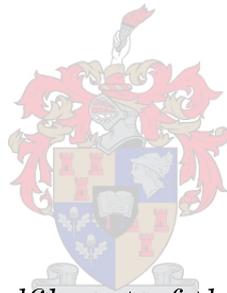


# Investigating the mechanisms that influence the health care outcomes in sub-Saharan African countries

by

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*Thesis presented in fulfilment of the requirements for the  
degree of Master of Engineering (Engineering Management)  
in the Faculty of Engineering at Stellenbosch University.*

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# Declaration

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# Abstract

## Investigating the mechanisms that influence the health care outcomes in sub-Saharan African countries

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Sub-Saharan Africa experiences some of the poorest health care outcomes in the world. With the combination of a high burden of disease and a severe lack of resources, the health systems in SSA face immense pressure to perform under difficult circumstances. The need to drive efficiency and gain an in depth understanding of health systems in SSA is thus clear.

In order to make improvements to health systems, an understanding of the way in which health systems function and the components which they are made up of and influenced by is required. The complexity of health systems is not only due to the number of components which make up a health system but due to the interactions with factors which extend beyond the health system. The significant impact of contextual impacts on the health care outcomes of an area must be recognised along with the way in which these interact and influence a health system. The ability to therefore map the way in which mechanisms influence health care outcomes over an area as large as SSA is found to be an inexhaustible task, therefore an approach is developed in order to facilitate the identification of health care outcome bottlenecks in a specific area.

In order to gain an in depth understanding of factors that make up a health system, an analysis of existing conceptual frameworks of health systems is carried out. This analysis results in the emergence of nine overarching areas to consider when analysing a health system; along with five performance measure categories.

A systematic literature review is carried out in order to populate the understanding of health systems in relation to the components identified in terms of a SSA setting. The review considers an extensive array of literature in order to gain a broad understanding of the factors attributed to influencing health care outcomes in SSA.

From the analysis of the conceptual frameworks along with the results from the systematic literature review, a series of challenges and complexities within health systems are highlighted. In order to address these a number of tools are investigated to develop a method by which to identify bottlenecks found in health systems.

The recognition of the complexity of health systems and the emphasis placed on contextual factors is reiterated as the recognition of over arching health system factors such as lack of resources is found to be well researched and recorded. Thus the contribution of over arching health system factors is less valuable than the ability to recognise specific factors.

In order to facilitate health care outcome improvements and identify mechanisms which influence these outcomes, an approach to identify bottlenecks in district health systems emerges. The approach consists of the following stages: (i) Select a physical area or location; (ii) Select a health care outcome; (iii) Identify the population at risk; (iv) Interpret available data to identify bottlenecks; (v) Discuss process of care identified as the bottleneck; (vi) Discuss factors relating to the bottleneck identified; and (vii) Identify stakeholders and roleplayers to be involved in planning and change management.

The approach is seen to contribute to the initiation of interventions as it hopes to identify a point in the health system which needs improvement. Extensive literature on planning and implementing interventions exists, therefore this approach makes no effort to contribute hereto but is a decision making tool as to where effort in health systems can be directed toward.

An illustrative case study is carried out in order to demonstrate the way in which the approach can be populated and to facilitate the study validation. Subject matter experts are consulted in order to improve upon and approve the results of the study and the emergent approach.

This study makes a contribution by illustrating the complexity of health systems and suggests an approach which may be followed in order to facilitate the identification of mechanisms affecting health care outcomes in specific settings.

# Uittreksel

## 'n Onderzoek van die meganismes wat gesondheidsorg uitkomstes in sub-Sahara Afrika lande beïnvloed

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Sub-Sahara Afrika ondervind van die swakste gesondheidsorguitkomstes in die wereld. Met die kombinasie van 'n hoe las van siekte en 'n ernstige gebrek aan hulpbronne, ondervind die gesondheidstelsels in SSA geweldige druk om onder moeilike omstandighede te presteer. Die behoefte om doeltreffendheid te bestuur en 'n grondige begrip van gesondheidstelsels in SSA te verkry, is dus duidelik.

Ten einde verbeterings aan gesondheidstelsels te maak, word 'n begrip van die wyse waarop gesondheidstelsels funksioneer en die komponente waaruit hulle bestaan en beïnvloed word benodig. Die kompleksiteit van gesondheidstelsels is nie net as gevolg van die aantal komponente wat 'n gesondheidstelsel vorm nie, maar as gevolg van die interaksies met faktore wat buite die gesondheidstelsel strek. Die wesenlike impak van die kontekstuele impak op die gesondheidsorguitkomstes van 'n gebied moet erken word saam met die wyse waarop dit in wisselwerking is met die gesondheidstelsel, asook hoe hierdie stelsels beïnvloed word. Die vermoede om die wyse waarop meganismes gesondheidsorguitkomstes oor 'n gebied so groot soos SSA beïnvloed, te bepaal, is dus onuitputlik. Daarom word 'n benadering ontwikkel om die identifisering van knelpunte vir gesondheidsorguitkomstes in 'n spesifieke gebied te fasiliteer.

Ten einde 'n deeglike begrip te verkry van faktore wat 'n gesondheidstelsel vorm, word 'n ontleding van bestaande konseptuele raamwerke van gesondheidstelsels uitgevoer. Hierdie analise lei tot die opkoms van nege oorkoepelende gebiede wat in ag geneem moet word wanneer 'n gesondheidstelsel geanaliseer word; saam met vyf prestasie-maatstaf kategoriee.

'n Sistematiese literatuuroorsig word uitgevoer om die begrip van gesondheidstelsels te vul met betrekking tot die komponente wat geïdentifiseer is ingevolge 'n SSA-omgewing. Die hersiening oorweeg 'n uitgebreide verskeidenheid literatuur om 'n breek begrip te verkry van die faktore wat toegeskryf word aan die uitwerking van gesondheidsorguitkomst in SSA.

Uit die ontleding van die konseptuele raamwerke, tesame met die resultate van die sistematiese literatuuroorsig, word 'n reeks uitdagings en kompleksiteite binne gesondheidstelsels beklemtoon. Om dit aan te spreek, word 'n aantal gereedskap ondersoek om 'n metode te ontwikkel om knelpunte in gesondheidstelsels te identifiseer.

Die erkenning van die kompleksiteit van gesondheidstelsels en die klem wat op kontekstuele faktore geplaas word, word herhaal, aangesien die erkenning van oorkoepelende gesondheidstelselfaktore, soos die gebrek aan hulpbronne, goed ondersoek en aangeteken word. Die bydrae van oorkoepelende gesondheidstelselfaktore is dus minder waardevol as die vermoë om spesifieke faktore te herken.

Ten einde verbeterings van gesondheidsorguitkomst te fasiliteer en meganismes te identifiseer wat hierdie uitkomst beïnvloed, kom 'n benadering tot knelpunte in distriksgesondheidstelsels voor. Die benadering bestaan uit die volgende stadiums: (i) Kies 'n fisiese area of plek; (ii) Kies 'n gesondheidsorguitkomst; (iii) Identifiseer die bevolking in gevaar; (iv) Interpreteer beskikbare data om knelpunte te identifiseer; (v) Bespreek sorgproses wat as die knelpunt geïdentifiseer word; (vi) Bespreek faktore wat verband hou met die knelpunt wat geïdentifiseer is; en (vii) Identifiseer belanghebbendes en rolspelers wat betrokke sal te wees by beplanning en veranderingsbestuur.

Die benadering word gesien om by te dra tot die inisiering van intervensies, aangesien dit hoop om 'n punt in die gesondheidstelsel te identifiseer wat verbeter moet word. Uitgebreide literatuur oor beplanning en implementering van intervensies bestaan, dus maak hierdie benadering nie deur die moeite om hierby by te dra nie, maar is eerder 'n besluitnemingsinstrument vir waar die poging in gesondheidstelsels gerig kan word.

'n Illustratiewe gevallestudie word uitgevoer om te demonstreer hoe die benadering ingevul kan word en om die studievalidering te fasiliteer. Onderwerpkenners word geraadpleeg om die resultate van die studie en die opkomende benadering te verbeter en goed te keur.

Hierdie studie lewer 'n bydrae deur die kompleksiteit van gesondheidstelsels te illustreer en stel 'n benadering voor wat gevolg kan word om die identifisering van meganismes wat gesondheidsorguitkomst in spesifieke instellings beïnvloed, te fasiliteer.

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# Nomenclature

AFR	African Region
AIDS	Acquired immune deficiency syndrome
CESCR	Committee on Economic, Social and Cultural Rights
CHIP	Community Health Improvement Process
CHSS	Centre for Health System Strengthening
CHW	Community health workers
CIHI	Canadian Institute for Health Information
DHB	District Health Barometer
DPAS	Strategy on diet, physical activity and health
DR TB	Drug resistant Tuberculosis
FBO	Faith Based Organisation
GCI	Global competitiveness index
HCQI	Health Care Quality Indicators
HCO	Health care outcome
HCW	Healthcare worker
HIV	Human immunodeficiency virus
HLE	Healthy Life Expectancy
HSPA	Health system performance assessment
ICT	Internet and communication technologies
IHSPRP	Interdisciplinary health systems and policy research program
MDG	Millennium Development Goals
MOH	Ministry of Health
NCD	Non-communicable disease
NGO	Non government organisation
OECD	Organization for Economic Co-operation and Development
PATH	Performance Assessment tool for quality improvement in Hospitals
PHC	Primary healthcare facility
RDT	Rapid Diagnostic Test

*NOMENCLATURE*

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SEAR	South East Asia Region
SSA	Sub-Saharan Africa
SDG	Sustainable Development Goal
SMS	Short message service
TB	Tuberculosis
UHC	Universal Health Coverage
UN	United Nations
WHO	World Health Organisation
YLL	Years of Life Lost

# Chapter 1

## Introduction

The purpose of the research presented in this document is to establish a way in which to identify factors hindering the improvement of health care outcomes (HCOs) in sub-Saharan Africa (SSA). Chapter 1 serves as an introduction to the project by providing the project background in Section 1.1 and Section 1.2 which discuss the state of health and health care systems in SSA. Section 1.3 provides a formal statement of the problem, followed by the research aim in Section 1.4 and the list of project objectives in Section 1.5. The research scope is outlined in Section 1.6. Section 1.7 describes the methodology that is to be followed and provides an overview of the content of the document.

### 1.1 The state of health in sub-Saharan Africa

SSA is classified as any country south of the Sahara Desert, illustrated in green in Figure 1.1. It comprises of 49 of the 54 states in Africa, with a population of one billion as of 2016 [Worldbank, 2017]. According to the World Health Organization (WHO) when looking at indicators to assess overall progress in health, the African Region (AFR) consistently performs poorly. This is illustrated by the results and progress made by the United Nations (UN) Millennium Development Goals (MDG), over the period of 2000-2015, where several areas of health care targeted worldwide, were scantily, if at all met by AFR [WHO, 2016]. However, it must be noted the initial baselines were found to be poor, this was particularly true for those pertaining to health care [United Nations Economic Commission for Africa *et al.*, 2015]. Several of these areas may have made significant improvements but were not met in completion. This reinforces the fact that health care in AFR requires great attention in order to move toward meeting the basic requirements for human well-being. The importance of health care is unquestionable, not only for moral reasons but for a prosperous economy. The right to the highest attainable standard of health is a basic human right according to UN Committee on Economic, Social and Cultural Rights (CESCR) [2009]. In many developing countries



Figure 1.1: Map of Africa highlighting the SSA region

populations are not always able to experience this right to health.

The importance of health is also economically driven, in order for African development and global competitiveness, the improvement of health care systems in Africa must take place. A healthy population can be productive encouraging prosperity [World Economic Forum, 2016]. In order to make these improvements an in depth and comprehensive understanding of the state of health care in SSA is required.

There are many issues which need to be understood in order to tackle this problem as the SSA dynamic is unique, with many underlying factors such as politics, culture or terrain playing a role in the HCOs found in SSA. These underlying factors must be identified and understood in order to begin making sustainable changes to the current health capabilities in SSA.

WHO [2015a] identified 100 core health indicators divided into four overarching categories which should be investigated in order to diagnose problems in the health system and consequently create solutions. The categories are: Health status, Risk factors, Service coverage and Health systems, Table 1.1 shows the areas which each category is comprised of, the list of the 100 indicators can be found in B.1. These indicators give an overarching view of the factors which comprise the health care field, and allow one to begin developing an idea of factors which need to be considered.

Table 1.1: Categories for WHO 100 core health indicators

<b>Health Status</b>	Mortality by age and sex Mortality by cause Fertility Morbidity
<b>Risk Factors</b>	Nutrition Infections Environmental risk factors Noncommunicable diseases (NCDs) Injuries
<b>Service Coverage</b>	Reproductive, maternal, newborn, child and adolescent Immunization Human Immuno Deffeciency Virus (HIV) HIV/Tuberculosis (TB) TB Malaria Neglected tropical diseases Screening and preventive care Mental Health
<b>Health Systems</b>	Quality and safety of care Access Health workforce Health information Health financing Health security

## 1.2 Health care systems in sub-Saharan Africa

In SSA, one can receive health care from the public or government; privately funded hospitals; mission or church groups; local patent drug stores and pharmacies; as well as traditional or folk medicine doctors [Fongwa, 2002]. It is

imperative for a health system to deliver services equitably and efficiently in order to improve HCOs. The health system consists of all organizations, institutions, resources and people whose primary purpose is to improve health [WHO, 2010].

In order to define a health care system, WHO have developed a health system framework which includes six pivotal building blocks of a health system, namely: Leadership/governance; Health care financing; Health workforce; Medical products, technologies; Information and research; and Service delivery. It must be noted that this model is the most commonly cited, and discusses the health system itself not the environment in which it is set. Each of these blocks must be investigated in order to discover the functionality thereof in a SSA context, and therefore the factors which affect or govern them.

The functionality of a health system directly influences access to health care. In order to fully grasp the problems behind HCOs in SSA it is important to note the state of the health system is not the only factor contributing to HCOs. The state of the population and dynamics of the country will also play a major role, however these are significantly more difficult to model. Several attempts at comprehensively modelling factors affecting health care systems have been made. However, these frameworks are diverse and illustrate the lack of a common understanding of what a health system entails [Papanicolas and Smith, 2013].

### 1.3 Problem Statement

In order to make improvements to HCOs in SSA; an in-depth understanding of the factors which influence these outcomes needs to be established. By developing an understanding of these factors, solutions and improvements to the health system can be made at a root cause level. Due to the complex nature of health systems the identification of factors is necessary to identify both direct and indirect or secondary factors. It must be noted these factors extend well beyond the health system itself, but includes the population factors which the health system services as well as the contextual factors in which the system is found. The poor state of HCOs and resource restricted nature of SSA demonstrates the need to establish an understanding of the system in order to facilitate efficiency improvements. By recognizing the respective influencing factors, one is able to make more informed decisions when looking to establish changes and make improvements to HCOs.

