secondly, whether they thought that dental technicians, provided they are adequately trained, should be allowed to fit and supply dentures directly to the public. To each of the above-mentioned responses, subjects also had to provide their reasons for either agreeing or disagreeing with the statement. Subjects who had no teeth in the upper and/or lower jaw, who wanted all their teeth in either the upper or lower jaw extracted or objectively required extractions of all remaining teeth of the upper and/or lower jaw were also asked about their views on the current cost of dentures and how much they would be willing and able to pay for a complete set of dentures (full upper and full lower dentures), laboratory fees included. The individuals' perceptions on

whether dentists adequately meet all the denture treatment needs of the community were also obtained.

### **Priority placed on prosthetic oral health care**

Each participant was interviewed by means of a structured questionnaire, developed in collaboration with personnel from the Department of Political Economics, School of Public Management, University of Stellenbosch to establish what priority individuals placed on prosthetic oral health care.

Due to time constraints, only the parents in large households were asked to participate.

Four basic prioritisation questions were asked to determine the priority of (1) health care in relation to other social services, (2) elderly people in relation to other individual sub-groups, (3) dentures in relation to other functional and aesthetic health services, and (4) dentures in relation to other oral health services. Priorities were set, based on the perceived importance of services.

The following questions were asked:

(1) "It is said that any future South African government will have to determine priorities for spending on public services due to a limited budget. In what order of importance do you think housing, education, infrastructure (water, electricity, sanitation, roads, refuse removal), health care, security and protection, and recreation and sport should enjoy priority as far as state spending is concerned?"

(2) "It is said that health care services could also experience a shortage of funding in the new South Africa. In what order of importance do you think mother and child, pre-school children, school children, adults and the elderly should be given priority for health care funding?"

(3) "Following is a list of health care services in which prostheses or functional aids are provided to restore or improve the functional status or appearance of the individual. In what order of importance do you think eye care (spectacles), dentures (false teeth), hearing aid, leg or foot prostheses or walking aids, and facial prostheses (eye, nose or ear) should enjoy priority as far as state spending is concerned?"

(4) "Dental or oral health can be described as the total process of care for one's mouth and teeth. Below is a list of essential dental/oral health care services. In what order do you think that pain and sepsis care (i.e. extraction of teeth or drainage of an abscess), preventive care (fluoride treatment, and fissure sealant), restorative care (filling of teeth), denture care (provision of partial or full dentures) and orthodontic treatment (treatment of crooked teeth) should enjoy funding priority?"

Each participant was provided with a card listing the items for each of the four groups and asked to rank the items in each group in order of importance from (1) the most important item, to (5) or (6), the least important item. The respondents were assured that there were no right or wrong answers and that

the purpose of the study was to establish how they perceived different services in relation to one another and which would benefit the people in their community most.

For each question people also had to provide their reason why their most important social service, individual category, health service or oral health service was given highest priority. Additionally, each respondent also had to motivate why a higher or lower priority was given to (1) health care, relative to other social services, (2) the elderly, relative to other individual sub-groups, (3) dentures, relative to other functional and aesthetic health services, and (4) dentures, relative to other oral health services.

An open-ended question format was used to obtain information on the reasons for allocating a higher priority to a specific service in relation to other services.

A probing technique was used to stimulate discussion, motivate the respondent to elaborate or clarify an answer and help to focus the conversation on the specific topic of interest.

Throughout the interview consideration was given to avoid interviewer bias by not influencing respondents by facial expressions or tone of voice. Extreme care was taken, when dealing with illiterate or seem-literate respondents, not to push respondents in any direction.

#### **2.2.2.10 Data processing and statistical analysis**

The recording forms and questionnaires were individually checked for coding errors and missing values. Responses for open-ended questions were coded before being processed.

Sub-regions were replaced by recoding magisterial districts into the proposed new health regions for the Western Cape (140) and the data analysed accordingly.

All the dependent variables were analysed according to the demographic sub-groups: health region, population group, gender and age group, and the socio-economic subgroups: educational level, occupation and household income.

The categorisation based on 'population group' as defined in the Population Registration Act of 1950 (556) during the apartheid era is used to identify disparities in oral health due to social or political origin. The use of 'population group' represents a valid political concept that can be used for assessing the impact of social discrimination on health (141). The identification of inequalities in oral health status will help to direct or target resources aimed at reducing these inequalities. This study considers this terminology to be a relevant reflection of the particular social reality that is still existent at large in South Africa (142). The Minister of Health, Dr NC Dlamini Zuma, supports the view that racial terminology still be used in epidemiological surveys in the foreseeable future in order to eliminate racial inequalities (143). The reason

for analysing data on a racial basis is not to establish any cause-effect relationship but to gain information on predictors of oral health status and behaviour. Groups of people can easily be identified by their location of residence whereas other factors such as age, income, occupation and gender are integrated in society and therefore difficult to locate for addressing specific needs. Other factors such as area of residence, occupation, household income and education have also been taken into consideration in an attempt to further the understanding of oral health status and service utilisation behaviour.

Occupational status was ranked according to the broad CASS occupational categories described by Schlemmer and Stopforth (144).

Data on removable and complete dentures or edentulism without denture wearing is presented in such a way that comparisons at jaw level as well as at individual level can be made.

The age of dentures was categorised into three groups namely, less than 5 years, from 6 to 30 years and older than 30 years.

The response categories for the belief questions relating to oral health, dentures and dentists were reduced to three, namely 'disagree', 'uncertain' and 'agree' or as 'no', 'undecided' or 'yes' to simplify the presentation and interpretation of the data.

The data was processed on the mainframe computer of the University of Stellenbosch and was statistically analysed using the SAS program (145) with the assistance of a senior biostatistician at the Department of Statistics, University of Stellenbosch.

All the dependent variables were cross-tabulated according to the independent demographic and socio-economic sub-groups. Where appropriate, the Chi-square test or Analysis of Variance test was applied in order to identify significant relationships between the dependent variables and sub-groups.

Log-linear models were used to identify significant predictive factors for edentulousness. An unsaturated model using the predictor's race, gender, age, educational level and income was fitted. The fitted model included only the main effects of these predictors. According to the goodness of fit criterion ( $\chi^2 = 447,5$ ;  $df = 424$ ;  $p = 0,2078$ ) this model provided a satisfactory fit to the data.

### **2.2.3 A socio-demographic study of oral health care providers in the Western Cape Province**

All dentists, oral hygienists and dental technicians practising in the Western Cape Province were included in the oral health care workforce survey sample. Names and addresses for each work force category were obtained from the computer registers of the South African Medical and Dental Council.

Questionnaires were pre-tested and modified prior to being posted to all dentists (n= 797), dental technicians (n=241) and oral hygienists (n=282) who were listed on the 1995 National Register of the South African Medical and Dental Council with a residential address in the Western Cape Province. The author was advised not to use the National Register for Dental Therapists because of the inaccuracies of addresses caused by the mobility of its registrants. Because there were only two known dental therapists practising in the Western Cape at that time, questionnaires were mailed to all dental therapists listed on the register of the Dental Therapists Association.

The questionnaires were developed in collaboration with leading and prominent individuals in each respective association. The questionnaire was devised to elicit essential information and allow practitioners to express their views on various issues relating to the practice and attitudes regarding removable prosthodontics, auxiliaries, extended functions and denturism.

Structured questionnaires were posted to individuals in each work force category. A covering letter, explaining the purpose of the survey and endorsed by the respective co-worker representing that profession was attached to each questionnaire to ensure credibility of the study and to ensure maximum response rate. A stamped, addressed envelope was also enclosed. A reminder postcard was sent after one month appealing to all personnel,

included in the study, to complete the questionnaire and return it as soon as possible.

The checking and coding were done by the author prior to capturing the data on the mainframe computer of the University of Stellenbosch. The data was processed and analysed using the SAS program.

Questionnaires that were excluded from the study were unfilled or incompletely filled questionnaires, individuals who had died, retired, changed their address, were overseas or pursuing another occupation.

Because of the poor response by dentists, a further survey was conducted by telephone to obtain a more accurate distribution of dentists in the four health regions. Post Offices in each town throughout the Western Cape were called to obtain telephone numbers of dentists practising in that specific town. The dentists were subsequently phoned to confirm their practice status and to cross check the existence of other dentists. Due to time and financial limitations the same survey could not be carried out for the other occupational categories.

## **CHAPTER THREE**

### **POLICY RELEVANT INFORMATION FROM THE RESULTS OF THE STUDY**

#### **3.1 Adult sample distribution**

The distribution of the initial sample by sub-region and population group with the number of residential areas shown in parenthesis is presented in (**Table 6**). A total of 1787 subjects were included in the study. The sample included 348 institutionalised elderly who were drawn from 18 randomly selected institutions for the elderly (**Table 7**).

The distribution of the sample according to population group and the proposed health regions in the Western Cape Province is shown in **Table 8**. Male and female subjects were approximately evenly distributed in the various sub-regions (**Table 9**). The distribution of the sample by age category is presented in **Table 10**. The educational level of the sample was low with almost fifty per cent of subjects having an education of not higher than Std 6 (**Table 11**). The wealth profile of the sample expressed as the yearly household income per family is presented in **Table 12**. More than 50 per cent of the sampled subjects live below the household subsistence level, based on

annual income of R14649 for an urban Coloured family with 5 members, R10350 for a rural Coloured family and R12672 for an urban Black family with six members (547). Most of the subjects who participated in the study were economically non-active (55,1%) (Table 13). The largest proportion of the latter category was either retired (32,2%) or dependent (14,9%).

### **3.2 Sociodemographic characteristics of the study population**

Data obtained from the Central Statistical Service included the distribution of the adult population in the Western Cape Province by population group (Table 14), gender (Table 15), age (Table 16), educational level (Table 17) and household income (Table 18). A comparison of the above-mentioned variables between the sample and population is provided in Table 19.

Considering the comparison of socio-demographic characteristics, the study sample can be considered as fairly representative of the population in the Western Cape Province.

### **3.3 Calibration study, intra-examiner consistency and respondent variability**

The results of the calibration study indicate that the intra-examiner agreement range was substantial to perfect for the variables tested (Table 20). Overall,

the agreement between the examiner and calibrator was moderate to substantial.

The low kappa values measured for denture assessment and caries treatment needs can be explained by most of the agreement observations being concentrated in one cell and the large standard errors of kappa resulting from an inadequate number of subjects used for the calibration study (146).

A total of 92 individuals were re-examined to measure examiner consistency and reliability of the data collected. Overall, the strength of agreement was moderate to substantial and therefore complied with the necessary scientific requirements.

The pre-study intra- and inter-examiner variability or agreement scores are presented in (Table 20). The combined estimates for Kappa ( $K_c$ ) for denture status and oral mucosal disorders were perfect. Intra-examiner agreement for denture assessment was substantial. Inter-examiner agreement on denture assessment showed greater variability with a moderate kappa score of 0,58. Intra-examiner consistency during the study was substantial for all the variables studied and thus complied with the scientific requirements.

The kappa statistics of the intra-and inter-examiner reliability for denture treatment needs were 0,89 and 0,77 respectively. This indicates substantial reliability.

The respondent variability for the priority rating of services ranged between slightly ( $k=20$ ) and moderately consistent ( $k=60$ ) (**Table 21**). Based on the kappa values for the priority rating assessment the data collected can be considered as sufficiently consistent and valid for the purposes of the study.

Intra-examiner consistency during the study was substantial for all the variables studied and thus complied with the necessary scientific requirements.

#### **3.4 Dental and dentition status of adults in the Western Cape Province**

The only epidemiological studies which give some indication of the dental status of populations in the Western Cape are surveys of random samples of the Cape Coloured population (**147, 148, 149, 150**). Studies which give some indication of the dental status of the elderly in the Western Cape are convenience samples of institutionalised elderly whites (**151**), institutionalised elderly Cape Coloureds (**152**), Cape Malay (**153**) and of Cape Town Asians (**154**). These studies all revealed a very high prevalence of dental caries and that the majority of persons is edentulous.

Only three studies have been conducted which report on the dental status of blacks in the Western Cape, namely by Myburgh (**155**), Carstens, Hartshorne, de Vos, & Blignaut (**156**) and Louw, Carstens, Hartshorne, & Van Wyk Kotze (**157**). Studies on the dental health of Whites are rare.

The National Oral Health Survey of 1988/89 included a sample of the Cape Metro, but the data was reported by population group only (**158**). Although the National Oral Health Survey provides very important information on a national level its usefulness on a regional level, such as this study, is very limited because information on the elderly and rural populations were not included in the survey.

#### **3.4.1 Dental status**

The average number of sound teeth retained in a dentition indicates a fundamental measure of good dental health in a population. Therefore tooth morbidity (decayed teeth) and tooth mortality (missing teeth) and edentulousness can be viewed as an indicator of poor or neglected oral health.

##### **Decayed teeth**

The mean number of decayed teeth for total sample was 2,79 (**Table 22**). The latter represented approximately 11,6 per cent of the teeth present in the study population. Black and coloured subjects presented with more decayed teeth than white individuals ( $p < 0,0001$ ) (**Part 2: Table 1**). The average number of decayed teeth was not significantly associated with the health region were they stayed ( $p = 0,2737$ ), gender ( $p = 0,1808$ ) and age group ( $p = 0,5288$ ).

Individuals with higher education, occupational skills and income had on the average fewer decayed teeth in comparison with those individuals with no schooling, who were less skilled and had no income (**Table 23**).

The high rate of dental caries amongst coloured and black individuals compared to that of white individuals is consistent with that found in other studies in the Western Cape (**147, 149, 153, 155**) and in the NOHS (**159**).

The average number of decayed teeth amongst whites in the present study was consistent with the findings in developed countries such as the United States of America (**160**), United Kingdom (**161**) and in Denmark (**162**).

The large mean number of decayed teeth observed amongst in adult dentate subjects and the high prevalence of edentulousness (**Table 24**), especially amongst the elderly, indigent and coloured population, may be indicative of the low value individuals place on dental health and retaining their teeth. On the other hand, this may also be interpreted as the oral health outcome when individuals cannot afford appropriate care or do not have access to essential services.

The large mean number of decayed teeth in adult dentate subjects (**Table 22**) showed that dental caries remains to a large extent untreated in the coloured and black population whilst it is adequately cared for in the white population. Various studies show that socio-economic status plays a major role in caries prevalence (**163, 164, 165, 166, 167, 168**). This study strongly supports the

view that there is a sharp increase in the number of decayed teeth with a decrease in income, educational level and occupational skills.

It has been shown that unfavourable conditions such as increased sugar consumption; poor oral hygiene and inadequate access to and availability of preventive and restorative care may have a negative impact on dental status (557). Such prevailing situations may further increase tooth mortality rates and edentulism amongst coloureds and blacks.

### **Missing teeth**

Adults in the Western Cape Province presented with an average of 7,7 missing teeth per individual. This represents approximately 24,4 per cent of all teeth present per individual in the study population.

The average number of missing teeth increased significantly with an increase in age ( $p < 0,0001$ ) (Table 22). Coloured dentate subjects had an average 10,3 teeth missing in comparison with the 7,5 and 5,3 teeth missing in whites and blacks respectively (Table 22).

The average number of missing teeth increased significantly in those individuals with a lower educational level who were unskilled or economically non-active and those in the lower income categories (Table 23). The above-mentioned trend was also observed when the data was analysed while controlling the population group ( $p < 0,0001$ ).

The finding that the highest rate of missing teeth was amongst coloured individuals is consistent with that found in the NOHS (159).

The incremental increase in the average number of missing teeth with an increase in age corresponds with the findings of the NOHS (159). The mean number of missing teeth for all the population groups, however, was higher in the NOHS compared with the findings of this study. The NOHS only measured teeth missing due to caries; therefore it can be expected that their figures represent an under reporting in the average number of missing teeth. In the present study teeth missing due to all causes were measured. The large discrepancy between the present study and that of the NOHS may be due to the fact that the NOHS sample did not include rural and elderly sectors of the community. Edentulous individuals have also been included in the calculation of the average number of missing teeth.

Whites presented the highest number of fillings (5,9). Fillings were almost non-existent in coloureds (0,45) and blacks (0,11) (**Table 22**).

#### **3.4.2 Dentition status and edentulousness**

Tooth loss has been dubbed as one of the most severe compromises of dental function (169) and therefore considered as a general indicator of a population's oral health status (170, 171).

Tooth loss is the dental equivalent of mortality. It is the product of oral disease but also reflects the attitudes of patients and providers, availability and accessibility of care, and the prevailing philosophies of dental treatment at various times in the past (163).

In the Western Cape Province 43,9 per cent of the overall sample were edentulous. This proportion varied significantly among the four health regions, population groups, gender and age ( $p < 0,0001$ ) (**Table 24**).

The highest rate of edentulousness was found in the Boland (46,1%) and South Cape health region (48,7%) (**Table 24**).

The highest prevalence of edentulousness was observed amongst coloured (54,4%) and white (49,6%) individuals. Only 13,8 per cent of blacks were edentulous. Females (51,1%) were more likely to be edentulous than males (35,9%). Edentulousness increased with increase in age (**Table 24**). Edentulousness was also more prevalent amongst individuals with a lower education, occupation status and household income (**Table 25**).

A higher prevalence of edentulous adults was observed in the economically non-active group (59,4%) as opposed to the professional and managerial occupational category where only 14,8 per cent of subjects were edentulous (**Table 25**).

The percentage of fully edentulous individuals increased with age in all the population groups (**Table 26**). Edentulousness was more prevalent in the younger age groups amongst coloured individuals in comparison with whites and blacks (**Table 26**). Elderly whites (> 65 years) (72,1%) presented with a higher prevalence of edentulousness compared to elderly coloured (39,1%) and black (11,1%) individuals.

Blacks had the lowest prevalence of edentulousness ranging between 6,3 and 20,0 but showed an alarmingly high rate of tooth loss as indicated by the

high prevalence of partially dentate individuals amongst black individuals of all age groups (**Table 26**).

Findings from the multivariate analyses were consistent with the bivariate results. Age, education and income were independently correlated with edentulousness after controlling for all the other variables.

A large proportion of adults was partially dentate (31,61%) or otherwise had some teeth missing (**Table 24**). More than half of all the blacks examined fell into this group (**Tables 24 and 26**). In the coloured population group 48,2 per cent of adults 20 to 34 years old were partially edentate (**Table 26**).

Only 6,01 per cent of the subjects examined were partially edentulous (all teeth missing in either upper or lower jaw) (**Table 24 and 26**).

Amongst coloureds, only seven individuals of 65 years and older were found to have 21 or more functional teeth (**Table 27**). In comparison, 28,6 to 37,5 per cent whites with degrees and with a household income greater than R32401.00 had 21 or more functional teeth. More than 50 per cent of all blacks still had 21 or more of their teeth remaining.

A significant relationship was found between the dental status of subjects and the prevalence of clicking sounds, deviation with opening, jaw tiredness and clicking of the TMJ ( $p < 0,0001$ ). The results of the study indicate that individuals with teeth missing or who were edentulous were more prone to

TMJ problems. From the latter it can be deduced that a healthy dentition makes some contribution towards health in general and quality of life.

The present study also supports the finding of the NOHS (159) that from 20 years onwards coloureds lose their teeth at a much faster rate than the other two groups in all the age categories.

The results of the present study indicated that whites below 65 years of age had a similar average number of teeth present to that of blacks. However, above 65 years whites had less teeth than blacks. It can be speculated that the elderly have reached the stage where their teeth are beyond any further restoration; thus tooth extraction is the next natural step in the disease process. Blacks, on the other hand, traditionally have not had the resources to have teeth restored, or had a much better dental status for dietary or other reasons. The gradual decrease in the number of remaining teeth corresponds with tooth mortality patterns reported in the NOHS. The results indicate that at the time of this survey the age of 35 is critical relative to tooth loss in the coloured population group, whilst in the white population group the critical age is 65. Studies conducted by Håkansson in Sweden in 1978 (172) indicate that the age of about fifty is critical with respect to relative loss of teeth. From age 50 an accelerated reduction of the mean number of teeth occurs as well as a dramatically increased prevalence of edentulousness. The findings of this study are consistent with the results of other studies, which show that, next to age, education and income are the most important predictors of tooth loss (147, 159, 163, 165, 166, 167, 173).

The WHO goal for oral health states that at least 20 functional teeth should be retained throughout life to meet the functional and aesthetic requirements of a normal dentition (174).

As regards persons in the 65 years and older age group only blacks, irrespective of sociodemographic status, and whites, in the higher household income bracket, met the requirements of the WHO goal of retaining at least 20 functional teeth.

In the present study the typical pattern of survival of teeth, namely mandibular teeth being retained longer than maxillary teeth, is consistent with that found in other studies (175, 176). In this study central incisors were lost more frequently in the upper arch rather than the typical pattern of molars being lost first (175, 176). The specific reasons for the latter trend could not be established from the results of this study. It is, however, common knowledge that coloureds especially, have in the past extracted the four front teeth for cultural reasons. The findings of this study confirm the common experience in which some mandibular teeth oppose a completely edentulous upper arch more frequently than the reverse situation. According to Langer and co-workers (177) this seems to be the natural process which precedes complete edentulousness.

In the present study 84 per cent of coloureds, 65 years and older, had no natural teeth (Table 26). Of the dentate elderly subjects in the age group 65

to 79, 35, 4 per cent had fewer than 5 teeth remaining in the upper arch and 21,9 per cent had fewer than 5 teeth remaining in the lower arch .

Overall, coloured subjects presented the lowest number of remaining teeth and this decreased significantly with increasing age. In all the population groups the critical age at which the number of remaining teeth drops below the level of 21 teeth is 65 years. Based on these goals, it can be speculated that the present results predict serious functional and aesthetic problems amongst the elderly in the coloured population.

The percentage edentulous persons are a very simple method for describing the oral health status of a population. Data on tooth mortality and edentulousness may provide important information for planning preventive and oral health programs for the growing and adult population or for the planning of prosthetic oral health services.

In this study edentulism was most prevalent amongst coloured individuals, the elderly, females, less educated, economically non-active, and lower household income groups (**Tables 24 to 26**). From the results of this study the two most typical profiles of edentulous adults that were observed were white elderly females (>65 years) and coloured females.

The prevalence of edentulousness in this study was greater in all the population groups compared with the findings of the NOHS (159) (**Table 26 and 28**). This discrepancy can be attributed to the fact that elderly and rural

people were excluded from the NOHS or that edentulousness is more prevalent in the Western Cape.

The high rate of edentulism found amongst the coloured population is consistent with that found by other studies conducted locally (**147, 149, 152, 153, 159**) (**Table 28**). Edentulism rates found in this study are however, higher compared with studies conducted in other countries (**160, 161, 162, 164, 177, 178, 179, 180, 181, 182, 183, 184**) (**Table 29 and 30**).

Various studies have shown consistently that edentulousness is more often associated with the elderly, less educated, poor, rural inhabitants and women (**164, 165, 166, 167, 168, 173, 185, 186, 187, 188, 189**). Increasing tooth loss among older age groups is a universal finding (**163**). In general most studies indicate a trend towards declining tooth loss with increasing levels of education and income irrespective of gender or race (**163**). Decreasing edentulism in most industrialised countries has been attributed to economic welfare, changes in attitude towards oral health, use of fluoride and availability of health care services (**166, 190, 191, 192, 193**).

Weintraub and Burt (**163**) found in their review of national studies that tooth loss and edentulousness will continue to decline despite the ageing of the population. They also concluded that tooth loss will remain a dental problem among lower socio-economic groups and that replacement of lost teeth is unlikely to disappear as a needed dental care service.

Edentulousness occurs due to various combinations of oral disease, cultural and attitudinal determinants and treatment received (163).

National studies in the United States of America found that edentulism, in general, is more prevalent among whites than blacks, and among women than men (163). Older adults, those with low socio-economic levels, and those residing in rural areas are more likely to be edentulous.

Ainamo and Ainamo (194), in their comparative review of edentulousness in various countries, concluded that the number of available dentists correlated poorly with the longevity of the dentition. The latter epidemiological association is, however, not proof of a cause and effect relationship.

According to Newbrun (195), sucrose consumption is the major cause of impaired dental health. Ainamo and Ainamo (194), in their review of the prevalence of and the reasons for edentulousness, indicate that the total loss of teeth is historically related to rather rapid changes in dietary habits, combined with ignorance of prevention, unfortunate social circumstances and insufficient dental manpower resources at the right time and the right place.

### **3.4.3 Value placed on retaining teeth and reasons for tooth loss**

The present study indicates that adults generally placed a low value on retaining their teeth. More than fifty per cent (54,4%) of all adults that were partially or fully edentulous were very happy to get rid of their teeth. Coloured (63,7%) and black (67,8%) were more likely to be very happy to rid if their teeth compared to white individuals (32,2%).

The general trend was that individuals of a lower educational level ( $p < 0,0001$ ), with fewer skilled occupations ( $p < 0,0001$ ) and in the lower income categories ( $p < 0,0001$ ) were more likely to be very happy to be rid of their teeth. In most cases (69,7%) the respondents themselves requested to have their teeth extracted in 20 per cent of cases the dentist suggested that a tooth or teeth should be extracted.

Tooth decay or toothache was cited most often (86,8%) as a reason for having teeth extracted, followed by periodontal disease (20,4%), poor appearance (13,9%) and medical reasons (11,7%). Only 5,5 per cent of individuals stated that they wanted their teeth extracted because they wanted dentures.

Various studies have been conducted on tooth mortality in pursuing the fate of the human dentition and are concerned primarily with the causes (**196, 197, 198**).

Whilst tooth loss is an end product of oral disease (dental caries, periodontal disease or trauma) it is generally accepted that non-disease factors also play an important role in tooth loss.

Tooth decay (86,8 %) and periodontal disease (20,4%) was the most commonly cited reasons for loss of teeth in this study. This finding is consistent with that found in the NOHS (**159**) and in other international studies (**167, 173, 181, 182, 199, 200, 201, 202**).

Takala and co-workers (173) reported that decayed teeth (70%) were the most frequently cited reason for extraction of teeth, followed by periodontal disease (20%) and prosthetic reasons (10%) (173). In the present study prosthetic reasons only 5,5 per cent said they wanted teeth extracted for prosthetic reasons.

The present study indicates that dental caries is a substantial problem with increasing age in all population groups and is bound to have a negative impact on tooth survival in the future. The implementation of waterfluoridation, however, may have a positive effect of tooth morbidity and survival of teeth.

Various studies investigating the reasons for tooth extraction have found that non-disease factors such as varying degrees of interest in tooth retention, poor appearance of teeth and accessibility to dental care are substantially related to the decision to have teeth extracted (203, 204, 205, 206).

According to Weintraub and Burt (163) tooth loss in older adults is not necessarily a factor in ageing *per se*, but rather reflects oral hygiene status and treatment philosophies of the past. Takala and co-workers (173) have stated that, although dental caries constitutes the greatest cause for extraction of teeth, it is practically impossible to make a distinction between behavioural reasons for and biological causes of extractions during a particular time period.

In a study by edentulous patients carried out in Sydney, Australia, Ettinger (202) found that elderly patients regarded the loss of their natural teeth as a 'good thing, in fact quite a natural and expected thing', and that no real value was placed on their natural dentition. Ettinger also found that lack of finance (38,9%), lack of interest in fillings (38%), scarcity of dentists (14,9%), and fear of drilling (7,1%) were some of the most commonly cited reasons for negative attitudes towards restorative care which subsequently led to extraction of teeth.

Lundquist (207) found that over 47 per cent of extractions amongst patients over 60 years are attributed to prosthetic indications for extractions. Various studies suggest that socio-economic conditions (lack of resources and access to services), and cultural background (lack of knowledge and interest in the importance in maintaining teeth), may influence people to have teeth extracted rather than having teeth restored (168, 175, 177, 201, 208, 209).

Corbet and Davies (201) have also concluded that dentists' and patients' attitudes and behaviour could be significant determinants of the longevity of dentitions in countries where there is ready access to dental care providers.

The results of this study support the finding of Watermeyer *et al* (210) that many people, especially whites and coloureds, had their teeth removed at an early age, believing that acquiring dentures would eliminate the necessity for any further oral health care during life. Many people, however, may be resorting to dentures to get relief from pain and because they cannot afford expensive restorative care.

Bouma and co-workers (199) concluded in their study that patients who lived in a cultural environment where full dentures are prevalent, combined with a social background of dental anxiety caused by social learning, might support behaviour eventually leading to full mouth extractions. Subjects who fall into this group mainly have a rural background, are men, of low socio-economic status, older, and anxious people. Anxiety, induced by negative perception of or bad experiences with dental treatment in the past, reinforcing the cycle of poor utilisation of dental care, with subsequent deteriorating dental status, was cited as a third reason for tooth loss. Such individuals were generally younger in age, had a high rate of anxiety and negative dental experiences, showed a negative attitude towards dentists but a positive attitude towards dentures.

Data on the cause and reasons for loss of teeth and decision to extract teeth, however, have to be interpreted with caution as most studies have not followed the same methods and criteria.

The enumeration of dental status and dentition status is basic and reliable clinical parameters to assess oral health in epidemiological surveys. However, owing to variations in the selection and stratification of participants, demographic patterns, data collection criteria, etc., direct comparisons between different epidemiological surveys should be viewed with caution.

It can be concluded from the results of this study that edentulousness is exceptionally high in the Western Cape Province (43,9%) and was most prevalent amongst coloureds and elderly individuals.

The dental and dentition status was poorest amongst coloured and black subjects and was strongly associated with socio-economic status and increasing age. Coloureds, followed by blacks, were at greatest risk of becoming edentulous due to the high rate of dental caries present and the relatively low value attached to retaining their teeth.

Low income and educational level and lack of occupational skills and being economically non-active were the most likely determinants of tooth loss and edentulousness. The frequently reported association between edentulousness and socio-economic factors was strongly corroborated in this study. Based on the sociodemographic status of the population in the Western Cape Province, many people are living in poor conditions and are thus at an increased risk of poor dental health and losing teeth.

Extrapolated to the study population there are a very large number of people, especially in the lower socio-economic groups, who cannot afford care that are completely edentulous and likely to provide the public health care system with resource allocation problems regarding prosthetic oral health care.

### **3.5 Denture status of the adult population in the Western Cape Province**

No comprehensive regional epidemiological study, which describes the status of the adult dentition, edentulousness and denture status in relation to socio-demographic variables, has ever been conducted in the Western Cape Province.

Although the National Oral Health Survey provides very important information on a national level its usefulness on a regional level, such as for the purposes of this study, is very limited because information on the elderly and rural populations were not included in the survey.

There is a lack of prosthetic epidemiological data in most developing countries.

Most investigations during the last decade have been conducted in developed countries (211, 212, 213). Moreover, most studies that have been conducted are on elderly populations (211, 212, 213, 214, 215, 216). South Africa is no exception in that studies in this field have been limited to a few cross-sectional surveys conducted in convenience samples of the elderly in the Western Cape population. Local surveys that pertain to denture status and needs and demand, address mostly the problems of the urban coloured and their subculture groups with special emphasis on the elderly and institutionalised groups (210, 217, 218). The National Oral Health Survey (NOHS), however, has reported on the prosthetic status and treatment needs of the adult population in South Africa (219) and denture wearer's degree of satisfaction (220).

Reports that indicate that edentulism is on the increase in the lower socio-economic groups and among people from rural areas (221) has led to an increased epidemiological interest in edentulousness in developing countries. Louw and Moola (222) reported a high prevalence of edentulousness among Cape Coloured people and that the greatest need for complete dentures existed in the low socio-economic and education groups. The NOHS reported that the coloured population had the highest prevalence of edentulousness (37%) and the rural blacks the lowest (3%) (219). The NOHS is the only survey that has ever been carried out to determine the prevalence of edentulousness and denture status in the South African adult population (age 20-64). Only one survey reporting on the denture status and treatment of farm workers in the Western Cape had been conducted previously (223).

### 3.5.1 Denture wearing status

Of the 1787 people examined, 604 individuals (33,8%) had complete dentures. Seventy seven per cent (77%) of all edentulous subjects were wearing dentures. Eleven (11) per cent of subjects with edentulous upper jaws had no dentures and 10,6 per cent had edentulous lower jaws with no dentures (Table 31).

Only 7,4 per cent of the study population had a partial denture. Twenty-one (21) per cent of upper jaws and 26 per cent of lower jaws were partially dentate without dentures.

Denture wearing was significantly associated with all the socio-demographic variables studied ( $p < 0,0001$ ) (Table 31). The highest prevalence of

individuals that had no upper ( $p < 0,0001$ ) or lower dentures ( $p < 0,0001$ ) were found in the Boland (17,5 per cent and 15,1 per cent for upper and lower jaw respectively) and South Cape health region (21,5 per cent and 17,7 per cent for the upper and lower jaw respectively) (**Table 31**). The highest prevalence of individuals with removable partial and full dentures was found in the Cape Metropolitan area.

Denture status (upper or lower jaw) was also significantly associated with population group. Subjects within the white population group presented with most full dentures, namely 52,6 per cent upper and 47,4 per cent lower dentures compared with the 39,7 per cent upper and 36,7 per cent lower dentures in the coloured population group and the 9,9 per cent upper and 9,5 per cent lower dentures amongst black people (**Table 32**). The highest prevalence of subjects without dentures was found amongst the coloured people, namely 20,1 per cent in the lower jaw and 19,4 per cent in the upper jaw. In comparison, only 1,4 per cent of whites had no upper dentures and 2,4 had no lower dentures whilst 6,6 per cent of blacks had no upper denture and 4,3 per cent no lower denture (**Table 32**).

Twice as many individuals were without partial dentures compared to full dentures (**Table 31, 32**). The absence of partial dentures was most prevalent amongst coloureds and blacks (**Table 32**).

Edentulous individuals without dentures increased proportionately with increasing age ( $p < 0,00001$ ) (**Table 33**). The highest rate of edentulous

people without dentures were found in the 65-79 year age category, namely 18,9 per cent and 20,5 per cent without dentures in the upper and lower jaw respectively.

Edentulous people that had no dentures were significantly more prevalent amongst individuals with a lower educational level ( $p < 0,0001$ ) (**Table 34**), that was economic non-active ( $p < 0,0001$ ) (**Table 35**) or had a low household income ( $p < 0,0001$ ) (**Table 36**).

The results of the present study confirm that an extremely large proportion of the people amongst whites and coloureds are denture wearers. In the present study almost 50 per cent of whites surveyed had complete dentures, whilst approximately 35 per cent of the coloured and 9 per cent of the black population had complete dentures. The NOHS of 1989 found significantly fewer denture wearers, namely 18 per cent of whites, 25 per cent of coloureds and only 1 per cent of blacks (**219**). Louw (**224**) found in his study that 27 per cent of urban adults in the coloured population in the Cape Peninsula had complete dentures. The reason for the discrepancy in the denture status between the present study and other local studies can be attributed to the fact that no elderly persons or individuals from rural areas were included in their samples. A survey of the farm-working coloured population in the Boland region showed that 28 per cent of adults between the age of 20-44 years and 9 per cent of those 45 years and older had complete dentures (**223**).

The prevalence of dentures in the elderly population (older than 65 years) was consistent with other studies on elderly persons conducted locally (210, 225) but were significantly lower to that found in other countries (126, 211, 226, 227, 228). The lower prevalence of complete dentures in comparison with other western countries can probably be ascribed to the following:

- (i) A large proportion of the population studied cannot afford dentures.
- (ii) Public Health Services in South Africa place a low priority on the provision of dentures.

In the present study approximately 10 per cent of the edentulous subjects surveyed did not possess dentures and 20 per cent of edentulous coloureds had no dentures (Table 32). Only about 1 per cent of edentulous whites and 5 per cent of edentulous blacks had no dentures. In the NOHS 3 per cent of the edentulous study population in South Africa did not possess dentures and lack of dentures was greatest in the coloured population group, namely 12 per cent. Watermeyer and co-workers (210) found in their study on elderly whites in the Cape Peninsula that 5 per cent were not wearing any dentures. The relatively low percentage of whites not possessing dentures may be attributed to the fact that they have traditionally been better able to afford dentures in comparison with the other population groups.

Carstens and co-workers (223) found in their study that approximately 75 per cent of coloured farm-workers had no dentures. Possible explanations for the lower prevalence of dentures prevailing in the coloured population are the high cost involved, lack of transport, limited time for treatment, absence of

perceived need and unavailability of services and/or resources (223). Cultural values where edentulousness without a denture is the norm may also be a contributing factor.

The low prevalence of partial dentures found in the present study, namely 5 per cent and 2 per cent wearing upper and lower partial dentures respectively, is consistent with the findings of Watermeyer *et al* (5,5%) (210). In the present study whites (9 % uppers and 5 % lowers) had twice as many partial dentures than coloureds (4% upper and 1-% lowers). Blacks presented the least number of partial dentures (1%) (Table 32). The prevalence of partial dentures was also significantly lower in lower educational categories and lower income groups. Studies conducted in western countries have found a similar prevalence of partial dentures (229, 230) or greater, ranging from 12 per cent to 25 per cent (216, 231).

It may also be speculated that people feel that there is no necessity for a removable partial denture, or that partial dentures will not necessarily contribute towards improving function, or people may perceive that partial dentures are more of a nuisance to adapt to. It is also a known fact that partial dentures can be disadvantageous to the patient due to loading effect on the mucosal and periodontal tissues together with poor oral hygiene, causing dentists to be reluctant to prescribe partial dentures to their patients. Many of the indigent population also feel that being partially dentate is merely

a stage towards being edentulous and that teeth will eventually all be extracted.

The results of the present study therefore support the findings of Gray *et al* (232) and Norheim and Valderhaug (233) that the prevalence of complete dentures is influenced by demographic and socio-economic characteristics. In the present study edentulous individuals with a lower socio-economic status (no schooling, lower occupational categories and lower income groups) showed a lower prevalence of dentures in comparison with edentulous individuals in the higher socio-economic groups.

### 3.5.2 Denture age

The mean age of maxillary and mandibular dentures was 14,6 and 22,3 years respectively. Overall, 30,7 per cent of dentures were less than 5 years old, 56,5 per cent between 6 and 30 years old, and 12,8 per cent of dentures were older than 30 years (Table 37).

The average age of a full set of dentures differed significantly between population groups ( $p < 0,0001$ ), ranging between an average of 18 years for whites, 12 years for coloureds and 7 years for blacks. Amongst white individuals 18,9 per cent had dentures older than 30 years compared to the 8,4 per cent of coloureds and 2,8 per cent of blacks that had dentures that were older than 30 years (Table 37).

The general trend observed was that denture age increased proportionately with increasing age ( $p < 0,0001$ ), the lower the educational level ( $p < 0,0001$ ), occupational status ( $p < 0,0001$ ) and household income ( $p < 0,0001$ ) were

There was no significant relationship between the age of a denture and patient perceived satisfaction with the fitting of a denture ( $p > 0,05$ ), facial support ( $p > 0,05$ ), comfort of dentures ( $p > 0,05$ ), chewing ability ( $p > 0,05$ ), and overall satisfaction with dentures ( $p > 0,05$ ). Denture age was, however, significantly associated with the stability of dentures ( $p = 0,002$ ). Paradoxically, age of dentures showed no relationship to retention of upper dentures ( $p = 0,967$ ). Age of dentures was significantly associated with the prevalence of denture stomatitis ( $p < 0,0001$ ) but not with angular cheilitis ( $p = 0,114$ ) and traumatic ulcers ( $p = 0,549$ ).

The high numbers of persons with complete dentures older than 10 years is in agreement with previous epidemiological surveys (210, 216, 225, 231, 233, 234). This finding, together with the low frequency of persons with one or two previous dentures, may reflect the patients' belief in the fact that complete dentures are a more or less permanent treatment modality (233). Other factors that may contribute to the wearing of older dentures are the inability to afford new dentures or that people have habituated quite happily to their dentures irrespective of age or problems.

In the present study dentures older than 10 years were mainly found amongst whites, subjects older than 50 years, lower occupational categories and individuals that had a household income of less than R32400 per annum. The findings of the present study are consistent with those of Mersel and co-workers (231) that older dentures were more prevalent amongst lower socio-economic groups compared to the newer dentures found in the higher socio-economic groups. It can be speculated that more highly educated persons are more aware of their oral health status and/or have easier access or better means to acquire dentures.

### 3.5.3 Denture wearing habits

Approximately seventy three per cent (73%) of individuals that have dentures, wear them on a regular basis whilst about eight per cent (8%) of those that had dentures were either unable to wear their dentures or were wearing their upper and lower dentures on an irregular basis (Table 38). Almost twice as many individuals were unable to wear their lower dentures (10,2%) compared to upper dentures (5,6%).

Individuals who were unable to wear their dentures were mostly found amongst the coloured community ( $p < 0,0001$ )(Table 39).

There was a statistically significant association between denture wearing habits and the type of provider who made the dentures (Table 40).

'Backdoor providers' made the largest proportions of dentures that people were unable to wear or that were worn irregularly (Table 40).

The most common reasons provided for not wearing their dentures were that they were too loose (33,3% - upper denture and 26,8% - lower denture), caused pain (29,4% - upper denture and 26,8% - lower denture), dentures were broken (11,8% - upper denture and 14,3% - lower denture) or caused discomfort during eating (9,8% - upper denture and 10,7% - lower denture).

Only 22 of edentulous subjects (3,4%) reported that they had never had dentures before. The most common reason given for not having dentures was that they could not afford dentures (n=8) (36,4%). Others stated that they could not have dentures for medical reason (4), were not interested in wearing dentures (4), had inadequate gums (2) or were coping well enough without dentures (4).

Most dentures that people were unable to wear, were mostly found amongst *coloured people (upper 78,9%; lower 60,9%)*. *Of those dentures that people were unable to wear 'backdoor providers' made only 11 upper (11,1%) and 16 lower dentures (16,2%)*. *The number of successful dentures made by 'backdoor providers compared favourably with those made by dentists in the private and public sector.*

Seen in the above perspective, only a small percentage of the edentulous population wearing dentures made by 'backdoor providers' has to accept an unsuccessful denture. These individuals were nevertheless prepared to take such a chance to obtain a denture at a price they could afford.

#### **3.5.4 Functional and physical quality of dentures**

Overall, the functional quality of dentures in the Western Cape Province could be described as within acceptable limits. Dentures provided by dentists, however, were more acceptable by the criteria evaluated than the dentures provided by the 'informal sector' (backdoor providers). (**Table 41**) gives a comparison of the functional quality of dentures provided by dentists and 'backdoor providers'. In all the variables, except for stability, a statistically significant relationship was observed between the functional quality of dentures and the type of denture provider.

The most common problems found with dentures when physically examined were severe attrition and missing or fractured teeth (**Table 42**). For both of the latter variables the upper denture was more affected. In 18,4 per cent of cases, upper dentures had no posterior border seal. Posterior border seal was significantly more absent from dentures made by 'backdoor providers' (36,4%) than those made by dentists (15,4%) (**Table 42**). In 30,2 per cent of mandibular dentures the posterior teeth were set up lingual to the alveolar ridge. The latter characteristic was observed more frequently in dentures made by 'backdoor providers' (42,5%) compared with those made by dentists (28,2%). A significantly higher rate of missing or fractured teeth as well as attrition of teeth was observed in dentures made by 'backdoor providers'.

Overall the functional (**Table 41**) and physical quality (**Table 42**) of dentures in this survey was found to be acceptable. The results of the present study contrast with the poor quality of dentures measured by Hendricks (225) in a

survey of elderly coloured people. The reasons for this variation are most likely attributed to age of denture and age of the patient. The findings of this study are consistent with those found in other surveys namely that the physical quality of dentures decreases with increasing age of the denture (233, 235) and that functional quality of dentures decreases with increasing age of the patient (236, 237, 238). Various researchers have however stated that the clinical evaluation of dentures is notoriously unreliable due to the lack of acceptable and reliable criteria (239, 240, 241, 242). The data on the functional quality of dentures in this study is also subjective in nature and should therefore be interpreted with the necessary caution.

Although most functional and physical problems were found in dentures made by backdoor providers, the overall satisfactory rate was relatively large considering that 'backdoor providers' have no clinical training at all.

The poorer quality of dentures can be expected considering that 'backdoor providers' have no clinical training at all. The low frequency of problems, however, was negligible compared with the functional and aesthetic advantages that many indigent people are enjoying due to this service.

### **3.5.5 Satisfaction with dentures**

An analysis of the satisfaction with dentures made by different providers is presented in **Table 43**. Sixty per cent of the subjects questioned expressed overall satisfaction with their dentures, 24 per cent had occasional problems but were fairly satisfied, 12 per cent had frequent problems and were

somewhat dissatisfied and 3 per cent were very dissatisfied and could not wear their dentures at all.

A statistically significant relationship was found between the degree of denture satisfaction and type of denture provider (**Table 43**). For all the criteria examined more problems were experienced, or dissatisfaction expressed, where 'backdoor providers' made dentures. Twice as many individuals expressed dissatisfaction with their dentures who had their dentures made from 'backdoor providers' (29%) compared with the 13 per cent that had their dentures made by dentists.

Most dissatisfaction was expressed with the fitting (26,5%) and comfort (24,9%) of lower dentures (26,5%) and the chewing ability with dentures (19%) (**Table 43**).

Overall, a high rate of patient perceived satisfaction was measured for all the criteria evaluated (**Table 43**). In the present study only 3,3 per cent of denture wearers were most dissatisfied and could not wear their dentures, and a further 12,4 per cent expressed some dissatisfaction with their dentures because of frequent problems. A greater percentage of subjects who had their dentures made by 'backdoor providers' expressed dissatisfaction with their dentures compared to those who had dentures made by dentists (**Table 43**). This confirms the fact that the quality of dentures made by 'backdoor providers' is more inferior to those provided by dentists.

In the present study there was no significant difference in the satisfaction with dentures amongst the population groups.

Although the sample of the NOHS is not comparable with that of the present study, the relatively high rate of dissatisfaction with dentures (20%) that was found in the NOHS of 1989 (220) was consistent with the findings of the present study. The results of the present study indicate that cultural background and communication do not play such an important role in denture satisfaction as implied in the results of the NOHS (220).

The results of the present survey are also consistent with those found in other surveys. Studies of complete denture wearers have shown that dissatisfaction with dentures varies between 12 and 30 per cent (231, 233, 243, 244).

Overall, most subjects surveyed were satisfied (84%) with their dentures and had habituated reasonable well to their dentures irrespective of their perceived problem. Lemasney and Murphy (245) concluded from their study that a clinically unsatisfactory denture with which an elderly person is coping quite happily, may serve better than new dentures to which it is difficult or impossible to adapt. Lemasney and Murphy (245) also stated that elderly individuals who have been without dentures for many years are unlikely to adapt to dentures or benefit from dentures, which are imposed on them at a late stage in their life. The finding that denture wearers with old dentures were generally satisfied with their dentures may indicate that subjects may have become used to their dentures or are unable to discriminate between clinically good and bad dentures. Rise and Heloë (215) also found that the longer dentures were worn the better they were tolerated, despite poor fit. According

to Hendricks *et al*, (225), dissatisfaction with dentures could possibly stem from a cosmetic consideration and a 'comfortable feel' in the mouth rather than from a functional perspective. Hendricks *et al* (225) also emphasised the point that patient satisfaction encompasses qualities other than the measures used by a dentist. Other investigators (214, 246) also support the observation that the expectations of denture wearers are different from those of the examiner.

People who had dentures made by 'backdoor providers' showed twice as much dissatisfaction with their dentures compared to those that had dentures made by dentists. This may be attributed to the fact that the functional and physical quality of their dentures was relatively poor and that a 'back-up' service to adjust or repair dentures by 'backdoor providers' was lacking.

### 3.5.6 Oral mucosal disorders related to dentures

The prevalence of oral mucosal lesions directly related to the use of dentures in denture wearers, analysed by type of denture provider is presented in **Table 44**.

Denture stomatitis was the most common denture related oral mucosal lesion found (16,5%). More than half of all cases was of the diffuse erythema type.

Significantly more cases of denture irritation hyperplasia or epulis fissuratum were found in individuals who had their dentures made by 'backdoor providers' (5,6%) compared to individuals who had dentures made from dentists (1,9%) (**Table 44**). There was no statistically significant difference in

the prevalence of any of the other oral mucosal lesions when comparing dentures made by dentists and 'backdoor providers'.

A statistically significant relationship was found between denture wearing habits and the prevalence of denture stomatitis ( $p < 0,0001$ ). No denture stomatitis was diagnosed in individuals not wearing dentures or who were wearing dentures irregularly. Denture stomatitis was diagnosed in 14,3 per cent of individuals who wore their dentures during the daytime only, whereas 23,3 per cent who wore their dentures day and night had denture stomatitis. Denture stomatitis also increased significantly with increase in age ( $p < 0,0001$ ).

The present study supports the finding that denture stomatitis is the most common oral mucosal lesion of clinical importance amongst denture wearing elderly subjects (247, 248).

The observed prevalence for all age groups (16,5%) were more or less in agreement with other studies (248, 249, 250). The prevalence of denture stomatitis for the elderly in the present study (21,6%) is also in agreement with the findings of Van Wyk *et al*, (21,6%) (210), Watermeyer *et al*, (23,3%) (11), but significantly lower to that reported by Jorge *et al* (47,8%) (251) and Budtz-Jorgensen (50,0%) (250).

In the present study it was found that increase in age and denture wearing habits were directly associated with occurrence of denture stomatitis ( $p <$

0,0001). The findings of the present study are consistent with those of Watermeyer *et al* (210) and others (247, 252, 253) that sleeping with dentures increases the prevalence of denture stomatitis. Budtz-Jorgensen (250) concluded in his review that wearing a denture constantly would predispose both infection and mechanical irritation of the palate.

Although subjects wearing dentures made by a 'backdoor provider' showed a significant higher rate of denture irritation hyperplasia (5,6%) in comparison with dentures made by a dentist (1,9%) the prevalence was still significantly lower than that reported by other investigators ranging from 10 to 23 per cent (218, 250, 251).

Angular cheilitis is the clinical diagnosis of lesions, which affect the angles of the mouth, and is primarily caused by an infectious agent (yeast, streptococci or staphylococci). The infection is secondary to a local or systemic predisposing factor (250). Complete dentures may have both a direct and indirect etiologic significance. A loss of occlusal vertical dimension (over closure), inadequate maxillary lip support and ill-fitting, pathogenic dentures (254) can directly predispose to an infection of the angles of the mouth. On the other hand, poor functioning dentures may divert the patient's choice of food to a deficient diet, which may result in a state of nutritional deficiency (250) and therefore indirectly predispose to angular cheilitis. In the present study only 3,3 per cent of the overall study population examined had angular cheilitis. The prevalence of angular cheilitis among the elderly wearing dentures was 5,3 per cent and for persons younger than 65 years old, 1,3 per

cent. According to previous research findings the prevalence of angular cheilitis has been shown to vary between 8 and 30 per cent among wearers of complete dentures (250, 254). No explanation could be found for the low prevalence of angular cheilitis in the present study.

Traumatic ulcers caused by dentures with overextended or unbalanced occlusion are seen in about 5 per cent of denture wearer's (250). In the present study less than 3 per cent had acute traumatic ulcers. Traumatic ulcers usually occur soon after new dentures are placed in the mouth and present a special problem to patients who have received dentures from 'backdoor providers' who do not provide a follow-up service to adjust dentures where necessary.

In the present study no cases with denture related oral cancer were found. Investigations by Beiswanger and Stenstrom (255) and Gardener and Hamburger (256) found that ill-fitting dentures worn for more than 10 years were related to oral cancer in 12 to 15 per cent of cases. Other studies, however, have shown that denture irritation is not a significant carcinogenic factor (257) and that squamous cell carcinoma does not appear to be related to poorly fitting dentures (249, 254).

According to MacEntee (254) various studies support the claim by dentists that disease in edentulous mouths is a problem because many of these lesions are painless, regardless of the length of time the denture has been

worn. As a result dental education in most parts of the world places great significance on the diagnostic service expected of dentists. Oral examinations, from the time of denture insertion onwards, and renewal and / or correction of dentures should be conducted regularly by personnel trained in oral diagnosis to reduce the prevalence of oral mucosal lesions (228, 247, 250, 251). Vigild's statement that "it is hazardous to relegate responsibility for such supervision to other categories of dental personnel" (247), is however, not supported by the findings of his study but merely an expressed opinion which requires further investigation.

In the present study no conclusive evidence could be found indicating that dentures made by 'backdoor providers' pose a risk of increasing the prevalence of oral mucosal lesions. Therefore, if dentures made by 'backdoor providers' pose no or little risk to the public it can be deducted that dentures made by denturists, who would possess appropriate training, would be and even lesser risk to peoples oral health.

### **3.5.7 Temporo-mandibular joint complaints**

The most common TMJ complaints given by denture wearers were clicking sounds (9,8%), subluxation or dislocation (7,5%), and pain and tenderness of the TMJ with chewing. Statistically, there was no significant relationship between the prevalence of TMJ complaints and the type of provider in denture wearing subjects ( $p > 0,05$ ) (Table 44).

Studies conducted by MacEntee *et al* (258) and Loisel (259) found no association between TMJ dysfunction and the status of the dentition. Various other studies have, however, reported that loss of natural teeth and use of complete dentures is related to limited mandibular movement (260, 261, 262, 263). In the present study no association could be found between denture status and any of the symptoms of TMJ dysfunction.

It has also been reported that there is a strong correlation between increase in a patient's age, complete denture wearing and TMJ dysfunction (264, 265, 266). This relationship has been ascribed to the onset of degenerative conditions occurring frequently in adulthood, mostly in subjects who were complete denture wearers.

According to Budtz-Jorgensen *et al* (267) loss of occlusal support with subsequent loss in vertical dimension was positively correlated with severity of mandibular dysfunction. Monteith (268) reported that faulty vertical dimension was the most frequent cause of pain among complete denture wearers, due to muscle hyperactivity from the increased contraction. Carlsson (269) reported that occlusal instability was an important factor contributing to the development of mandibular dysfunction among complete denture wearers. This study suggests that there is no significant difference in the prevalence of symptoms irrespective of the patient being fully dentate, partially dentate or completely edentulous. This finding is also consistent with the findings of others (131, 263, 266, 270, 271, 272, 273).

Clark and Mulligan (274) concluded from their studies on patients attending an oro-facial pain TMJD clinic that TMJ dysfunction signs and symptoms are either self-limiting in most elderly patients or the associated disability and the need for treatment are low. MacEntee and co-workers (270) reported that the clinical signs, with the exception of joint noises, were uncommon in elderly people, whilst, Serfaty *et al* (275) reported that TMJ symptoms were not bothersome and were not associated with impaired general health in elderly subjects. Bibb and co-workers (132) also concluded from their study of an elderly population that TMJ dysfunction was not a significant health concern. In their study only 1 per cent of subjects evaluated warranted referral for treatment.

From the results of this study it can be concluded that:

- (i) Although the prevalence of edentulosity amongst the individuals that were edentulous was most prevalent amongst the coloured population and elderly people.
- (ii) Edentulous people in the lower socio-economic groups had a greater likelihood of not possessing dentures. The greatest demand for dentures is therefore amongst the indigent people.
- (iii) Although the dentures made by 'backdoor providers were of poorer quality this service still filled a much needed gap.

- (iv) Irrespective of who provided the dentures and what the age of the dentures were, the overall rate of perceived satisfaction with dentures was still high.
- (v) Wearing of partial dentures were not a common finding and were least prevalent amongst the coloured and black people.
- (vi) The findings of the present study support the notion that people view complete dentures as a permanent treatment modality and that people habituate quite happily to their dentures.
- (vii) Only a small percentage of the edentulous population (3,4%) reported that they had never had dentures before, mostly because they could not afford it.
- (viii) Oral mucosal and temporo-mandibular disorders are not a significant health concern for people that are edentulous or wearing dentures irrespective of where they had dentures made.

### **3.6 Utilisation of dental services by adults in the Western Cape Province**

Optimal oral health of a population can only be facilitated through developing interventions, which will enhance effective utilisation of oral health services (276, 277). Information on groups who traditionally have been non-users is also particularly important for those seeking to develop dental services and an oral health policy that addresses the needs of the older and disadvantaged population (278).

A comprehensive review of the literature on factors affecting the use of oral health services has been provided by Gift (276). The four major groups of factors influencing the use of services comprise demographic factors, attitudes towards dentists and dentistry, access to care and oral health status. Gift (276) suggests that Andersen's model could provide a unifying conceptualisation to oral health service utilisation. According to this model three conditions must exist if individuals are to seek health care (279, 280, 281, 282). These are classified as predisposing such as availability, accessibility and attitudes, enabling factors such as financial means and transport and need related factors. According to Andersen (279) predisposing factors temporally precede and predict enabling factors which in turn precede and predict need and, ultimately, need predicts the use of services. [Predisposing ⇒ Enabling ⇒ Need ⇒ Use]

Data on the utilisation of services among adults in South Africa is scarce. Only two local studies reporting on utilisation behaviour have previously been conducted, one on the urban Cape Coloured population (283) and the other on a rural farm working community in the Boland (284). The 1988/89 National Oral Health survey also investigated the patterns in (285) and barriers to oral health services (286). One common factor in the above-mentioned South African studies is the absence of elderly individuals in the samples. More attention is now being given to the oral health of older people, particularly because the size of this group is increasing and the elderly will continue to

remain at risk of oral disease and tooth loss (287, 288). The progressive nature of oral disease, limited access to care, particularly amongst those in the lower socio-economic groups, and the increasing likelihood of physically and medically compromising conditions that influence oral health care may seriously impair oral function (289, 290).

### **3.6.1 Availability of services**

The availability of oral health services in the Western Cape is summarised in (Table 45). On average private dental services are available, either on a full-time or part-time basis to 91,8 per cent and public dental health services to 84 per cent of the subjects in the Western Cape. Only 10,7 per cent of the population studied had no public services available and 8,2 per cent had no private services. Private services were least available in the South Cape (38,6%) and public dental services in the Boland / Overberg health region (17,5%).

Almost 34 per cent of the total study population did not know whether public services were available compared with the 16 per cent who did not know whether private services were available in the area where they were resident. Individuals that did not know where private services were located were mainly those living in the Cape Metro (27,4%) and the institutionalised elderly (45,5%). Whites (53,9%) and the institutionalised elderly (62,3%) were the largest groups that did not know where public dental health services were located. Perceived availability was significantly associated with socio-

economic status. Individuals with a lower educational level, who were economically non-active, and had a low household income, were least likely to know whether private dental services were available ( $p < 0,0001$ ). The reversed trend was observed with public services, namely individuals with a higher socio-economic status were the least likely not to know whether public dental health services were available ( $p < 0,0001$ ).

According to the NOHS (286) there is a lack of availability of oral health services for blacks. This finding contrasts with that of the present study which found that coloureds had fewer services available in the Western Cape Province. Both private and public services were less available in the rural areas.

Faber *et al* (286) also concluded that only 23 per cent of white respondents who regularly visited a dentist did not have to wait more than two weeks for an appointment, may point to a possible over-supply of dentists.

An interesting finding in this study was that 33,1 per cent of subject's thought that no private services were available when full-time services were in fact available. Those individuals who had not been aware of available services were mostly coloureds (16,1%) and blacks (31,7%) and were mostly indigent (47,3%). In comparison only 13 per cent indicated that no public services were available. These subjects were also mainly indigent.

### **3.6.2 Accessibility of services**

Most subjects that were interviewed stated that services were easily accessible (82,2%). Only three (3) individuals stated that services were totally inaccessible to them. Some 11 per cent of subjects stated that it was very difficult to access dental services. Accessibility to services was rated most difficult in the South Cape/Karoo health region (24,2%) and amongst the institutionalised elderly (29,8%).

Lack of transport (10,9%); of knowledge where services were located (6,1%) and physical disability (3,4%) were the most common barriers reported which prevented access to services. A greater number of blacks (11,0%) responded that they did not know where services were located. Only 0,1 per cent of individuals reported that they could not access services due to lack of finances.

Almost 80 per cent of the participants indicated that they lived within 10 km from their nearest dentist or dental clinic. Individuals who were resident more than 20 kilometres from their nearest dentists or dental clinic were mainly in the South Cape (31,6%) and Boland (19,6%) health regions.

The institutionalised elderly generally experienced the poorest accessibility mostly due to physical disability (14,1%), non-availability of transport (11,7%) and lack of knowledge of service location (14,7%). The elderly who were non-institutionalised generally had fewer barriers to access care than those living in institutions ( $p < 0,0001$ ).

### 3.6.3 Affordability of services

The primary method of payment for oral health services, analysed by socio-demographic characteristics, is summarised in **Table 46**. Most individuals (44,4%) paid cash for services, whereas only 24,3 per cent paid for their services by means of a medical aid. Almost one third of all the participants (29,8%) responded that they could not afford any services (**Table 46**). Most individuals who could not afford services were coloureds (41,8%) and blacks (26,8%), situated in the South Cape (50,0%), were elderly (40 - 50%), economically non-active (47,3%) and had a household income of less than R9600 (50,2%) (**Table 46**). The method of payment was significantly related to the various socio-demographic characteristics that were analysed (**Table 46**).

Only 24,1 per cent of individuals interviewed had a medical aid (**Table 47**). People with a medical aid were mostly white (52,2%), and had a higher socio-economic status. Most coloureds (88,1%) and blacks (92,5%) did not have a medical aid (**Table 47**) and therefore were less able to afford care.

Utilisation of services was significantly associated with having a medical aid ( $p < 0,0001$ ). Most individuals with a medical aid (85,1%) reported that they used private dental services. In comparison only 39,4 per cent of people without a medical aid used private services, 25,6 per cent a state dentist and 23,4 per cent reported not having a dentist at all. Individuals with a medical aid showed the highest prevalence of regular users (once every year). In comparison, only 4,4 per cent of those without a medical aid visited a dentist once every year. Individuals without a medical aid (81,3%) were also more

likely to visit a dentist when they perceived a problem compared with those who had a medical aid (55,6%).

Health care providers, planners, and health care reformists have pointed to cost as the primary barrier in seeking dental care by older person's (291). The findings of this study are consistent with those of previous studies i.e. that ability to pay and insurance coverage play an important role in the use of oral health services (291).

#### **3.6.4 Utilisation behaviour**

Most individuals visited a dentist only when they had a problem (75,1%). Only 15 per cent of individuals reported that they visited a dentist on a regular basis (at least once every 3 years) (Table 48). Nine per cent (9%) of subjects reported that they had never visited a dentist before. Individuals who had never visited a dentist before were mostly blacks (32,3%) (Table 48). Twice as many males (12,3%) had never visited a dentist before in comparison with their female counterparts (6,7%) ( $p < 0,0001$ ) (Table 48). A statistically significant difference in regularity of use of services was observed between population groups ( $p < 0,0001$ ), in the various health regions ( $p < 0,0001$ ), gender ( $p < 0,0001$ ) and age groups ( $p < 0,0001$ ) (Table 48). Younger adults were more regular users. Most individuals (59,1%) reported that they use dental services only they had a problem. (Table 15).

Generally, most people (75,1%) usually visited a dentist only when they had a problem. The non-institutionalised elderly (84,3%) and institutionalised elderly

(93,4%) showed a greater tendency to visit a dentist only when a problem was perceived. The demand for denture services by the elderly during the past 12 months was practically non-existent. The last type of services that elderly used were mainly complete full upper and lower dentures (42%).

Regularity of use was also significantly associated with socio-economic status (**Table 49**). People with no schooling, in lower occupational categories and lower household income categories were more likely to be non-users of services, or visited a dentist only when they had a perceived problem. The results of the study indicate that regularity of use is strongly associated with availability of services ( $p = 0,0013$ ).

The NOHS reported that 26,9 per cent of blacks, 3,9 per cent of coloureds and 0,5 per cent of white had never visited a dentist before. These results are in accordance with those found in the present study. The survey of an urban Cape Coloured population revealed that only 2,4 per cent had never visited a dentist before (**283**). In comparison a study of a rural farm worker community found that 16,6 per cent had not visited a dentist before (**284**).

Individuals who had a medical aid were also more likely to be regular users of services (34,7%) ( $p < 0,0001$ ) compared to the 7 per cent who did not have a medical aid.

The results of this study are consistent with those of others, showing that lower socio-economic groups make less use of oral health services (276, 292, 293). Possible explanations for the relatively low use in some population sub-groups include unavailability of, or inaccessible providers, inability to pay, lack of a medical aid, ignorance of the importance of regular oral health care and differences in attitudes, behaviour or beliefs about dental care (293). According to Rickcardsson and Hanson (294) the social class differences in dental care utilisation could to some extent be explained by differences in development of social network, social support and social influence.

Dental services were more regularly used in the upper socio-economic groups and are thus in accordance with previous studies (276, 284). The social profile of non-users of dental services in this study showed a low income, low educational level, lesser skilled occupational categories and subjects were mainly black people. This trend is in agreement with other studies (284). Studies have shown that the educational level of the household head is an important predisposing variable across all age groups (291, 295). Families headed by persons in the highest occupational groups were found to be two to three times more likely to seek dental services than those subjects headed by persons in the lower occupational categories (295).

The differences in the use of services across cultural and sociodemographic groups can be ascribed to availability of oral health services, availability of transport, and affordability of services. Rickardsson and Hanson (294) have

also shown that social network and social support variables are important determinants of regular use of oral health care.

Regular use of oral health services can be considered a preventive health action (296). Research has shown that people who make regular dental visits are also more likely to take other preventive measures concerning oral health (297, 298) and general health (299, 300). Therefore the low rate of regular use of dental services, especially amongst the lower socio-economic groups, may impact on increasing levels of tooth loss and edentulousness and subsequent need for prosthetic care.

Individuals within the lower socio-economic categories were more likely to have had care longer than 5 years previously or never had had care before, whereas individuals in the higher socio-economic categories were more likely to be recent users of services ( $p < 0,0001$ ).

Most adult users of dental services during the past 12 months were white (65,3%) followed by coloureds (24,1%) and blacks (10,5%). Most services received during the past 12 months were examinations (63,5%), restorations (41,8%), and extractions (23,2%). Denture related care was mostly for rebase or reline of dentures (13,0%). Complete dentures were obtained by 5,3 per cent, a full upper or lower denture only by 3,4 per cent and a partial denture by 3,4 per cent of the sample studied. Most restorative work was received by white (55,9%), whilst extractions mostly applied to coloureds (37,2%) and blacks (52,9%). No denture services were used by Blacks during the past 12

months. Coloureds (11,5%) compared with the 3,8 per cent by whites obtained most full upper and lower dentures.

Various studies have shown consistent disparities in the use of oral health services among various sociodemographic categories (292).

According to the NOHS 59,9 per cent of white, 26,7 per cent of coloureds and 21,5 per cent of blacks used dental services during the past 12 months (285).

In the present study only 36,2 of white, 9,7 per cent of coloureds and 9,2 per cent of blacks made use of such services. The wide discrepancy between the two studies can possibly be explained by the fact that rural and elderly populations were excluded in the NOHS. A study of rural farm workers in the Boland region showed that 27, 6 per cent of individuals had used oral health services during the previous year, and that this percentage decreased with increasing age (284). Louw (283) in his study of urban coloured people found that 19,7 per cent had visited a dentist during the past 12 months. The study conducted by Resine (301) also showed that whites used services more than non-white subjects did.

The type of care demanded during the last visit to a dentist is presented in **Table 50**. Treatments utilised most were extractions (34,4%) and complete full upper and lower dentures (26,5%). Mostly coloureds (48,3%) and blacks (50,3%) had teeth extracted. A large number of coloureds received a full clearance (6,3%). Amongst the first time recipients of complete full upper and lower dentures (22,8%), whites were the most frequent recipients (32,1%)

followed by coloureds (23,5%). Black individuals received only 7,2 per cent of complete dentures. (**Table 50**). Replacement of old dentures was requested by 3,7 per cent of the study population.

The average number of complete full upper and lower dentures denture wearers have had to date was 1,7 dentures (**Table 51**). The average number of full upper or lower dentures that subjects had were less, with an average of 0,2 and 0,1 dentures up to date respectively. Individuals in the lower socio-economic categories had fewer dentures up to date compared with individuals with a higher socio-economic status (**Table 51 and 52**). Overall, the mean cumulative number of dentures, denture wearers have had to date was greater for subjects who had a medical aid compared with those without a medical aid (**Table 53**).

A longitudinal study of a universal dental plan in Alberta, Canada, showed that the mean interval of replacement of complete full upper and lower dentures was about 6,5 years (**302**). The latter study also found that denture replacement occurred cyclically. It is more than likely that the cyclic pattern policy induced behaviour because the dental plan made provision for replacement of dentures every 5 years. The above-mentioned study also showed that the replacement rate of complete full upper and lower dentures for denturists was three times higher than for dentists but could not explain the reason for the difference (**302**).

In comparison the average age of dentures worn by denture wearers in the present study ranged between 7,3 and 18,1 years. In comparison, a longitudinal study conducted by Lewis and his co-workers in Canada found that the average age of dentures in their study population was 6,5 years (302). This may indicate that dentures are replaced less frequently in the Western Cape Province.

The use of partial dentures was low in the study population. The average number of partial upper and lower dentures obtained were 0,07 and 0,05 respectively. Partial denture use was more prevalent among individuals with a higher socio-economic status.