### 1.4 Research Aim

The aim of the research is to investigate the current state of health care in SSA and develop a manner by which to understand the health system in order

to facilitate improvements in HCOs. The study aims to introduce an approach which aids policy makers, future research activities, investors or project planners to improve the performance of health systems in SSA by equipping them with an approach which allows one to identify mechanisms influencing HCOs. The identification of mechanisms aims to encourage changes made and projects embarked on which have been directed in a manner that considers the health system in its entirety, to ensure maximized efficiencies.

## 1.5 Research Objectives

The objectives that will support the achievement of this research aim are:

1. Analyse existing conceptual frameworks relating to health care systems and identify pivotal points thereof;
2. Systematically review existing literature to develop an understanding of the health care system in SSA, according to literature, in alignment with the identified points of interest;
3. Identify overarching challenges faced in health systems in SSA;
4. Map out a series of tools which could potentially be utilized in order to combat the challenges identified;
5. Develop a method by which to identify factors that may be expected to influence specific HCOs;
6. Make recommendations regarding the focus of future research.

## 1.6 Research scope

The scope of the study broadly includes all countries within the SSA region. The choice to include all countries is made in order to remove bias, or the opportunity of unwittingly selecting countries which have similar traits which may introduce unrecognizable biases. The limitations to be recognized in the SSA setting are the ability to make an overarching tool which applies to all settings, as the SSA landscape is found to be extremely diverse, when considering the array of ethnicities or economic disparities as examples. The lack of data found in SSA is a large topic of concern, as there is very little accurate data planned for and collected which can be utilized, unless previously planned for, and in many cases sponsored. In order to counter the issues of diversity and lack of data, detailed analysis is avoided, with the focus being on an overarching approach which can be developed in spite of these issues. The topic of identifying HCOs in SSA is to be approached conceptually, to produce a manner of thinking about health system factors ahead of looking at

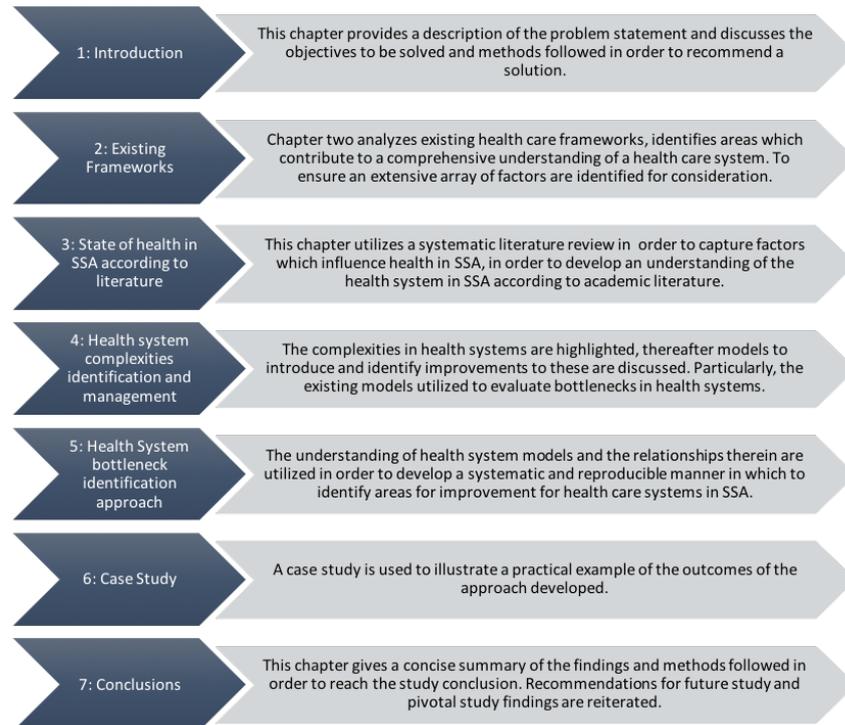


Figure 1.2: Structure of the document

developing a quantitative outcome. The outcome of the study aims to provide a broad reaching approach which can be applied to the entirety of SSA.

## 1.7 Structure of Document

The structure of the document is described in Figure 1.2.

## 1.8 Conclusion: Introduction

The introduction to this document describes the context in which the study will be carried out and highlights the importance of understanding what a health system comprises of and the external factors which influence it. The problem statement which the report aims to answer is clearly defined and the objectives to comprehensively respond to the question at hand are established. The structure of the document is described, which aims to achieve the objectives described. In Chapter 2, the methodology which the study will follow is outlined in order to structure the approach taken to achieve the final outcomes of the study.

# Chapter 2

## Methodology

The purpose of this chapter is to describe the methodology followed in order to reach the final approach recommended in this study. Section 2.1 describes the the conceptual framework approach and the way in which this approach is followed in this study.

### 2.1 Building a conceptual framework

The purpose of the study is to identify the mechanisms which influence health care outcomes in SSA, due to the diverse array of aspects which fall into this scope a conceptual framework or in this case approach is seen as the most appropriate method to tackle the topic at hand. The advantages of a conceptual framework analysis are its flexibility, capacity for modification and emphasis on understanding the topic at hand ahead of predicting outcomes [Jabareen, 2009]. The approach designed closely follows the methodology defined by Jabareen [2009] who defines a conceptual framework as a network or a plane of linked concepts. The Jabareen approach is listed in Table 2.1 which includes the corresponding Sections which fulfil each phase found in this study.

#### 2.1.1 Phase 1: Mapping the selected data sources

Jabareen describes the first task as mapping a spectrum of multidisciplinary literature regarding the topic at hand. This is done by firstly mapping existent conceptual frameworks on the topic of health systems, found in Section 3.2. Thereafter in order to ensure the literature analysed is multidisciplinary, a systematic literature review on the topic is carried out in Chapter 4. The literature review aims to be extensive, including a large variety of articles with a purposefully broad scope to ensure the initial review is unbiased and returns a broad spectrum of information to support the study. The manner in which the articles are selected is described in Section 4.2. A vast array of frameworks analysed in conjunction with a broad literature review, aims to facilitate the

Table 2.1: Conceptual Framework development methodology followed in this study [Jabareen, 2009]

<b>The procedure of conceptual framework analysis:</b>	<b>Section:</b>
Phase 1: Mapping the selected data sources	Chapter 3: Health care conceptual frameworks:  Section 3.2 Existing frameworks Chapter 4: Factors influencing health care outcomes in SSA: A systematic literature review: Section 4.2 Methods
Phase 2: Extensive reading and categorizing of the selected data	Chapter 3: Health care conceptual frameworks:  Section 3.2 Existing frameworks Chapter 4: Factors influencing health care outcomes in SSA: A systematic literature review: Section 4.2 Results
Phase 3: Identifying and naming concepts	Chapter 3: Health care conceptual frameworks:  Section 3.3 Health system components
Phase 4: Deconstructing and categorizing the concepts	Chapter 3: Health care conceptual frameworks:  Section 3.3 Health system components Chapter 4: Factors influencing health care outcomes in SSA: A systematic literature review: Section 4.4: Factors influencing HCOs in SSA
Phase 5: Integrating the concepts	Chapter 5: Building an approach: Improving the understanding of health systems: Section 5.1: Health system complexities Section 5.2: Explanation Theory and Theory of Change Section 5.3: Identifying bottlenecks for achieving optimal HCOs
Phase 6: Synthesis, resynthesise and making it all make sense	Chapter 6: Health systems analysis approach  Chapter 7: Case study: Factors influencing the incidence, management and YLL to TB in the Western Cape, South Africa
Phase 7: Validating the conceptual framework	Validation done through the consultation of an SME.
Phase 8: Rethinking the conceptual framework	Chapter 8: Conclusions:  Section 8.3 Future Work Section 8.4: Shortcomings and Limitations

holistic mapping of the topic and ensure that a complete data collection is analysed which will support the validity of the study [?] .

### **2.1.2 Phase 2: Extensive reading and categorizing of the selected data**

The aim of this phase is to read the selected data and categorize it by discipline and representative power. This is done in two parts, firstly existing frameworks are analysed, in order to establish existing categories found which describe health systems, thereafter these categories are to be populated with results pertaining to SSA. Section 3.3 illustrates the categorisations made when analysing the frameworks and thereafter factors which come through the most predominantly are identified. In order to share the results found in the systematic literature review in a structured manner the categories identified in Section 3.3 are adopted. This allows for one to further elaborate on the idea of the representative power of the category. An understanding of the discipline of the articles returned in the review is described in Section 4.3, thereafter Section 4.4 aims to populate the understanding of the category and to illustrate the emphasis found by returning the statistics on the selected category found in the review.

### **2.1.3 Phase 3: Identifying and naming concepts**

The aim of this phase is to "discover" or identify concepts, following the Jabareen method these concepts should emerge from the literature. For the purpose of this study, the aim is to identify concepts which are specific to SSA, however it is of interest to investigate a vast array of concepts and categories to ensure no assumptions or areas are missed due to scoping or scaling down of a study too early. At this point it is of importance to note that the categories identified and concepts identified are not the same. Every concept has components and is defined by them, concepts need to be understood relative to their own components, other concepts and the plane in which it is defined [Jabareen, 2009], whilst categories house these components.

### **2.1.4 Phase 4: De-constructing and categorizing the concepts**

Having identified the categories and concepts in the preceding phase, this phase aims to populate these findings with an in depth breakdown and understanding, and the SSA perspective. From the conceptual framework analysis, the categories are to be populated with the components listed within these categories. Jabareen suggests this phase should aim to identify the main attributes of a concept or category. Therefore the use of a systematic literature

review is made, in order to retrieve academic literature to populate and gain an understanding of these concepts and categories in a SSA context.

### **2.1.5 Phase 5: Integrating concepts**

From this phase onwards in the Jabareen method a more adapted method of applying each phase is to be followed to suit the purpose of the study. When integrating the concepts the aim is to group the concepts which have similarities. In essence this phase aims to address the overarching mechanisms which can be identified to influencing health care outcomes from the results collected up until this point. Due to extensive work done developing health system frameworks, it is anticipated in order to make a meaningful contribution these aspects will need to extend beyond the health system integrated factors and dependencies. The investigation of these frameworks prior will allow for a contribution which extends, utilises or dissects a segment of these frameworks.

### **2.1.6 Phase 6: Synthesis, resynthesis and making it all make sense**

At this point in the study a comprehensive collection of data, and indepth understanding of the concepts to be included in the framework should have been assimilated. The concepts identified act as the driving motivators of the eventual framework. From the data collected an approach or framework need be developed in order to identify mechanisms influencing health care outcomes. At this point it is assumed this phase will need to utilise existing theories or tools, which up until this point in the study may not yet have been introduced in order to facilitate analysis and to structure the findings of the study. Once a draft of the framework has been developed it is suggested that a case study or attempted real life application is demonstrated in order to address weaknesses or improvements of the framework that can be made and to assess the applicability of the framework. Jabareen suggests the process to find the outputted framework be iterative until such a point that the researcher recognizes a general theoretical framework that makes sense.

### **2.1.7 Phase 7: Validating the conceptual framework**

The resultant framework is then presented to subject matter experts from various backgrounds in order to ensure that the framework is all encapsulating, validated and critiqued by multidisciplinary points of view. The feedback from these sessions should result in the return to Phase 6, and the reiteration of processing the framework.

### 2.1.8 Phase 8: Rethinking the conceptual framework

In this the final phase, reflection of the final framework is carried out. This reflection, should not only include a reflection of the resultant framework, but of the methods at each phase in the study which were carried out in order to reach this point. Areas for future research which are recognised, can be discussed as well as the shortcomings and limitations which need be acknowledged in the completion of the study. These need to be discussed in order to recognise the shortcomings of the study, as well as to recommend improvements for future studies.

## 2.2 Conclusion: Methodology

In order to attempt to complete a reproducible, reliable and unbiased study this Chapter attempts to outline the strategy to be followed to enable that. The adoption of Jabareen's method to develop conceptual frameworks is found as the primary resource and method which is followed. The chapters to follow will attempt to produce the expected outcomes of the described methodology, starting with the analysis of conceptual frameworks in Chapter Three. In Chapter Three, existing health care frameworks will be identified and understood. Once frameworks have been carefully analysed overarching themes to be utilized within this study will be synthesized utilising the existing frameworks.

## Chapter 3

# Health care conceptual frameworks

In order to analyze and measure the performance of health care systems systematically several conceptual frameworks have been developed. These frameworks can be used to gauge the performance and capabilities of the system. Many frameworks exist, each with different objectives and focus, Section 3.1 discusses the idea of conceptual frameworks as a whole. This chapter aims to discuss the existing frameworks, listed in Section 3.2.1 and identify the various factors identified as contributing to or measuring the performance of the health system. This is done in order to develop an understanding of the components identified which influence health systems. These components, are discussed in terms of the health system elements in Section 3.3.1 and the performance measures in Section 3.3.2.

### 3.1 Conceptual Frameworks

In order to map the state of health in a nation, focus is placed on resultant HCOs. These HCOs are often measured using health indicators, which span a broad spectrum of health areas. Many health indicators are internationally used and thus can give a good indication of the health status within a country, and whether it is found to be of an acceptable level in comparison to worldwide norms and standards. However when considering indicators the reasons for poor results cannot be easily diagnosed due to the vast array of health system factors which could negatively influence the result.

Conceptual frameworks lay out key factors, constructs, or variables, and indicates relationships among them [Miles and Huberman, 1994], thus health care frameworks are seen to make an attempt at developing a more systematic way in which to analyse health care systems. Jabareen [2009] defines a conceptual framework as a network of interlinked concepts that together provide a comprehensive understanding of phenomena. Conceptual frameworks can be

used as tools to interpret the measures of performance of health systems.

Over the last decade several health system frameworks have been proposed, with the objectives and boundaries varying, however a robust conceptual basis has not been arrived at [Wendt *et al.*, 2009]. This can be attributed to the motivation behind the development of the framework and who the stakeholders receiving the results thereof are. Hoffman *et al.* [2012] describe the field of health systems greatest strength as the interdisciplinary culture, however strengthening of this culture is necessary and provides a great conceptual challenge. Papanicolas and Smith [2013] and Hoffman *et al.* [2012] consider several existing frameworks and dissect them in order to provide an understanding of which framework to utilise in order to achieve different goals. When selecting a framework it is important to establish the purpose behind selecting a framework. The health system boundaries must be identified, the health system goals discussed and the key factors influencing these goals must be identified in order to ensure the selected framework aligns with the purpose at hand.

## 3.2 Existing Frameworks

Three types of frameworks have been identified descriptive, analytic and deterministic [Papanicolas and Smith, 2013]. Descriptive frameworks are used to understand organizational and structural features making up the health care system by providing a basic description of the health system and the components which it is made up of. Analytic frameworks consider the performance of a system and attempt to understand which factors influence resultant goals. Deterministic frameworks attempt to identify factors influencing the health system in order to establish which reforms, interventions or policies could be most effective.

In order to establish the frameworks investigated, frameworks listed by Papanicolas and Smith [2013] in the book "Health System performance comparison: An agenda for policy, information and research" and a conceptual model report by Hoffman *et al.* [2012] are used as a starting point to gather models. Thereafter the snowballing method as well as serendipitous discovery is utilised in order to find other frameworks. When a comprehensive array of well cited frameworks were attained and an arguably acceptable level of research saturation is reached, analysis of frameworks commenced. It must be noted all frameworks that were identified were developed in a first world setting. Very few frameworks were identified that have been developed for a developing country setting, with no frameworks having been developed in or published by a developing country.

Hoffman *et al.* [2012] classifies frameworks as system frameworks, sub-frameworks or supra-frameworks. Frameworks are focussed on the whole health system, frameworks which focus on parts of the health system or frameworks which focus on how other societal systems interact with the health system.

In order to develop a holistic view of health systems the current frameworks are classified accordingly. Thereafter, where possible, models are categorised according to the areas which they define the health system to comprise of, namely: Health system frameworks; Uncategorised sub-frameworks; Hospital frameworks; Resource-related frameworks; Quality frameworks; Supra-frameworks; and completed supra-framework comparisons, as listed in Table 3.1. Research saturation was reached in terms of health system frameworks, not necessarily the other categories as they are not the point of focus but are considered, as they provide an extension of the understanding of health sub-systems.

The choice to investigate a number of frameworks is firstly, with the intent of removing bias and secondly due to framework boundaries. It has been argued that health system frameworks are not neutrally descriptive but purposive, products of their time or setting and shaped by the author's agenda [Olmen *et al.*, 2012]. Framework boundaries can range from considering a specific area, such as a hospital functionality, to the entire system including the context in which the system is found and influenced by. Health system performance frameworks tend to narrow the scope of the health system they consider. The area of improvement which an institution aims to achieve, should align with the definition and boundaries of their chosen framework. The broader the scope the more difficult to make changes or hold stakeholders accountable and thus track or implement progress. However with a broad view a more realistic view of all influences on the health system is given. By considering health system frameworks a broader understanding of the system as a whole is developed, whilst area specific framework categories share more detail [Papanicolas and Smith, 2013].

Table 3.1: Existing health care frameworks reviewed

Framework name	Reference	Type
<b>Health System Frameworks</b>		
Actors Framework	[Evans, 1983]	analytical
Lalonde Health Field Framework	[Lalonde, 1981]	analytical
Model of a national health system its structures and functional interrelationships	[Kleczkowski <i>et al.</i> , 1984]	analytical
The five main interacting components of national health systems	[Roemer, 1993]	analytical
Reform Framework	[Frenk, 1994]	analytical
Kissick's Iron Triangle	[Kissick, 1994]	analytical
A Framework informing change in Latin American health care reform	[Londono and Frenk, 1997]	deterministic
EGIPSS (Integrated Performance Model for the health care system)	[Sicotte <i>et al.</i> , 1998]	analytical
Framework for assessing behavioural health care	[Aday <i>et al.</i> , 1999]	analytical
Health Systems Assessment Framework: Functions and goals	[Murray and Frenk, 2000]	analytical
A Framework informing change in health systems reform for low- and middle-income countries	[Merson <i>et al.</i> , 2006]	descriptive
A conceptual framework to measure performance of the public health system	[Handler <i>et al.</i> , 2001]	analytical
WHO Health System Performance	[Murry and Evans, 2003]	descriptive
Public health functions framework	[Khaleghian and Das Gupta, 2004]	descriptive
EU Open Method of Coordination (OMC)	[European Commission, 2005]	descriptive
A Framework informing change in British Colombia's public health renewal efforts	[MoH Services British Colombia, 2005]	analytical

Core goals and priorities for performance improvement	[The Commonwealth Fund, 2006]	analytical
The WHO Health Systems Framework	[WHO, 2007]	analytical
A framework for understanding the key components of well-functioning health systems	[WHO, 2007]	analytical
A Framework evaluating health systems performance using 11 essential public health functions	[Ramagem and Ruales, 2008]	descriptive
A behavioral model of health services use	[Andersen, 2008]	analytical
Monitoring and evaluation of health systems strengthening	[IHP, 2009]	deterministic
Strengthening Health Services Framework	[Peters <i>et al.</i> , 2009]	analytical
Reforms framework	[Roberts <i>et al.</i> , 2009]	deterministic
A framework for understanding how governance parameters exist at all levels of the WHO Building Blocks model	[Mikkelsen-Lopez <i>et al.</i> , 2010]	deterministic
A framework for comparing health system performance across countries	[Rechel <i>et al.</i> , 2010]	analytical
The health system dynamics framework	[Van Olmen <i>et al.</i> , 2012]	analytical
<b>Sub-Frameworks</b>		
The health belief model	[Rosenstock, 1974]	analytical
Framework for health promotion	[Epp, 1987]	analytical
A sub-framework informing change in primary health care service delivery	[WHO, 2008]	descriptive
Framework for DPAS implementation at country level	[WHO, 2008]	analytical

A sub-framework informing change in health communications technology through a grid-based health information network	[Savel <i>et al.</i> , 2010]	analytical
A sub-framework evaluating health system approaches to maternal, neonatal and child health as it relates to the broader health system	[Ergo <i>et al.</i> , 2011]	analytical
<b>Hospital Frameworks</b>		
IDB and IDRC Institutional and Organizational Assessment	[Lusthuas <i>et al.</i> , 2002]	analytical
WHO Euro Hospital Performance PATH	[Veillard <i>et al.</i> , 2005]	analytical
Baldrige Framework	[Goldstein and Schweikhart, 2002]	analytical
Adapted EFQM based on PATH	[Vallejo <i>et al.</i> , 2006]	analytical
<b>Resource related Frameworks</b>		
Distributional Aspects of national health insurance benefits and finance	[Feldstein <i>et al.</i> , 1972]	descriptive
Health manpower planning: An econometric approach	[Yett <i>et al.</i> , 1972]	analytical
The effect of national health insurance on the price and quantity of medical care	[Feldstein and Friedman, 1976]	deterministic
A sub-framework for understanding the insurance function of health systems	[Kutzin, 2001]	analytical
A sub-framework comparing the relationship between health spending and health outcomes in 15 EU countries	[Nixon and Ulmann, 2006]	analytical
Capacity framework (system restraints)	[Mills <i>et al.</i> , 2006]	descriptive
Health care systems efficiency and institutions	[Joumard <i>et al.</i> , 2010]	descriptive
<b>Quality Frameworks</b>		
Quality Improvement- Donabedian model	[Donabedian, 1966]	descriptive

Maxwell Expanded	[Maxwell, 1984]	descriptive
Balanced scorecard	[Kaplan and Norton, 1996]	deterministic
UK Performance Assessment Framework	[Ferlie and Shortell, 2001]	descriptive
EFQM	[EFQM, 2012]	deterministic
<b>Supra-Frameworks</b>		
A supra-framework for comparing and informing change for the health sector reform in developing countries	[Cassels, 1995]	descriptive
OECD Health Care Quality Indicators	[Arah <i>et al.</i> , 2006]	analytical
Healthy Development	[The World Bank, 2007]	descriptive
A supra-framework for understanding how health status affects macro economy	[Hsiao <i>et al.</i> , 2008]	analytical
A framework for analysing health systems and the context	[Atun and Memable, 2008]	deterministic
A supra-framework evaluating national health systems by tracing the impact of donors' health system strengthening expenditures	[Shakarishvili <i>et al.</i> , 2011]	analytical
A supra-framework for understanding the concept of stewardship and its applications to the health sector	[Veillard <i>et al.</i> , 2011]	analytical
<b>Comparisons</b>		
Fund flows and payment framework	[Hurst, 1991]	descriptive
A supra-framework comparing health care resource profiles across multiple national health systems	[Anell and Willis, 2000]	descriptive
Performance Measurement and Management in OECD Health Systems	[Hurst and Jee-hughes, 2001]	comparative

A supra-framework comparing health system reforms across OECD countries	[Docteur and Oxley, 2003]	analytical
A supra-framework comparing the impact of health worker density on health outcomes across multiple countries	[Anand and Barnighausen, 2004]	descriptive
A supra-framework comparing ten principles for health system governance assessment across countries in the Eastern Mediterranean region	[Siddiqi <i>et al.</i> , 2009]	analytical
Health Systems Institutional Characteristics	[Paris <i>et al.</i> , 2010]	comparative
International profiles of health care systems	[The Commonwealth Fund, 2011]	comparative
International profiles of health care systems	[The Commonwealth Fund, 2015]	comparative

### 3.2.1 Health Systems Frameworks

In this study emphasis is placed on health system frameworks, opposed to sub- or supra-frameworks as they take into consideration a broader view of the factors making up and influencing health systems. Three areas have been identified to shape health systems thinking: the change of actor landscape in global health, the WHO's attention to health system performance and the recognition of health system complexity [Olmen *et al.*, 2012].

A total of 27 health system frameworks are investigated as referenced by Papanicolas and Smith [2013], Hoffman *et al.* [2012] or through further literature searches. The shaping of health systems thinking is made evident when considering the progression of frameworks over time. Of the nine frameworks published pre 2000, seven do not consider performance measures aside from health status. Whilst the more recent models are more inclusive of a broader array of health system components. The Iron triangle proposed by Kissick [1994] appears to be ahead of its time in the sense that it includes quality as a pivotal aspect of the health system. Table A.1 found in Appendix A gives a descriptive view of the areas which each framework considers.

It is important to understand the purpose of a health system framework, for example, recent models such as Van Olmen *et al.* [2012] and Rechel *et al.* [2010] do not consider health performance measures as they are classified as health system frameworks and not necessarily health system performance assessment frameworks (HSPA).

However, HSPA and health system frameworks are not differentiated in this chapter as there is an overlap between the two, most health system frameworks are made with the intention of mapping the health system to gauge the performance thereof but do not necessarily list measures of this performance. Whilst HSPA include specific performance measures, Papanicolas and Smith [2013] identifies the EGPISS, OMC and IHP models as strictly HSPA.

The health system Building Blocks developed by WHO [2007] is one of the most widely used health system frameworks. This framework was developed and adapted from the Murray and Frenk [2000] model published by the WHO in 2000. The model does not consider outside influences affecting the health system but comprehensively maps the areas that make up an effective health system, namely: Service delivery; Health workforce; Information; Medical products, vaccines and technologies; Financing; and Leadership and Governance. With the intermediate goals of: access, coverage, quality and safety; and the outcomes of: improved health, responsiveness, financial risk protection and improved efficiency. These factors are highlighted as they make up the base of most health system frameworks to date.

The models from Aday *et al.* [1999] and Andersen [2008] have similar foci, but are presented differently with different levels of detail. The choice to discuss these frameworks specifically is due to the fact that they consider the behaviour of the population in conjunction to that of the state of the health

system, which is particularly applicable to the SSA setting. It must be noted that the model published by Andersen in 2008 was developed in collaboration with Lu Ann Aday. Both models address health policy, contextual characteristics addressing the system, population and environment in which the population accessing the health care is found and the individual characteristics which will have an influence on health behaviour. Where the two models differ is that Andersen [2008] addresses health behaviour as a stand alone pillar considering personal health practices, process of medical care and use of personal health services whilst Aday *et al.* [1999] addresses these factors under more general topics and places focus on the effectiveness, efficiency and equity of the health system. When considering health behaviour frameworks the Aday and Andersen models are of specific interest due to the fact that they acknowledge the contextual factors, the state of the health system and the populations predisposed attitudes toward seeking health care and how behaviour is influenced by these factors. These models at a high level may be seen as a comprehensive overview of the health system however do not provide enough detail to ascertain an in depth understanding of the functionality of a health system. The framework developed by Peters *et al.* [2009] is arguably the most comprehensive health systems framework to date and could also be classified as a supra-framework as it considers the macro environment within which it is found. Figure 3.1 shows the framework, this is included to illustrate the relationships shown between areas. Peters cites both WHO [2007] and Roberts *et al.* [2009] as models considered to be comprehensive but not fully comprehensive thus leading to the development of the framework. The title of the book where this model is developed is "Improving Health Service Delivery in Developing countries: From evidence to action" which shows the perspective of the model developed, supporting the comprehensiveness of this model, particularly to the SSA landscape.

### 3.2.2 Sub-Frameworks

Sub-frameworks are defined to include frameworks which are uncategorised, hospital frameworks discussed in Section 3.2.2.1, resource related frameworks, Section 3.2.2.2 and quality frameworks, Section 3.2.2.3. These frameworks consider a sub-section of the health system, giving deeper insight to specific areas of the health system. A discussion of the uncategorised frameworks follows, namely discussing health behaviour models, health promotion, primary care models and grid based technology.

Health behaviour models share many common threads, the aim of all models or final outcome of models is to achieve health for all. These frameworks generally assess the population's utilization of health care, and acknowledge the factors which affect utilization. Young [1981] developed a choice making model which suggests the four main factors influencing utilization, namely: gravity of illness; knowledge of home treatment; faith in treatment; and access

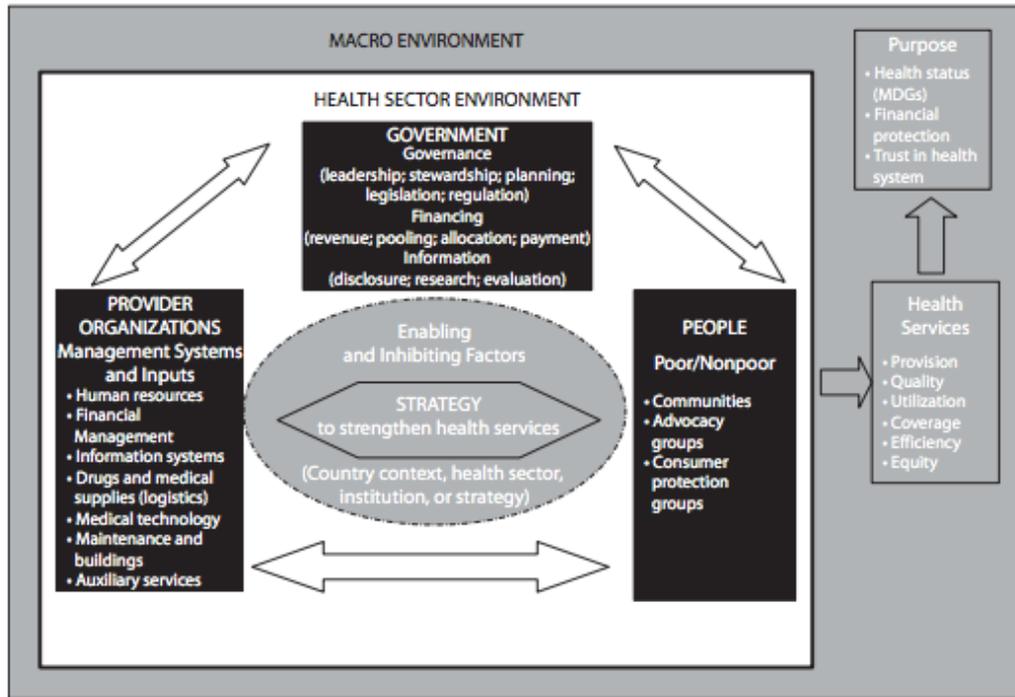


Figure 3.1: Descriptive Health Services Framework [Peters *et al.*, 2009]

to treatment. These areas are highlighted as they set the general theme for the areas which the health behaviour models address. These factors align with the Health Belief model developed by Rosenstock [1974] however Rosenstock acknowledges modifying factors. These modifying factors are demographic or socio-psychological variables or cues to action, such as media campaigns, advice from others, reminders from physicians or illness of family or a friend, which originate from the model developed by Kasl and Cobb [1966]. The Kasl and Cobb model is not explored further as it is seen as the origin of the Health Belief model and does not contribute any additional ideas. Another model to be acknowledged as a supporting document is the Stages of Illness model developed by Suchman [1966], this model is found to be very specific in the modelling of behaviour when ill and thus is excluded from the study but could be utilised as a supporting document, if investigating illness behaviour.