### **3.6.5 Type of denture service provider used**

A distribution of denture service providers by population group is summarised in **Table 54**. Private dental practitioners provided 72,8 per cent of all dentures currently worn, whereas state dentists provided only 9,3 per cent and 'backdoor providers' (the informal sector) 14 per cent of dentures that were currently worn. Most dentures made by State dentists were for coloured people (67,8%). Dentures supplied by 'backdoor providers' were also mainly for coloureds (87,6%) (**Table 54**). Most dentures provided by private dentists (48,3%) and state dentists (76,3%) were made for individuals in the Cape Metropolitan health region. Dentures made by 'backdoor providers' were more evenly distributed throughout all the health regions. Private practitioners provided 49,1 per cent of all their dentures to adults, 17,9 per cent to the non-institutionalised elderly and 32,9 per cent to the institutionalised elderly. State

dentists provided fewer dentures to adults (22,0%) and the non-institutionalised elderly (18,6%), but significantly more dentures to the institutionalised elderly individuals (59,3%).

The results revealed that there was a significant relationship between educational level ( $p < 0,0001$ ), occupation ( $p = 0,002$ ), household income ( $p < 0,0001$ ) and the type of denture service provider used. Individuals with a higher education or occupational status, or household income, made more use of a private dentist, whereas those with a lower education, occupational status, or household income, primarily used public services or a 'backdoor provider'. Most of the dentures provided by state dentists (93,2%) or 'backdoor providers' (94,4%) were for individuals who had no medical aid (**Table 55**).

The fact that backdoor providers are providing more dentures to disadvantaged people indicates that the public sector is not sufficiently available or accessible to the disadvantaged as far as dentures are concerned. This trend may be explained by the fact that resources for dentures are made less available because dentures are not considered a priority in Public Health Services.

### **3.6.6 Reasons for using and non-using of dental services**

Overall, the most common motivation behind visiting a dentist was 'toothache' (36,1%). Self-responsibility (17,2%) and restoring a broken tooth (8,4%) were

also commonly reported. Toothache was a greater motivating factor amongst blacks (64,9%) and coloureds (38,3%) in comparison with whites (13,6%). Self-responsibility was mostly perceived as a strong motivator amongst white individuals (33,2%), compared with the 10,6 per cent amongst coloureds and 7,4 per cent of blacks.

The reasons for not utilising services differed significantly amongst the various population groups ( $p < 0,0001$ ). The most common reasons provided for not using services was that no problem was perceived with oral health (95,7%) and an inability to afford care (12,3%).

Only 16 individuals in the study population reported that they had experienced problems getting access to dental treatment during the past 12 months. Of those who had experienced problems eight individuals reported they could not get dentures. The most common reason provided for not being able to get the required treatment was that treatment could not be afforded.

According to Gift (276) individuals with a low income had the most negative attitude towards health care and used services the least.

Songpaisan *et al* (303) reported that lack of time (21,7%) was the most common reason for not visiting a dentist. He stated that with both private and public oral health services being more available to the public, cost is presumably becoming less of a problem because if private services cannot be afforded, public services are used where care is mostly provided free or at a nominal fee.

Although cost is a major factor in seeking care, several studies have reported that it is not the predominant reason for avoiding care (276, 303, 304). Affordability as a reason for not using services scored low by whites (4,6%) and blacks (8,7%) but higher in the coloured population group (17,9%) in this study. The results for whites are in agreement with those found in the NOHS, namely 5,5 per cent (286). The NOHS reported that a lack of finances as a barrier was higher among indigent groups (286). According to Faber and his co-workers (286) the high response by indigent people that cost is a fundamental barrier clearly indicates that services are either unaffordable or are unavailable in the public sector due to a general lack of resources.

The results of this study are in accordance with those of the NOHS (285), namely that lack of financial means are the main reason why the majority of black and coloured respondents could not obtain the treatment they wanted, especially services such as dentures which are both expensive and resource intensive.

The results of this study showed that only 0,6 per cent of subjects reported that lack of availability of services was the main reason for non-use of services. According to the NOHS, non-availability of services accounted for 2,9 to 13,5 per cent of non-use of services (286).

Various studies have reported that the elderly utilise oral health services at a significantly lower rate than that by which they use other health services (278, 291). The elderly also use less oral health services compared to the younger age groups. The use of services by the edentulous population is even lower (289). The National Centre for Health Statistics, United States of America (305) reported that 72 per cent of edentulous elderly had not sought dental care in more than five years. The U.S. National Health Interview Survey (NHIS) found that 43 per cent of adults aged 65 and older had visited a dentist in the past 12 months (289). A study of Native American elderly also found that 40,7 per cent had not visited a dentist within the last 5 years (306). A review of the literature concerning studies conducted indicates that fewer than 20 per cent of elderly people visit a dentist regularly, while 20-30 per cent of the subjects had not visited a dentist for more than 20 years (307). The latter study also concluded that a high proportion of the elderly might have a tendency to accept the degeneration of the oral structures as part of the ageing process.

In the present study fewer than 10 per cent of the elderly had made use of services during the past 12 months. Gift (289) concluded from the results of the NHIS of 1989 that edentulousness appears to be a major factor for not using services and that large socio-economic differences still exist amongst the elderly. Gift (289) has further emphasised that the pattern of low use of oral health services among edentulous individuals is a persistent concern because of the risk of these individuals to oral soft tissue disease.

Dolan and Atchison (308) stated that the elderly should receive special consideration in terms of their oral health care needs because it is integral to an elderly person's general health and quality of life. Furthermore, the elderly may have problems accessing the health care delivery system, experience different patterns and prevalence of oral disease, and may have characteristics that affect the amount and type of oral health care needed. Amongst the elderly, a lack of perceived need for oral health services is the most commonly cited reason for not seeking care. The elderly generally perceive that a problem is due to ageing rather than to oral disease, or that nothing can be done to improve their condition, or else that obtaining oral health care is beyond their financial or logistical means (308.)

Transportation difficulties are particularly relevant to the elderly because many of them do not drive and are dependent on others for transportation. Barriers such as financial constraints, lack of interest by the resident elderly person and/or lack of interest by care-givers or the family may also affect the institutionalised elderly person's access to oral health services (308). Kiyak (278) showed in his study that neither dental insurance nor transportation was a significant barrier to the elderly utilising dental care. An elderly person's financial situation was, however, associated with the type of service provider an individual would use after entering the system (278). According to Dolan and Atchison, (308) more attention should be devoted to educating and communicating with nursing home residents as well as family members or guardians when planning oral health services. According to Rickardsson and

Hanson (294), social support and network systems are important resources that should be considered when public health efforts are made to increase the number of elderly persons receiving regular dental care.

Kiyak (278) also emphasised that programs should be made available for the elderly that would provide an educational component to enhance awareness and the importance of oral health in improving the quality of life.

According to Kiyak (291) improving an individuals' attitudes, i.e. the individuals health beliefs and degree of personal importance attached to these beliefs, may play a greater role in improving oral health behaviour than the predisposing, enabling and need variables which have traditionally been used in studies of utilisation.

From these results the following can be concluded.

- (i) Dental services (public or private, full-time or part-time) are readily available and accessible to the majority of the population studied. The elderly however presented with most problems relating to the availability and accessibility to dental services.
- (ii) This is particularly problematic for elderly people who face a double burden due to medical and physical limitations. The pattern of low use of oral health care among the elderly is a special concern because these individuals are at greater risk to oral soft tissue disease.
- (iii) A significant proportion of subjects did not know whether services were available.

- (iv) A very low percentage of people in the Western Cape Province, irrespective of cultural or socioeconomic background, are in the habit of visiting a dentist or dental clinic regularly (once every three years). Furthermore, people seem to use oral health services only for 'symptomatic reasons' or when they perceive a problem.
- (v) Individuals with a high socio-economic status mainly use private dental services, whereas people in the lower socio-economic categories mainly use dental clinics in the public sector. The regularity with which services were used increased dramatically with increasing socio-economic status.
- (vi) The utilization of dental services especially preventive and restorative care is very low amongst the coloureds and blacks in the Western Cape Province. The latter groups also made more use of extraction services. If this trend continues an increase in tooth loss, edentulousness and need for prosthetic care will prevail.
- (vii) Ability to pay is the most important reason why the majority of people could not obtain the treatment they needed.
- (viii) Public dental services play a relatively insignificant role in the provision of dentures. 'Backdoor providers' therefore fill a much-needed gap where public services are unavailable or where private services cannot be afforded.
- (ix) A lack of financial resources or a medical aid were the most significant factors affecting the use of services.

- (x) Private dental practitioners provided most of the denture services used. The informal sector (backdoor providers) provided more dentures for disadvantaged people than Public Health Services. Coloured and elderly people mostly consumed denture services. The use of dentures was relatively low considering the high rate of edentulousness and full clearances of teeth in the coloured population. The replacement rate of old dentures was also low. The social profile of denture care users was mainly white and coloureds and elderly people. Blacks made the least use of denture services.

### **3.7 Denture treatment needs and demands of adults in the Western Cape Province**

Need for treatment can be evaluated in several ways (309, 310). First, need for treatment can be measured objectively or professionally (normative or objective need). Normative or professionally assessed need is the quantity of services which expert opinion believes ought to be consumed over a relevant period of time. Assessment of normative need alone may, however, lead to an overestimation of the treatment needed and therefore calculated costs of care.

Secondly, it can be measured according to the patients' perceived need (felt need or wants) for treatment. Perceived need is based on an individual's awareness of potential disease and on personal experiences and depends on various cultural, educational and social attitudinal or belief factors. Finally, the

need for dental care can be measured according to the patients' potential demands or expressed need for treatment, which is perceived, need turned into action. The concept of potential demand imparts a desire and attempt by an individual to seek or make a claim upon oral health care resources based on information such as symptoms or the advice of a dental health care professional.

Although there are different concepts of need, it is argued that the patient himself should play an important role in the assessment of her or his own needs. Various studies emphasise the importance of inclusion of self-perceived or subjective as well as professionally assessed or objective measurements in determination of oral health care needs (136, 311). Gordon (310) emphasises the importance of including factors beyond oral status when estimating treatment need. These include the general health of the patient, discomfort, patient-perceived need for treatment, and desire for treatment. Very few studies make any reference to these factors (312, 313).

Information on "objective" and "subjective" needs in South Africa is very scarce. Furthermore, the scope of the available information regarding denture treatment needs is very limited. The National Oral Health Survey reported some information on normative and perceived needs by population groups (136, 314). Only two other local studies provide some information on the denture treatment needs of the coloured population in the Western Cape. One study was done on the Cape Coloured population in the Cape Peninsula (315) and the other on farm workers in the Boland area (316). Besides the

studies which reported on the relationship between denture treatment needs and population group in adults (314), age and location (316), and socio-economic status (315), no other studies have made any detailed investigation of demographic and socio-economic factors that influence denture treatment needs in South Africa. Information on perceived denture treatment needs is practically non-existent in the RSA. Furthermore, no studies on denture treatment needs have ever been conducted on a regional basis in South Africa.

### **3.7.1 Professionally assessed denture needs**

Denture treatment needs have traditionally been determined by means of objective or professional assessment. Various studies have concluded that more effective denture treatment needs can be expected if professionally assessed or objective needs are based on a diagnosis in which both clinical and psychosocial factors are taken into account (317, 318, 319). In this study the clinical assessment of denture treatment needs was based on specific criteria relating to real life situations and non-dental factors. The objective clinical assessment of needs in this study was closer to the real life situation because the patient perceived need, general health status and the technical feasibility of providing dentures was part of the decision making criteria for treatment need.

Approximately 28 per cent of subjects need a complete set of dentures, 2 per cent need either a full upper or lower denture and about 11 per cent need a partial upper or lower denture (**Table 56 and 58**).

Overall, the need for dentures was greatest in the Boland and South Cape Health Regions ( $p < 0,0001$ ), amongst the coloured population group ( $p < 0,0001$ ) and in elderly individuals (**Table 56 and 58**). The need for dentures was significantly associated with socio-economic status. Denture needs were greater for those individuals who had a lower education ( $p < 0,0001$ ), who were in unskilled occupations or economically non-active ( $p < 0,0001$ ), and had a lower household income ( $p < 0,0001$ ) (**Table 57 and 59**).

Twice as many blacks need partial dentures compared to white or coloured subjects (**Table 56**).

Extrapolated to the study population, approximately 950417 dentures are needed in the Western Cape Province. Of these dentures 82 per cent (780750) are needed by coloured subjects, 202944 (21,4%) by whites and 59824 (6,3%) by blacks. Most dentures needed were by the elderly (463224) (48,7%) and by indigent people (690159) (72,6%).

The professionally assessed needs for dentures was more or less consistent with the findings of other local and international studies with age the most prominent determining factor.

The professionally assessed needs for a complete set of dentures for the elderly in Western countries varied between 18 per cent and 70 per cent in

other countries (320, 321, 322, 323, 324, 325, 326, 327, 328). The corresponding percentage in the present study was approximately 50 per cent. The study of rural farm workers in the Boland reported that 81 per cent of individuals needed a complete set of dentures (316). In a study of the Cape Coloured population in the Cape Peninsula it was found that 40,1 per cent of persons required a full set of dentures (315). The large discrepancy between the latter two studies and that of the present study can partly be explained by the fact that the dentition status of rural farm workers might be poorer due to lack of services or are less able to afford services thereof. Differences between various findings can also be attributed to the diagnostic criteria used in studies and different study samples used.

### **3.7.2 Patient-perceived denture treatment needs**

Consumers' perceived needs are based on their awareness of potential diseases and conditions and on personal experiences.

Overall, 24,8 per cent of subjects felt they needed a new complete denture (Table 60). Patient perceived needs for a partial denture or a single upper or lower denture were negligible. Perceived need for dentures was strongly associated with all the demographic (Table 60) and socio-economic variables studied (Table 61).

Individuals in the South Cape/Karoo health region had the greatest perceived need for dentures (41,7%). Thirty-five (35%) per cent of coloureds perceived

a need for full upper and lower dentures in comparison with the 15 per cent of whites and 17 per cent of blacks (**Table 60**). There was also a greater perceived need for full upper and lower dentures amongst females (25,9%) compared to males (23,6%) ( $p < 0,0001$ ). Individuals in the lower educational and household income categories had a greater perceived need for full upper and lower dentures (**Table 61**).

Perceived needs are dependent on cultural, religious, educational and social status (**138**). Gilbert and co-workers (**136**) reported that patients who reported dental pain, or one or more psychosocial impacts that interfered with daily activities had a greater likelihood of perceiving a current need for prosthetic care. They also found that persons with a lower household income were more likely to perceive a current need for prosthetic care (**136**).

The findings of this study support the findings of Gilbert *et al* (**136**) which underscore the necessity of distinguishing perceived need from actually sought care. The mere fact that people perceive a need for prosthetic care does not mean that they will necessarily seek treatment. Gilbert and co-workers (**136**) suggested that people in the lower income category and with lower levels of satisfaction with recent dental care are more likely to perceive a need for dental care. They also concluded that these individuals, for financial or attitudinal reasons, are not likely to seek care in response to that perceived need. According to Gordon (**310**), elderly people also perceived a need for much less treatment than would be recommended by a dentist. The results of this study also showed that there was no relationship between

perceived need and the age of dentures ( $p = 0,556$ ). Hoad-Reddich (134), however, found that professionally assessed need were related to the age of dentures. Various reasons have been ascribed to poor levels of perceived need, namely lack of knowledge and a fatalistic attitude towards health (329). The perceived need for dental care by potential patients has been identified as an important correlate and predictor of dental care attendance (330, 331, 332). Various studies, however, have shown that patients' perceived need for dental care correlates poorly with professionally assessed need (normative need) (133, 333, 334).

### 3.7.3 Potential demand for dentures

All individuals were asked whether they had perceived a need for dentures and intended having dentures made during the following 6-months. A summary of potential demands for dentures by demographic and socio-economic characteristics are presented in **Tables 62 and 63** respectively.

The potential demand for a complete set of dentures in the Western Cape Province was 8,9 per cent and approximately 1 per cent for a full upper or lower or partial denture (**Table 62**).

Potential demands for dentures were significantly associated with region, population group, gender and age category (**Table 62**). The greatest potential demand for full upper and lower dentures was recorded in the Boland (10,1%) and South Cape (10,8%) ( $p < 0,0001$ ), amongst coloureds (11,8%) ( $p < 0,0001$ ), and those between the age of 35 and 79 years ( $p < 0,0001$ ) (**Table 62**).

The potential demand for dentures was also significantly associated with socio-economic status (**Table 63**). Most individuals who intended having dentures made had a lower education, were either in unskilled occupations or economically non-active or had a low household income.

Extrapolated to the study population there is a potential demand for approximately 305000 complete sets of dentures in the Western Cape Province.

Of the latter 77,8 per cent (237244) coloureds require dentures, 19,8 per cent (60298) by whites and 10,3 per cent (31533) by blacks. The potential demand for a complete set of dentures was mostly by indigent people (75,6%) (230621). Twenty eight per cent (28%) (85844) of dentures for which there was a potential demand for replacement were for the elderly.

#### **3.7.4 Potential demands (wants) for extraction of teeth and replacement thereof with a denture**

The percentage individuals that want to extract teeth and replace them with a removable partial denture, analysed by demographic and socio-economic characteristics, are summarised in **Tables 64 and 65** respectively. Overall 19,2 per cent of the dentate population in the Western Cape Province stated that they intended having some teeth extracted. Of the latter group of individuals 15,9 per cent responded that they intended having a partial denture made to replace the teeth that were extracted (**Table 63**). The

greatest potential demand for extractions was again observed amongst coloured (24,5%) and black (26,6%) individuals in comparison with the 3,8 per cent of whites. The potential demand for extractions was also strongly associated with health region ( $p < 0,0001$ ) and age category ( $p = 0,003$ ), but not with gender ( $p = 0,462$ ). The results indicate that there is no relationship between the potential demand (want) for partial dentures to replace teeth extracted and the various demographic factors studied.

The potential demand for extractions showed a strong relationship to socio-economic status (**Table 65**). The results show that the potential demand for the extraction of teeth is greater in the lower socio-economic groups. The latter trend was, however, not found with regards to replacement of extracted teeth with partial dentures.

A summary of potential demand for extraction of all teeth in the upper or lower jaw, and replacement thereof with a full denture, analysed by demographic and socio-economic characteristics, is presented in **Tables 66 and 67**. Only 5,45 per cent of the dentate population stated that they intended having all their remaining upper or lower teeth extracted (**Table 66**) whilst 1,5 per cent responded that they intended replacing their extracted teeth with a full upper or lower denture. A strong relationship was observed between the potential demand for full jaw extractions as well as replacement with full dentures and the demographic status of the study population. The potential demand for full jaw extractions was greater in the South Cape, amongst

coloureds, in the elderly (**Table 66**), and in the lower socio-economic categories (**Table 67**).

The potential demand for full clearance of remaining teeth and replacement with a complete set of dentures is summarised by demographic and socio-economic factors in **Tables 68 and 69** respectively. Twelve per cent (12%) of the dentate population indicated that they intended having all their remaining teeth extracted and 11,2 per cent intended to replace their extracted teeth with a complete set of dentures (**Table 68**). Almost all those who wanted a full clearance stated that they also intended getting a complete denture (91,7%). Full clearance was strongly associated with health region ( $p < 0,0001$ ), population group ( $p < 0,0001$ ) and age category ( $p = 0,002$ ) but not with gender ( $p = 0,937$ ) (**Table 68**). Full clearance was also associated with educational level ( $p < 0,0001$ ), occupation ( $p < 0,0001$ ) and household income ( $p < 0,0001$ ) (**Table 69**). The greatest potential demand for extraction of all remaining teeth was found in the South Cape (28,4 %) and amongst the coloured population group (22,3%). The same trend was found for replacing extracted teeth with a complete denture. The potential demand for a full clearance and replacement with a complete denture was more common among the lower socio-economic groups (**Table 69**).

Extrapolated to the study population, approximately 233530 (12,2%) dentate subject's intended having all their remaining teeth extracted. Most of those that wanted a full clearance were coloureds (204988) (87,8%). Approximately 54508 (23,3%) of dentate black subjects intended having all their remaining

teeth extracted. Only 1473 (0,6%) of dentate white subjects intended having all their remaining teeth extracted. Most subjects that intended having all their teeth extracted stated that they wanted to replace their teeth with dentures.

The most common reasons given for wanting to have some teeth extracted were pain affecting sleep (58,7%) and badly decayed teeth (25,5%). The most common reasons provided for having all remaining teeth extracted were that pain was affecting their sleep (30,5%), they were experiencing difficulty with chewing (27,1%), or were dissatisfied with the appearance of their teeth (10,2%).

The general trend observed was that people without a medical aid showed a greater potential demand for extracting teeth compared to individuals who had a medical aid. The above mentioned trend was not observed with regards to replacing extracted teeth with dentures.

The high proportion of dentate subjects requiring extractions found in the study should also be seen as an indication of dental neglect. This may also be seen as a reflection of a general lack of awareness of potential dangers of oral neglect, benefits of modern dentistry, lack of financial resources or a combination of all three.

This study is consistent with the NOHS in that the greatest potential demand for extractions was found amongst coloureds (46%) and blacks (41%).

Several studies have been conducted in western countries which mainly focus on normative or objective denture needs (133, 134, 313, 320, 321, 322, 323, 324, 325, 326, 327, 328, 335, 336, 337, 338, 339, 340, 341) Most of the latter studies have mainly focused on the elderly. Remarkably fewer studies are available that provide insight on the subjective or perceived needs of individuals, particularly amongst the adult population (323, 336, 342).

For all types of dentures, professionally assessed needs were greater than patient perceived needs. On the other hand, individuals' intention to have dentures made (potential demands) were, overall, much less prevalent than their perceived need for dentures.

Most literature on denture treatment needs reports a discrepancy between self-perceived and professionally assessed needs because of ignorance on the part of the individual that services exist, or because of the many systems of rationing or barriers which operate to deter the expression of need (133, 343, 344). This study confirms previous results, which have found large discrepancies between the professionally assessed and perceived need by individuals (135, 136, 320, 328, 329, 332, 334, 336, 342, 345, 346)

A substantial discrepancy between professionally assessed and individuals' perceived need for denture care was evident in the population examined.

This is expected, given that dentists are more experienced at recognising early signs or conditions relating to poorly fitting dentures, and are conducting an examination for the purpose of detecting these conditions (expectation bias). On the other hand, individuals may be unaware of the signs of poor quality dentures or denture related oral mucosal lesions (332).

Perceived need has the shortcoming in that it is subjective and depends on a complexity of factors related to the subject's interpretation of signs and symptoms, the disease process and the availability of dental services (347, 348). Improvement of people's awareness and knowledge of the oral health status thus raising the level of perceived need is likely to increase the demand for dental services (349). Individuals may place more importance on the functional and psychosocial impact of conditions such as edentulousness when assessing their need for denture care, rather than on the visible signs of oral disease (330, 350, 351, 352). Equally, patients may not desire care because of their inability to afford care or by the priority the individual places on oral health in the context of other competing needs and burdensome life circumstances (332).

To complicate matters further, consideration must also be given to the fact that normative assessment of treatment needs is liable to a great variation in clinical judgements among dentists.

The results of this study supported the findings of others i.e. that people tend to underestimate their needs for denture treatment. The reason for this discrepancy between the subjective and objective assessed needs is multifactorial, but may be largely based upon the differing criteria applied by dentists and by subjects. Professionals value criteria such as stability, retention, aesthetics, vertical dimension, occlusion and the presence of denture related pathology, whilst subjects use pain associated with denture

use, chewing ability, appearance, and looseness of dentures when evaluating the adequacy of dentures (135).

In the present study dental and denture treatment needs were strongly related to social class. Kandleman *et al* (328) in their comparative review of studies on the dental needs of the elderly have also reported on the variations that occur among people of different social classes.

Oral health needs, measures the individuals clinical and perceived level of health or illness. Because oral conditions are not life threatening, oral health services are generally considered more discretionary in nature compared with the use of either physician or hospital services (279). The latter study proposed that predisposing and enabling variables are more important than need in the use of oral health services. The reasons found in this study for not visiting a dentist are in accordance with those found by Gift (276). The results indicate that a lack of perceived need (95,7%) is the most significant barrier to using oral health services.

Various studies have found a low perceived need among non-users of dental care (291). Gift (276) has stated that, across cultures, the lack of perception of need persists in being the most frequent reason for not going to the dentist. Perceived need, as experienced by the patient, has emerged in many studies as one of the most accurate predictors of use of services (278).

Tuominen (277) found that the utilisation rate was much greater amongst dentate (70,3%) than edentulous subjects (27,9%). The results of this study are consistent with those of Tuominen.

The results of this study indicate a very low level of ill-met need compared with those reported by the NOHS (353). The NOHS found that extractions and other procedures that would bring relief of pain was the type of treatment that the majority of respondents had experienced problems in obtaining. In this study only two individuals reported that they had experienced problems in getting extractions.

### **3.7.5 Potential demand for replacement of existing dentures**

If dentures are worn for many years without replacement, tissue damage may result due to excessive resorption. Such behaviour may result in dissatisfaction with dentures and an increase in the perceived need and demand for new dentures.

The potential demand for the replacement of existing dentures analysed by demographic and socio-economic characteristics is presented in **Tables 70 and 71**. The majority of denture wearers (64,1%) were happy with their existing dentures, 5,6 per cent indicated that they intended having only an upper or lower denture replaced, and 20,9 per cent a complete denture (**Table 70**). No relationship was found between the intention to replace existing dentures and health region ( $p = 0,082$ ), population group ( $p = 0,173$ ), gender ( $p = 0,429$ ) (**Table 70**), educational level ( $p = 0,301$ ), occupation ( $p = 0,413$ ), household income ( $p = 0,103$ ) (**Table 71**), or medical aid ( $p = 0,600$ ). Younger individuals, however, were more inclined to replace existing dentures than the elderly was ( $p = 0,043$ ).

Extrapolated to the study population there are approximately 1,269,607 (37,3%) people wearing dentures in the Western Cape Province. Denture wearing subjects were mostly coloureds (623377) (49,1%) and whites (573862) (45,2%). Only 72367 (5,7%) of blacks are wearing dentures. Of those wearing dentures 264967 (20,9%) intend having their existing dentures replaced. Those wanting to replace their dentures were mostly coloureds (143082) (54%) and whites (111286) (42%). Approximately 10598 (4%) of the black denture wearing population intend replacing their dentures. The proportion of indigent (36989) (13,9%) and elderly subjects (21489) (8,1%) that intend replacing their dentures are relatively small in relation to the total needs of the population.

Simard *et al* (322) found that perceived need for replacement of dentures was significantly related to the age of the most recent upper denture. They measured a perceived need for replacement in 18,7 per cent of dentures less than 5 years old compared to the 27,7 per cent of individuals in the present study. In the study conducted by Simard *et al* (322), the perceived need for replacement increased to 41 per cent where dentures were older than 30 years. In the present study 60,4 per cent of individuals that had dentures that were between 6 and 30 years old and 11,9 per cent of individuals who were wearing dentures that were older than 30 years perceived a need for replacing their dentures. Hoad-Reddick and co-workers (345) concluded in

their study of edentulous elderly that all dentures more than 10 years old are likely to need replacement.

Hoad-Reddick and co-workers (345) showed in their studies that 40 per cent of dentures need replacement 5 years after placement. It was concluded from the latter studies that check-ups be provided annually for the elderly, to prevent patients from losing contact with their dentist and to ensure that denture problems can be resolved at an early stage. Budtz-Jorgensen (354) also reported that neglecting to repair or replace removable dentures resulted in the development of oral mucosal lesions. In a population, such as in the present study, where there is a high rate of indigence and a substantial number of dentures made by backdoor providers it can be expected to find an increased likelihood of oral mucosal lesion and dissatisfaction with dentures. Banting and his co-workers (355), however, emphasised that when people were rendered edentulous late in life, it was often more difficult for them to adapt to dentures.

The high rate of replacement need for dentures that are older than 6 years (60,4%) would suggest that all denture-wearing subjects should have regular check-ups of their dentures at least 10 years after insertion. The dental profession has long acknowledged the need for regular check-ups and replacement of dentures. It is therefore important that the dental profession should try to educate the denture-wearing public about the need for regular check-ups and regular replacement before irreparable damage results. Unfortunately this service can only be provided at a price, therefore only

those that can afford such care or where the State is able to afford and provide such a service, would benefit.

### **3.7.6 Choice of service provider by those who intended having their existing dentures replaced**

The majority of subjects (42,5%) who wanted their dentures replaced indicated that the private dental practitioner was their provider of choice (**Table 72**). Twenty eight per cent (28%) chose a state dentist, 4,9 per cent a dental school, 11,6 per cent a dental technician, 10,5 per cent a 'backdoor' provider and 2,2 per cent indicated a specialist as their provider of choice.

A significant relationship was found between provider of choice and population group ( $p = 0,001$ ). Whites (57,1%) and coloureds (35,8%) mostly chose a private dentist, whilst blacks indicated a State dentist as their provider of choice (44,4%) (**Table 72**). Of those persons preferring backdoor providers 89,5 per cent were coloureds.

The large proportion of individuals that indicated that a dental technician or backdoor provider was their choice for replacing their dentures emphasises the need for auxiliary prosthetic providers. Cost and availability of services seemed to be the primary factors the determined choice of provider.

From these results it can be concluded that:

- (i) The perceived need for a complete set of dentures is relatively high (24,8%) and was by far the largest amongst the coloured community.

- (ii) On the other hand the potential demand for prosthetic dental care was relatively low in all population groups which therefore reflect on the prevailing socio-economic realities.
- (iii) This study found that not many people intended translating their wants for denture care into demands. The need for dentures is irrelevant for resource planning unless it can be translated into demand for care. The implications of such an intervention, however, need serious consideration as this may impact on services in both the public and private sector. Issues that need to be addressed are how will people be enabled to access and afford the prosthetic care that is needed? Will current resource infrastructure be able to manage the increase in demand for dentures? Given the scenario that the current needs for dentures can be translated into demands and provided resources are available it can be argued that, at least from a public sector point of view, a class of dental auxiliary specialised in making dentures could make a positive contribution to a more cost effective supply of denture services. However, with the focus on primary health care, it has been argued whether satisfying the need for dentures is a major priority for public services at the moment. Additionally, a lack of adequate resources places great pressure on health administrators to prioritise the allocation of scarce resources.
- (iv) The increase in the elderly population, as is found elsewhere in the world, is also a reality in the present study population and is bound to impact on the demand for denture services.

- (v) Although professionally assessed need for partial dentures was greatest amongst Blacks, the perceived need for partial prosthetic dental care among black people was practically non-existent.
- (vi) The high potential demand for prosthetic care was approximately a third of the perceived and professionally assessed need. Affordability was most important determinant enabling people to acquire dentures.
- (vii) The high potential demand for the extraction of teeth, especially amongst indigent people, is likely to ensure that there will be a consistent demand for dentures in the foreseeable future.
- (viii) Inability to afford restorative care was also to a large extent a determining factor that led people to extract teeth to rid of their pain and discomfort.
- (ix) The high rate of indigence among the denture wearing population will in all probability increase the likelihood of people reverting to seeking prosthetic care from 'backdoor providers' or retain their old dentures for longer periods.

### **3.8 Oral health, denture and denture provider related attitudes and beliefs of subjects in the Western Cape Province**

Attitudes, beliefs, values and perceptions regarding oral health and oral health care are important predisposing factors in the development of appropriate oral health behaviour (356). Each individual has a unique set of attitudes and values, which influence health behaviour. Equally, each

community should also be recognised as a dynamic collection of people and institutions that present a unique set of values and attitudes (357). These values, attitudes and beliefs are formed through and influenced by a complex interaction of multiple factors. Health beliefs and attitudes are also considered as important barriers against the adoption of appropriate health behaviour (358).

The majority of people in the Western Cape Province suffers from diseases of the oral cavity, have a lack of perceived need for oral health care and generally use services only when a problem is perceived. Any attempts at improving the oral health situation need serious consideration of persons' attitudes towards and their beliefs regarding oral health and oral health care (359, 360).

The acquisition of such information in a given community would help to identify specific needs, problems or priority areas and to facilitate the planning and implementation of programs that have the potential to influence change in oral health behaviour and, consequently, oral health status.

Information on attitudes and beliefs regarding oral health are relatively scarce. Apart from the NOHS study (360) no previous studies of this nature have ever been conducted on a regional basis in the Republic of South Africa.

### **3.8.1 Oral health beliefs**

Most adults (96,1%) were in agreement that it is wise to have one's teeth checked regularly by a dentist. Only 2,5 per cent of individuals interviewed felt

that it was not necessary to have one's teeth checked regularly. Coloureds, the elderly and those with lower education were the least concerned about having their teeth checked regularly.

Slightly more than half of the subjects interviewed (52,2%) felt that it was important to have one's teeth filled and 35,3 per cent felt that having teeth filled was unimportant. More whites agreed that having teeth filled was important (85,6%) compared with the 35,5 per cent of coloureds and 37,4 per cent of blacks ( $p < 0,0001$ ). Most individuals that felt that it was not important to have their teeth filled were from the lower socio-economic groups.

Although the results reflect a generally high degree of positive attitude towards oral health, perceived needs and values are not turned into utilisation of care because people simply do not have the resources to afford care.

The high percentage of disagreement on the value of restorative care is indicative of the relatively low value placed on curative care, especially in the coloured and black communities where extractions have traditionally been the treatment of choice when dental problems were perceived. The latter findings were also in accordance with that found in the NOHS (360) According to Rudolph *et al* (358), this negative attitude towards having teeth filled may reflect differences in education, financial resources and the availability and affordability of dental services.

Thirty four per cent (34,8%) of subjects interviewed agreed that losing teeth was the inevitable result of the ageing process. Statistically significant

variations for this belief were observed in all the socio-demographic variables studied. White (36,4%) and coloured (38,7%) individuals, females (37,7%), elderly (55%), people with a lower education, unskilled occupation or economically non-active and indigent people were most likely to respond that losing teeth was the inevitable result of the ageing process. Edentulous subjects (50,3%) were also more likely to respond that losing teeth was the result of ageing compared with dentate individuals (22,8%).

Recent studies have shown that the perception of tooth loss as a sign of ageing, rather than a sign of ill health, may discourage seeking routine dental care (361). According to Gift (361) socio-economic and cultural factors appear to influence the original need for dentures (i.e. an acceptance of or a wish for edentulousness). Psychological or emotional factors, on the other hand, affect the acceptance of and satisfaction with a denture and a lack of continuity of care seems to reflect a failure to recognise the need for care.

Seventy nine per cent (79,1%) of subjects agreed that going without teeth could affect one's social life and job opportunities (Table 73). Ten per cent of subjects disagreed with the latter statement. Mostly coloureds (14,4%) and blacks (12,0%), compared with the 3,4 per cent of whites, disagreed that going without teeth could affect one's social life and job opportunities ( $p < 0,0001$ ). Individuals with a higher education ( $p < 0,0001$ ), occupation ( $p < 0,0001$ ) or household income ( $p < 0,0001$ ) were more likely to believe that going without teeth could affect one's social life and job opportunities (Table 73). Twice as many edentulous subjects (14,6%) compared with dentate

subjects (7%) disagreed with the fact that going without teeth could affect one's social life and job opportunities ( $p < 0,0001$ ).

The NOHS found that there were almost twice as many blacks (21,7%) and almost 50 per cent fewer coloureds (6,8%) felt that going without teeth would not affect one's social life. The results clearly indicate that blacks and coloureds are more likely to be able to adjust to getting along without teeth compared with whites because of necessity. The results of this study confirm the socio-economic reality that most people are not able to afford the luxury of having dentures made to replace missing teeth.

### 3.8.2 Denture related beliefs

More than half of all the subjects interviewed (55,9%) believed that "one was freed from many dental problems if one had dentures" (**Table 74**). The latter belief was found to be the highest amongst coloureds (64,6%) and females (59,5%). Individuals in lower socio-economic groups were more likely to believe that dentures resolved all dental problems compared with those in higher socio-economic groups. Seventy four per cent of edentulous subjects (74%) ( $p < 0,0001$ ) and 80,5 per cent of those wearing dentures ( $p < 0,0001$ ) had this belief in comparison with 41,3 per cent of dentate and 45,4 per cent of subjects not wearing dentures. (**Table 74**).

Thirty six per cent (36%) of the subjects interviewed felt that "dentures were as good as their own teeth" whilst 57,8 per cent of subjects felt that dentures were not as good as their own teeth (**Table 75**). Coloureds (43,9%) were most likely to respond that dentures were as good as their own teeth.

compared with the 31,1 per cent of blacks and 29,0 per cent of whites ( $p < 0,0001$ ). Elderly individuals and those who were indigent ( $p < 0,0001$ ) had a low education ( $p < 0,0001$ ), an unskilled occupation or were economically non-active ( $p < 0,0001$ ) was most likely to respond that dentures were as good as their own teeth (**Table 75**). A higher percentage of edentulous people (50,9%) or wearing dentures (53,5%) felt that dentures are as good as their own teeth in comparison with those who were dentate (24,8%) or who were not wearing dentures (29%).

### **3.8.3 Perceptions regarding cost and affordability of dentures**

A distribution of the current perceptions regarding the costs of dentures is shown in **Table 76**. Of those who responded (individuals who were edentulous or those who were potential candidates for dentures), 35,2 per cent responded that dentures were unaffordable and 7,7 per cent stated that dentures were difficult to afford. Only 3,7 per cent of the respondents perceived dentures as affordable. The majority of subjects, however, had no perception of the cost of dentures at the time of the interview. Statistically significant variations in the perceived affordability were found in all the socio-demographic variables that were studied (**Table 76**). Dentures were perceived as least affordable by coloureds (39,2%) and blacks (36,5%) ( $p < 0,0001$ ), people living in the West Coast health region (40,7%) ( $p = 0,005$ ) and those who did not have a medical aid (36,7%). Dentures were more likely to be perceived as unaffordable to people in the lower socio-economic groups

(low education, unskilled occupations or economically non-active or having a low household income) ( $p < 0,0001$ ) (**Table 76**).

The percentage distribution of what adults were willing and able to pay for a complete set of dentures, laboratory fees included, is shown in **Table 77**. Most adults in the Western Cape (65,6%) cannot afford more than R250 for a complete set of dentures. Only 1,1 per cent can afford dentures that cost over R1000. Statistically significant variations in what people can afford were observed amongst all the socio-demographic variables that were studied (**Table 77**). People who could least afford dentures over R250 were coloureds (74,2%) and blacks (84,3%), the institutionalised elderly (80,2%), people not wearing dentures (79,9%), those without a medical aid (75,4%) and people in the lower socio-economic categories.

The high percentage of subjects who perceived the cost of complete dentures as unaffordable (35,2%) may reflect an important barrier towards denture care utilisation behaviour. At the current medical aid tariff of approximately R1200, dentures provided by a dentist are out of reach for the largest section of the population (75,4%). Due to a lack of resources in the public sector, dental budgets have been cut and resources reallocated to fund other social services that have a higher priority. Currently each state dental clinic in the Western Cape is limited to the provision of only two dentures per month (**362**). With this scenario in mind it is easy to understand why people risk

having dentures made by 'backdoor providers' at the cost of approximately R200<sup>8</sup>.

#### 3.8.4 Denture provider beliefs and attitudes

The response of individuals to the statement: "All denture services should only be provided by dentists and by no other auxiliary personnel" is presented in **Table 78**. Sixty eight per cent (68%) of subjects agreed that dentists should provide denture services only. Although most subjects were in agreement that only dentists should provide denture services, statistically significant variations did occur amongst different population groups ( $p < 0,0001$ ), health regions ( $p = 0,016$ ), age categories ( $p < 0,0001$ ), dental status ( $p < 0,0001$ ) and denture status ( $p < 0,0001$ ) (**Table 78**). Subjects who did not agree with the above-mentioned statement were mainly coloured people (21,2%), those living in the South Cape (24,8%) and Cape Metro (20,7%), the non-institutionalised elderly (21,9%) and edentulous subjects (21,1%).

The reasons supplied by the respondents why only dentists should provide dentures to the public are summarised in **Table 79**. The most common reasons supporting denture provision by dentists only were their professional training and education (35,3%), greater expertise (18,9%), greater trust and reputation (16,4%) and better quality service (14,5%). Although statistically significant variations in the responses were observed among the various

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<sup>8</sup> Although not part of the survey, individuals who had dentures made by backdoors ( $n=89$ ), were asked as a matter of interest, what they had paid for their dentures. The average cost of dentures made illegitimately by backdoor providers ranged between R180 to R240.

population groups ( $p < 0,001$ ), the same trend was noticed. An interesting finding was that more blacks (50,8%) gave professional training and education as a reason in support of dentists as their provider of choice compared with the 34,9 per cent of whites and 28,4 per cent of coloureds (**Table 79**).

Nineteen per cent (19%) of the study population felt that dentists should not only provide denture services. Reasons provided by respondents for opposing dentists as a sole provider is shown in **Table 80**. The most common reasons were unaffordability of dentures supplied by them (66,2%), poor quality of dentures provided (13,6%) and inadequate accessibility (8,5%). More coloured people (74,6%) gave unaffordability as a reason than whites (55,1%) and blacks (58,7%).

The percentage of individuals responding to the statement: "Do you think that dental technicians should be allowed to fit and supply dentures directly to the public provided that they are adequately clinically trained" is shown in **Table 81**. Fifty seven per cent (57%) responded positively, 16,9 per cent were undecided and 25,5 per cent did not agree. The relationship between response and socio-demographic variables was significantly related to population group ( $p < 0,0001$ ), health region ( $p < 0,0001$ ), age category ( $p < 0,0001$ ), educational level ( $p = 0,001$ ), occupation ( $p < 0,0001$ ), household income ( $p = 0,001$ ), dental status ( $p < 0,0001$ ) and denture status ( $p < 0,0001$ ) (**Table 81**). Coloured respondents had the highest number of positive reactions

(63,4%) to dental technicians supplying dentures directly to the public, compared with the 57,4 per cent of whites and 45,6 per cent of blacks. Individuals in the Cape Metro (63,7%), the non-institutionalised elderly (64,1%), those who were edentulous (64,2%) and subjects wearing dentures (65,4%) also supported the principle of dental technicians providing dentures directly to the public.

**Table 82** summarises the reasons of those in support of dental technicians providing dentures directly to the public. The most common reasons provided by those supporting the principle were that it would lower the cost of dentures (36,9%), improve the quality of dentures (33,7%) and improve the accessibility and availability of services (11,9%). The same trend was observed amongst the various population groups.

The reasons provided by respondents why they were opposed to the idea that dental technicians should provide dentures directly to the public are summarised in **Table 83**. The most common reasons provided for opposing dentures supplied by dental technicians were a decline in the quality of dentures (39,4%), lack of medically-based knowledge and diagnostic expertise (28,5%), lack of trust in non-dentists (13,4%) and an attitude that non-dentists will not take responsibility for the services provided. More coloureds (46,8%) gave a decline in the quality of dentures as the most important reason compared with whites (31,4%) and blacks (36,5%). Blacks (40,4%) rated lack of medically based knowledge and diagnostic expertise as

their most important reason. More white people (22,9%) than coloureds (8,5%) and blacks (9,6%) stated that they did not trust 'non-dentists' (**Table 83**).

The percentage response of subjects to the statement: "Dentists are adequately meeting all the denture treatment needs of the community in our area" is presented in **Table 84**. Only 19,2 per cent of the respondents agreed that there are adequate human resources for meeting denture treatment needs, in comparison with the 16,4 per cent who disagreed. A total of 64,4 per cent of the respondents were undecided whether dentists were adequately meeting all denture treatment needs. Mostly coloureds (23,3%), blacks (20,6%) and those living in rural areas (West Coast, Boland and Overberg health regions) responded that dentists were not adequately meeting all denture treatment needs (**Table 84**).

The overall perception of the public seems to reflect the view that alternative or auxiliary denture providers will lower the cost of dentures. Whether denturists will be able to reduce the cost of dentures to an affordable level, which seems to be at a level of approximately R250 for the largest proportion of the population is debatable. It is also inconceivable that denturists will be able to provide dentures at the cost which 'backdoor providers are currently providing dentures (below R200).

Although these results provide valuable information towards the identification of needs and planning of services, they should nevertheless be treated with some circumspection because of the possibility of expectation bias.

The following conclusions can be reached from the results of this study:

- (a) Although people value maintaining their teeth the extraction and loss of teeth will remain a reality within the adult population in the Western Cape Province. The most important indicators of this trend are:
  - (i) The relatively low importance that people, especially in the lower socioeconomic groups, place on visiting dentists and on preventive and restorative care.
  - (ii) People will maintain their teeth provided they are free of problems.
  - (iii) Large proportions of the population still believe that loss of teeth is the inevitable result of the aging process.
  - (iv) More than half of the subjects interviewed believes that dentures will relieve them from dental problems.
- (b) People value their dentition or dentures in the case of those that are edentulous, as an important contributor to quality of life because they believe that absence of teeth could affect one's social life or job opportunities.
- (c) More than two thirds of the population cannot afford more than R250 for a complete set of dentures and are therefore unable to afford

dentures in the private sector. Individuals who could least afford dentures were those without a medical aid and the elderly. Most individuals that could not afford dentures were coloureds and blacks.

- (d) The majority of the population supported denturism primarily because they believe it would lower the cost and improve the quality of dentures.
- (e) A need clearly exists for providing affordable dentures by providers who meet the criteria of appropriate clinical training, quality, professionalism and trust, accessibility and availability. Whether 'clinically trained' dental technicians or other trained auxiliaries, with extended functions will be able to provide dentures at a price below R300 is debatable.

### **3.9 A qualitative assessment of the priority placed on various types of social services, functional and aesthetic health services and oral health services in relation to denture care**

The central issues in the public debate about health care delivery are those of quality, cost, equity and distribution of services in relation to need (363, 364). Any planning, implementation and development of health care programs to improve access and quality at an affordable price will require priority and choice (364). Kissick's (364) second law states that:

**“ No society in the world has sufficient resources to provide all the health services its population is capable of utilising”, which brings us to medicine’s dilemma of “infinite needs versus finite resources”.**

Priority setting is a fundamental process for resource allocation decisions, because needs are infinite whilst resources are finite. Resources are by implication scarce because there is a limit to the amount of money government is willing to make available, and what people are willing to spend on such services. (365). Some form of priority setting process is therefore required as part of any fundamental solution to the health care resource allocation problem (366). The public’s preferences provide a context within which decision-makers can develop specific allocation rules to help determine who gets what when. Comparison of preferences is essential in the process of making decisions and lies at the very heart of the concept of majority rule and of various voting procedures upon which democracies depend (366, 367).

Florio (368) has also emphasised that the strongest link between people and their leaders i.e. government officials, policy makers and / or health professionals, is the respect for individual choice and personal values.

No studies have previously been conducted to establish what priority people place on oral health care, on specific dentures, in relation to other social and health services.

This information is fundamental in helping policy decision-makers with allocation and rationing decisions at various levels of society.

The distribution of health care resources generally occurs at three distinct levels: (1) between health care and other social expenditures (macro-allocation) (2) within the health care system (meso-allocation) and (3) among individual patients (micro-allocation) (369).

### **3.9.1 Prioritisation of social services**

At the macro-allocation level, health care competes with housing, education, safety and protection and a host of other social services to satisfy the myriad of individual wants and needs (369).

The overall prioritisation of social services in the Western Cape Province is shown in **Table 85**. A total of 1547 adults participated in providing their preferences.

Housing received the highest overall rating as first priority, followed by health care as second priority, education third, infrastructure fourth, security and protection fifth and sports and recreation the last priority.

All the population groups were in agreement that housing was the number one priority in the Western Cape. More blacks (50%) rated housing as their number one priority, compared with the 43,5 per cent of coloureds and 42,8 per cent of whites ( $p = 0,002$ ). Whites ranked education as a higher priority compared with coloureds and blacks ( $p < 0,0001$ ).

The highest percentage that ranked health care as the number one priority were coloureds (37,1%), followed by blacks (31,8%) and whites (30,7%) ( $p <$

0,0001). A greater percentage of blacks (33,3%) ranked health care as their second priority.

Significant variations in preferences for allocating resources for social services were found when analysed by socio-demographic factors.

Health care priorities were significantly associated with educational level ( $p = 0,014$ ), occupation ( $p < 0,0001$ ) and income ( $p < 0,0001$ ). Gender was not associated with preferences allocated to any of the social services.

### **3.9.2 Reasons for ranking health services a higher or lower priority relative to other social services**

The reasons why people thought health care should receive priority for funding relative to other social services are shown in **Table 86**. Most participants perceived that health care should receive a high priority (90,8%). The most common reason stated for ranking health care as a high priority was 'people cannot afford private care or are dependent on public services for help' (23,4%). To be able to work and uplift the economy (17,3%) was the second most common reason provided. Reasons varied significantly among population groups but followed the same trend.

A small percentage of respondents (7,9%) rated health care a low priority for funding. The most common reasons provided to support their view were that they perceived that health was a social disease and that all the other services would complement and promote health (43,4%), secondly, that they perceived health as one's own responsibility (33,6%). The reasons stated by

blacks for rating health care as a low priority differed fundamentally from the other population groups ( $p = 0,001$ ). The majority of blacks (86,9%) stated that the other services would complement and promote health, whilst only 8,7 per cent perceived health as one's own responsibility. In contrast, 42,9 per cent of whites and 34,9 per cent of coloureds perceived that health was one's own responsibility and should therefore not receive priority for funding.

### **3.9.3 Prioritisation of functional and aesthetic health services**

At meso-level of resource allocation society must choose where limited resources must be allocated. The choices require comparing health care expenditure (allocation) within the health care budget, choices between treatment, preventive care, health promotion, rehabilitation, research and development, and training and education. It would be unfair to make resource allocation decisions by comparing dentures, for instance, with the treatment of tuberculosis. Dentures were therefore compared with other functional or aesthetic related health services.

The overall prioritisation of functional and aesthetic health services is summarised in **Table 87**. Most participants rated 'spectacles' as their number one priority for funding (85,3%). Hearing aids were ranked as the second most important priority (51,2%) and leg/foot prostheses third (37,4%). Dentures (42,0%) and facial prostheses were rated (49,42%) the low priorities. The same trend was observed in various population groups. White

and coloured subjects, however, placed somewhat greater importance on the priority of dentures.

#### **3.9.4 Reasons for ranking dentures as high or low priority relative to other functional and aesthetic health services**

The most important reasons for rating 'spectacles' as the first priority were to ensure that people were self-reliant (26,7%) and that people were able to conduct a productive life (20,9%). The ability to communicate was the primary reason why people rated hearing aids as a first priority (50,0%). The most important reason for rating foot / leg prostheses as a first priority was to be independent in life (70,2%). The few people who ranked facial prostheses as a first priority stated that appearance (52,1%) and self-consciousness (43,8%) were important factors affecting a person's self-image.

The reasons why dentures were rated as a high or low priority for funding relative to other functional or aesthetic health services are shown in **Table 88**. A total of 23,6 per cent of the participants stated that dentures should receive priority for funding. Of those respondents rating dentures as a high priority, most were coloureds (55,3%), 28,7 per cent whites and 15,9 per cent blacks. In all three population groups the most common reasons provided for rating dentures a high priority were 'to help reduce digestive problems due to poor mastication' (41,1%) and 'to be able to eat a wider selection of food' (26%) (**Table 88**). A high percentage of whites (18,1%) and blacks (12,1%) stated that dentures should receive priority because they were necessary to improve

appearance and self-image. Only 11 per cent of those who rated dentures as a high priority said that people couldn't afford dentures.

Most of the respondents (76%) were in agreement that dentures were not a priority for health resources relative to other functional and aesthetic health services (Table 88). The same trend was observed amongst whites, coloureds and blacks. Most respondents (68,4%) stated that 'dentures were not essential and that many people live without them'.

According to Priester and Caplan (369) no amount spent on health care would be sufficient to provide universal access to all desired health care. Secondly, the appetite for health care is infinitely expandable. Priester and Caplan (369) argue that significantly increasing health care's share of the GNP, even if politically or economically feasible, will not solve the dilemma of limited health care resources.

The third level of distribution therefore sometimes of necessity involves rationing (369). According to Priester and Caplan (369) rationing refers to the distribution of scarce resources that either save lives or significantly enhance quality of life, i.e. patients who are most likely to benefit from receiving care irrespective of their age group or other extraneous classification.

### **3.9.5 Prioritisation of people according to age groups**

The overall preferences of the participants towards health care funding for individual categories of people based on age groups are shown in Table 89. Most of the participants ranked mother and child as the first priority (53,0%),

pre-school children as the second priority (38,6%), schoolchildren as the third priority (40,7%) and adults as the last priority (61,4%). There was some ambivalence towards the priority that should be allocated towards the elderly. Most of the participants (27,2%), however, felt that the elderly should receive first priority. Amongst population groups the same trend was observed as that for the overall population.

### **3.9.6 Reasons for rating elderly people as a high or low priority relative to other age groups**

The most common reason for ranking mother and child as the first priority was 'to give children a headstart in life' (32,20%). Pre-school children were ranked as a first priority because participants perceived this would promote health and the prevention of disease (30,2%). Most of the respondents stated that schoolchildren should be the first priority for health care funding to ensure that children were able to go to school and learn (ability to receive formal education) (58,4%).

Adults were perceived as the group that should receive the lowest priority for health care funding. Those who supported adults as the first priority (7,2%) stated that adults are the work force and have to provide for their families, therefore they have to receive top priority for health care funding.

The reasons for rating elderly people as a higher or lower priority, relative to the other sub-groups, are presented in **Table 90**. Sixty-three (63%) of the respondents rated the elderly as a high priority for health care funding. Most participants supported the elderly because they felt that the elderly were

dependent on others for some physical assistance (32,9%). Reasons varied significantly amongst population groups ( $p < 0,0001$ ) (Table 90). Most whites (41,1%) stated each community had a social responsibility to take care of its elderly citizens, whilst coloureds (35,8%) and blacks (33,3%) gave 'dependency on physical assistance' as their most important reason for rating elderly people as a higher priority relative to the other sub-groups.

Thirty five per cent (35%) of the respondents gave reasons why elderly people should not receive priority for health care funding. Most participants (42,1%) responded that although important, the elderly were not a priority because they had had their prime years of life. A large percentage of whites (37,4%) stated that the elderly receive adequate care and government support. In comparison, only 18,9 per cent of coloureds and 11,6 per cent of blacks gave this as their reason. A large percentage of blacks (10,2%) stated that their elderly were well supported by their families (Table 90).

### **3.9.7 Prioritisation of oral health services**

The overall prioritisation of oral health services for funding is shown in Table 91. The largest percentage of the respondents said that 'pain and sepsis care' (49,8%) as well as preventive care (42,78%) should be the first priority for funding. Most participants rated restorative services as a fourth priority (34,4%). Denture care (35,5%) and orthodontic care (42,2%) were mostly rated as low priority services. The same trend was observed amongst the various population groups.

However, some interesting observations found among population groups were that blacks place more emphasis on preventive care as a priority compared to whites and coloureds. Whites, on the other hand, placed greater emphasis on restorative care whilst a larger percentage of coloureds supported dentures as a priority compared with the other population groups.

Significant variations in the prioritisation of oral health care variables were found when the data was analysed by socio-demographic variables. Pain and sepsis care was highest in the South Cape Region ( $p < 0,0001$ ). Pain and sepsis care increased in priority rating with increasing age ( $p < 0,0001$ ), lower education ( $p < 0,0001$ ) and lower income ( $p < 0,0001$ ).

Prevention was more commonly rated as a high priority in the West Coast region ( $p < 0,0001$ ), younger age groups ( $p = 0,001$ ) and people in higher education ( $p < 0,0001$ ), income ( $p < 0,0001$ ) and occupational categories ( $p < 0,0001$ ). Individuals in the urban areas placed greater value on restorative care compared with individuals in rural areas ( $p < 0,0001$ ). The priority rating for restorative care also increased with increasing age ( $p = 0,001$ ) and higher socio-economic status ( $p < 0,0001$ ). Dentures were generally rated a higher priority in the rural areas ( $p < 0,0001$ ). Greater priority was also placed on dentures amongst lower socio-economic groups ( $p < 0,0001$ ). Orthodontic care was more commonly rated as a priority amongst younger adults and individuals with a higher socio-economic status ( $p < 0,0001$ ).

### **3.9.8 Reasons for ranking dentures a high or low priority relative to other oral health services**

All three groups were in agreement that 'pain and sepsis' should be the first priority for funding because people are afraid of pain or people tend to avoid pain as much as possible (30,6%). A large percentage also rated treatment for pain and sepsis as their first priority because they felt that people couldn't be productive or work when they experience pain (19,9%).

The most common reasons stated for rating 'prevention' as the first priority were, 'to maintain teeth as long as possible' (28,2%), 'to reduce dental problems' (25,3%) and to save cost of treatment (15,4%). Those participants who said that restorative care should be a first priority felt that it was important to maintain teeth as long as possible (71,9%).

The reasons why dentures were rated as important for funding are summarised by population group in **Table 92**. Thirty five per cent (35%) of the respondents stated that dentures should receive some priority for funding. Most of the respondents (39,9%) stated that dentures were essential for digestion of food and that edentulousness could affect one's health as their reasons for supporting dentures. A large percentage of participants (15%) also stated that dentures were a priority because of the role they play in improving appearance and self-image. Only 10 per cent of those that rated dentures as a high priority said that people couldn't afford dentures. Significant variations in the reasons provided were observed amongst population groups ( $p < 0,0001$ ) (**Table 92**). Most whites gave digestion and health as their most important reason (53,8%) and appearance and self-image as their second most important reason (19,8%). Coloureds stated

digestion and health as their most important reasons (39,0%) and unaffordability (12,8%) and improvement of self-image (11,9%) as the next important reasons. Blacks, on the other hand, said that digestion (26,9%), improvement of self-image (21,4%) and the promotion of oral health in general (19,1%) were their most important reasons for supporting dentures as a high priority for funding (**Table 92**).

The reasons why dentures were rated as a low priority for health care funding, relative to other oral health services, are summarised in **Table 93**. Sixty four per cent (64%) of the respondents gave reasons why dentures should be a low priority. Most of the participants who rated dentures as a low priority stated that dentures were not essential and that people could live without them (37,9%). A large percentage of respondents (15,4%) also felt that people ought to take responsibility for looking after their own teeth. Significant variations in reasons for rating dentures as a low priority were found among population groups ( $p < 0,0001$ ) (**Table 93**). Forty three per cent (43%) of coloureds not in favour of dentures as a priority said that dentures were not essential, compared with the 39,1 per cent of whites and 28,3 per cent who stated the same reason. Whites (23,2%) placed more emphasis on the fact that people should take more responsibility for looking after their own teeth, compared with the 12,8 per cent of coloureds and 10,9 per cent of blacks who gave the latter as a reason (**Table 93**). A large percentage of blacks (17,7%) felt that dentures gave more problems than one's own teeth. In contrast only 10,6 per cent of whites and 11,3 per cent of coloureds stated that dentures

gave more problems than one's own teeth. More blacks (13,3%) than coloureds (12,3%) or whites (7,3%) felt that with effective prevention programs there would be less need for dentures.

From the results of this study it can be concluded that:

- (i) Dentures are a relatively low priority compared to housing, essential medical and preventive care and a myriad of other essential services.
- (ii) Adults and elderly who are the primary users of denture services were also rated a low priority for the allocation of health resources. The study population rated children by far as the highest priority for the allocation of health care resources.
- (iii) People rated preventive care as a high priority because they felt that it was important to maintain teeth as long as possible, to reduce dental problems and to save costs on unnecessary treatment. A large percentage of respondents also felt that people ought to take greater responsibility for looking after their own teeth.
- (iv) It should however, be kept in mind that the primary goal of oral health and health care in general should be to provide benefits to those in need of care. The principle that should guide rationing or allocation of resources is that oral health care providers should strive to pursue distribution policies that have the greatest chance of providing the greatest benefit to the greatest number of people.

### **3.10 Practice profile and attitudes towards extended functions and denturism of oral health care providers in the Western Cape Province**

Knowledge of professional perceptions and attitudes in combination with practice characteristics and experiences of the oral health care delivery system are of crucial importance in the future planning of appropriate, effective and efficient utilisation of human resources for oral health.

No studies have previously been conducted in South Africa to investigate the relative importance of denture services in dental practice in terms of preference for such service by the dentist and impact on practice income.

Neither has previous studies been conducted concerning perceptions and attitudes of oral health care providers regarding extended functions with specific reference to denturism and the relationship between the dental technician and the dentist.

#### **3.10.1 Demographic characteristics of oral health care providers in the Western Cape Province**

The number of questionnaires posted to various oral health care providers and the number of questionnaires that were received and included in the survey are shown in **Table 94**. The provider samples that were surveyed included dentists (n = 222), dental technicians (n = 93), dental therapists (n = 29) and oral hygienists (n = 83). The overall response rate was poor, ranging

from 24,2 per cent for dental therapists, 29,6 per cent for dentists, 32,4 per cent for oral hygienists and 41,1 per cent for dental technicians.

The greater response shown by dental technicians in this study may be an indication of the concern with their profession towards the issue of denturism. The Liddell Report on Denturism reported that only three questionnaires (1,5%) sent to dentists, were returned (370).

The demographic characteristics of the oral health care providers included in the survey are summarised in **Table 95**. The largest proportion of dentists and dental technicians fell in the age category 30-49, whereas dental therapists and oral hygienists mostly fell into the 20-29-age category.

Dentists (89,1%) and dental technicians (89,3%) were mostly males and oral hygienist females (100,0). A significant proportion of responding dental therapists were female (31%) (**Table 95**).

The sample reflects the urban - rural maldistribution of human resources. Dentists, dental technicians and oral hygienists were predominantly located in the Cape Metropolitan Health Region. The only two dental therapists in the Western Cape were situated in the Cape Metropolitan area. All the other dental therapists included in this sample were from rural areas located in other provinces.

The dentist to population ratios for the health regions is shown in **Table 96**. The Cape Metropolitan area had the smallest dentist to population ratio (1:3546).

There were twice to three times as many dentists per member of the population in the Cape Metropolitan Health Region compared to the West Coast, Boland and South Cape.

Various studies have been conducted on the demographic distribution and professional characteristics of private dental practitioners (371, 372, 373) and dental manpower needs in South Africa (374, 375). Approximately 28 per cent of dentists are located in the Western Cape Province, the majority of which are whites (89%). (373). Reports have expressed a growing concern about a possible overproduction of dental human resources and that fewer dentists should be trained (375, 376). The National Oral Health Survey of 1988/1989, however, reported that private dental practitioners felt that there was a shortage of dentists for black and coloured patient's (377). Dentists in private practice also felt that more dentists were needed for developing areas, more auxiliaries should be used and greater emphasis should be placed on prevention and health education services (376).

The dentist to population ratio has dropped over the past decade by 67,3 per cent in the Cape Metropolitan Health Region and by 30,4 per cent in the West Coast Region, when compared to the dentist population ratio of 1982 reported by Smith and Cleaton-Jones (372). The dentist to population ratio

declined by only 15,6 per cent in the Boland / Overberg region and remained almost the same in the South Cape Health region (**Table 96**).

The present study supports the findings of previous studies that there is an urban predominance in the distribution of dentists (**371, 372**). The present study also found that the latter trend was also true for oral hygienists and dental technicians. The reason for the urban predominance of dental practice was most probably due to economic reasons. Dental technicians obviously will follow a dental practice on which they are currently dependent for their existence.

Dentists are also predominantly located in urban areas because most rural and remote areas cannot economically support a dental practitioner. An uneven distribution has also been reported in other countries (**378**).

Smith and Cleaton-Jones (**372**) speculated that the dental profession would need to guard against the temptation of over-servicing as the dentist to population ratio declines and economic pressures increase.

The patient profile of oral health providers in the present study shows that 10% of the patients seen by dentists are elderly people. For the proportion of elderly in the population this proportion appears to be normal. The present study, however, has shown that many elderly people have unmet needs and do not have the financial means to afford needed care. Due to a lack of resources, government also is not in a position to meet its responsibility for caring properly for the special needs of the indigent elderly. The Bureau of Economic and Behavioural Research (**379**) in the USA stated that dentists

need to make special efforts to reach, work with and adequately serve the nation's increasing number of elderly and special patient groups. Special efforts are also needed to prevent dentists being perceived as unsympathetic towards the special needs of older people. The Oregon lesson has shown that this was one of the key factors why people swing their vote in favour of denturism (379).

The dentist to dental technician ratio in South Africa is approximately 2,6:1 and 3,3:1 in the Western Cape. Most developed countries show a similar ratio, i.e. Australia 2,9:1 (380), UK 2,9:1 (381), France 2,3:1, Japan 2,1:1 and New Zealand 3,3:1. Other developed countries show a higher ratio, i.e. Finland 6,3:1, Denmark 6,4:1, and USA 6,9:1. Most developing countries show a higher ratio to that of developed countries, i.e. Brazil 21,2:1, Zaire 33:1, Argentina 4,5:1, Chile 4,4:1 and the Philippines 8,7:1 (382).

### **3.10.2 Practice profile of oral health care providers in the Western Cape Province**

#### **3.10.2.1 Practice setting**

The distribution of oral health care providers who participated in the survey according to their practice setting is shown in **Table 97**. The largest proportions of dentists (84,5%), dental technicians (89,6%) and oral hygienists (78,3%) were from the private sector. A fair and representative number of providers were also drawn from the public sector, academic

institutions, SA Medical Services and the private industry. All dental therapists were employed in the public sector.

Most of the responding dentists were practising in a group practice situation (35,6%) (**Table 98**), two dentists being the most common combination for a practice. Almost 25 per cent of practising dentists employed an oral hygienist on a full-time basis and 20,2 per cent on a part-time basis. Only 6,3 per cent of dentists employed a dental technician on a full-time basis (**Table 98**). More than 50 per cent of dentists had between 1000 and 5000 patients registered on their records (**Table 98**).

The practice setting of responding oral hygienists is shown in **Table 99**. Most oral hygienists are employed in the private sector, predominantly on a part-time basis.

The practice profile of responding dental technicians is shown in **Table 100**. Most dental technicians were practising in a commercial laboratory setting (53,8%). Only five dental technicians (5,4%) were employed full-time by a dentist. Dental technicians stated that they preferred working in a private or commercial laboratory setting because they valued their independence (32,6%) and thus reduced the risk of being exploited financially by dentists (36,9%) (**Table 100**). The largest proportion of work conducted by dental technicians consisted of crown and bridge work (49,5%), followed by removable prosthetics (38,7%) (**Table 100**).

The patient profile of oral health care providers is summarised in **Table 101**. The results indicate that the various age categories are more or less evenly distributed for dentists, dental therapist and oral hygienists.

### **3.10.2.2 Busyness profile**

The “busyness” profile of oral health care personnel is shown in **Table 102**. Almost 50 per cent of dentists managed between 40 to 60 patients per week. The largest proportion of dental therapists (47,9%) was seeing more than 100 patients per week and the largest proportion of oral hygienists (36,7%) was seeing fewer than 40 patients per week (**Table 102**).

Forty five per cent (45%) of dentists, 39,1 per cent of dental technicians and 28,6 per cent of oral hygienists, compared to the 6,9 per cent of dental therapists, stated that they were not busy enough in their practices. Dental technicians had the most time available per week (11,9 hours) to increase their productivity, compared to the 9,6 hours available by dentists. Dental therapists, on the other hand, were busier and had an average of only 5,8 hours available each week to see more patients (**Table 102**).

The Ad Hoc Committee on the Future Dental Manpower Needs of South Africa reported that dental practitioners were less busy than before as assessed by patient numbers and financial turnover (**375**).

The study conducted by Wilding and co-workers (**374**) showed that 29 per cent of dentists reported their practices were declining in patient attendance.

The results of the present study indicate a decline in practice “busyness” when compared to the data of the National Oral Health Survey (NOHS) (373). The data of the NOHS showed that 29,3 per cent of dentists were not busy enough and needed more patients compared to the 45,9 per cent found in this survey. In the NOHS, 51,3 per cent of dentists were satisfied with the number of patients seen compared to the 38,5 per cent of dentists who were satisfied in the present study.

The Ad Hoc Committee on the future dental manpower needs of South Africa (375) has also reported that practitioners, based on their patient numbers and financial turnover, are less busy than before. Reasons given for the lack of “busyness” were decreased caries prevalence, the negative economic growth rate, a depressed economy, low value placed on oral health by so many and an over-production of dentists (375). Other reasons stated by dentists that may have contribute to the reduced “busyness” are due to a large proportion of people who are reportedly discontinuing their membership from medical aids due to excessive premium costs and medical aids placing more restrictions and control mechanisms on services provided to their members.

### **3.10.2.3 Distribution of time spent on procedures**

The percentage distribution of time spent by oral health care providers on various procedures is shown in **Table 103**. Dentists spent most of their time on restorative work (26,2%) and practice administration (29,7%), dental therapists 41,4 per cent of their time on extractions, oral hygienists 30,4 per

of dentists did all the laboratory work associated with full or partial dentures themselves.

The fee structure used in most dental practices (80%) is the Scale of Benefit (**Table 107**). Approximately 38 per cent of dentists used the National Schedule of fees. Dentists in private practice reported that clinical prosthetics contributed approximately 20 per cent and denture related laboratory work 4,5 per cent to their average gross monthly turnover (**Table 107**). Laboratory fees for work contracted out and done in the practice formed the largest part (28,4%) of a dentist's total overhead expenditure. The average monthly dental laboratory account for work contracted out by dentists is shown in **Table 107**. Dentists paid on average approximately R4000 per month for crown and bridgework; R2000 for full dentures and R1000 for partial dentures for laboratory work contracted to dental laboratories.

The results demonstrated that most dental practitioners spent most of their time carrying out restorative procedures (**Table 103**). This finding is in accordance with that of the NOHS (**373**). According to the NOHS, prosthetics were ranked second highest in terms of time consumption in private practice (**373**). This finding contrasts with the 10,3 per cent of average practice time spent on removable prosthodontics by dentists that was found in the present study. The reason for this discrepancy may be that the majority of people requiring dentures in the Western Cape are from the disadvantaged coloured population who cannot afford dentures in private practice. Alternatively the wide network of illegitimate denture providers in the Western Cape may also

have a large impact on the provision of denture services by dentists in the Western Cape.

Wilding, Reddy and Owen (374) reported that in predominantly black practices, 24,8 per cent of the time was spent on emergency work (mainly extractions), 19 per cent on prosthetics, 36,1 per cent on restorative dentistry, 11,5 per cent on periodontics and only 3,8 per cent on orthodontics.

A survey of all dentists in South Australia in 1993 showed that removable prosthodontics constituted a significant part of most dental practices (383). In a survey of practising dentists in British Columbia in 1978, it was found that many dentists did not make complete dentures and that income derived from providing dentures represented approximately 9 per cent of total net income (384). The latter authors also found the average dentist received a smaller proportion of income from removable prosthetics than that which the proportion of total practice time devoted to this service merited and that removable prosthetic services were not as remunerative as other dental services.

The present study confirms that of previous studies i.e. that most of the dental technicians' time was spent on crown and bridge work and dentures (385). Partial dentures accounted for only a small percentage of a laboratory's production. Dental technicians anticipated a growth of 59,3 per cent in crown and bridgework and a growth of only 9,9 per cent in full dentures and 4,9 per cent in partial dentures (385). The above mentioned trend may indicate that in

the future more emphasis is likely to be placed on those procedures which are more remunerative.

#### **3.10.2.5 Procedure preferences**

In order to establish preferences for services, (the kind of work providers would prefer to do), providers were asked to rank various procedures with 1 = their first choice, 2 = second choice etc.

The percentage of oral health care personnel who ranked specific procedures as their first preference is shown in **Table 108**. Most dentists (34,2%) rated crown and bridge work as their first preference. Only 5 per cent of dentists rated removable prosthodontics as their first preference. Dental therapists rated diagnosis and treatment planning (57,1%), restorative dentistry (39,3%) and oral health education (39,3%) as their preferred procedures. The procedures preferred most by oral hygienists were oral health education (31,3%) and scaling and polishing (20,5%). Dental technicians predominantly preferred crown and bridge work (60,7%). Thirty eight per cent (38%) preferred doing full dentures and 8,7 per cent partial dentures (**Table 108**).

A survey of practitioners in the Western Cape, conducted by Miller, Schach and Van Niekerk (**386**), showed that the majority of respondents (62%) enjoyed doing removable prosthodontics, 32 per cent considered it routine work and 6 per cent found it frustrating. In the present study only 5 per cent of dentists rated prosthetics as their service of first preference.

A study conducted by MacEntee, Pierce and Williamson (387) on the attitudes of dentists in British Columbia on removable prosthodontics revealed that restorative procedures were more popular amongst dentists than making complete dentures.

Preferences for certain procedures might possibly be linked to the need for increasing practice income, i.e. those procedures that are more remunerative.

### **3.10.2.6 Career satisfaction**

Dental therapists showed the highest level of dissatisfaction with their working environment (44,8%), work (27,6%), opportunities for development (62,1%), remuneration (96,6%) and professional autonomy (34,5%) (**Table 109**).

Remuneration was cited as the factor causing most dissatisfaction amongst all the occupational categories. Dental therapists (96,6%), dental technicians (48,9%) and oral hygienists (46,7%) reported the highest level of dissatisfaction with their opportunities for professional development (**Table 109**).

All occupational categories were also asked to rank the factors contributing to a successful career in order of importance. All occupational groups ranked work satisfaction and remuneration as the most important contributory factors (**Table 110**). Dental therapists (32,1%) and oral hygienists (24,0%) also ranked professional development opportunities as a very important factor as opposed to dentists (69,7%) and dental technicians (30,0%) who placed a relatively low value on those factors. All occupational groups rated their

working environment as an unimportant factor with regards to career success (**Table 110**).

If oral health care personnel experience personal satisfaction and well being they are unlikely to want to change their career. Further practice expansion and improvement of standard of living will then be their main focus (**388**). If on the other hand, oral health care personnel work within a profession or society, which is constantly under professional, economic and political pressure, their attitudes regarding expectations, satisfaction and well being will change (**388**). Changes in any profession should be seen as an evolutionary process and all personnel should show initiative and creativity in adapting to further development and expectations.

In the present study a greater number of dentists was satisfied with their working environment (80,4%) and work satisfaction (73,4%) in the Western Cape, compared to the findings of the NOHS, namely 67,8 per cent and 56,6 per cent respectively (**373**). A greater number of dentists in the Western Cape expressed their dissatisfaction with remuneration (56,7%) compared to the 30,7 per cent found in the NOHS. The NOHS also showed that dentists in the private sector generally felt that their remuneration and working conditions were much better than those of their colleagues in the public sector (**373**).

This study supports the findings of the Nuffield Foundation (**381**) that there is a lack of career opportunities for dental auxiliaries.

### **3.10.2.6 Financial status of dentist and dental technician practices**

Dentists and dental technicians were asked to give their views on their past, present and perceived future financial status. Views were ranked according to a ladder scale where 1 = worst scenario to 9 = best scenario.

The results indicated a distinct downward trend in the perceived financial status of both dentists and dental technicians (**Table 111**).

### **3.10.2.7 Employment of and attitudes towards auxiliary personnel by dentists**

Dentists were asked whether they employed an oral hygienist and/or a dental technician and to state their reason for employing such an auxiliary.

Thirty eight per cent (38%) of dentists employed an oral hygienist on a full- or part-time basis (**Table 112**). The majority stated that they employed an oral hygienist because it was necessary to maintain a high standard of restorative care (50,6%) and that it saved time for the dentist (32,9%) (**Table 112**). Forty eight per cent (48%) of dentists did not employ an oral hygienist. The most common reason provided for the latter was an insufficient volume of patients to justify the employment of an oral hygienist (38,3%) and because the dentist perceived that it was economically more feasible to do the work himself (33,6%) (**Table 112**).

Only 7,2 per cent of dentists reported that they employed a dental technician on a full- or part-time basis, the most common reasons stated being patient convenience (31,5%) and financial considerations (18,8%) (**Table 113**). The

majority of dentists who did not employ a dental technician (76,1%) stated as their reason that they had an insufficient volume of laboratory work (economically not viable) (43,8%) and that dental laboratories were conveniently located near their practices (23,1). Fourteen per cent (14%) also stated that they preferred to use various specialist laboratories (**Table 113**).

Each country has a different set of circumstances and needs for using auxiliaries. Underdeveloped and developing areas have widespread oral disease, a shortage of and poor access to and communication with oral health care providers (**389, 390**).

The increasing cost of dental care and the inability to attract or even support oral health care providers in remote and rural areas have led to community pressure on the government to provide dental services that are more affordable, accessible and economically feasible. Gleaning from the experience of other countries, government has sought to do this by way of introducing auxiliary personnel in the public sector.

In developed countries on the other hand, routine clinical tasks are delegated to auxiliaries to increase practice efficiency and productivity (**390, 391**). Newbury (**378**) stated that geography and government played leading roles in the introduction of dental auxiliary personnel into Australia.

This study indicates that dentists in the private sector primarily use oral hygienists as auxiliaries (38%). Only a small percentage of dentists (7,2%) use dental technicians in an auxiliary capacity. In the present study most dentists responded that hygienists promoted the standard of care provided

(50,6%) and saved the dentists a considerable amount of time (32,9%). Dentists mainly used dental technicians as auxiliaries for patient convenience (31,5%) or financial considerations (18,8%).

In the public sector, oral hygienists as well as dental therapists are utilised as auxiliaries. Dental therapists are primarily used in rural or underserved areas where there are inadequate dentists to provide services. Oral hygienists in the public sector are primarily used to provide and promote preventive care and oral health education.

Different definitions have been given in the past to oral health care providers to whom tasks are delegated. It is important to interpret these definitions in order to understand the delegation of 'expanded duties'. An ancillary is defined as 'subordinate or subservient (to)' whereas auxiliary is 'helpful assistant giving support' (392). Allred (393) defines dental auxiliary personnel as:

*"...Those persons who are involved to a greater or lesser extent in the practice of dentistry in its widest terms but who are not qualified in a degree or diploma in dentistry."*

Auxiliary personnel assist in increasing the efficiency and productivity of the dentists in private practice. On the other hand, auxiliaries in the mind of the government are substitute-dentists assisting government in achieving its goals of providing essential oral health care to the masses and meeting the

increasing oral health care demands by the most efficient and affordable means (394).

Various types of auxiliaries exist today, i.e. the dental chairside assistant, dental hygienist, New Zealand Dental Nurse, Dental Therapist and the semi-trained dentists and all differ in legal status, education and training, duties and functions and acceptance by the profession.

Various studies support the utilisation of dental auxiliaries in private practice (395, 396). It is envisaged that the introduction of operating dental auxiliaries in the private sector be based on an oral health care team approach and that diagnosis, treatment planning, prescription and quality control remain the responsibility of the dentist (396). Razak and Lind (396) also concluded from their study that increasing effective utilisation of properly trained dental auxiliaries in private practice would require basic changes in dental education, continuing education and the structure of private practice.

The concept of the dental team where dental auxiliaries are used is not only relevant in public health but also in private practice (389).

Leatherman (389) stated that:

*"Where there is an unsatisfactory ratio of dentists to population, it is vital that the dentist be relieved of the necessity of performing routine and mechanical treatment and thus be able to give attention to the more complicated operations for a larger number of patients."*

A study conducted by Razak and Lind (396) on dentists' attitudes towards auxiliaries in Malaysia indicated that dentists in general agree that auxiliaries usually increased productivity and permitted dentists to devote more time to more complex tasks. The former study, however, showed that dentists felt uncomfortable when held accountable for the performance of auxiliaries.

The perceived value of auxiliaries was most positive amongst public sector dentist's (396). Several studies have also endorsed the positive contribution of dental auxiliaries in the public sector (396). Public dental health services of the future will have to make extensive use of expanded duty dental auxiliaries to be able to achieve their primary prevention goals and to make oral health care services more accessible and available to the masses.

Research has provided ample evidence to show that the dentists who make efficient use of auxiliary personnel will be able to care for more persons and hence render a more valuable service (397). Dental auxiliaries should thus be seen in relation to the dental team concept as part of the total oral health care delivery system. According to Berrnan (397) the function of auxiliaries is to supplement and complement the dentists and not to act as a substitute. Today, although dental therapists are rendering a valuable service in public dental services, the objective of implementing them has failed, because of a lack of dentists to act as supervisors and to provide the necessary supporting role. To compensate for deteriorating work satisfaction and the need for greater professional autonomy and opportunities for professional

development, dental therapists have now been allowed to conduct private practice.

Although oral hygienists play a very important role in both the public and private sector at supplementing and complementing the dentists' functions; their utilisation has only taken place on a very limited basis. Specialist orthodontic practices have benefited the most from oral hygienists. There is currently a move from the oral hygienists' fraternity to increase the scope of their functions, thereby increasing their effectiveness and productivity and improving work satisfaction.

In the present study twice as many dentists employed oral hygienists on either a full-time (24,9%) or part-time (20,2%) basis in comparison with the 12,8 per cent and 11,0 per cent respectively found in the NOHS (373). This finding may be ascribed to a geographic phenomenon. Various reasons were given for employing and not employing oral hygienists. Dentists who employed oral hygienists mainly did so for practice or professional reasons, whilst dentists who did not employ oral hygienists mainly did so for (perceived) economic reasons (Table 112).

A survey of Finnish dentists showed that 34 per cent had expanded-duty dental hygienists in their employment at the time of the survey (398). The same ratio was also found amongst British (399) and Norwegian dentist's (400).

The Finnish survey showed that dentists' reasons for not employing or working with expanded-duty dental hygienists were; lack of room to accommodate them (29%), lack of patients (16%), inability to afford them (15%) and some (9%) said they were unnecessary or were not available (9%) (399). Scandinavian dentists generally had a negative attitude towards operating auxiliaries, feeling there would be no need for expanded-duty dental hygienists in the future and 31 per cent of dentists expressed the opinion that selected functions should be reduced (398).

Gift (401) reported that public sector dentists in the United States had a more positive attitude towards operating auxiliaries compared to private dental practitioners.

Murtomaa and Haugejorden (398) have stated that in Scandinavian countries the reduced demand for dental services and the threat of unemployment amongst dentists may result in rivalry and a possibility of inter-professional conflict of interests between dentists and operating auxiliaries.

The establishment and practical experiences of dental therapy are described by Prinsloo (402). The review concluded that the attrition rate of dental therapists increased from 32 per cent in 1985 to 61 per cent in 1990. This was primarily due to dissatisfaction with remuneration, lack of domestic accommodation, status, poor equipment and official transport and unsuitability of training, poor promotion potential as well as unsatisfactory support and assistance (402).

Prinsloo also emphasised that the introduction of therapists into private practice might absorb many of the remaining State employed dental therapists, with a subsequent detrimental effect on the provision of dental services to state dependent people.

The introduction of auxiliaries is considered as a continuing process of professional evolution. This evolutionary process is essential to maintain the vitality of a profession and to secure and promote the oral health of the community (378).

The training of operating auxiliaries is an essential prerequisite for ensuring a high standard of dental care (403) as well as promoting oral health education and preventive dentistry (404).

### **3.10.3 Attitudes and perceptions of oral health care providers regarding extended functions**

Dentists were asked to provide their views on extending their spectrum of skills to perform more specialised functions (Table 114). Dentists were also asked to give their views on extending the function of dental therapists and oral hygienists (Table 115).

The majority of dentists (66,2%) felt that they should be enabled to perform more specialised functions (Table 114). Dentists stated that 'to provide a comprehensive service to the public' was the most common reason stated for supporting extended specialised function (23,8%). A large proportion of dentists also stated that extending specialised functions of the dentist was

necessary to improve affordability on a broader spectrum of specialised services (16,6%) and to improve work satisfaction (15,9%) (**Table 114**). Dentists who opposed extended specialised functions (19,8%) reported that dentists had inadequate knowledge and skills to perform such functions (38,6%) and that basic training and continuing education were inadequate to justify such functions (18,2%).

The disciplines where the need for expanded functions were exceptionally high were orthodontics (75,0%), Oral Surgery (73,2%) and periodontal procedures (73,0%). The specific procedures to which they would like more access most cited by dentists were crown lengthening procedures (27,9%), Class I fixed orthodontic therapy (22,5%) and surgical removal of impacted teeth (16,2%) (**Table 114**).

Dentists were also asked to state their views on the need for extending the functions of dental therapists and oral hygienists and their reasons for doing so.

Dentists were more in favour of allowing extended functions for oral hygienist (48,2%) than for dental therapists (21,2%) (**Table 115**). Dentists who supported extended functions for dental therapists (18,5%) stated that it was necessary to increase availability of care to the masses (68,3%). Dentists who supported extending the functions of oral hygienists (43,2%) said that this was a more cost-effective way of utilising human resources (53,1%) and that it could relieve dentists of less challenging routine tasks (20,8%) (**Table 115**).

The majority of dentists supporting extended functions for dental therapists felt that they should be allowed more extended functions in emergency care (84,3%) and denture care (58,8%) (**Table 115**). Dentists supporting extended functions for oral hygienists felt that they should be allowed more functions in preventive care in various disciplines (84,5%). Forty eight per cent (48%) was of the opinion that oral hygienists should be enabled to provide extended functions in denture care (**Table 115**).

The most common reasons provided by dentists for opposing extended functions for dental therapists and oral hygienists were professional encroachment and inadequate training (**Table 115**).

Dental therapists and oral hygienists were also asked to give their views on the need for extending their own functions (**Table 116 and 117**). All dental therapists felt their functions should be extended. Their most common reason for extending functions was a lack of availability of dentists to provide required services (55,6%) and to meet the increasing and unmet demands in developing areas (29,6%) (**Table 116**). The most common fields cited by dental therapists, in which functions should be extended were denture care (85,7%) and treatment under general anaesthesia (76,0%). More than 50% of them are also in favour of extended functions relating to most other dental disciplines.

The majority of oral hygienists (96,3%) felt their functions should be extended, (including 56,1% who suggest "much more" extension) (**Table 117**). The most frequently cited reasons for supporting extended functions were to increase work satisfaction (33,8%) and to facilitate autonomous practice (22,6%). Types of extended functions cited most were writing prescriptions (75,7%), mouthguards (53%), denture adjustments (51,8%), local anaesthesia (48,6%), placement of direct attachments (46,7%), class I restorations (35,5%) and extraction of primary teeth (22,7%) (**Table 117**).

Faced with an acute shortage of dentists and rampant dental disease, countries such as New Zealand (**405**) and Malaysia (**406**) have pioneered the use of auxiliary human resources for oral health.

In the late 1960s and 1970s a shortage of dentists in the USA was accentuated by an uneven rural-urban distribution, large unmet needs in the population, the large percentage of people who could not afford to see a dentist and the high prevalence of almost total dental neglect in poverty-stricken areas. This created a need for change in the oral health care system to meet the increasing oral health care needs of population's (**407**).

Oral health personnel have traditionally been classified into three categories (**408**), namely:

(I) Category I: Professional - i.e. dentists

*"A graduate of a university or dental college who is registered to practice dentistry independently"*

- (ii) Category 2: Operating auxiliaries - i.e. dental therapist, oral hygienists and denturist

*"A person who, not being a professional, is permitted to carry out certain treatment procedures in the mouth under the direction and supervision of the dentist"*

- (iii) Category 3: Non-operating auxiliaries - i.e. dental assistant and dental technician

*"A person who assists the dentist in his clinical work but does not carry out any independent procedures in the oral cavity"*

Worldwide, a number of different types of dental auxiliaries have developed. The well-known New Zealand dental nurse program has now also been established in Great Britain, Sri Lanka, Singapore and Indonesia (409). In the United States the principal auxiliaries who have developed are the chairside assistant, the dental hygienists and the dental laboratory technician (409). The trend towards utilising dental auxiliaries developed quickly, resulting in the revision of State Practice Acts, which enabled dentists to delegate specific procedures and tasks to dental hygienists and dental assistants (410). Various studies indicate that despite the changes in practice acts, expanded duties delegated to hygienists remained low (410). Dentists who had graduated from dental school more recently were more likely to delegate expanded functions to hygienists (410, 411).

'Expanded duties are defined by Turner and Pinson (390) as those procedures that are performed solely by the dentist but are now determined to be safe to delegate to an auxiliary. Dental auxiliaries can be taught to perform, with no reduction of quality, selected reversible and irreversible dental procedures traditionally performed by dentists.

According to Douglass and Lipscomb (412) the spectrum of services provided by practices using auxiliaries tends to be broader and offers a more comprehensive type of care to patients. A survey of Georgia dentists indicated approval of 31,7 per cent of reversible functions, but did not approve of the delegation of irreversible functions (394). Seventy four per cent (74%) of dentists responded affirmatively that auxiliaries be allowed to take impressions for special trays (394).

Younger dentists, salaried dentists and specialists generally favoured the delegation of more functions (394). Tommasone (413) recommended that procedures that are safe to delegate to auxiliaries should be reversible and not risk permanent or irreversible damage to the patient. According to Tommasone (413), tasks that are appropriate to delegate to expanded function auxiliaries are those procedures which are (i) within the law, (ii) the dentists are willing to delegate, (iii) the auxiliary is capable of performing within the set standard requirements, (iv) for which the auxiliary accepts responsibility for successful completion, (v) to which the patient does not object being performed by an auxiliary, (vi) are performed regularly in the

particular surgery, (vii) are clearly defined and (viii) are standard treatment for a particular situation.

A survey of hygienists in Missouri, USA, in 1979, showed that 44 per cent of active hygienists were performing expanded functions (414). The most frequent non-traditional functions performed were soft-tissue curettage (54,2%), finishing of restorations (41%) and local infiltration anaesthesia (25%). Only 4,6 per cent of hygienists performed placement of amalgam restorations (414). Respondents stated that the most common reason for not performing restorative functions was that the dentist chose not to delegate those functions. Participants also reported that there was no difference in patient load or cost of dental services provided as a result of their performing expanded duties (414). Minervini (414) also found that dentists generally delegated parts of a total procedure to hygienists. The Missouri hygienists' study also found that 45 per cent of dental hygienists felt that they were being fully utilised in their place of employment, whilst 55 per cent indicated a need for increased utilisation of their skills (414). In the present study almost all hygienists (96%) indicated a need for extending functions. Minervini (414) proposed that dentists should delegate more complete functions to allow for greater efficiency in the dental practice.

The Canadian dental therapist operating in the Canadian Armed Forces may also take impressions for partial dentures and carry out denture repairs (389). In general there is a trend of thinking which suggests that auxiliaries should be trained to perform extended functions specifically targeted towards areas

in the public sector where services are not easily available or disadvantaged communities by whom services are not affordable. This finding is in accordance with that of the NOHS (396).

The study conducted by MacEntee and co-workers (387) on the attitudes of dentists in British Columbia to dental mechanics<sup>9</sup> showed that dentists were strongly opposed to dental mechanics providing dental services other than complete dentures.

In the present study dentists were more in favour of allowing extended functions for oral hygienists (48,2%) than for dental therapists (21,2%). This may be so because dentists perceive dental therapists as competition, especially now that they are allowed to practice independently.

Bates (415) propagated the concept of a team approach where dental ancillaries<sup>10</sup> are utilised to overcome the human resource problem as a result of the increasing demand for dental services. Bates (415) envisaged that prosthetic ancillaries would treat the patient requiring the simplest type of complete denture but not partial dentures. According to Bates (415) the interests of the public would best be served if greater priority were given to the training of oral hygienists, as this would contribute to reducing the number of potential denture wearers.

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<sup>9</sup> The British Columbia Dental Technicians Act of 1958 defines a dental mechanic as a person who may make upper or lower complete dentures directly for the member of the public who has previously obtained a Certificate of Oral Health in which a dentist or medical practitioner has attested to the health of the denture supporting tissues.

### **3.10.3.1 Access and availability considerations in extended functions**

It has been suggested that increasing the use of dental auxiliary personnel is the most frequently discussed widely advocated and thoroughly studied alternative for increasing the supply of dental services (412).

Research has shown that expanded function dental auxiliaries has the ability to increase the amount and scope of services provided and that this could greatly help improve the oral health status of the community (416).

A survey of New York dentists in 1974 suggested that the development of preventive programs and greater delegation of responsibilities to auxiliaries were the most favoured means of coping with a nation-wide increase in the demand for dental services (417).

### **3.10.3.2 Cost considerations in extended functions**

Lowered costs are likely to arise through specialisation of labour thus raising output per unit of time or through division of labour, i.e. the delegation of certain aspects of treatment to auxiliaries (418). There is also the possibility that with greater specialisation of expanded duty auxiliaries, cost may rise as a result of higher wages and training cost (418). Doherty argued that if substitution of auxiliaries for dentists did lower the costs of producing services, one should expect lower cost services to be reflected in lower prices, i.e. fees. But dental prices have not fallen. Doherty explained that the

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<sup>10</sup> An ancillary is defined as a person specifically trained to undertake simpler forms of treatment under the supervision of the dentist.

failure of price reduction may be due to (i) the demand for dental services not being negatively related to price (ii) dentists are producing higher quality services (iii) increase in supply is offset by increases in demand and (iv) the dental market is relatively non-competitive, so that potential cost-savings are retained in the practice.

Studies conducted on the utilisation of dental assistants with expanded functions have shown that the efficient utilisation of expanded function auxiliaries will result in decreased cost per service and increased net income (416). Various studies have clearly demonstrated that the delegation of expanded functions to dental auxiliaries could increase the dental teams' productivity, thereby containing, if not reducing the cost of dental care (216, 419, 420, 421, 422, 423).

Thirty two per cent (32%) of New York dentists stated that expanded duty auxiliaries would increase operating expenses, which would necessitate a rise in fees (417). Thirty-seven (37) per cent of the dentists reported that the use of expanded duty auxiliaries in dental practice would facilitate the reduction of fees due to increased productivity. Seventy four per cent of dentists felt the use of expanded duty auxiliaries would be financially advantageous (417).

According to Douglas and Lipscomb (412), dental auxiliary utilisation and expanded function dental auxiliaries seemed to have a positive effect on the cost of care in public settings, but proved neutral in a private setting.

A study of New York dentists in 1974 suggested that dentists had not yet come to grips with the financial implications of the employment of expanded function auxiliary (417).

The Ad Hoc Committee on the Future Dental Manpower Needs of South Africa has suggested that the future role of dental therapists, especially regarding the extension of their function, be reassessed since it is less expensive to train and employ therapists (375).

According to a survey of New York dentists, 57 per cent of the dentists reported that the use of expanded duty auxiliaries would increase cost because they would require considerable input in supervising time (417).

### **3.10.3.3 Quality considerations in extended functions**

Studies on expanded function dental auxiliaries conducted during the 1960s were primarily focused on the delegation of reversible procedures to dental assistants (419, 420, 424, 425, 426, 427, 428, 429).

During the 1970s the emphasis changed to studies involving the delegation of both reversible and irreversible expanded functions for dental hygienists (421, 430, 431, 432, 433).

Since the early 1960's various studies have demonstrated conclusively that dental auxiliaries, with proper training, can provide dental services traditionally performed only by the dentist and that the quality of their services was comparable to that of dentists (416, 419, 434, 435). Abromovitz and Berg (416) also showed that participating auxiliaries were able to provide

restorations of acceptable quality increase productivity and improve cost-benefit.

Douglas and Lipscomb (412) have reported that the services provided by auxiliaries have been reviewed repeatedly and shown to meet the standards expected by the dental profession.

#### **3.10.3.4 Efficiency / productivity / economic feasibility of extended functions**

The increase in productivity and quality of services delivered in the private and public setting is well documented in a review by Douglass and Lipscomb (412).

Research has demonstrated that the productivity of dentists is greatly enhanced if they utilise specially trained dental auxiliaries who provide intra-oral services for patients (418, 436).

By increased utilisation of a greater number of supportive chairside personnel or expanded duty auxiliaries, dentists can gain more time to provide the highly technical services that only they can perform (394). Greater availability of time would allow the dentist to concentrate on treatment, which required greater skills and knowledge (417).

Ninety four per cent of dentists surveyed in New York reported that expanded duty auxiliaries would allow the dentists to render more services to a greater number of people.

A variety of other factors, however, also contribute to an increase in the productivity of dentists. Such factors include the age of the dentists, proper equipment, efficient office design, knowledge of personnel management, efficient methods for controlling appointments and the availability of specially trained expanded duty auxiliary personnel (394).

In a survey of New York dentists, 70 per cent of dentists reported that expanded duties would increase the job satisfaction of auxiliaries and thus reduce personnel turnover.

#### **3.10.3.5 Professional receptivity and public acceptability of extended functions**

Relatively little is known about professional receptivity to the employment and utilisation of expanded duty auxiliary (437).

Waller (394), however, has stated that although practice acts have been amended to permit increased delegation of duties, this legal authorisation does not ensure active support by practitioners.

Other studies have also shown that younger dentists tend to have more favourable attitudes towards expanded duty auxiliaries than their older counterparts (394, 437). Waller (394) also found in his study that salaried dentists and specialists favoured the delegation of more functions to auxiliaries.

McKenzie and Born (437) found in their study that 71 per cent of dentists agreed that patients would accept services rendered by an auxiliary. A survey of dentists' attitudes towards auxiliaries in Malaysia indicated that the

perceived value of auxiliaries was more positive among public sector dentists compared to private practitioner's (396).

The Georgia dentists' survey in the USA indicated that reversible duties were more acceptable for delegation to expanded duties auxiliaries than were irreversible service (394). Leske and Leverett (417) found in their survey of New York State dentists that recent graduates were more likely to favour delegation of various responsibilities to properly trained auxiliaries. Dentists were generally opposed to delegation of more complex tasks and irreversible procedures (417).

Patient acceptance of expanded function auxiliaries has been reported as being quite favourable (422, 438). Thirty nine per cent of New York dentists, however, stated that auxiliaries would alienate a substantial number of patients who would not readily accept treatment by an expanded duty auxiliary (417).

Development of preventive programs and greater delegation of responsibilities to auxiliaries were favoured by New York dentists as a means of coping with a nation-wide demand for dental services (417).

#### **3.10.3.6 Training and educational considerations of extended functions**

A survey of Minnesota dentists' attitudes towards expanded dental auxiliaries also reported an emphasis on entry requirements for expanded dental

auxiliary (437). Eighty per cent (80%) of dentists felt it would be desirable to test applicants for manual dexterity.

Eighty five per cent (85%) of dentists indicated that a continuing education program should be developed to teach dentists how to better utilise an expanded duty auxiliary (437).

A survey conducted in South Australia (383) reported that 65 per cent of dentists found that the age of patients when they first required a removable prosthesis was increasing, indicating the retention of teeth to a greater age. This may indicate that removable prosthodontics may in the future require more expertise and skills in managing the treatment of the elderly patient (383).

Although most surveys on expanded dental auxiliaries were conducted more than 10 years ago, there is no evidence that the opinions of dentists in the various countries have changed during the last decade.

The changing role of dental auxiliaries, nevertheless, holds implications for dental education that should not be overlooked. Opportunities should be made available for those auxiliaries who are experienced, able and motivated to enter the field of dentistry, in other words to establish a career ladder (439).

#### **3.10.4 Priority ranking of oral health services in the public sector**

Health education, pain and sepsis care and preventive services were regarded by the majority of dentists as the highest priority in the public dental services (Table 118) whereas orthodontics, periodontics and crown and

bridge- work were given the lowest priorities (**Table 118**). Denture services were placed between restorative care and endodontics as a median priority.

The majority of dental therapists regard pain and sepsis relief, preventive care and educational services as the most important public health services (**Table 119**). They cited crown and bridgework, denture services and endodontics as low priority services in the public sector.

#### **3.10.5 Perceptions on the adequacy of supply and utilisation of oral health care personnel in the public sector**

Oral hygienists were asked their views regarding the adequacy of supply of oral hygienists to meet all the demands for preventive care in their area (**Table 120**).

Thirty eight per cent (38%) responded that there were too few or far too few oral hygienists to meet the preventive needs of the community whilst 38,3 per cent stated that there were enough oral hygienists (**Table 120**).

Dental technicians were asked their views on the adequacy of supply of dental technicians to meet all the denture demands in their community. The majority of dental technicians (65,2%) stated that there were too many or far too many dental technicians (**Table 120**).

Dentists and dental therapists were asked their views on the overall adequacy of supply of human resources to provide for various oral health care

demands. The majority of dentists felt that there were too few human resources available to provide the educational (53,3%) and preventive services (41,2%) that were demanded (**Table 121**). Forty six per cent (46%) felt that there were enough and 37,1 per cent stated the amount of human resources available to meet the demands for dentures was too high. (**Table 121**). The majority of dentists felt that there were enough human resources available to satisfy the demands for restorative, orthodontic, periodontal, fixed prosthodontics and oral surgery.

Dental therapists overall felt that human resources in developing areas were inadequate in all fields of dentistry (**Table 121**). Eighty five (85%) per cent of them felt that human resources were inadequate to provide for the dentures that were demanded in their area (**Table 121**).

Dentists and dental therapists were asked to state their views on the need for utilising various occupational categories in the public sector.

Dentists felt that dentists (50,3%), dental therapists (42,9%), and oral hygienists (66,4%) were under-utilised in the public sector in urban areas (**Table 122**). Almost half of the dentists stated that the utilisation of dental technicians in urban public services should stay the same.

The majority of dentists felt that the utilisation of all oral health occupational groups should be increased in the public sector in rural areas (**Table 122**).

The majority of dental therapists felt that the utilisation of all occupational groups should be increased in the public sector in both urban and rural areas (**Table 123**).

Oral hygienists also felt that public services should make more use of oral hygienists in urban (77,1%) and rural areas (95,2%) (**Table 124**).

The Ad Hoc Committee (**375**) stated that any substantial increase in the demand for dental treatment was most likely to stem from the lower socio-economic strata and especially those strata of the black and coloured groups. For the foreseeable future dental treatment services for these groups would remain largely the responsibility of the state (**375**).

Two important aspects were of particular relevance in this recommendation by the Ad Hoc Committee, namely demand for dentures were mostly from the coloured population group and secondly, it was highly unlikely that the State would provide the human and financial resources to provide for the demand in dentures.

According to the NOHS (**376**) nearly a quarter (24,2%) of dentists indicated that there were too many dentists and fewer should be trained. The NOHS, however, suggested that there should be more black dentists as opposed to auxiliaries (**376, 377**).

A survey conducted by Wilding, Reddy and Owen (**374**) on the dental manpower needs in South Africa shows that half of all dentists were of the opinion that there was an excess of dentists in practice.

### **3.10.6 Dental technicians' relationship with dentists and illegitimate practices**

The responses of dental technicians regarding attitudes towards denture services and their relationship with dentists are shown in **Table 125**.

The majority of dental technicians (84,3%) reported having done denture repairs, complete dentures (22,5%), relines or rebasing of dentures (22,5%) and partial dentures (18%) directly for patients who were referred to them by a dentist during the past three years (**Table 125**). The most common reason cited why the dentists referred the patient directly to the dental technician for treatment was that the dentist was unable to satisfy the patients' needs (62,7%) and because the dentist had no time to attend to the patient (21,6%). Forty three per cent (43%) of dental technicians reported having had to remake dentures during the past three years at their own cost because the dentists had provided inadequate instructions (**Table 125**). Dental technicians also stated that dentists frequently approached them to provide dentures at no charge (33,1%). Dental technicians reported a median of three dentures during the past three years that were provided at no cost on the request of the dentist (**Table 126**).

The majority of dental technicians (69,9%) stated that they had been approached during the past three years to provide services at a discounted rate in exchange for the dentists' continued support (**Table 125**). Dental technicians reported that they provided approximately one denture at

discounted rates every month in exchange for continued support of dentists providing work (**Table 126**).

Thirty two per cent (32%) of dental technicians reported that during the past three years they had been requested by dentists to invoice work that had not been done, so that this could be claimed from the patients' medical aid (**Table 125**). Dental technicians reported an average of 58 dentures requested for fraudulent invoicing by dentists over the past three years (**Table 126**).

The reasons provided why dental technicians preferred not to work as employees for dentists were that they felt that dental technicians were being exploited financially by dentists (36,9%), they preferred to practice independently (32,6%) or that they wanted job satisfaction (28,3%) (**Table 125**).

Most dental technicians, nonetheless, reported having a good relationship with dentists (75,8%) (**Table 125**).

One of the most frequent complaints from dental technicians is that they are not treated as equals (**381, 440**). It has been argued that the dental technician is the seller and this seller needs the dentist as his client. In any vendor relationship the buyer, in this case the dentist, dictates the rules (**440**).

The relationship between dentist and dental technician has been the subject of much concern for many years (**384**).

According to the Nuffield Foundation (381) dentists are reluctant to accept technicians as equal partners. The relationship between dentists and dental technicians has been widely described as one in which rapport is poor and there is discontent over a wide spectrum. (387). MacEntee and his co-workers (387) reported that the communication gap between dentist and dental technician<sup>11</sup>, that might in the past have contributed to the technicians' desire to work directly for the public, appears to be diminishing.

Various studies have previously commented on the inadequacy or absence of prescriptions for the design of partial dentures (441, 442).

Close co-operation and understanding between dentists and dental technicians are likely to increase the standard of prosthetic services. The South African Medical and Dental Council has made a ruling that it is unethical for a dentist to refer a patient to a dental technician for a shade determination, nevertheless the dental technician's attendance at the chairside is permissible. Although much has been said about the dental health team in South Africa, this ruling does not contribute towards teamwork, nor does it benefit the dentist, technician or the patient (443).

Unsatisfactory levels of communication and collaboration between the dentist and dental technician prejudice the quality of care provided. The Federation Dentaire Internationale (444) accepted the following principles of collaboration

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<sup>11</sup> The British Columbia Dental Technicians Act of 1958 defines a dental Technician as a person licensed to make a dental prosthesis on prescription from a dentist, and without a

between the dentist and dental laboratory technician: (i) close personal communication (ii) respect for each other's skills and limitations (iii) availability of both for consultation (iv) ensurance of an acceptable personal relationship (v) pre-arranged time allowance and avoidance of undue pressure on the technician (vi) avoidance of unrealistic economic restrictions on technicians (vii) maintenance of proper business relationships (viii) materials should conform to acceptable standards and (ix) provision of a written work order embodying complete specifications and explicit directions.

According to Telivuo (445) the role of the dental technician is at its best when he or she works as a member of the dental team and when both parties contribute to this co-operation. This will enable the combination of knowledge and skills of both parties for the benefit of the patient.

Heffron (380) in his review of the dental technician in Australia reported that although the working relationship between dentists and dental technicians was quite good, complaints were common from both sides. Some of the most common complaints reported among dental technicians were: (i) inadequate impressions by dentists (ii) no or inadequate instructions provided by the dentists (iii) unreasonable demands for completion (iv) free of charge remakes expected when the fault lay with the dentist and (v) the blame put on the technician (380). The above mentioned complaints are also supported in the present study. Comments made by dentists about dental technicians generally related to (i) service too costly (ii) slow service (iii) inadequate standard of work and (iv) lack of emergency service (380).

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prescription, to repair a dental prosthesis directly for a patient, providing the task does not

Various cases of dental technicians conducting practice in competition with dentists have been reported (446). Reports of "quacking" continue to be received from all parts of the country (447). A case was reported where a denture was made by a dental technician for a patient who had active squamous cell carcinoma of the mandible (448).

Taljaard (449) has stated that one of the shortfalls in the dental technician profession is the lack of progress towards uniformity of action to regulate and discipline itself.

Most dentists believe it is essential to allow the dental technician to be present at a consultation between the patient and the dentist or the attendance of a dental technician at the surgery for a colour matching involving porcelain work during the provision of dentures. Dental technicians could thereby contribute vastly to the expansion of goodwill in the oral health care team. Consideration, however, has to be given to the fact that the attendance of the technician at the surgery means a loss of productive time.

The dental technician profession has changed fundamentally over the past decade as a result of scientific and technological development.

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involve an intra-oral procedure.

Dental technicians were also asked to state whether they had been involved with any potential or definitive illegitimate practices during the past three years. The responses are shown in **Table 127**.

Most dental technicians (54,8%) reported that they had been approached many times by members of the public to provide dentures. The respondents stated that the public's reaction when turned away was that of disappointment at being forced to pay the higher price charged by a dentist (60,5%). The public also found it difficult to understand (17,4%) why dental technicians could not provide dentures directly to them and expressed their dissatisfaction at the injustice of legislation (10,3%) (**Table 127**).

Dental technicians reported that the main reason why people requested treatment directly from a dental technician was that the dentist was too expensive (65,9%).

A large percentage of dental technicians (35,4%) had provided a complete set of dentures directly to patients during the past three years (**Table 127**). Sixty eight per cent (68%) of dental technicians did repairs and 29,3 per cent made partial dentures directly for patients. Motivations mostly given for providing services directly to patients were: 'personal favour to a family member or friend (20,3%)', 'can provide better quality dentures because of technical experience' (15,3%) and 'the patient cannot afford dentures elsewhere' (13,6%).

Illegal practice by dental technicians has been reported as a fact of life in many countries (380). Dental technicians have fought actively for registration enabling them to provide dentures directly to the public, whilst dentists have been strongly opposed to this development for over 30 years. The technicians who advocate registration for autonomous practice claim that dentists are protecting a vested interest and its principal concern is loss of income if denturists are established as a new occupational category (380).

This issue will be analysed in greater detail in the final part of this study.

### **3.10.7 Perceptions and attitudes regarding denturism and denturists as a new occupational category**

Dentists were asked to state their views about dental technicians receiving further clinical training so that they could provide dentures directly to the public (denturism).

The majority of dentists (77,1%) were opposed to the principle that dental technicians should provide dentures directly to the public (Table 128). Their reasons for opposing and supporting denturism are listed in Table 128. The most prevalent reasons why dentists opposed denturism were professional encroachment (41,8%) and inadequate knowledge and skills (40%).

Dentists who supported denturism (15,8%) said that it was their opinion that this would make dentures more affordable to a broader spectrum of the public (Table 128).

Sixty one per cent (61%) of dentists were strongly in favour of patients paying laboratory bills directly to dental technicians (**Table 128**).

Dental therapists and oral hygienists were also asked to give their views on providing dentures directly to the public themselves. Most dental therapists (82,8%) felt that they should be enabled to provide dentures directly to the public (**Table 129**). Only 29 per cent of oral hygienists were in favour of providing dentures directly to the public (**Table 129**).

The reasons cited most frequently by dental therapists in support of the provision of dentures directly to the public were a need to satisfy the growing but unmet demands (34,4%). Dental therapists felt they had a professional obligation to replace teeth if they extract teeth (17,2%) and that it would make dentures more affordable (17,2%) (**Table 129**).

Six oral hygienists (24%) were in favour of oral hygienists providing dentures because there was a large unmet demand, five (20%) stated that it would make dentures more affordable and 4 (16%) stated that it would reduce the workload of the dentists.

Forty eight per cent (48%) of oral hygienists were opposed to the principle that oral hygienists provide dentures directly to the public (**Table 129**). The two principle reasons for the latter view were that they felt that oral hygienists were not trained for this function (35,5%) and that providing dentures conflicted with their goal of maintaining natural teeth as long as possible (47,5%) (**Table 129**).

Dental technicians' views and attitudes regarding the establishment of denturists as a new occupational category are presented in **Table 130**. Almost all dental technicians supported the principle of establishing denturists as a new occupational category (96,7%) and there was nobody who opposed it. (**Table 130**).

The most prevalent reasons given by dental technicians for supporting denturism were to improve cost effective utilisation of human resources (29,7%), to increase affordability of dentures (27,5%) and to improve the quality of dentures (13,2%) (**Table 130**).

The majority of dental technicians felt that they ought to play a greater role in the provision of complete dentures (93,5%), repair of dentures (91,3%) and provision of partial dentures (83,7%) directly to the public (**Table 130**).

Dental technicians who opposed denturism (17,2%) said that it would be too difficult to control (37,5%) denturism and that dental technicians had inadequate training to provide dentures directly to the public (31,5%) (**Table 130**).

The majority of dental technicians (89,1%) felt that dental technicians ought to receive clinical training before being allowed to practice as denturists (this figure includes 64,1% who replied "definitely yes") (**Table 130**). Sixty eight per cent (68%) of dental technicians responded that they would become denturists if denturism were to be legalised (**Table 130**). Those who chose

not to practice as a denturist gave Professional preferences (93,7%) as the most general reasons.

Dental technicians were asked at what price they would be able to provide a full upper and lower set of dentures if they were able to practice denturism today. The median, modal and average prices for a denture were estimated at R500 (**Table 130**).

Although the general opinion of dentists regarding denturism is well known, data on the attitudes of dentists regarding denturism is very scarce. The Dental Laboratories Association in the UK conducted an extensive survey in 1990 on the views of various role players on denturism. Of the 200 questionnaires that were sent to dentists only three were returned. The Committee concluded that this might have been an indication of the low interest shown in dental technicians affairs by dentist's (**377**).

A survey of dental technicians in the USA in 1982 found that about 24 per cent reported that they would become a denturist should the profession be made legal (**450**). In the present study 68,5 per cent of dental technicians felt that they would become a denturist. This attitude may reflect the depressed economic situation and poor work satisfaction that dental technicians are currently experiencing in South Africa.

According to a survey conducted in 1979 in the USA, the Dental Laboratory Association was split in half on the issue of denturism. Fifty two per cent (52%) were in favour of denturism. Smaller labs were more in favour of denturism (451).

The following conclusions are made from the results of this study:

- (i) Dentists, oral hygienists and dental technicians are primarily located in the metropolitan areas and those providers mostly practise in the private sector. Only two dental therapists are employed in the public oral health services in the Western Cape.
- (ii) Oral health care providers, especially in the public sector, are under-supplied in rural and developing areas in the Western Cape.
- (iii) Dental technicians prefer not to be employed by a dentist for personal and economic reasons. Separating the dental technician from the dentist means that it will be increasingly difficult to incorporate the dental technician into the oral health team concept. The outcry for professional autonomy and independence also holds serious implications for the oral health team approach.
- (iv) A large percentage of dentists, dental technicians complain that they are not busy enough and that they have experienced a decline in practice income during the past 5 years.

- (v) Dentists and dental technicians perceive that they are in oversupply in the private sector and that this has contributed to their decreasing income and busyness.
- (vi) Dental therapists, on the other hand, seem to be overwhelmed by the number of patients demanding services in the areas where they are employed and experience the highest level of dissatisfaction with their work. More dental therapists are likely to leave the public sector for private practice in urban areas to improve their income and work satisfaction. This trend is likely to cause further deterioration in the availability and accessibility of much needed services in rural and developing areas.
- (vii) The perceived oversupply of providers, professional encroachment, decreasing "busyness", depressed economy and the need for professional development are currently major forces influencing all occupational categories towards extending their functions to be able to survive financially and to revive career satisfaction. It makes economic sense to extend functions in all occupational categories. The implications thereof on training and control are, however, not within the scope of this study.
- (viii) Although dentists show less preference for prosthetic work, it still constitutes a sizeable proportion of the dentists' and dental technicians' gross monthly turnover. Considering the depressed economic situation and decline in "busyness", dentists and dental

technicians will increasingly prefer those procedures, such as crown and bridge work, that will improve their practice income the most.

- (ix) Oral health education, preventive services and relief of pain and sepsis should remain high priorities in Public Dental Health Services. More auxiliaries should be utilised in the public sector to meet the demands for such services with the primary goal of maintaining a healthy dentition for life. Greater emphasis on and a stronger commitment towards preventive dentistry should be made to promote the retention of a healthy dentition as long as possible. Denture care, on the other hand, remains a low priority for resource allocation in the public sector.
- (x) Although dentists are strongly opposed to denturism, primarily because this would further erode their scope of practice, the community at large could benefit by its implementation, provided adequate training is given. The majority of dental technicians supported denturism mainly for economic reasons. Most dental technicians were in favour of receiving clinical training before being allowed to practise as a dentist. Dental technicians estimated that they would be able to provide a complete set of dentures at approximately R500 if they were allowed to practise as a dentist today. Although the sample of dental therapists is too small to reach a conclusion, the results do seem to indicate that the provision of dentures by dental therapists could also fill the gap for such demands in areas where dentists are not available or accessible.

- (xi) The number of oral hygienists should be increased to improve the availability and accessibility of preventive services at all levels of society. It is envisaged that this will ensure that the loss of teeth is prevented and subsequently reduce the number of potential denture wearers.
- (xii) In this country where demographic, social, cultural, political and economic circumstances and prevalence of oral diseases and conditions are changing rapidly, the role of oral health care providers, in particularly auxiliaries, should be reassessed for the mutual benefit of the providers and the communities they serve. Special attention should also be given to extend functions and the career development opportunities of all operating auxiliaries in the oral health care team.
- (xiii) Because the responses were relatively small in relation to the whole, results can only be an estimate of the characteristics of the provider population. The findings, nevertheless, are an important indicator and adjunct to the overall information needed for policy analysis.

## **CHAPTER FOUR**

### **POLICY PROBLEM STATEMENT AND DEFINITION**

Policy problems are unrealised values, needs or opportunities that may be obtained through public action (111). They are typically characterised as (i) interdependent entities, (ii) by their subjectiveness or artificiality and (iii) being dynamic and therefore have to be viewed within this context.

Policy problems are interdependent entities or parts of whole systems best described as “messes” (111). Problems cannot be solved independently from one another. A holistic approach is therefore used to analyse the problem.

Policy problems are also products of subjective human judgement; therefore a specific policy problem may either become accepted as legitimately socially constructed, maintained and / or changed. Policy problems have no existence apart from the individuals or society, which defined them (111).

Finally, policy problems are dynamic because there are many different solutions for a given policy problem, hence problems do not stay solved.

Problem structuring is the most critical phase of the policy analysis since solving the wrong problem will lead to wrong solutions to the right problem (111).

The policy problem regarding denturism is in reality a “whole system” of problems.

#### **4.1 Description of the problem**

The provision of dentures has been a constant issue during the evolution of dentistry. The following prominent issues relating to the provision of dentures were identified by this study

##### **4.1.1 Edentulousness**

Poor awareness and low value attached to oral health as well as a general lack of resources by a predominantly indigent population for accessing essential care have led to rampant dental caries amongst the adult indigent population, a culture of extracting teeth, edentulousness and a subsequent high demand for dentures.

##### **4.1.2 Inaccessibility and lack of resource availability**

The total public oral health budget of the Western Cape for the 1996 / 1997 book year was approximately R16 million. This represents only 0,7 per cent of the total health budget. At present each public health dentist is allowed only about R1000 per dentist/month for the provision of dentures. At a cost of approximately R1000 for a denture (laboratory fees included) the budget restrictions allow a public dentist to provide only one denture per month.

For all practical purposes the state does not have funds available for dentures; neither does it consider denture care as a priority.

#### **4.1.3 Unaffordability of dentures**

The majority of the edentulous population falls into the low income category and can therefore not afford the dentures of a private dentist as at present these cost about R1200 for a full upper and lower denture.

The state, on the other hand, cannot afford to supply the existing and increasing demand for dentures arising from the education and social upliftment of developing communities.

#### **4.1.4 Monopolistic control of denture services**

Dental technicians have in the past drawn attention to restrictive clauses and regulations in different Acts that prohibit dental technicians from working directly with the public. Restrictive clauses allow the dental profession to control the supply of prosthetic services and prohibit the developing of new markets where an unmet demand exists, thus having a negative effect on free enterprise.

#### **4.1.5 Dentist - dental technician relationship**

As dentists have in the past exploited dental technicians both financially and professionally, this has led to a situation where the relationship between dentist and dental technician can at best be described as poor.

Dental technicians have also expressed the need for greater scope and independence in developing their own profession and the desire to gain greater status and respect as professionals in their own right.

#### **4.1.6 Illegitimate practice**

It is also recognised that there are a considerable number of licensed and unlicensed technicians providing a service directly to the public.

#### **4.1.7 Supply of oral health care personnel**

The over-supply of dentists and dental technicians, their predominantly urbanised location and the high costs of practice are threatening the economic viability of dentists and dental technician practices.

The State, on the other hand, does not have adequate financial resources to employ more dentists and clinical dental auxiliaries in under-served or rural areas to meet the increasing demand for oral health care.

Based on the above mentioned problem issues, it is clear that the provision of dentures can basically be described as an economic or a resource allocation problem.

#### **4.2 Problem perception from the major stakeholders point of view**

The formulation of a problem is heavily influenced by the assumption that different policy stakeholders bring to a given problematic situation.

The ability to recognise differences among policy stakeholders is crucial for *"understanding the different ways that common experiences are translated into disagreements about actual and potential courses of government action"*

(111).

#### **4.2.1 Consumers' view**

- (i) The demand for dentures, especially in the lower socio-economic sector of the community, is great.
- (ii) Dentures are difficult to obtain from the public sector due to lack of resources or inaccessibility.
- (iii) The low-income sector of the population cannot afford dentures provided by private dental practitioners. Their only alternative is to obtain dentures from illegitimate backdoor providers.
- (iv) The dentures obtained from backdoor providers are of a poor quality.

#### **4.2.2 Dentist's view**

- (i) Dentists argue that denturism is a problem because dental technicians /denturists are infringing on their field of work (professional encroachment).
- (ii) Dentures that are provided by denturists or backdoor providers are a health risk to society.

#### **4.2.3 Dental technicians' view**

- (i) Dental technicians lack scope for professional development and professional autonomy. To the dental technician, denturism is a natural process of professional development or evolution.
- (ii) Dental technicians claim that they do not have enough work.
- (iii) Dental technicians can provide dentures more cost-effectively.

#### **4.2.4 Government's view**

- (i) Government realises that it has a responsibility to provide essential care to the indigent.
- (ii) Denture care is not a high priority in comparison to other essential oral health needs.
- (iii) Government does not have adequate resources to provide for all denture needs.

#### **4.3 Problem classification and conceptualisation**

A policy problem basically consists of the following elements: (i) decision makers (ii) alternatives (iii) utilities or values (iv) outcomes and (v) probabilities.

The policy problem regarding denture care has many stakeholders, various policy alternatives, conflict of values among competing goals; its outcomes are uncertain and probabilities are incalculable.

Based on the above mentioned structure of the policy problem on denturism, the problem is clearly considered as relatively complex and therefore classified as an ill-structured problem (111). Ill-structured problems typically involve many different decision-makers whose values are impossible to rank in a consistent fashion (111). The main characteristic of ill-structured problems is conflict among competing goals held by the various policy stakeholders.

Ill-structured problems demand that the analyst first take an active part in defining the nature of the problem itself.

The request for legalising denturism basically stems from an economic problem. The problem thus concerns factors related to the production and distribution of goods i.e. dentures and services.

The conceptual framework or world view on the production and distribution of dentures can be summarised as follows:

#### **Micro-level: Consumer level**

##### **System A: Public / consumers**

- Demand / need for dentures by low-income groups
- Cannot afford dentures in the private sector
- Denture services are inaccessible to rural and the elderly groups
- Use denture services where it is most affordable irrespective of quality

#### **Meso-level: Provider level**

##### **System B: Dentists in private sector**

- Dentists provide a high cost, high availability, high quality service to those who are willing to pay and can afford their services
- Dentists justify the high cost of dentures on the basis of providing quality care and covering high costs of running a practice.
- There is a perceived over-supply of dentists in the private sector.

- Denturism will encroach on the field of dentistry that is already diminishing, thus threatening the economic viability of dental practice.

**System C: Public health sector**

- Dentists in the public sector provide a low cost, high quality denture service to a limited number of individuals only because a low priority is placed on denture care and the lack of adequate resources to finance such a service.
- Dentists, dental technicians and clinical auxiliaries are under-supplied in the public sector
- Dental therapists are not allowed to provide dentures.

**System D: Dental technician**

- Dental technicians are legally not permitted to provide denture services directly to the public.
- Dental technicians need to extend their scope of practice to sustain the economic viability of their practices.
- Dental technicians claim they have a right to self-determination and not being held in bondage by the dentist profession.

**System E: Informal sector providers (“Backdoor providers”)**

- Backdoor providers are illegitimate, but provide dentures at a low cost to a large proportion of individuals in the low-income bracket.

- Dentures are also of a poor quality and services are not easily accessible due to their illegitimate nature.

### **Macro-level: Government**

#### **System F: Political system**

- Resources are limited whereas demands are unlimited.
- Oral health care is a relatively low health care priority and has to compete with health and social services for scarce resources.
- Using health care auxiliaries is more cost-effective than professional dentists and specialists.
- Denture care has to compete with other oral health services, health services and social service for scarce resources.

#### **4.4 Significance of the problem**

The oral health care workforce is an important national asset and its economic viability should be protected to ensure its future existence and thus being able to provide a service to the community. Maintaining the viability of such resources is important for the following reasons:

#### **4.4.1 To promote well-being**

Tooth loss has been dubbed as one of the most severe compromises of dental function and therefore considered as a general indicator of a population's oral health status (452, 453, 454).

Restoring the mouth to optimal occlusion is generally considered a desirable and necessary state to ensure an acceptable level of oral wellbeing (free of discomfort and disease), functional wellbeing (speech and mastication), psychological wellbeing (self-esteem) and social wellbeing (social acceptance and interaction).

Denture care contributes to the physical, social and psychological wellbeing of an individual and can therefore be considered as an essential component of comprehensive primary oral health care service to any community.

#### **4.4.2 To promote affordability of denture care**

Disadvantaged individuals or socially deprived communities such as the elderly and the indigent have no financial means for obtaining oral health care. Furthermore, the ever-increasing demand for more social services in a society, which is handicapped by inadequate resources and the high costs of health care, has created a tremendous financial burden on the state, which it is unable to carry.

#### **4.4.3 To promote access to denture care**

People living in rural areas, institutionalised elderly and socially deprived communities, more often than not, do not have access to services that are

needed simply because the state does not have an abundance of resources to provide for every need. Secondly, it is not economically feasible for the private sector to provide services in remote or rural areas.

#### **4.5 Outcome of *a priori* efforts to resolve the problem**

The historical background summarised in the introduction gives some insight into the evolution of the problem and how ways were sought through legislation to protect rights and vested interests until implementation of the current Dental Technicians Act (Act 19 of 1979) (554)

A range of manpower conferences was held under the auspices of the Committee of Dental Deans and sponsored by the Dentistry Development Foundation of the Dental Association of South Africa with the aim of planning an appropriate oral health care work force for South Africa for the year 2020.

One of the recommendations resulting from the above mentioned proceedings was that removable prosthodontics be added to the tasks of dental therapists. Alternatively, consideration should be given to establishing denturists as a new occupational category, provided a demand is identified and a cost-effective service can be guaranteed (39). A new policy direction of providing services on a more equitable, accessible and affordable basis was set.

On 12 February, 1991, a Joint Denturism Ad hoc Committee of the South African Federation of Dental Technicians and the South African Dental

Laboratory Association submitted a report titled: "Denturism - A new profession" to the Director-General of the then Department of National Health and Population Development (455).

The Chief-Director, Oral Health Services, made the following comments in response to the above mentioned report (456):

- (i) "the demand by state dependent patients for dentures will increase as a result of population development."
- (ii) "The supply of dentures however has a very low priority in oral health services rendered by the state."
- (iii) "The results of the National Oral Health Survey seem to indicate that the dental profession is reaching a saturation point and that the training of dentists will have to be monitored and properly planned for the future".
- (iv) "75 per cent of the population is state dependent and as a result of limited resources the State will not be in a position to employ more dentists".
- (v) "The dental technician will have to receive additional training in the clinical handling of the patient".
- (vi) "The implementation of denturism in the RSA should be carefully planned and care must be taken to create a well balanced viable profession that is acceptable to all concerned (dentists, dental technician, the public and health administrators.)"

In response to the above mentioned report, the Director-General expressed the view that the establishment of denturists as a new occupational category should receive consideration and recommended that the report and

motivation be submitted to the South African Dental Technicians Council for further evaluation (457).

The consensus of opinion within the Dental Association was that the South African Dental Technicians Council had no mandate to get involved with denturism which falls under the purview of the South African Medical and Dental Council (458).

A Denturism Committee was subsequently established by the South African Dental Technicians Council in terms of Section 11 (3) of Act 19 of 1979. The purpose of this Committee was to investigate the desirability of establishing a new category of oral health supplementary personnel such as denturists and to report back to the council (459).

The National Medical and Dental Association (NAMDA) in principle supported any measures that would result in a decreased cost of health care to the public. NAMDA also supported the principle that denture services should, as far as possible, be provided by the state by means of a National Health Service or National Health Insurance Scheme (460).

In May 1992, after various discussions and meetings with interest groups, the Denturism Committee concluded that the available information in the report of the Joint Ad hoc Committee was inadequate, too subjective and lacking scientific evidence to justify a decision regarding the legalisation of denturism. The Denturism Committee recommended that further studies be conducted to fulfil the informational requirements for making a policy decision on denturism.

## **CHAPTER FIVE**

### **GOALS AND OBJECTIVES**

One of the most important aspects of defining and analysing policy alternatives is the specification of goals and objectives (111). Goals and objectives facilitate in the establishment of the desired kind of product or service. Although goals and objectives are future orientated, goals express broad purposes while objectives set specific aims.

For reasons of simplicity goals and objectives are stated according to the various stakeholders.

#### **5.1 Goals**

The goals of any policy relating to denture care should embrace the following:

##### **5.1.1 Consumer perspective**

- (i) To improve oral health status, health in general and the overall quality of life of people by decreasing the prevalence of edentulousness by making dentures available at an affordable price to those in need of such care.
- (ii) To make denture services available at an affordable price.

## **5.1.2 Provider perspective**

### **5.1.2.1 Public sector dentist**

- (iii) To make public denture services available and accessible to low-income groups, the elderly and rural communities in the most cost-effective manner.

### **5.1.2.2 Private sector dentists**

- (iv) To protect and promote the economic viability of the dentists' profession.
- (v) To create and promote opportunities for their career development and satisfaction.

### **5.1.2.3 Dental technicians**

- (vi) To protect and promote the economic viability of the dental technicians' profession.
- (vii) To create and promote opportunities for career development and satisfaction.
- (viii) To create and improve a professional collaborative environment that will enhance dentist - dental technician relationships and mutual respect between the professions.

### **5.1.2.4 Dental therapists**

- (ix) To create and promote opportunities for career development and satisfaction.

**5.1.2.5 Informal sector (Backdoor providers)**

- (x) To eliminate the illegal provision of dentures.
- (xi) To protect the safety and wellbeing of the public by providing a quality denture service through oral health personnel who have received appropriate education and training.

**5.1.2.6 Government or policymakers' view**

- (xii) To provide cost-effective and affordable denture care to all.
- (xiii) To provide quality dental care.
- (xiv) To provide equitable dental care that is accessible to all.

**5.2 Objectives and target groups**

The provision of prosthetic oral health services should not be seen in isolation from other oral health services but as an integral part of a comprehensive primary oral health care service. The cost of dentures is very expensive and the need for such care can be prevented through appropriate oral health care policies. The primary objectives of any oral health care policy should therefore focus on prevention and reducing expenditure on expensive care.

- (i) Reduce dental caries through the delivery of fluoride to 75 per cent of children by the year 2010.

- (ii) Implement health education initiatives in all schools and places of employment to promote an appreciation of the value of retaining a healthy dentition for life by the year 2010.
- (iii) To increase the proportion of individuals, 35-44 years of age, who have never lost a permanent tooth due to dental caries or periodontal disease to 45 per cent by 2010.
- (iv) To reduce the proportion of individuals 65-74 years of age who have lost all their teeth to 20 per cent by 2010.
- (v) To prepare a protocol for the provision of dentures to selected cases in public service and table legislation to deregulate denture delivery by the year 2000.

## **CHAPTER SIX**

### **IDENTIFICATION OF POLICY ALTERNATIVES FOR PROVIDING DENTURE SERVICES**

Setting or forecasting policy alternatives are not only a prerequisite of societal guidance, but also helps policy makers foresee and avoid unanticipated negative consequences of public policy (111).

The three work force options for the future provision of dentures are (i) maintaining the current status quo of dentists doing the clinical work and the dental technicians the technical work (ii) expanded function dental auxiliaries or (iii) denturists.

#### **6.1 Dentists' provider model**

In this model the dentists are the only providers of dentures directly to the public while the dental technicians provide the mechanical work for the dentist who contracts him for the work. Dental therapists and dental technicians are not permitted to provide any denture services directly to the public.

## **6.2 Expanded-function dental auxiliary provider model**

Expanded function dental auxiliaries (EFDA) are noted as the most frequently discussed, widely advocated and thoroughly studied alternative for increasing the supply of dental services (461).

The use of EFDA, such as dental therapists, allows more services to be rendered (increased productivity) and increases the availability and accessibility of services in remote or under-serviced areas.

Research has shown that the scope of services provided by the practice setting using EFDA tends to be broader, thus providing more comprehensive care to the community (461).

By using EFDA's the dentist can reduce the number of hours he works and can still increase the number of patients seen in his surgery. In the private sector EFDA's are necessary to increase the productivity of the dentist.

In this model it is envisaged that all oral health care personnel function as a team and that various personnel, such as dental technicians, dental therapists and even oral hygienists, may perform certain auxiliary denture services for the dentist under prescription.

Expanded duty dental auxiliaries, such as dental therapists, are especially useful to assist dentists in rural or under-supplied areas. EFDA's working in the public sector in under-served areas are seen more as substitute dentists (462).

It would seem logical to add expanded functions in prosthodontics to existing training programmes for dental therapists.

### **6.3 Denturist provider model**

The denturist (clinical dental technologists) provider model makes provision for dental technicians to undergo further clinical training after which they may provide denture services directly to the public.

## **CHAPTER SEVEN**

### **CONSIDERATIONS AND CONSTRAINTS REGARDING MAJOR STAKEHOLDERS**

Various interest groups, such as the public, providers, training institutions, health departments, medical aids and health insurance groups, civic organisations and political parties to name but a few, will have a marked influence on the development, structure and effective implementation of the oral health workforce. It is recognised that ignoring these groups and their demands would be unwise.

In the past, the planning of oral health care services was based on perceptions rather than knowledge of needs and demands.

The planning and implementation of any workforce structure would necessitate consultations with and recognition of all the stakeholders.

#### **7.1 The public**

##### **7.1.1 Socio-demographic trends**

The present annual population growth of South Africa of approximately 2,5 per cent and rapid urbanisation are expected to increase the social and health problems which have already become a major concern to health planners

(391, 463, 464). It is believed that despite major demographic shifts, a significant rural population will be retained which will tax the country's health care resources further beyond their limits (39, 463). The growth of the population will lead to an increased competition for scarce financial resources in the fields of housing, education, health services, social and economic infrastructure.

Next to rapid urbanisation, the high unemployment rate will even have a greater impact on the affordability of health services. The socio-economic status of a country has a direct impact on the potential resources available for health services (463, 464). Approximately 80 per cent of the country's wealth is in the hands of only 5 per cent of the population, compared with 54 per cent in the United Kingdom and 44 per cent in the United States (464).

The implication of unemployment and scarcity of resources point toward increasing privatisation. Focus will be more on the provision of dentures through private dentists and alternative private providers such as denturists because the public sector is unlikely to have adequate resources to finance auxiliaries.

#### **7.1.2 Oral health status and changing disease patterns**

Approximately 60 to 80 per cent of all children are infected with dental caries, involving between 25 and 50 per cent of all their teeth (465).

Adults in the Western Cape have the highest caries rates and the highest rates of tooth loss in the country, to such an extent that Cape Town has

become known as the tooth loss capital of the country (465). The high prevalence rate of advanced tooth decay and tooth loss has the potential to translate into a massive future demand for dentures. Neither a public dental service nor any private financing scheme can afford the high cost associated with denture care. The Task Group on Western Cape oral health priorities stated that the public dental services have a preoccupation with tooth removal and replacement instead of prevention of oral disease and oral health promotion (465).

The high prevalence of dental caries and tooth loss is likely to increase under conditions of poverty, increasing urbanisation and a low level of dental awareness. Such a trend cannot be afforded and can only be reduced by increasing the focus on preventive dentistry.

On the other hand the prevalence of oral disease may decline due to the increasing use of fluoride, dental health education, preventive dentistry and the development of special dental services and technology. The increased level of patient understanding of his/her own dental needs, has also contributed significantly to deterring oral disease and reducing the loss of teeth and supporting structures.

### **7.1.3 Needs and demands**

The needs and demands of the population in the Western Cape Province can be classified into two groups namely those with a developing world pattern of disease and demand and, secondly, those who fall within a developed world pattern of disease and demand. Any system will have to recognise the needs

and demands of the two groups and will have to be sufficiently flexible to accommodate a large section of the community in transition to the developed world category (39).

The high cost of dental care and the inability to obtain care under conditions acceptable to the public have resulted in an apathy towards the seeking of dental care and the promotion of oral health.

Most individuals needing dentures are from lower socioeconomic groups who cannot afford dentures in the private sector, or are resident in areas where there are no formal denture services (private or public). On the other hand, it is highly unlikely that the public sector, irrespective of the type of financing system that is implemented, will be able to absorb the demand for dentures because resources needed to fund such a service are very limited and because denture services have to compete with a magnitude of other priorities for scarce resources.

The direct implication of the latter is that people will seek alternative providers for their denture needs.

Based on the latter argument, there is clearly an argument for alternative providers who can provide dentures at a reduced cost to the public. If this gap is not filled, individuals will continuously seek care from illegitimate backdoor providers.

#### **7.1.4 Affordability of dentures**

In the private sector individuals' needs and ability to pay determine access to benefits. On the other hand, benefits in the public sector are determined by an individuals' needs and the availability of resources to provide such care.

The clinical fees for of a full upper and lower denture (complete set of dentures) in the private sector, according to the scale of benefits as recommended by the Representative Association of Medical Schemes (RAMS) (558) is R635.00. The laboratory fees for a complete set of dentures is approximately R875.00. Therefore the total cost of a complete full upper and lower denture, based on the RAMS tariffs, is approximately R1510. The cost of a full upper or full lower denture only is currently approximately R950 (clinical fees = R400 and laboratory fees R550).

Based on the national scale of benefits recommended by the Dental Association, the fee for a full upper and lower denture is approximately R2750 (laboratory fees included).