The framework for health promotion by Epp [1987] addresses specific areas which need improvement in order to achieve health for all, namely: health challenges, health promotion mechanisms and implementation strategies. From these themes it is clear the model does not aim to model the current state but to target areas for improvement. The framework addresses the way in which the population responds to the health system in place. The WHO framework for strategy on diet, physical activity and health (DPAS) implementation at country level is similar to this, it reinforces if there are supportive environments, policies and programmes in place there will be a behaviour change or

response which will lead to social, environmental, health and economic outcomes [WHO, 2008].

The framework considering informing change in primary health care service delivery focusses on four broad policy areas essential for change, namely: universal coverage; putting people at the centre of service delivery; integrating health into public policies across sectors; and providing inclusive leadership for health governance [WHO, 2008]. The framework may specifically focus on primary health, but it is arguable these areas are transferable to the health system as a whole. The same goes for the framework by Ergo *et al.* [2011], who focusses on maternal, neonatal and child health but whose areas of focus could be applicable to more broad health fields. The framework evaluates: the health care sector (governance and service delivery), the community (physical and social environments) and households (household characteristics and individual factors). The four control knobs represent the types of tools available to address weaknesses in the system: financing, organization, regulation and communication.

The contribution from Savel *et al.* [2010], a sub-framework informing change in health communications technology through a grid-based health information network, is of interest as the topic of health communications technology and health information is a current topic, which SSA has been slow on the uptake to for various reasons. This framework informs change and highlights areas of importance when considering to adopt technologies, namely: the importance and manner by which to interconnect public health departments, regional health information organizations, providers and federal agencies; fostering an open collaborative effort involving the public health information network community, clinical partners, academia and industry to provide scientific and public health rigour, collaborative (and well-defined) governance/oversight and long term return on investment. This framework identifies the importance of partnerships and leveraging off other sectors.

### 3.2.2.1 Hospital Frameworks

Hospital frameworks differ from health system frameworks in that they consider the functionality of the hospitals more so than external factors affecting the system. With the exception of Lusthuas *et al.* [2002] who considers the external environment in terms of: administration, political, social/cultural, economic and stakeholders. The Baldrige framework acknowledges the environment, relationships and strategic situation in which the organization is found, but the body of the framework focus's on, what Lusthuas *et al.* [2002] refers to, as organizational capacity.

Lusthuas *et al.* [2002], Goldstein and Schweikhart [2002], Vallejo *et al.* [2006] and Veillard *et al.* [2005] consider organizational capacity, each have a general focus on leadership, resources and customer satisfaction but at different levels of detail. Lusthuas *et al.* [2002] identify strategic leadership; structure;

human resources; financial management; infrastructure; program management; process management; and inter-organizational linkages. The Baldrige framework includes leadership, strategic planning, customer focus, workforce focus and operations focus. Veillard *et al.* [2005] considers staff, responsive governance and being patient centred, it must be noted the model developed by Vallejo *et al.* [2006] is adapted from the same performance assessment tool for quality improvement in hospitals (PATH) model which Veillard *et al.* [2005] discuss. Thus Veillard *et al.* [2005] consider the same three points with the extension of partnership development, leadership and constancy of purpose. These areas give an understanding of the functionality within hospitals and the areas which to focus on for performance improvement.

Performance is measured consistently by models as efficiency and effectiveness, with the exception of Goldstein and Schweikhart [2002] whom acknowledges performance measures but does not specify these. Other performance areas listed are safety, relevance, economic, financial viability, quality, appropriateness, accessibility and equity.

Other areas which the hospital models addressed were continuous learning, improvement and innovation [Vallejo *et al.*, 2006], knowledge management [Goldstein and Schweikhart, 2002] and organizational motivation Lusthuas *et al.* [2002]. The investigation of hospital frameworks is of interest as it gives a full picture of hospitals, what they are comprised of and what they are striving toward, which is of importance when attempting to holistically understand the health system due to the pivotal role which hospitals play.

### 3.2.2.2 Resource related frameworks

Resource related frameworks consider modelling the manner by which resources are handled within the health system, in terms of health insurance, human resources and system spending. These frameworks are notably not a complete collection of resource related frameworks, but appeared in the search description and are thus included. Feldstein *et al.* [1972], Feldstein and Friedman [1976] and Kutzin [2001] discuss health insurance and the effect which it has on the population seeking care, and the care delivered. The contributions from Feldstein develop mathematical models to simulate the benefits of insurance as well as the price and demand implications. These frameworks give an increased understanding of the implications and complexities of health insurance. Kutzin [2001] discusses how health reforms take place whilst funding systems stay the same showing how funding does not determine the health system activities nor the access to care it provides. Instead it discusses a framework of how health system financing functions and the population links; and the way in which this is influenced by information and regulation. These frameworks expand the understanding of health insurance in terms of the structure of insurance, for example deductibles and coinsurance [Feldstein *et al.*, 1972], revenue sources and collection, pooling of funds and the expenditure distribu-

tions. Nixon and Ulmann [2006] who investigated health spending, discusses how it has been difficult to prove the causal link between health care spending and HCOs due to other factors such as diet, lifestyle and environment. However through the country comparison makes a further effort to substantiate the link.

Health financing plays a pivotal role in the health system, however Mills *et al.* [2006] identifies seven key constraints to be considered, namely: financial, physical inaccessibility, poorly skilled staff, poorly motivated staff, weak planning and management, lack of inter sectoral action/partnership and poor quality care in the private sector. Joumard *et al.* [2010] considers efficiencies and countries to identify strengths and weaknesses in order to assess the scope for improving value for money, which takes a broader focus than financing improvements. Yett *et al.* [1972] developed econometric models considering demand and supply for health services and health manpower, these are aimed to inform policy and aid national planning. The models consider not only manpower but individuals, health institutions and health professions education institutions. The regional health model identifies and discusses: consumers, services markets, providers, labour markets and health manpower whilst the health manpower demand planning model considers: health services, health manpower and health services education. The second model includes a comprehensive description of population and health service institution attributes found within the model, which is included in Appendix A, Table A.2 due to the interesting contribution it makes when considering these areas.

### 3.2.2.3 Quality frameworks

Quality frameworks can be seen as frameworks which describe the health system goals and consider strategies employed to achieve these, it must be noted that strong focus is placed on the customer. This is an interesting point of view as it considers the system once the customer has chosen to engage, which the other frameworks do not assume. There is a strong sense of focus on strategic planning and decision making.

The European foundation for quality management (EFQM) model is adapted by Vallejo *et al.* [2006] to fit a hospital setting, however this section considers the EFQM more generally. The EFQM and balanced scorecard methods, although general quality frameworks, are investigated as they are commonly applied in the health care sector [Vallejo *et al.*, 2006] [Zelman *et al.*, 2003].

The main principle to understand the balance scorecard is that it defines four perspectives which provide a balanced picture of operating performance, namely: Financial; Internal business process; Learning and growth; and customer, with vision and strategy making up the core of the model. When considering the balanced scorecard it is of interest to note that the balanced scorecard, according to Zelman *et al.* [2003] has five major differences depending on whether it is considering the health sector, or a health organization. These

differences are namely: units of analysis; purposes; audiences; methods; data; and results.

The EFQM model contains two connected sections: enablers leading to results. The enablers are listed as: leadership; people; strategy; partnerships and resources; and processes products and services. Whilst the results are in terms of people; customers; society and business these results are utilised for learning, creativity and innovation to make changes to the enablers in order to improve the results.

The Maxwell [1984] and Ferlie and Shortell [2001] frameworks are descriptive, with different approaches and foci. The Maxwell framework discusses measurements for quality, which interestingly enough are not explicitly stated by the other frameworks, these are namely: access; relevance; effectiveness; equity; social acceptability; and efficiency and economy. It is interesting to note these measurements link closely with those highlighted in the Hospital frameworks. The performance assessment framework discussed by Ferlie and Shortell [2001] may not list performance measurements but lists areas of importance when assessing performance, namely: leadership; organizational culture; team/micro-system development; and information technology which aligns more closely with the EFQM model.

These models are of interest as they can be used as guidance tools when looking to improve health systems. They may not map the health system but they highlight strategies to be considered when looking to better an existing health system.

### 3.2.3 Supra-Frameworks

Supra-frameworks, as defined earlier, consider how societal systems interact with health systems. These frameworks make an interesting contribution to the understanding of health systems as they introduce more abstract ideas of what influences health care systems. For example Cassels [1995] discusses other sector agencies which indirectly affect the health system and populations, similarly Arah *et al.* [2006] cites non health care determinants of health.

The framework developed by Atun and Memable [2008] is a very comprehensive model as it encompasses the health system inputs, intermediate goals and outcomes by a descriptive array of contextual factors, namely: Environmental; demographic; epidemiological; political; legal; economic; social; and technological.

The Healthy Development model developed by The World Bank [2007] acknowledges the way which client-country efforts, strategic engagement and disease interventions can strengthen the health system. This shows the health system can be strengthened through indirect measures. Veillard *et al.* [2011] considers stewardship and again acknowledges how sectors outside of the health system must be influenced in order to achieve better health.

Understanding how health status affects macro economy by Hsiao *et al.* [2008], is a very interesting contribution to developing an economic motivation for health improvement as it discusses how health affects the productivity of a population. It is clear the supra-frameworks discussed above contribute a somewhat abstract view of the health system. These are of interest as they expand ones understanding of the importance of health care, as well as appreciating the inter-linkages between seemingly unrelated sectors within a country.

### 3.2.4 Comparison Frameworks

The choice to include comparison frameworks is made as it is interesting to investigate the frameworks developed by which comparisons are made. To establish the areas highlighted as pivotal areas in the health system and the measurement used to compare these areas. It is interesting to gain insight into the current state of health systems worldwide, regardless of the fact that none of the comparisons include a country from SSA.

In order to make comparisons, frameworks are developed in order to develop a systematic manner by which comparisons are carried out. The comparison carried out by Hurst and Jee-hughes [2001] compares concepts of performance, and not only current indicators of performance but also aims to identify future performance measures. The performance concepts compared are taken from the WHO, OECD, and proposals from four countries, namely: the United Kingdom, Australia, Canada and the United States of America.

Paris *et al.* [2010] survey 29 OECD to carry out their comparison, this is of interest as it quantifies the areas of health care identified in the comparison. The three over arching themes are identified for comparison: Health financing and coverage arrangements; Health care delivery; and Governance and resource allocation. The comparison was carried out with the purpose of assessing current arrangements and to develop a set of quantitative indicators designed to capture the main characteristics of health systems. These indicators are of interest as they not only highlight pivotal health system characteristics, but introduce indicators to measure these.

International profiles of health care systems both the 2011 edition and 2015 edition are of interest as although similar in the comparisons which they carry out, it is of interest to see where the differences are indicating progress in the health care field. The 2011 edition compares 14 countries whilst the 2015 edition compares 18 countries showing an increased database, but more importantly the extension of "health system organization" to "health system organization and governance" as well as "quality of care" to "quality of care and co-ordination. These observations although minor are of interest to take note of the research progress and interest over the four year period.

The interest placed on resources, governance and reform across the comparisons listed is notable. No countries from SSA are considered in the comparisons, however the comparisons are of interest to show the data needed to

make such comparisons and the areas of focus. If such a comparison were to be made in SSA a drive for accurate data would need to be planned for and captured well in advance in order to ensure quality data is available to carry it out.

### 3.3 Health System Components

Health system frameworks are developed in order to fulfil a purpose from a specific perspective as illustrated in the section above. In order to gain an overview of what comprises a health system, the existing health system elements and performance measures are analysed. These components are briefly discussed, in Section 3.3.1 outlining the elements and Section 3.3.2 outlining the performance measures. In Section 3.3.3 a heat map is developed showing the frequency and thus the apparent importance of each component identified.

#### 3.3.1 Health System Elements

Due to the various origins and motivations behind health system frameworks, the elements presented within these models vary to a large extent. A large portion of the models have overlapping elements, however may be presented differently. Papanicolas and Smith [2013] identifies five broad elements addressed by most frameworks, namely: Service Provision; Financing; Resource generation; Leadership and governance; and Risk factors. Service provision describes the organization of processes which allows for delivery of health care. Financing describes the financing involved in both accessing care, through insurance schemes or out-of-pocket payments, as well as funding within the health care system, and the distribution thereof. Resource generation refers to the sectors which supply the resources necessary to provide health services. Leadership and governance ensures strategic policy frameworks exist and are combined with effective oversight, coalition building, the provision of appropriate regulation and incentives, attention to system design, and accountability. Risk factors refer to the social, environmental, economic and behavioural transactions influencing health risks [Papanicolas and Smith, 2013].

In order to map correlations between frameworks and to recognise emergent patterns the above five categories, along with several extensions are highlighted with a list of sub-elements, as worded in the frameworks, listed in Table 3.2. In order to determine these broad categories Table 3.2, adapted from Hoffman *et al.* [2012], lists elements included in each framework, these are then grouped accordingly. Elements are categorised into the five broad categories listed above with the addition of several factors found during the analysis of frameworks. Factors which did not fit into any of these categories were then reviewed in order to develop categories for more comprehensive categorisation. These elements are namely, the population utilising the health system, man-

agement and organization, resources, technology, knowledge and information and access. A final category listed as "Other" is developed in order to capture the areas which do not fit any given category however must be duly noted.

### 3.3.2 Health System performance measures

Health systems are mapped in order to establish what they are comprised of, what influences them, what state they are in and how they are performing. In order to measure and evaluate the performance of health systems, performance measurements must be established. Papanicolas and Smith [2013] highlights the importance of performance measurements and comparative tools to inform policy makers, but caution against bias when considering performance measurements or comparisons. The perspectives of stakeholders, framework boundaries and a clear definition of framework objectives must be understood.

Some frameworks are designed with the purpose of being HSPA, these frameworks commonly list the following performance dimensions: health improvement, health status, responsiveness, financial protection, equity and efficiency [Papanicolas and Smith, 2013]. These aspects were used as a guideline when grouping the health performance measures highlighted in the frameworks. The following performance measures were established accordingly: quality and customer satisfaction are grouped; efficiency, effectiveness and safety; equity; responsiveness and health status and health improvement. Financial protection was grouped under financing, the health system element. Table 3.2 lists these performance measure groupings along with the wording specified in each model.

### 3.3.3 Health System framework heat map

It is of interest to establish the frequency by which the model components are addressed by the existing frameworks. Papanicolas and Smith [2013] lists the most frequent appearing elements and performance measures, but do not investigate the same quantity of frameworks. The heat map, in Figure 3.2, presents the categories as listed in Table 3.2 and the percentage of frameworks within each category which lists the specified framework components. Appendix A includes a more comprehensive heat map, Table A.2 expanding on the components highlighted in this section. Figure 3.3 illustrates the comprehensiveness with which each model maps the health system out of the 16 health system components listed.

Unsurprisingly, health system frameworks are the most inclusive overall of the highlighted components as they consider the system as a whole. The components which are most frequently cited are leadership and governance, financing and resources, which interestingly are strongly linked. This highlights the importance of these components and the way in which together they affect the functionality of the health system.

Table 3.2: Table listing alternative references to components

Components	Alternative component terms
Service Provision	Health care organization (relationships of people and resources in the provision of health care. It includes medical practice, nursing, hospitals, nursing homes, medical drugs, public and community health care services, ambulances, dental treatment, and other health services such as optometry, chiropractic's, and podiatry)[Lalonde, 1981]; Delivery of services (primary health care, secondary care and tertiary care) [Roemer, 1993]; Diagnosis and treatment of disease, rehabilitation, care of the profoundly disabled and incurable, Delivery of health care [Kleczkowski <i>et al.</i> , 1984]; Availability and utilization of services [Aday <i>et al.</i> , 1999]; Health care providers [Frenk, 1994]; Public Health System [Handler <i>et al.</i> , 2001]; Delivering services (provision) [Murry and Evans, 2003]; Capacity building [IHP, 2009]; Strengthening community health services [Epp, 1987]; Health service institutions [Yett <i>et al.</i> , 1972]; Demands on health care system [Hsiao <i>et al.</i> , 2008]
Financing	Insurers [Evans, 1983]; Economic support [Kleczkowski <i>et al.</i> , 1984]; Economic Support (governmental tax revenues, social insurance, voluntary insurance, charity and personal households) [Roemer, 1993]; payment mechanisms [Frenk, 1994]; Cost [Kissick, 1994]; Flows of payment [Aday <i>et al.</i> , 1999]; Financial protection [Murray and Frenk, 2000], [European Commission, 2005]; Financing agents and providers [Merson <i>et al.</i> , 2006]; Adequate funding [IHP, 2009]; Contextual/Individual Characteristics: enabling(financing) [Andersen, 2008]; Financing (pooling, collecting, purchasing), Fair financial contribution [Murry and Evans, 2003]; Financing-revenue, pooling, allocation, payment [Peters <i>et al.</i> , 2009]; Financial viability [Lusthuas <i>et al.</i> , 2002]; Structure of insurance coverage (deductibles, coinsurance rates, etc.), income and family composition, mix of revenue sources (income-related premiums, payroll tax, general tax revenue, etc.) [Feldstein <i>et al.</i> , 1972]; Health care expenditures of a group of families with the same demographic composition, income, and insurance coverage; formulas for expenditure distribution, net out-of-pocket expenses, etc., quantities and prices of hospital and medical care [Feldstein and Friedman, 1976]; Revenue collection, pooling of funds, purchasing of services [Kutzin, 2001]; Health spending [Nixon and Ulmann, 2006],[Joumard <i>et al.</i> , 2010]; Provider payment systems [Atun and Memable, 2008]; Financial protection from poverty, Financial sustainability [The World Bank, 2007]; Health expenditure of GDP [Hurst, 1991]; Measured health expenditures: percent GDP, expenditures per capita, drug expenditures per capita [Anell and Willis, 2000]; Financial contributions and health expenditure [Hurst and Jee-hughes, 2001]; Allocating an "appropriate" level of public sector and economy-wide resources to health care (macroeconomic efficiency) [Docteur and Oxley, 2003]; Cost containment, Including overall health care spending, hospital spending and utilization [The Commonwealth Fund, 2011], [The Commonwealth Fund, 2015];

Table 3.2: Table listing alternative references to components

Components	Alternative component terms
Leadership and governance	<p>Governments [Evans, 1983]; The state, programmatic (setting priorities) [Frenk, 1994]; Modulation (setting transparent and fair rules of the game) [Londono and Frenk, 1997]; Formulating and implementing policies and programs [Aday <i>et al.</i>, 1999]; Strategic alignment, tactical alignment, legitimization alignment [Sicotte <i>et al.</i>, 1998]; Enforcement of public health laws and regulations, health policy development [Khaleghian and Das Gupta, 2004]; Governments, Regulation [Merson <i>et al.</i>, 2006]; Public health strategies: strategies to implement core programs [European Commission, 2005]; Stewardship [Murray and Frenk, 2000], [Murry and Evans, 2003]; PHS mission and purpose [Handler <i>et al.</i>, 2001]; Contextual Characteristics: enabling(health policy) [Andersen, 2008]; Indispensable set of actions, under the primary responsibility of the state that are fundamental to achieving public health; Strengthen public health practice, improve capacity of the national health authority to execute the EPHF and develop public health infrastructure [Ramagem and Ruales, 2008]; Collective action, alignment with country processes, balance between country participation and independence [IHP, 2009]; Government (Governance-leadership, stewardship, planning, legislation, regulation), Enabling and Inhibiting Factors, Strategy to strengthen health services (health sector, institution, strategy) [Peters <i>et al.</i>, 2009]; Coordinating healthy public policy [Epp, 1987]; Governance inputs (participation, strategic vision, consensus orientation), attributes (control of corruption, accountability, transparency) [Mikkelsen-Lopez <i>et al.</i>, 2010]; Integrating health into public policies across sectors and providing inclusive leadership for health governance [WHO, 2008]; National strategic leadership, supportive policies [WHO, 2008]; Interconnects public health departments, regional health information organizations, providers and federal agencies; collaborative (and well-defined) governance or oversight and long term return on investment [Savel <i>et al.</i>, 2010]; Leadership, strategic planning [Goldstein and Schweikhart, 2002]; Strategic leadership [Lusthuas <i>et al.</i>, 2002]; Six stewardship functions: define the vision and strategy for better health, exert influence across all sectors for better health, govern health systems in a way that is consistent with prevailing values, ensure system design is aligned with health system goals, leverage available legal and regulatory instruments and compile, disseminate and apply intelligence [Veillard <i>et al.</i>, 2011]; Vision and strategy [Kaplan and Norton, 1996]; Lack of intersectoral action or partnership [Mills <i>et al.</i>, 2006]; Responsive governance, partnership development, Leadership and constancy of purpose [Vallejo <i>et al.</i>, 2006]; [Siddiqi <i>et al.</i>, 2009]; strategy, partnerships [EFQM, 2012]; Governance and accountability [The World Bank, 2007]; Rule of law, transparency, accountability [Siddiqi <i>et al.</i>, 2009]</p>

Table 3.2: Table listing alternative references to components

Components	Alternative component terms
Risk Protection	Environment [Lalonde, 1981],[WHO, 2008]; The state [Frenk, 1994], [Cassels, 1995]; Macro context [Handler <i>et al.</i> , 2001]; Social and financial risk protection [European Commission, 2005],[WHO, 2007]; Physical and social environment [Kleczkowski <i>et al.</i> , 1984]; Contextual alignment [Sicotte <i>et al.</i> , 1998]; Macro environment [IHP, 2009]; Contextual Characteristics: Predisposing (Demographic, social, beliefs), need (environmental) [Andersen, 2008]; Enabling and Inhibiting Factors, Strategy to strengthen health services (country context) [Peters <i>et al.</i> , 2009]; Healthy environments [Epp, 1987]; Social, Economic [WHO, 2008]; The community (physical and social environments) [Ergo <i>et al.</i> , 2011]; External Environment: administrative/legal, political, social/cultural, ecological, technological, stakeholder, economic [Lusthuas <i>et al.</i> , 2002]; microeconomic variables (labour productivity, poverty rates, demand for medical care), macro-economic variables (inflation rate, wage and exchanges rates) [Hsiao <i>et al.</i> , 2008]
Populations	Consumer patients [Evans, 1983]; Human biology [Lalonde, 1981]; The population (community participation) [Frenk, 1994]; People (Nonpoor/Poor (communities, advocacy groups, consumer protection groups) [Peters <i>et al.</i> , 2009]; Populations groups, families and individuals in need of care [Kleczkowski <i>et al.</i> , 1984]; Population health; Contextual /individual Characteristics: Predisposing (Demographic, social, beliefs), need (environmental, population health indices) [Andersen, 2008]; Households (household characteristics and individual factors) [Ergo <i>et al.</i> , 2011]; Demographic variables, sociopsychological variables [Rosenstock, 1974]; Lifestyle, environmental and occupational factors [Nixon and Ulmann, 2006];
Management and Organization	Management [Kleczkowski <i>et al.</i> , 1984]; Organization (principal authority of government, other governmental agencies with health functions, voluntary health agencies, enterprises, private health care market) [Roemer, 1993]; Management (health planning, administration, regulation and legislation) [Roemer, 1993]; Organizational (production of services) [Frenk, 1994]; Operational alignment [Sicotte <i>et al.</i> , 1998]; Articulation (managing and organizing transactions between groups) [Londono and Frenk, 1997]; Contextual Characteristics: enabling(organization) [Andersen, 2008]; Provider organizations (Management systems and inputs- human resources, financial management, information systems, drugs and medical supplies (logistics), medical technology, maintenance and buildings, auxiliary services) [Peters <i>et al.</i> , 2009]; Process management [Goldstein and Schweikhart, 2002]; Organizational capacity: financial- process- program- management, inter-organizational linkages, Organizational motivation: culture, history, mission, incentives/rewards [Lusthuas <i>et al.</i> , 2002]; Management by processes and facts [Vallejo <i>et al.</i> , 2006]; Internal business processes [Kaplan and Norton, 1996]; Weak planning and management [Mills <i>et al.</i> , 2006]; Health care coordination, care coordination, chronic care management [The Commonwealth Fund, 2011], [The Commonwealth Fund, 2015] Organizational culture [Ferlie and Shortell, 2001];

Table 3.2: Table listing alternative references to components

Components	Alternative component terms
Resources	First-line providers, second-line providers [Evans, 1983]; Organized arrangement of resources, Development of health resources [Kleczkowski <i>et al.</i> , 1984]; Resources (human resources, facilities, commodities and knowledge) [Roemer, 1993]; Allocation alignment [Sicotte <i>et al.</i> , 1998]; Organizations that generate resources(human resources, payment mechanisms, scientific information, technology) [Frenk, 1994]; Structural capacity (information resources, organizational resources, physical resources, human resources, fiscal resources) [Handler <i>et al.</i> , 2001]; Workforce development [Khaleghian and Das Gupta, 2004]; Creating resources(investment, training) [Murry and Evans, 2003]; Inputs- human resources, financial management, information systems, drugs and medical supplies (logistics), medical technology, maintenance and buildings, auxiliary services) [Peters <i>et al.</i> , 2009]; Team microsystems development [Ferlie and Shortell, 2001]; Health manpower [Yett <i>et al.</i> , 1972]; Organization of resources(human resources, infrastructure and supplies); Human resources, infrastructure, structure) [Van Olmen <i>et al.</i> , 2012]; Poorly skilled staff, poorly motivated staff [Mills <i>et al.</i> , 2006]; Resource institutions [Cassels, 1995]; Aggregate density of human resources for health; doctor and nurse densities separately [Anand and Barnighausen, 2004]; Consultations with general practitioners and specialists, medicines prescribed per capita [Hurst, 1991]; MRI units per capita, CT scanners per capita, number of hospital beds per capita, health care employment per capita, number of physicians per capita, number of nurses per capita, and health care employment as percentage of total employment [Anell and Willis, 2000];
Technology	Vaccines and technologies [WHO, 2007]
Knowledge and Information	Promotion of health, prevention of illness, health education [Kleczkowski <i>et al.</i> , 1984]; Scientific information, Instrumental (intelligence generating) [Frenk, 1994]; Health education, disease surveillance, public health research [Handler <i>et al.</i> , 2001]; mutual learning [European Commission, 2005]; Health information system strengthening [IHP, 2009]; Information-disclosure, research, evaluation [Peters <i>et al.</i> , 2009]; Perceived -susceptibility-seriousness to disease, cues to action [Rosenstock, 1974]; Information and analysis [Goldstein and Schweikhart, 2002]; Continuous learning improving and innovation [Vallejo <i>et al.</i> , 2006]; Fosters an open collaborative effort involving the public health information network community, clinical partners, academia and industry to provide scientific and public health rigor [Savel <i>et al.</i> , 2010]; Learning and growth [Kaplan and Norton, 1996]; Intelligence and information and ethics [Siddiqi <i>et al.</i> , 2009] Development of a common HSS classification system and harmonization of HSS programmatic and financial data for inter-agency comparative analyses [Shakarishvili <i>et al.</i> , 2011];
Access	Access to essential medicines [WHO, 2007]; Utilization, Coverage [Peters <i>et al.</i> , 2009]; Universal coverage [WHO, 2008]; Acute hospital admissions [Hurst, 1991]; Physical inaccessibility [Mills <i>et al.</i> , 2006]
Quality/ Customer Satisfaction	Value [Kissick, 1994]; patient-centered care [The Commonwealth Fund, 2006]; trust in health system [Peters <i>et al.</i> , 2009]