The private health sector (including medical aid schemes and health insurance) caters for the health care needs of less than 25 per cent of the population (466). According to the Registrar of Medical Schemes, approximately 80 per cent of whites, 40 per cent of Asians, 36 per cent of coloureds and 6 per cent of blacks have coverage by medical schemes (467). With such an imbalance it is evident that dentures would be out of reach for the majority of the population in the private sector.

In a two tier model of funding of for prosthetic care it is evident that the majority of people needing dentures would not have access to such care because they would not be in a position to afford care in the private sector. Although people are able to afford dentures provided in the public sector, resources are inadequate to provide for all the prosthetic needs of the indigent population.

To make dentures more available, cost-effective ways of providing dentures in the public sector will have to be found. The utilisation of denturists in the private sector can also play a significant role in making dentures more available at an affordable price.

According to Rossouw (468) 75 per cent of the population is dependent on the state for care. The greatest potential demand for dentures by state dependent individuals will mainly come from the coloured and the elderly people.

Owing to a lack of resources and the increasing number of social needs in our developing population, government is forced to place priorities on the allocation of its limited resources. Therefore, owing to the high costs involved with providing a denture service, it is unlikely that denture care will feature as a priority in any state funded health care delivery system.

#### **7.1.5 Availability and accessibility of denture services**

It is inconceivable that with the largely unmet health care needs and inadequate resources dentures will be included in a basic package of services that will be available to all. Diagnostic, emergency, preventive and basic

restorative services will receive preference over dentures for inclusion in a basic service package. Access to dentures will therefore be based on affordability rather than needs-based, irrespective of the type of financing or delivery system used.

Free dentures to all is also an inconceivable concept for the simple reason that resources are limited and dentures are not considered a priority compared with all the other social and economic needs of our developing society.

Dentures will largely remain unavailable to state dependent patients because the state does not have the resources to provide for such expensive replacement services. The state also does not have the human and financial resources to provide dentures in rural and under-served areas. Dentures are most likely to feature as a low priority service in any state owned or financed health care delivery system, thus making dentures less available to state dependent patients.

#### **7.1.6 Quality of care**

As in the past, dental auxiliary services are likely to be perceived as inferior because of the load on the public dental services, the fact that auxiliaries are limited by regulation in their scope of treatment and because dentists are more highly trained than dental therapists (469).

Low-income groups will increasingly seek dentures from alternative providers irrespective of the quality of denture they receive.

The public, however, also has every right to expect that its health professionals will keep themselves well informed and up-to-date with the latest scientific and technological developments. Therefore some mention of opportunities for continuing education is relevant to ensure that appropriate standards of care are maintained.

#### **7.1.7 Health risk**

Successful partial denture prosthodontics requires an in-depth knowledge of all aspects of dentistry. The potential for causing harm to oral tissues, general health hazards and technical difficulties are far greater with partial dentures than with full dentures. Furthermore, the need to render a mouth healthy prior to partial denture construction and then maintain it preventively afterwards implies the availability of a continuum of care that only a dentist can provide (470).

It is perceived by dentists that the entry of insufficiently skilled personnel into a highly complicated field, such as the provision of partial dentures, will inevitably impose upon members of the public much additional expense and suffering in order to rectify the damage caused by poor clinical judgement and faulty technique (470).

#### **7.1.8 Providers choice**

Subjects chose a denturist based first on price and second on recommendation by friends or relatives, whilst dentists are selected based first on recommendation and second on previous use of their services (471).

Friederichsen and co-workers (471) also reported that advertising played a more significant role for denturists than it did for dentists. Garfunkel (472) reported that the public is dangerously ignorant about the meaning of the word “denturist” and that the term “denturist” is misleading, since it seems to suggest “a dentist specialised in making dentures”. The term “clinical dental technologist” seems to be more appropriate and less misleading.

## **7.2 Dentists**

### **7.2.1 Distribution of providers**

In South Africa today, there are essentially two parallel oral health care delivery systems namely the private and public sector. The two systems have practically no interaction between them.

According to Price (469), only approximately 25 per cent of the population receive dental care through the private sector, compared to the 75 per cent of the population dependent on public services for their dental care.

There are currently four legitimate provider categories that provide oral health services namely specialists, dentists, dental therapists and oral hygienists. Only dentists and specialists are permitted to provide removable prostheses directly to the public. So-called backdoor providers also provide dentures illegitimately on a wide scale in the informal sector.

Although South Africa has a relatively large and highly trained oral health care workforce, its effectiveness is limited by a marked maldistribution in favour of

affluent urban communities (39, 465). Access and availability are generally limited in rural areas.

Public dental services in the Western Cape are provided by 61 dentists at 135 different locations, whilst up to 700 dentists are found in the private sector (465). In total there are 761 dentists and 217 dental technicians practicing in the Western Cape Province. More than 80 per cent of the total oral health care work force, including dental technicians, work in the metropolitan area. Of the 61 dentists in the public sector 50 (82%) are employed full-time, 4 dentists are appointed on a session basis and seven dentists are private practitioners are contracted on a part-time basis (473). The majority of public health dentists (64%) are servicing clinics in the Cape Metropolitan area primarily because the largest sector of the population is located in this area.

Currently there is only one state owned dental laboratory that provides removable prostheses in the Western Cape Province. The laboratory is situated at the Good Hope Clinic in Cape Town. Most prosthetic services are therefore contracted to dental laboratories in the private sector.

Where public services are not available, such as in rural areas, private dentists may provide services on a contractual basis on behalf of the state on a fee per item basis.

Because public health dentists derive their income from the state they are closely tied in to regulations and requirements of the public sector. Place of work and type of treatment provided are generally determined by policy requirements and the availability of resources.

Private providers on the other hand, are exemplified by the dentists in private practice in South Africa, are self-employed, autonomous and generate income from the services they provide. Private dentists have the freedom to choose where they want to work, who they want to treat and what fees they want to charge. Dentists can also be employed in the industrial sector to provide care for employees of a specific sector or firm.

Private dental health care is often said to lead to gross inequality in access, firstly because the poor cannot afford private providers and secondly because dental practitioners distribute themselves geographically according to market forces (469).

The maldistribution of dentists in favour of urban populations is evident considering that the dentist to population ratio in the Cape Metropolitan area is 1:3546 compared with the dentist to population ratios of 1:9742 in the Boland / Overberg, 1:7444 in the West Coast and 1:6736 in the South Cape / Karoo health regions.

Dental therapists are legally not permitted to provide dentures to the public and no expanded duty dental auxiliaries exist for the provision of dentures in South Africa. Furthermore, there are only two dental therapists in the Western Cape Province who are both employed by the State.

At present it is perceived that private practising dentists' are over-supplied while dental auxiliaries are under-supplied (468). According to the Strategic Management Team (SMT) Task Group (465) the cost effectiveness, morale and productivity in public clinics are at a low level and inadequate use is made of auxiliary oral health workers.

It can therefore be deduced that providers, especially in the public sector and in rural areas, are totally inadequate to supply the denture needs and demands of the indigent population.

### **7.2.2 Economic viability**

The demand for dentures in the private sector may show a declining trend as a result of decreasing dental caries prevalence and loss of teeth and/or the unaffordability of dentures. Some dentists, especially those who have established practices that primarily focus on extracting and replacing teeth, will find that their livelihood will increasingly be influenced by a decline in denture demands and especially if alternative providers such as denturists or dental therapists are permitted to provide dentures to the public, therefore further eroding the dentists' scope of practice. The economic viability of marginal private practices, especially in rural or over-supplied areas, may become threatened if edentulousness levels decrease and the demand for dentures decline.

Furthermore, the duplication of one service, i.e. supply of dentures, could force the disappearance of other necessary dental services. A denturist or a dental therapist could not perform these other services, either professionally or legally.

Current demand levels also indicate that there is considerable excess capacity within the dental work force contributing to a decreasing economic viability of practices in the dental profession. This is most evident in the fields

of restorative dentistry and removable prostheses where dramatic advances against dental caries are reducing both need and demand. The argument is raised whether there is any economic justification for allowing more funds to train technicians who will become redundant in a diminishing market of patient clients.

### **7.2.3 Role relationships**

There are traditional role relationships and expectations among members of the dental profession, e.g. dentists and auxiliaries and dentists and dental technicians, which should receive serious consideration. Douglass and Lipscomb (461) have reported that the apparent reluctance of dentists to accept new auxiliaries is an important factor affecting productivity.

Furthermore, relationships between oral health workers are changing from the traditional hierarchical structured health team approach led by dentists to a more independent arrangement between dentists and auxiliaries or para-professional group (474). On the one hand, dentists are finding it increasingly difficult to employ auxiliary personnel, primarily for economic reasons, whilst on the other hand auxiliaries (i.e. dental therapists and dental technicians) are seeking greater independence so that they may practise independently without the supervision of a dentist.

The legalisation of denturism may also cause further deterioration between dentists and dental technicians, which may not be in the best interests of the patient.

#### **7.2.4 Organisational barriers**

The private sector is currently facing a cost escalation crisis and is thus undergoing quite radical restructuring facilitated by amendments to the Medical Schemes Act. This restructuring will allow the medical aid schemes to play a much greater role in containing the costs of dental care through the following (469):

- (i) Negotiating discounts with dentists.
- (ii) Advising patients to use preferred providers who may be dental auxiliaries or dentists who generate fewer costs in terms of laboratory services and materials.
- (iii) Requiring authorisation for high cost procedures such as dentures.
- (iv) Employing dentists or preferred providers directly who provide the most cost-effective service.
- (v) Establishing contracts with dental care providers who would then be paid largely on a capitation basis.
- (vi) Medical schemes may even set up their own laboratories or have contracts with laboratories which practise economies of scale in order to bring down the cost of private dental care.

#### **7.2.5 Legal obligations**

The question of professional indemnity arises and along with it, the question whether dentists are prepared to accept the financial and legal obligations of malpractice by expanded function auxiliaries or denturists who may be

working under their supervision. Denturists, however, prefer to practice independently from the supervision of dentists.

### **7.3 Dental technicians / Denturists**

#### **7.3.1 Cost-effectiveness**

Denturists claim they can provide dentures at approximately 50 per cent less than the clinical fee of the dentists. Therefore a clinical fee of R315, if based on the medical scheme tariff. Added to the clinical fee the laboratory fee of approximately R875 would give a fee of approximately R1200 for a full upper and lower denture. Current legislation does not allow dental technicians to provide or offer discount on their laboratory fees. No studies have previously been conducted to show that denturists are more cost-effective than dentists. The claimed reduction in fees is also not based on scientific evidence.

If denturists had to provide dentures at the abovementioned reduced fee they would be in direct competition with dentist for those patients that are already well-serviced. Patients in the lower income segment of the population would not benefit from such a decrease in the fees of dentures and therefore have no significant impact on the accessibility of dentures by those needing it the most. It can therefore be argued that such a reduction in fees would not justify the introduction of denturists as a new occupational category.

### **7.3.2 Economic viability**

It is not known whether the demand for dentures will be sufficient to make denturism an economically viable profession. A further consideration for denturists is how they were going to deal with the illegitimate provider sector (backdoor providers) who will be their main competitors in the denture market. Those dental technicians who opt to receive clinical training so that they can provide dentures directly to the public will experience a vast improvement to career satisfaction and their future livelihood.

As the need for dentures declines a greater redundancy among dental technicians and denturists could possibly develop.

### **7.3.3 “Grandfather clause”**

If legislation makes provision for a “grandfather clause”, a technician who can prove that he has been providing dentures to the public for a certain period of time will be eligible for registration. A compulsory examination, however, must be taken to show that the applicant is competent and has adequate diagnostic and treatment abilities prior to registering.

The Nuffield Foundation (475) has also recommended that the contribution of dental technicians could be enhanced were they able to receive clinical training.

### **7.3.4 Extending scope of practice**

Further challenges by denturists to the monopoly of dentists in the provision of dental services must be envisaged (476). These could include the

extenuation of the scope of their activities to include partial dentures and orthodontic appliances. The potential for health risk to the public has already been discussed. Extended functions could however, benefit those communities in under-served areas, provided appropriate training and skills development are given.

### **7.3.5 Public and provider acceptance**

Many investigators have reported research on the acceptance of denturists. In general the acceptance by dentists is negative, but acceptance by patients is quite positive (461). If this assumption is true, allowing denturists to work under the supervision of a dentist in the private sector is likely to fail.

### **7.3.6 Affordability**

Dental technicians motivate denturism on the basis that they were able to provide dentures at 50 per cent lower than the fees charged by dentists. If the total cost of a denture provided by a dentist was R1200 (laboratory fees included), then denturists would have to supply dentures at a fee of approximately R600.

Dental technicians reported that they would be able to provide dentures at a cash price of approximately R500 if they could provide dentures directly to the public.

Considering that the largest proportion of the target population needing dentures in the Western Cape Province comprises indigent people who can

only afford a maximum of R250 for a complete denture, this means that it would be difficult for denturists to break into this market sector, or for that purpose, compete with the illegitimate informal sector.

The majority of individuals needing dentures would fall into this income category and will therefore still be left at the mercy of backdoor providers to, meet their denture needs.

### **7.3.7 Safety**

Dentists may persist that a prescription of good oral and general health be required as a prerequisite for the supply of dentures by denturists.

Denturists, however, do not support the latter view as this would still place denturists in a position inferior to the dentists'. Rather, a spirit of professional collaboration and respect is envisaged by dental technicians.

## **7.4 Dental therapists**

### **7.4.1 Cost-effectiveness**

The effect of using dental therapists as EFDA's on cost of care seems to be positive in a public setting and neutral in a private setting, indicating greater cost-effective delivery of care in the public sector (461).

One of the major implications that can be drawn from both public clinic and private practice studies is that organisational and management skills must be applied in the practice setting before the benefits of EFDA will begin to accrue

(461). Basic management skills include appropriate task delegation, supervision, patient scheduling and office and equipment design.

#### **7.4.2 Legal considerations**

The legal procedures for registration and listing the procedures or types of services that auxiliaries may or may not perform are critical when considering the process of implementation of EFDA. Alternatively the dentist is allowed to delegate any procedure he or she selects while retaining responsibility for that procedure. The latter form of legal arrangement would regulate and restrict the use of EFDA's to practice settings that have the highest likelihood of being successful in their implementation.

#### **7.4.3 Education and training**

The legal issue involved in qualifying implies the need for training and education.

The expense of training dental therapists in the fabrication of dentures as well as setting up laboratory facilities and equipment in all public dental clinics does not seem to be a viable option considering the priority given to denture care. A more cost-effective approach would be to contract a private laboratory to do the technical work.

#### **7.4.4 Public and provider acceptance**

Research on the acceptance of dental therapists or EFDA indicates that most dentists support delegating many routine reversible procedures to an

auxiliary, i.e. preventive care (461). Acceptance of EFDA's by the public has been reported to be positive.

Public sector dentists favoured delegation of procedures more than fee-for-service private practitioners (461).

Research has also indicated that patient acceptance is linked to dentists' acceptance, meaning that if dentists are supportive of the auxiliary's role, patient acceptance is rarely noted as a problem (461).

## **7.5 The State**

### **7.5.1 Availability of health care resources**

Only 0,7 per cent of the total State health budget are appropriated for oral health care. Price (469) estimated the expenditure on oral health in the private sector in 1991 at approximately R104 per person, compared with the expenditure of approximately R5 per person in the public sector. Thus according to Price: *"approximately 20 times more is being spent per medical aid beneficiary than per public sector beneficiary"*.

Dentistry enjoys a low priority in the public health budget. The Committee of Dental Deans has stated that it is unlikely that the latter will change substantially in the near future and that *"it will be difficult, if not impossible, to establish equity in the total health budget of the country within the near future"* (39).

The public sector has the responsibility of caring for approximately 75 per cent of the population who do not have the means to afford health services.

It can therefore be deduced from these imbalances that firstly, government resources are very limited and that funds are totally inadequate to finance dentures for those needing such care. If the oral health care expenditure is only R5.00 per person there is merit in questioning the justification on spending more than R1000 on one denture unit per person where the majority of people do not even have access to basic or essential oral health services.

During 1996, 2248 individuals applied for dentures. Only 1692 full upper and/or lower denture units and 581 partial denture units were approved (473). It could not be ascertained how many people received a complete set of dentures (two units). The number of applications and type of dentures demanded have remained constant over the past five years. Many patients could not be accommodated.

Public sources of funding denture care refer to funding by government, usually out of taxes. Patients are also required to pay user fees for denture services.

Three types of tariffs are applicable to state dependent patients categorised by socio-economic status:

Single person		Family unit		Denture Tariff
Income	Assets	Income	Assets	
R11000	R55000	R20,000	R99,000	R118
R11001-R16000	R55001-R77000	R20001-R29000	R99001-R142000	R235
R16001-R23000	R77001-R115000	R29001-R39000	R142001-R192000	R353

The tariffs for state dependent patients exclude laboratory fees, which are subsidised by the state. The real cost of a complete set of dentures for the state can be calculated more realistically by determining the amount the state remunerates a part-time private dentist who is contracted to provide dentures on behalf of the state, which is approximately R950.

No statistics are available on the specific expenditure on dentures. Some estimates on denture expenditures, however, are possible. During 1996, 1692 full upper or lower denture units were provided in the public sector.

At a cost of approximately R702.50 (laboratory fees included) per upper or lower unit this amounts to a total cost of approximately R1, 188,630. The total amount of user fees payable by the applicants would be R73 per unit, giving a total income of R123 516. After deducting the user fees (R123 516) from the total cost (R1,188,630), the remaining figure of R1,065,114 is the approximate expenditure by government on dentures to state dependent patients in the Western Cape Province. The subsidised amount for a single upper or lower denture is therefore approximately R473 per individual. The resources spent on full upper and lower dentures only represent about 4 per cent of the total public health care budget for oral health care in the Western Cape Province (academic hospitals excluded). Spending such a large amount of money per capita on dentures, considering the scarcity of financial resources and the quantity of other needs and priorities cannot be justified on any grounds.

### **7.5.2 Public safety**

The community must have the assurance that all health workers are genuinely knowledgeable and skilful in the areas where they seek to provide expert services. Government, therefore, has the responsibility for maintaining and upgrading the qualification levels of health professionals and the setting of licensing criteria for new classes of health personnel that adequately safeguard the public.

### **7.5.3 Cost-effective utilisation of resources**

The new government is committed to greater equity and greater coverage for dental services. This will require a much more cost-effective mode of dental care delivery, drawing heavily on dental therapists who are paid on a salary basis.

The resources of the state are limited whilst the demands for services are unlimited. The demand for dentures will therefore increasingly contribute to the state burden.

The state is continuously seeking ways of providing services more cost effectively. Obviously, it would be less costly to train and employ a denturist to provide denture services than a dentist. This option is, however, unlikely because the state would not be able to afford to employ a significant number of denturists that would be needed to make an impact on the provision of dentures. Secondly, denturists would prefer to practise in the private sector

owing to better career and financial prospects compared with the public sector. Furthermore, services provided by denturists are very limited in scope because they can only provide dentures and are therefore not considered as a feasible option for the public sector. Training dental therapists to provide dentures seems to be a much more appropriate alternative for the state, because the infrastructure for training / educating dental therapists has already been established, thus requiring no additional costs for setting up training facilities.

Furthermore, dental therapists have the additional advantage that they can provide a comprehensive primary health care service that includes denture care to people where such services are needed most. It should, however, be kept in mind that the state with its limited resources is likely to maintain its policy of giving a low priority to denture care relative to other oral health care services.

The Nuffield Foundation Inquiry into the education and training of personnel auxiliary to dentistry in the United Kingdom has recommended that a more cost-effective oral health service could be provided within the resource constraints by the government if suitably qualified auxiliaries were used in greater numbers (475).

Although expanded dental auxiliary options may incur lower salary costs, this option may still have high set up costs, such as the cost of training auxiliaries and equipping surgeries.

Although water fluoridation is acknowledged world-wide as the most cost-effective method of preventing oral disease, this measure has not yet been implemented by the health authorities. Furthermore, oral health care workers are focused on the more expensive restorative procedures that generate income, rather than preventive care (39).

#### **7.5.4 Organisational and administrative barriers**

The organisational barriers that impede our society from assuring universal access to health care arise from structural deficiencies such as the poor distribution and insufficient numbers of oral health care providers and the failure of government to control the rising costs of health care.

It is believed that any revenue achieved through savings in the rationalisation of apartheid structures is likely to be absorbed in the increased bureaucracy required by affirmative action policies, the proliferation of local authorities and the fact that most civil servants have been guaranteed their jobs (469). Thus, if there are any windfalls, it is most likely that spending will be increased on education, housing and water supplies, all of which are higher priorities than dental care. Denture care will, therefore, remain a very low priority in the public sector for the foreseeable future in the present health care delivery system.

In many places in the public dental services, the lack of supervision and absence of dentists to whom they can refer means that auxiliaries may be expected to undertake work for which they were not adequately trained. Thus,

even the use of more cost-effective auxiliary health personnel requires the employment of dentists to supervise care or act as a referral point.

Public discontent has also resulted, not only from the rising cost of dental care in the private sector, but also out of an alienation from the increasingly complex social arrangements surrounding the provision of oral health care in the public sector (476). For instance, the selection criteria and queuing for dentures in the public sector are both complex and frustrating to the public.

#### **7.5.5 Internal costs**

The internal costs of supporting dental therapists or denturists, which include training costs, salaries and wages, supplies and transportation, data collection and analysis, will create a further burden on the limited resources of the state.

#### **7.5.6 Policy considerations**

Although it is agreed that the demand by state responsible patients for dentures will increase as a result of population development, the supply of dentures by the state enjoys a very low priority (456). The government rates dentures as replacement therapy and therefore considers it a low priority.

#### **7.5.7 Healthcare financing system**

Three systems of financing health care are considered for the purposes of this study. Firstly, continuation of the status quo private/public mix (two-tier

system). Secondly, nationalisation of the private dental sector (socialist model) and thirdly the establishment of a National Health Insurance System (NHIS).

In the two-tier system health care is seen as consumer goods provided by private practitioners and state employees. The public and private sectors would remain separate with those able to afford private dental care doing so, while the rest of the population would receive only what the state could afford. In the private sector payment would take place via direct payment or indirectly through a third party payer such as a medical aid society.

In the public sector oral care is provided through payment of a nominal user fee. Services are primarily funded through tax revenues.

The nationalisation strategy or social service model was particularly popular amongst progressive health worker organisations and the more socialistic political organisations and trade unions prior to 1990 (469). In this model health care embraces state-provided consumer services provided by state employees. Ownership of health care facilities is public and totally controlled through public policy.

According to Price (469) two principal arguments motivated this strategy:

- (i) *“Firstly, the growth of the private sector had undermined the public sector through the brain-drain of dentists from public to private sectors and had resulted in massive inequalities of access which could only be redressed by bringing all dentists back within the public sector.”*

- (ii) *"Secondly, private dental health care was ineffective and extremely costly, that salaries were higher than appropriate for South Africa and that a single integrated national health service could provide dental care for everyone in a more rational way at lower cost."*

In a socialist health care system the state plays a central role in planning organisation and financing of health care and health care is a basic right of each citizen and therefore available and accessible to all on an equal basis.

The implementation of a nationalisation strategy, however, holds serious financial implications for the state that cannot be ignored (469) In a socialist or nationalised health care delivery system, neither of the provider scenarios would be feasible or desirable for the following reasons (469):

- (i) Private dentists and dental technicians would have to be compensated at least for their capital investment in their dental surgeries and laboratories.
- (ii) The state would be committed to employ and take over the salaries of all those dentists and dental technicians.
- (iii) The state would be committed to employing all denture providers, many of whom would not be needed.
- (iv) The running of hundreds of practices and dental laboratories all over the country would create enormous logistical problems.
- (v) Much political damage would be caused by removing from practitioners their right to practise as they have been doing for most of their lives.

- (vi) Also political resistance will be encountered from the 25 per cent of the population who currently use private providers.
- (vii) Denturists would not be able to practise where and how they like but according to the regulations and availability of resources.
- (viii) The 25 per cent of the population who currently use private providers and constitute the most articulate and politically active component of the electorate could exert significant political resistance against such a move.
- (ix) Government can achieve its policy goals through other alternative methods, such as through direct funding or regulation of dental care.

According to Price (469) there are at present no longer any key political stakeholders that defend the nationalisation or social service option.

A NHIS health policy is most likely to exclude dentures from a basic health care package because of the lack of resources to fund such a service.

Because public health dentists' income is derived from the state or a quasi public source, those dentists are closely tied in to the regulation and requirements of the public sector.

Based on the above mentioned, it is evident that the logistical problems of implementing a ban on private practice are enormous and therefore such a strategy is neither feasible nor desirable.

It has become clear that government can achieve its policy goals in ways that do not require nationalisation but merely by substantial control of the financing of dental care, either through direct funding or through regulation (469).

According to Price (469), there are no longer any policy analysts or key political stake holders that defend the nationalisation option.

Ideally, a national health insurance system (NHIS) would cover all members of the population and would be funded partly through contributions by employees and their employers and partly through a government subsidy to the NHIS on behalf of the unemployed. National Health Insurance Systems are not-for-profit medical aid institutions that are either administered through multiple non-government health insurance schemes or through a single government run fund (469).

Membership of the NHIS would be compulsory for all people employed in the formal sector as a way of expanding cover rapidly and reducing the burden on the state for financing the dental care of those who cannot afford to fund it themselves. Everyone would have access to a nationally determined basic package of care which would include dental care up to certain limits and for a certain range of services (469).

The major issue regarding benefits is the conflict between including a comprehensive package of benefits for a smaller targeted population such as the elderly, versus a relatively narrow benefit package for a large eligible population, such as preventive services for everyone

If funding for a basic package of care came from a central national health insurance fund or pool, then dental care would be free at the point of services, irrespective of being provided by private or public dentists and therefore payment would not be an obstacle for the poor.

Due to the high cost of dentures, it seems highly unlikely that dentures would be included in a basic oral health care service package. If this is the case, dentures in the private sector will still be provided to those who can afford dentures and in the public sector denture provision will still be based on the availability of resources.

It is envisaged that even with a NHIS a large sector of the population will remain dependent on the state for funding,

Furthermore, the market forces that contribute to the distribution of private dentists in urban and affluent areas could be countered and even reversed since dentists would be reimbursed for the services they provide regardless of whether or not individuals can pay (469).

## **7.6 Training institutions**

The cost of running an adequate course of training for registered dental technicians would be substantial. The number of individuals in each work force category and the cost of setting up adequate facilities for training are some of the considerations which training institutions have to consider. It is, however, not within the scope of this study to provide an analysis of costs of training alternative denture providers.

It seems appropriate that for a private-based system it would be cost-effective to train denturists to provide dentures. Alternatively, for a public-based system, it would be more cost effective to train dental therapists to provide complete dentures.

Obviously, training dental therapists or denturists in sufficient numbers to make a significant impact on oral health care services available for edentulous patients would require a continuation of these programmes over substantial periods of time. Needless to say, the cost implications of such training programmes on already cast-strapped training institutions will have to be considered.

A well-structured course would have to be modified and lowered in standard as a result of deficiencies in the formal education of most prospective and disadvantaged students.

The provision of dentures may in future become increasingly restricted to elderly persons who may have concomitant geriatric problems. These problems require identification and diagnosis by fully trained dental practitioners.

If denturists and dental therapists are going to be involved with the provision of dentures, they will have to receive adequate training in geriatric dentistry to be able to cope satisfactorily with elderly patients.

## **7.7 Representative Association for Medical Schemes**

If denturism were legalised, medical aid schemes will have to deal with the lower fee structures for denturists. Obviously it would not be fair to have a separate fee structure for dentists and denturists for the same product. Dentists would argue that their fees are justifiably based on their superior education compared to that of denturists'. Denturists, on the other hand, claim that their education and training makes them experts in removable prostheses and they can therefore command an equal fee to that asked by dentists.

Dental technicians, however, have motivated denturism by claiming that they will be able to charge a reduced fee compared to the fee charged by dentists for dentures. The logical approach for medical aid schemes would be to adopt the lower fees of denturists in their recommended scale of benefits to show commitment to making dentures more affordable.

Such a reduction of fees for removable prostheses would obviously be a disadvantage for dentists and have a considerable impact on their income. From a moral point of view, however, the interests of the patient come first and foremost.

Dentists can, however, adopt the national schedule of recommended fees, or any other fee structure for their denture services, if patients prefer to have their dentures made by their dentists. The medical aid scheme will then have to make a decision on whether to pay the benefits accepted for denturists or accept differential fees for the provision of dentures depending on the skills required to provide dentures.

## **7.8 Backdoor providers**

Although illegitimate, backdoor providers have obviously established themselves as significant providers and render an essential and affordable denture service outside the health care system. Backdoor providers mostly supply dentures in under-served areas, to people who cannot afford dentures in the private sector, or to those who cannot gain access to dentures in the public sector.

Overall, the public has benefited from this low-cost denture service (± R200 for a full upper and lower denture) even if the quality thereof is poor. It can be expected that without any training and appropriate facilities to practice in, dentures supplied by backdoor providers will remain of a poor standard and quality.

Backdoor providers will remain significant providers of dentures to low income groups in the foreseeable future or where formal services are not available. This service, although illegitimate, will have to be dealt with in the future. If this service is completely eliminated, will it be in the public's best interests or can it be replaced by a denture service of equal accessibility and affordability than that of backdoor providers? Alternatively, how can backdoor providers be recognised or utilised in any future oral health care delivery system?

Issues that need to be considered in this respect are whether their status quo should be maintained, how such practices can be eliminated and controlled,

## **CHAPTER EIGHT**

### **ETHICAL CONSIDERATIONS AND PROSTHETIC ORAL**

#### **HEALTH CARE**

Answers to issues such as: (i) is denture care a priority? (ii) should denture care be included in a basic oral health care package? and (iii) is denture care a health or social issue?

These issues require some ethical/moral discussion because there are no generally agreed upon societal values on which decisions can be based. Values often conflict, making it difficult or impossible to compare and weigh multiple conflicting goals and objectives. Policy makers also tend to maximise their own values and are not motivated to act on the basis of societal preferences. In maximising their own values policy makers satisfy immediate demands for a solution, rather than compare and weigh the consequences of a large range of policy alternatives (477).

#### **8.1 Resource allocation decisions**

Making choices about appropriate health care systems is complex because such decisions bear on life and death issues. Issues relating to oral health care, however, do not have quite the same urgency.

Different levels of investment in health care and different apportionment to health care budgets have implications not only for morbidity and mortality rates, but also for the character and quality of living and dying. Extrapolated to oral health care, morbidity equals tooth decay whereas mortality equates tooth loss.

The character and quality of living in the oral health situation may be interpreted as preventive and restorative care, whilst the character and quality of "dying" in relation to oral health may be interpreted as edentulousness or replacement of teeth with removable or fixed prosthesis.

Resource allocation decisions are primarily made at three levels:

- (i) Macro-level decisions - allocation of resources at central or regional level between various services, i.e. housing, education, health care, infrastructure, security, etc.
- (ii) Meso-level decisions - allocation of resources within a specific service, i.e. apportionment of the health care budget between clinical care, training of health personnel, research and prevention.
- (iii) Micro-level decisions - allocation of resources at patient level, i.e. apportionment of resources between emergency, preventive, restorative, replacement and specialised care.

These levels interact. The more one restricts the amount of funds allocated for health care at the macro-level, the more one will need to set policies on the micro-allocation level.

Health care allocations are best made in terms of an insurance metaphor (478). A particular health care system may insure its people against the untoward results of the natural and social lotteries (i.e. the poor do not have the financial resources to access essential oral health care). Because there are other untoward circumstances besides disease and disability against which society may wish to prepare (e.g. social development, policing, education, housing) and because our resources are limited, we must settle on a finite apportionment of funds to the health care system. Individuals and society cannot protect themselves against all the risks to which they were likely to be exposed and must choose to protect themselves against only some of them (479).

In a welfare society, for example, it has been asserted that a just distribution will occur when a balance can be struck between individual and collective responsibility, as well as between individual and communal solidarity (480). This balance is frequently lost when individuals have unrealistic expectations about what a welfare state would provide. Schuyt (480) cites the Netherlands as an example where unrealistic expectations grew far beyond the original purposes of the welfare state:

- (i) *"the original struggle against injustice turned into expectations of a fully just society;*
- (ii) *the struggle against disease and poverty turned into expectations of a totally healthy life and of riches for all;*
- (iii) *the struggle against lack of well-being became the need for optimal well-being;*

*(iv) the struggle against lack of self-esteem turned into deciding for others what self-esteem should mean."*

Schuyt (480) emphasised that collective care must be prevented from leading inevitably to the dominance of the state's responsibility and to the neglect of individual responsibility. This view is particularly relevant to denture care. If people do not neglect their teeth and take responsibility for their oral health, dental caries will diminish and tooth loss and the demand for dentures will decline.

The problem of health care resource distribution at meso-level, where for instance decisions have to be made about allocation of resources for the training and education of appropriate oral health care personnel, can be approached by using the principles of utilitarianism and of distributive justice (481). Based on the utilitarian approach, the health care goals of life prolongation (maintaining teeth) and improvement of quality of life can be justified by placing priorities on diseases which occur frequently, appear early in life and which can be treated successfully (482):

The above mentioned priorities clearly point towards focusing on the prevention and treatment of dental caries as the principal oral health care priority for resource allocation. Dental caries is also the most prevalent of all diseases and it is primarily a disease of childhood.

However, Dutch economists have pointed out that, as a result of the utilitarian approach, little attention is being paid to the handicapped, the elderly and the poor. They consider these omissions unethical and, therefore, plead for the egalitarian approach as the alternative principle for distributive justice (483).

There are three criteria for the application of the egalitarian principle of justice: (i) the individual's rights (ii) his merits (iii) his needs (482). Based on the application of the latter criteria, the highest priority goes to disease which, if left untreated, would lead to the worst possible state of life. Furthermore, the highest health care priorities would be those diseases or conditions that are life threatening rather than quality of life-threatening diseases or conditions. Edentulousness can only be considered as a "quality of life threatening" condition and can therefore not be considered as a high priority in any public health care resource allocation decision.

Limit setting or resource allocation decisions always raise ethical questions. Too much care as well as too little may represent the unethical practice of health care. It is recommended that the principles of human dignity and autonomy as well as solidarity and equity be followed for moral decision making regarding resource allocations in public health (482):

The first two principles speak for the human requirement in dentistry allowing determination of the minimum that must be defined when health care and dentistry suffer budget cuts.

Solidarity and equity, on the other hand, relate to decisions about health care cost coverage. Solidarity points to the responsibility of the group, to a collective duty of care for the common good (482). Policy makers, who organise the common good, thus have the right to impose the sharing of this duty as a burden on all. An example of the latter principle applied to the real life situation would be the implementation of a NHIS in which those who are employed and earn an income subsidise a basic health care package for all. As for equality, the Working Group believed that in general the health services covered must be equally accessible to all in the strict egalitarian sense of "none should be helped if not all can be helped." (482). The principle is especially appropriate in relation to the supply of costly dentures to a population which pose finite demands in the face of limited resources. It can therefore be concluded that denture services are not a high priority.

## 8.2 Conflicting values

Health care policy tends to involve four incompatible goals called the 'desiderata of an ideal health care system' (479) namely:

- (i) All should receive the best care (quality).
- (ii) There should be more equality in health care (equality).
- (iii) The costs of health care should be contained (cost containment).
- (iv) It is good to maintain consumer and provider choice (autonomy).

Best care and cost containment cannot both be pursued without losing at least marginal benefits from the health care foregone in the pursuit of cost savings. Similarly one cannot achieve equality in the distribution of health care, while one allows patients and doctors freely to contract for services. Patients with more resources will contract for more and better care. Cost containment and autonomy may also conflict with each other. If one attempts to curtail health costs, one may come to intrude into free agreements between patients and their providers. Engelhardt (479) states that: "*one cannot have the best of health care for all at an expensive price while retaining the freedom of all the parties involved.*"

A more appropriate response is that we should not provide the best of care for all, but only minimally decent care (basic care) or adequate care (479). In this model all individuals are provided with some level of care.

Because of the high cost of denture care and the arguments raised above, it is inconceivable that dentures will be included in a basic oral health care package.

### **8.3 The limits of health care**

In any resource allocation decision, taking cognisance of the limits of health care is an important criterion. Five types of limits to health care have been distinguished (482). Firstly, the determination of what does and what does not belong to health care e.g. when is health care no longer medical care but rather a social service. Secondly, what is ethically permissible or necessary?

The area between the upper limit of optimal care to be aimed at and the minimum of health care that is due to all e.g. in questions of maintaining teeth or providing dentures with seemingly no benefit. Thirdly, the determination of what is or is not effective therapy. Fourthly, what can and cannot be done financially (what is attainable). Additional problems arise when expensive treatment of one patient means that others may be denied their less expensive therapy. Finally, the extent to which state authorities intervening in matters of health care also place limits to health care resource allocation decisions. The objective here is to identify policy issues such as quality, control, accessibility and financial coverage.

Based on the above mentioned criteria the following issues related to denture care need to be considered when resource allocation decisions are made:

- (i) Denture care seems to be a social service rather than medical care
- (ii) People can function effectively without dentures.
- (iii) Preventive care is more cost-effective than replacement therapy (dentures).
- (iv) Denture care is an expensive treatment that may deny others less expensive and more essential therapy.
- (v) The primary role of the state is to intervene with quality control (illicit practice), accessibility (distribution of providers) and affordability (financial coverage).

The underlying assumption of all five points is that budget cuts are necessary because of a lack of funds. From these principles it can therefore be

deducted that dentures would not be considered as a priority for resource allocation.

#### **8.4 The right to health care**

Health care rights are limited by availability. According to De Wachter (482) *“The right to health care is a social right, which entitles citizens to share in services to the extent that they were available: scarcity of resources, therefore, reduces the social right to care.”* On the other hand, Wachter (482) has stated that the right to health care is also an individual right, which does not fluctuate with available resources.

Government policies should focus on three specific aspects of the right to health care. Firstly, competence or quality controls that seeks to assure equal levels of health care provision throughout the country. Secondly, territorial accessibility, and thirdly, financial accessibility which concerns the role of government regarding social justice and the distribution of health care through such mechanisms as health insurance (482).

Access to an affordable basic oral health care package for all, which include disease prevention, health promotion and basic restorative care, will reduce dental caries and loss of teeth and therefore reduce the need for allocation of scarce resources to denture care.

## **CHAPTER NINE**

### **CONSIDERED JUDGEMENT OF OTHERS REGARDING DENTURISM**

#### **9.1 Professional rights**

Professional dental association's world-wide has unanimously opposed attempts by dental technicians to perform functions reserved for dentists. Dentists claim that they have exclusive rights to provide dentures.

Dentists have argued that by virtue of being a part of a learned profession they have the responsibility for the overall maintenance of oral health and for protecting the health and well-being of the public (484).

Denturists, on the other hand, argue that the dental profession does not have an exclusive right to provide dentures owing to the knowledge they possess as a learned profession. The "learned professions", i.e. medicine and dentistry, over the centuries have been considered as apart from the "crafts" or "trades" within the marketplace. The two most important characteristics of the "learned professions" are that it is based on an exceptionally large body of knowledge on which to provide quality of care and secondly that it has an obligation to serve the public above and beyond mere financial reward " (488).

Many types of people from automobile mechanics to airline pilots, all of whom are responsible for safeguarding person's lives, have access to extensive knowledge and the responsibility to use it correctly with the aim of benefiting and serving the consumer the best. Most denturists entering the profession are now required to receive appropriate education and training, which includes amongst others, general anatomy and physiology, oro-facial anatomy, microbiology, oral pathology and medicine, psychology and preventive dentistry. Such training will allow denturists to diagnose conditions in the oral environment and to deal with complex oral problems (485).

The dental profession is not unique in trying to maintain an exclusive right to practise within circumscribed limits. Examples of professional encroachment in the health profession can be seen in the historical development of podiatrists, optometrists and clinical psychologists (51, 486, 487). Nurse practitioners are also lobbying for the right to set up independent practice. Lawyers have also sought to limit the activities of paralegal aide's (51).

The exclusive right to learning by the "learned professions" has accordingly become a thing of the past (488, 489).

Denturists have claimed that dental licensing laws have given harmful and wasteful monopolistic control of the 'dental prosthetic industry' to the dentist and thus contravene the principles of free enterprise (490). Consumers should have the freedom of choice regarding where they choose to obtain their dentures. The public therefore should have the right to deal directly with

the people making the dentures. Dental technicians, likewise, should have the right to conduct a service for the public without restraint.

Denturists also claim a right to self-determination. Self-determination means different things to different people. To some it means the right to operate a practice one-to-one with the dentist or customer without outside or internal interference. To others, it means setting standards to promote fair competition in business. Another section believes that greater status can be achieved through self-determination (491). Greater status, according to Wicklund (491), is not conferred by legislation or rights but is something one earns.

## **9.2 Biological and health risk considerations**

Organised dentistry has sought to prevent the establishment of denturism on the grounds that members of such groups are not adequately trained and, therefore, represent a threat to the health and safety of the public (51). Dentists further base their argument on the fact that denturists view dentures as merely products in isolation from an individual's oral and general health. Because dentures interact intimately with the oral tissues and masticatory apparatus, dentists have claimed that dentures provided by denturists could thus greatly affect a person's health or quality of life (492).

The provision of dentures cannot be viewed in isolation from the care of the total oral and general health of patients because placement of dentures may have a significantly beneficial or harmful effect on the remaining teeth, gums,

oral mucous membrane and the whole of the masticatory apparatus (493). The oral soft tissues are composed of unkeratinized epithelium, which may be injured from the wearing of poorly fitting dentures. Shafer (494) have categorised these injuries specifically as: traumatic ulcer; generalised inflammation, inflammatory hyperplasia; papillary hyperplasia of the palate and denture base intolerance or allergy.

MacEntee (495) found in his study that oral health was not a prominent concern amongst the denture wearing elderly. In his study he also concluded that complete denture services provided by denturists were not a serious threat to oral health.

Another factor that has been receiving more emphasis in arguments against denturism is that patients are living longer and often present oral manifestations and medical complications that are associated with the ageing process (93, 496).

In Western Australia, a survey has shown that 30 to 40 per cent of denture wearers have oral conditions requiring identification and diagnosis by a professionally trained person (93). In South Africa, a radiographic survey of edentulous jaws showed that 46 per cent of patients without teeth had some previously undetected disease process of the jaws (497).

Dentists claim that denturists are not trained adequately to diagnose diseases of the oral cavity and oral manifestations of systemic conditions that occur in the elderly. The public is therefore jeopardising its health by placing itself in

the hands of unskilled persons who are not trained in the health sciences or the prevention, diagnosis and treatment of oral disorders (78, 92, 93). Dentists have argued that conditions associated with the elderly demand special diagnostic skills, therefore the health of the public is best protected by having dentists who are appropriately trained to assess the total oral health needs and provide comprehensive oral health care.

One study has demonstrated that there was a greater incidence of oral cancer amongst males who persisted with old and, presumably, poorly fitting dentures (498). Another study has also shown that badly finished edges of dentures and unsuitable denture bearing areas are a major cause of oral cancer (499). Evidence was presented to the Australian Dental Association of cases where inadequately trained dental technicians fitted dentures over existing oral cancers, thereby placing the lives of the patients in jeopardy (93). According to MacEntee (500) dentists have behaved irrationally to the challenge of denturists, accusing denturists of "treating patients with no regard for health and with no understanding of disease." MacEntee (500) has stated that although the last point may be true, dentists have been unable to produce the predicted "rash of dentures made on carcinomas by denturists".

Telivuo (501) has also reported that denturists do not adhere to the restrictions of regulatory boards as stipulated and has provided evidence that dentures are produced while disease present in the mouth is ignored.

In the past and also recently, denturists have made demands for expanding their activities into the realm of providing a partial removable prosthodontic service directly for the public.

Placement of partial dentures is a risk to the public and a serious concern to the dental profession because "human behaviour and the virulence of oral pathogens often combine to convert even a simple denture into a destructive entity. Placing removable partial dentures can exacerbate and increase the risk of dental and periodontal disease (60, 502, 503).

Research has indicated that a removable partial denture doubled the risk of caries for the remaining teeth in the mouth (504). One study showed that dental caries was found on 75 per cent of teeth, not crowned by a dentist, that were in direct contact with dentures (505).

Research indicates that the long-term effects of partial dentures on the development and progress of periodontal disease are unpredictable because partial dentures contribute substantially to the deposition, retention and quality of plaque on teeth (506, 507, 508). Furthermore, damage to the supporting tissue of teeth can occur without any signs or discomfort (503, 509, 510). Inflammatory responses of the oral mucosa underlying partial dentures, with or without ulceration, are not uncommon. Microbial infection, obstruction of mucosal glands and allergy to base materials have been suggested as probable causes (511).

According to MacEntee (112) *"it is this dilemma that undermines the best efforts of the dental profession and lends credibility to the claim that dentures made by dentists are no more or no less successful than the dentures made by technicians or denturists"*.

MacEntee (503) emphasises that a practical understanding of oral physiology, biomechanics, microbiology, pathology, pharmaco-therapeutics and psychotherapy, combined with appropriate application of biomaterials, precision attachments, implants and surgical modification of the supporting natural teeth and of the surrounding gingival tissues, allow the dentist to make an accurate assessment and diagnosis of the problem, to control disease and to use the removable partial denture beneficially in mouths where there are few natural teeth.

Carefully planned treatment also requires familiarity with alternative methods of replacing teeth and an ability to provide the complete range of fixed and removable prosthodontic treatment modalities (503).

MacEntee (503) has stated that the therapeutic benefits of removable partial dentures "will not be achieved by allowing others with less than accredited dental education to misuse it as an intimate mechanical appliance around weak teeth supported by unhealthy tissues. The goal of prosthodontic treatment, especially when it involves natural teeth or implants, should achieve the perpetual preservation of what remains rather than the meticulous restoration of what is missing" (513). MacEntee (503), who did extensive research on the subject of denturism, has stated that claims of clinical success with partial dentures made by denturists are unfounded and that there is no evidence to support the view that denturists can make partial dentures as effectively and more cheaply than dentists.

In Finland, denturists are not legally permitted to provide partial dentures. However, Laine and Murtomaa (514), have shown that almost one-fourth of all partial dentures in Finland were provided illegally by dental technicians or denturists without any complaints from the public.

According to the American Dental Association (490) the greatest fiasco of the denturist legislation in Canada was the "certificate of oral health" signed by a dentist or physician that had to be presented to the denturist before denture fabrication was started. The certificate provided no protection for the public because physicians signed 75 per cent of certificates received by denturists. Although physicians are trained to diagnose soft tissue abnormalities, they generally know little about the physical and pathological attributes influencing the construction of a denture (487).

Dentists are trained in oral pathology and diagnosis to detect whether the patient has any abnormality or underlying systemic condition that could potentially compromise the oral tissues, or necessitate special treatment (49). The education of the dentists prepares them to deal with these complex oral rehabilitation problems (60).

It is true that without proper biological training, dental technicians cannot be expected to diagnose any oral condition. However, most denturists entering the profession are now required to receive appropriate education and training, which includes among others, general anatomy and physiology, oro-facial anatomy, microbiology, oral pathology and medicine, psychology and preventive dentistry. Such training has equipped the denturists to diagnose

conditions in the oral environment and to deal with complex oral problems (515). Studies have, however, shown that denture services provided by denturists were not a serious threat to oral health (495).

The Liddell report (516) provided evidence that supports the view that patients are more satisfied with dentures that were provided by denturists and that more complaints were received from patients who had their dentures made by dentists.

The argument has also been made that if denturists practise independently, there would be inadequate control of their work and that unfamiliarity with sterilisation techniques and infection control would increase the incidence of communicable disease such as hepatitis (517). In response to dentists' statements regarding infection control, denturists have stated that the equipment necessary to destroy and control infectious disease is as available to denturists as it is to dentists (487).

### **9.3 Training, skills and quality of care**

Dentures have to function in harmony with bones, joints, muscles and other tissues in the oral environment. Any person who has the responsibility of providing a denture service must understand the anatomy, physiology and pathology of the oral tissue and the masticatory system (76).

Dentists have argued that the patient has the right to be seen by a person with the necessary clinical training and skills to understand the full

implications of their patients' clinical condition and to be able to propose an appropriate treatment plan (75, 76). Any move therefore, to allow independent practice without adequate training must result in a service of an unacceptably low standard. Governing bodies have always recognised this need by maintaining or upgrading the qualification levels of health professionals in order to adequately safeguard the public (76).

Dentists argue that because of the wide range of treatment modalities and advanced dental technology available today, such as osseo-integrated implants, ridge augmentation and precision attachments, treatment has reached a stage of sophistication that requires skills far beyond those which a community college course or apprenticeship can provide (60, 496).

With increasing life expectancy providers will have to deal more with degenerative changes in bone and soft tissue, the decreasing ability to adapt to new dentures in the elderly. A number of studies have also reported that the elderly often present with oral manifestations and systemic conditions which denturists are not adequately trained to diagnose, prevent and treat (496, 497, 518, 519, 520). Providing dentures to the elderly will therefore require an even wider range of skills, knowledge and training (75, 76).

The dental profession has argued that it has taken almost a hundred years of effort to raise the standards and quality of dental practice to a professional level based on knowledge and understanding of the biological and health sciences (76). Therefore, giving people who have no scientific and biological

training the right to practice independently would be a negation of all these efforts.

MacEntee (500) believes that denturists should not be allowed to provide removable partial dentures, over-dentures or implant supported dentures unless they are suitably educated.

Denturists, however, view themselves as denture specialists based on the training they receive (490). In Canada, it is reported that the denturists' training in removable dentures covers approximately 2000 hours as opposed to students of dentistry who spend approximately 75 to 100 hours in the same subject area (521). It is also reported that denturist students treat up to 25 times as many denture patients than dental students do (522).

The survey of the Dental Laboratory Association in the U.K. concluded from its survey that the average dentist does not possess the denture related skills any more than a properly trained denturist would or, if dentists did, there was little evidence of those skills being used (52). The Association of Denture Prosthesis, that run training courses for denturists in the U.K., therefore argues that denturists specifically trained to fit and make dentures would be able to offer a far better service than the dentists (52).

It is reported that over 75 per cent of removable prosthetic appliances in the United States are made with absolutely no guidance or instruction to the laboratory (523). As a consequence, dentists have forced upon dental technicians a significant degree of professionalism by depending on them to

provide the scientific knowledge and skills to design and create removable prosthetic appliances. Denturists have reasoned that many dentists in the lower ranks of dentistry have deserted their professionalism and that there is no difference between a technician, with little or no scientific training and a dentist, who does not bother to use his skills and knowledge (523). This state of affairs has created a vacuum that the denturist wants to enter because he feels he can do just as well or better.

Denturists argue that they can make dentures as good as those made by dentists. Through the licensing of denturists, standards can be established which would assure the quality of service. Such standards would include the establishment of educational requirements for licensing and a requirement that the denture patient obtain a certificate of oral health from a dentist or physician before a denturist may fabricate a denture.

Denturists in Canada have also argued that during their existence of nearly 40 years, they have never had a successful malpractice suit incurred against the profession (521, 522).

The educational standards of Canadian programmes for training denturists have improved dramatically. According to Fee (44), "denturist students receive more than twice the number of hours of instruction in denture construction and treat up to 25 times as many denture patients than do dental students".

Denturists receive training at the five colleges of denturism in Canada. The International Denturists Education Centre provides high quality, verifiable, accredited continuing education for licensed denturists to supplement basic

training (524). The International Federation of Denturists (I.F.D.), at its 1992 Congress in Holland, officially endorsed the International Denturist Education Centre (I.D.E.C.) as the education arm of the I.F.D. According to the I.F.D. the denturist profession is at the forefront in the world and is the only profession that has developed and implemented international standards of training and qualification. The denturist profession believes that it now has the means to ensure that all practitioners have the opportunity to practise at the highest possible standards (525).

An accreditation Board will be overseeing all aspects of the training programme to ensure continuity of and adherence to baseline competency profile objectives that have been laid down.

No studies have ever been conducted in countries where denturism has been established to compare the quality of dentures provided by denturists that were established by "grandfather clause" and those with formal training.

Studies conducted in Finland, however, indicate that there is no significant difference in the quality of dentures provided by dentists and those provided by denturists (100).

Dunning (488), the quality concept which dentistry has elected to emphasise has recently become restrictive because if only the best and sophisticated care is tolerated, then a segment of the population which is unable to pay for this gets nothing. Thus according to Voltaire's phrase, the "best" has thus become "the enemy of the good."

#### **9.4 The paradigm shift from “replacement of teeth” to “prevention of tooth loss”**

World-wide the dental profession has adopted the goal of achieving a standard of oral health for all which would lead to a functional, natural dentition for life. In pursuit of this objective, the dental profession has changed its emphasis in dental practice from a removal and replacement-orientated approach to a preventive and treatment orientated approach (526). In the United States of America it has been reported that the population has evolved from an attitude of resignation (extraction of teeth), to an era of replacement, (with removable prosthesis), to an era of repair (restorative dentistry) and finally to the era of protection (preventive dentistry) (527).

Research evidence indicates that the introduction of fluoridation, dental health education, preventive dentistry and the increased availability and accessibility of dental services have contributed towards improved dental status, less extraction of teeth, a reduction of edentulousness, thus leading to a diminishing need for dentures (519, 528, 529, 530).

Dentists have claimed that since fewer people today need to have teeth extracted and replaced with dentures, little permanent cost saving is likely to result from legalising denturism (484).

Dentists have also claimed that denturists, because they are interested only in making dentures, will want to see all teeth removed, thus jeopardising preventive dental practice (487).

### 9.5 Needs and demands for denture care

Since the 1950s the demand for dentures has gradually declined. The latter can be attributed to declining caries rates and loss of teeth as a result of increased emphasis on prevention, the advent of new restorative technologies such as endodontics and fixed prosthodontics and people placing greater value on retaining a health dentition (76, 93, 529, 530).

Douglass (532) has argued that *"if the political and consumer demand for denturism is a function of unmet needs for complete dentures, this demand should decrease as the per cent of edentulous adults declines during the next 30 years."*

One of the primary reasons why the British Dental Association has opposed the introduction of denturists is that there is a declining need in the population for full dentures (75). According to the statistics of the British Dental Association the percentage of the adult population with no natural teeth will decline from 37 per cent in 1968 to a projected 10 per cent by the end of this century (75). Surveys conducted in New Zealand also shows that there is a decline in denture wearers of 33 per cent. It is also reported that the decline in denture wearer's will continue to such an extent, that the demand for full upper and lower dentures will decline to a level which could not support a new class of worker in the prosthetic field (76).

in New Zealand the prevalence of edentulousness has decreased by 46 per cent over a period of just six years (76). With the marked technological

development in the field of dentistry, a major paradigm shift has occurred from the replacement of defective natural teeth with artificial dentures to functional and cosmetic restoration of teeth with advanced materials and procedures.

There is increasing evidence that more elderly people retain at least some of their natural teeth and that the provision of partial dentures will be an inseparable part of the total oral health care of the elderly patient (493).

In contrast, a survey of the Dental Laboratory Association found that the demand for dentures was high and that elderly patients lived longer and that they were not restricted to one set of dentures (52). Under the National Health Scheme in 1989, 1,109,000 full upper and lower dentures were made compared with the 1,083,000 in 1988 (52). It is felt that even if the demand for dentures declined, the decision to become a denturist, would be a business decision made by the individual, presumably after studying the market (52).

In no country to date, where denturism has been introduced, could reports be found of denturists experiencing difficulties due to declining levels in the demand for dentures.

## 9.6 Economic basis of denturism

The economic basis of the denturism issue has been acknowledged by both organised dentistry and denturists (49).

Scientific advances over the past few decades have made dentistry so sophisticated and, consequently, so expensive that many dental services are priced beyond the reach of some patients. The cost of denture care has subsequently placed denture services beyond the reach of many individuals in low-income group's (531).

According to the American Dental Association (490), one of the charges laid against the dental profession is that it is not responsive to public needs. The dental profession has been accused of failing to meet the needs of some segments of society by not having made provision for the necessary denture care needs of people of limited economic means. The dental profession has therefore contributed to the development of denturism by failing to set up mechanisms in both the private and public sector to provide acceptable prosthetic care at minimal costs to members of the public who do not have the financial means to afford dentures (490).

Reduced cost of service is the main argument put forward in favour of denturism (51, 531). It is reported that the consumer continues to realise approximately 50 per cent savings as a result of receiving dentures from a denturist and that this price differential has remained constant over the past 20 years since denturism was made legal in Canada (51, 484).

Denturists have traditionally convinced the public and politicians that dentures are made in the laboratory and that the dentist is merely an expensive and unnecessary middle-man who has contributed to increasing the cost of dentures, therefore placing them out of reach of the indigent (534). The denturists argue that the public will experience personal financial gain through the elimination of the "middleman" or dentists.

Denturists argue that since they have a low overhead, they can provide dentures at a more affordable price.

The Oregon post-referendum results indicated that the public viewed denturism as a consumer issue, dentures were viewed as "appliances" and their availability at low cost was generally perceived as an economic convenience for the elderly (532).

A review of Oregon dental insurance data showed that the costs of dentures, which had been rising at the same rate as other dental services, had a much lower rate of increase after passage of the denturism initiative (533).

Dental technicians in New Zealand have for many years alleged that their fees were substantially lower than those charged by dentists (76). However, surveys conducted in 1981 and 1982 in New Zealand indicated that there were no great differences in the fee levels (76).

Some dentists have argued that any differential in the price of dentures charged by dentists and denturists would be eliminated after denturism became legal because the setting up and maintenance of practice facilities for

denturists are very costly (102). Despite the claims by American dentists that if denturism became legal, denturists' fees would rise to match those of dentists, this had not been the case in British Columbia where, after several decades of denturism, the fees of denturists have remained approximately half those of dentists (49, 79).

A study of dentists and dental technicians as competing suppliers of complete dentures in Finland also showed that dentures supplied by denturists cost the patient only about 50 per cent of what he would have to pay a dentist (101). The latter study, however, showed that there were contradictions among the reasons underlying the patients' choice between the dentist and the dental technician. In localities where subsidised services of the health centre dentists were available, the majority chose the dentist (101). Although the population considered the dentist's treatment better, people resorted to the denturist for reasons of cost.

A study conducted recently in Ontario, Canada, revealed that a number of procedure fees were on average 15 per cent higher in the dentists' fee guide compared to the denturists fee guide (534). Partial dentures were less expensive in the dentists' fee guide. In this study, however, no attempts were made to examine variations in the quality of care provided by dentists and denturists.

The New Zealand and Australian Dental Associations have expressed their concern that the granting of chairside status to dental technicians would

seriously threaten the viability of dental practices in rural and marginal areas. If dental practices were to close in marginal areas because dentists were not able to survive this would create a far greater problem for legislators and to the oral health and welfare of the community (519, 526). The potential over-supply of dentists that has been reported in many countries, has caused concern over adding redundant personnel to an economy that already suffers high levels of unemployment (519).

Furthermore, many doubt the economic viability of a purely prosthetic practice, especially if an appropriately equipped surgery with adequate means of sterilisation has to be set up if the denturist is only going to occupy his surgery for a very small proportion of his time (535).

A survey of Dental Laboratory members in the United Kingdom noted an important underlying view that if dental laboratory technicians were properly remunerated, the perceived need for denturism to supplement income would diminish (516). The expressed feeling was that the real problem was the result of under-financing of the National Health Service, which did not properly reward dentists and dental technicians.

According to the Liddell report this under-funding prevented the dentist from using the skills the British Dental Association claimed they possess, resulting in poor quality dentures and a furtherance of the argument for denturists (516).

It has been stated that, if dental technicians want a higher income, they should ask why their income is below par now.

Important questions that need to be asked are whether dental technicians are trying to compete with price-cutters by charging less than their services are worth or whether they were rendering a super service with huge overheads that they don't recover (536).

### **9.7 Monopoly abuse by dentists**

Denturists have claimed that dental licensing laws have given harmful and wasteful monopolistic control of the dental prosthetic industry to dentists and thus contravene the principles of free enterprise (518).

Denturists in the United Kingdom have alleged that dentists were abusing their monopoly through high prices and profits on dentures (537). Further investigations were unable to support the allegations of monopoly abuse by dentists (537). The latter investigations also concluded that denturism had reduced the cost of dentures. In the United Kingdom where dentures are readily available on the National Health Service and where the Department of Health closely controls the price, there is no evidence that dentists are making monopoly profits on the supply of dentures. It was the view of the Director General of the Department of Health that it was unlikely that denturists in the United Kingdom could provide dentures more cheaply (540).

### **9.8 Practice preferences**

Those supporting denturism claim those desirable activities such as preventive dentistry, restorative dentistry, periodontics, endodontics etc. have eroded undergraduate training in prosthetic care and consequently have detracted from the importance of prosthetics in overall health care (514). This has subsequently led to the dental profession losing interest in full denture care.

Studies have also suggested that dentists do not make many complete dentures because removable prosthetic services are not as remunerative as some other services (538). Denturists, on the other hand, are highly interested in and motivated concerning denture service.

### **9.9 Cost-effective utilisation of human resources**

It is generally agreed by authorities in the health professions and in government that the grouping of health practitioners and the creation of interdependent auxiliaries under a team leader is an economical way of improving the efficiency and productivity of delivering health care to patients (539). According to the American Dental Association, the creation of denturists as a new occupational category that would practise independently from the rest of the delivery system with a very limited scope of services is not within the espoused principles for improving patient care (518).

Some feel that the establishment of new educational facilities would amount to a waste of public money, especially when expenses in other educational fields are being curtailed (526). Furthermore, as early as 1983, concern was expressed in New Zealand about the enormous costs of training dentists, who upon graduation were forced to leave the country to find employment. The Irish Dental Association has also stated that denturists should not be introduced because proper training would take up to four years and the demand for dentures was decreasing (530). Any move to introduce a new form of dental worker to the practice of dentistry can only serve to exacerbate the situation.

Denturists have argued that the provision of dentures by denturists will free the dentists to perform those functions for which the dentist alone is qualified and will therefore provide a more efficient use of manpower.

According to Ross and Speed (526) one of the factors used to justify denturism is the chance it offers to remedy chaotic conditions which exist within the technicians' industry and to tighten the control on illegal dentistry.

#### **9.10 Cost of establishing and maintaining training facilities**

Establishing a new occupational category such as denturists requires resources for establishing and maintaining training facilities and regulatory machinery (528). The British Dental Association has argued that that it would be very expensive to create adequate training facilities for a new category of

dental worker whose sphere of practice is very narrow, especially in view of the declining need for full dentures (528). From a policy point of view, it has been stated that it would be irresponsible of government to create a new class of dental worker with no long-term career prospect (526).

The Australian Dental Association (Western Australia Branch) (519) does not support advanced training leading to direct dealing with the public because this will lead to greater expenditure of already limited government funds for preparing new registrants in an over-supplied market of dental services (519).

#### **9.11 Access and availability of services**

One of the most important arguments in favour of denturism is the inadequate availability of denture services to a large proportion of the community (531).

Denturists have also claimed that the edentulous public has limited or no access to a sophisticated dental team for the denture care they need or desire.

While an economic case may exist for denturists in countries without comprehensive public dental services, it is highly unlikely that in the United Kingdom denturists could provide dentures at a lower price than dentists practising within the National Health Service could.

While there is an unmet need for the provision of complete dentures among geriatric and handicapped patients, such cases are generally seen as not suitable for delegation to "narrowly trained" denturists, because of the special problems and difficulties, which they present.

Auxiliaries are of great use, especially in the public sector where demand is high and manpower insufficient to meet the needs of the population. The dental profession in various countries has increasingly expressed its concern that they have been moving from a position of health work force shortage to one of potential over-supply (526). Various dental schools have adjusted their intake of dental students to match the demand for dental treatment. The introduction of denturism will compound the already complex work force situation, which is developing in dentistry.

In New Zealand a submission of the Dental Association has noted that: "*it would be a sad reflection on our legislators if at the same time as entrants to the dental profession were being reduced, their places were being filled by untrained clinical dental workers*" (526). Concern has also been expressed that marginally viable dental practices in remote areas would be adversely affected to such an extent that a community might be deprived of a complete dental service and find that it was replaced by a substandard denture service.

### **9.12 Dentist - dental technician relationship**

Dental technicians have accused the dental profession of enslavement within the dental technology profession for many decades. Dentists have abused dental technicians for many years and this has been one of the most important factors that have influenced the development of denturism. The most common complaints cited by dental technicians against dentists are: not paying laboratory bills promptly, sending poor quality work to the laboratory,

sending incomplete work authorisations, sending sub-standard casts and records and sending patients to the laboratory for shade selection or repairs (540).

The National Denturists Association in the United States of America has encouraged denturism as an end to dental technology slavery and as a means towards ending frustration amongst dental technologists (104). Denturists have argued that there is no other industry besides dentistry that is controlled by a middleman. Denturists believe that a service industry should be answerable to the ultimate consumer (541).

In the past dentists have traditionally shown little respect for dental technicians' skills, forcing some to seek job appreciation directly from the public (518). To improve their stature and recognition within society, dental technicians have a need to develop themselves within their profession and to belong to a legally recognised profession.

The expressed desire of the majority is recognition of their aspirations and the freedom to determine their own destiny (536).

### **9.13 Legislative considerations**

In Manitoba, denturists have already succeeded in divorcing dentures from dentistry, both within the minds of the public and also within the laws of the province (495). Under the 1972 Dental Mechanics Act, dentures are no longer legally part of the treatment and procedures defined as dentistry. With recent

advances in science and technology, this is currently most irrational, especially with the new dimension that implants have brought to the management of the edentulous patient.

Underlying the principle of licensure is the assumption that the public cannot judge whether practitioners are qualified and competent.

The legal fight between Illinois denturists and dentists, for instance, has taken a new twist that is expected to have implications on many other states in the United States of America. Ms Caroline Basony, an Illinois technician / denturist has expanded the scope of suit against the Illinois State Dental Society into new constitutional realms. Ms Basony alleges that *"the Illinois law deprives denturists of their constitutional right to practise their profession and that the law constitutes restraint of trade, that the law is designed to benefit a specific profession in a manner that exceeds constitutional limits, that the law works to the detriment rather than the advantage of the public welfare by restricting the flow of information concerning products and services to the public, that the law is without reason or foundation because there is no evidence indicating that impressions for oral prosthetic devices were or are harmful to the public nor is there any record indicating that a member of the public would be harmed by being fitted with a removable prosthesis."* (542). She also alleges that the law eliminates a person's individual right to choose a supplier of a removable prosthetic device for himself (542). She goes on to state that *"the law is unnecessary and unwarranted and the state exceeded*

*its authority in passing a law giving itself police power and judicial authority over making and installing dentures".*

Dental technicians commonly view dental legislation as being restrictive over their right to provide a service to members of the public and an infringement on the freedom of the individual to select a provider of his choice. Denturists have reasoned that a person suffering from a medical (as opposed to dental) complaint was free to choose between a doctor, a homeopath or traditional healer for treatment (530).

The National Consumer Council in the United Kingdom has said that it favours a controlled form of denturism whereby a register of denturists is established (528). The British Dental Association believes that this would lead to fragmentation of care and would not be in the patient's best interest (528).

The Dental Laboratories Association in the U.K. claimed dental technicians who would not make the grade as denturists would still carry on practising illegally as before (516). The Association of Denture Prosthesis, however, pointed out that there was a great number of dental technicians already practising denturism in the U.K. and therefore would like to see the implementation of a "grandfather clause in legislation to make provision for those who considered themselves to be time-served to register as denturists (516). The Association of Denture Prosthesis, however, stated that in Holland this situation was dealt with by allowing only registered qualified denturists the right to be covered by assurance (516).

## **CHAPTER TEN**

### **CONCLUSIONS AND POLICY RECOMMENDATIONS**

#### **10.1 Conclusions**

##### **10.1.1 Importance of teeth**

Teeth play an important role in preserving one's self-image and to enhance one's social interaction with other people in the community. Furthermore, teeth are also an essential requirement of speech and mastication. Being edentulous without dentures or having poorly fitting dentures may compromise an individual's quality of life and is therefore considered an essential component of any comprehensive health service.

People value their dentition, or dentures in the case of those that are edentulous, as an important contributor to quality of life because they believe that absence of teeth or dentures could affect one's social life or job opportunities.

##### **10.1.2 Oral health status trends**

The literature survey presented in this study indicates that various factors have contributed both world-wide and nationally towards improving dental

status, less extraction of teeth, a reduction of edentulous adults and therefore a declining need for dentures.

Factors that have contributed towards these trends are (i) the introduction of water fluoridation, (ii) dental health education, (iii) greater emphasis on preventive dentistry, (iv) the advent of new restorative and preventive technologies and (v) the increased availability and accessibility of dental services.

Above mentioned factors, apart from water fluoridation which is in the process of being implemented in South Africa, have also had a significant effect on the oral health status of the population in the Western Cape Province.

As in the rest of South Africa, the Western Cape Province is also facing rapid changes on demographic, social, cultural, political and economic levels. These changes will also have a major impact on the prevalence of oral disease and demand for oral health care.

The results of this study clearly point towards a continuation of the trend of extracting teeth, edentulousness and consistent demand for dentures, especially amongst the low income coloured population group in the Western Cape Province for the foreseeable future. This trend is supported by the following findings in this study.

- (i) The general neglect and low value placed on oral health amongst indigent people.

- (ii) The large prevalence of decayed and missing teeth, especially amongst the coloured people.
- (iii) The relatively low importance that individuals place on preventive and restorative dental care.
- (iv) A large segment of the population cannot afford preventive and restorative care.
- (v) The high demand for extraction of teeth.
- (vi) The relatively low importance that people place on visiting a dentist regularly.
- (vii) Peoples' beliefs that loss of teeth is the inevitable result of the ageing process and that a denture will relieve them from their dental problems.

People in the lower socio-economic categories are most likely to loose teeth and become edentulous. The high rate of indigence among edentulous people will in all probability increase the likelihood of people reverting to seeking prosthetic care from 'backdoor providers' or retain their old dentures for longer periods.

### **10.1.3 Need for dentures**

This study clearly indicated that there is a need and demand for low cost dentures in the Western Cape Province. Indigent people, especially amongst the coloureds (82%) and the elderly (40%), presented with the greatest need and demand for a complete set of dentures.

Coloured people also constitute the largest sector of the population in the Western Cape Province and are therefore indicated as the primary target group for dentures. Blacks are considered a low risk for prosthetic care in the Western Cape Province due to the low prevalence of edentulousness. Most edentulous adult white subjects were able to afford dentures.

Single upper and lower dentures were less in demand. The need and demand for partial dentures, especially amongst the coloured and black people were exceptionally low.

#### **10.1.4 Availability and accessibility of denture services**

Dental services are readily available and accessible to the majority of the population studied in the Western Cape Province. Dentures provided by the private sector, however, is largely out of reach for the largest segment of the population.

A significant proportion of subjects did not know whether services were available. The private sector oral health care system is characterised by its maldistribution of resources, primarily benefiting the affluent and urban sectors of the population. Public dental health services on the other hand is mainly characterised by its lack of resources to meet the demands of the indigent population.

From a provider perspective, the majority of dentists and dental technicians are primarily located in the metropolitan areas and provide services to only those who can pay or who have a medical aid. On the other hand, oral health care providers, especially in the public sector, were under-supplied. The

greatest shortage of oral health care providers occurred in rural and developing areas.

The elderly presented with most problems relating to the availability and accessibility to dental services. This is particularly problematic for elderly people who face a double burden due to medical and physical limitations. The pattern of low use of oral health care among the elderly is a special concern because these individuals are at greater risk to oral soft tissue disease. Furthermore, elderly subjects also fall within the group that is less able to afford dentures. Providing dentures for the elderly will therefore place an increased burden on the already limited resources of public dental health services.

Private dental practitioners provided most of the denture services used in the Western Cape Province. A lack of financial resources or a medical aid was the most significant factor affecting the use of services. Only a minority of the population (25%) who have a medical aid or the ability to pay have access to prosthetic oral health services in the private sector. On the other hand the majority of the population (75%) is dependent on the state (public sector) for their health needs. Access to dentures in the public sector is very limited because resource constraints allow each public health dentist to provide only one full set of dentures per month.

Public dental services play a relatively insignificant role in the provision of dentures due to lack of resources. Most dentures supplied by the public

sector were mainly provided to coloured and elderly people. Public dental health care also places a low priority on the provision of dentures.

#### **10.1.5 Cost and affordability of dentures**

This study clearly indicated that the cost of dentures to be the greatest barrier towards the accessibility of dentures and has placed denture services beyond the reach of many individuals in the low-income category. More than two thirds of the population (65%) cannot afford more than R250 for a full upper and lower denture.

Individuals who could least afford dentures were those without a medical aid or were elderly people. Most individuals that could not afford dentures were mostly coloureds and blacks.

The cost of a complete set of dentures (laboratory fees included) in the private sector, based on the recommended scale of benefits, is approximately R1500.

From the results of this study it is estimated that approximately 86 per cent of the population in the Western Cape Province are unable to pay more than R500 for a full upper and lower denture. Only 13 per cent were willing and able to pay more than R500 but less than R1000 for a complete set of dentures.

Dental technicians reported in this study that they could make and supply dentures directly to the public at approximately R500. The latter figure,

however, should be kept in mind is purely speculative and may be biased due to the low response rate in the survey.

It is inconceivable that clinical dental technologists would be able to reduce their fee for a full set of dentures to lower than R250 or for that matter less than R500. This would mean that approximately 86 per cent of prospective patients would immediately be excluded from their market segment.

The residual market segment on which clinical dental technologists would have to focus are those people that are able and willing to pay more than R500 for a complete set of dentures (13%). Alternatively they may opt to compete with dentists to provide denture services to those patients that have a medical aid (18%) or that can afford dentures that cost more than R1000 (1%).

Article 25 of the Dental Technicians Amendment Bill (**Act No. 43 of 1997**) does not allow dental technicians to offer or give discount on the tariff of fees (**559**).

Therefore, if clinical dental technologists were prepared to provide dentures at a 50 per cent reduction on the recommended clinical fee, the total cost of the dentures they would provide will be approximately R1200. Such a reduction in fees would be negligible and certainly not justify the cost for implementing clinical dental technologists as a new occupational category.

Furthermore, a more realistic clinical fee would have to include the cost of

(i) training and continuing education, (ii) materials and supplies, (iii) investment in clinical equipment and instruments, (iv) salaries and wages towards clinical and administrative staff, (v) administration and accounting, (vi) professional indemnity and (vi) the facility in which clinical work is to be conducted in.

The ability of denturists to reduce the cost of dentures to a significant level that will increase the accessibility to dentures in the Western Cape is not supported by the results of this study.

#### **10.1.6 Consumer and provider beliefs and expectations**

Dentures are a relatively low priority compared to housing, essential medical and preventive care and a myriad of other essential services.

People rated preventive care a higher priority because they felt that it was important to maintain teeth as long as possible, to reduce dental problems and to save costs on unnecessary treatment. A large percentage of respondents also felt that people ought to take greater responsibility for looking after their own teeth. Dentists in the private and public sectors also supported the view that greater emphasis be placed on preventive and restorative services rather than removable prosthetic care.

Concurrent with rapid changes on demographic, social, cultural, political and economic levels, changes in the role of oral health care providers, in particularly auxiliaries, should be reassessed for the mutual benefit of the

providers and the communities they serve. Special attention should also be given to extend functions and the career development opportunities of all operating auxiliaries in the oral health care team to improve cost effective delivery of dental services.

The perceived oversupply of providers, professional encroachment, decreasing "busyness", depressed economy and the need for professional development are currently major forces influencing all occupational categories towards extending their functions to be able to survive financially and to revive career satisfaction.

There are increasing concerns that the dentist and dental technician work force is presently in a situation of over-supply. Dental and dental technology training schools need to investigate the current and future demands for their workforce categories and adjust their intake of students accordingly.

Although dentists show less preference for prosthetic work, it still constitutes a sizeable proportion of the dentists' gross monthly turnover. Dentists will therefore continue to oppose professional encroachment on their scope of practice to secure this source of income.

Illicit denture practice has been in existence for nearly a century and all attempts to eliminate it in the past have failed and are bound to continue to fail in the future. Illicit practice by dental technicians in the Western Cape Province currently can be described as insignificant. Unqualified persons or so-called 'backdoor providers' make most dentures that are provided illegitimately.

The informal sector (backdoor providers) provided more dentures for disadvantaged people than Public Health Services. 'Backdoor providers' therefore fill a much-needed gap of providing dentures to the indigent population at below R250.

The illegitimate backdoor providers have established themselves as significant providers and render an essential and affordable denture service outside the health care system even if the quality of the dentures is poor. Backdoor providers mostly supply dentures in under-served areas, to people who cannot afford dentures in the private sector, or to those who cannot gain access to dentures in the public sector.

Backdoor providers will remain significant providers of dentures to low income groups in the foreseeable future or where formal services are not available. Backdoor providers could be acknowledged and included in the health care system because they provide a low cost denture service that neither the private sector, the public sector nor denturists would be able to match. This service, although illegitimate, will have to be dealt with in the future. If this service is completely eliminated it may not be in the public's best interest. Issues that need to be considered in this respect are whether their status quo should be maintained, how such practices can be eliminated and controlled, or whether provision should be made to legitimise such a category of health worker.

People needing dentures have expressed the need for denture providers who meet the criteria of appropriate clinical training, quality, professionalism, trust, accessibility, availability and affordability.

#### **10.1.7 Dentist – dental technician relationship**

Since the beginning of the century, dental technicians have been opposed to being 'enslaved' to dentists and have pleaded for an independent profession. The dental technicians have viewed dental legislation as oppressive and one that has placed a monopoly of the denture trade in the hands of the dentist. Dental legislation in South Africa has primarily aimed at preventing dental technicians from infringing in the rights or fields of the dentists and to eliminate the illicit provision of dentures.

Over the past four decades, dental technicians and denturists world-wide have all attempted to establish themselves separately and independently from the supervision of dentists.

The need for denturism has originated from the continuing poor professional relationship between dentists and dental technician. This relationship has further deteriorated due to an over-supply of dentists and dental technicians. The latter has placed economic pressures on both professions and the need for independence and greater autonomy by dental technicians to develop their profession.

Denturism is today legally recognised as a respected profession in fifteen countries but is still strongly opposed by dentists primarily because it is eroding their scope of practice.

The majority of dental technicians, on the other hand, support denturism mainly for economic reasons and to be able to develop their profession independently from dentists. Most dental technicians were in favour of receiving clinical training before being allowed to practise. Most dental technicians that were interested in practising as denturists expressed the view that they did not want to practice under the supervision of a dentist. The majority of the population supported denturism primarily because they believe it would lower the cost and improve the quality of dentures.

#### **10.1.8 Denturists (Clinical Dental Technologists)**

The results of this study are inconclusive to support the hypothesis that the introduction of clinical dental technologists would be a cost-effective way of providing dentures in either the public or private sectors. The following reasons support this conclusion.

- (i) There is no evidence that this would lead to a substantial reduction in cost of dentures that will in effect increase the accessibility to dentures for a large segment of the indigent population that cannot afford dentures.
- (ii) The market segment which clinical dental technologists will have to focus on to make a living would be those people that have a medical aid or

that have the means and willing to pay for dentures more than R1000 for a complete set of dentures. The reality is that this market segment is already well or over-supplied.

(ii) It is irrational to justify clinical dental technology as a new occupational category to promote or serve the interest of the dental technician profession. In other words, improving the economic viability of an occupation, career development opportunities and occupational satisfaction are not acceptable criteria for legalising denturism. The primary aim for justifying the implementation clinical dental technologists can only be based on whether the interests of the community or patients are served.

(iv) Comprehensive public dental services are available and accessible to the majority of people with limited income who need denture care in the Western Cape Province.

(v) Establishing and maintaining educational facilities or providing additional resources to implement or advance the training of clinical dental technologists would be irrational and amount to waste of public money, especially when budgets are currently drastically being curtailed in dental educational facilities.

Dental therapists seem to be a more cost-effective way of providing dentures in the public sector because it costs less to train and employ them. Training

dental therapists to provide dentures would broaden their scope of services and therefore benefit the community at large. However, extending the functions of dental therapists to the provision of dentures will not be a cost-effective exercise if adequate resources are not made available to meet the demand for dentures in the public sector.

The cost-effectiveness will mainly be determined to what extent and how current facilities can be utilised to train dental therapists with extended functions and retaining such personnel in geographic areas where oral health needs are greatest.

## **10.2 Policy recommendations**

The primary goal of a oral health service is to provide comprehensive oral health care to those in need of such care. Because resources are limited and needs are unlimited resources must be allocated towards a work force and oral health care that will be in the best interests of the population's health, welfare and quality of life, both individually and collectively.

The principle that should guide rationing or allocation of resources is that oral health care providers should strive to pursue distribution policies that have greater balance of benefits over disadvantages, greater balance of good over harm and greater contribution to the common good to the greatest number of people.

The following policy recommendations are made for the Western Cape Province:

1. A new paradigm shift is required that embraces prevention of disease and the promotion of oral health rather than extraction and replacement of teeth. **Efforts and resources should primarily be directed towards oral health promotion and disease prevention.** Disease prevention and oral health promotion programmes will reduce the prevalence of dental caries and the need for extractions of teeth, thus leading to a decline in edentulousness and the demand for dentures.

A change of emphasis towards prevention and the promotion will, besides improving the well being and quality of life, also result in considerable cost savings, thus benefiting the population at individual and community level.

Disease prevention and health promotion programmes should be enhanced while systematically de-emphasising curative, extraction and denture services.

Oral health education, preventive services and relief of pain and sepsis should remain high priorities in Public Dental Health Services. More auxiliaries should be utilised in the public sector to meet the demands for such services with the primary goal of maintaining a healthy dentition for life. Greater emphasis on, and a stronger commitment towards preventive dentistry should be made to promote the retention of a healthy dentition as long as possible.

2. While the emphasis on the prevention and the promotion is necessary and desirable, the fact remains that a substantial segment of the population will for various reasons become completely or partially edentulous. This imposes a responsibility that the profession and the state cannot ignore.

**Denture services should remain a low priority** in the public sector Because of the limited availability of resources and unlimited range of other more essential priorities. The provision of dentures in the public sector should be limited to selected cases only, provided resources are available.

Resources should be distributed on a just and fair basis. No one should be denied access to any dental care or dentures for that matter on irrelevant grounds. Fairness should not of itself imply that there is a social obligation to equalise the health status of different groups in society, since differences of health status might arise, say, from freely made life-style choices that might have a deleterious effect on oral health, such as neglect of oral hygiene.

The proper basis for oral health care treatment should be measured according to need. The principle of need implies that resources should be committed to those fields where needs are greatest for instance areas where services have previously not been available or those who have less chance than others of making their voice heard or exercising their rights i.e. the poor and the elderly.

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**3. Denturism (clinical dental technologists) should not be accepted as a new occupational category in the oral health care work force.**

Denturism cannot be justified unless proof can be given that the introduction thereof will provide more affordable dentures that will substantially increase the accessibility for those individuals needing dentures the most and cannot afford dentures in the private sector.

**4. The dental profession urgently needs to set up mechanisms in both the private and public sectors to provide acceptable and affordable prosthetic care to people who cannot afford dentures. To fill this gap the functions of dental therapists can be expanded to include the provision of dentures.**

More dental therapists should be appointed in public dental health services to make dental services more accessible and available in under-served areas.

The scope of practice of dental therapists should be limited to supplying full upper and or lower dentures. The provision of partial removable prostheses is a skilled procedure requiring the knowledge and integrated application of many branches of dentistry and should not be included as part of the practice of or dental therapists.

**5. Including backdoor providers in the present denture care delivery system, without compromising standards of care, may be a window of opportunity that needs to be investigated rather than focusing resources and**

efforts on excluding backdoor providers from the system. Backdoor providers could be registered as '**clinical denture auxiliaries**' and complement the services provided by dentists or dental therapists. The cost of dentures could be maintained at a low level while increasing the standard of care if clinical denture auxiliaries could use public dental clinics to provide their service.

6. Any legislation introduced to extend the clinical responsibilities of dental/oral health therapists or to incorporate backdoor providers into the arena of denture provision should recognise that the **patients' interests and well-being should be safeguarded** and that any potential harm or inconvenience should be avoided. Government must provide for adequate legislation that makes provision for qualification requirements, registration and continuing education to ensure the safety of the public.

7. Prosthetic oral health care must be regarded as part of an essential continuum of service rather than a commodity. **Patients should not under any pretext be separated from the routine of surveillance, supervision and maintenance care that dentists provide** and which is essential for long-term success of full or partial dentures and oral health in general.

8. Dental and dental technology training schools need to **investigate the current and future demands for their work force categories and adjust the intake of students** to prevent and over-supply of human resources.

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**9. Further studies also need to be conducted to investigate the following issues:**

- (i) The need for and supply of dental technicians.
- (ii) A cost estimation study to determine a realistic value of dentures.
- (iii) The influence of water fluoridation on incidence of edentulousness on a regional basis in South Africa.
- (iv) Regional trends in edentulousness.

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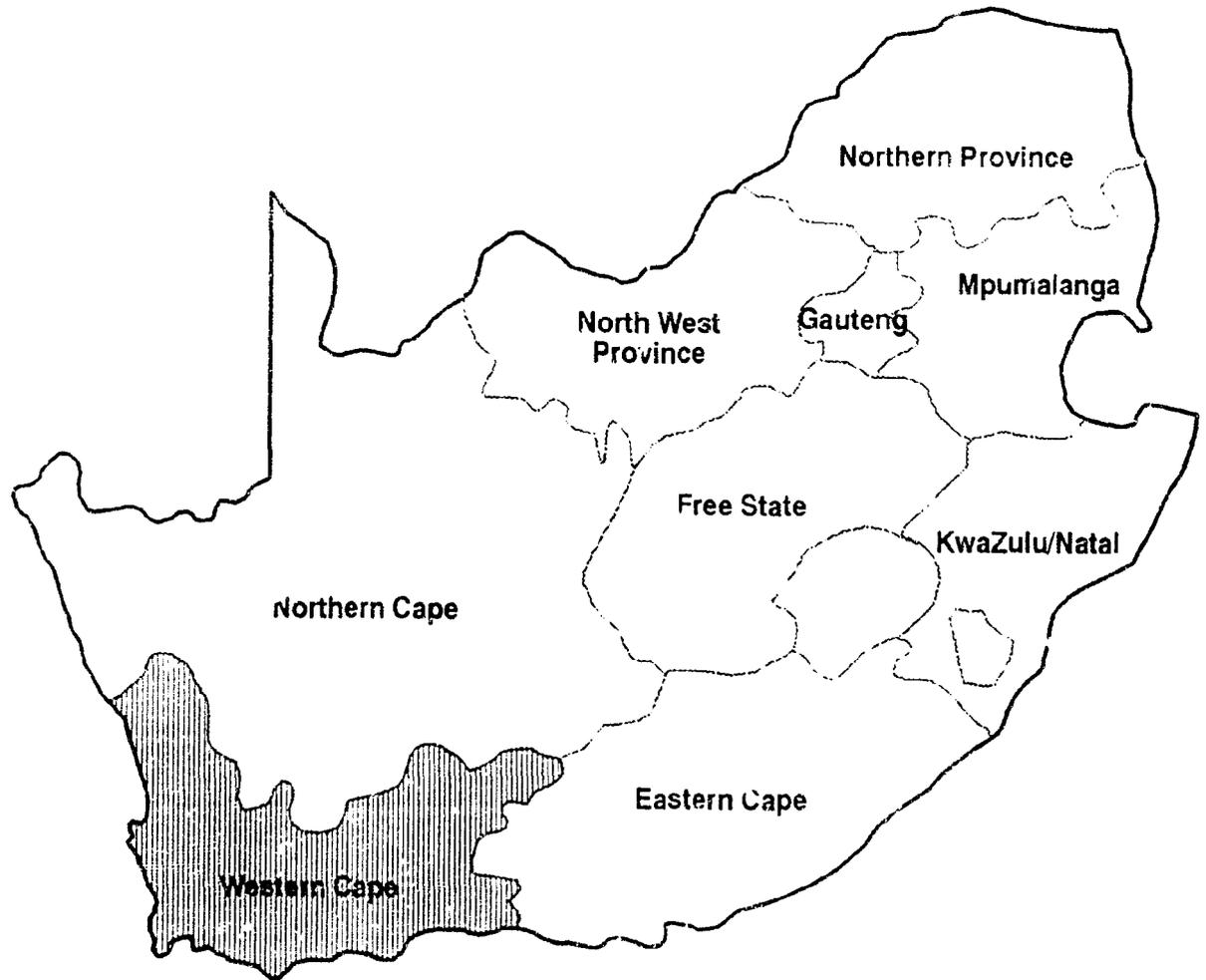
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**Figure 1: Provinces in the Republic of South Africa**

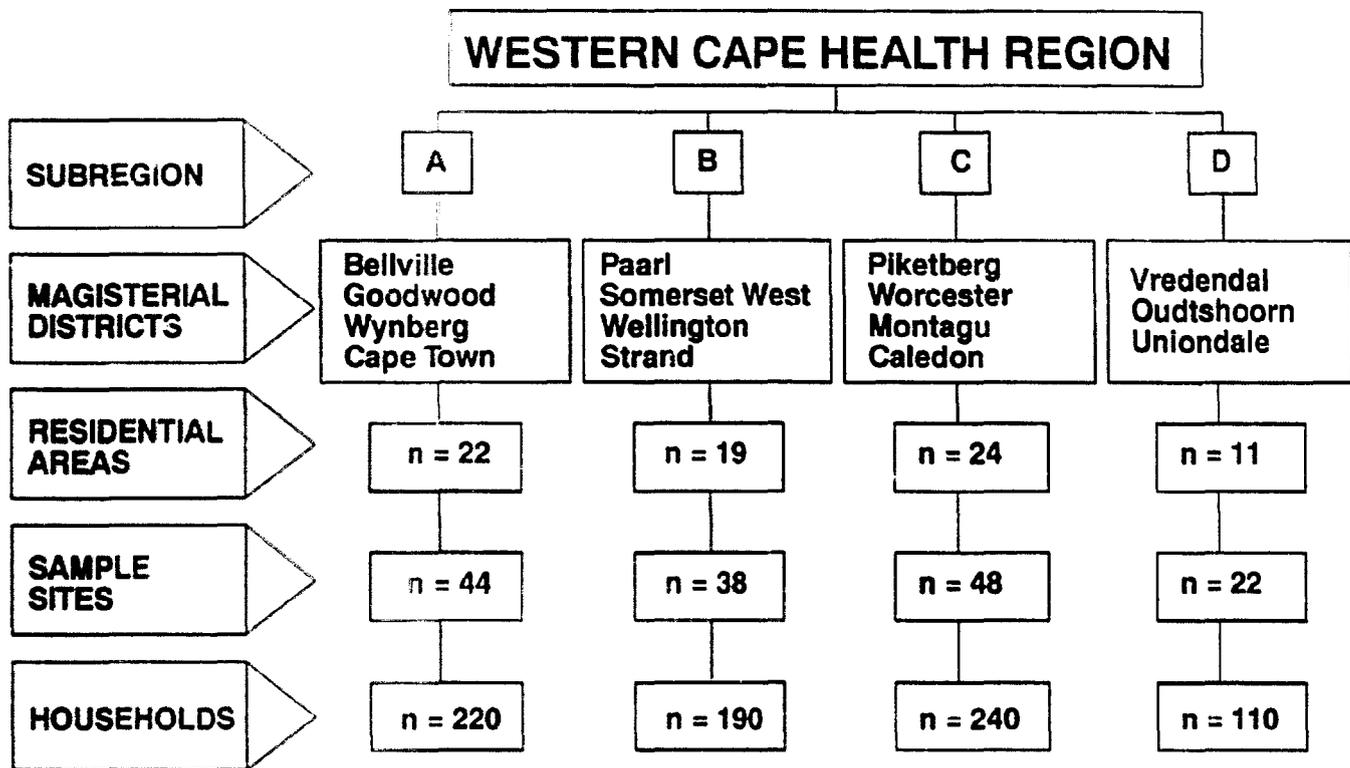


Figure 2. Schematic representation of the sampling design

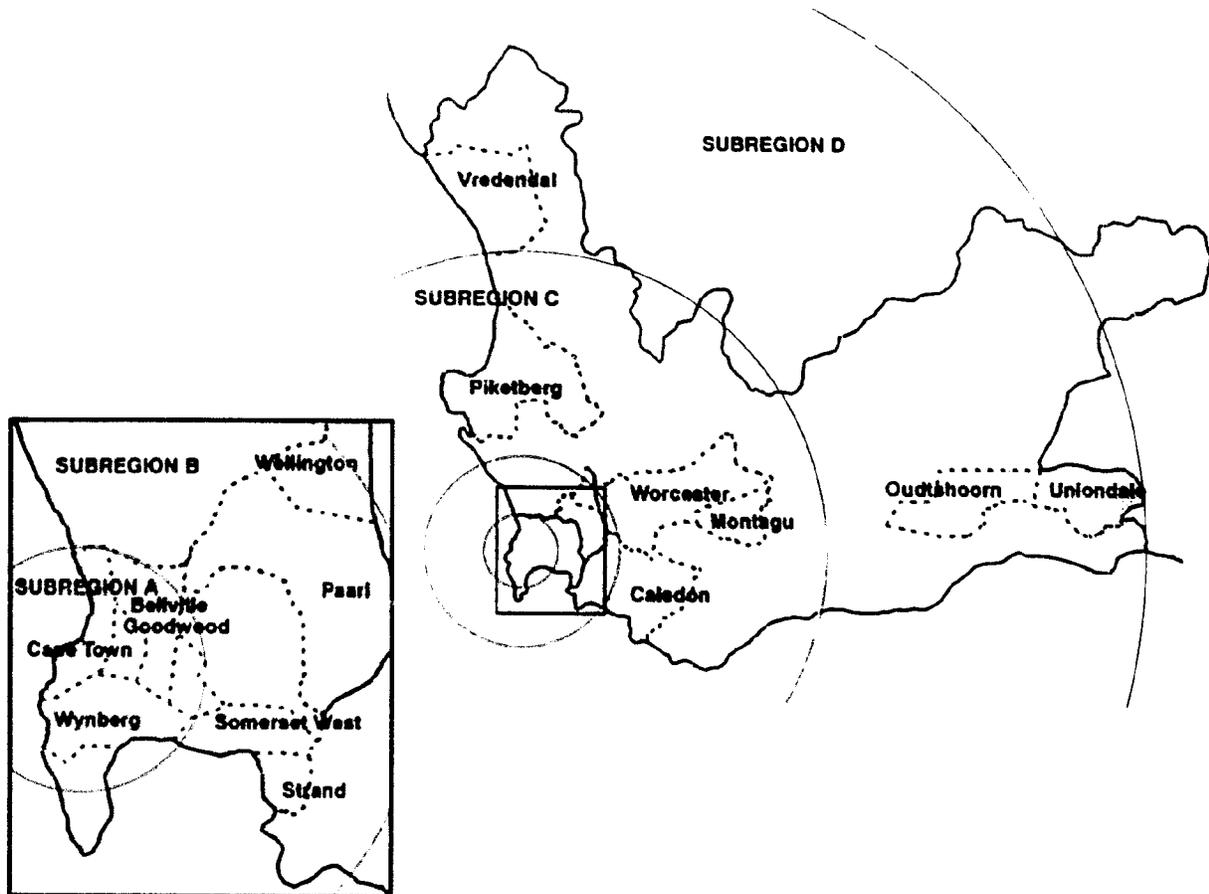


Figure 3: Geographic distribution of sampling subregions and magisterial districts in the Western Cape Province



Table 1: A summary of the world situation regarding denture providers <sup>1</sup>

Country	Population	Dentists <sup>2</sup> (S) <sup>3</sup>	Dentist: population	Dental technicians (S) <sup>4</sup>	Technician: dentist	Denturists (S) <sup>5</sup>	Denturist: population
Canada	26,218,500	13,623 (10)	1:1924	2900 (5)	1:5	2700 (5)	1:9710
USA	245,871,000	137,817 (55)	1:1784	20,000 (50)	1:7	197 (1)	1:1243076
Australia	16,506,000	6897 (5)	1:2393	2213 (9)	1:3	607 (4)	1:27192
Denmark	5,133,000	5100 (2)	1:1006	800 (2)	1:6	550 (1)	1:9332
Finland	4,950,000	4225 (4)	1:1171	363 (2)	1:12	424 (2)	1:11674
New Zealand	3,307,000	1233 (1)	1:2682	368 (1)	1:3	Unknown	Unknown
Netherlands	14,760,000	6000 (2)	1:2460	3500 (1)	1:2	200 (1)	1:73800
Iran	50,000,000	3500 (8)	1:14285	170 (2)	1:20	2000 (0)	1:25000
Pakistan	102,000,000	2127 (5)	1:47954	250 (1)	1:8	7000 (?)	1:14571
China P.Rep.	1,096,140,000	11044 (32)	1:99252	3500 (3)	1:3	400 (?)	1:2740350

<sup>1</sup> Federation Dentaire International, 1990 (30)<sup>2</sup> Practising dentists<sup>3</sup> Number of dental schools<sup>4</sup> Number of schools for dental technicians<sup>5</sup> Number of schools for denturists

Table 2: Summary of legislative provision for denturists in Canada<sup>6,7</sup>

	Alberta	British Columbia	Manitoba	New Brunswick	Nova Scotia	Ontario	Quebec	Saskatchewan	Yukon
Year enacted	1961	1958	1970	1977	1973	1974	1973	1973	1979
Independent practice	Yes	Yes	Yes	Yes	Yes	Yes <sup>8</sup>	Yes <sup>9</sup>	Yes	Yes
Oral health certificate required	No	Yes	Yes	No	No	No	Yes	No	No
Services <sup>10</sup> allowed	C	C	C/P	C	C	C/P	C/P	C/P	C/P
Regulatory Board Body	Denturists Board	Denturist Board	Denturist Board	Denturist Board	Denturist Board	Denturist Board	Denturists Board	Denturist Board	Denturist Board
Title	Dental Mechanic	Dental Mechanic	Denturists	Denturist	Denturist	Denture therapist	Denturologist	Denturist	Denturist
Number licensed	210	200	53	42	50	430	900	53	1
Denturist training	5 years	4 years	Not required	Not required	Not required	Not Required	Not required	2 years	Not specified
Denturist training	4 years	3 years	4 Years	3 years	3 years	3 years	3 years	4 years	4 years

<sup>6</sup> American Dental Association, 1984 (85)<sup>7</sup> International Federation of Denturists, 1991 (81)<sup>8</sup> Oral procedures for partials in dentists office<sup>9</sup> Supervision required for partials only<sup>10</sup> C = complete dentures; P = partial dentures

Table 3: Summary of legislative provision for denturists in the United States of America<sup>11, 12</sup>

	Arizona	Colorado	Idaho	Maine	Montana	Oregon
Year enacted	1978	1979	1982	1977	1984	1978
Independent practice	No <sup>13</sup>	No <sup>14</sup>	Yes	No		Yes
Oral health certificate required	No	No	No	No	Yes	Yes
Services <sup>15</sup> allowed	C / P	C	C	C	C / P	C
Regulatory Board Body	Dental	Dental	Independent	Dental	Dental	State Health Division
Title	Denturist	Dental auxiliary	Denturist	Denturist	Denturist	Denturist
Number licensed	29	0	39	0	?	115
D. Tech training	Required	Not specified	Required	Required	Required	Not required
Denturist training	12 weeks	Not specified	4 years	2 years	4 years	4 years

<sup>11</sup> American Dental Association, 1984 (85)

<sup>12</sup> International Federation of Denturists, 1991 (81)

<sup>13</sup> Must work under the supervision of a dentists

<sup>14</sup> Must work under the supervision of a dentists

<sup>15</sup> C = complete dentures; P = partial dentures

Table 4: Summary of legislative provision for denturism in Australia<sup>16, 17</sup>

	<b>New South Wales</b>	<b>South Australia</b>	<b>Victoria</b>	<b>Western Australia</b>	<b>Tasmania</b>
<b>Year enacted</b>	1975	1984	1972	1987	1988
<b>Independent practice</b>	Yes	Yes	Yes	Yes	Yes
<b>Oral health certificate required</b>	No	No	No	No	No
<b>Services<sup>18</sup> allowed</b>	C / P	C	C	C	C / P
<b>Regulatory Board Body</b>	Dental Technicians Board	Dental Board	Advanced Dental Tech. Board	Dental Technicians Board	Dental Technicians Registration Board
<b>Title</b>	Dental Prosthetist	Dental Prosthetist	Dental Prosthetist	Dental Prosthetists	Dental Prosthetists
<b>Number licensed</b>	360	24	170	53	64
<b>D.Tech training</b>	4 years	4 years	4½ years	4 years	4 years
<b>Denturist training</b>	2 years	1 year	2 years	2 years	2 years

<sup>16</sup> American Dental Association, 1984 (85)<sup>17</sup> International Federation of Denturists, 1991 (81)<sup>18</sup> C = complete dentures; P = partial dentures

Table 5: Summary of legislative provision for denturists in other countries

	<b>New Zealand</b>	<b>Denmark</b>	<b>Finland</b>	<b>Netherlands</b>	<b>Switzerland</b>	<b>Iran</b>
Year enacted	1988	1979	1964	1989	1961	?
Independent practice	Yes	Yes <sup>19</sup>	Yes	Yes	Yes	Yes
Oral health certificate required	Yes <sup>20</sup>	No	No	No	Yes	No
Services <sup>21</sup> allowed	C / P	C / P	C	C	C / P	C / P
Regulatory Board Body	National Board of Health	?	National Board of Health	?	independent	?
Title	Clinical Dental Technician	Clinical Denturist	Advanced Dental Technicians	Denture Prosthetist	Denture Prosthetist	Registered Dental Mechanic
Number licensed	Unknown	580	420	206	100	2000
D.Tech training	3 years	2½ years	4 years	5 years	4 years	?
Denturist training	2 years	2 years	6 months / 100 days	3 years	2 years	

<sup>19</sup> Supervision for first-time partials and immediate dentures only<sup>20</sup> Certificate of oral health issued by a dentists required for partial dentures<sup>21</sup> C = complete dentures; P = partial dentures

Table 6: Distribution of the sample size and number of residential areas (RA) by sub-region and population group in the Western Cape Province

Sub-region	Sample size		Population group					
	n	(RA)	White	Coloured	Indian	Black		
Bellville	-	(-)	83	(4)	158	(5)	249	(9)
Goodwood	-	(-)	90	(2)	103	(4)	193	(6)
Wynberg	162	(4)	66	(2)	-	(-)	228	(6)
Cape Town	-	(-)	-	(-)	34	(-)	34	(1)
<b>SUB-REGION A</b>	<b>162</b>	<b>(4)</b>	<b>239</b>	<b>(8)</b>	<b>295</b>	<b>(10)</b>	<b>696</b>	<b>(22)</b>
Paarl	32	(1)	79	(3)	38	(3)	149	(7)
Somersot West	24	(1)	89	(4)	23	(2)	136	(7)
Strand	30	(1)	-	(-)	-	(-)	30	(1)
Wellington	-	(-)	36	(2)	20	(2)	56	(4)
<b>SUB-REGION B</b>	<b>86</b>	<b>(3)</b>	<b>204</b>	<b>(9)</b>	<b>81</b>	<b>(7)</b>	<b>371</b>	<b>(19)</b>
Piketberg	33	(1)	64	(2)	29	(1)	126	(4)
Worcester	41	(1)	41	(5)	20	(3)	102	(9)
Montagu	25	(1)	33	(2)	30	(1)	88	(4)
Caledon	-	(-)	133	(5)	54	(2)	187	(7)
<b>SUB-REGION C</b>	<b>99</b>	<b>(3)</b>	<b>271</b>	<b>(14)</b>	<b>133</b>	<b>(7)</b>	<b>503</b>	<b>(24)</b>
Vredendal	-	(-)	16	(1)	43	(2)	59	(3)
Oudtshoorn	11	(1)	85	(4)	29	(1)	125	(9)
Unlondale	-	(-)	20	(1)	13	(1)	33	(2)
<b>SUB-REGION D</b>	<b>11</b>	<b>(1)</b>	<b>121</b>	<b>(6)</b>	<b>85</b>	<b>(3)</b>	<b>217</b>	<b>(10)</b>
<b>WESTERN CAPE TOTAL</b>	<b>358</b>	<b>(11)</b>	<b>835</b>	<b>(37)</b>	<b>594</b>	<b>(27)</b>	<b>1787</b>	<b>(64)</b>

Table 7. Number of institutions and elderly sampled

Institution	Institutions	Elderly
<b>Sub-region A</b>		
Bellville	5	82
Cape Town	1	23
Goodwood	3	63
Wynberg	3	81
<b>Sub-region B</b>		
Somerset West	1	16
<b>Sub-region C</b>		
Caledon	2	41
Montagu	1	11
<b>Sub-region D</b>		
Vredendal	1	13
Oudtshoorn	1	8
<b>Total</b>	<b>18</b>	<b>348</b>

Table 8. Distribution of the sample by population group and health region in the Western Cape Province

Population Group	Cape Metropole a (R%) (C%)	West Coast b (R%) (C%)	South Coast c (R%) (C%)	South Eastern d (R%) (C%)	Total e (C%)
Coloureds	320 (40.54) (32.28)	195 (23.96) (50.00)	182 (22.36) (48.28)	107 (13.14) (67.72)	814 (45.53)
Whites	314 (53.95) (36.43)	128 (17.01) (32.82)	99 (13.01) (25.38)	47 (5.94) (29.88)	598 (32.57)
Blacks	218 (55.75) (25.29)	67 (17.14) (17.16)	96 (24.55) (25.46)	10 (2.56) (6.33)	391 (21.88)
Total	862 (48.21)	390 (21.81)	377 (21.09)	158 (8.84)	1787 (100.00)

\* Row percentage. \*\* Column percentage

Table 9: Distribution of the sample by gender and health region in the Western Cape Province

Gender	Cape Metropole	West Coast	Eastern Overberg	South West	Total
	n (C%)*	n (C%)	n (C%)	n (C%)	n (C%)
Male	361 (41,88)	197 (50,51)	195 (51,72)	86 (54,43)	839 (46,95)
Female	501 (58,12)	193 (49,49)	182 (46,28)	72 (45,57)	948 (53,05)

\* Column percentage

Table 10: Distribution of the sample by age category and health region in the Western Cape Province

Age category	Cape Metropole	West Coast	Boland / Overberg	South Cape / Karoo	Total
	n (R%) (C%)	n (R%) (C%)	n (R%) (C%)	n (R%) (C%)	n (C%)
20 – 34	220 (41,67) (25,52)	134 (25,38) (34,36)	121 (22,92) (32,10)	53 (10,04) (33,54)	528 (29,55)
35 – 49	171 (41,50) (19,84)	119 (28,88) (30,51)	85 (20,63) (22,55)	37 (8,98) (23,42)	412 (23,06)
50 – 64	152 (44,71) (17,63)	92 (27,06) (23,59)	63 (18,53) (16,71)	33 (9,71) (20,89)	340 (19,03)
65 – 79	205 (58,91) (23,78)	36 (10,34) (9,23)	78 (22,41) (20,69)	29 (8,33) (18,35)	348 (19,47)
85+	114 (71,70) (13,23)	9 (5,66) (2,31)	30 (18,87) (7,96)	6 (3,77) (3,80)	159 (8,90)

Row percentage    Column percentage

Table 11 Distribution of the sample by highest educational qualification and health region in the Western Cape Province

Educational Level	Cape Metropole	West Coast	Boland / Overberg	South Cape/ Karoo	Total
	n (R%) (C%)	n (R%) (C%)	n (R%) (C%)	n (R%) (C%)	n (C%)
No schooling	82 (51,80) (9,51)	15 (9,49) (3,85)	43 (27,22) (11,41)	18 (11,39) (11,39)	158 (8,84)
Primary	195 (44,32) (22,62)	72 (16,36) (18,46)	117 (26,59) (31,03)	56 (12,73) (35,44)	440 (24,62)
Std 6	124 (45,62) (14,39)	64 (23,36) (16,41)	58 (21,17) (15,38)	28 (10,22) (17,72)	274 (15,33)
Std 7 –9	234 (51,23) (27,15)	111 (24,34) (28,46)	81 (17,76) (21,49)	30 (6,58) (18,99)	456 (25,53)
Std 10	139 (48,60) (16,13)	75 (26,22) (19,23)	55 (19,23) (14,59)	17 (5,94) (10,96)	286 (16,00)
Std 10 + Cert/ Diploma	54 (51,43) (6,26)	27 (25,71) (6,92)	17 (16,19) (4,51)	7 (6,67) (4,43)	105 (5,88)
Std 10 + Degree	34 (50,00) (3,94)	26 (38,24) (6,67)	6 (8,82) (1,59)	2 (2,84) (1,27)	68 (3,81)

\* Row percentage \*\* Column percentage

Table 12: Distribution of the sample by yearly household income and health region in the Western Cape Province

Yearly household income	Cape Metropole		West Coast		Boland / Overberg		South Cape/ Karoo		Total	
	n	(R%) (C%)	n	(R%) (C%)	n	(R%) (C%)	n	(R%) (C%)	n	(C%)
None	31	(58.49) (3.60)	5	(9.43) (1.28)	7	(13.21) (1.86)	10	(18.87) (6.33)	53	(2.97)
< 9600	413	(48.30) (47.97)	125	(14.62) (32.05)	224	(26.20) (59.57)	93	(10.88) (58.86)	855	(47.90)
9601 – 14400	120	46.15) (13.94)	73	(28.08) (18.72)	56	(21.54) (14.89)	11	(4.23) (6.96)	260	(14.57)
14401 – 32400	137	(54.15) (15.91)	56	(22.13) (14.36)	40	(15.81) (10.64)	20	(7.91) (12.66)	253	(14.17)
32401 – 48000	84	(44.21) (9.76)	66	(34.74) (16.92)	25	(13.16) (6.65)	15	(7.89) (9.49)	190	(10.64)
48001 – 71999	47	(47.96) (5.46)	30	(30.61) (7.69)	15	(15.31) (3.99)	6	(6.12) (3.80)	98	(5.49)
> 72000	29	(38.16) (3.37)	35	(46.05) (8.97)	9	(6.12) (2.39)	3	(3.95) (1.90)	76	(4.26)

Row percentage      Column percentage  
(Missing values = 2)

Table 13. Distribution of the sample by occupational category and health region in the Western Cape Province

<b>Professional/ Managerial</b>	52 (44.44) (6.04)	41 (35.04) (10.57)	14 (11.97) (3.71)	10 (8.55, (6.33)	117 (6,56)
<b>Middle white collar</b>	46 (45.54) (5.34)	30 (29.70) (7.73)	16 (15.84) (4.24)	9 (8,91) (5,70)	101 (5,66)
<b>Skilled manual</b>	45 (45.92) (5.23)	37 (37.76) (9.54)	14 (14.29) (3.71)	2 (2,04) (1,27)	98 (5,49)
<b>Semi-skilled Services</b>	119 (52.19) (13,82)	59 (25,38) (15,21)	37 (16,23) (9,81)	13 (5,70) (8,23)	228 (12,78)
<b>Unskilled Manual</b>	66 (25.68) (7.67)	58 (22.57) (14.95)	87 (33.85) (23.08)	46 (17.90) (29.11)	257 (14,41)
<b>Economic non-active</b>	533 (54.22) (61.90)	163 (16.58) (42.01)	209 (21.26) (55.44)	78 (7.93) (49.37)	983 (55,10)

(Missing values = 2)

Table 14: Adult study population by population group and health region in the Western Cape Province

<b>Population Group</b>	<b>Cape Metropole</b>	<b>West Coast</b>	<b>Boland / Overberg</b>	<b>South Cape / Karoo</b>	<b>Total</b>
	<b>n (C%)</b>	<b>n (C%)</b>	<b>n (C%)</b>	<b>n (C%)</b>	<b>n (C%)</b>
<b>Coloureds</b>	1098224 (52.25)	364174 (70.90)	277337 (69.43)	244003 (62.46)	1983738 (58.23)
<b>Whites</b>	555065 (26.40)	106517 (20.74)	74810 (18.73)	96770 (25.28)	835162 (24.52)
<b>Blacks</b>	422992 (20.12)	41910 (8.16)	46785 (11.71)	47417 (12.14)	559104 (16.41)
<b>Asian</b>	26484 (1.26)	1044 (0.20)	501 (0.13)	481 (0.12)	28510 (0.84)
<b>Total</b>	2102765 (61.73)	513646 (15.08)	399435 (11.72)	390671 (11.47)	3406514 (100.00)

Table 15: Adult study population by gender and health region in the Western Cape Province

Gender	Cape Metropole n (%) <sup>*</sup>	West Coast n (%)	Boland / Overberg n (%)	South Cape / Karoo n (%)	Total n (%)
Male	1035652 (49,25)	261852 (50,98)	208326 (52,16)	198441 (50,79)	1704271 (50,03)
Female	1067114 (50,75)	251794 (49,02)	191408 (47,88)	192208 (48,29)	1702524 (49,97)

\* Column percentage

Table 16 Adult study population by age group and health region in the Western Cape Province

<b>Age Category</b>	<b>Cape Metropole</b>	<b>West Coast</b>	<b>Boland / Overberg</b>	<b>South Cape / Karoo</b>	<b>Total</b>
	<b>n (C%)</b>	<b>n (C%)</b>	<b>n (C%)</b>	<b>n (C%)</b>	<b>n (C%)</b>
<b>20 – 34</b>	623663 (48,01)	152752 (50,76)	114164 (48,98)	102351 (45,26)	992930 (48,22)
<b>35 – 49</b>	349880 (26,93)	79855 (26,54)	59997 (25,61)	59513 (26,45)	549245 (26,67)
<b>50 – 65</b>	219170 (16,87)	48422 (16,09)	40061 (17,19)	41761 (18,47)	349414 (16,97)
<b>65 &gt;</b>	106294 (8,18)	19902 (6,61)	19181 (8,22)	22227 (9,63)	167584 (8,14)
<b>Missing Values</b>	803758	227155	166351	164519	1361783

\*\* Column percentage

Table 17 Adult study population by educational level and health region in the Western Cape Province

Educational Level	Health region				
	Cape Metropole	West Coast	Boland / Overberg	South Cape/ Karoo	Total
	n (C%)*	n (C%)	n (C%)	n (C%)	n (C%)
No schooling	347137 (17,78)	108980 (22,31)	96734 (25,15)	88094 (23,79)	640945 (20,05)
Primary	582960 (29,85)	184493 (37,77)	163640 (42,55)	141247 (38,15)	1072340 (33,51)
Std 6	225149 (11,53)	50817 (10,40)	37134 (9,65)	35712 (9,64)	348812 (10,91)
Std 7 -9	389034 (19,92)	68702 (14,07)	44798 (11,55)	51050 (13,79)	553584 (17,32)
Std 10	280545 (14,37)	52033 (10,65)	27970 (7,27)	37480 (10,12)	398028 (12,45)
Std 10 + Cert. Diploma	77329 (3,96)	14148 (2,90)	10293 (2,68)	11670 (3,15)	113440 (3,55)
Std 10 + Degree	50788 (2,60)	9249 (1,89)	4049 (1,05)	5012 (1,35)	69098 (2,16)
Missing values	149822	25222	14816	20406	210266

\* Column percentage

Table 18 Adult study population by household income and health region in the Western Cape Province

Household Income	Health region				Total
	Cape Metropole	West Coast	Boland / Overberg	South Cape/ Karoo	
	n (C%)*	n (C%)	n (C%)	n (C%)	n (C%)
0	1100122 (53.08)	274112 (53.89)	200625 (50.47)	2092352 (54.37)	1784094 (53.04)
< 10000	508972 (24.56)	159969 (31.45)	153158 (36.53)	117903 (30.64)	840022 (27.95)
10000-15000	136359 (6.58)	23871 (4.69)	12069 (3.04)	14556 (3.78)	186855 (5.55)
15001-30000	173490 (8.37)	27800 (5.47)	17252 (4.34)	21949 (5.70)	240491 (7.15)
30001-50000	117846 (5.69)	17612 (3.46)	11143 (2.80)	16121 (4.19)	162722 (4.78)
> 500000	35833 (1.73)	5289 (1.04)	3289 (0.82)	5097 (1.32)	49499 (1.47)
Missing values	30143	4979	1917	5809	42848

\* Column percentage

Table 19 A comparison of selected sociodemographic characteristics of sampled subjects and the population in the Western Cape Province

<b>Sociodemographic Characteristics</b>	<b>Sample %</b>	<b>Population %</b>
<b>Health region</b>		
Cape Metropole	48,21	61,73
West Coast	21,81	15,08
Boland/Overberg	21,09	11,72
South Cape/Karoo	8,84	11,47
<b>Population group</b>		
White	32,57	24,52
Coloured	45,53	58,23
Asian	-	0,54
Black	21,88	16,41
<b>Gender</b>		
Male	46,95	50,03
Female	53,05	49,97
<b>Age</b>		
20-34	29,55	48,22
34-49	23,06	26,67
50-64	19,03	16,97
65-79	19,47	8,14 (65 +)
85+	8,90	
<b>Educational level</b>		
No schooling	8,84	20,05
Primary	24,62	33,55
Std 6	15,33	10,91
Std 7-9	25,53	17,32
Std 10	16,00	12,45
10+ Cert / Diploma	5,88	3,55
10+ Degree	3,81	2,16
<b>Household income</b>		
None	2,97	(None) 52,37
<9600	47,90	(<10000) 27,69
9601 - 14400	14,57	(10000 - 15000) 5,48
14401 - 32400	14,17	(15001 - 30000) 7,06
32401 - 48000	10,64	(30001 - 50000) 4,78
48001 - 71999	5,49	(> 50000) 1,45
> 72000	4,26	

Table 20. Intra-and inter-examiner variability (agreement) measured by percentage agreement scores and the combined estimates for kappa ( $k_c$ )

Variable	Intra-examiner		Inter-examiner	
	% Agreement	$k_c$	% Agreement	$k_c$
Dental status	97,3	0,89	92,5	0,77
Denture status	100	1,0	100	1,0
Denture bearing Tissue	100	1,0	100	1,0
Denture Assessment	84,3	0,78	96,7	0,58
Oral mucosal Disorders	100	1,0	100	1,0
Caries treatment Needs	95,6	0,86	93,7	0,57
Denture needs	97,3	0,89	92,5	0,77

Table 21: Consistency of ranking variables determined by means of kappa values (k) (N = 74)

<b>Social services</b>		<b>Individual subgroups</b>		<b>Health services</b>		<b>Dental services</b>	
Housing	0,51	Mother/child	0,27	Spectacles	0,49	Pain/sepsis	0,50
Education	0,37	Pre-school	0,29	Dentures	0,45	Prevention	0,53
Infrastructure	0,28	Children	0,29	Hearing aid	0,36	Restorative	0,20
Health care	0,41	Adults	0,45	Leg prosthesis	0,16	Dentures	0,48
Security	0,20	Elderly	0,44	Facial prosthesis	0,34	Orthodontics	0,36
Sport	0,13						

Table 22: Dental status of adult dentate subjects by demographic characteristics in the Western Cape Province

Independent Variable	Sample size n (%)	Dental status				
		Teeth Present x ( $\pm$ SD)	Sound teeth x ( $\pm$ SD)	Decayed teeth x ( $\pm$ SD)	Missing Teeth x ( $\pm$ SD)	Filled teeth x ( $\pm$ SD)
<b>Health region</b>						
Cape Metropole	480 (48,10)	24,21 (8,21)	19,01 (8,97)	2,97 (3,81)	7,78 (8,21)	1,87 (3,55)
West Coast	234 (23,45)	26,78 (6,59)	21,39 (7,77)	2,44 (3,63)	5,15 (6,56)	2,61 (3,91)
Bo!land/Overberg	203 (20,34)	23,04 (8,40)	18,69 (8,94)	2,65 (3,48)	8,96 (8,40)	1,53 (3,53)
South Cape/Karoo	81 (8,12)	19,69 (8,99)	15,18 (8,89)	3,06 (3,58)	12,31 (8,99)	1,30 (2,82)
ANOVA p-value		(< 0,0001)	(< 0,0001)	(0,2737) NS	(< 0,0001)	(0,0036)
<b>Population group</b>						
Whites	292 (29,33)	24,51 (8,06)	16,64 (8,41)	1,00 (1,87)	7,49 (8,06)	5,89 (4,36)
Coloureds	370 (37,04)	21,71 (9,09)	17,46 (9,16)	3,78 (4,16)	10,28 (9,09)	1,45 (1,42)
Blacks	336 (33,63)	26,69 (6,19)	23,31 (7,19)	3,25 (3,78)	5,25 (6,17)	0,11 (0,69)
ANOVA p-value		(< 0,0001)	(< 0,0001)	(< 0,0001)	(< 0,0001)	(< 0,0001)
<b>Gender</b>						
Male	536 (53,71)	24,57 (8,11)	19,47 (8,79)	2,93 (3,91)	7,40 (8,11)	1,89 (3,49)
Female	462 (46,25)	23,79 (8,24)	18,87 (8,85)	2,62 (3,41)	8,21 (8,24)	1,97 (3,73)
ANOVA p-value		(0,1325) NS	(0,2809) NS	(0,1808) NS	(0,1175) NS	(0,7398) NS
<b>Age</b>						
20 – 34	469 (46,99)	27,37 (5,74)	22,74 (7,17)	2,99 (3,67)	4,62 (5,74)	1,46 (3,01)
35 – 49	262 (26,25)	23,53 (8,03)	18,04 (8,10)	2,60 (3,60)	8,46 (8,03)	2,54 (4,06)
50 – 64	146 (14,63)	21,16 (8,21)	16,49 (9,00)	2,57 (3,32)	10,93 (8,25)	1,67 (2,92)
65 – 79	96 (9,61)	17,86 (10,29)	12,04 (9,11)	2,57 (4,49)	14,13 (10,29)	2,72 (4,80)
80+	25 (2,51)	14,08 (9,09)	7,88 (7,51)	3,16 (3,60)	17,92 (9,09)	2,64 (5,34)
ANOVA p-value		(< 0,0001)	(< 0,0001)	(0,5288) NS	(< 0,0001)	(0,0002)
<b>Overall</b>	998 (55,85)	24,21	19,19	2,79	7,77	1,93)

(NS = statistically not significant)

Table 23: Dental status of adults by socio-economic characteristics in the Western Cape Province

Independent Variable	Sample size n (%)	Dental status				
		Teeth present n (%)	Sound Teeth n (%)	Decayed teeth n (%)	Missing teeth n (%)	Filled teeth n (%)
<b>Educational level *</b>						
No schooling	88 (8,80)	22,06 (9,75)	18,09 (9,75)	3,90 (4,98)	9,94 (9,21)	0,07 (0,64)
Std 5	200 (20,04)	22,60 (9,20)	18,69 (9,52)	3,85 (4,22)	9,40 (9,20)	0,05 (0,64)
Std 6	107 (10,72)	21,41 (9,26)	17,49 (9,75)	3,47 (3,84)	10,59 (9,26)	0,45 (1,94)
Std 7 – 9	366 (26,65)	24,61 (7,51)	20,04 (8,17)	3,29 (3,64)	7,32 (7,51)	1,18 (2,81)
Std 10	202 (20,24)	26,14 (6,83)	19,88 (8,21)	1,37 (2,34)	5,86 (6,83)	4,31 (4,32)
Diploma / Cert	76 (7,62)	25,95 (6,84)	18,84 (8,27)	1,09 (1,76)	6,05 (6,84)	5,05 (4,76)
Degree	59 (5,90)	21,27 (5,98)	19,86 (8,34)	1,10 (2,29)	4,73 (5,98)	4,95 (4,30)
ANOVA p-value		<b>(0,0001)</b>	<b>(0,1176) NS</b>	<b>(0,0001)</b>	<b>(0,0001)</b>	<b>(0,0001)</b>
<b>Occupation **</b>						
Profes./Manager	98 (9,85)	28,29 (5,19)	21,96 (7,18)	0,73 (1,42)	3,70 (5,19)	4,60 (4,24)
White collar	70 (7,04)	27,13 (5,64)	20,37 (7,45)	1,23 (2,27)	4,87 (5,64)	4,84 (3,68)
Skilled manual	71 (7,14)	26,56 (5,45)	20,22 (6,69)	3,41 (3,79)	5,44 (5,45)	2,69 (3,45)
Semi-skilled	167 (16,78)	25,92 (6,78)	22,07 (7,54)	2,51 (3,13)	5,99 (6,75)	1,19 (2,81)
Unskilled menial	191 (19,20)	24,44 (7,86)	20,57 (9,25)	3,73 (4,45)	7,55 (7,86)	0,14 (0,98)
Econ. Non-active	398 (40,00)	21,43 (9,28)	16,24 (9,21)	3,11 (3,80)	10,56 (9,28)	1,81 (3,85)
ANOVA p-value		<b>(0,0001)</b>	<b>(0,0001)</b>	<b>(0,0001)</b>	<b>(0,0001)</b>	<b>(0,0001)</b>
<b>Household income ***</b>						
None	32 (3,21)	19,84 (7,99)	15,59 (7,54)	4,06 (3,54)	12,16 (7,99)	0,19 (1,06)
< 9600	409 (41,02)	22,18 (9,29)	18,21 (9,78)	3,53 (4,11)	9,78 (9,30)	0,40 (2,11)
9601 – 14400	142 (14,24)	24,31 (8,05)	20,58 (8,87)	3,21 (3,75)	7,69 (8,05)	0,44 (1,34)
14401 – 32400	150 (15,05)	26,49 (6,33)	21,14 (7,80)	2,93 (3,33)	5,51 (6,33)	2,22 (3,65)
32401 – 48000	125 (12,54)	26,23 (6,45)	19,82 (7,56)	1,70 (3,27)	5,77 (6,45)	4,20 (4,19)
48001 – 71999	78 (7,82)	27,29 (5,48)	19,39 (7,29)	0,74 (1,30)	4,71 (5,48)	5,86 (4,08)
> 72000	61 (6,12)	26,11 (6,10)	17,90 (7,63)	0,67 (1,50)	5,88 (6,10)	6,23 (4,12)
ANOVA p-value		<b>(0,0001)</b>	<b>(0,0007)</b>	<b>(0,0001)</b>	<b>(0,0001)</b>	<b>(0,0001)</b>

\* Missing values = 1; \*\* Missing values = 14; \*\*\* Missing values = 2

Table 24: Dentition status of adults by demographic characteristics in the Western Cape Province

Independent Variable	Sample size n (%)	Dentition status				Chi-Square p-value
		Fully dentate n (%)	Partially dentate n (%)	Partially edentulous n (%)	Fully edentulous n (%)	
<b>Health region</b>						
Cape Metropole	858 (48,18)	143 (16,67)	289 (33,68)	48 (5,59)	378 (44,06)	p < 0,0001
West Coast	388 (21,79)	111 (28,61)	108 (27,84)	15 (3,87)	154 (39,67)	
Boland/Overberg	377 (21,17)	62 (16,45)	110 (29,18)	31 (8,22)	174 (46,15)	
South Cape/Karoo	158 (8,87)	12 (7,59)	56 (35,44)	13 (8,23)	77 (48,73)	
<b>Population group</b>						
Coloureds	812 (45,59)	87 (10,71)	220 (27,09)	63 (7,76)	442 (54,43)	p < 0,0001
Whites	579 (32,51)	120 (20,73)	141 (24,35)	31 (5,35)	287 (49,57)	
Blacks	390 (21,90)	121 (31,03)	202 (51,79)	13 (3,33)	54 (13,85)	
<b>Gender</b>						
Male	838 (49,36)	184 (22,01)	303 (36,24)	49 (5,86)	300 (35,89)	p < 0,0001
Female	945 (53,06)	144 (15,24)	260 (27,51)	58 (6,14)	483 (51,11)	
<b>Age</b>						
20 – 34	526 (29,53)	225 (42,78)	223 (42,40)	21 (3,99)	57 (10,84)	p < 0,0001
35 – 49	409 (22,96)	67 (16,38)	159 (38,88)	36 (8,80)	147 (35,94)	
50 – 64	339 (19,03)	20 (5,90)	103 (30,38)	23 (6,78)	193 (56,93)	
65 – 79	348 (19,54)	16 (4,60)	80 (17,24)	20 (5,75)	252 (72,41)	
80+	159 (8,93)	0 (0,00)	18 (11,32)	7 (4,40)	134 (84,28)	
<b>Overall</b>	1781(100,00)	328 (18,42)	563 (31,61)	107 (6,01)	783 (43,95)	

(Missing values = 6)

Table 25: Dentition status of adults by socio-economic characteristics in the Western Cape Province

Independent Variable	Dentition status					Chi-Square p-value
	Sample size	Fully dentate	Partially dentate	Partially edentulous	Fully edentulous	
	n (%)	n (%)	n (%)	n (%)	n (%)	
<b>Educational level</b>						
No schooling	157 (8,83)	20 (12,74)	57 (36,31)	11 (7,01)	69 (43,95)	p < 0,0001
Std 5	439 (24,65)	48 (10,93)	120 (27,33)	32 (7,29)	239 (54,44)	
Std 6	274 (15,38)	22 (8,03)	71 (25,91)	14 (5,11)	167 (60,95)	
Std 7 – 9	454 (25,49)	83 (18,28)	155 (34,14)	28 (6,17)	188 (41,41)	
Std 10	286 (16,06)	94 (32,87)	94 (32,87)	14 (4,90)	84 (29,37)	
Diploma / Cert	105 (5,90)	28 (26,67)	42 (40,00)	6 (5,71)	29 (27,62)	
Degree	66 (3,71)	33 (36,36)	24 (36,36)	2 (3,03)	7 (10,61)	
<b>Occupation</b>						
Profes./Manager	115 (6,47)	55 (47,83)	39 (33,91)	4 (3,48)	17 (14,78)	p < 0,0001
White collar	101 (5,68)	41 (40,59)	24 (23,76)	5 (4,95)	31 (30,69)	
Skilled manual	97 (5,46)	29 (29,90)	38 (39,18)	4 (4,12)	26 (26,80)	
Semi-skilled	227 (12,77)	58 (25,55)	95 (41,85)	14 (6,17)	60 (26,43)	
Unskilled menial	257 (14,45)	55 (21,40)	117 (45,53)	19 (7,39)	66 (25,68)	
Econ.non-active	981 (55,17)	90 (9,17)	247 (25,18)	61 (6,22)	583 (59,43)	
<b>Household income</b>						
None	53 (2,98)	00 (0,00)	27 (50,94)	5 (9,43)	21 (39,62)	p < 0,0001
< 9600	853 (47,95)	104 (12,19)	247 (28,96)	58 (6,80)	444 (52,05)	
9601 – 14400	260 (14,61)	41 (15,77)	84 (32,31)	17 (6,54)	118 (45,38)	
14401 – 32400	253 (14,22)	64 (25,30)	75 (29,64)	11 (4,35)	103 (40,71)	
32401 – 48000	188 (10,57)	53 (28,19)	63 (33,51)	9 (4,79)	53 (33,51)	
48001 – 71999	98 (5,51)	38 (38,78)	37 (37,76)	3 (3,06)	20 (20,41)	
> 72000	74 (4,16)	27 (36,49)	30 (40,54)	4 (5,41)	13 (11,57)	

(Missing values = 8)

Table 26: Dentition status of adults by age and population group in the Western Cape Province (N = 1781)

Dentition status by age	Whites		Coloureds		Blacks	
	n	(%)	n	(%)	n	(%)
<b>Fully dentate</b>						
20 – 34	67	(68,4)	70	(27,7)	88	(50,3)
35 – 49	41	(36,6)	16	(8,2)	10	(9,7)
50 – 64	5	(4,9)	1	(0,6)	14	(17,9)
65 – 79	7	(4,3)	-	-	9	(30,0)
80 +	-	-	-	-	-	-
<b>Partially dentate</b>						
20 – 34	28	(28,6)	122	(48,2)	73	(41,7)
35 – 49	42	(37,5)	49	(25,3)	68	(66,0)
50 – 64	36	(3,53)	25	(15,7)	42	(53,8)
65 – 79	27	(16,5)	18	(11,7)	15	(50,0)
80 +	8	(7,8)	6	(11,5)	4	(100,0)
<b>Partially edentulous</b>						
20 – 34	1	(1,0)	17	(6,7)	3	(1,7)
35 – 49	6	(5,4)	24	(12,4)	6	(5,8)
50 – 64	6	(5,9)	13	(8,2)	4	(5,1)
65 – 79	13	(7,9)	7	(4,5)	-	-
80 +	5	(4,9)	2	(3,8)	-	-
<b>Fully edentulous</b>						
20 – 34	2	(2,0)	44	(17,4)	11	(6,3)
35 – 49	23	(20,5)	105	(54,1)	19	(18,4)
50 – 64	55	(53,9)	120	(75,5)	18	(23,1)
65 – 79	117	(71,3)	129	(83,8)	6	(20,0)
80 +	90	(87,4)	44	(84,6)	-	-

Table 27: Percentage of individuals 65 years and older (N = 507) with 21 or more functional teeth in the Western Cape Province

Independent variable	Whites n (%)	Coloureds n (%)	Blacks n (%)
<b>Health region</b>			
Cape Metropole	14 (8,1)	4 (3,3)	17 (73,9)
West Coast	7 (23,3)	0 (0,0)	3 (75,0)
Boland / Overberg	1 (2,0)	3 (6,0)	3 (42,9)
South Cape / Karoo	0 (0,0)	0 (0,0)	-
<b>Gender</b>			
Male	10 (10,5)	4 (4,8)	17 (70,8)
Female	12 (7,0)	3 (2,4)	6 (60,0)
<b>Educational level</b>			
No schooling	0 (0,0)	2 (3,6)	18 (69,2)
Std 5	0 (0,0)	3 (3,2)	5 (71,4)
Std 6	0 (0,0)	0 (0,0)	0 (0,0)
Std 7 – 9	4 (4,5)	2 (10,5)	-
Std 10	11 (19,6)	0 (0,0)	-
Diploma / Certificate	4 (15,4)	-	-
Degree	3 (37,5)	-	-
<b>Occupation</b>			
Professional /Manag	0 (0,0)	0 (0,0)	1 (100,0)
White collar	1 (50,0)	0 (0,0)	-
Skilled manual	-	-	-
Semi-skilled	0 (0,0)	-	1 (50,0)
Unskilled menial	-	-	1 (100,0)
Economic non-active	19 (7,2)	7 (3,5)	19 (65,5)
<b>Household income</b>			
None	-	0 (0,0)	-
< 9600	3 (2,0)	7 (3,8)	22 (66,7)
9601 – 14400	1 (3,1)	0 (0,0)	-
14401 – 32400	1 (3,0)	0 (0,0)	-
32401 – 48000	8 (28,6)	-	1 (100,0)
48001 – 71999	6 (37,5)	-	-
> 72000	3 (37,5)	-	-

Table 28: Comparison of studies on dental status in the Western Cape Province and the National Oral Health Survey

Researcher	Study area	Study Population	Sample size	Age	Total teeth	Sound teeth	Decayed teeth	Missing teeth	Filled teeth	Edentulous	
Du Plessis et al. (1994) (159)	National R.S.A.	Blacks	1159	20-34	28,7		3,5	3,2	0,2	1,0	
			158	35-44	25,9		3,7	6,1	0,1	4,3	
			194	45-64	19,6		2,9	12,4	0,1	14,3	
		Coloureds	835	20-34	19,4		2,6	12,6	1,0	20,5	
			304	35-44	9,4		1,5	22,7	0,4	49,0	
			266	45-64	6,0		1,2	26,1	0,1	68,8	
			571	20-34	27,6		1,1	4,4	7,9	5,8	
			395	35-44	21,1		0,7	10,9	8,3	15,0	
512	45-64	12,4		0,5	19,6	4,9	38,0				
Hartshorne et al. (1993) (149)	Western Cape Boland	Coloureds	257	20-29			4,8	4,4	0,04	23,8	
			250	30-44			3,3	5,2	0,02		
			197	45+			2,2	5,6	0,00	40,1	
Myburgh (1989) (155)	Cape Metro	Blacks	290	20-34		20,3	6,1	5,6	0,00		
				35-44		20,2	5,0	6,8	0,00		
				45-64		19,1	3,8	9,1	0,00		
				65+		15,5	4,0	12,5	0,00		
Louw (1982) (147)	Cape Metro	Coloureds	232	20-34		15,5	3,3	12,2	0,3	11,3	
				35-44		12,8	2,9	15,9	0,2	52,8	
				67	45+		10,3	3,2	17,9	0,1	70,7
Watermeyer (1979) (151)	Cape Metro	Institutionalized Whites	510	54+	12,9	7,8	3,1	19,1	2,1	88,8	
Van Wyk, Farman & Staz (1977) (150)	Cape Metro	Institutionalized Coloureds	585	54+	10,5	6,9	3,8	21,5	0,01	65,5	
Dreyer (1978) (153)	Cape Metro	Cape Malay	241	20-34			3,5	20,0	0,0	41,9	
				171	35-44			1,0	28,5	0,0	82,7
				47	55-64			0,6	30,6	0,0	91,5
				35	65+			0,7	29,7	0,0	89,7
Present study	Western Cape	Whites	292	20+	24,5	16,6	1,0	7,5	5,9	54,4	
		Coloureds	370		21,7	17,5	3,8	10,3	0,5	49,6	
		Blacks	336		26,7	23,3	3,3	5,3	0,1	13,8	

Table 29: Comparison of some international studies on dental status

Researcher	Study area	Study Population	Sample	Age	Total teeth	Sound teeth	Decayed teeth	Missing teeth	Filled teeth	Edentulous
U.S. Department of Health and Human Services, (1987) (160)	USA	Employed Adults	5634	20-34	26,5		1,1		7,8	0,2
			5400	35-49	23,8		0,6		10,6	4,2
			3833	50-64	20,6		0,5		9,8	14,1
			4571	65-79	17,5		0,7		7,1	39,5
			1115	80+	15,1		0,8		5,6	49,3
Stæle et al.(1996) (179)	U.K.	Elderly	255	60-64	19,1		0,9		8,8	27,8
			573	65-75+	15,6		0,9		7,1	55,5
Schier et al. (1995) (42)	Namibia	Adults	581	35-44			1,7		0,8	2,0
Downer (1991) (161)	U.K.	Adults	821	25-34		16,4	1,1	4,7	9,9	1,0
			781	35-44		13,3	1,0	6,6	11,1	4,0
			618	45-54		11,7	1,1	9,5	9,7	17,0
			1482	55+		9,5	1,1	15,1	6,2	58,0
Grabowski and Bertram (1975) (162)	Denmark	Elderly	560	65+	11,8	5,0	2,8		5,3	68,2
Langer et al. (1975) (177)	Israel	Elderly (Instit.)	862	60+	10,7					72,0
Present study	Western Cape	Whites	292	20+	24,5	16,6	1,0	7,5	5,9	54,4
		Coloureds	370		21,7	17,5	3,8	10,3	0,5	49,6
		Blacks	336		26,7	23,3	3,3	5,3	0,1	13,8

Table 30: Comparison of edentulousness in some international studies

Researcher	Study area	Study population	Sample	Age	Edentulousness (%)
Luan et al. (1989) (181)	China	Elderly		60-69	6
Helldén et al. (1989) (22)	Sweden	Adults	340	20-39	0,5
			142	40-49	2,1
			252	50-69	18,7
			101	70-79	57,4
			85	79+	70,6
Manji et al. (1988) (164)	Kenya	Rural adults		60+	18,0
Vehkalahti and Paunio (1988) (178)	Finland	Elderly		65+	58,0
Hunt et al. (1985) (183)	Iowa (USA)	Rural elderly	3673	65+	39,0
Lemasney and Murphy (1984) (184)	Ireland	Elderly (Institutionalized)	386	65+	78,0
Manderson and Ettlinger (1975) (547)	Edinburgh	Elderly (Institutionalized)	442		91,0

Table 31: Distribution of dentures by jaw type and health region in the Western Cape Province (N = 1787)

Health Region	Partially dentate				Edentulous				
	With dentures		Without dentures		With dentures		Without dentures		
	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	
<b>Cape Metro</b> <b>N=862</b>	50	26	186	230	340	306	74	77	
	2,80	1,45	10,41	12,87	19,03	17,12	4,14	4,31	
	5,80	3,02	21,58	26,68	39,44	35,50	8,58	8,93	
	54,35	63,41	49,21	49,15	50,90	50,00	37,37	40,74	
<b>West Coast</b> <b>N=390</b>	28	8	57	73	143	128	24	27	
	1,57	0,45	3,19	4,09	8,00	7,16	1,34	1,51	
	7,18	2,05	14,62	18,72	36,67	32,82	6,15	6,92	
	30,43	19,51	15,08	15,60	21,41	20,92	12,12	14,29	
<b>Boland</b> <b>N=377</b>	13	5	88	105	132	126	66	57	
	0,73	0,28	4,92	5,88	7,39	7,05	3,69	3,19	
	3,45	1,33	23,34	27,85	35,01	33,42	17,51	15,12	
	14,13	12,20	23,28	22,44	19,76	20,59	33,33	30,16	
<b>South Cape</b> <b>N=158</b>	1	2	47	60	53	52	34	28	
	0,06	0,11	2,63	3,36	2,97	2,91	1,90	1,57	
	0,63	1,27	29,75	37,97	33,54	32,91	21,52	17,72	
	1,09	4,88	12,43	12,82	7,93	8,50	17,17	14,81	
<b>Total</b> <b>N=1787</b>	n	92	41	378	468	668	612	198	189
	%	5,15	2,29	21,15	26,19	37,38	34,25	11,08	10,58

(Row percentages do not add to 100% because fully dentate individuals have been omitted to simplify the table)

Table 32: Distribution of dentures by jaw type and population group in the Western Cape Province (N=1787)

Population group	Partially dentate				Edentulous				
	With dentures		Without dentures		With dentures		Without dentures		
	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower	
<b>Whites</b> N = 582	52 2,91 8,93 56,52	30 1,68 5,15 73,17	61 3,41 10,48 16,14	104 5,82 17,87 22,22	306 17,12 52,58 45,81	276 15,44 47,42 45,10	8 0,45 1,37 4,04	14 0,78 2,41 7,41	
<b>Coloureds</b> N = 814	34 1,90 4,18 36,96	6 0,34 0,74 14,63	172 9,63 21,13 45,50	210 11,75 25,80 44,87	323 18,07 39,68 48,35	299 16,73 36,73 48,86	164 9,18 20,05 82,83	158 8,84 19,41 83,60	
<b>Blacks</b> N = 391	6 0,34 1,53 6,52	5 0,28 1,28 12,20	145 8,11 37,08 38,36	154 8,62 39,39 32,91	39 2,18 9,97 5,84	37 2,07 9,46 6,05	26 1,45 6,65 13,13	17 0,95 4,35 8,99	
<b>Total</b> N = 1787	n %	92 5,15	41 2,29	378 21,15	468 26,19	668 37,38	612 34,25	198 11,08	189 10,58

(Upper jaw: Chi-square p-value &lt;0,0001; Lower jaw: Chi-square p-value p &lt;0,0001)

Table 33: Distribution of full dentures by jaw type and age category in the Western Cape Province (N=1787)

AGE CATEGORY		EDENTULOUS SUBJECTS			
		With dentures		Without dentures	
Frequency	Per cent	Upper	Lower	Upper	Lower
Row Pct	Col Pct				
		49	42	21	22
20 – 34		2,74	2,35	1,18	1,23
n=528		9,28	7,95	3,98	4,17
		7,34	6,86	10,61	11,64
		131	115	46	38
35 – 49		7,33	6,44	2,57	2,13
n=412		31,80	27,91	11,17	9,22
		19,61	18,79	18,79	20,11
		161	154	52	43
50 – 64		9,01	8,62	2,91	2,41
n=340		47,35	45,29	15,29	12,65
		24,10	25,16	26,26	22,75
		199	182	66	71
65 – 79		11,14	10,18	3,69	3,97
n=348		57,18	52,30	18,97	20,48
		29,79	29,74	33,33	37,57
		128	119	13	15
80+		7,16	6,66	0,73	0,84
n=159		80,50	74,84	8,18	9,43
		19,16	19,44	6,57	7,94
Total	n	668	612	198	189
N=1787	%	37,38	34,25	11,08	10,58

(Upper jaw: Chi-square p-value <0,0001;

Lower jaw: Chi-square p-value <0,0001)

\*Individuals that are edentulous in either or both upper and lower jaw

Table 34. Distribution of full dentures by jaw type and educational level in the Western Cape Province (N=1787)

EDUCATIONAL LEVEL	EDENTULOUS SUBJECTS				
	Frequency	With dentures		Without dentures	
Per cent					
Row Pct	Upper	Lower	Upper	Lower	
Col Pct					
<b>No Schooling</b> n=158	33 1.85 20.89 4.94	32 1.79 20.25 5.23	43 2.41 27.22 21.76	40 2.24 25.32 21.16	
<b>Std 5</b> n=440	164 9.18 37.27 24.55	156 8.73 35.45 25.49	96 5.37 21.82 48.48	88 4.92 20.00 46.56	
<b>Std 6</b> n=274	148 8.28 54.01 22.16	135 7.55 49.27 22.06	32 1.79 11.68 16.16	35 1.96 12.77 18.51	
<b>Std 7-9</b> n=456	188 10.52 41.23 28.14	176 9.85 38.60 28.76	22 1.23 4.82 11.11	18 1.01 3.95 9.52	
<b>Std 10</b> n=286	93 5.20 32.52 13.92	78 4.36 27.27 12.75	4 0.22 1.40 2.02	7 0.39 2.45 3.70	
<b>Diploma/Cert</b> n=105	34 1.90 32.38 5.09	28 1.57 26.67 4.57	1 0.06 0.95 0.51	1 0.06 0.95 0.53	
<b>Degree</b> n=68	8 0.45 11.76 1.20	7 0.39 10.29 1.14	0 0.00 0.00 0.00	0 0.00 0.00 0.00	
<b>Total</b> N=1787	n %	668 37.38	612 34.25	198 11.08	189 10.58

(Upper jaw: Chi-square p-value &lt;0.0001;

Lower jaw: Chi-square p-value &lt;0.0001)

\*Individuals that are edentulous in either or both upper and lower jaw

Table 35 Distribution of full dentures by jaw type and occupational category in the Western Cape Province (N=1787)

OCCUPATIONAL CATEGORY	EDENTULOUS SUBJECTS			
	With dentures		Without dentures	
Frequency Per cent	Upper	Lower	Upper	Lower
Row Pct Col Pct				
<b>Professional/ Managerial n=117</b>	18 1.01 15.38 2.69	16 0.90 13.68 2.61	2 0.11 1.71 1.01	1 0.06 0.85 0.53
<b>White collar n=101</b>	32 1.79 31.68 4.79	29 1.63 28.71 4.74	3 0.17 2.97 1.52	3 0.17 2.97 1.59
<b>Skilled/manual n=98</b>	27 1.51 27.55 4.04	24 1.35 24.49 3.92	3 0.7 3.06 1.52	2 0.11 2.04 1.06
<b>Semi-skilled n=228</b>	56 3.14 24.56 8.38	48 2.69 21.05 7.84	16 0.90 7.02 8.08	15 0.84 6.58 7.94
<b>Unskilled menial n=257</b>	45 2.58 17.90 6.89	46 2.58 17.90 7.52	32 1.79 12.45 16.16	26 1.45 10.12 13.76
<b>Economic non-active n=983</b>	489 27.41 49.75 73.20	449 25.17 45.68 73.37	142 7.95 14.45 71.72	142 7.95 14.45 75.13
<b>Total N=1787</b>	<b>n</b> 668 <b>%</b> 37.38	612 34.25	198 11.08	189 10.58

(Upper jaw: Chi-square p-value &lt;0.0001.