Table 3.2: Table listing alternative references to components

Components	Alternative component terms
Efficiency/ Effectiveness/ Safety	Measures effectiveness (how structure, process or both contribute to outcomes of health care at the community, system, institution or patient level), and efficiency (the combination of goods and services with the highest attainable total value be produced given limited resources and technology) [Aday <i>et al.</i> , 1999]; to deliver effective, safe, well-coordinated, efficient care [The Commonwealth Fund, 2006]; Improved efficiency [WHO, 2007]; Logical and economic efficiency [Donabedian, 1966]; Improve system performance [The World Bank, 2007]; efficiency (technical and allocative efficiency) [Atun and Memable, 2008]
Equity	Equity (participation and freedom of choice) [Aday <i>et al.</i> , 1999]; Reducing inequities [Epp, 1987]; Inclusiveness [Siddiqi <i>et al.</i> , 2009]; Disparities [The Commonwealth Fund, 2011], [The Commonwealth Fund, 2015]
Responsiveness	
Health Status	Health [Lalonde, 1981]; Achieving health for all [Epp, 1987]; Long healthy and productive lives [The Commonwealth Fund, 2006]; Outcomes: perceived health, evaluated health [Andersen, 2008]
Other	Other sectors that produce services with health effects at systemic (institutional arrangements), Potential personnel, money, data [Frenk, 1994]; Processes [Handler <i>et al.</i> , 2001]; Monitoring and evaluation [Khaleghian and Das Gupta, 2004]; system and workforce innovation and improvement [The Commonwealth Fund, 2006]; Health Behaviour: health practices, process of medical care, use of personal health services [Andersen, 2008]; harmonized approaches to performance assessment [IHP, 2009]; principal health reforms, assessment of health system [Rechel <i>et al.</i> , 2010]; Increasing prevention, enhancing coping; Health promotion mechanisms: self-care, mutual aid, healthy environments; Implementation strategies: fostering public participation [Epp, 1987]; Behaviour change, Programmes [WHO, 2008]; Communication [Ergo <i>et al.</i> , 2011]; Relevance [Lusthuas <i>et al.</i> , 2002]; Health care acceptability, Sustainability and timeliness [Joumard <i>et al.</i> , 2010]; Focus on markets [Goldstein and Schweikhart, 2002]; Relevance to need (for the whole community) [Maxwell, 1984]; society results, business results [EFQM, 2012]; Institutional purchasers, other sector agencies that produce health benefits indirectly and populations [Cassels, 1995]; Harmonization of conceptual and operational understanding of what constitutes HSS [Shakarishvili <i>et al.</i> , 2011]; Participation and consensus orientation [Siddiqi <i>et al.</i> , 2009]; Disease interventions and foster strategic engagement [The World Bank, 2007]; Public/private mix [Paris <i>et al.</i> , 2010] Recent reforms and innovations, disease prevention, public views [The Commonwealth Fund, 2011], [The Commonwealth Fund, 2015];

Framework:	Service Provision	Financing	Leadership and Governance	Risk Protection	Populations	Management and Organization	Resources	Technology	Knowledge and information	Access	Other	Quality/ Customer Satisfaction	Efficiency/ Effective/ Safe	Equity	Responsiveness	Health Status
Health System Frameworks	74.07%	74.07%	62.96%	33.33%	37.04%	40.74%	70.37%	29.63%	18.52%	29.63%	25.93%	25.93%	25.93%	33.33%	18.52%	55.56%
Sub-Frameworks	50.00%	16.67%	83.33%	50.00%	33.33%	16.67%	0.00%	0.00%	33.33%	16.67%	50.00%	16.67%	0.00%	16.67%	0.00%	50.00%
Hospital Frameworks	0.00%	0.00%	100.00%	25.00%	0.00%	75.00%	75.00%	0.00%	50.00%	0.00%	50.00%	75.00%	75.00%	0.00%	50.00%	0.00%
Resource related Frameworks	16.67%	100.00%	0.00%	33.33%	50.00%	16.67%	50.00%	0.00%	0.00%	33.33%	16.67%	33.33%	16.67%	16.67%	0.00%	33.33%
Quality Frameworks	20.00%	40.00%	60.00%	0.00%	20.00%	40.00%	40.00%	20.00%	20.00%	20.00%	40.00%	40.00%	40.00%	20.00%	0.00%	60.00%
Supra-Frameworks	38.46%	23.08%	38.46%	23.08%	7.69%	0.00%	15.38%	0.00%	0.00%	7.69%	23.08%	15.38%	23.08%	7.69%	15.38%	23.08%
Comparisons	11.11%	44.44%	11.11%	11.11%	0.00%	0.00%	44.44%	0.00%	11.11%	22.22%	44.44%	11.11%	22.22%	11.11%	11.11%	33.33%

Figure 3.2: Health System Framework Heat Map

Health System Frameworks		Hospital Frameworks:	
Actors Framework	25.00%	IDB and IDRC Institutional and Organizational Assessment (Organizations)	37.50%
Lalonde health field framework	18.75%	WHO Euro Hospital Performance PATH (Hospitals)	31.25%
Model of a national health system its structures and functional interrelationships	50.00%	Baldrige Framework (Hospitals)	31.25%
The five main interacting components of national health systems	31.25%	Adapted EFQM based on PATH (Hospitals)	43.75%
Reform Framework	43.75%	Resource related Frameworks:	
Kissicks Iron triangle	37.50%	Distributional aspects of national health insurance benefits and finance	12.50%
A framework informing change in Latin American health care reform	25.00%	Health Manpower Planning: An Econometric Approach	6.25%
EGIPSS (Integrated Performance Model for the health care system	31.25%	The Effect of National Health Insurance on the Price and Quantity of Medical Care	12.50%
Framework for assessing behavioral healthcare	37.50%	A sub-framework for understanding the insurance function of health systems	12.50%
Health Systems Assessment Framework: functions and goals	37.50%	A sub-framework comparing the relationship between health spending and health outcomes in 15 EU countries	25.00%
A framework informing change in health systems reform for low- and middle- income countries	25.00%	Capacity framework (system restraints)	31.25%
A conceptual framework to measure performance of the public health system	50.00%	Health Care systems Efficiency and institutions	56.25%
Public health functions framework	25.00%	Quality Frameworks:	
WHO Health System Performance (combines it all)	50.00%	Quality improvement- Donabedian model	31.25%
OMC (EU open method of coordination)	43.75%	Maxwell Expanded (Quality)	37.50%
A framework informing change in British Columbia's public health renewal efforts	37.50%	Balanced scorecard	37.50%
Core goals and priorities for performance improvement	50.00%	UK Performance Assessment Framework	25.00%
The WHO Health Systems Framework	68.75%	European Foundation for quality management (EFQM)	43.75%
A framework for understanding the key components of well-functioning health systems	37.50%	Supra-Frameworks:	
A framework evaluating health systems performance using 11 essential public health functions	12.50%	A supra-framework for comparing and informing change for health sector reform in developing countries	25.00%
A behavioural model of health services use	43.75%	OECD HCQI	37.50%
Monitoring and evaluation of health systems strengthening	31.25%	Healthy Development	31.25%
Strengthening Health Services Framework	87.50%	A supra-framework for understanding how health status affects the macro economy	43.75%
Reforms framework (Policy cycle, control knobs)	62.50%	A framework for analysing health systems and the context	56.25%
A framework for understanding how governance parameters exist at all levels of the WHO Building Blocks model	62.50%	A supra-framework evaluating national health systems by tracing the impact of donors' health system strengthening expenditures	12.50%
A framework for comparing health system performance across countries	31.25%	A supra-framework for understanding the concept of stewardship and its applications to the health sector	6.25%
The health system dynamics framework	50.00%	Comparisons:	
Sub-Frameworks:		Fund flows and payment framework	31.25%
The health belief model	18.75%	A supra-framework comparing health care resource profiles across multiple national health systems	12.50%
Framework for health promotion	37.50%	Performance Measurement and Performance Management in OECD Health Systems	6.25%
A sub-framework informing change in primary health care service delivery	25.00%	A supra-framework comparing health system reforms across OECD countries	25.00%
Framework for implementation at country level	25.00%	A supra-framework comparing the impact of health worker density on health outcomes across multiple countries	25.00%
A sub-framework informing change in health communications technology through a grid-based health information network	12.50%	A supra-framework comparing ten principles for health systems governance assessment across countries in the Eastern Mediterranean region	37.50%
A sub-framework evaluating health system approaches to maternal, neonatal and child health as it relates to the broader health system	43.75%	Health Systems Institutional Characteristics	6.25%
		International profiles of health care systems	12.50%
		International profiles of health care systems	12.50%

Figure 3.3: Heat Map showing the considerations included per model to illustrate the comprehensiveness of models

Health status is most frequently listed thus is arguably the pivotal performance measure. This is understandable as generally the improvement of health is the goal of a health system, the other measurements being to support and aid quantifying the performance at an operational level. As the performance of the system results in an improved health status. Chapter 3 will further quantify and discuss the areas highlighted in the heat map and the state thereof in the SSA landscape, as well as expand on the elements found within these broad categories.

### **3.4 Conclusion: Health care frameworks**

This chapter investigates existent health system frameworks in terms of their purpose and comprehensiveness, listing the broad categories identified to make up a health system. These categories are used as a framework for structuring the study to follow. In Chapter 3, a systematic literature review is carried out in order to establish an understanding of the health in a SSA setting constituting the development of a comprehensive study.

## Chapter 4

# Factors influencing health care outcomes in SSA: A systematic literature review

The systematic review is carried out following the motivation and methods described in Section 4.1 and Section 4.2 respectively. The way in which information is synthesised is discussed in Section 4.2.4 in order to convey the outcomes of the search. Finally the search findings are discussed in Section 4.3 according to the categories outlined in Chapter Two. Yin [2006] states that a literature review is not carried out to find answers but to allow for more insightful questions on the topic to be asked, which directly aligns with what this chapter hopes to achieve. Section

### 4.1 Introduction

The topic of health care is multifaceted, illustrated by the definition of health care as the set of services provided by a country or organisation for the treatment of the physically and the mentally ill [Oxford Dictionary [Online]]. When considering health care it is therefore necessary to analyse the provision of services in conjunction with the state of the community to be served. It is not possible to accurately understand the level of health care provision without analysing the two collectively. Thus, factors which influence health care are multidimensional. Both services in terms of policy, organization and resources and the state of the community, in terms of demographics and health pandemics must be thoroughly understood and analysed [Andersen, 1995*b*].

In order to monitor the health of a region, and thus give an indication of the health care systems in place, the WHO have selected three overarching indicators to be used to do so, these indicators are: life expectancy; healthy life expectancy (HLE) and number of deaths before age 70. When analysing the standing of SSA for each indicator attention needed in the field of health

care becomes clear. When considering life expectancy: 22 of the 48 SSA countries make up the lowest ranking countries worldwide. HLE which considers the number of years from birth one can expect to live in full health, shows, according to the WHO in 2015, that the average world expectancy is 63.1 years. The AFR is the only region below this average, coming in almost 10 years behind the South East Asia Region (SEAR), the next lowest region. The third indicator, the number of deaths before age 70, yields results no differently, with the number of deaths in AFR being significantly higher than any other regions. When considering the health in Africa these results clearly highlight the importance of understanding this sector in order for improvement and development to take place.

## 4.2 Methods

A systematic and comprehensive literature search was carried out on 7 October 2016. The search was completed in accordance with the protocol described in this section. The electronic platforms and the search terms used are described in Section 4.2.1. The restrictions and reasons for inclusion or exclusion of literature is described in Section 4.2.2. The literature was analysed through the data extraction method described in Section 4.2.3 in order to accurately sort and synthesize data collected as discussed in Section 4.2.4.

### 4.2.1 Search Strategy

The electronic platforms identified from which to search and retrieve literature were: Academic Search Premier; Emerald; ProQuest; Scopus; and Web of Science. These platforms are selected due to their extensive and well renowned reputations regarding the quality and diversity of articles and databases accessed. On each platform literature is restricted to articles, reviews and conference proceedings to ensure that both high quality and a variety of opinions are identified.

The search terms were defined and in order to identify a comprehensive array of literature addressing the various factors influencing the HCOs in SSA. When searching "*mechanisms*" within five words of "*influencing*" OR "*affecting*" the volume and relevance of articles returned were found to be poor. Thus the search term "*factors*" was used instead of the term "*mechanisms*". Health care was searched as both one word and two words to make room for spelling differences, enclosing "*health care*" in inverted commas to return only articles with the words in conjunction. The use of the asterix at the end of "*Africa*" was to allow for the return of articles which made reference to the root word africa in any form, to extend the search to articles which may not specify the focus as SSA. The selected keywords of the search defined to retrieve the relevant literature were therefore selected as follows:

*({factors influencing} OR {factors affecting}) AND  
(healthcare OR "health care") AND africa\**

The choice of search terms are notably broad which makes room for articles tackling specific issues to fall through the cracks, the use of the broad terms is however done with a purpose in mind. By utilising such a broad term, any preconceived ideas about the factors affecting health care in SSA do not influence the study- resulting in the factors identified coming about organically. If more specific terms were utilised it is possible that factors beyond these ideas would not have been identified.

#### 4.2.2 Inclusion and exclusion criteria

The time period was selected due to the rapid developments and changes in the health care field in the new millennium. Thus articles published prior to 2000 were excluded from the scope of the literature reviewed. There are several reasons for the exponential changes, but two specific reasons should be mentioned. Firstly the MDGs set by the UN served to focus attention on specific issues. Secondly, the exponential growth of HIV in this period demanded a considerable amount of attention [WHO, 2016].

The titles, and where necessary abstracts of literature resulting from the search strategy were analysed in order to eliminate any articles which did not pertain to the field of human health or health care. The number of articles considered was then further reduced by eliminating articles which did not consider SSA either directly or in an indirect manner. The abstracts and keywords of articles were reviewed in order to ascertain the area and scope of the study to establish whether the literature is relatable to SSA.

Citation statistics can be valuable to support the identification of key foundational articles in a field. However, filtering articles based on the number of citations, may lead to the exclusion of more recent articles that have not yet been cited and articles that propose ideas that have not yet been accepted into orthodox thinking. The decision was thus made to not filter on the number of citations to ensure an up-to-date and sample of articles representing a broad spectrum of ideas.

The scope of studies found which met the above criteria were broad. The studies were not further vetted to meet specific quality criteria. This was done to establish a broad spectrum of literature allowing for a comprehensive and diverse array of data to be gathered creating a large library of literature, which touched on an array of factors. The intention behind this decision is to establish a comprehensive understanding of the different aspects and perspectives on health care in SSA.

### 4.2.3 Data Extraction

After completing the study selection process, data was extracted utilising the Atlas.ti platform. Atlas.ti was used to capture text excerpts, where relevant, taken from the full text using coded keywords to capture data and classify themes. For each paper reviewed data was extracted according to a standardized data capturing outline. Not all studies could be classified or contributed to each data field, due to the comprehensive list of fields captured, creating some gaps in the data fields. The data fields comprised of study characteristics, namely: year of publication; first author; article title; geographic location and setting; study population subgroup; study type; disease or HCO of focus; and highlighted factors identified to influence HCOs.

The keywords of studies are also captured and analysed, this however proved to be an inconsistent manner of data mapping as not all studies list keywords. It is important to note specifically for text relevant to highlighted factors that when extracting data from full-texts some similar or closely related themes are grouped together. Examples of this are the grouping of patient referral and transfer, compensation and incentives and classifying planning and protocol under governance. This data extraction process is repeated to compensate for errors made during the first sweep.

Highlighted factors were listed according to the categories defined and selected in Section 3.3 as illustrated in Figure 4.1. These categories are recognised to cover the health system as a whole, making them the selected categories. The data extracted from the articles are then used to expand on the state of health care and health systems in SSA, according to literature. The use of these categories was in order to group the articles in a structured manner. This broad grouping allowed for initial sorting. Each category was then further explored as needed.

### 4.2.4 Data Synthesis

In order to synthesize the data captured several methods were applied. Utilising the data table described in Section 4.2.3, quantifiable data captured such as year of publication, geography, subgroups and HCO or disease are mapped. This is done in order to create an understanding of the landscape of health care research foci which research focusses on in SSA, according to literature.