Lower jaw: Chi-square p-value &lt;0.0001;

\*Individuals that are edentulous in either or both upper and lower jaw

Table 36: Distribution of full dentures by jaw type and household income in the Western Cape Province (N=1787)

HOUSEHOLD INCOME	EDENTULOUS SUBJECTS*				
	Frequency	With dentures		Without dentures	
Per cent					
Row Pct		Upper	Lower	Upper	Lower
Col Pct					
Nonv		16	15	9	6
n=53		0.90	0.84	0.50	0.34
		30.19	28.30	16.98	11.32
		2.40	2.45	4.57	3.19
< R9600		329	300	158	152
n=855		18.43	16.97	8.84	8.51
		38.48	35.44	17.31	17.78
		49.25	49.51	80.20	80.85
R9601-R14400		114	102	18	18
n=260		6.39	5.71	1.01	1.01
		43.85	39.23	6.92	6.92
		17.07	16.67	9.14	9.57
R14401-R32400		102	96	10	9
n=253		5.71	5.38	0.56	0.50
		40.32	37.94	3.95	3.56
		15.27	15.69	5.08	4.79
R32401-R48000		69	62	2	3
n=190		3.87	3.47	0.11	0.17
		36.32	32.63	1.05	1.58
		10.33	10.13	1.02	1.61
R48001-R71999		22	20	0	0
n=98		1.23	1.12	0.00	0.00
		22.45	20.41	0.00	0.00
		3.29	3.27	0.00	0.00
> R72000		16	14	0	0
n=76		0.90	0.78	0.00	0.00
		21.05	18.42	0.00	0.00
		2.40	2.29	0.00	0.00
Total	n	668	612	198	189
N=1787	%	37.38	34.25	11.08	10.58

(Upper jaw: Chi-square p-value <0.0001.

Lower jaw: Chi-square p-value <0.0001)

\*Individuals that are edentulous in either or both upper and lower jaw

Table 37 Age category of dentures by population group in the Western Cape Province (N=602)

POPULATION GROUP		DENTURE AGE CATEGORY (YEARS)		
		< 5 years	6 - 30 years	> 30 years
Frequency				
Per cent				
Row Pct				
Col Pct				
<b>Whites</b> (n = 270)		69 11.46 25.56 37.30	150 24.92 55.56 44.12	51 8.47 18.89 66.23
<b>Coloureds</b> (n = 296)		95 15.78 32.09 51.35	176 29.24 59.46 51.76	25 4.15 8.45 32.47
<b>Blacks</b> (n = 30)		21 3.49 58.33 11.35	14 2.33 38.89 4.12	1 0.17 2.78 1.30
<b>Total</b> (N= 602)	n %	185 30.73	340 56.48	77 12.79

Chi-square test  $\chi^2 = 28.977$ ,  $df = 4$ ,  $p < 0.0001$

Table 38: Denture wearing habits of edentulous adults in the Western Cape Province (N=676)

FULL UPPER DENTURE	FULL LOWER DENTURE					Total n (%)
	Not able to wear n (%)	Wearing irregularly n (%)	Wearing regularly daytime only n (%)	Wearing regularly day and night n (%)	No denture broken or lost n (%)	
Not able to wear	27 (3.99)	0 (0.00)	3 (0.44)	2 (0.29)	6 (0.89)	38 (5.62)
Wearing irregularly	0 (0.00)	30 (4.44)	0 (0.00)	0 (0.00)	1 (0.15)	31 (4.59)
Wearing regularly daytime only	25 (3.70)	3 (0.44)	333 (49.26)	0 (0.00)	28 (4.14)	389 (57.54)
Wearing regularly day and night	17 (2.51)	1 (0.15)	11 (1.63)	164 (24.26)	19 (2.81)	212 (31.36)
No denture broken or lost	0 (0.00)	0 (0.00)	2 (0.03)	4 (0.59)	0 (0.00)	6 (0.89)
<b>Total</b>	<b>69 (10.21)</b>	<b>34 (5.03)</b>	<b>349 (51.83)</b>	<b>170 (25.15)</b>	<b>54 (7.99)</b>	<b>676 (100.00)</b>

Table 39: Denture wearing habits of edentulous adults by population group in the Western Cape Province (N=676)

POPULATION GROUP BY DENTURE TYPE	DENTURE WEARING HABITS				
	Not able to wear	Wearing irregularly	Wearing regularly daytime only	Wearing regularly day and night	No denture broken or lost
<b>WHITES (n = 309)</b>					
Upper: n	7	4	151	143	4
Row %	2,27	1,29	48,87	46,28	1,29
Col %	18,42	12,90	38,82	67,45	66,67
Lower: n	26	8	139	111	25
Row %	8,41	2,59	44,98	35,92	8,09
Col %	37,68	23,53	39,83	65,68	45,45
<b>COLOUREDS (n = 328)</b>					
Upper: n	30	25	217	54	2
Row %	9,15	7,62	66,16	16,46	0,61
Col %	78,95	80,65	55,78	25,47	33,33
Lower: n	42	24	189	44	29
Row %	12,80	7,32	57,62	13,41	8,84
Col %	60,87	70,59	54,15	26,04	52,73
<b>BLACKS (n = 39)</b>					
Upper: n	1	2	21	15	0
Row %	2,56	5,13	53,85	38,46	0,00
Col %	2,63	6,45	5,40	7,08	0,00
Lower: n	1	2	21	14	1
Row %	2,56	5,13	53,85	35,90	2,56
Col %	1,45	5,88	6,02	8,28	1,82
<b>TOTAL (N=676)</b>					
Upper: n (%)	38 (5,62)	31 (4,59)	389 (57,54)	212 (31,36)	6 (0,89)
Lower: n (%)	69 (10,21)	34 (5,03)	349 (51,63)	169 (25,00)	55 (8,14)

Chi-square test upper denture:  $\chi^2 = 83,345$ ; df 8;  $p < 0,0001$

Chi-square test lower denture:  $\chi^2 = 53,305$ ; df 8;  $p < 0,0001$

Table 40: Denture wearing habits of adults by service provider in the Western Cape Province (N=671)

SERVICE PROVIDER BY DENTURE TYPE	DENTURE WEARING HABITS				
	Not able to wear	Wearing irregularly	Wearing regularly daytime only	Wearing regularly day and night	No denture broken or lost
<b>PRIVATE (n = 480)</b>					
Upper: n	17	9	284	164	6
Row %	3,54	1,88	59,17	34,17	1,25
Col %	47,22	29,03	73,01	78,47	100,00
Lower: n	42	13	256	132	37
Row %	8,75	2,71	53,33	27,50	7,71
Col %	60,87	38,24	73,35	79,52	69,81
<b>STATE (n = 92)</b>					
Upper: n	8	6	54	24	0
Row %	8,70	6,52	58,70	26,09	0,00
Col %	22,22	19,35	13,88	11,48	0,00
Lower: n	11	5	51	16	9
Row %	11,96	5,43	55,43	17,39	9,78
Col %	15,94	14,71	14,61	9,64	16,98
<b>BACKDOOR (n = 99)</b>					
Upper: n	11	16	51	21	0
Row %	11,11	16,16	51,52	21,21	0,00
Col %	30,56	51,61	13,11	10,05	0,00
Lower: n	16	16	42	18	7
Row %	16,16	16,16	42,42	18,18	7,07
Col %	23,19	47,06	12,03	10,84	13,21
<b>TOTAL (N=671)</b>					
Upper: n (%)	36 (5,37)	31 (4,62)	389 (57,97)	209 (31,15)	6 (0,89)
Lower: n (%)	69 (10,28)	34 (5,07)	349 (52,01)	166 (24,74)	53 (7,90)

Chi-square test upper denture:  $\chi^2 = 69,127$ ; df 8;  $p < 0,0001$ Chi-square test lower denture:  $\chi^2 = 80,042$ ; df 8;  $p < 0,0001$  (frequency missing = 5)

Table 41: Comparison of the functional quality of dentures made by different providers in the Western Cape Province

FUNCTIONAL QUALITY CRITERIA	DENTIST n (%)	'BACKDOOR' n (%) <sup>1</sup>	OVERALL n (%)
<b>LIP SUPPORT</b>			
Normal – patient and dentist satisfied	446 (86.10)	62 (71.26)	508 (83.97)
Unacceptable - patient satisfied	61 (11.78)	20 (22.99)	81 (13.39)
Unacceptable - dentist and patient dissatisfied	11 (2.12)	5 (5.75)	16 (2.64)
<b>Chi-square test</b>	$\chi^2 = 12,646; p = 0,002$ (S)		
<b>INTER-OCCLUSAL RELATIONSHIP</b>			
Normal	396 (77.19)	53 (63.68)	449 (75.84)
Bite open - no free space	12 (2.34)	5 (6.02)	17 (2.85)
Bite closed	105 (20.47)	25 (30.12)	130 (21.81)
<b>Chi-square test</b>	$\chi^2 = 8,140; p = 0,017$ (S)		
<b>RETENTION</b>			
<b>UPPER JAW:</b>			
Acceptable	483 (94.34)	77 (87.50)	560 (93.33)
Poor – displaces easily	29 (5.66)	11 (12.50)	40 (6.67)
<b>LOWER JAW:</b>			
Acceptable	274 (61.02)	29 (39.73)	303 (58.05)
Poor – displaces easily	175 (38.98)	44 (60.27)	219 (41.95)
<b>Chi-square test - Retention upper jaw</b>	$\chi^2 = 5,640; p = 0,018$ (S)		
<b>Chi-square test - Retention lower jaw</b>	$\chi^2 = 11,696; p = 0,001$ (S)		
<b>STABILITY</b>			
Good – can bite an apple	316 (60.54)	45 (50.56)	361 (59.08)
Average - can bite bread but not apple	202 (38.70)	44 (49.44)	246 (40.26)
Poor – cannot bite bread	4 (0.77)	0 (0.00)	4 (0.65)
<b>Chi-square test</b>	$\chi^2 = 4,141; p = 0,126$ (NS)		
<b>OCCLUSAL PLANE</b>			
Correct	397 (77.24)	36 (40.91)	433 (71.93)
High in relation to the anterior lip-line	111 (21.60)	46 (52.27)	157 (26.08)
Upper teeth hanging posterior or tilted	6 (1.17)	6 (6.88)	12 (1.99)
<b>Chi-square test</b>	$\chi^2 = 52,936; p < 0,0001$ (S)		
<b>CENTRIC OCCLUSION</b>			
Acceptable – bilateral contact	356 (76.39)	37 (46.84)	393 (72.11)
Unacceptable for dentist only*	108 (23.18)	42 (53.16)	150 (27.52)
Unacceptable for patient and dentist*	2 (0.43)	0 (0.00)	2 (0.37)
<b>Chi-square test</b>	$\chi^2 = 30,596; p < 0,0001$ (S)		

\* Unilateral or anterior contact only

<sup>1</sup> Backdoor providers' are individuals who illegitimately provide dentures directly to the public.

Table 42: Comparison of the physical quality of dentures made by different providers in the Western Cape Province

PHYSICAL QUALITY CRITERIA	DENTIST n (%)	'BACKDOOR' n (%)	OVERALL n (%)	CHI-SQUARE p-value
<b>Missing / fractured teeth</b>				
Upper denture	48 (9,38)	17 (19,32)	65 (10,83)	p = 0,006 (S)
Lower denture	19 (4,19)	9 (12,33)	28 (5,32)	p = 0,004 (S)
<b>Severe attrition</b>				
Upper denture	73 (14,20)	24 (27,27)	97 (16,11)	p = 0,002 (S)
Lower denture	55 (12,04)	19 (26,03)	74 (13,96)	p = 0,001 (S)
<b>Fractured denture base</b>				
Upper denture	16 (3,11)	6 (6,82)	22 (3,65)	p = 0,087 (NS)
Lower denture	4 (0,88)	1 (1,37)	5 (0,94)	p = 0,685 (NS)
<b>Surface / internal porosity's</b>				
Upper denture	0 (0,00)	2 (2,27)	2 (0,33)	p = 0,001 (S)
Lower denture	3 (0,66)	0 (0,00)	3 (0,57)	p = 0,488 (NS)
<b>Broken flanges</b>				
Upper denture	17 (3,31)	5 (5,68)	22 (3,65)	p = 0,273 (NS)
Lower denture	2 (0,44)	0 (0,00)	2 (0,38)	p = 0,571 (NS)
<b>Cracks</b>				
Upper denture	1 (0,91)	4 (4,55)	5 (0,83)	p > 0,0001 (S)
Lower denture	2 (0,44)	0 (0,00)	2 (0,38)	p = 0,571 (NS)
<b>Temporary lining</b>				
Upper denture	6 (1,17)	1 (1,14)	7 (1,16)	p = 0,980 (NS)
Lower denture	4 (0,88)	0 (0,00)	4 (0,75)	p = 0,422 (NS)
<b>Severe discoloration</b>				
Upper denture	13 (2,53)	2 (2,27)	15 (2,49)	p = 0,887 (NS)
Lower denture	10 (2,19)	1 (1,37)	11 (2,08)	p = 0,649 (NS)
<b>Severe plaque or calculus</b>				
Upper denture	23 (4,48)	2 (2,27)	25 (4,16)	p = 0,337 (NS)
Lower denture	20 (4,43)	3 (4,11)	23 (4,39)	p = 0,900 (NS)
<b>Posterior border seal absent in upper denture</b>	79 (15,37)	32 (36,36)	111 (18,44)	p < 0,0001 (S)
<b>Posterior mandibular teeth placed lingual to alveolar ridge</b>	129 (28,23)	31 (32,47)	160 (30,19)	p = 0,014 (S)

Table 43: Comparison of perceived satisfaction with dentures by denture provider in the Western Cape Province

FUNCTIONAL CRITERIA EVALUATED	PERCEIVED DENTURE SATISFACTION			
	Very satisfied no problems	Fairly satisfied occasional problem	Somewhat dissatisfied frequent problem	Very dissatisfied cannot wear denture
BY PROVIDER OF DENTURE	n (%)	n (%)	n (%)	n (%)
<b>Speechability</b>				
Dentist (n = 522)	446 (85,44)	60 (11,49)	11 (2,11)	5 (0,96)
Backdoor (n = 88)	66 (75,00)	15 (17,05)	4 (4,55)	3 (3,41)
Overall (n = 610)	512 (83,93)	75 (12,30)	15 (2,46)	8 (1,31)
Chi-square test	$\chi^2 = 8,136; p = 0,043$ (S)			
<b>Fitting of upper denture</b>				
Dentist (n = 516)	417 (80,81)	76 (14,73)	18 (3,49)	5 (0,97)
Backdoor (n = 87)	58 (66,67)	19 (21,84)	7 (8,05)	3 (3,45)
Overall (n = 603)	475 (78,72)	95 (15,75)	25 (4,15)	8 (1,33)
Chi-square test	$\chi^2 = 11,460; p = 0,009$ (S)			
<b>Fitting of lower denture</b>				
Dentist (n = 467)	267 (57,17)	88 (18,84)	73 (15,63)	39 (8,35)
Backdoor (n = 77)	29 (37,66)	16 (20,78)	19 (24,68)	13 (16,88)
Overall (n = 544)	296 (54,41)	104 (19,12)	92 (16,91)	52 (9,56)
Chi-square test	$\chi^2 = 12,985; p = 0,005$ (S)			
<b>Facial support</b>				
Dentist (n = 519)	381 (73,41)	99 (19,08)	32 (6,17)	7 (1,35)
Backdoor (n = 89)	42 (47,19)	27 (32,34)	18 (20,22)	2 (2,25)
Overall (n = 608)	423 (69,57)	126 (20,72)	50 (8,22)	9 (1,48)
Chi-square test	$\chi^2 = 30,831; p < 0,0001$ (S)			
<b>Comfort upper denture</b>				
Dentist (n = 516)	424 (82,17)	72 (13,95)	13 (2,52)	7 (1,36)
Backdoor (n = 88)	59 (67,05)	21 (23,86)	5 (5,68)	3 (3,41)
Overall (n = 604)	483 (79,97)	93 (15,40)	18 (2,98)	10 (1,66)
Chi-square test	$\chi^2 = 11,382; p = 0,010$ (S)			
<b>Comfort lower denture</b>				
Dentist (n = 468)	283 (60,47)	80 (17,09)	66 (14,10)	39 (8,33)
Backdoor (n = 77)	32 (41,56)	14 (18,18)	18 (23,38)	13 (16,88)
Overall (n = 545)	315 (57,80)	94 (17,25)	84 (15,41)	52 (9,54)
Chi-square test	$\chi^2 = 12,892; p = 0,005$ (S)			
<b>Chewing ability</b>				
Dentist (n = 523)	330 (63,1)	106 (20,27)	65 (12,43)	22 (4,21)
Backdoor (n = 88)	39 (44,32)	20 (22,73)	21 (23,86)	8 (9,09)
Overall (n = 611)	369 (60,39)	126 (20,64)	86 (14,08)	30 (4,91)
Chi-square test	$\chi^2 = 15,278; p = 0,002$ (S)			
<b>Overall satisfaction</b>				
Dentist (n = 523)	333 (63,67)	120 (22,94)	58 (11,09)	12 (2,29)
Backdoor (n = 89)	37 (41,57)	26 (29,21)	18 (20,22)	8 (8,99)
Overall (n = 612)	370 (60,46)	146 (23,86)	76 (12,42)	20 (3,27)

Table 44: Prevalence of denture related oral mucosal lesions and temporo-mandibular disorders (complaints) in individuals wearing dentures made by different providers

DISORDER	PROVIDER OF DENTURE			CHI-SQUARE TEST
	Dentist n (%)	Backdoor n (%)	Overall n (%)	
<b>ORAL MUCOSAL LESIONS</b>				
Denture stomatitis	87 (16,86)	13 (14,61)	100 (16,53)	$\chi^2 = 0,279; p = 0,597$ (NS)
Type: Pinpoint	20 (22,99)	3 (23,08)	23 (23,00)	
Diffuse erythema	43 (49,93)	7 (53,85)	50 (50,00)	
Papillary hyperplasia	24 (27,59)	3 (23,08)	27 (27,00)	
Angular cheilitis	18 (3,48)	2 (2,25)	20 (3,30)	$\chi^2 = 0,363; p = 0,542$ (NS)
Epulis fissuratum	10 (1,94)	5 (5,62)	15 (2,48)	$\chi^2 = 4,252; p = 0,039$ (S)
Acute traumatic ulcer	13 (2,52)	3 (3,37)	16 (2,64)	$\chi^2 = 0,214; p = 0,644$ (NS)
Leucoplakia	2 (0,38)	0 (0,00)	2 (0,33)	$\chi^2 = 1,554; p = 0,460$ (NS)
Tongue lesion	1 (0,19)	0 (0,00)	1 (0,17)	$\chi^2 = 0,173; p = 0,678$ (NS)
<b>TEMPORO-MANDIBULAR COMPLAINT</b>				
Restricted mouth opening	14 (2,68)	5 (5,62)	19 (3,12)	$\chi^2 = 2,187; p = 0,139$ (NS)
Clicking	51 (9,75)	9 (10,11)	60 (9,80)	$\chi^2 = 0,011; p = 0,916$ (NS)
Deviation with opening (< 5 mm)	16 (3,06)	0 (0,00)	16 (2,61)	$\chi^2 = 2,798; p = 0,095$ (NS)
Pain and tenderness with chewing	33 (6,31)	8 (8,99)	41 (6,70)	$\chi^2 = 0,873; p = 0,350$ (NS)
Popping (subluxation and/or dislocation)	36 (6,88)	10 (11,24)	46 (7,52)	$\chi^2 = 2,073; p = 0,150$ (NS)
Tired jaw	27 (5,16)	5 (6,62)	32 (5,23)	$\chi^2 = 0,032; p = 0,858$ (NS)
Clenching or grinding of teeth	26 (4,97)	1 (1,12)	27 (4,41)	$\chi^2 = 2,670; p = 0,102$ (NS)

Table 45: Availability of oral health services in the Western Cape Health Province

TYPE OF ORAL HEALTH CARE SERVICES AVAILABLE							
HEALTH REGION	PUBLIC HEALTH SERVICES				PRIVATE DENTAL SERVICES		
	Full-time n (%)	Part-time n (%)	School n (%)	None n (%)	Full-time n (%)	Part-time n (%)	None n (%)
<b>Cape Metro</b>							
N	709	34	47	69	827	35	0
(%)	(82,25)	(4,29)	(5,45)	(8,00)	(95,94)	(4,06)	(0,00)
<b>West Coast</b>							
N	145	173	15	56	224	162	4
(%)	(37,18)	(44,36)	(4,10)	(14,36)	(57,44)	(41,54)	(2,72)
<b>Boland</b>							
N	112	199	0	66	292	3	82
(%)	(29,71)	(52,79)	(0,00)	(17,51)	(77,45)	(0,80)	(21,75)
<b>South Cape</b>							
N	62	64	32	0	63	34	61
(%)	(39,24)	(40,51)	(20,25)	(0,00)	(39,87)	(21,52)	(38,61)
<b>Total</b>							
N	1028	473	95	191	1406	234	147
(%)	(57,52)	(26,47)	(5,32)	(10,69)	(78,68)	(13,09)	(8,23)

Table 46: Method of payment for oral health services by socio-demographic characteristics in the Western Cape Province

SOCIO-DEMOGRAPHIC CHARACTERISTICS	Sample n	METHOD OF PAYMENT			
		Cannot afford n (%)	Cash n (%)	Medical aid n (%)	Employer subsidy n (%)
<b>Population group</b>					
Whites	582	88 (15,12)	189 (32,47)	305 (52,41)	0 (0,00)
Coloureds	814	340 (41,77)	361 (44,35)	98 (12,04)	15 (1,84)
Blacks	391	105 (26,85)	244 (62,40)	32 (8,18)	10 (2,56)
<b>Chi-square test</b>		$\chi^2 = 423,321$ ; df = 6; p < 0,0001			
<b>Health Region</b>					
Cape Metro	862	287 (33,29)	363 (42,11)	212 (24,59)	0 (0,00)
West Coast	390	50 (12,82)	212 (54,36)	127 (32,56)	1 (0,26)
Boland / Overberg	377	117 (31,03)	179 (47,48)	61 (16,18)	20 (5,31)
South Cape / Karoo	158	79 (50,00)	40 (25,32)	35 (22,15)	4 (2,53)
<b>Chi-square test</b>		$\chi^2 = 166,255$ ; df = 9; p < 0,0001			
<b>Age subgroups</b>					
Adults	1256	267 (21,26)	620 (49,36)	344 (27,39)	25 (1,99)
Elderly non-institution.	197	80 (40,61)	79 (40,10)	38 (19,29)	0 (0,00)
Elderly institutionalised	334	186 (55,69)	95 (28,44)	53 (15,87)	0 (0,00)
<b>Chi-square test</b>		$\chi^2 = 167,693$ ; df = 68; p < 0,0001			
<b>Occupational level</b>					
Prof / manager	117	3 (2,56)	20 (17,09)	94 (80,34)	0 (0,00)
White collar	101	4 (3,96)	38 (37,62)	59 (58,42)	0 (0,00)
Skilled manual	98	1 (1,02)	61 (62,24)	36 (36,73)	0 (0,00)
Semi-skilled	228	6 (2,63)	164 (71,93)	57 (25,00)	1 (0,44)
Unskilled menial	257	51 (19,84)	173 (67,32)	12 (4,67)	21 (8,17)
Econ. Non-active	983	465 (47,30)	338 (34,38)	177 (18,01)	3 (0,31)
<b>Chi-square test</b>		$\chi^2 = 724,956$ ; df = 15; p < 0,0001			
<b>Household income</b>					
None	53	49 (92,45)	4 (7,55)	0 (0,00)	0 (0,00)
< 9600	855	429 (50,18)	366 (42,81)	36 (4,21)	24 (2,81)
9601 – 14400	260	40 (15,38)	165 (63,46)	54 (20,77)	1 (0,38)
14401 – 32400	253	13 (5,14)	152 (60,08)	88 (34,78)	0 (0,00)
32401 – 48000	190	1 (0,53)	65 (34,74)	123 (64,74)	0 (0,00)
48001 – 71999	98	0 (0,00)	18 (18,37)	80 (81,63)	0 (0,00)
> 72000	76	0 (0,00)	23 (30,26)	53 (69,74)	0 (0,00)
<b>Chi-square test</b>		$\chi^2 = 955,093$ ; df = 18; p < 0,0001			
<b>Total</b>	1787	533 (29,83)	794 (44,43)	435 (24,34)	25 (1,40)

Table 47: Medical aid by sociodemographic characteristics in the Western Cape Province

<b>SOCIODEMOGRAPHIC CHARACTERISTICS</b>	<b>Sample n</b>	<b>With medical aid n (%)</b>	<b>No medical aid n (%)</b>
<b>Population group</b>			
Whites	582	304 (52,23)	278 (47,77)
Coloureds	814	97 (11,92)	717 (88,08)
Blacks	391	29 (7,42)	362 (92,48)
<b>Chi-square test</b>		$\chi^2 = 377,784; df = 2; p < 0,0001$	
<b>Health Region</b>			
Cape Metro	862	213 (24,71)	649 (75,29)
West Coast	390	122 (31,28)	268 (68,72)
Boland / Overberg	377	59 (15,65)	318 (84,35)
South Cape / Karoo	158	36 (22,78)	122 (77,22)
<b>Chi-square test</b>		$\chi^2 = 26,065; df = 3; p < 0,0001$	
<b>Age subgroups</b>			
Adults	1256	338 (26,91)	918 (73,09)
Elderly non-institution.	197	38 (19,29)	159 (80,71)
Elderly institutionalised	334	54 (16,17)	280 (83,83)
<b>Chi-square test</b>		$\chi^2 = 19,426; df = 2; p < 0,0001$	
<b>Occupational level</b>			
Prof / manager	117	93 (79,49)	24 (20,51)
White collar	101	57 (56,44)	44 (43,56)
Skilled manual	98	36 (36,73)	62 (63,27)
Semi-skilled	228	54 (23,68)	174 (76,32)
Unskilled menial	257	10 (3,89)	247 (96,11)
Econ. Non-active	983	180 (18,31)	803 (81,69)
<b>Chi-square test</b>		$\chi^2 = 337,886; df = 5; p < 0,0001$	
<b>Educational level</b>			
No schooling	158	4 (2,53)	154 (97,47)
Std 5	440	21 (4,77)	419 (95,23)
Std 6	274	38 (13,87)	236 (86,13)
Std 7 – 9	450	97 (21,27)	359 (78,73)
Std 10	286	153 (53,50)	133 (46,50)
Diploma / certificate	105	66 (62,86)	39 (37,14)
Degree	68	51 (75,00)	17 (25,00)
<b>Chi-square test</b>		$\chi^2 = 465,853; df = 6; p < 0,0001$	
<b>Household income</b>			
None	53	0 (0,00)	53 (100,00)
< 9600	855	36 (4,21)	819 (95,79)
9601 – 14400	260	55 (21,15)	205 (78,85)
14401 – 32400	253	85 (33,60)	168 (66,40)
32401 – 48000	190	121 (63,68)	69 (36,32)
48001 – 71999	98	79 (80,61)	19 (19,39)
> 72000	76	53 (69,74)	23 (30,26)
<b>Chi-square test</b>		$\chi^2 = 637,030; df = 6; p < 0,0001$	
<b>Total</b>	<b>1787</b>	<b>430 (24,06)</b>	<b>1357 (75,94)</b>

Table 48: Regularity of visiting a dentist in the Western Cape Province by demographic characteristics

DEMOGRAPHIC CHARACTERISTICS	Sample n (%)	REGULARITY OF VISITING A DENTIST				
		Never n (%)	Yearly n (%)	3 yearly n (%)	5 yearly n (%)	Only when I have a problem n (%)
<b>Population group</b>						
Whites	582	2 (0,34)	167 (28,69)	28 (4,81)	2 (0,34)	383 (65,81)
Coloureds	814	39 (4,79)	29 (3,56)	18 (2,21)	7 (0,86)	721 (88,57)
Black	391	126 (32,23)	14 (3,58)	11 (2,81)	2 (0,51)	238 (60,87)
<b>Chi-square test</b>			$\chi^2 = 595,781; df = 10; p < 0,0001$			
<b>Health region</b>						
Cape Metro	862	94 (10,90)	103 (11,95)	31 (3,60)	7 (0,81)	627 (72,74)
West Coast	390	40 (10,26)	68 (17,44)	9 (2,31)	0 (0,00)	273 (70,00)
Boland / Overberg	377	31 (8,22)	30 (7,96)	11 (2,92)	2 (0,53)	303 (80,37)
South Cape / Karoo	158	2 (1,27)	9 (5,70)	6 (3,80)	2 (1,27)	139 (87,97)
<b>Chi-square test</b>			$\chi^2 = 68,183; df = 15; p < 0,0001$			
<b>Gender</b>						
Male	839	103 (12,28)	104 (12,40)	33 (3,93)	9 (0,95)	591 (70,44)
Female	948	64 (6,75)	106 (11,18)	24 (2,53)	3 (0,32)	751 (79,22)
<b>Chi-square test</b>			$\chi^2 = 25,780; df = 5; p < 0,0001$			
<b>Age groups</b>						
20 – 34	528	104 (19,70)	88 (16,67)	29 (5,49)	4 (0,76)	303 (57,39)
35 – 49	412	20 (4,85)	75 (18,20)	13 (3,16)	2 (0,49)	302 (73,30)
50 – 64	340	23 (6,76)	24 (7,06)	11 (3,24)	1 (0,29)	281 (82,65)
65 – 79	348	15 (4,31)	19 (5,46)	4 (1,15)	3 (0,86)	307 (88,22)
80+	159	5 (3,14)	4 (2,52)	0 (0,00)	1 (0,63)	149 (93,71)
<b>Chi-square test</b>			$\chi^2 = 276,969; df = 20; p < 0,0001$			
<b>Total</b>	1787	167 (9,35)	210 (11,75)	57 (3,19)	11 (0,62)	1342 (75,10)

Table 49: Regularity of visiting a dentist in the Western Cape Province by socioeconomic characteristics

SOCIOECONOMIC CHARACTERISTICS	Sample n (%)	REGULARITY OF VISITING A DENTIST				
		Never n (%)	Yearly n (%)	3 yearly n (%)	5 yearly n (%)	Only when I have a problem n (%)
<b>Educational level</b>						
No schooling	158	35 (22,15)	0 (0,00)	2 (1,27)	0 (0,00)	121 (76,58)
Std 5	440	46 (10,45)	1 (0,23)	5 (1,14)	1 (0,23)	387 (87,95)
Std 6	274	16 (5,84)	1 (0,36)	4 (1,46)	5 (1,82)	248 (90,51)
Std 7 – 9	456	46 (10,09)	33 (7,24)	16 (3,51)	3 (0,66)	358 (78,51)
Std 10	286	19 (6,64)	95 (33,22)	19 (6,64)	2 (0,70)	151 (52,80)
Diploma / certificate	105	4 (3,81)	41 (39,05)	9 (8,57)	0 (0,00)	51 (48,57)
Degree	68	1 (1,47)	39 (57,35)	2 (2,94)	0 (0,00)	26 (38,24)
<b>Chi-square test</b>			$\chi^2 = 587,551$ ; $df = 30$ ; $p < 0,0001$			
<b>Occupation</b>						
Prof / Manager	117	0 (0,00)	64 (54,70)	6 (5,13)	0 (0,00)	47 (40,17)
White collar	101	3 (2,97)	40 (36,60)	11 (10,89)	1 (0,99)	46 (45,54)
Skilled manual	98	13 (13,27)	21 (21,43)	7 (7,14)	0 (0,00)	57 (58,16)
Semi-skilled	228	36 (15,79)	20 (8,77)	19 (7,02)	1 (0,44)	155 (67,96)
Unskilled manual	257	50 (19,46)	4 (1,56)	1 (2,33)	3 (1,17)	194 (75,49)
Econ. Non-active	983	65 (6,61)	61 (6,21)	11 (1,12)	6 (0,61)	840 (85,45)
<b>Chi-square test</b>			$\chi^2 = 525,471$ ; $df = 25$ ; $p < 0,0001$			
<b>Household income</b>						
None	53	2 (3,77)	0 (0,00)	1 (1,89)	1 (1,89)	49 (92,45)
< 9600	855	103 (12,05)	10 (1,77)	13 (1,53)	8 (0,94)	721 (84,33)
9600 – 14400	260	29 (11,15)	9 (3,46)	5 (1,92)	1 (0,38)	216 (83,08)
14401 – 32400	253	29 (11,46)	34 (13,44)	17 (6,72)	1 (0,40)	172 (67,98)
32401 – 48000	190	3 (1,58)	56 (29,47)	14 (7,37)	0 (0,00)	117 (61,58)
48001 – 71999	98	1 (1,02)	51 (52,04)	5 (5,10)	0 (0,00)	41 (41,84)
>72000	76	0 (0,00)	49 (64,47)	2 (3,51)	0 (0,00)	25 (32,89)
<b>Chi-square test</b>			$\chi^2 = 632,180$ ; $df = 30$ ; $p < 0,0001$			

Table 50: Type of oral health care demanded by adults in the Western Cape during their last visit to a dentist (N = 1784)

TYPE OF CARE DEMANDED DURING LAST VISIT	POPULATION GROUP			TOTAL n (%)
	Whites n (%)	Coloureds n (%)	Blacks n (%)	
Examination	48 (8,25)	17 (2,09)	4 (1,03)	69 (3,87)
Preventive care	28 (4,81)	14 (1,72)	9 (2,31)	51 (2,86)
Restorations	125 (21,48)	23 (2,83)	6 (1,54)	154 (8,63)
Endodontic treatment	9 (1,55)	0 (0,00)	0 (0,00)	9 (0,50)
Crown and Bridge work	25 (4,30)	1 (0,12)	0 (0,00)	26 (1,46)
Extraction's	25 (4,30)	392 (48,28)	196 (50,26)	613 (34,36)
Full clearance	2 (0,34)	51 (6,28)	11 (2,82)	64 (3,59)
Removal of impacted teeth	4 (0,69)	1 (0,12)	0 (0,00)	5 (0,28)
Extract and immediate denture	9 (1,55)	0 (0,00)	1 (0,26)	10 (0,56)
New upper and lower denture	187 (32,13)	191 (23,52)	28 (7,18)	406 (22,76)
Full upper or lower denture only	21 (3,61)	17 (2,09)	1 (0,26)	39 (2,19)
Replace old denture	28 (4,81)	34 (4,19)	4 (1,03)	66 (3,70)
Partial denture	16 (2,75)	20 (2,46)	4 (1,03)	40 (2,24)
Cobalt chrome partial denture	2 (0,34)	1 (0,12)	0 (0,00)	3 (0,17)
denture repair	31 (5,33)	9 (1,11)	0 (0,00)	40 (2,24)
Rebase / Reline denture	15 (2,58)	1 (0,12)	0 (0,00)	16 (0,90)
Orthodontic treatment	1 (0,17)	1 (0,12)	0 (0,00)	2 (0,11)
<b>TOTAL</b>	<b>582 (32,62)</b>	<b>812 (45,52)</b>	<b>390 (21,86)</b>	<b>1784 (100,0)</b>

Table 51: Average number of full dentures subjects have had up to date in the Western Cape Province by population group, age subgroups and educational level

	FULL UPPER DENTURE ONLY			FULL LOWER DENTURE ONLY			COMPLETE DENTURE		
	n	Mean	(SD)	N	Mean	(SD)	n	Mean	(SD)
<b>Population group</b>									
Whites	295	0,29	(0,84)	292	0,10	(0,43)	287	1,99	(1,15)
Coloureds	297	0,13	(0,39)	288	0,04	(0,23)	285	1,47	(0,87)
Black	39	0,08	(0,27)	37	0,03	(0,10)	37	1,16	(0,50)
<b>ANOVA TEST</b>	<b>F = 5,33 ; p = 0,0051</b>			<b>F = 2,38 ; p = 0,0930</b>			<b>F = 24,89 ; p = 0,0001</b>		
<b>Age subgroups</b>									
Adults	312	0,18	(0,67)	299	0,04	(0,21)	293	1,63	(1,03)
Elderly institution	110	0,25	(0,81)	109	0,09	(0,32)	108	1,80	(0,93)
Elderly non-institut	209	0,21	(0,67)	209	0,10	(0,47)	208	1,75	(1,11)
<b>ANOVA TEST</b>	<b>F = 0,52 ; p = 0,5920</b>			<b>F = 2,49 ; p = 0,0835</b>			<b>F = 1,41 ; p = 0,2457</b>		
<b>Educational level</b>									
No schooling	30	0,03	(0,18)	30	0,00	(0,00)	30	1,17	(0,53)
Std 5	149	0,09	(0,34)	150	0,05	(0,24)	149	1,39	(0,73)
Std 6	139	0,19	(0,50)	137	0,07	(0,26)	136	1,70	(1,01)
Std 7 – 9	183	0,24	(0,76)	177	0,04	(0,21)	175	1,73	(1,03)
Std 10	90	0,29	(0,77)	86	0,12	(0,60)	84	2,13	(1,22)
Diploma / Cert	32	0,50	(1,14)	29	0,24	(0,09)	28	2,25	(1,38)
Degree	8	0,12	(0,35)	8	0,00	(0,00)	7	2,42	(1,90)
<b>ANOVA TEST</b>	<b>F = 2,70 ; p = 0,0136</b>			<b>F = 2,06 ; p = 0,0563</b>			<b>F = 8,41 ; p = 0,0001</b>		
<b>TOTAL</b>	<b>617</b>	<b>0,20</b>		<b>631</b>	<b>0,07</b>		<b>609</b>	<b>1,70</b>	

Table 52: Average number of full dentures subjects have had up to date in the Western Cape Province by occupation and household income

	FULL UPPER DENTURE ONLY			FULL LOWER DENTURE ONLY			COMPLETE DENTURE		
	n	Mean	(SD)	n	Mean	(SD)	n	Mean	(SD)
<b>Occupation</b>									
Prof / Manager	17	0,12	(0,33)	15	0,00	(0,00)	15	2,00	(0,92)
White collar	32	0,34	(1,06)	31	0,03	(0,18)	29	2,07	(1,33)
Skilled manual	26	0,11	(0,32)	24	0,00	(0,00)	23	1,52	(0,79)
Semi-skilled	55	0,31	(0,81)	50	0,06	(0,24)	49	1,71	(1,32)
Unskilled menial	42	0,05	(0,31)	42	0,00	(0,00)	42	1,40	(0,79)
Econ. Non-active	459	0,20	(0,62)	455	0,08	(0,38)	451	1,70	(1,01)
<b>ANOVA TEST</b>	<b>F = 1,26 ; p = 0,2775</b>			<b>F = 0,91 ; p = 0,4728</b>			<b>F = 1,80 ; p = 0,1100</b>		
<b>Household income</b>									
None	15	0,07	(0,26)	15	0,00	(0,00)	15	0,93	(0,26)
< R9600	304	0,17	(0,52)	299	0,06	(0,24)	298	1,56	(0,92)
R9601 - R14400	107	0,27	(0,87)	104	0,10	(0,55)	103	1,63	(1,13)
R14401 - R32400	100	0,16	(0,59)	100	0,05	(0,33)	97	1,67	(0,99)
R32401 - R48000	67	0,24	(0,52)	62	0,06	(0,25)	61	2,26	(1,21)
R48001 - R71999	22	0,14	(0,35)	21	0,09	(0,30)	21	2,43	(1,29)
> R72000	16	0,75	(0,44)	16	0,25	(0,58)	14	2,64	(1,34)
<b>ANOVA TEST</b>	<b>F = 2,57 ; p = 0,0181</b>			<b>F = 1,11 ; p = 0,3555</b>			<b>F = 9,71 ; p = 0,0001</b>		
<b>TOTAL</b>	617	0,20		631	0,07		609	1,70	

Table 53: Denture utilisation history by medical aid in the Western Cape Province

DENTURE UTILISATION HISTORY	With medical aid			No medical aid			ANOVA TEST	
	n	Mean	(SD)	n	Mean	(SD)		
<b>Years ago when first denture was acquired</b>								
Upper only	23	22.91	(14,82)	60	28,97	(20,79)	<b>F = 1,63</b>	<b>p = 0,2057</b>
Lower only	12	21.58	(12,76)	27	<b>41,00</b>	(17,07)	<b>F = 12,37</b>	<b>p = 0,0012</b>
Complete denture	139	29.42	(15,48)	409	26.64	(17,27)	<b>F = 2,83</b>	<b>p = 0,0932</b>
<b>Cumulative number of partial dentures to date</b>								
Partial upper	164	0.12	(0,38)	471	0.06	(0,28)	<b>F = 4,86</b>	<b>p = 0,0278</b>
Partial lower	163	0.07	(0,33)	465	0.04	(0,27)	<b>F = 1,21</b>	<b>p = 0,2711</b>
<b>Cumulative number of full dentures to date</b>								
Full upper	161	0.10	(0,49)	456	0.06	(0,27)	<b>F = 1,85</b>	<b>p = 0,1741</b>
Full lower	159	0.24	(0,74)	472	0.19	(0,60)	<b>F = 0,62</b>	<b>p = 0,4321</b>
Complete denture	154	2.00	(1,27)	455	1.60	(0,93)	<b>F = 17,67</b>	<b>p = 0,0001</b>

Table 54: Distribution of service providers of dentures that individuals are currently wearing (N = 637) by population group in the Western Cape Province

POPULATION GROUP		DENTURE PROVIDER							
		Sample	Private dentist	State dentist	Student University	Specialist	Backdoor (Informal)	Welfare clinic	Don't know
<b>Whites</b>									
n	299	262	16	13	2	5	0	1	
%	46,94	41,13	2,51	2,04	0,31	0,78	0,00	0,16	
Row %		87,63	5,35	4,35	0,67	1,67	0,00	0,33	
Col %		56,47	27,12	72,22	66,67	5,67	0,00	33,33	
<b>Coloureds</b>									
n	299	172	40	5	1	78	1	2	
%	46,94	27,00	6,28	0,78	0,16	12,24	0,16	0,31	
Row %		57,53	13,38	1,67	0,33	26,09	0,33	0,67	
Col %		37,07	67,80	27,78	33,33	87,64	100,00	66,67	
<b>Blacks</b>									
n	39	30	3	0	0	6	0	0	
%	6,12	4,71	0,47	0,00	0,00	0,94	0,00	0,00	
Row %		76,92	7,69	0,00	0,00	15,38	0,00	0,00	
Col %		6,47	5,08	0,00	0,00	9,74	0,00	0,00	
<b>Total</b>									
n	637	464	59	18	3	89	1	3	
%	35,65	72,84	9,26	2,83	0,47	13,97	0,16	0,47	
<b>Chi-square test</b>		$\chi^2 = 100,234$ df = 12; p < 0,0001							

Table 55: Distribution of service provider of dentures that individuals are currently wearing by medical aid in the Western Cape Province (N = 637)

MEDICAL AID		DENTURE PROVIDER			
		Sample	Private dentist	State dentist	'Backdoor'
<b>With medical aid</b>					
n	165	149	4	5	
%	25,90	23,39	0,63	0,78	
Row %		90,30	2,42	3,30	
Col %		32,11	6,78	5,62	
<b>No medical aid</b>					
n	472	315	55	84	
%	74,10	49,45	8,63	13,19	
Row %		66,74	11,65	17,80	
Col %		67,89	93,22	94,38	
<b>TOTAL</b>					
n	637	464	59	89	
%	35,65	72,84	9,26	13,97	
<b>Chi-square test</b>		$\chi^2 = 42,803; df = 6; p < 0,0001$			

Table 56: Professionally assessed denture treatment needs by demographic characteristics in the Western Cape Province (N =787)

DEMOGRAPHIC CHARACTERISTICS	PROFESSIONALLY ASSESSED DENTURE TREATMENT NEEDS				
	Sample n	Partial upper n (%)	Partial lower n (%)	Full upper n (%)	Full Lower n (%)
<b>Health Region</b>					
Cape Metro	862	107 (11,95)	103 (11,95)	265 (30,74)	279 (32,37)
West Coast	390	35 (8,97)	29 (17,69)	69 (17,69)	77 (19,74)
Boland / Overberg	377	50 (13,26)	43 (11,41)	135 (35,81)	140 (37,14)
South Cape / Karoo	158	16 (10,13)	26 (16,46)	81 (51,27)	71 (44,94)
Chi-Square Test		p = 0,099	p = 0,240	p < 0,0001	p < 0,0001
<b>Population group</b>					
Whites	582	24 (4,12)	39 (6,70)	146 (25,09)	170 (29,21)
Coloureds	814	91 (11,18)	87 (10,69)	352 (43,24)	351 (43,12)
Blacks	391	93 (23,79)	75 (19,18)	52 (13,30)	46 (11,76)
Chi-Square Test		p < 0,0001	p < 0,0001	p < 0,0001	p < 0,0001
<b>Age groups</b>					
Adults	1256	178 (14,17)	161 (12,82)	272 (21,66)	267 (21,26)
Elderly non-institution	197	14 (7,11)	17 (8,63)	90 (45,69)	93 (47,21)
Elderly institution	334	16 (4,79)	23 (6,89)	188 (56,29)	207 (61,98)
Chi-Square Test		p < 0,0001	p = 0,003	p < 0,0001	p < 0,0001
<b>Gender</b>					
Male	839	115 (13,71)	109 (12,99)	250 (29,80)	252 (30,04)
Female	948	93 (9,81)	92 (9,70)	300 (31,65)	315 (33,23)
Chi-Square Test		p = 0,045	p = 0,227	p < 0,0001	p < 0,0001
<b>Age category</b>					
20 – 34	528	79 (14,96)	62 (11,74)	42 (7,95)	38 (7,20)
35 – 49	412	60 (14,56)	58 (14,08)	102 (24,76)	102 (24,76)
50 – 64	340	41 (12,06)	44 (12,94)	142 (41,76)	139 (40,88)
65 – 79	348	22 (6,32)	27 (7,76)	186 (53,45)	197 (56,61)
80+	159	6 (3,77)	10 (6,29)	78 (49,06)	91 (57,23)
Chi-Square Test		p < 0,0001	p = 0,002	p < 0,0001	p < 0,0001
<b>OVERALL</b>	1787	208 (11,64)	201 (11,25)	550 (30,78)	567 (31,73)

Table 57: Professionally assessed denture treatment needs by socio-economic characteristics in the Western Cape Province (N = 1787)

SOCIOECONOMIC CHARACTERISTICS	PROFESSIONALLY ASSESSED DENTURE TREATMENT NEEDS				
	Sample n	Partial upper n (%)	Partial lower n (%)	Full upper n (%)	Full Lower n (%)
<b>Educational level</b>					
None	158	33 (20,89)	30 (18,99)	73 (46,20)	75 (47,47)
Std 5	440	52 (11,82)	50 (11,36)	207 (47,02)	202 (45,91)
Std 6	274	32 (11,68)	25 (9,12)	122 (44,53)	131 (47,81)
Std 7 – 9	456	69 (15,13)	63 (13,82)	103 (22,59)	109 (23,90)
Std 10	286	17 (5,94)	21 (7,34)	33 (11,54)	36 (12,59)
Diploma / Certificate	105	3 (2,86)	9 (8,57)	10 (9,52)	12 (11,43)
Degree	68	2 (2,94)	3 (4,41)	2 (2,94)	2 (2,94)
<b>Chi-Square Test</b>		<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>
<b>Occupation</b>					
Professional/Manage	117	2 (1,71)	7 (5,98)	7 (5,98)	7 (5,98)
White collar	101	3 (2,97)	6 (5,94)	12 (11,88)	13 (12,87)
Skilled manual	98	11 (11,22)	10 (10,20)	8 (8,16)	9 (9,18)
Semi-skilled	228	37 (16,23)	26 (11,40)	29 (12,72)	34 (14,91)
Unskilled manual	257	55 (21,40)	53 (20,62)	72 (28,02)	66 (25,68)
Econ. Non-active	983	98 (9,97)	98 (9,97)	422 (42,93)	438 (44,56)
<b>Chi-Square Test</b>		<b>p &lt; 0,0001</b>	<b>p = 0,018</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>
<b>Household income</b>					
None	53	11 (20,75)	15 (28,30)	24 (45,28)	19 (35,85)
< 9600	855	119 (13,92)	107 (12,51)	379 (44,33)	393 (45,96)
9601 – 14400	260	34 (13,08)	26 (10,00)	68 (26,15)	67 (25,72)
14401 – 32400	253	23 (9,09)	24 (9,49)	47 (18,58)	51 (20,16)
32401 – 48000	190	17 (8,95)	17 (8,95)	26 (13,68)	28 (14,74)
48001 – 71999	98	3 (3,06)	8 (8,16)	4 (4,08)	6 (6,12)
> 72000	76	1 (1,32)	4 (5,26)	1 (1,32)	2 (2,63)
<b>Chi-Square Test</b>		<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>
<b>OVERALL</b>	1787	208 (11,64)	201 (11,25)	550 (30,78)	567 (31,73)

Table 58: Professionally assessed full denture treatment needs by demographic characteristics in the Western Cape Province (N=1787)

DEMOGRAPHIC CHARACTERISTICS	PROFESSIONALLY ASSESSED DENTURE TREATMENT NEEDS				Chi-square test
	Sample n	Full upper n (%)	Full lower n (%)	Complete denture n (%)	
<b>Health Region</b>					
Cape Metro	862	17 (1,97)	25 (2,90)	238 (27,61)	$\chi^2 = 81,492$ df = 9 p<0,0001
West Coast	390	3 (0,77)	11 (2,82)	66 (16,92)	
Boland / Overberg	377	7 (1,86)	12 (3,18)	126 (33,42)	
South Cape / Karoo	158	12 (7,59)	2 (1,27)	69 (43,67)	
<b>Population group</b>					
Whites	582	3 (0,52)	26 (4,47)	141 (24,23)	$\chi^2 = 142,095$ df = 6 p<0,0001
Coloureds	814	27 (3,32)	21 (2,58)	316 (38,82)	
Blacks	391	9 (2,30)	3 (0,77)	42 (10,74)	
<b>Age groups</b>					
Adults	1256	28 (2,23)	22 (1,75)	244 (19,43)	$\chi^2 = 193,19$ df = 6 p<0,0001
Elderly non-institution	197	3 (1,52)	6 (3,05)	86 (43,65)	
Elderly institution	334	8 (2,40)	22 (6,59)	169 (50,60)	
<b>Gender</b>					
Male	839	22 (2,62)	21 (2,50)	219 (26,10)	$\chi^2 = 4,435$ df = 3 p = 0,218
Female	948	17 (1,79)	29 (3,06)	280 (29,50)	
<b>Age category</b>					
20 - 34	528	11 (2,08)	7 (1,33)	31 (5,87)	$\chi^2 = 304,64$ df = 12 p<0,0001
35 - 49	412	10 (2,43)	10 (2,43)	92 (22,33)	
50 - 64	340	9 (2,65)	5 (1,47)	133 (39,12)	
65 - 79	348	5 (1,44)	14 (4,02)	172 (49,43)	
80+	159	4 (2,52)	14 (8,81)	71 (44,75)	
<b>OVERALL</b>	<b>1787</b>	<b>39 (2,18)</b>	<b>50 (2,80)</b>	<b>499 (27,92)</b>	

Table 59: Professionally assessed full denture treatment needs by socio-economic characteristics in the Western Cape Province (N = 1787)

SOCIOECONOMIC CHARACTERISTICS	PROFESSIONALLY ASSESSED DENTURE TREATMENT NEEDS				Chi-square Test
	Sample n	Full upper n (%)	Full lower n (%)	Complete denture n (%)	
<b>Educational level</b>					
None	158	5 (3,16)	5 (3,16)	64 (40,51)	$\chi^2 = 226,31$ df = 18 p < 0,0001
Std 5	440	20 (4,55)	12 (2,73)	184 (41,82)	
Std 6	274	5 (1,82)	14 (5,11)	115 (41,97)	
Std 7 – 9	456	6 (1,32)	12 (2,63)	95 (20,83)	
Std 10	286	2 (0,70)	4 (1,40)	31 (10,84)	
Diploma / Certificate	105	1 (0,95)	3 (2,86)	9 (8,57)	
Degree	68	0 (0,00)	0 (0,00)	1 (1,47)	
<b>Occupation</b>					
Professional/Manage	117	0 (0,00)	0 (0,00)	7 (5,98)	$\chi^2 = 191,28$ df = 15 p < 0,0001
White collar	101	1 (0,99)	2 (1,98)	11 (10,89)	
Skilled manual	98	1 (1,02)	2 (2,04)	7 (7,14)	
Semi-skilled	228	1 (0,44)	6 (2,63)	28 (12,28)	
Unskilled menial	257	12 (4,67)	6 (2,33)	60 (23,35)	
Econ. Non-active	983	24 (2,44)	34 (3,46)	386 (39,27)	
<b>Household income</b>					
None	53	7 (13,21)	1 (1,89)	17 (32,08)	$\chi^2 = 221,73$ df = 18 p < 0,0001
< 9600	855	23 (2,69)	33 (3,86)	345 (40,35)	
9601 – 14400	260	6 (2,31)	4 (1,54)	61 (23,46)	
14401 – 32400	253	2 (0,79)	6 (2,37)	45 (17,70)	
32401 – 48000	190	1 (0,53)	3 (1,58)	25 (13,16)	
48001 – 71999	98	0 (0,00)	2 (2,04)	4 (4,08)	
> 72000	76	0 (0,00)	1 (1,32)	1 (1,32)	
<b>OVERALL</b>	<b>1787</b>	<b>39 (2,18)</b>	<b>50 (2,80)</b>	<b>499 (27,92)</b>	

Table 60: Patient perceived denture treatment needs by demographic characteristics in the Western Cape Province (N = 1787)

<b>PATIENT PERCEIVED DENTURE TREATMENT NEEDS</b>						
<b>DEMOGRAPHIC CHARACTERISTICS</b>	Sample	Partial upper n (%)	Partial lower n (%)	Full upper n (%)	Full lower n (%)	Complete n (%)
<b>Health Region</b>						
Cape Metro	862	20 (2.32)	9 (1.04)	18 (2.09)	24 (2.78)	192 (22.27)
West Coast	390	7 (1.80)	1 (0.26)	2 (0.51)	3 (0.77)	80 (20.51)
Boland / Overberg	377	8 (2.12)	5 (1.33)	5 (1.33)	10 (2.65)	106 (28.12)
South Cape / Karoo	158	2 (1.27)	2 (1.27)	2 (1.27)	7 (4.43)	66 (41.77)
<b>Chi-Square Test</b>		<b>p = 0,048</b>	<b>p = 0,028</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>
<b>Population Group</b>						
Whites	582	13 (2.24)	9 (1.55)	7 (1.20)	14 (2.41)	88 (15.12)
Coloureds	814	15 (1.85)	4 (0.49)	15 (1.84)	26 (3.19)	287 (35.26)
Blacks	391	9 (2.30)	4 (1.02)	5 (1.28)	4 (1.02)	69 (17.65)
<b>Chi-Square Test</b>		<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>
<b>Gender</b>						
Male	839	22 (2.62)	9 (1.07)	9 (1.07)	9 (1.07)	198 (23.60)
Female	948	15 (1.59)	8 (0.84)	18 (1.90)	35 (3.69)	246 (25.95)
<b>Chi-Square Test</b>		<b>p = 0,008</b>	<b>p = 0,027</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>
<b>Age category</b>						
20 – 34	528	15 (2.85)	4 (0.76)	5 (0.95)	8 (1.52)	73 (13.83)
35 – 49	412	9 (2.18)	7 (1.70)	8 (1.94)	9 (2.18)	111 (26.94)
50 – 64	340	9 (2.65)	4 (1.18)	4 (1.18)	3 (0.88)	124 (36.47)
65 – 79	348	4 (1.15)	2 (0.57)	8 (2.30)	14 (4.02)	106 (30.46)
80+	159	0 (0.00)	0 (0.00)	2 (1.26)	10 (6.29)	30 (18.87)
<b>Chi-Square Test</b>		<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>
<b>OVERALL</b>	1787	37 (2.07)	17 (0.95)	27 (1.51)	44 (2.46)	444 (24.85)

Table 61: Patient perceived denture treatment needs by socioeconomic characteristics in the Western Cape Province (N = 1787)

<b>PATIENT PERCEIVED DENTURE TREATMENT NEEDS</b>						
<b>SOCIOECONOMIC CHARACTERISTICS</b>	<b>Sample</b>	<b>Partial upper n (%)</b>	<b>Partial lower n (%)</b>	<b>Full upper n (%)</b>	<b>Full lower n (%)</b>	<b>Complete n (%)</b>
<b>Educational level</b>						
None	158	1 (0,63)	0 (0,00)	1 (0,63)	5 (3,16)	52 (32,91)
Std 5	440	2 (0,45)	2 (0,45)	10 (2,27)	8 (1,82)	168 (38,18)
Std 6	274	4 (1,47)	1 (0,36)	5 (1,82)	11 (4,01)	94 (34,31)
Std 7 – 9	456	20 (4,39)	7 (1,54)	6 (1,32)	13 (2,85)	95 (20,83)
Std 10	286	8 (2,81)	3 (1,05)	3 (1,05)	5 (1,75)	27 (9,44)
Diploma / Certificate	105	1 (0,95)	3 (2,86)	2 (1,90)	2 (1,90)	6 (5,71)
Degree	68	1 (1,47)	1 (1,47)	0 (0,00)	0 (0,00)	2 (2,94)
<b>Chi-Square Test</b>		<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>
<b>Occupation</b>						
Professional/Managerial	117	1 (0,85)	1 (0,85)	0 (0,00)	0 (0,00)	7 (5,98)
White collar	101	2 (1,98)	1 (0,99)	0 (0,00)	0 (0,00)	12 (11,88)
Skilled manual	98	5 (5,10)	2 (2,04)	1 (1,02)	2 (2,04)	10 (10,20)
Semi-skilled	228	7 (3,07)	3 (1,32)	2 (0,88)	6 (2,63)	40 (17,54)
Unskilled menial	257	7 (2,72)	4 (1,56)	1 (0,39)	4 (1,56)	83 (32,30)
Econ. Non-active	983	15 (1,53)	6 (9,61)	23 (2,34)	32 (3,26)	292 (29,70)
<b>Chi-Square Test</b>		<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>
<b>Household income</b>						
None	53	1 (1,89)	1 (1,89)	3 (5,66)	2 (3,77)	17 (32,08)
< 9600	855	16 (1,87)	3 (0,35)	17 (1,99)	31 (3,63)	284 (33,22)
9601 – 14400	260	5 (1,93)	4 (1,54)	3 (1,15)	5 (1,92)	69 (26,54)
14401 – 32400	253	5 (1,98)	2 (0,79)	2 (0,79)	2 (0,79)	40 (15,81)
32401 – 48000	190	7 (3,70)	4 (2,11)	2 (1,05)	4 (2,11)	23 (12,11)
48001 – 71999	98	2 (2,04)	2 (2,04)	0 (0,00)	0 (0,00)	6 (6,12)
> 72000	76	1 (1,32)	1 (1,32)	0 (0,00)	0 (0,00)	4 (5,26)
<b>Chi-Square Test</b>		<b>p = 0,346</b>	<b>p = 0,095</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>
<b>OVERALL</b>	1787	37 (2,07)	17 (0,95)	27 (1,51)	44 (2,46)	444 (24,85)

Table 62: Patient perceived intention to seek care (potential demand) for dentures by demographic characteristics in the Western Cape Province