Thereafter the categories defined in Chapter 3 are used to synthesize the conceptual factors identified as influencing HCOs. These over-arching themes are selected due to the comprehensiveness by which they cover the health system. By populating these themes with the data found in the systematic literature review, an understanding of the health system in SSA can be developed in alignment with the overarching health components selected during the health system framework analysis.

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Within each category several sub categories have been established to structure the review results further. These categories are found within the models reviewed in Chapter 3 and are found to be particularly of interest or applicable to the study.



Figure 4.1: Categorisation of factors identified in articles retrieved from the systematic literature review

## 4.3 Results

A description of the literature found and the characteristics thereof are discussed in this section of the paper. An understanding of health care in SSA according to the literature is presented, with clarification on geographic regions.

### 4.3.1 Study Selection

The search across the five e-platforms initially yielded 1199 articles, these articles were then screened. Duplicates across platforms were then removed resulting in 793 articles, of these any articles preceding publication in 2000 were removed. The titles, and where necessary abstracts, of the remaining 683 articles were analysed in order to remove any articles which did not relate in any way to health care or human health, resulting in 646 articles. Of the final 646 articles any article with a focus that did not consider SSA, or the general population thereof either directly or indirectly was removed resulting in a final 363 articles. This process is summarised in Figure 4.2.

### 4.3.2 Study Characteristics

After mapping the 363 articles into Table C.1 found in Appendix B, a landscape of health care research focussed on SSA was developed. This table is of interest as it compiles all the literature captured giving indications of which regions and illnesses were captured by literature. The table captures the fields as described in the data extraction section. Figure 4.3 shows the distribution of papers published between 2000-2016, with the dip in 2016 attributable to the date of the systematic literature search being before the end of 2016. Whereas less than ten percent of the papers were published in the first four years between 2000-2004, this is an indication of a steady increase in research interest.

By categorising the articles geographically one can get a grasp of where the perspective or information for the literature is coming from as well which areas are unaccounted for and may need to investigate health care further. By excluding any articles which do not in any way consider SSA, all articles fell into several geographic categories, namely:

- General: these articles look at an idea without considering the geographic or environmental effects;
- Global: articles use examples from all around the world to derive a globally applicable result;
- Low and middle income: consider developing countries, low resourced countries and countries with low or middle incomes, not all countries

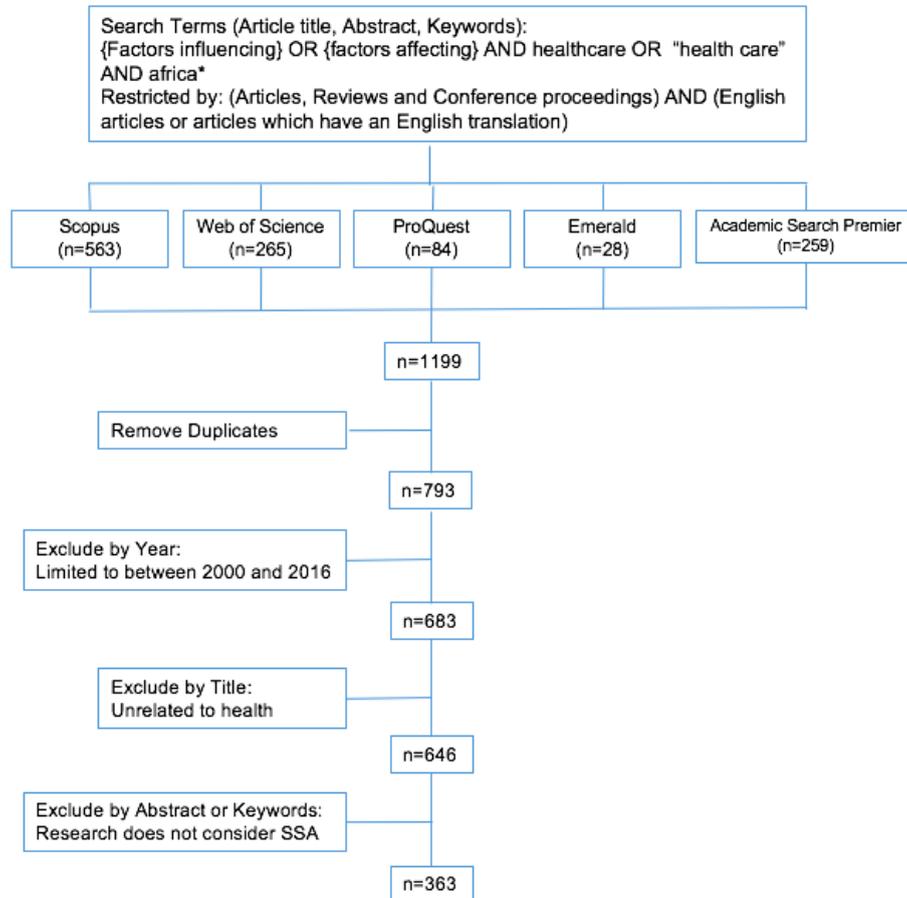


Figure 4.2: Flow chart depicting systematic literature review filtering process.

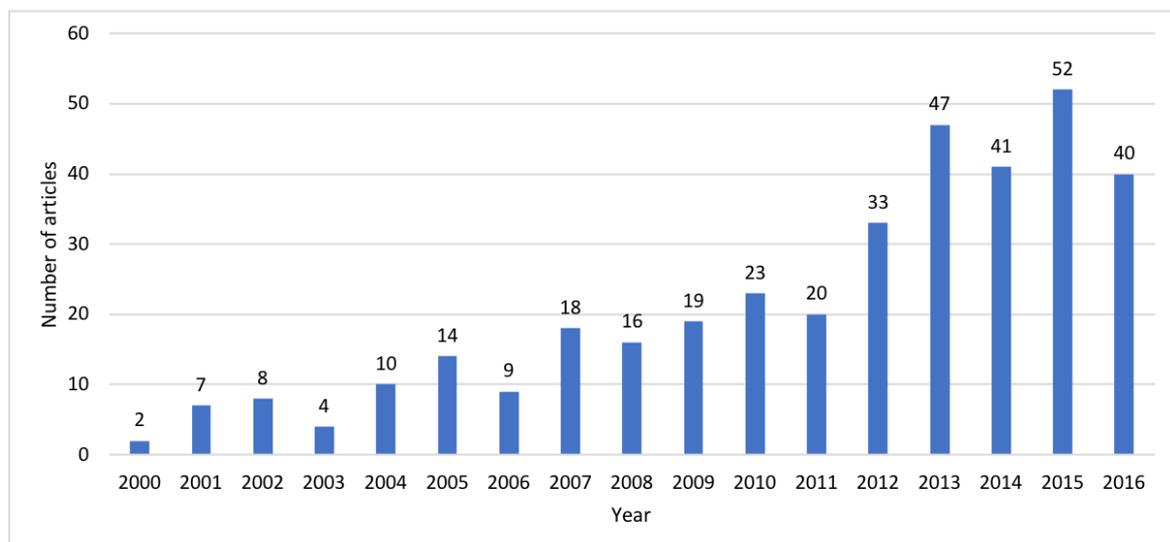


Figure 4.3: Percentage distributions of articles published yearly.

within the article are based in SSA, yet a country within SSA is mentioned;

- Africa: which made mention of countries both within SSA and the rest of Africa, or referred to Africa as a whole;
- SSA: which considered SSA as a whole or where articles considered several countries which did not fall into the same geographic regions.
- Middle Africa: Angola and Cameroon;
- East Africa: Ethiopia, Kenya, Tanzania, Uganda, Mozambique, Madagascar, Malawi, Rwanda, South Sudan, Zambia and Zimbabwe;
- West Africa: Benin, Burkino Faso, the Gambia, Ghana, Guinea, Mali, Nigeria, Sierra Leone and Togo;
- Southern Africa: Botswana, South Africa and Swaziland.

Figure 4.4 shows the proportions by which each region contributes to the academic literature reviewed. Geographical sub-regions containing countries as stated above follow the categorisation by the UN. The contribution from East Africa dominates, which can be attributed to the extensive list of countries found in this region. It must be noted that the contribution from Southern Africa follows East Africa and of this 95 of the 101 articles are South African. This is significantly greater than any other country. This result is not unexpected as the review is being carried out in English, so the review may be biased towards Anglophone Africa. Middle Africa contributes three articles, less than 1% of the review articles. This could be attributed to the fact that Cameroon is the only country in this region which lists English as an official language.

Of the 49 countries in SSA, only 24 are found to be made specific reference to in this review. Reasons for this can only be speculated. [such as language barriers, size of nation, political turmoil or academic institutes amongst others.] The countries not mentioned are listed by region, namely:

- Middle Africa: Central African Republic, Chad, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Republic of Congo and Sao Tome and Principe;
- East Africa: Burundi, Comoros, Djibouti, Eritrea, Mauritius, Mayotte, Reunion, Seychelles and Somalia;
- West Africa: Cabo Verde, Cote d'Ivoire, Guinea-Bissau, Liberia, Mauritania, Niger, Saint Helena, Ascension and Tristan da Cunha and Senegal; and
- Southern Africa: Lesotho and Namibia.

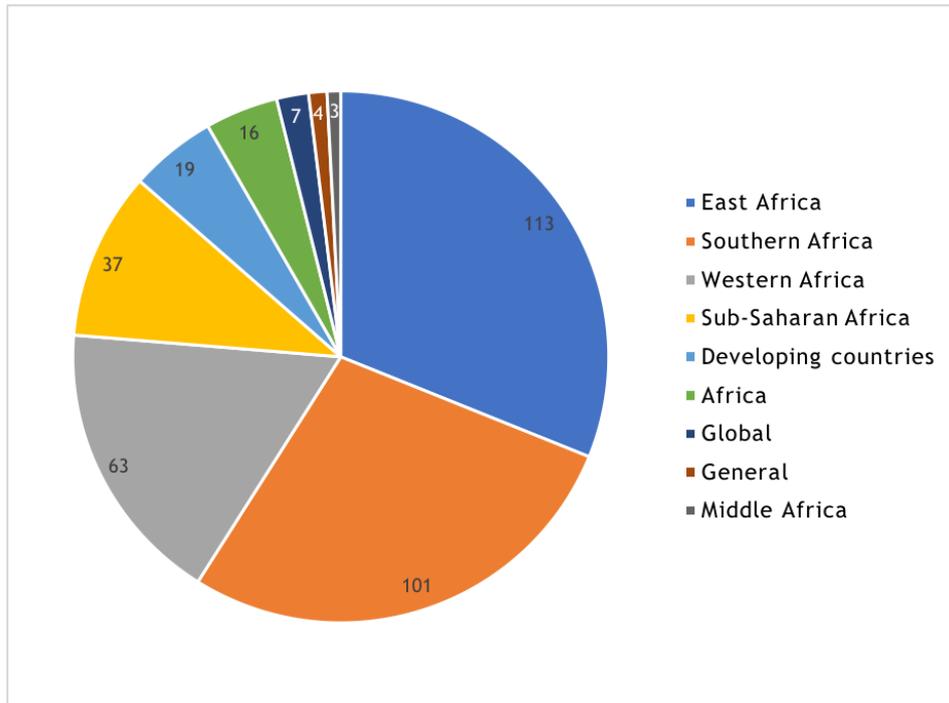


Figure 4.4: Proportion of geographic focus according to reviewed articles.

The assessment of the study characteristics gives an idea of the landscape of health research, Section 4.4 discusses the findings of the research in terms of the pivotal categories discussed. This section to follow is seen as more interpretive as the resulting areas of discussion need to be synthesized through reading and interpreting the results and findings of articles.

### 4.3.3 Result limitations

Several limitations need to be highlighted for the systematic literature review carried out. A systematic literature review removes space for bias and returns literature pertaining to specific search terms only. As a result of this, areas in health care which do not specifically pertain to the search terms may not surface. The search carried out is in English and only English papers, or papers with English translations are considered, this limits the study, as many countries within SSA do not have English as the national language. Increasing the opportunity to overlook information from these areas, especially francophone African regions. The analysis of such a significant number of papers is another area which could introduce room for error as it is difficult to accurately analyse each paper fully, this factor was considered when embarking on the analysis however the broad spectrum of results return was found to be more valuable to the over understanding of the system.

## 4.4 Factors influencing HCOs in SSA

The literature reviewed conveys numerous areas of weakness or barriers in SSA which have an impact on HCOs. These factors have been categorised as described in Section 4.2.4. The model contains eleven over-arching themes with nested topics. Each area is discussed according to factors identified when reviewing the selected literature.

### 4.4.1 Service Provision

#### *Health care organisations*

Health care organisations in SSA are comprised of several fields, the health facilities, health clinics and external drivers such as financing systems. For countries with high burdens of disease, such as the prevalence of HIV/AIDS in SSA, it is imperative to strengthen the capacity of public systems as well as improve resource allocation to address immediate needs [Zeng *et al.*, 2012].

17 articles referenced poor health infrastructure as a barrier to health care, eight of which investigated woman and child health, five focussed on HIV/AIDS and the remaining four discussed the health system in terms of HCWs motivation and location, information systems and the public health system. Health care infrastructure in SSA can be found to face three issues, either facilities do not exist, are poorly managed or underfunded. As a result, facilities are frequently found to be overburdened and in a poor state pushing people away from making use thereof [Sipsma *et al.*, 2013] [Sialubanje *et al.*, 2015]. In rural areas, it has been found in some cases facilities are in such a poor state women choose not to seek maternity care and deliver babies at home, putting them at greater risk of both maternal mortality and infant mortality [Sipsma *et al.*, 2013].

The lack of infrastructure has led to the development of several other means of health care delivery, such as community health centres, home visitations and initiatives such as m-Health. These may be innovative solutions but cannot be relied on to cater for more dire cases, or larger volumes, the limited infrastructure poses as a barrier to up-scale such programmes [Jordan *et al.*, 2016]. An article addressing voluntary medical male circumcision (VMMC) discusses the use of mobile services such as tents, mobile trucks and prefabricated clinics during outreach campaigns [Ledikwe *et al.*, 2014].

Poor infrastructure, especially facilities which are badly managed, have difficulty implementing improvements or new systems. Often the current system is not strong enough to house the improvements, particularly with regards to introducing computer based systems [Gordon and Hinson, 2007]. This is unfortunate as these systems are used worldwide to improve functionality. One system was able to be successfully implemented with sufficient training and regular support, however power supply and perceived increased workload were hindrances. This electronic decision support system for antenatal care was

found to be successfully implemented regardless of the resource constrained setting in SSA [Sukums *et al.*, 2014].