DEMOGRAPHIC CHARACTERISTICS	SAMPLE n	TYPE OF DENTURE TREATMENT NEEDED (POTENTIAL DEMAND)				
		Partial upper n (%)	Partial lower n (%)	Full upper n (%)	Full lower n (%)	Complete n (%)
<b>Health region</b>						
Cape Metro	862	13 (1,51)	5 (0,58)	12 (1,39)	12 (1,39)	72 (8,36)
West Coast	390	3 (0,77)	2 (0,51)	1 (0,26)	2 (0,51)	33 (8,46)
Boland / Overberg	377	2 (0,53)	0 (0,00)	3 (0,80)	4 (1,06)	38 (10,08)
South Cape / Karoo	158	1 (0,64)	1 (0,63)	1 (0,63)	4 (2,53)	17 (10,76)
<b>Chi-square test</b>		p = 0,043	p = 0,073	p = 0,001	p = 0,001	p < 0,0001
<b>Population group</b>						
Whites	582	9 (1,55)	6 (1,03)	5 (0,86)	8 (1,37)	42 (7,22)
Coloureds	814	8 (0,98)	1 (0,12)	9 (1,11)	13 (1,60)	96 (11,79)
Blacks	391	2 (0,51)	1 (0,26)	3 (0,77)	1 (0,26)	22 (5,64)
<b>Chi-square test</b>		p < 0,0001	p < 0,0001	p < 0,0001	p < 0,0001	p < 0,0001
<b>Gender</b>						
Male	839	12 (1,43)	5 (0,60)	7 (0,83)	4 (0,48)	76 (9,06)
Female	948	7 (0,74)	3 (0,32)	10 (1,06)	18 (1,90)	84 (8,87)
<b>Chi-square test</b>		p = 0,007	p = 0,059	p < 0,0001	p < 0,0001	p < 0,0001
<b>Age category</b>						
20 – 34	528	7 (1,33)	0 (0,00)	4 (0,76)	4 (0,76)	19 (3,60)
35 – 49	412	4 (0,97)	4 (0,97)	3 (0,73)	7 (1,70)	49 (11,92)
50 – 64	340	6 (1,76)	3 (0,88)	4 (1,18)	0 (0,00)	47 (13,82)
65 – 79	348	2 (0,570)	1 (0,29)	6 (1,72)	7 (2,01)	36 (10,34)
80+	159	0 (0,00)	0 (0,00)	0 (0,00)	4 (2,52)	9 (5,66)
<b>Chi-square test</b>		p < 0,0001	p < 0,0001	p < 0,0001	p < 0,0001	p < 0,0001
<b>Overall</b>	1787	19 (1,06)	8 (0,45)	17 (0,95)	22 (1,23)	160 (8,95)

Table 63: Patient perceived intention to seek care (potential demand) for dentures by socioeconomic characteristics in the Western Cape Province

SOCIOECONOMIC CHARACTERISTICS	SAMPLE n	TYPE OF DENTURE TREATMENT NEEDED (POTENTIAL DEMAND)				
		Partial upper n (%)	Partial lower n (%)	Full upper n (%)	Full lower n (%)	Complete n (%)
<b>Educational level</b>						
None	158	0 (0,00)	0 (0,00)	0 (0,00)	2 (1,27)	15 (9,49)
Std 5	440	1 (0,23)	1 (0,23)	7 (1,59)	5 (1,14)	47 (10,68)
Std 6	274	1 (0,36)	0 (0,00)	2 (0,73)	6 (2,20)	38 (13,92)
Std 7 - 9	456	12 (2,63)	3 (0,66)	6 (1,32)	6 (1,32)	41 (8,99)
Std 10	286	4 (1,40)	2 (0,70)	1 (0,35)	1 (0,35)	14 (4,90)
Diploma/certificate	105	0 (0,00)	1 (0,95)	1 (0,95)	2 (1,90)	5 (4,76)
Degree	68	1 (1,47)	1 (1,47)	0 (0,00)	0 (0,00)	0 (0,00)
<b>Chi-square test</b>		<b>p = 0,002</b>	<b>p = 0,082</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>
<b>Occupational level</b>						
Professional/Manager	117	0 (0,00)	0 (0,00)	0 (0,00)	0 (0,00)	3 (2,58)
White collar	101	2 (2,00)	2 (1,98)	0 (0,00)	0 (0,00)	5 (4,95)
Skilled manual	98	2 (2,04)	1 (1,02)	1 (1,02)	2 (2,04)	4 (4,08)
Semi-skilled	228	2 (0,88)	1 (0,44)	0 (0,00)	3 (1,32)	17 (7,49)
Unskilled menial	257	3 (1,17)	1 (0,39)	2 (0,78)	1 (0,39)	21 (8,17)
Economic non-active	963	10 (1,02)	3 (0,31)	14 (1,42)	16 (1,63)	110 (11,19)
<b>Chi-square test</b>		<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>
<b>Household income</b>						
None	53	1 (1,89)	1 (1,89)	3 (5,66)	2 (3,77)	10 (18,87)
< 9600	855	7 (0,82)	1 (0,12)	8 (0,94)	13 (1,52)	95 (11,11)
9601 - 14400	260	2 (0,77)	1 (0,38)	3 (1,16)	2 (0,77)	16 (6,18)
14401 - 32400	253	4 (1,59)	1 (0,40)	1 (0,40)	2 (0,79)	19 (7,51)
32401 - 48000	190	2 (1,05)	1 (0,53)	2 (1,05)	3 (1,58)	13 (6,84)
48001 - 71999	98	2 (2,04)	2 (2,04)	0 (0,00)	0 (0,00)	4 (4,08)
> 72000	76	1 (1,32)	1 (1,32)	0 (0,00)	0 (0,00)	3 (3,95)
<b>Chi-square test</b>		<b>p = 0,076</b>	<b>p = 0,042</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>	<b>p &lt; 0,0001</b>
<b>Overall</b>	<b>1787</b>	<b>19 (1,06)</b>	<b>8 (0,45)</b>	<b>17 (0,95)</b>	<b>22 (1,23)</b>	<b>160 (8,95)</b>

Table 64: Potential demands for extraction's and replacement with a partial denture in the Western Cape Province by demographic characteristics

DEMOGRAPHIC CHARACTERISTICS	TOTAL SAMPLE N <sub>T</sub>	DENTATE SAMPLE N <sub>D</sub>	POTENTIAL DEMANDS (WANTS)					
			Partial extraction's			Replacement with partial denture		
			n.	% of N <sub>T</sub>	% of N <sub>D</sub>	n.	% of N <sub>T</sub>	% of n.
<b>Health Region</b>								
Cape Metro	862	472	91	(10,56)	(19,28)	22	(4,66)	(24,18)
West Coast	390	233	37	(9,49)	(15,88)	3	(1,29)	(8,11)
Boland / Overberg	377	194	37	(9,81)	(19,20)	4	(2,06)	(10,18)
South Cape / Karoo	158	81	23	(14,50)	(28,30)	1	(1,23)	(4,35)
<b>Chi-square test</b>				<b>p &lt; 0,0001</b>			<b>p = 0,235</b>	
<b>Population group</b>								
Whites	582	286	11	(1,89)	(3,85)	5	(1,75)	(45,45)
Coloureds	814	359	88	(10,89)	(24,51)	10	(2,79)	(11,36)
Blacks	391	335	89	(22,76)	(26,57)	15	(4,48)	(16,85)
<b>Chi-square test</b>				<b>p &lt; 0,0001</b>			<b>p = 0,085</b>	
<b>Gender</b>								
Male	839	529	93	(11,08)	(17,58)	17	(3,21)	(18,28)
Female	948	451	95	(10,02)	(21,06)	13	(2,88)	(13,68)
<b>Chi-square test</b>				<b>p = 0,462</b>			<b>p = 0,478</b>	
<b>Age category</b>								
20 – 34	528	465	100	(18,94)	(21,51)	14	(3,01)	(14,00)
35 – 49	412	259	46	(11,17)	(17,76)	7	(2,70)	(15,22)
50 – 64	340	141	28	(8,24)	(19,86)	7	(4,96)	(25,00)
65 – 79	348	92	8	(2,30)	(8,70)	2	(2,17)	(25,00)
80 +	159	23	6	(3,77)	(26,09)	0	(0,00)	(0,00)
<b>Chi-square test</b>				<b>p = 0,003</b>			<b>p = 0,717</b>	
<b>OVERALL</b>	<b>1787</b>	<b>980 (54,88)</b>	<b>188</b>	<b>(10,52)</b>	<b>(19,18)</b>	<b>30</b>	<b>(3,06)</b>	<b>(15,96)</b>

N<sub>T</sub> = Total population; N<sub>D</sub> = Dentate population; N<sub>T</sub> = number of individuals wanting extractions, N<sub>D</sub> = number of individuals wanting replacement with dentures

Table 65: Potential demands for extraction's and replacement with a partial denture in the Western Cape Province by socioeconomic characteristics

SOCIOECONOMIC CHARACTERISTICS	TOTAL	DENTATE	POTENTIAL DEMANDS (WANTS)					
	SAMPLE	SAMPLE	Partial extraction's			Replacement with partial denture		
	N <sub>1</sub>	N <sub>2</sub>	n <sub>1</sub>	% of N <sub>1</sub>	% of N <sub>2</sub>	n <sub>2</sub>	% of N <sub>1</sub>	% of n <sub>2</sub>
<b>Educational level</b>								
No schooling	158	88	23	(14.56)	(26.14)	4	(4.55)	(17.39)
Std 5	440	195	60	(13.64)	(30.77)	5	(2.56)	(8.33)
Std 6	274	102	33	(12.04)	(32.85)	4	(3.92)	(12.12)
Std 7 – 9	456	261	53	(11.62)	(20.31)	13	(4.98)	(24.53)
Std 10	286	198	15	(5.24)	(7.58)	4	(2.02)	(26.67)
Diploma/Certificate	105	75	1	(0.95)	(1.33)	0	(0.00)	(0.00)
Degree	68	61	3	(4.41)	(4.92)	0	(0.00)	(0.00)
<b>Chi-square test</b>				<b>p &lt; 0,0001</b>			<b>p = 0,425</b>	
<b>Occupation</b>								
Professional/Manager	117	99	4	(3.42)	(4.04)	1	(1.01)	(25.00)
White collar	101	69	3	(2.97)	(4.35)	0	(0.00)	(0.00)
Skilled manual	98	72	7	(7.14)	(9.72)	2	(2.78)	(28.57)
Semi-skilled	228	165	35	(15.35)	(21.21)	7	(4.24)	(20.00)
Unskilled menial	257	188	48	(18.68)	(25.53)	6	(3.19)	(12.50)
Econ. Non-active	983	384	88	(8.95)	(22.92)	14	(3.65)	(15.91)
<b>Chi-square test</b>				<b>p &lt; 0,0001</b>			<b>p = 0,216</b>	
<b>Household income</b>								
None	53	30	11	(20.75)	(36.67)	1	(3.33)	(9.09)
< 9600	855	401	116	(13.57)	(28.93)	18	(4.48)	(15.52)
9600 – 14400	260	136	33	(12.69)	(24.26)	7	(5.15)	(21.21)
14401 – 32400	253	147	20	(7.91)	(13.61)	2	(1.36)	(10.00)
32401 – 46000	190	126	6	(3.16)	(4.76)	2	(1.59)	(33.33)
48001 – 71999	98	77	1	(1.02)	(1.30)	0	(0.00)	(0.00)
> 72000	76	62	1	(1.34)	(1.61)	0	(0.00)	(0.00)
<b>Chi-square test</b>				<b>p &lt; 0,0001</b>			<b>p = 0,844</b>	
<b>OVERALL</b>	1787	980 (54.94)	188	(10.52)	(19.18)	30	(3.08)	(16.98)

Table 66: Potential demands (wants) for extraction of all remaining teeth in either upper or lower jaw and replacement with a full upper or lower denture in the Western Cape Province by demographic characteristics

DEMOGRAPHIC CHARACTERISTICS	TOTAL SAMPLE N <sub>t</sub>	DENTATE SAMPLE N <sub>d</sub>	POTENTIAL DEMANDS (WANTS)					
			Full upper or lower clearance			Replacement with a F/U or F/L denture		
			n.	% of N <sub>t</sub>	% of N <sub>d</sub>	n.	% of N <sub>t</sub>	% of n.
<b>Health Region</b>								
Cape Metro	862	476	19	(2.20)	(3.99)	11	(2.31)	(57.89)
West Coast	390	235	5	(1.28)	(2.13)	0	(0.00)	(0.00)
Boland / Overberg	377	198	19	(5.04)	(9.60)	4	(2.02)	(21.05)
South Cape / Karoo	158	81	11	(6.96)	(13.58)	0	(0.00)	(0.00)
<b>Chi-square test</b>				<b>p &lt; 0,0001</b>			<b>p &lt; 0,0001</b>	
<b>Population group</b>								
Whites	582	287	9	(1.55)	(3.14)	2	(0.70)	(22.22)
Coloureds	814	367	29	(3.56)	(7.90)	6	(1.63)	(20.69)
Blacks	391	336	16	(4.09)	(4.76)	7	(2.08)	(43.75)
<b>Chi-square test</b>				<b>p &lt; 0,0001</b>			<b>p &lt; 0,0001</b>	
<b>Gender</b>								
Male	839	533	27	(3.22)	(5.07)	5	(0.94)	(18.52)
Female	948	457	27	(2.85)	(5.91)	10	(2.19)	(37.04)
<b>Chi-square test</b>				<b>p = 0,937</b>			<b>p = 0,289</b>	
<b>Age category</b>								
20 - 34	528	468	13	(2.46)	(2.78)	4	(0.85)	(30.77)
35 - 49	412	263	19	(4.61)	(7.22)	4	(1.52)	(21.05)
50 - 64	340	143	12	(3.53)	(8.39)	2	(1.40)	(16.67)
65 - 79	348	93	8	(2.30)	(8.60)	4	(4.30)	(50.00)
80 +	159	23	2	(1.26)	(8.70)	1	(4.35)	(50.00)
<b>Chi-square test</b>				<b>p = 0,002</b>			<b>p = 0,062</b>	
<b>OVERALL</b>	<b>1787</b>	<b>990 (55.40)</b>	<b>54</b>	<b>(3.02)</b>	<b>(5.45)</b>	<b>15</b>	<b>(1.52)</b>	<b>(27.78)</b>

N<sub>t</sub> = Total population; N<sub>d</sub> = Dentate population; N<sub>e</sub> = number of individuals wanting extractions; N<sub>r</sub> = number of individuals wanting replacement with dentures

Table 67: Potential demands (wants) for extraction of all remaining teeth of either the upper or lower jaw and replacement with a full upper or lower denture in the Western Cape Province by socioeconomic characteristics

SOCIOECONOMIC CHARACTERISTICS	TOTAL SAMPLE	DENTATE SAMPLE	POTENTIAL DEMANDS (WANTS)					
			Full upper or lower clearance			Replacement with F/U or F/L denture		
	N <sub>t</sub>	N <sub>d</sub>	n <sub>c</sub>	% of N <sub>t</sub>	% of N <sub>d</sub>	n <sub>r</sub>	% of N <sub>t</sub>	% of n <sub>c</sub>
<b>Educational level</b>								
No schooling	158	89	10	(6.33)	(11.24)	1	(1.12)	(10.00)
Std 5	440	199	19	(4.32)	(9.55)	3	(1.51)	(15.79)
Std 6	274	105	10	(3.65)	(9.52)	3	(2.86)	(30.00)
Std 7 – 9	456	265	11	(2.41)	(4.15)	6	(2.26)	(54.55)
Std 10	286	201	3	(1.05)	(1.49)	2	(1.00)	(66.67)
Diploma/Certificate	105	73	1	(0.95)	(1.37)	0	(0.00)	(0.00)
Degree	68	58	0	(0.00)	(0.00)	0	(0.00)	(0.00)
<b>Chi-square test</b>				<b>p &lt; 0,0001</b>			<b>p = 0,001</b>	
<b>Occupation</b>								
Professional/Manager	117	99	1	(0.85)	(1.01)	0	(0.00)	(0.00)
White collar	101	69	0	(0.00)	(0.00)	0	(0.00)	(0.00)
Skilled manual	98	71	0	(0.00)	(0.00)	1	(1.41)	-
Semi-skilled	228	167	9	(3.95)	(5.39)	4	(2.40)	(44.44)
Unskilled menial	257	190	16	(6.23)	(8.42)	1	(0.53)	(6.25)
Econ. Non-active	983	391	28	(2.85)	(7.16)	9	(2.30)	(32.14)
<b>Chi-square test</b>				<b>p &lt; 0,0001</b>			<b>p = 0,010</b>	
<b>Household income</b>								
None	53	31	2	(3.77)	(6.45)	1	(3.23)	(50.00)
< 9600	855	406	40	(4.68)	(9.85)	11	(2.71)	(27.50)
9600 – 14400	260	142	8	(3.08)	(5.63)	1	(0.70)	(12.50)
14401 – 32400	253	145	2	(0.79)	(1.38)	1	(0.69)	(50.00)
32401 – 48000	190	126	0	(0.00)	(0.00)	1	(0.79)	-
48001 – 71999	98	76	1	(1.02)	(1.32)	0	(0.00)	(0.00)
> 72000	76	64	1	(1.32)	(1.56)	0	(0.00)	(0.00)
<b>Chi-square test</b>				<b>p &lt; 0,0001</b>			<b>p = 0,108</b>	
<b>OVERALL</b>	<b>1787</b>	<b>990 (55.40)</b>	<b>54</b>	<b>(3.02)</b>	<b>(5.45)</b>	<b>15</b>	<b>(1.52)</b>	<b>(27.78)</b>

Table 68: Potential demands (wants) for a full clearance (extraction of all remaining teeth) and replacement with a complete (full upper and lower) denture in the Western Cape Province by demographic characteristics

DEMOGRAPHIC CHARACTERISTICS	TOTAL SAMPLE N <sub>t</sub>	DENTATE SAMPLE N <sub>d</sub>	POTENTIAL DEMANDS (WANTS)					
			Extraction of all remaining teeth			Replacement with a complete denture		
			n <sub>e</sub>	% of N <sub>t</sub>	% of N <sub>d</sub>	n <sub>r</sub>	% of N <sub>t</sub>	% of n <sub>e</sub>
<b>Health Region</b>								
Cape Metro	862	476	45	(5.22)	(9.45)	45	(9.45)	(100.00)
West Coast	390	235	17	(4.36)	(7.23)	17	(7.23)	(100.00)
Boland / Overberg	377	198	36	(9.55)	(18.18)	38	(19.19)	(100.00)
South Cape / Karoo	158	81	23	(14.56)	(28.40)	11	(13.58)	(47.83)
<b>Chi-square test</b>				<b>p &lt; 0.0001</b>			<b>p &lt; 0.0001</b>	
<b>Population group</b>								
Whites	582	287	1	(0.17)	(0.35)	6	(2.09)	(100.00)
Coloureds	814	367	82	(10.07)	(22.34)	64	(17.44)	(78.05)
Blacks	391	336	38	(9.72)	(11.31)	41	(12.20)	(100.00)
<b>Chi-square test</b>				<b>p &lt; 0.0001</b>			<b>p &lt; 0.0001</b>	
<b>Gender</b>								
Male	839	533	68	(8.10)	(12.76)	61	(11.44)	(89.21)
Female	948	457	53	(5.59)	(11.60)	50	(10.94)	(94.34)
<b>Chi-square test</b>				<b>p = 0.937</b>			<b>p = 0.289</b>	
<b>Age category</b>								
20 - 34	528	468	48	(9.09)	(10.26)	44	(9.40)	(91.67)
35 - 49	412	263	40	(9.66)	(15.21)	40	(15.21)	(100.00)
50 - 64	340	143	18	(5.29)	(12.59)	20	(13.99)	(100.00)
65 - 79	348	93	12	(3.45)	(12.90)	6	(6.45)	(50.00)
80 +	159	23	3	(1.89)	(13.04)	1	(4.35)	(33.33)
<b>Chi-square test</b>				<b>p = 0.002</b>			<b>p = 0.062</b>	
<b>OVERALL</b>	<b>1787</b>	<b>990 (55.40)</b>	<b>121</b>	<b>(6.77)</b>	<b>(12.22)</b>	<b>111</b>	<b>(11.21)</b>	<b>(91.74)</b>

N<sub>t</sub> = Total population; N<sub>d</sub> = Dentate population; N<sub>e</sub> = number of individuals wanting extractions. N<sub>r</sub> = number of individuals wanting replacement with dentures

Table 69: Potential demands (wants) for extraction of all remaining teeth and replacement with a complete (full upper and lower) denture in the Western Cape Province by socioeconomic characteristics

SOCIOECONOMIC CHARACTERISTICS	TOTAL SAMPLE	DENTATE SAMPLE	POTENTIAL DEMANDS (WANTS)						
			Extraction of all remaining teeth			Replacement with a complete denture			
			N <sub>t</sub>	N <sub>d</sub>	n <sub>e</sub>	% of N <sub>t</sub>	% of N <sub>d</sub>	n <sub>r</sub>	% of N <sub>t</sub>
<b>Educational level</b>									
No schooling	158	89	15	(9.49)	(16.85)	14	(15.73)	(93.33)	
Std 5	440	199	50	(11.36)	(25.13)	40	(20.10)	(80.00)	
Std 6	274	105	24	(8.76)	(22.86)	22	(20.95)	(91.67)	
Std 7 – 9	456	265	28	(6.14)	(10.57)	30	(11.32)	(100.00)	
Std 10	286	201	2	(0.70)	(1.00)	3	(1.49)	(100.00)	
Diploma/Certificate	105	73	1	(0.95)	(1.37)	1	(1.37)	(100.00)	
Degree	68	58	1	(1.47)	(1.72)	0	(0.00)	(0.00)	
<b>Chi-square test</b>				<b>p &lt; 0,0001</b>			<b>p = 0,001</b>		
<b>Occupation</b>									
Professional/Manager	117	99	0	(0.00)	(0.00)	1	(1.01)	-	
White collar	101	65	0	(0.00)	(0.00)	0	(0.00)	-	
Skilled manual	98	71	4	(4.08)	(5.63)	2	(2.82)	(50.00)	
Semi-skilled	228	167	9	(3.95)	(5.39)	14	(8.38)	(100.00)	
Unskilled menial	257	190	46	(17.90)	(24.21)	45	(23.68)	(97.83)	
Econ. Non-active	983	391	62	(6.30)	(15.86)	48	(12.28)	(77.42)	
<b>Chi-square test</b>				<b>p &lt; 0,0001</b>			<b>p = 0,018</b>		
<b>Household Income</b>									
None	53	31	6	(11.32)	(19.35)	6	(19.35)	(100.00)	
< 9600	855	406	80	(9.36)	(19.70)	70	(17.24)	(87.50)	
9600 – 14400	260	142	27	(10.38)	(19.01)	27	(19.01)	(100.00)	
14401 – 32400	253	145	4	(1.58)	(2.78)	3	(2.07)	(75.00)	
32401 – 48000	190	126	4	(2.11)	(3.17)	3	(2.38)	(75.00)	
48001 – 71999	98	76	0	(0.00)	(0.00)	1	(1.32)	-	
> 72000	76	64	0	(0.00)	(0.00)	1	(1.59)	-	
<b>Chi-square test</b>				<b>p &lt; 0,0001</b>			<b>p = 0,188</b>		
<b>OVERALL</b>	1787	990 (55.40)	121	(6.77)	(12.22)	111	(11.21)	(91.74)	

Table 70: Distribution of individuals with dentures or that had dentures by demographic characteristics in the Western Cape Province that intend having their dentures replaced (potential demand) (N = 666)

Demographic Characteristics	Sample	No, happy with old denture	Yes, F/U or F/L denture	Yes complete denture	Not sure	No getting on well without a denture	Chi-square test
	n	N (%)	n (%)	n (%)	n (%)	n (%)	
<b>Health region</b>							
Cape Metro	340	251 (63,24)	24 (7,06)	74 (21,76)	20 (5,88)	7 (2,06)	$\chi^2 = 19,300$ df = 12 p = 0,082
West Coast	142	97 (68,31)	2 (1,41)	28 (19,72)	14 (9,86)	1 (0,70)	
Boland / Overberg	131	87 (66,41)	8 (6,11)	25 (19,08)	11 (8,40)	0 (0,00)	
South Cape/ Karoo	53	28 (52,83)	3 (5,66)	12 (22,64)	9 (16,98)	1 (1,89)	
<b>Population group</b>							
Whites	301	207 (68,77)	15 (4,98)	59 (19,60)	17 (5,65)	3 (1,00)	$\chi^2 = 11,542$ df = 8 p = 0,173
Coloureds	327	195 (59,63)	20 (6,12)	75 (22,94)	31 (9,48)	6 (1,83)	
Blacks	38	25 (65,79)	2 (5,26)	5 (13,16)	6 (15,99)	0 (0,00)	
<b>Age group</b>							
Adults	330	191 (57,88)	20 (6,06)	80 (24,24)	34 (10,30)	5 (1,52)	$\chi^2 = 15,925$ df = 8 p = 0,043
Elderly non-institution	112	76 (67,86)	4 (3,57)	24 (21,43)	8 (7,14)	0 (0,00)	
Elderly institutionalized	224	160 (71,43)	13 (5,80)	35 (15,63)	12 (5,36)	4 (1,79)	
<b>Gender</b>							
Male	228	147 (64,47)	10 (4,39)	54 (23,68)	14 (6,14)	3 (1,32)	$\chi^2 = 3,834$ df = 4 p = 0,429
Female	438	280 (63,93)	27 (6,16)	85 (19,41)	40 (9,13)	6 (1,37)	
<b>Age category</b>							
20 – 34	51	30 (58,82)	5 (9,80)	13 (25,49)	3 (5,88)	0 (0,00)	$\chi^2 = 27,010$ df = 16 p = 0,041
35 – 49	130	76 (58,46)	11 (8,46)	31 (23,85)	11 (8,46)	1 (0,72)	
50 – 64	100	93 (58,13)	3 (1,88)	41 (25,63)	19 (11,88)	4 (2,50)	
65 – 79	199	132 (66,33)	12 (6,03)	38 (19,10)	14 (7,04)	3 (1,51)	
80+	126	96 (76,19)	6 (4,76)	16 (12,70)	7 (5,56)	1 (0,79)	
<b>OVERALL</b>	<b>666</b>	<b>427 (64,11)</b>	<b>37 (5,56)</b>	<b>139 (20,87)</b>	<b>54 (8,11)</b>	<b>9 (1,35)</b>	

Table 71: Distribution of individuals with dentures or that had dentures by socioeconomic characteristics in the Western Cape Province that intend having their dentures replaced (potential demand) (N = 666)

Socioeconomic Characteristics	Sample	No, happy with old denture	Yes, F/U or F/L denture	Yes complete denture	Not sure	No getting on well without a denture	Chi-square test
	n	N (%)	n (%)	n (%)	n (%)	n (%)	
<b>Educational level</b>							
None	32	18 (56,25)	2 (6,25)	8 (25,00)	4 (12,50)	0 (0,00)	$\chi^2 = 27,065$ df = 24 p = 0,301
Std 5	164	99 (60,37)	9 (5,49)	35 (21,34)	17 (10,37)	4 (2,44)	
Std 6	147	87 (59,18)	12 (8,16)	29 (19,73)	16 (10,88)	3 (2,04)	
Std 7 – 9	189	124 (65,61)	8 (4,23)	45 (23,81)	11 (5,82)	1 (0,53)	
Std 10	92	66 (71,74)	2 (2,17)	17 (18,48)	6 (6,52)	1 (1,09)	
Diploma / Certificate	34	25 (73,53)	4 (11,76)	5 (14,71)	0 (0,00)	0 (0,00)	
Degree	8	8 (100,00)	0 (0,00)	0 (0,00)	0 (0,00)	0 (0,00)	
<b>Occupation</b>							
Professional/Manager	18	14 (77,78)	0 (0,00)	2 (11,11)	2 (11,11)	0 (0,00)	$\chi^2 = 20,740$ df = 20 p = 0,413
White collar	32	20 (62,50)	0 (0,00)	10 (31,25)	2 (6,25)	0 (0,00)	
Skilled manual	27	17 (62,96)	3 (11,11)	4 (14,81)	3 (11,11)	0 (0,00)	
Semi-skilled	57	38 (66,67)	5 (8,77)	13 (22,81)	1 (1,85)	0 (0,00)	
Unskilled menial	47	25 (53,19)	2 (4,26)	13 (27,66)	7 (14,89)	0 (0,00)	
Economic non-active	485	313 (64,54)	27 (5,570)	97 (20,00)	39 (8,04)	9 (1,86)	
<b>Household income</b>							
None	16	5 (31,25)	2 (12,50)	4 (37,50)	3 (18,75)	0 (0,00)	$\chi^2 = 33,050$ df = 24 p = 0,103
< 9600	328	200 (60,98)	21 (6,40)	72 (21,95)	28 (8,54)	7 (2,13)	
9601 – 14400	111	79 (71,17)	6 (5,41)	13 (11,71)	13 (11,71)	0 (0,00)	
14401 – 32400	103	71 (68,93)	4 (3,88)	25 (24,27)	3 (2,91)	0 (0,00)	
32401 – 48000	70	45 (64,29)	4 (5,71)	16 (22,86)	3 (4,29)	2 (2,86)	
48001 – 71999	21	14 (66,67)	0 (0,00)	4 (19,05)	3 (14,29)	0 (0,00)	
> 72000	17	13 (76,47)	0 (0,00)	3 (17,65)	1 (5,88)	0 (0,00)	
<b>Medical aid</b>							
Yes	163	112 (68,71)	6 (3,68)	32 (19,63)	11 (6,75)	2 (1,23)	$\chi^2 = 2,7520$ df = 4 p = 0,800
No	503	315 (62,62)	31 (6,16)	107 (21,27)	43 (8,55)	7 (1,39)	
<b>OVERALL</b>	<b>666</b>	<b>427 (64,11)</b>	<b>37 (5,56)</b>	<b>139 (20,87)</b>	<b>54 (8,11)</b>	<b>9 (1,35)</b>	

Table 72: Choice of denture provider by individuals who intend having their dentures replaced by population group in the Western Cape Province (N = 181)

PREFERRED DENTURE PROVIDER	POPULATION GROUP			
	Whites n (%)	Coloureds n (%)	Blacks n (%)	Total n (%)
Denture specialist	2 (3,17)	2 (1,93)	0 (0,00)	4 (2,21)
Private dentist	36 (57,14)	39 (35,78)	2 (22,22)	77 (42,54)
State dentist	16 (25,40)	31 (28,44)	4 (44,44)	51 (28,18)
Dental school	6 (9,52)	2 (1,83)	1 (11,11)	9 (4,97)
Dental technician	3 (4,75)	18 (16,51)	0 (0,00)	21 (11,60)
'Backdoors'	0 (0,00)	17 (15,60)	2 (22,22)	19 (10,50)
<b>Total</b>	<b>63 (34,81)</b>	<b>109 (60,22)</b>	<b>9 (4,97)</b>	<b>181 (100,00)</b>
Chi-square test	$\chi^2 = 28,564; df = 10; p = 0,001$			

Table 73 Oral health beliefs of adults in the Western Cape Province by sociodemographic characteristics regarding the statement 'Going without teeth can affect your social life and job opportunities'

Sociodemographic characteristics	Disagree n (%)	Uncertain n (%)	Agree n (%)	Chi-square test
<b>Population group</b>				$\chi^2 = 92.60$ df = 6 p < 0.0001
Whites	20 (3.44)	31 (5.33)	531 (91.24)	
Coloureds	117 (14.37)	92 (11.30)	605 (74.32)	
Blacks	47 (12.02)	64 (16.37)	278 (71.10)	
<b>Gender</b>				$\chi^2 = 12.98$ df = 3 p = 0.005
Males	92 (10.97)	108 (12.87)	639 (76.16)	
Females	92 (9.70)	79 (8.33)	775 (81.75)	
<b>Age category</b>				$\chi^2 = 33.76$ df = 12 p = 0.001
20 - 34	36 (3.82)	79 (14.96)	413 (78.22)	
35 - 49	51 (12.38)	41 (9.95)	319 (77.43)	
50 - 64	36 (10.59)	25 (7.35)	278 (81.76)	
65 - 79	48 (13.79)	32 (9.20)	268 (77.01)	
80+	13 (8.18)	10 (6.29)	136 (85.53)	
<b>Age sub-groups</b>				$\chi^2 = 8.41$ df = 6 p = 0.209
Adults	121 (9.63)	144 (11.46)	989 (78.74)	
Elderly non-institution	22 (11.17)	12 (6.09)	163 (82.74)	
Elderly institutionalized	41 (12.28)	31 (9.28)	262 (78.44)	
<b>Educational level</b>				$\chi^2 = 82.23$ df = 18 p < 0.0001
No schooling	22 (13.92)	26 (17.72)	107 (67.72)	
Std 5	76 (17.27)	51 (11.59)	312 (70.91)	
Std 6	31 (11.31)	30 (10.95)	213 (77.74)	
Std 7 - 9	37 (8.11)	50 (10.96)	369 (80.92)	
Std 10	12 (4.20)	22 (7.69)	252 (88.11)	
Diploma /Certificate	5 (4.76)	4 (3.81)	96 (91.43)	
Degree	1 (1.47)	2 (2.94)	65 (95.59)	
<b>Occupation</b>				$\chi^2 = 45.82$ df = 15 p < 0.0001
Prof / Manage.	5 (4.27)	3 (2.56)	109 (93.16)	
White collar	2 (1.92)	5 (4.85)	94 (93.07)	
Skilled manual	5 (5.10)	14 (14.29)	79 (80.61)	
Semi-skilled	28 (12.28)	34 (14.91)	166 (72.81)	
Unskilled manual	31 (12.05)	37 (14.40)	189 (73.54)	
Economic non-active	113 (11.50)	94 (9.56)	774 (78.74)	
<b>Household income</b>				$\chi^2 = 63.59$ df = 15 p < 0.0001
< R9600	129 (14.21)	110 (12.11)	667 (73.46)	
R9601 - R14000	27 (10.38)	30 (11.54)	203 (78.08)	
R14001 - R32000	18 (7.11)	27 (10.57)	208 (82.21)	
R32001 - R40000	7 (3.68)	9 (4.74)	174 (91.58)	
R48001 - R71999	1 (1.02)	7 (7.14)	90 (91.84)	
> R72000	1 (1.32)	4 (5.26)	71 (93.42)	
<b>Dental status</b>				$\chi^2 = 75.14$ df = 3 p < 0.0001
Dentate	70 (6.97)	153 (15.24)	780 (77.99)	
Edentulous	114 (14.56)	34 (4.34)	634 (80.97)	
<b>Denture status</b>				$\chi^2 = 78.19$ df = 3 p < 0.0001
Without dentures	157 (12.48)	172 (13.67)	927 (73.69)	
With dentures	25 (5.10)	15 (2.84)	484 (92.06)	
<b>Total</b>	<b>184 (10.30)</b>	<b>187 (10.46)</b>	<b>1414 (79.13)</b>	

Table 74 Denture related beliefs of adults by sociodemographic characteristics regarding the following statement "One is freed from a lot of dental problems if you have dentures"

<b>SOCIODEMOGRAPHIC CHARACTERISTICS</b>	<b>No n (%)</b>	<b>Undecided n (%)</b>	<b>Yes n (%)</b>	<b>Chi-square test</b>
<b>Population group</b>				$\chi^2 = 60.19$ df = 4 p < 0.0001
Whites	194 (33.33)	66 (14.78)	302 (51.89)	
Coloureds	193 (23.71)	95 (11.67)	526 (64.62)	
Blacks	133 (34.19)	88 (22.62)	168 (43.19)	
<b>Gender</b>				$\chi^2 = 11.11$ df = 2 p = 0.004
Males	264 (31.50)	141 (16.83)	433 (51.67)	
Females	256 (27.03)	128 (13.52)	563 (59.45)	
<b>Age category</b>				$\chi^2 = 83.68$ df = 8 p < 0.0001
20 - 34	201 (38.07)	112 (21.21)	215 (40.72)	
35 - 49	120 (29.20)	56 (13.63)	235 (57.18)	
50 - 64	97 (28.61)	37 (10.91)	205 (60.47)	
65 - 79	73 (20.93)	44 (12.64)	231 (66.38)	
80+	29 (18.24)	20 (12.58)	110 (69.18)	
<b>Age sub-groups</b>				$\chi^2 = 42.26$ df = 4 p < 0.0001
Adults	415 (33.09)	199 (15.87)	640 (51.04)	
Elderly non-institution	39 (19.80)	29 (14.72)	129 (65.48)	
Elderly institutionalized	66 (19.76)	41 (12.28)	227 (67.96)	
<b>Educational level</b>				$\chi^2 = 96.44$ df = 12 p < 0.0001
No schooling	38 (24.20)	36 (22.93)	83 (52.84)	
Std 5	96 (21.87)	61 (13.90)	282 (64.24)	
Std 6	67 (24.45)	29 (10.58)	178 (64.96)	
Std 7 - 9	124 (27.19)	57 (12.50)	275 (60.31)	
Std 10	118 (41.26)	54 (18.88)	114 (39.68)	
Diploma /Certificate	42 (40.00)	18 (17.14)	45 (42.86)	
Degree	35 (51.47)	14 (20.59)	19 (27.94)	
<b>Occupation</b>				$\chi^2 = 101.32$ df = 10 p < 0.0001
Prof / Manager	64 (54.70)	24 (20.51)	29 (24.79)	
White collar	52 (51.49)	15 (14.85)	34 (33.66)	
Skilled manual	35 (35.71)	13 (13.27)	50 (51.02)	
Semi-skilled	70 (30.84)	38 (16.74)	119 (52.42)	
Unskilled manual	67 (26.07)	45 (17.51)	145 (56.42)	
Economic non-active	230 (23.42)	134 (13.65)	618 (62.93)	
<b>Household income</b>				$\chi^2 = 85.93$ df = 10 p < 0.0001
< R9600	222 (24.50)	136 (15.01)	548 (60.49)	
R9601 - R14000	57 (24.50)	27 (10.38)	176 (67.69)	
R14001 - R32000	83 (32.81)	39 (15.42)	131 (51.78)	
R32001 - R48000	67 (35.26)	33 (17.37)	90 (47.37)	
R48001 - R71999	50 (51.02)	19 (19.39)	29 (29.59)	
> R72000	39 (51.32)	15 (19.74)	22 (28.95)	
<b>Dental status</b>				$\chi^2 = 208.08$ df = 2 p < 0.0001
Dentate	365 (36.39)	224 (22.33)	414 (41.28)	
Edentulous	155 (19.82)	45 (5.75)	582 (74.42)	
<b>Denture status</b>				$\chi^2 = 197.38$ df = 2 p < 0.0001
Without dentures	432 (39.39)	254 (20.22)	570 (45.38)	
With dentures	88 (16.64)	15 (2.84)	426 (80.53)	
<b>Total</b>	<b>518 (29.05)</b>	<b>269 (15.09)</b>	<b>996 (55.86)</b>	

Table 75. Denture related beliefs of adults by sociodemographic characteristics regarding the following statement "Dentures are as good as your own teeth"

<b>SOCIODEMOGRAPHIC CHARACTERISTICS</b>	<b>No n (%)</b>	<b>Undecided n (%)</b>	<b>Yes n (%)</b>	<b>Chi-square test</b>
<b>Population group</b>				$\chi^2 = 59.90$ df = 4 p < 0.0001
Whites	393 (67.53)	20 (3.44)	169 (29.04)	
Coloureds	410 (50.37)	47 (5.77)	357 (43.86)	
Blacks	228 (58.61)	40 (10.28)	121 (31.11)	
<b>Gender</b>				$\chi^2 = 9.61$ df = 2 p = 0.008
Males	515 (61.46)	50 (5.97)	273 (32.58)	
Females	516 (54.49)	57 (6.02)	374 (39.47)	
<b>Age category</b>				$\chi^2 = 64.92$ df = 8 p < 0.0001
20 - 34	366 (69.32)	39 (7.39)	123 (23.30)	
35 - 49	236 (57.42)	18 (4.38)	157 (23.30)	
50 - 64	184 (54.28)	22 (6.49)	133 (39.23)	
65 - 79	173 (49.71)	19 (5.46)	156 (44.83)	
80+	72 (45.28)	9 (5.66)	78 (49.06)	
<b>Age sub-groups</b>				$\chi^2 = 35.51$ df = 4 p < 0.0001
Adults	779 (62.12)	71 (5.66)	404 (32.22)	
Elderly non-institutional	98 (49.75)	16 (8.12)	83 (42.13)	
Elderly institutionalized	154 (46.11)	20 (5.99)	160 (47.90)	
<b>Educational level</b>				$\chi^2 = 138.11$ df = 12 p < 0.0001
No schooling	66 (42.04)	22 (14.01)	69 (43.95)	
Std 5	201 (45.79)	34 (7.64)	204 (46.47)	
Std 6	144 (52.55)	14 (5.11)	116 (42.34)	
Std 7 - 9	266 (58.33)	21 (4.61)	169 (37.06)	
Std 10	218 (76.22)	7 (2.45)	61 (21.33)	
Diploma /Certificate	74 (70.48)	7 (6.67)	24 (22.86)	
Degree	62 (91.18)	2 (2.94)	4 (5.88)	
<b>Occupation</b>				$\chi^2 = 107.79$ df = 10 p < 0.0001
Prof / Manager	103 (88.03)	4 (3.42)	10 (8.55)	
White collar	85 (84.16)	3 (2.97)	13 (12.87)	
Skilled manual	68 (69.39)	3 (3.06)	27 (27.55)	
Semi-skilled	140 (61.67)	8 (3.52)	79 (34.80)	
Unskilled manual	133 (51.75)	24 (9.34)	100 (38.91)	
Economic non-active	501 (51.02)	65 (6.62)	416 (42.36)	
<b>Household income</b>				$\chi^2 = 141.09$ df = 10 p < 0.0001
< R9600	428 (47.24)	69 (7.62)	409 (45.14)	
R9601 - R14000	134 (51.54)	17 (6.54)	109 (41.92)	
R14001 - R32000	173 (68.38)	8 (3.16)	72 (28.46)	
R32001 - R48000	151 (79.47)	4 (2.11)	35 (18.42)	
R48001 - R71999	81 (82.65)	4 (4.08)	13 (13.27)	
> R72000	63 (82.89)	4 (5.26)	9 (11.84)	
<b>Dental status</b>				$\chi^2 = 136.43$ df = 2 p < 0.0001
Dentate	670 (66.81)	84 (8.37)	249 (24.83)	
Edentulous	361 (46.16)	23 (2.94)	398 (50.90)	
<b>Denture status</b>				$\chi^2 = 114.92$ df = 2 p < 0.0001
Without dentures	789 (62.82)	103 (8.20)	364 (28.98)	
With dentures	242 (45.75)	4 (0.76)	283 (53.50)	
<b>Total</b>	<b>1031 (57.76)</b>	<b>107 (5.99)</b>	<b>647 (36.25)</b>	

Table 76: Perceptions regarding the current costs of dentures in the Western Cape Province by sociodemographic characteristics

SOCIODEMOGRAPHIC CHARACTERISTICS	Sample		Much too high unaffordable		Somewhat high difficult to afford		Reasonable can afford		Don't know what dentures cost		Chi-square test
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	
<b>Population group</b>											$\chi^2 = 26,05$ df = 6 $p < 0,0001$
Whites	314	(35,89)	90	(28,66)	34	(10,83)	21	(6,69)	169	(53,82)	
Coloureds	498	(56,91)	195	(39,16)	30	(6,02)	11	(2,21)	262	(52,61)	
Blacks	63	(7,20)	23	(36,51)	3	(4,76)	0	(0,00)	37	(58,73)	
<b>Health Region</b>											$\chi^2 = 23,75$ df = 9 $p = 0,005$
Cape Metro	416	(47,54)	151	(36,30)	32	(7,69)	15	(3,61)	218	(52,40)	
West Coast	167	(19,39)	58	(40,72)	20	(11,98)	8	(4,79)	71	(42,51)	
Boland	202	(23,09)	62	(30,69)	7	(3,47)	9	(4,46)	124	(61,39)	
South Cape	90	(10,29)	27	(30,00)	8	(8,89)	0	(0,00)	55	(61,11)	
<b>Age sub-groups</b>											$\chi^2 = 26,20$ df = 6 $p < 0,0001$
Adults	446	(50,97)	172	(38,57)	40	(8,97)	14	(3,14)	220	(49,33)	
Elderly non-institution	145	(16,57)	27	(18,62)	13	(8,97)	5	(3,45)	100	(68,97)	
Elderly institutionalized	284	(32,46)	109	(38,38)	14	(4,93)	13	(4,58)	148	(52,11)	
<b>Medical aid</b>											$\chi^2 = 53,54$ df = 3 $p < 0,0001$
Yes	174	(19,89)	51	(29,31)	31	(17,82)	16	(9,20)	76	(43,68)	
No	701	(80,11)	257	(36,66)	36	(5,14)	16	(2,28)	392	(55,92)	
<b>Total</b>	875	(48,96)	308	(35,20)	67	(7,66)	32	(3,66)	468	(53,49)	

Table 76 / Continued:  
Perceptions regarding the current costs of dentures in the Western Cape Province by sociodemographic characteristics

SOCIOECONOMIC CHARACTERISTICS	Sample		Much too high unaffordable		Somewhat high difficult to afford		Reasonable can afford		Don't know what dentures cost		Chi-square test
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	
<b>Educational level</b>											
No schooling	80	(9,14)	30	(37,50)	1	(1,25)	1	(1,25)	48	(60,00)	$\chi^2 = 95,57$ df = 18 p < 0,0001
Std 5	266	(30,40)	93	(34,96)	11	(4,14)	4	(1,50)	158	(59,40)	
Std 6	180	(20,57)	75	(41,67)	10	(5,56)	5	(2,78)	90	(50,00)	
Std 7 - 9	211	(24,11)	79	(37,44)	14	(6,64)	12	(5,69)	106	(50,24)	
Std 10	95	(10,86)	22	(23,16)	18	(18,95)	7	(7,37)	48	(50,53)	
Diploma /Certificate	35	(4,00)	8	(22,86)	9	(25,71)	1	(2,86)	17	(48,57)	
Degree	8	(0,91)	1	(12,50)	4	(50,00)	2	(25,00)	1	(12,50)	
<b>Occupation</b>											
Prof / Manager	20	(2,29)	4	(20,00)	8	(40,00)	1	(5,00)	7	(35,00)	$\chi^2 = 61,70$ df = 15 p < 0,0001
White collar	35	(4,00)	13	(37,14)	7	(20,00)	2	(5,71)	13	(37,14)	
Skilled manual	30	(3,43)	9	(30,00)	4	(13,33)	3	(10,00)	14	(46,67)	
Semi-skilled	72	(8,23)	34	(47,22)	6	(8,33)	3	(4,17)	29	(40,28)	
Unskilled menial	82	(9,37)	38	(46,34)	4	(4,88)	0	(0,00)	40	(48,78)	
Economic non-active	636	(72,69)	210	(33,02)	38	(5,97)	23	(3,62)	365	(57,39)	
<b>Household income</b>											
None	23	(2,63)	7	(30,43)	0	(0,00)	1	(4,35)	15	(65,22)	$\chi^2 = 126,75$ df = 18 p < 0,0001
< R9600	495	(56,64)	174	(35,15)	16	(3,23)	7	(1,41)	298	(60,20)	
R9601 - R14000	135	(15,45)	60	(44,44)	12	(8,89)	7	(5,19)	56	(41,48)	
R14001 - R32000	112	(12,81)	45	(40,18)	13	(11,61)	5	(4,46)	43	(43,75)	
R32001 - R48000	70	(8,01)	15	(21,43)	12	(17,14)	5	(7,14)	38	(54,29)	
R48001 - R71999	22	(2,52)	4	(18,18)	8	(35,36)	3	(13,64)	7	(31,82)	
> R72000	17	(1,95)	3	(17,65)	6	(35,29)	4	(23,53)	4	(23,53)	
<b>Total</b>	<b>875</b>	<b>(48,96)</b>	<b>308</b>	<b>(35,20)</b>	<b>67</b>	<b>(7,66)</b>	<b>32</b>	<b>(3,66)</b>	<b>468</b>	<b>(53,49)</b>	

Table 77: Percentage distribution of what adults are willing and able to pay for a complete set of dentures, laboratory fees included, by sociodemographic characteristics.

DEMOGRAPHIC CHARACTERISTICS	Sample n (%)	< R250 n (%)	R250 - R499 n (%)	R500 - R999 n (%)	> R1000 n (%)	Chi-square test
<b>Health region</b>						
Cape Metro	473	334 (70,61)	74 (15,64)	60 (12,68)	5 (1,06)	$\chi^2 = 50,97$ df = 9 p < 0,0001
West Coast	184	83 (45,11)	65 (35,33)	32 (17,39)	4 (2,17)	
Boland	228	166 (72,81)	43 (18,86)	17 (7,46)	2 (0,88)	
South Cape	109	69 (60,30)	25 (22,94)	13 (11,93)	2 (1,83)	
<b>Population group</b>						
Whites	318	140 (44,03)	66 (20,75)	99 (31,13)	13 (4,09)	$\chi^2 = 200,31$ df = 6 p < 0,0001
Coloureds	574	426 (74,22)	125 (21,78)	23 (4,01)	0 (0,00)	
Blacks	102	86 (84,31)	16 (15,69)	0 (0,00)	0 (0,00)	
<b>Age category</b>						
20 – 34	122	77 (63,11)	41 (33,61)	3 (2,46)	1 (0,82)	$\chi^2 = 71,95$ df = 12 p < 0,0001
35 – 49	211	118 (55,92)	68 (32,23)	24 (11,37)	1 (0,47)	
50 – 64	233	144 (61,80)	54 (23,18)	30 (12,88)	5 (2,15)	
65 – 79	287	202 (70,38)	34 (11,85)	47 (16,38)	4 (1,39)	
80 +	141	111 (78,72)	10 (7,09)	18 (12,77)	2 (1,42)	
<b>Age sub-groups</b>						
Adults	547	322 (58,87)	161 (29,94)	57 (10,42)	7 (1,28)	$\chi^2 = 70,46$ df = 6 p < 0,0001
Elderly non-institutionalized	154	95 (61,69)	27 (17,53)	29 (18,83)	3 (1,95)	
Elderly institutionalized	293	235 (80,20)	19 (6,48)	36 (12,29)	3 (1,02)	
<b>Dental status</b>						
Dentate	215	153 (71,16)	40 (18,60)	17 (7,91)	5 (2,33)	$\chi^2 = 8,38$ df = 3 p = 0,039
Edentulous	779	499 (64,06)	167 (21,44)	105 (13,48)	8 (1,03)	
<b>Denture status</b>						
Non-denture wearing	465	370 (79,95)	63 (13,55)	27 (5,81)	5 (1,08)	$\chi^2 = 78,37$ df = 3 p < 0,0001
Denture wearing	529	282 (53,31)	144 (27,22)	95 (17,96)	8 (1,51)	
<b>TOTAL</b>	994	652 (65,59)	207 (20,82)	122 (12,27)	13 (1,13)	

Table 77 / continued: Percentage distribution of what adults are willing and able to pay for a complete set of dentures, laboratory fees included, by socioeconomic characteristics.

<b>SOCIOECONOMIC CHARACTERISTICS</b>	<b>Sample n (%)</b>	<b>&lt; R250 n (%)</b>	<b>R250 - R499 n (%)</b>	<b>R500 - R999 n (%)</b>	<b>&gt; R1000 n (%)</b>	<b>Chi-square test</b>
<b>Educational level</b>						
No schooling	93	89 (95,70)	2 (2,15)	2 (2,15)	0 (0,00)	$\chi^2 = 303,30$ df = 18 p < 0,0001
Std 5	310	266 (85,81)	39 (12,58)	5 (1,61)	0 (0,00)	
Std 6	200	124 (62,00)	60 (30,00)	16 (8,00)	0 (0,00)	
Std 7 – 9	245	132 (53,88)	66 (26,94)	46 (18,78)	1 (0,41)	
Std 10	100	27 (27,00)	30 (30,00)	36 (36,00)	7 (7,00)	
Diploma /Certificate	36	11 (30,56)	9 (25,00)	13 (36,11)	3 (8,33)	
Degree	10	3 (30,00)	1 (10,00)	4 (40,00)	2 (20,00)	
<b>Occupation</b>						
Prof / Manager	20	4 (20,00)	5 (25,00)	11 (55,00)	0 (0,00)	$\chi^2 = 163,32$ df = 15 p < 0,0001
White collar	35	10 (28,57)	10 (28,57)	11 (31,43)	4 (11,43)	
Skilled manual	34	10 (29,41)	17 (50,00)	7 (20,59)	0 (0,00)	
Semi-skilled	84	40 (47,62)	37 (44,05)	7 (8,33)	0 (0,00)	
Unskilled menial	120	94 (78,33)	26 (21,67)	0 (0,00)	0 (0,00)	
Economic non-active	700	493 (70,43)	112 (16,00)	86 (12,29)	9 (1,29)	
<b>Household income</b>						
< R9600	603	520 (86,24)	59 (9,78)	22 (3,65)	2 (0,33)	$\chi^2 = 598,69$ df = 15 p < 0,0001
R9601 – R14000	161	85 (52,80)	60 (37,27)	16 (9,94)	0 (0,00)	
R14001 - R32000	115	36 (31,30)	53 (46,09)	24 (20,87)	2 (1,74)	
R32001 - R48000	74	10 (13,51)	30 (40,54)	31 (41,89)	3 (4,05)	
R48001 - R71999	22	0 (0,00)	4 (18,18)	18 (81,82)	0 (0,00)	
> R72000	18	18 (0,00)	1 (5,56)	11 (61,11)	6 (33,33)	
<b>Medical aid</b>						
Yes	181	39 (21,55)	63 (34,81)	70 (38,67)	9 (4,97)	$\chi^2 = 234,62$ df = 3 p < 0,0001
No	813	613 (75,40)	144 (17,71)	52 (6,40)	4 (0,49)	
<b>TOTAL</b>	<b>994</b>	<b>652 (65,59)</b>	<b>207 (20,82)</b>	<b>122 (12,27)</b>	<b>13 (1,31)</b>	

Table 78: Percentage of individuals responding to the statement: "All denture services should only be provided by dentists' and by no other auxiliary personnel such as dental technicians or denture therapists."

<b>SOCIODEMOGRAPHIC CHARACTERISTICS</b>	<b>Agree n (%)</b>	<b>Undecided n (%)</b>	<b>Disagree n (%)</b>	<b>Chi-square test</b>
<b>Population group</b>				$\chi^2 = 41,53$ df = 4 p < 0,0001
Whites	346 (70,90)	45 (9,22)	97 (19,88)	
Coloureds	550 (67,65)	91 (11,19)	172 (21,16)	
Blacks	255 (65,38)	85 (21,79)	50 (12,82)	
<b>Health region</b>				$\chi^2 = 15,55$ df = 6 p = 0,016
Cape Metro	497 (64,63)	113 (14,69)	159 (20,68)	
West Coast	285 (73,26)	42 (10,80)	62 (15,94)	
Boland	268 (71,28)	49 (13,03)	59 (15,69)	
South Cape	101 (64,33)	17 (10,83)	39 (24,84)	
<b>Age category</b>				$\chi^2 = 35,22$ df = 8 p < 0,0001
20 – 34	331 (62,69)	98 (18,56)	99 (18,75)	
35 – 49	280 (68,13)	49 (11,92)	82 (19,95)	
50 – 64	240 (70,59)	31 (9,12)	69 (20,29)	
65 – 79	209 (69,44)	30 (9,97)	62 (20,60)	
80+	91 (81,98)	13 (11,71)	7 (6,31)	
<b>Age sub-groups</b>				$\chi^2 = 12,47$ df = 4 p = 0,014
Adults	837 (66,69)	169 (13,47)	249 (13,47)	
Elderly non-institution	131 (66,84)	22 (11,22)	43 (21,94)	
Elderly institutionalized	183 (76,25)	30 (12,50)	27 (11,25)	
<b>Educational level</b>				$\chi^2 = 16,82$ df = 12 p = 0,156
No schooling	102 (65,81)	31 (20,00)	22 (14,19)	
Std 5	277 (64,57)	66 (15,38)	86 (20,05)	
Std 6	175 (69,44)	25 (9,92)	52 (20,63)	
Std 7 – 9	288 (69,06)	52 (12,47)	77 (18,47)	
Std 10	189 (69,49)	33 (12,13)	50 (18,38)	
Diploma /Certificate	70 (70,71)	9 (9,09)	20 (20,20)	
Degree	50 (74,63)	5 (7,46)	12 (17,91)	
<b>Occupation</b>				$\chi^2 = 8,59$ df = 10 p = 0,571
Prof / Manager	90 (76,92)	10 (8,55)	17 (14,53)	
White collar	71 (70,30)	13 (12,87)	17 (16,83)	
Skilled manual	69 (70,41)	11 (11,22)	18 (18,37)	
Semi-skilled	155 (67,98)	26 (11,40)	47 (20,61)	
Unskilled menial	164 (63,81)	41 (15,95)	52 (20,23)	
Economic non-active	599 (67,53)	120 (13,53)	168 (18,94)	
<b>Household income</b>				$\chi^2 = 12,07$ df = 10 p = 0,281
< R9600	556 (66,67)	125 (14,99)	153 (18,35)	
R9601 – R14000	168 (66,93)	35 (13,94)	48 (19,12)	
R14001 - R32000	174 (71,60)	29 (11,93)	40 (16,46)	
R32001 - R48000	133 (71,12)	17 (9,09)	37 (19,79)	
R48001 - R71999	68 (69,39)	7 (7,14)	23 (23,47)	
> R72000	50 (65,79)	8 (10,53)	18 (23,68)	
<b>Dental status</b>				$\chi^2 = 61,93$ df = 2 p < 0,0001
Dentate	636 (64,24)	183 (18,48)	171 (17,27)	
Edentulous	515 (73,47)	38 (5,42)	148 (21,11)	
<b>Denture status</b>				$\chi^2 = 54,21$ df = 2 p < 0,0001
Without dentures	797 (65,60)	206 (16,75)	227 (18,46)	
With dentures	354 (76,79)	15 (3,25)	92 (19,96)	
<b>Total</b>	<b>1151 (68,07)</b>	<b>221 (13,07)</b>	<b>319 (18,86)</b>	

Table 79: Reasons provided by respondents why they agree that denture services should only be provided by dentists (N = 1134)

Reasons supporting dentists	Population group			
	Whites n (%)	Coloureds n (%)	Blacks n (%)	Total n (%)
1. Professional training and education	120 (34,99)	154 (28,36)	126 (50,81)	400 (35,27)
2. Dentist's have greater experience / expertise	62 (18,08)	112 (20,63)	40 (16,13)	214 (18,87)
3. Greater trust in the dentist's service / reputation	71 (20,76)	86 (15,84)	29 (11,69)	186 (16,40)
4. Will provide better quality care	38 (11,08)	95 (17,50)	31 (12,50)	164 (14,46)
5. Dentist's are more professional	31 (9,04)	61 (11,23)	8 (3,23)	100 (8,82)
6. Dentist's have the facilities	17 (4,96)	26 (4,79)	12 (4,84)	55 (4,85)
7. Because it is legal	2 (0,58)	5 (0,92)	2 (0,81)	9 (0,79)
8. Informed so by others	2 (0,58)	4 (0,74)	0 (0,00)	6 (0,53)
<b>Total</b>	<b>343 (30,25)</b>	<b>543 (47,88)</b>	<b>248 (21,82)</b>	<b>1134 (63,46)</b>
<b>Chi-square test:</b>	<b><math>\chi^2 = 54,962</math>; <math>df = 14</math>; <math>p &lt; 0,0001</math></b>			

Missing / no response = 653

Table 80: Reasons provided by respondents why they disagree that denture services should only be provided by dentists (N = 317)

Reasons opposing dentists	Population group			
	Whites n (%)	Coloureds n (%)	Blacks n (%)	Total n (%)
1. Dentures provided by dentist is inaffordable	54 (55,10)	129 (74,57)	27 (58,70)	210 (66,25)
2. Some dentists provide poor quality dentures	22 (22,45)	20 (11,56)	1 (2,17)	43 (13,56)
3. Inadequate accessibility	6 (6,12)	14 (8,09)	7 (15,22)	27 (8,52)
4. Dentists do not have the expertise of the technician	9 (9,18)	4 (2,31)	3 (6,52)	16 (5,05)
5. To promote free enterprise	2 (2,04)	2 (1,16)	3 (6,52)	7 (2,21)
6. Dentist's are not always available	2 (2,04)	2 (1,16)	2 (4,35)	6 (1,89)
7. Others can also be trained to provide dentures	2 (2,04)	1 (0,58)	2 (4,35)	5 (1,58)
8. Restricts the right of others to provide dentures	1 (1,02)	1 (0,58)	1 (2,17)	3 (0,95)
<b>Total</b>	<b>98 (30,91)</b>	<b>173 (54,57)</b>	<b>46 (14,51)</b>	<b>317 (17,74)</b>
<b>Chi-square test:</b>	<b><math>\chi^2 = 35,04; df = 14; p = 0,001</math></b>			

Missing / no response = 1470

Table 81 Percentage of individuals responding to the statement "Do you think that dental technicians should be allowed to fit and supply dentures directly to the public provided that they are adequately clinically trained"

<b>SOCIODEMOGRAPHIC CHARACTERISTICS</b>	<b>Yes n (%)</b>	<b>Undecided n (%)</b>	<b>No n (%)</b>	<b>Chi-square test</b>
<b>Population group</b>				$\chi^2 = 52.94$ df = 4 p < 0.0001
Whites	278 (57.44)	67 (13.84)	139 (28.72)	
Coloureds	515 (63.42)	110 (13.55)	187 (23.03)	
Blacks	177 (45.62)	107 (27.58)	104 (26.80)	
<b>Health region</b>				$\chi^2 = 42.64$ df = 6 p < 0.0001
Cape Metro	486 (63.70)	139 (18.22)	138 (18.09)	
West Coast	197 (50.77)	62 (15.98)	129 (33.25)	
Boland	201 (53.46)	62 (16.49)	113 (30.05)	
South Cape	86 (54.78)	21 (13.38)	50 (31.85)	
<b>Age category</b>				$\chi^2 = 43.97$ df = 8 p < 0.0001
20 - 34	279 (52.84)	128 (24.24)	121 (22.92)	
35 - 49	246 (60.15)	55 (13.45)	108 (26.41)	
50 - 64	204 (60.00)	40 (11.76)	96 (28.24)	
65 - 79	192 (64.43)	38 (12.75)	68 (22.82)	
80+	49 (44.95)	23 (21.10)	37 (33.94)	
<b>Age sub-groups</b>				$\chi^2 = 7.02$ df = 4 p = 0.135
Adults	720 (57.46)	214 (17.08)	319 (25.46)	
Elderly non-institution	125 (64.10)	23 (11.79)	47 (24.10)	
Elderly institutionalized	125 (62.97)	47 (19.92)	64 (27.12)	
<b>Educational level</b>				$\chi^2 = 32.43$ df = 12 p = 0.001
No schooling	69 (44.81)	36 (23.38)	49 (31.82)	
Std 5	238 (55.74)	83 (19.44)	106 (24.82)	
Std 6	163 (64.69)	33 (13.15)	55 (21.91)	
Std 7 - 9	255 (61.30)	70 (16.83)	91 (21.88)	
Std 10	148 (54.41)	42 (15.44)	82 (30.15)	
Diploma /Certificate	62 (63.27)	14 (14.29)	22 (22.45)	
Degree	35 (53.03)	6 (9.09)	25 (37.88)	
<b>Occupation</b>				$\chi^2 = 32.32$ df = 10 p < 0.0001
Prof / Manager	59 (50.86)	10 (8.62)	47 (40.52)	
White collar	48 (47.52)	17 (16.83)	36 (35.64)	
Skilled manual	55 (56.12)	16 (16.33)	27 (27.55)	
Semi-skilled	135 (59.21)	31 (13.60)	62 (27.19)	
Unskilled manual	140 (54.47)	54 (21.01)	63 (24.51)	
Economic non-active	533 (60.50)	156 (17.71)	192 (21.79)	
<b>Household income</b>				$\chi^2 = 29.15$ df = 10 p = 0.001
< R9600	457 (55.13)	172 (20.75)	200 (24.13)	
R9601 - R14000	159 (63.60)	34 (13.60)	57 (22.80)	
R14001 - R32000	141 (58.02)	40 (16.46)	62 (25.51)	
R32001 - R46000	115 (61.50)	22 (11.76)	50 (26.74)	
R48001 - R71999	53 (54.08)	8 (8.16)	37 (37.76)	
> R72000	44 (58.67)	8 (10.67)	23 (30.67)	
<b>Dental status</b>				$\chi^2 = 58.06$ df = 2 p < 0.0001
Dentate	523 (52.94)	224 (22.67)	241 (24.39)	
Edentulous	447 (64.22)	60 (8.62)	189 (27.16)	
<b>Denture status</b>				$\chi^2 = 55.58$ df = 2 p < 0.0001
Without dentures	672 (54.72)	258 (21.01)	298 (24.27)	
With dentures	298 (65.35)	26 (5.70)	132 (28.95)	
<b>Total</b>	<b>970 (57.60)</b>	<b>284 (16.86)</b>	<b>430 (25.53)</b>	

Table 82: Reasons provided by respondents why they are in favor of dental technicians providing dentures directly to the public (N = 957)

Reasons supporting dental technicians	Population group			
	Whites n (%)	Coloureds n (%)	Blacks n (%)	Total n (%)
1. It will lower the cost of dentures	129 (46,24)	179 (35,17)	45 (26,63)	353 (36,89)
2. It will improve the quality of dentures	71 (25,45)	192 (37,72)	59 (34,91)	322 (33,65)
3. It will improve accessibility and availability	29 (10,39)	51 (10,02)	34 (20,12)	114 (11,91)
4. To enable them to develop professionally	13 (4,66)	22 (4,32)	9 (5,33)	44 (4,60)
5. It will provide new job opportunities	11 (3,94)	23 (4,52)	8 (4,73)	42 (4,39)
6. It will take a lot of work pressure off the dentist	13 (4,66)	15 (2,95)	9 (5,33)	37 (3,87)
7. So that they can take responsibility for services	9 (3,23)	20 (3,93)	1 (0,59)	30 (3,13)
8. To promote teamwork with the dentist	4 (1,43)	7 (1,38)	4 (2,37)	15 (1,57)
<b>Total</b>	<b>279 (29,15)</b>	<b>509 (53,19)</b>	<b>169 (17,66)</b>	<b>957 (53,67)</b>
<b>Chi-square test:</b>	<b><math>\chi^2 = 39,96; df = 14; p &lt; 0,0001</math></b>			

Missing / no response = 830

Table 83: Reasons provided by respondents why they are opposed to the idea that dental technicians should provide dentures directly to the public (N = 432)

Reasons opposing dental technicians	Population group			
	Whites n (%)	Coloureds n (%)	Blacks n (%)	Total n (%)
1. The quality of dentures will decline	44 (31,43)	88 (46,81)	38 (36,54)	170 (39,35)
2. Lack of medically-based knowledge and diagnostic expertise	44 (31,43)	37 (19,68)	42 (40,38)	123 (28,47)
3. Do not trust non-dentist's	32 (22,96)	16 (8,51)	10 (9,62)	58 (13,43)
4. No responsibility taken for services provided	7 (5,00)	42 (22,34)	7 (6,73)	56 (12,96)
5. Professional conflict - taking work away from the dentist	12 (8,57)	2 (1,06)	2 (1,92)	16 (3,70)
6. It is unnecessary - service is adequate	1 (0,71)	0 (0,00)	3 (2,88)	4 (0,93)
7. Non-dentist's are only out to make money or to cheat the public	0 (0,00)	2 (1,06)	1 (0,96)	3 (0,69)
8. Dentures will not be affordable	0 (0,00)	1 (0,53)	1 (0,96)	2 (0,46)
<b>Total</b>	<b>140 (32,41)</b>	<b>188 (43,52)</b>	<b>104 (24,07)</b>	<b>432 (24,17)</b>
<b>Chi-square test:</b>	<b><math>\chi^2 = 74,49; df = 14; p = &lt; 0,0001</math></b>			

Missing / no response = 1355

Table 84: Percentage of adults in the Western Cape Province responding to the statement: "Dentists are adequately meeting all the denture treatment needs of the community in our area."

DEMOGRAPHIC CHARACTERISTIC	Sample n (%)	Agree strongly n (%)	Agree n (%)	Undecided n (%)	Disagree n (%)	Disagree strongly n (%)	Chi-square test
<b>Health Region</b>							
Cape Metro	416 (47,49)	42 (10,10)	57 (13,70)	283 (68,03)	24 (5,77)	10 (2,40)	$\chi^2 = 70,89$ df = 12 p < 0,0001
West Coast	167 (19,06)	11 (6,59)	11 (6,59)	114 (68,26)	17 (10,18)	14 (8,38)	
Boland	203 (23,17)	17 (8,37)	22 (10,84)	111 (54,68)	46 (22,66)	7 (3,45)	
Overberg	90 (10,27)	2 (2,22)	6 (6,67)	56 (62,22)	17 (18,89)	9 (10,00)	
<b>Population group</b>							
Whites	315 (35,96)	35 (11,11)	45 (14,29)	220 (69,84)	11 (3,49)	4 (1,27)	$\chi^2 = 59,41$ df = 8 p < 0,0001
Coloureds	498 (56,85)	33 (6,63)	49 (9,84)	300 (60,24)	86 (17,27)	30 (6,02)	
Blacks	63 (7,19)	4 (6,35)	2 (3,17)	44 (69,84)	7 (11,11)	6 (9,52)	
<b>Total</b>	876 (100,00)	72 (8,22)	96 (10,96)	564 (64,38)	104 (11,87)	40 (4,57)	

Table 85: Overall prioritization of social services (%) by adults in the Western Cape Province for resource allocation (N = 1547)

SOCIAL SERVICES	PRIORITY ALLOCATED TO SOCIAL SERVICE (%)					
	1	2	3	4	5	6
<b>Housing</b>	694 (44,89)	405 (26,20)	269 (17,40)	122 (7,89)	49 (3,17)	7 (0,45)
<b>Education</b>	225 (14,55)	318 (20,57)	382 (24,71)	435 (28,14)	169 (10,93)	17 (1,10)
<b>Infrastructure</b>	40 (2,59)	190 (12,28)	277 (17,91)	547 (35,36)	393 (25,40)	100 (6,46)
<b>Health care</b>	527 (34,07)	475 (30,70)	401 (25,92)	91 (5,88)	39 (2,52)	14 (0,90)
<b>Security &amp; Protection</b>	58 (3,75)	138 (8,92)	184 (11,89)	56 (3,63)	202 (13,05)	41 (2,65)
<b>Sport &amp; Recreation</b>	3 (0,19)	21 (1,36)	36 (2,33)	86 (5,56)	194 (12,55)	1205 (77,94)

Table 86: Reasons why health care was rated as a high priority for funding relative to the other social services (N =1405)

Reasons for ranking health care a high priority	% Whites	% Coloureds	% Blacks	Total %
<b>Sample</b>	<b>351 (24,68)</b>	<b>701 (49,89)</b>	<b>353 (25,12)</b>	<b>1405 (90,82)</b>
• To be able to work and uplift the economy	17,38	15,98	19,83	17,30
• To promote self-supportive behaviour	5,41	8,42	8,78	7,76
• It is an essential need that everyone depends upon	12,82	13,98	13,31	13,52
• Will contribute / support socio-economic development	11,96	11,84	9,35	10,89
• There is an increasing demand / need for health services	6,84	5,52	3,68	5,41
• People cannot afford private care / dependent on public care	29,63	24,11	15,58	23,35
• To promote quality of life	3,42	6,28	9,07	6,26
• To prevent diseases and deaths	3,13	3,42	6,23	4,06
• A healthy body will promote psychological welfare	4,56	5,42	6,23	4,06
• To allow children to go to school and learn	0,28	1,00	0,00	0,57
• The facilities for health care are inadequate	2,28	3,00	6,23	3,63
• Health care facilities are inaccessible	0,00	0,14	0,00	0,07
• Don't know	0,28	2,00	2,55	1,71
<b>Chi-square test</b>	<b><math>\chi^2 = 70,65; df = 28 ; p &lt; 0,0001</math></b>			

Table 87: Overall prioritization of functional and aesthetic health services for funding (%) (N = 1546)

HEALTH SERVICE	PRIORITY ALLOCATED TO HEALTH SERVICE (%)				
	1	2	3	4	5
<b>Spectacles</b>	1319 (85,32)	161 (10,41)	44 (2,85)	19 (1,23)	3 (0,19)
<b>Dentures</b>	23 (1,49)	106 (6,86)	266 (17,21)	501 (32,41)	650 (42,04)
<b>Hearing aid</b>	49 (3,17)	791 (51,16)	464 (30,01)	205 (13,26)	37 (2,39)
<b>Leg / foot prostheses</b>	107 (6,92)	318 (20,57)	578 (37,39)	454 (29,37)	89 (5,76)
<b>Facial prostheses</b>	50 (3,23)	170 (11,00)	195 (12,61)	367 (23,67)	764 (49,42)

Table 88: Reasons why dentures was rated as a high and low priority for health care funding relative to the other functional and aesthetic health services by population group

	% Whites	% Coloureds	% Blacks	Total %
<b>Reasons for ranking dentures as a high priority (Sample)</b>	<b>105 (28,77)</b>	<b>202 (55,34)</b>	<b>58 (15,89)</b>	<b>365 (23,64)</b>
• To help reduce digestive problems due to poor mastication	32,38	48,51	31,03	41,10
• To be able to eat a wider selection of food	37,14	21,29	22,41	26,03
• People cannot afford dentures	6,67	12,87	12,79	11,23
• To improve appearance and self-image	18,10	5,45	12,07	10,14
• Many people need dentures	1,90	7,43	1,72	4,93
• To improve oral function (i.e. speaking and eating)	1,90	1,98	10,34	3,28
• Don't know	1,90	2,48	8,62	3,29
<b>Chi-square test</b>	<b><math>\chi^2 = 53,78</math>; <b>df = 14</b>; <b>p &lt; 0,0001</b></b>			
<b>Reasons for ranking dentures as a low priority (Sample)</b>	<b>309 (26,28)</b>	<b>547 (46,51)</b>	<b>320 (27,21)</b>	<b>1176 (76,02)</b>
• Not essential - many people live without teeth	60,52	75,32	64,06	68,37
• People should take responsibility for their own teeth	10,36	6,22	6,25	7,31
• People extract teeth for cultural or vanity reasons	8,74	4,02	1,88	4,68
• There are not many people that need dentures	0,94	0,00	3,13	1,11
• People can eat without teeth	8,41	6,40	6,88	7,06
• It is a luxury service	2,91	2,74	2,81	2,81
• Most elderly already have dentures	3,88	0,55	0,31	1,30
• Dentures services are adequate	2,27	0,55	0,31	0,94
• Spending resources on one's own teeth is better than on dentures	1,29	1,46	5,94	2,64
• Don't know	0,65	2,74	8,44	3,74
<b>Chi-square test</b>	<b><math>\chi^2 = 122,84</math>; <b>df = 18</b>; <b>p &lt; 0,0001</b></b>			

Table 89: Overall prioritization of categories of people for health care funding (%) (N = 1547)

INDIVIDUAL CATEGORIES	PRIORITY ALLOCATED TO INDIVIDUAL CATEGORIES (%)				
	1	2	3	4	5
<b>Mother and child</b>	820 (53,04)	318 (20,57)	201 (13,00)	154 (9,96)	53 (3,43)
<b>Pre-school children</b>	64 (4,14)	597 (38,62)	312 (20,18)	373 (24,13)	200 (12,94)
<b>School children</b>	128 (8,28)	274 (13,20)	629 (40,69)	408 (26,39)	177 (11,45)
<b>Adults</b>	114 (7,37)	129 (8,34)	118 (7,63)	236 (15,27)	949 (61,38)
<b>Elderly</b>	421 (27,23)	298 (19,28)	286 (18,50)	374 (24,19)	167 (10,80)

Table 90: Reasons why elderly people were rated as a high and low priority for health care funding relative to the other individual categories

	% Whites	% Coloureds	% Blacks	Total %
<b>Reasons for ranking elderly care a high priority (Sample)</b>	<b>263 (26,67)</b>	<b>495 (50,20)</b>	<b>228 (23,12)</b>	<b>986 (63,74)</b>
• They are a higher risk, therefore have more needs	22,05	16,16	14,47	17,34
• Is dependent on others for physical assistance	27,00	35,76	33,33	32,86
• It is the community's social responsibility	41,06	24,65	16,23	27,08
• They cannot afford health services	4,94	5,86	3,95	5,17
• They play an important supportive role in the family	0,38	6,46	15,35	6,90
• They are the most neglected group of all in society	4,18	9,70	13,16	9,03
• Don't know	0,38	1,41	3,51	1,62
<b>Chi-square test</b>	<b><math>\chi^2 = 104,07; df = 14; p &lt; 0,0001</math></b>			
<b>Reasons for ranking elderly care a low priority (Sample)</b>	<b>147 (26,82)</b>	<b>254 (46,35)</b>	<b>147 (26,82)</b>	<b>548 (35,42)</b>
• They have had their years - are important but not a priority	41,50	43,70	40,14	42,15
• They receive adequate care and government support	37,41	18,90	11,56	21,90
• They are not economic active	7,48	5,91	2,04	5,29
• They have learnt to live with their situation	2,72	1,18	0,68	1,46
• They should take self-responsibility for their own health	5,44	7,87	5,44	6,57
• Adequate preventive care will negate the need treating disease	1,36	0,00	0,68	0,55
• Elderly are well supported by their families	0,68	8,27	10,20	6,75
• Don't know	3,40	14,17	29,25	15,33
<b>Chi-square test</b>	<b><math>\chi^2 = 79,86; df = 14; p &lt; 0,0001</math></b>			

Table 91: Overall prioritization of oral health services for funding (%) (N = 1545)

ORAL HEALTH CARE	PRIORITY ALLOCATED TO ORAL HEALTH SERVICE (%)				
	1	2	3	4	5
<b>Pain and sepsis care</b>	770 (49,84)	454 (29,39)	212 (13,72)	94 (6,08)	15 (0,97)
<b>Preventive care</b>	661 (42,78)	521 (33,72)	241 (15,60)	98 (6,34)	24 (1,55)
<b>Restorative care</b>	41 (2,65)	258 (16,69)	412 (26,65)	531 (34,35)	304 (19,66)
<b>Denture care</b>	45 (2,91)	167 (10,80)	399 (25,81)	386 (24,97)	549 (35,51)
<b>Orthodontic care</b>	29 (1,88)	145 (9,38)	281 (18,18)	439 (28,40)	652 (42,17)

Table 92: Reasons why dentures were rated as a high priority for health care funding relative to the other oral health services by population group

Reasons for ranking dentures as a high priority	% Whites	% Coloureds	% Blacks	Total %
<b>Sample</b>	<b>106 (19,41)</b>	<b>351 (64,29)</b>	<b>89 (16,30)</b>	<b>546 (35,34)</b>
• It is a second opportunity for those who have lost their teeth	0,00	3,4	1,12	2,38
• Essential for digestion of food – can affect your health	53,77	39,03	26,97	39,93
• To improve appearance and self-image	19,81	11,97	21,35	15,02
• To get rid of dental problems	0,94	9,69	10,11	8,06
• One cannot eat without teeth	8,49	3,70	3,37	4,58
• Many people need dentures	0,00	8,83	1,12	5,86
• People cannot afford dentures	6,60	12,82	5,62	10,44
• To promote oral health in general	8,49	5,49	19,10	10,26
• Poor availability of services	0,94	1,70	7,86	2,56
• Don't know	0,94	1,70	7,86	2,56
Chi-square test	$\chi^2 = 100,64; df = 26; p < 0,0001$			

Table 93: Reasons why dentures was rated as a low priority for health care funding relative to the other oral health services by population group

Reasons for ranking dentures as a low priority	% Whites	% Coloureds	% Blacks	Total %
<b>Sample</b>	<b>302 (30,41)</b>	<b>398 (40,08)</b>	<b>293 (29,51)</b>	<b>993 (64,27)</b>
• Not essential - can live without dentures	39,07	42,97	28,33	37,87
• People must take self-responsibility for looking after their own teeth	23,18	12,81	10,92	15,41
• Dentures are the last resort if prevention and restorative care fails	5,96	4,27	4,10	4,73
• Dentures give more problems than your own teeth	10,60	11,31	17,75	12,99
• Many people don't wear their dentures	0,33	0,75	0,00	0,40
• Many people are not interested in having dentures	0,00	0,50	0,00	0,20
• They are less important relative to other health needs	8,94	6,53	7,85	7,65
• It is a minority requirement	1,32	0,25	5,12	2,01
• It is an expensive luxury – wastage of scarce resources	2,32	2,01	1,71	2,01
• Prevention will negate the need for dentures	7,28	12,31	13,31	11,08
• Dentures can break easily	0,33	0,75	1,02	0,70
• Don't know	0,66	4,52	9,90	4,93
<b>Chi-square test</b>	$\chi^2 = 97,83; df = 22; p < 0,0001$			

Table 94: Sample and response of the oral health care personnel survey

	<b>Dentists</b>	<b>Dental technicians</b>	<b>Dental therapists</b>	<b>Oral hygienists</b>
<b>Number of questionnaires mailed</b>	792	241	131	282
<b>Returned unknown</b>	13	8	5	7
<b>Excluded / incomplete</b>	35	7	6	19
<b>Questionnaires received for inclusion in study</b>	222	93	29	83
<b>Response rate (%)</b>	29,6	41,1	24,2	32,4

Table 95: Demographic characteristics of the oral health care personnel sampled

<b>Demographic Characteristics</b>	<b>Dentists</b>	<b>Dental technicians</b>	<b>Dental therapists</b>	<b>Oral hygienists</b>
<b>Sample size (n)</b>	222	93	29	83
<b>Age category</b>				
20 – 29	19 (8,6)	24 (25,8)	16 (55,2)	43 (52,4)
30 – 39	81 (36,5)	30 (32,8)	10 (34,5)	31 (37,8)
40 – 49	74 (33,3)	22 (23,7)	3 (10,3)	5 (6,1)
50 – 59	3 (14,0)	14 (15,1)		3 (3,7)
60 – 69	13 (5,9)	2 (2,2)		
70 >	4 (1,8)	1 (1,1)		
<b>Gender</b>				
Male	197 (89,1)	83 (89,3)	20 (69,0)	0 (0,00)
Female	24 (10,9)	10 (10,7)	9 (31,0)	83 (100,00)
<b>Geographic location</b>				
Cape Metro	161 (73,5)	74 (79,6)	2 (6,9)	73 (89,0)
West Coast	25 (11,4)	5 (5,4)	*	4 (4,9)
Boland	15 (6,9)	4 (4,3)	*	2 (2,4)
South Cape	18 (8,2)	6 (6,4)	*	3 (3,7)

\* Dental therapists were drawn from the National Register - there are only two known dental therapist practising in the Western Cape

Table 96: Dentist to population ratios in the Western Cape Province by health region

Health region	Dentist to population ratios				
	1972*	1982*	% Decrease	1995	% Decrease
Cape Metro	1:17481	1:10833	38,0	1:3546	67,3
West Coast	1:15980	1:10689	33,1	1:7444	30,4
Boland / Overberg	1:16738	1:11547	31,0	1:9742	15,6
South Cape / Karoo	1:13628	1:6886	49,5	1:6736	2,2

\* Dentist to population ratios for 1972 and 1982 derived from the study of Smith and Cleaton-Jones (1985)

Table 97. Practice setting of oral health care personnel sampled

	Dentists n (%)	Dental technicians n (%)	Dental therapists n (%)	Oral hygienists n (%)
<b>Sample size</b>	222	93	29	83
<b>Private practice</b>	185 (84,5)	78 (83,9)	0 (0,0)	65 (78,3)
<b>Public health</b>	10 (4,6)	4 (4,3)	26 (89,6)	10 (12,1)
<b>Academic institution</b>	7 (7,8)	10 (10,7)	1 (3,5)	5 (6,0)
<b>S.A. Medical Services</b>	5 (2,3)	1 (1,1)	0 (0,0)	3 (3,6)
<b>Industry</b>	2 (0,9)	0 (0,0)	2 (6,9)	0 (0,0)

Table 98: Practice profile of dentists

<b>Dentists in group practices</b>		
n	(%)	79 (35,6)
Average (SD) number of dentists in group practice		2,52 (0,97)
Median number of dentists in group practice		2
Modal number of dentists in group practice		2
<b>Percentage of dentists employing auxiliary personnel</b>		n (%)
Oral hygienists:	Full-time	48 (24,9)
	Part-time	39 (20,2)
Dental technicians:	Full-time	12 (6,3)
	Part-time	6 (3,1)
<b>Patients registered</b>		n (%)
< 500		17 (8,7)
500 – 999		15 (7,7)
1000 – 1999		36 (18,5)
2000 – 2999		26 (13,3)
3000 – 4999		51 (26,2)
5000 – 6999		23 (11,8)
7000 – 8999		6 (3,1)
9000 – 10999		8 (4,1)
> 11000		13 (6,7)

Table 99 Oral hygienists practice setting profile (n = 83)

<b>Type of practice setting</b>	<b>n</b>	<b>(%)</b>
<b>Private single dentist practice</b>		
Full-time	13	(15,7)
Part-time	14	(16,9)
<b>Private group dentist practice</b>		
Full-time	12	(14,5)
Part-time	18	(21,7)
<b>Specialist dental practice</b>		
Full-time	11	(14,5)
Part-time	18	(21,7)
<b>Public Health Services</b>	10	(12,1)
<b>Academic Institution</b>	5	(6,0)
<b>SA Medical Services</b>	3	(3,6)

Table 100 Dental technicians practice profile

	n	(%)
<b>Place of qualification</b>		
Technicon	61	(65.6)
Apprenticeship	24	(25.8)
Immigrant	8	(8.6)
<b>Type of laboratory work practised</b>		
Crown and bridge work	46	(49.5)
Prosthetics	36	(38.7)
Chrome-cobalt	9	(9.7)
Orthodontics	2	(2.2)
<b>Present practice position</b>		
Private dental laboratory		
Solo	17	(18.3)
Partner	6	(6.5)
Commercial laboratory		
Owner	17	(18.3)
Partner	8	(8.6)
Employee	25	(26.9)
Employed by dentist	5	(5.4)
Government employed	4	(4.3)
Academic institution	10	(10.8)
SA Medical services	1	(1.1)
<b>Employment status</b>		
Practice or employed full-time	88	(94.6)
Practice or employed part-time	4	(4.3)
Retired	1	(1.1)
<b>Reason for working in or running own commercial laboratory</b>		
Like to be independent	30	(32.6)
Exploited financially by dentists	34	(36.9)
Job satisfaction	26	(28.3)
Bursary commitment	2	(2.2)
<b>Reasons working for a dentist</b>		
No other jobs available	5	(5.4)
Age - too slow	2	
Don't like piecework	1	
Opportunity to work in close relationship with a dentist	1	

Table 101 Patient profile of oral health care personnel sample (%)

<b>Oral health care personnel</b>	<b>Average (SD)</b>	<b>Median</b>	<b>Modal</b>
<b>Dentists</b>			
Elderly (60+)	16.7 (16.3)	10	10
Adults (35 - 59)	29.1 (13.7)	30	30
Adults (20 - 34)	24.0 (11.9)	20	20
Teenagers (13 - 19)	17.2 (11.1)	15	20
Children (< 13)	15.3 (10.3)	15	10
<b>Dental therapists</b>			
Elderly (60+)	10.6 (8.4)	10	10
Adults (35 - 59)	23.3 (12.9)	20	20
Adults (20 - 34)	26.6 (13.4)	30	30
Teenagers (13 - 19)	18.8 (10.0)	18	20
Children (< 13)	17.7 (14.4)	10	10
<b>Oral hygienists</b>			
Elderly (60+)	10.3 (10.4)	10	10
Adults (35 - 59)	27.6 (19.9)	25	20
Adults (20 - 34)	19.8 (13.2)	20	20
Teenagers (13 - 19)	24.7 (20.3)	20	20
Children (< 13)	20.3 (18.3)	15	10

Table 102 Busyness profile of oral health care personnel (%)

	Dentists	Dental Technicians	Dental therapists	Oral hygienists
<b>Sample (n)</b>	222	93	29	83
<b>Number of patients handled during a week n (%)</b>				
< 40	28 (13.5)		4 (13.8)	29 (36.7)
40 - 59	54 (26.0)		4 (13.8)	25 (31.6)
60 - 79	48 (23.1)		5 (17.2)	12 (15.2)
80 - 99	37 (17.8)		2 (6.9)	5 (6.3)
100 - 119	24 (11.5)		5 (17.2)	4 (5.1)
120 - 139	6 (2.9)		3 (10.3)	2 (2.5)
> 140	11 (5.3)		6 (20.7)	2 (2.5)
<b>Number of working weeks per year n (%)</b>				
< 35	3 (1.4)	2 (2.2)	3 (10.3)	5 (6.3)
35 - 39	3 (1.4)	8 (8.8)	0 (0.0)	0 (0.0)
40 - 44	32 (15.4)	61 (67.0)	3 (10.3)	10 (12.5)
45 - 49	158 (76.3)	20 (22.0)	22 (75.9)	63 (78.8)
> 50	11 (5.3)	0 (0.0)	1 (3.4)	2 (2.5)
<b>Number of working hours per week n (%)</b>				
<30	16 (7.6)	1 (1.1)	1 (3.4)	22 (27.1)
30 - 34	13 (6.2)	3 (3.3)	0 (0.0)	0 (0.0)
35 - 39	33 (15.7)	4 (4.4)	4 (13.8)	34 (42.0)
40 - 44	78 (37.1)	31 (34.5)	16 (55.2)	0 (0.0)
45 - 49	37 (17.6)	27 (30.0)	3 (10.3)	24 (29.6)
> 50	33 (15.7)	24 (26.7)	5 (17.2)	1 (1.25)
<b>Busyness n (%)</b>				
Not busy enough	95 (45.7)	36 (39.1)	2 (6.9)	22 (28.6)
Satisfied with number of patients	80 (38.5)	43 (46.7)	7 (24.1)	42 (54.5)
Can just about manage patients	25 (12.0)	9 (9.8)	13 (44.8)	10 (13.0)
Cannot manage all patients	8 (3.8)	4 (4.3)	7 (24.1)	3 (3.9)
<b>Time (hours) available per week to see more patients</b>				
Number (%)	91 (43.8)	36 (38.7)	5 (17.2)	28 (33.7)
Average (SD)	9.5 (6.2)	11.9 (9.4)	5.8 (2.5)	6.6 (5.6)
Median	8	10	6	5.5
Modal	10	10	8	0

Table 103 Percentage time spent by oral health personnel on various procedures during an average month

Procedures by personnel	Average (SD)	Median	Modal
<b>DENTISTS</b>			
Diagnosis and treatment planning	12.0 (8.7)	10	10
Preventive dentistry	8.4 (7.9)	5	5
Restorative dentistry	26.2 (13.7)	25	30
Oral surgery	9.9 (14.7)	5	5
Orthodontics	6.5 (16.8)	1.5	0
Endodontics	8.7 (11.0)	6	10
Periodontics and oral medicine	6.0 (13.7)	25	0
Crown and bridge work	11.9 (9.5)	10	10
Removable prosthodontics	10.3 (9.7)	10	10
Prosthetic laboratory work	2.0 (4.3)	0	0
Other (i.e. administration)	29.7 (39.8)	10	100
<b>DENTAL THERAPISTS</b>			
Diagnosis and treatment planning	12.6 (9.6)	10	10
Preventive dentistry	17.8 (8.6)	15	15
Restorative dentistry	17.3 (7.1)	18	20
Extractions	41.4 (17.9)	40	30
Treatment of traumatic injuries	5.9 (5.4)	5	5
Radiography	4.3 (4.2)	5	5
Other (i.e. admin. school programs, denture repairs)	6.4 (6.1)	4	1
<b>ORAL HYGIENISTS</b>			
Examination and treatment planning	8.9 (9.9)	2	0
Consultation with the dentist	5.3 (10.7)	2	9
Oral health education and instructions	17.2 (16.5)	10	10
Dietary analysis	3.6 (6.6)	2	0
Scaling and polishing	30.4 (21.2)	25	20
Rootplaning and curettage	5.9 (12.2)	2	0
Removal of restoration overhangs	1.3 (4.0)	0	0
Polishing of restorations	3.6 (9.2)	1	0
Fluoride treatment	13.1 (17.4)	10	10
X-rays and development	5.8 (7.3)	5	0
Impressions and models	3.9 (5.2)	1	0
Fissure sealants	11.1 (14.0)	10	0
Orthodontic related work	10.7 (21.6)	0	0
Assistance	2.0 (6.7)	0	0
<b>DENTAL TECHNICIAN</b>			
Full dentures	20.9 (26.3)	7	0
Partial dentures	11.9 (16.7)	2	0
Chrome-Cobalt dentures	8.4 (18.5)	0	0
Ceramic veneers and inlays	3.8 (7.1)	0	0
Gold inlays and onlays	5.4 (8.1)	0	0
Crown and bridge work	35.2 (38.1)	10	0
Orthodontic appliances	3.7 (9.4)	0	0
Other (i.e. implants and mouthguards)	3.9 (10.1)	0	0

**Table 104** Dental technicians percentage of time spent on various procedures versus the average gross monthly income derived from the same procedures

<b>Procedures</b>	<b>% Time Average (SD)</b>	<b>% Income Average (SD)</b>
<b>Full dentures</b>	20.9 (26.3)	19.5 (25.6)
<b>Partial dentures</b>	11.9 (16.7)	9.7 (12.6)
<b>Chrome-Cobalt dentures</b>	8.4 (18.5)	9.0 (18.8)
<b>Ceramic veneers and inlays</b>	3.8 (7.1)	4.5 (6.9)
<b>Gold inlays and onlays</b>	5.4 (8.1)	6.3 (8.9)
<b>Crown and Bridge work</b>	35.2 (38.1)	42.7 (38.9)
<b>Orthodontic appliances</b>	3.7 (9.4)	2.4 (4.2)
<b>Other (i.e. implants, mouthguards)</b>	3.9 (10.1)	14.4 (20.9)

Table 105: Estimated number of procedures (jobs) handled on an average week by dental technicians

Procedures	Estimated number of jobs handled on an average week						
	None	< 5	5 - 9	10 - 14	15 - 19	20 - 24	> 24
Full dentures	37 (41,1)	13 (14,4)	13 (14,4)	10 (11,1)	4 (4,4)	7 (7,8)	6 (6,7)
Partial dentures	40 (44,4)	14 (15,6)	17 (18,9)	10 (11,1)	2 (2,2)	4 (4,4)	3 (3,3)
Chrome-Cobalt dentures	58 (64,4)	13 (14,4)	10 (11,1)	4 (4,4)	3 (3,3)	1 (1,1)	1 (1,1)
Ceramic veneers and inlays	60 (66,7)	1 (12,2)	7 (7,8)	7 (7,8)	3 (3,3)	0 (0,0)	2 (2,2)
Gold inlays and onlays	48 (53,3)	21 (23,3)	11 (12,2)	4 (4,4)	3 (3,3)	1 (1,1)	2 (2,2)
Crown and bridge work	41 (46,1)	3 (3,4)	4 (4,4)	6 (6,7)	4 (4,4)	10 (11,2)	21 (23,6)
Orthodontic appliances	58 (64,4)	24 (26,7)	6 (6,7)	2 (2,2)	0 (0,0)	0 (0,0)	0 (0,0)
Other (i.e. implants and mouthguards)	68 (75,6)	11 (12,2)	6 (6,7)	4 (4,4)	0 (0,0)	1 (1,1)	0 (0,0)

Table 106 Management of denture related laboratory work by dentists in practice

	n	(%)
<b>Management of denture related laboratory work</b>		
Do all denture work myself	7	(3.5)
Do some of the work myself	68	(34.3)
I employ a dental technician that does all the work	15	(7.6)
I contract all dental laboratory work out	105	(53.0)
I don't have any laboratory work	3	(1.5)
<b>Percentage laboratory procedures dentists do themselves</b>		
Casting of models	111	(57.4)
Special impression trays	63	(32.1)
Preparation of bite rims	61	(31.4)
Setting up of teeth	24	(12.4)
Waxing and finishing	16	(8.2)
Repair of dentures	66	(33.8)
Partial dentures (all procedures)	19	(9.8)
Full dentures (all procedures)	18	(9.3)
Gold inlays and onlays	5	(2.6)
Crown and bridge work	1	(0.5)
Orthodontic appliances	35	(17.2)
Mouthguards	44	(22.4)
Other (i.e. denture reline, surgical splints, bite plane)	7	(3.6)

Table 107 Financial aspects of dental practice

	Average (SD)	Median	Modal
<b>Fee structure (%) (n=174)</b>			
National schedule	37.7 (39.1)	15	10
Scale of benefit	59.8 (34.8)	80	80
Mixed (National schedule + SOB)	46.4 (32.8)	45	20
Reduced nominal fees	11.3 (14.9)	9.5	10
<b>% estimate of clinical prosthetics contribution to average gross monthly turnover (n = 174)</b>			
	20 (25.9)	15	10
<b>Percentage contribution of denture related laboratory work, done by dentist himself, to average gross monthly turnover (n = 151)</b>			
	4.5 (8.2)	1	0
<b>Average monthly overheads expressed as a % of total overheads (n = 166)</b>			
Staff salaries	22.2 (10.3)	20	20
Office rent	11.2 (7.1)	10	10
Equipment lease	8.9 (9.3)	7	0
Laboratory costs	28.4 (15.6)	30	30
Materials and supplies	15.0 (7.8)	14	10
Electricity and telephone	8.7 (7.2)	8	10
Stationary, postage and admin	13.6 (12.3)	10	5
<b>Average monthly dental laboratory account for work contracted out (Rand) (n = 135)</b>			
Crown and bridge work	4168.6 (2684.2)	3500	3000
Full upper and lower dentures	1918.7 (1458.0)	1600	2000
Partial dentures	1130.5 (782.1)	1000	1000
Ceramic veneers and inlays	1002.4 (1070.5)	630	1000
Orthodontic appliances	683.4 (1253.1)	500	500
Other (i.e. Cobalt-chrome, gold inlays, repairs, mouthguards)	730.0 (924.1)	400	150

Table 108: Percentage of oral health care personnel ranking procedures as their first preference

<b>Procedures by oral health care personnel</b>	<b>n (%)</b>
<b>DENTISTS</b>	
Crown and bridge work	68 (34.2)
Restorative dentistry	57 (28.5)
Preventive dentistry	25 (12.5)
Oral surgery	24 (12.1)
Orthodontics	14 (7.0)
Prosthetics	10 (5.0)
Endodontics	7 (3.6)
Periodontics	6 (3.0)
<b>DENTAL THERAPISTS</b>	
Diagnosis and treatment planning	16 (57.1)
Restorative dentistry	11 (39.3)
Oral health education	11 (39.3)
Scaling and polishing	6 (21.4)
Oral surgery	5 (17.9)
Fissure sealants	5 (17.9)
Fluoride treatment	2 (7.1)
<b>ORAL HYGIENISTS</b>	
Oral health education	26 (31.3)
Scaling and polishing	17 (20.5)
Orthodontics	16 (19.3)
Fluoride treatment	8 (9.6)
Examination and assessment	7 (8.4)
Fissure sealants	6 (7.2)
X-rays and development	4 (4.8)
Root planing and periodontal curettage	4 (4.8)
Impressions and models	3 (3.6)
Dietary analysis	3 (3.6)
Polishing of restoration	1 (1.2)
Finishing of overhangs	1 (1.2)
Consultation with dentist	1 (1.2)
Assistance	0 (0.0)
<b>DENTAL TECHNICIAN</b>	
Crown and bridge work	34 (60.7)
Full dentures	27 (38.6)
Chrome-cobalt work	11 (20.4)
Orthodontic appliances	6 (10.5)
Partial dentures	6 (8.7)
Implants	6 (6.4)
Gold inlays and onlays	3 (5.5)
Ceramic veneers and inlays	2 (4.3)

Table 109 Perceptions of oral health care personnel regarding career satisfaction

	Dentists	Dental technicians	Dental therapists	Oral hygienists
<b>Satisfaction with working environment</b>	<b>N = 219</b>	<b>n = 92</b>	<b>n = 29</b>	<b>n = 80</b>
Satisfied	176 (80.4)	65 (70.7)	12 (41.4)	70 (87.4)
Uncertain	18 (8.2)	15 (16.30)	4 (13.8)	3 (3.8)
Dissatisfied	25 (11.4)	12 (13.0)	13 (44.8)	7 (8.8)
<b>Work satisfaction</b>	<b>N = 218</b>	<b>n = 91</b>	<b>n = 29</b>	<b>n = 80</b>
Satisfied	160 (73.4)	63 (69.2)	14 (48.3)	55 (68.8)
Uncertain	31 (14.2)	9 (9.9)	7 (24.1)	12 (15.0)
Dissatisfied	27 (12.40)	19 (20.9)	8 (27.6)	13 (16.2)
<b>Opportunities for development</b>	<b>N = 217</b>	<b>n = 92</b>	<b>n = 29</b>	<b>n = 77</b>
Satisfied	104 (47.9)	41 (44.6)	5 (17.2)	23 (29.9)
Uncertain	56 (25.8)	6 (6.5)	6 (20.7)	18 (23.4)
Dissatisfied	57 (26.3)	45 (48.9)	18 (62.1)	36 (46.7)
<b>Income</b>	<b>N = 217</b>	<b>n = 92</b>	<b>n = 29</b>	<b>n = 81</b>
Satisfied	55 (25.3)	26 (28.6)	0 (0.0)	29 (35.8)
Uncertain	39 (18.0)	14 (15.4)	1 (3.4)	18 (22.2)
Dissatisfied	123 (56.7)	51 (56.0)	28 (96.6)	34 (42.0)
<b>Professional autonomy</b>			<b>n = 29</b>	<b>n = 79</b>
Satisfied			11 (37.9)	39 (49.4)
Uncertain			8 (27.6)	17 (21.5)
Dissatisfied			10 (34.5)	23 (29.1)

Table 110: Rating of factors contributing to a successful career in order of importance by oral health care personnel (%)

	Most important			Least important	
	1	2	3	4	5
<b>WORK SATISFACTION</b>					
Dentists	165 (75,0)	41 (18,6)	10 (4,5)	4 (1,8)	
Dental technicians	48 (53,3)	27 (30,0)	13 (14,4)	2 (2,2)	
Dental therapists	17 (60,7)	7 (25,0)	2 (7,1)	2 (7,1)	0 (0,0)
Oral hygienists	45 (58,4)	12 (15,6)	13 (16,9)	6 (7,8)	1 (1,3)
<b>WORK ENVIRONMENT</b>					
Dentists	12 (5,5)	53 (24,1)	121 (55,0)	34 (15,5)	
Dental technicians	8 (8,9)	16 (17,8)	31 (34,4)	35 (38,9)	
Dental therapists	7 (25,0)	5 (17,9)	5 (17,9)	3 (10,7)	8 (28,6)
Oral hygienists	10 (13,0)	16 (20,8)	18 (23,4)	19 (24,7)	14 (18,2)
<b>DEVELOPMENT OPPORTUNITIES</b>					
Dentists	7 (3,2)	15 (6,9)	44 (20,2)	152 (69,7)	
Dental technicians	15 (16,7)	23 (25,6)	25 (27,8)	27 (30,0)	
Dental therapists	9 (32,1)	4 (14,3)	7 (25,0)	5 (17,9)	3 (10,7)
Oral hygienists	18 (24,0)	14 (18,7)	10 (13,3)	17 (22,7)	16 (21,3)
<b>INCOME</b>					
Dentists	46 (20,9)	112 (50,9)	41 (18,6)	21 (9,5)	
Dental technicians	25 (27,8)	29 (32,2)	16 (17,8)	20 (22,2)	
Dental therapists	15 (53,6)	7 (25,0)	5 (17,9)	0 (0,0)	1 (3,6)
Oral hygienists	7 (9,1)	28 (36,4)	21 (27,3)	13 (16,9)	8 (10,4)
<b>PROFESSIONAL AUTONOMY</b>					
Dental therapists	5 (17,9)	4 (14,3)	2 (7,1)	9 (32,1)	6 (28,6)
Oral hygienist	12 (15,8)	9 (11,8)	9 (11,8)	15 (19,7)	31 (40,8)

Table 111: Dentists and dental technicians perceptions regarding their practices past, present and future financial status (net profit)

RATING OF FINANCIAL STATUS	PAST		PRESENT		FUTURE	
	Dentists (n = 182) n (%)	Dental technicians (n=75) n (%)	Dentists (n = 201) n (%)	Dental technicians (n=76) n (%)	Dentists (n = 191) n (%)	Dental technicians (n=74) n (%)
<b>BEST SCENARIO</b>						
9	24 (13,2)	16 (21,3)	3 (1,5)	0 (0,0)	14 (7,3)	8 (10,8)
8	39 (21,4)	12 (16,0)	14 (7,0)	5 (6,6)	10 (5,2)	8 (10,8)
7	39 (21,4)	9 (12,0)	22 (10,9)	20 (26,3)	12 (6,3)	8 (10,8)
6	31 (17,0)	9 (12,0)	36 (17,9)	10 (13,2)	14 (7,3)	12 (16,2)
5	16 (8,8)	7 (9,3)	51 (25,4)	14 (18,4)	34 (17,8)	7 (9,5)
4	10 (5,5)	6 (8,0)	31 (15,4)	13 (17,1)	22 (11,5)	7 (9,5)
3	7 (3,8)	9 (12,0)	27 (13,4)	10 (13,2)	36 (18,8)	4 (5,4)
2	3 (1,6)	2 (2,7)	11 (5,5)	3 (3,9)	18 (9,4)	11 (14,9)
1	13 (7,1)	5 (6,7)	6 (3,0)	1 (1,3)	31 (16,2)	9 (12,2)
<b>WORST SCENARIO</b>						

Table 112: Dentists reasons for employing and not employing an oral hygienist

	n (%)
<b>Reasons for employing an oral hygienist</b>	<b>85 (38,3)</b>
To maintain a high standard of restorative care	43 (50,6)
Saves time for the practitioner	28 (32,9)
Is an asset to the practices image	4 (4,7)
Don't like preventive work	4 (4,7)
Profit motive - provides income	3 (3,5)
Patients prefer an oral hygienist	1 (1,2)
Dentist has space and equipment available	1 (1,2)
Oral hygienist is dentists wife	1 (1,2)
<b>Reasons for not employing an oral hygienist</b>	<b>107 (48,2)</b>
Insufficient volume of patients to justify an oral hygienist	41 (38,3)
Economically feasible for the dentist to do the work himself	36 (33,6)
Inadequate facilities and space to accommodate an oral hygienist	8 (7,5)
Too expensive - cannot afford an oral hygienist	7 (6,5)
Unnecessary - I have a specialist practice	4 (3,7)
Standard of work is unacceptable	2 (1,9)
No oral hygienists are available	2 (1,9)
Planning to employ one in the future	2 (1,9)
Patients prefer dentists doing their preventive work	2 (1,9)
Share an oral hygienist with another colleague	2 (1,9)
Oral hygienist not willing to help at chairside assisting	1 (0,9)

Table 113: Dentists reasons for employing and not employing a dental technician

	n	(%)
<b>Reasons for employing a dental technician</b>	<b>16</b>	<b>(7,2)</b>
To provide a better service to patients (patient convenience)	5	(31,5)
Financial reasons - more cost-effective	3	(18,8)
To improve quality of care	2	(12,5)
Saves the dentist time – more cost-efficient	2	(12,5)
Government appointed	2	(12,5)
Dentists lacks skills and knowledge in this field	1	(6,3)
Makes administration of labwork easier	1	(6,3)
<b>Reasons for not employing a dental technician</b>	<b>169</b>	<b>(76,1)</b>
Insufficient volume of labwork - economically not viable	74	(43,8)
Dental laboratories are conveniently located near practice	39	(23,1)
Prefer to use various specialist laboratories	24	(14,2)
Too expensive to set up a dental laboratory in the practice	11	(6,5)
Do labwork myself for financial reasons	6	(3,6)
I don't need a dental technician	6	(3,6)
Difficult to manage administratively	5	(3,0)
Will consider employing a dental technician in the future	2	(1,2)
Difficult to get a good technician	1	(0,6)
Dental technicians are not willing to work for a salary	1	(0,6)

Table 114: Dentists perceptions regarding extending their role to perform specialist functions

	n (%)
<b>Need for extended functions</b>	
Allow much more specialised functions	48 (22.5)
Allow slightly more specialised functions	93 (43.7)
Should remain the same	56 (26.3)
Don't know	16 (7.5)
<b>Reasons for supporting extended specialised functions</b>	<b>151 (68,0)</b>
To provide an advanced comprehensive service	36 (23.8)
To improve affordability to a broader spectrum of specialised services	25 (16.6)
To improve job satisfaction	24 (15.9)
Professional development	22 (14.6)
Increase availability and accessibility of specialised services	18 (11.9)
To increase income	7 (4.6)
The dentists field of work is shrinking	7 (4.6)
Basic training and continuing education is inadequate	6 (4.0)
To be able to identify better when and what to refer	5 (3.3)
<b>Reasons for opposing extended functions</b>	<b>44 (19,8)</b>
Inadequate knowledge and skills	17 (38.6)
Basic training and continuing education is inadequate	8 (18.2)
There are sufficient specialists available to perform these functions	6 (13.6)
Dentists have enough work to stay busy	6 (13.6)
Dentists are already over-trained and practising too specialised	3 (6.8)
Dentists are encroaching on the field of the specialist	3 (6.8)
Education should rather be focused on primary care	1 (2.3)
<b>Fields in which specialised functions should be extended</b>	
Orthodontics	114 (75.0)
Oral surgery	112 (73.2)
Periodontal procedures	111 (73.0)
Fixed prosthodontics	90 (59.2)
Removable prosthodontics	49 (32.5)
<b>Type of specialised functions in which skills are needed</b>	
Crown lengthening procedures	62 (27.9)
Class I fixed appliance orthodontic therapy	50 (22.5)
Surgical removal of impacted teeth	36 (16.2)
Implantology	21 (9.5)
Full range denture care	8 (3.6)

Table 115: Dentists perceptions on extending the functions of dental therapists and oral hygienists

	DENTAL THERAPISTS n (%)	ORAL HYGIENISTS n (%)
<b>Need for extending functions</b>		
Allow much more function	9 (4,1)	34 (15,5)
Allow slightly more functions	38 (17,1)	72 (32,7)
Should remain the same	113 (50,9)	102 (46,4)
Don't know	62 (28,0)	12 (5,5)
<b>Reasons for supporting extended functions</b>	<b>41 (18,5)</b>	<b>96 (43,2)</b>
To increase availability of care to the masses	28 (68,3)	1 (0,0)
More cost-effective utilisation of human resources	6 (14,6)	51 (53,1)
To take work load off the dentist	4 (9,8)	16 (16,7)
To improve job satisfaction	1 (2,4)	3 (3,1)
To relieve dentists of boring routine procedures	0 (0,0)	20 (20,8)
To reduce the cost of care for the patient	0 (0,0)	2 (2,1)
To promote professional autonomy	0 (0,0)	2 (2,1)
To promote free enterprise	1 (2,4)	0 (0,0)
<b>Reasons for opposing extended function</b>	<b>102 (45,9)</b>	<b>87 (39,2)</b>
Professional encroachment	47 (46,1)	39 (44,8)
Training is inadequate and limited	33 (32,4)	28 (32,2)
Current tasks are adequate to justify a profession	1 (1,0)	8 (9,2)
Difficult to control who is doing what	7 (6,9)	2 (2,3)
Resources are adequate to perform these functions	6 (5,9)	3 (3,4)
To ensure that the quality of services stays the same	2 (2,0)	1 (1,1)
Patients prefer dentists performing these functions	0 (0,0)	1 (1,1)
To prevent financial exploitation by dentists	0 (0,0)	1 (1,1)
The dentist-patient relationship will be affected	2 (2,0)	2 (2,3)
It will reduce / worsen preventive care	2 (2,0)	2 (2,3)
Will promote over-servicing and malpractice's	4 (3,9)	0 (0,0)
<b>Fields in which extended functions should be increased</b>		
Emergency care (i.e. extractions)	43 (84,3)	26 (25,2)
Preventive care	0 (0,0)	87 (84,5)
Periodontal care	19 (37,3)	68 (66,0)
Restorative care	29 (56,9)	90 (58,3)
Denture care	30 (58,8)	30 (48,5)
Orthodontics	6 (11,8)	50 (48,5)

Table 116: Dental therapists perceptions regarding extended functions

	n	(%)
<b>Need for extended functions</b>		
Allow much more extended functions	18	(66,7)
Allow slightly more extended functions	9	(33,3)
Functions should remain the same	0	(0,0)
Don't know	0	(0,0)
<b>Reasons for supporting extended functions</b>		
	<b>27</b>	<b>(93,1)</b>
There are no dentists available to provide needed services	15	(55,6)
To meet increasing and unmet demands of rural communities	8	(29,6)
Endodontics goes with restorative care	1	(3,7)
Auxiliary personnel are more cost-effective than dentists	1	(3,7)
Will provide greater job satisfaction	1	(3,7)
Dental therapists are already practising these functions	1	(3,7)
<b>Fields in which functions should be extended</b>		
Denture care	24	(85,7)
Treatment under general anaesthesia	19	(76,0)
Periodontal care	18	(64,3)
Restorative care	18	(64,3)
Endodontics	16	(57,1)
Crown and bridge work	14	(51,9)
Orthodontics	9	(32,1)
Drug prescriptions	2	(8,0)
Medical emergencies	1	(4,0)

Table 117: Oral hygienists perceptions regarding extended functions

	n	(%)
<b>Need for extended functions</b>		
Allow much more extended functions	46	(56,1)
Allow slightly more extended functions	33	(40,2)
Functions should remain the same	2	(2,4)
Don't know	1	(1,2)
<b>Reasons for supporting extended functions</b>	<b>80</b>	<b>(96,4)</b>
To increase job satisfaction	27	(33,8)
To be able to practice autonomously	18	(22,6)
To increase accessibility and availability of services	14	(17,5)
To increase oral hygienists productivity	7	(8,8)
To increase the status of the dental team	5	(6,3)
To reduce the workload of the dentist	4	(5,0)
More cost-efficient way of using human resources	3	(3,8)
Financial benefit for the community (services more affordable)	2	(2,5)
<b>Reasons for opposing extended functions</b>	<b>5</b>	<b>(6,0)</b>
Advanced training is required	2	
Oral hygienists may then just as well study to become a dentist	1	
Oral hygienists do not have the knowledge and skills	1	
Patients prefer a dentists performing these functions	1	
<b>Fields in which functions should be extended</b>		
Emergency care	44	(53,0)
Diagnosis and treatment planning	41	(49,4)
Periodontal care	35	(42,2)
Orthodontic care	30	(36,1)
Denture care	27	(32,5)
Preventive care	24	(28,9)
<b>Specific type of functions requested</b>		
Prescriptions (n = 74)	56	(75,7)
Mouthguards (n = 83)	44	(53,0)
Class I restoration (n = 62)	22	(35,5)
Local anaesthesia (n = 35)	17	(48,6)
Placement of direct attachments (n = 30)	14	(46,7)
Denture adjustment (n = 27)	14	(51,8)
Extraction of primary teeth (n = 44)	10	(22,7)

Table 118: Dentist's ranking of clinical services in the public sector in order of priority for resource allocation (n = 218)

TYPE OF SERVICE	PRIORITY RANKING FOR RESOURCE ALLOCATION								
	Highest priority						Lowest priority		
	1	2	3	4	5	6	7	8	9
<b>Health education</b>	105 (48,2)	51 (23,4)	27 (12,4)	7 (3,2)	11 (5,0)	1 (0,5)	1 (0,5)	8 (3,7)	7 (3,2)
<b>Pain and sepsis care</b>	90 (41,3)	52 (23,9)	52 (23,9)	18 (8,3)	2 (0,9)	1 (0,5)	0 (0,0)	2 (0,9)	1 (0,5)
<b>Preventive care</b>	22 (10,1)	81 (37,2)	84 (38,5)	21 (9,6)	3 (1,4)	2 (0,9)	2 (0,9)	2 (0,9)	1 (0,5)
<b>Restorative care</b>	9 (4,1)	29 (13,4)	30 (13,8)	109 (50,2)	35 (16,1)	1 (0,5)	1 (0,5)	0 (0,0)	3 (1,4)
<b>Denture care</b>	1 (0,5)	7 (3,2)	6 (2,8)	21 (9,7)	85 (39,2)	43 (19,8)	7 (3,2)	13 (6,0)	34 (15,7)
<b>Orthodontics</b>	2 (0,9)	3 (1,4)	1 (0,5)	12 (5,6)	11 (5,1)	37 (17,1)	49 (22,7)	42 (19,4)	59 (27,3)
<b>Endodontics</b>	2 (0,9)	0 (0,0)	7 (3,2)	7 (3,2)	22 (10,2)	70 (32,4)	62 (28,7)	35 (16,2)	11 (5,1)
<b>Crown and Bridge work</b>	1 (0,5)	1 (0,5)	2 (0,9)	3 (1,4)	13 (6,0)	19 (8,8)	44 (20,4)	74 (34,3)	59 (27,3)
<b>Periodontics</b>	2 (0,9)	2 (0,9)	7 (3,2)	16 (7,4)	34 (15,7)	34 (15,7)	41 (19,0)	32 (14,8)	48 (22,2)

Table 119: Dental therapist's ranking of clinical services in the public sector in order of priority for resource allocation

TYPE OF SERVICE	PRIORITY RANKING FOR RESOURCE ALLOCATION								
	Highest priority		3	4	5	6	7	Lowest priority	
	1	2						8	9
<b>Pain and sepsis care</b>	20 (69,0)	2 (6,9)	3 (10,3)	1 (3,4)	1 (3,4)	0 (0,0)	1 (3,4)	0 (0,0)	1 (3,4)
<b>Preventive care</b>	9 (31,0)	10 (34,5)	9 (31,0)	1 (3,4)	0 (0,0)	0 (0,0)	0 (0,0)	0 (0,0)	0 (0,0)
<b>Oral health education</b>	14 (48,3)	11 (37,9)	2 (6,9)	1 (3,4)	1 (3,4)	0 (0,0)	0 (0,0)	0 (0,0)	0 (0,0)
<b>Restorative care</b>	1 (3,4)	9 (31,0)	7 (24,1)	12 (41,4)	0 (0,0)	0 (0,0)	0 (0,0)	0 (0,0)	0 (0,0)
<b>Denture care</b>	2 (6,9)	4 (13,8)	1 (3,4)	0 (0,0)	5 (17,2)	6 (20,7)	2 (6,9)	7 (24,1)	2 (6,9)
<b>Orthodontics</b>	0 (0,0)	2 (6,9)	4 (13,8)	2 (6,9)	6 (20,7)	7 (24,1)	2 (6,9)	4 (13,8)	2 (6,9)
<b>Endodontics</b>	2 (6,9)	1 (3,4)	3 (10,3)	3 (10,3)	3 (10,3)	4 (13,8)	9 (31,0)	2 (6,9)	2 (6,9)
<b>Crown and Bridge work</b>	0 (0,0)	1 (3,4)	0 (0,0)	0 (0,0)	5 (17,2)	3 (10,3)	2 (6,9)	9 (31,0)	9 (31,0)
<b>Periodontics</b>	2 (6,9)	4 (13,8)	2 (6,9)	1 (3,4)	6 (20,7)	4 (13,8)	3 (10,3)	6 (20,7)	1 (3,4)

Table 120: Perceptions regarding the adequacy of supply of dental technicians and oral hygienists

	n (%)
<b>Dental technicians perceptions regarding adequacy of supply of dental technicians</b>	
Far too few	1 (1,1)
Too few	7 (7,6)
Enough	22 (23,9)
Too many	29 (31,5)
Far too many	31 (33,7)
Don't know	2 (2,2)
<b>Oral hygienists perceptions regarding adequacy of supply of oral hygienists</b>	
Far too few	11 (13,6)
Too few	20 (24,7)
Enough	31 (38,3)
Too many	11 (13,6)
Far too many	1 (1,2)
Don't know	7 (8,6)

Table 121: Dentist's and dental therapist's views on the overall supply of oral health care personnel to meet oral health care demands

TYPE OF SERVICE	ADEQUACY OF ORAL HEALTH CARE PERSONNEL					
	Far too few	Too few	Enough	Too many	Far too many	Don't know
<b>DENTISTS VIEWS</b>						
Health education	58 (26,2)	60 (27,1)	64 (29,0)	10 (4,5)	9 (4,1)	20 (9,0)
Preventive care	34 (15,4)	57 (25,8)	82 (37,1)	16 (7,2)	16 (7,2)	16 (7,2)
Restorative care	12 (5,4)	17 (7,7)	83 (37,6)	59 (26,7)	34 (15,4)	16 (7,2)
Denture care	10 (4,5)	10 (4,5)	102 (46,2)	49 (22,2)	33 (14,9)	17 (7,7)
Orthodontic care	17 (7,7)	40 (18,1)	114 (51,6)	23 (10,4)	10 (4,5)	17 (7,7)
Periodontal care	16 (7,2)	51 (23,1)	114 (51,6)	18 (8,1)	4 (1,8)	18 (8,1)
Fixed prosthodontics	8 (3,6)	26 (11,8)	120 (54,3)	29 (13,1)	10 (7,2)	22 (10,0)
Oral surgery	12 (5,4)	30 (13,6)	133 (60,2)	24 (10,9)	6 (2,7)	16 (7,2)
<b>DENTAL THERAPISTS VIEWS</b>						
Health education	17 (60,7)	9 (32,1)	1 (3,6)	0 (0,0)	0 (0,0)	1 (3,6)
Preventive care	15 (53,6)	10 (35,7)	3 (10,7)	0 (0,0)	0 (0,0)	0 (0,0)
Restorative care	9 (32,1)	12 (42,9)	7 (25,0)	0 (0,0)	0 (0,0)	0 (0,0)
Denture care	19 (67,9)	5 (17,9)	1 (3,6)	3 (10,7)	0 (0,0)	0 (0,0)
Orthodontic care	20 (71,9)	5 (17,9)	2 (7,1)	1 (3,6)	0 (0,0)	0 (0,0)
Periodontal care	14 (50,0)	9 (32,0)	4 (14,3)	1 (3,6)	0 (0,0)	0 (0,0)
Fixed prosthodontics	20 (71,4)	2 (7,1)	2 (7,1)	3 (10,7)	0 (0,0)	1 (3,6)

Table 122: Dentist's perceptions regarding the utilisation of oral health care personnel in the public sector (n = 221)

TYPE OF PERSONNEL	NEED FOR UTILISING ORAL HEALTH CARE PERSONNEL					
	Far more n (%)	More n (%)	Same n (%)	Less n (%)	Far less n (%)	Don't know n (%)
<b>IN URBAN AREAS</b>						
Dentists	45 (20,4)	66 (29,9)	55 (24,9)	18 (8,1)	15 (6,8)	22 (10,0)
Dental therapists	35 (15,8)	60 (27,1)	42 (19,0)	19 (8,6)	23 (10,4)	42 (19,0)
Oral hygienists	56 (25,3)	91 (41,1)	44 (19,9)	6 (2,7)	3 (1,4)	21 (9,5)
Dental assistants	28 (12,7)	50 (22,6)	92 (41,6)	11 (5,0)	3 (1,4)	37 (16,8)
Dental technicians	14 (6,3)	43 (19,5)	105 (47,5)	15 (6,8)	7 (3,2)	37 (16,8)
<b>IN RURAL AREAS</b>						
Dentists	62 (28,1)	79 (35,7)	36 (16,3)	10 (4,5)	7 (3,2)	27 (12,2)
Dental therapists	63 (28,5)	66 (29,9)	25 (11,3)	10 (4,5)	15 (6,8)	42 (19,0)
Oral hygienists	76 (34,4)	85 (38,5)	26 (11,8)	3 (1,4)	2 (0,9)	29 (13,1)
Dental assistants	42 (19,0)	66 (29,9)	64 (29,0)	8 (3,6)	1 (0,5)	40 (18,10)
Dental technicians	31 (14,0)	65 (29,4)	73 (33,0)	8 (3,6)	5 (2,3)	39 (17,6)

Table 123: Dental therapist's perceptions regarding the utilisation of oral health care personnel in the public sector (n=121)

TYPE OF PERSONNEL	NEED FOR UTILISING ORAL HEALTH CARE PERSONNEL					
	Far more n (%)	More n (%)	Same n (%)	Less n (%)	Far less n (%)	Don't know n (%)
<b>IN URBAN AREAS (n = 26)</b>						
Dentists	2 (7,7)	10 (38,5)	7 (26,9)	5 (19,2)	2 (7,7)	0 (0,0)
Dental therapists	9 (34,6)	16 (61,5)	1 (3,8)	0 (0,0)	0 (0,0)	0 (0,0)
Oral hygienists	16 (61,5)	10 (38,5)	0 (0,0)	0 (0,0)	0 (0,0)	0 (0,0)
Dental assistants	9 (34,6)	14 (53,8)	3 (11,5)	0 (0,0)	0 (0,0)	0 (0,0)
Dental technicians	3 (11,5)	13 (50,0)	6 (23,1)	1 (3,8)	2 (7,7)	1 (3,8)
<b>IN RURAL AREAS (n = 27)</b>						
Dentists	10 (37,0)	4 (14,8)	5 (18,5)	4 (14,8)	4 (14,8)	0 (0,0)
Dental therapists	16 (59,3)	11 (40,7)	0 (0,0)	0 (0,0)	0 (0,0)	0 (0,0)
Oral hygienists	20 (74,1)	6 (22,2)	0 (0,0)	1 (3,7)	0 (0,0)	0 (0,0)
Dental assistants	15 (55,6)	7 (25,9)	5 (18,5)	0 (0,0)	0 (0,0)	0 (0,0)
Dental technicians	8 (29,6)	7 (25,9)	3 (11,1)	3 (11,1)	4 (14,8)	2 (7,4)

Table 124: Oral hygienist's perceptions regarding the use of oral hygienists in the public sector

Do you think that public services should make more or less use of oral hygienists?	n	(%)
<b>IN URBAN AREAS</b>		
Far more	28	(33,7)
More	36	(43,4)
Same	12	(14,5)
Less	1	(1,2)
Far less	0	(0,0)
Don't know	6	(7,2)
<b>IN RURAL AREAS</b>		
Far more	57	(68,7)
More	22	(26,5)
Same	1	(1,2)
Less	0	(0,0)
Far less	0	(0,0)
Don't know	3	(3,6)

Table 125: Responses of dental technicians regarding denture services and their relationship with dentists

	n	(%)
<b>Have patients been referred to you by a dentist to provide services directly to a patient during the past 3 years?</b>	<b>89</b>	<b>(95,7)</b>
Ordinary repair of a denture	50	(56,2)
Repair of a denture where an impression or fitting was necessary	25	(28,1)
Complete dentures	20	(22,5)
Reline or rebase a denture	20	(22,5)
Partial dentures	16	(18,0)
<b>Reasons why the dentist referred patients directly to you for care</b>	<b>51</b>	<b>(54,8)</b>
Difficult case - dentist unable to satisfy patient's needs	27	(62,7)
Dentist was too busy - had no time to attend to the patient	11	(21,6)
Emergency case - dentist was on holiday	3	(5,9)
Patient cannot afford a dentist	2	(3,9)
Personal service to a friend	2	(3,9)
Dental technician has a good relationship with the dentist	1	(2,0)
<b>Have you had to remake a full denture at own cost as a result of a poor impression or fitting by the dentist during the past 3 years</b>	<b>80</b>	<b>(86,0)</b>
Many times	39	(48,8)
Often	8	(10,0)
Sometimes	15	(18,8)
Never	18	(22,5)
<b>Have you had to remake any denture related work at own cost because inadequate instructions had been provided by the dentists during the past 3 years?</b>	<b>80</b>	<b>(86,0)</b>
Many times	35	(43,8)
Often	14	(17,5)
Sometimes	15	(18,8)
Never	16	(20,0)
<b>Have dentists approached you during the past 3 years to provide dentures at no charge?</b>	<b>78</b>	<b>(83,9)</b>
Many times	15	(19,0)
Often	11	(14,1)
Sometimes	18	(23,1)
Never	34	(43,6)

Table 125: / Continued  
 Responses of dental technicians regarding denture services and their relationship with dentists

	n	(%)
<b>Have dentists requested you during the past 3 years to invoice work that was not done, for claiming from the patients medical aid?</b>		
Yes	28	(32,6)
No	54	(62,8)
Don't know	4	(4,7)
<b>Have you been a position where you were blackmailed to commit fraud or been exploited by a dentist in exchange for his support during the past 3 years?</b>		
Yes	29	(34,1)
No	56	(65,9)
<b>Have dentists approached you during the past 3 years to provide services at a discounted rate in exchange for their continued support?</b>		
Yes	65	(69,9)
No	22	(23,7)
Don't know	6	(6,5)
<b>Overall relationship with dentists</b>		
Very good / excellent	19	(14,3)
Good / positive	56	(61,5)
Poor / mostly negative	13	(14,3)
No response	3	(3,3)
<b>Reasons why you prefer not to work as an employee for a dentist?</b>	<b>92</b>	<b>(98,9)</b>
Dentists exploit dental technicians financially	34	(36,9)
Prefer to practice independently	30	(32,6)
Job satisfaction	26	(28,3)
Financial commitment for bursary received	2	(2,2)
<b>Reason for choosing to be full-time employed by a dentist?</b>	<b>5</b>	<b>(5,4)</b>
No other jobs available	2	
Age too slow	1	
Opportunity to work in close relationship with the dentist	1	
Don't like piecework	1	

Table 126: Responses of dental technicians regarding denture services and relationship with dentists

	<b>Average (SD)</b>	<b>Median</b>	<b>Modal</b>
Number of dentures provided at no cost to a dentist during the past 3 years	3,3 (2,7)	3	1
Number of requests for exploiting the patients medical aid during the past 3 years	58,7 (100,2)	50	100
Number of cases provided per month at discounted rate to the dentist in exchange for continued support	1,7 (1,9)	1	1

Table 127: Assessment of potential and illegitimate practices by dental technicians

	n	(%)
<b>Have you ever been approached by members of the public to provide denture services directly to them?</b>		
Many times	51	(54,8)
Often	15	(16,1)
Sometimes	25	(26,9)
Never	2	(2,2)
<b>Reaction of the public when turned away?</b>		
Astonished / disappointed at being forced to pay higher prices	52	(60,5)
They found it difficult to understand	15	(17,4)
Dissatisfaction by the injustice of legislation	14	(16,3)
Said they cannot afford a dentist	2	(2,3)
Dental technician was called a fool	1	(1,2)
<b>Main reason why people requested treatment directly from a dental technician?</b>		
The dentists was too expensive	60	(65,9)
In desperation for a successful denture	13	(14,3)
Ignorance by the public	6	(6,6)
Dentist not meeting the patients aesthetic needs	1	(1,1)
Two or more of above	11	(12,1)
<b>Services provided directly to a patient during the past 3 years?</b>		
Repair of a denture	56	(68,3)
Complete dentures	29	(35,4)
Partial dentures	24	(29,3)
Reline or rebase of a denture	17	(20,7)
<b>Motivations for providing services directly to patients</b>		
Personal favour to a family member or friend	12	(20,3)
Can provide better quality dentures because of technical Experience	9	(15,3)
Patient cannot afford care elsewhere	8	(13,6)

Table 128: Dentist's perceptions regarding the establishing of denturists as a new occupational category

<b>Do you think that dental technicians ought to receive further clinical training so that they can provide dentures directly to the public?</b>	<b>n</b>	<b>(%)</b>
Strongly support	11	(5,0)
Somewhat in favour of	21	(9,6)
Undecided	18	(8,8)
Somewhat opposed against	29	(13,3)
Strongly opposed against	139	(63,8)
<b>Reasons for opposing denturism</b>	<b>170</b>	<b>(76,6)</b>
Professional encroachment	71	(41,8)
Inadequate knowledge and skills	68	(40,0)
Will increase oral complications	9	(5,3)
Difficult to control the scope of denturism	4	(2,4)
Will create an avenue for malpractice	4	(2,4)
Will compromise the dentist-patient relationship	4	(2,4)
The quality of dentures will decline	3	(1,8)
Deregulation will cost too much	1	(0,6)
There are a adequate supply of dentists to meet current demands	1	(0,6)
<b>Reasons for supporting denturism</b>	<b>35</b>	<b>(15,8)</b>
To make dentures more affordable and accessible	15	(42,9)
Massive demand for denture services	3	(8,6)
To improve availability of dentures in rural areas	3	(8,6)
To make such practices legal	3	(8,6)
Will improve the quality of denture services	3	(8,6)
Dentists are not interested in doing prosthetics	2	(5,7)
To allow free enterprise and competition	2	(5,7)
Will relieve work pressure on the dentist	2	(5,7)
Will reduce the cost of training dentists	1	(2,9)
Economic survival of dental technicians	1	(2,9)
<b>Are you in favour of patients paying laboratory bills directly to the dental technician?</b>		
Strongly support	134	(61,5)
Somewhat in favour of	25	(11,5)
Undecided	24	(11,0)
Somewhat opposed against	8	(3,7)
Strongly opposed against	27	(12,4)

Table 129: Dental therapist's and oral hygienist's perceptions regarding the provision of dentures directly to the public by themselves

	<b>DENTAL THERAPIST S n (%)</b>	<b>ORAL HYGIENISTS n (%)</b>
<b>Need for providing dentures directly to the public</b>		
Strongly support	24 (82,8)	11 (13,3)
Somewhat in favour of	2 (6,9)	13 (15,7)
Undecided	3 (10,3)	30 (36,1)
Somewhat opposed against	0 (0,0)	16 (19,3)
Strongly opposed against	0 (0,0)	13 (15,7)
<b>Reasons in favour of providing dentures to the public</b>	<b>29 (100,0)</b>	<b>25 (30,1)</b>
To satisfy the growing unmet demands	10 (34,4)	6 (24,0)
Professional obligation - if you extract teeth you should be able to replace them	5 (17,2)	
Will make dentures more affordable	5 (17,2)	5 (20,0)
Inadequate service availability	3 (10,3)	0 (0,0)
Not difficult to make - can be trained easily	3 (10,3)	0 (0,0)
Don't know	3 (10,3)	0 (0,0)
To reduce the workload off the dentist	0 (0,0)	4 (16,0)
To control illegitimate practices	0 (0,0)	1 (4,0)
<b>Reasons for opposing the principle that dentures be provided directly to the public</b>	<b>0 (0,0)</b>	<b>40 (48,2)</b>
To keep teeth is our goal	0 (0,0)	19 (47,5)
Oral hygienists are not trained for this function		15 (37,5)
Danger of malpractice	0 (0,0)	2 (5,0)
Patients prefer dentures made by a dentist	0 (0,0)	2 (5,0)
Requires sophisticated equipment	0 (0,0)	1 (2,5)
Not interested in making dentures	0 (0,0)	1 (2,5)

Table 130: Dental technician's perceptions and attitudes on establishing denturists as a new occupational category

	n	(%)
<b>Do you support the idea of forming denturists as a new occupational category in South Africa?</b>		
Strongly support	73	(79,3)
Somewhat in favour of	16	(17,4)
Undecided	3	(3,3)
Somewhat opposed against	0	(0,0)
Strongly opposed against	0	(0,0)
<b>Reasons for supporting denturism</b>		
	<b>91</b>	<b>(97,8)</b>
More cost effective utilisation of human resources	27	(29,7)
To reduce the cost of dentures - increase affordability	25	(27,5)
To improve the quality of dentures	12	(13,2)
Skills and knowledge are better than those of dentists	8	(8,8)
To have better control over the price of dentures	8	(8,8)
Growing public demand for dentures	3	(3,3)
To gain professional independence	2	(2,2)
To improve job satisfaction	1	(1,1)
Inadequate supply of dentists - to increase availability	1	(1,1)
<b>Reasons for opposing denturism</b>		
	<b>16</b>	<b>(17,2)</b>
Control – existing difficulty in policing current laws would be worsened	6	(37,5)
Inadequate clinical training	5	(31,5)
Too many occupational hazards - danger of infections	1	(6,3)
Risk losing the dentists clientele	1	(6,3)
Will worsen the relationship between dentist-dental technician	1	(6,3)
Dental technicians lack professionalism	1	(6,3)
Too many unknown factors	1	(6,3)
<b>Clinical fields in which dental technicians ought to play a greater role as practising denturists</b>		
Provision of complete dentures	86	(93,5)
Repair of dentures	84	(91,3)
Provision of partial dentures	77	(83,7)
Orthodontic treatment	30	(33,7)
Provision of mouthguards	12	(13,0)
Provision of chrome-cobalt dentures	8	(8,7)
Relines and rebasing of dentures	3	(3,3)
Preparation of teeth for partial dentures	1	(1,1)

Table 130 / Continued: Dental technician's perceptions and attitudes on establishing denturists as a new occupational category

	n (%)
<b>Do you think that dental technicians should receive clinical training before being allowed to practice as a dentist?</b>	
Definitely yes	59 (64,1)
Yes	23 (25,0)
Uncertain	6 (6,5)
No	3 (3,3)
Definitely not	1 (1,1)
<b>If denturism were to be legalised, would you become a dentist?</b>	
Yes	63 (68,5)
No	18 (19,6)
Don't know	11 (12,0)
<b>If no, why would you not practice as a dentist?</b>	
Professional preferences	15 (93,7)
You can serve only one profession properly	1 (6,3)
<b>If your decision was to practice denturism, how would you prefer to conduct your practice?</b>	
Have my own practice	69 (79,3)
Look for a practice arrangement with a dentist	12 (13,8)
Other practice arrangements	5 (5,7)
Don't know	1 (1,1)
<b>If you were able to practice denturism today, at what price would you be able to provide a full upper and lower set of dentures directly to the public?</b>	
	<b>Rand</b>
Average	494,2
Standard deviation	158,3
Median	500
Modal	500
Upper quartile (> 75%)	600
Lower quartile (<25%)	375
Lowest value	180 (1)
Highest value	850 (1)

## **CHAPTER 12**

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