Primary health care facilities are widely used in SSA as they improve the accessibility of health care, especially in rural areas, both Marschall and Flessa [2011] and Cooke *et al.* [2010] find the distance to the closest facility directly reduces utilization and adherence. A study carried out by Marschall and Flessa [2011] highlights the four main activities carried out by primary health care facilities in Burkino Faso, 1) general consultation and nursing care, 2) deliveries, 3) immunisation, and 4) special services, such as: family planning, prenatal and postnatal consultation. Primary health care is also being utilised at large for the scale up of HIV services to match the urgent need for prevention, care and treatment [Mabelane *et al.*, 2016]. Strategies to integrate HIV care into primary care services also address related health needs such as TB, sexual health, and holistic care as well as integrating sexual and reproductive health and mental care [Uebel *et al.*, 2013]. A drive toward nurse led primary health clinics is taking place in order to combat staff shortages [Uebel *et al.*, 2013]. Figure 4.5 shows the proportion of areas of focus of the 19 articles which discuss primary health care.

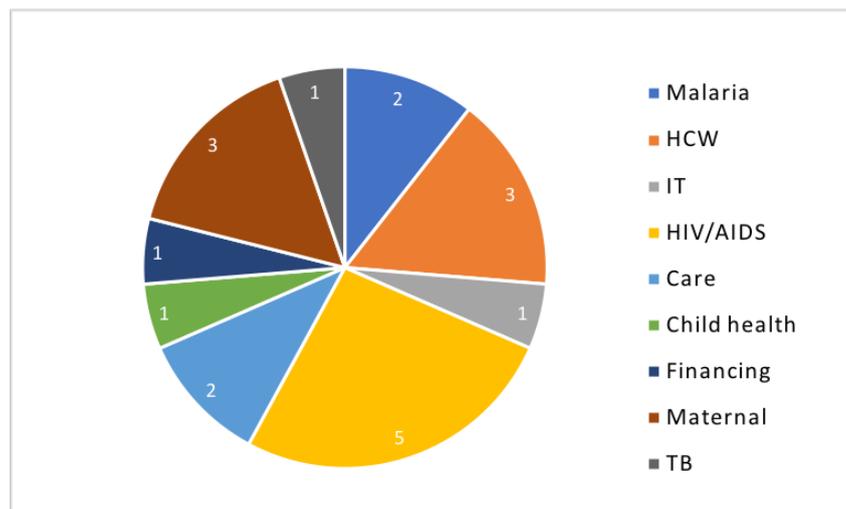


Figure 4.5: Distribution of primary health care facilities areas of focus according to literature.

#### *Service Quality*

When looking at the facilities a pivotal area recognised by 42 articles is that of service quality. Service quality is recognised of utmost importance for both satisfying patients, as well as ensuring they return- if service is poor it can result in loss to follow up or non-adherence [Bezabhe *et al.*, 2014]. In some cases, it is found poor service quality prevents seeking of care completely. Facilities are grossly wanting in terms of staffing, equipment, essential drugs

and supplies. Both quality of care and record keeping are well below acceptable standards [Rogo *et al.*, 2001].

Poor levels of quality deter HCWs as they need to work in sub-standard environments and must deal with treating patients in these conditions [Adzei and Atinga, 2012]. These conditions result in challenges for the HCWs as they must aim to serve patients to the best of their ability with very few of the resources needed [Lori *et al.*, 2012]. Shortage of staff increases patient load and as a result it is difficult to deliver the desired quality of care as well as adhering to clinical practice guidelines [Wasunna *et al.*, 2008].

#### 4.4.2 Financing

##### *Health care financing*

On the reverse to poor service delivery, populations are found to invest in health insurance schemes and seek health care if it is affordable and offers quality service [Dror *et al.*, 2016], it is therefore pivotal to the health of the population to have quality service encouraging health utilisation.

Health care financing in SSA is either done through the government, foreign aid, privately or through health insurance schemes. It is imperative health care is affordable by all and will not be the cause of impoverishment, health care financing provides much needed succour to the majority of the population seeking health care in SSA [Boateng and Awunyor-Vitor, 2013].

Health care financing is strongly aligned with policy as these schemes need to be well designed and implemented using policies to function successfully. Seven articles explicitly address community based health insurance programs. Community based health insurance (CBHI) schemes with a variety of designs have been introduced across SSA but with generally disappointing results so far, with two exceptions, Ghana and Rwanda. The success of these both countries can be attributed to introducing the schemes with effective government control and support coupled with intensive implementation programmes [Odeyemi, 2014]. With four articles addressing National health insurance schemes (NHIS), looking at the readiness of hospitals in South Africa [Dyers *et al.*, 2016], NHIS affecting the informal sector in Kenya [Mathauer *et al.*, 2008] and NHIS in Ghana in terms of the effect of moral hazard [Yawson *et al.*, 2012] and policy [Boateng and Awunyor-Vitor, 2013].

Reasons for joining a health insurance system in any form has mixed feedback from the literature, showing there is no one reason. Some prominent reasons, although not consistently found through all the articles discussing insurance are as follows: health service quality, income, education, age, household size, woman as head of the household, elderly family member, recent history of illness and distance to health facilities [Dong *et al.*, 2009] [Dror *et al.*, 2016]. It is found ambiguity of the benefits, capabilities and services offered by health insurance must be clearly communicated as often enrollees are discouraged, without a comprehensive understanding of the system [Robyn

*et al.*, 2012] [Mathauer *et al.*, 2008]. In 2016 Dror conducted a systematic literature review looking at factors which influenced the uptake of CBHI in low and middle income countries, of the 54 papers retrieved and reviewed, 36 were based in SSA.

Having health insurance is recognised to reduce the delay in seeking care [Njuguna *et al.*, 2016]. If the public health care systems are in a poor state often populations can turn to health insurance or community health insurance schemes. This is done to access health care that would otherwise be unaffordable. It has been found in an article addressing South Africa, Ghana and Tanzania, health insurance is pro-rich and regressive in the informal sector [Macha *et al.*, 2012]. Financing systems are urged not only to generate funds, but consider barriers such as affordability, availability and acceptability to improve equitable financing and benefit patterns of health care [Macha *et al.*, 2012].

It is of interest to note no articles investigated the disparities in health care provision between private and public health sectors, [George *et al.*, 2013] acknowledged the large disparity in service levels and HCW workloads but did not pursue the topic. The inequities between the two sectors are large and deserve increased attention.

### 4.4.3 Leadership and Governance

#### *Health policy*

Policy both at a national and organisation based level is found to have far reaching repercussions and is necessary for system functionality. Health policy is grouped, for the purpose of the review, as clinical practice, governance and policy. These are made reference to by 26% (95) of articles, referring to policy implementation or the barriers presented by a lack of policies, clinical practices and protocols and governance.

From the review it is clear that, at an organisation based level, lack of policy brings about functional issues such as mismanaging patients, poor service delivery due to resource mismanagement and issues regarding staff responsibilities and protocols [Kok *et al.*, 2015]. On a national level policies or moreover the lack of policy is recognised to hinder HCOs, as they are deemed to encourage good practice and project implementation. If there are clear policies laid out projects can be initiated to align with these as well as being a guideline for project goals and protocols. Having a system in place with good policies and protocols has been found to encourage donor and stakeholder investments [Gilson *et al.*, 2012]. A lack of policy or protocol is attributed to the lack of knowledge on the respective field, supporting the argument that these articles will be utilised for policy making. It must be noted that policies have limitations, in some cases especially in the SSA climate, rigid policies can be barriers to HCOs [Layer *et al.*, 2014]. If clinics have rigid policies they may not be able to make compromises when necessary and may push patients away [Welniak

*et al.*, 2014]. The opposing problem to this is that in some cases good policies may struggle to be received and implemented [Durrheim *et al.*, 2003]. A large problem facing policy adherence is lack of communication, there are many policies pertaining to many different spheres, which may undergo changes, it is not uncommon that policies do not reach operational levels resulting in poor adherence of policies [Abekah Nkrumah *et al.*, 2010] [Sissolak *et al.*, 2011].

The management of diseases and endemics has been strongly aligned with the existence of policies. With policies in place HCWs are able to align the way in which they process patients [Abekah Nkrumah *et al.*, 2010]. The development of policies requires much research therefore the resultant policy is often the most effective solution which, if followed, will have the best results [Aaserud *et al.*, 2005]. Articles recognised a lack of policy as a hindrance to systems functioning and disease management.

National health financing projects and insurance programmes are often dictated by policy makers and rely on policies to keep functional and intact [Dror *et al.*, 2016]. Having poor policies frequently lead to the demise of such projects, thus it is imperative to set up and communicate these [Twikirize and O'Brien, 2012].

On all levels of health care organizations policies dictate operations, resource allocations and influence the populations utilization thereof [Buseh *et al.*, 2002] [Twikirize and O'Brien, 2012][Fongwa, 2002]. Whilst not all policies may be adhered to, they make an attempt to influence all health system measures and in return are influenced by the current state. Figure 4.6 gives a graphical representation of the health areas which are addressed by policy, policy recommendation, clinical practice or governance in the literature and the level at which this occurs, either governmental, organizational or both.

#### *Public and Private Health*

29 articles discuss public health whilst only 6 discuss private, which gives a relatively true reflection of the presence of public and private health in SSA. Likwa [2015] acknowledges public health needs have risen due to population increase but also changes in health challenges, specifically with rising urban populations. Public institutions are being expected to accommodate more people with less resources [Raviola *et al.*, 2002]. In Uganda the public health system is found to have poor quality service, frequent drug stock-outs, unmotivated and insufficiently trained health personnel and over crowding [Twikirize and O'Brien, 2012], whilst the private sector is perceived to be of higher quality, due to flexibility of visit times and shorter time spent queuing [Parkhurst *et al.*, 2005]. Banderker and Van Belle [2006] state that doctors working in public health care in South Africa are faced with resource constraints prevalent in developing countries, doctors are expected to manage over 40 patients per shift and can find themselves working for more than 30 hours, this extreme pressure makes room for judgement errors. Maharaj and Rogan [2011] also cite long queues, and lack of health personnel as a problem faced when accessing

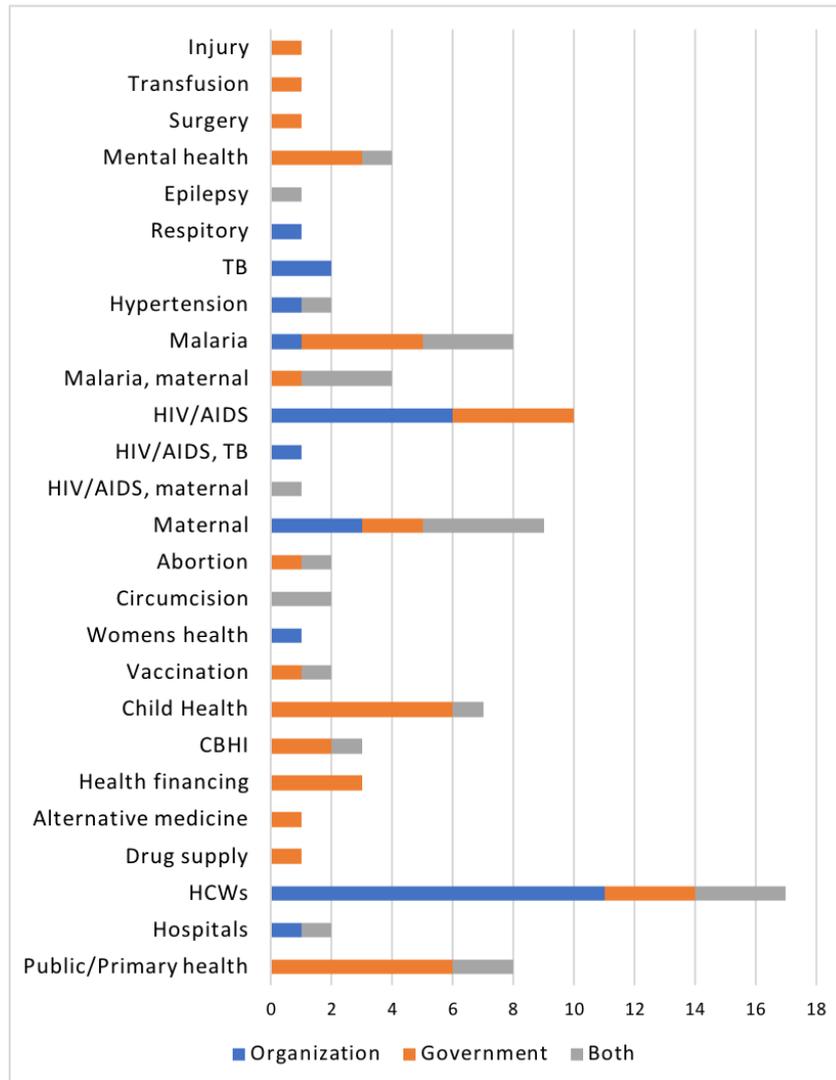


Figure 4.6: Distribution of articles addressing policy in terms of health areas, and level implementation or discussion.

public health care. An article based in Zambia addresses building capacity for public health by addressing the issue of limited health personnel [Likwa, 2015]. These three examples are a reflection of the state of public health across SSA and the issue of resource constraints.

The private sector or 'non-state health care' comprises of a wide range of providers, namely: the individual/family, traditional practitioners, private practitioners operating alone, corporate private clinics and hospitals, and NGOs including both secular and faith based organisations [Green *et al.*, 2002]. Health sector reforms in many countries are stressing the importance of developing a greater public/private mix. For the last two decades the private sector has been undergoing rapid growth, in South Africa approximately 60% of health care expenditure is spent in the private sector, catering for 23% of

the population [Parkhurst *et al.*, 2005].

Many low income countries have been implementing health sector reforms, as illustrated by the presence of reform models in Chapter 2. These reforms aim at making health systems more efficient and addressing problem such as health resource shortages and poor HCOs. Prominent features found in reforms include decentralization of health administration and funding from central to lower levels, development of more autonomy for institutions such as hospitals, integration of previously separate health services, enhancing the opportunities for non-State sectors, privatization of services, adopting 'private' sector management styles, enhanced orientation toward users, new prioritization approaches linked to minimum essential clinical packages, stronger regulatory mechanisms and financial reforms affecting the collection and payment of health sector funds [Parkhurst *et al.*, 2005][Green *et al.*, 2002].

#### *Non governmental organisation alignments*

Non government organisation's (NGO) are another stream through which health care is delivered. Green *et al.* [2002] discusses the way in which governments and NGO's or church based health services need to be integrated to achieve optimal results, Lesotho has developed a successful system whereby health organizations regardless of affiliation are responsible for the health in their surrounding area. Two articles discuss the involvement of Faith Based Organisation's (FBO) they provide health services in the same manner as NGO's however face some controversial issues especially with regards to HIV/AIDS interventions as they are trying to achieve both HCO goals and faith aligned goals. For example, the promotion of condoms is necessary to combat HIV/AIDS but the distribution thereof does not align with the message being relaying by the FBO [Morgan *et al.*, 2014].

Foreign aid is widely used in the health sector but needs to be carefully managed and aligned with the government to ensure optimal benefit there of. Projects such as results based financing are introduced by funders which make use of the existing system and support it to ensure further improvement and development. If stakeholders acknowledge the legitimacy of the funders and trust the team implementing such interventions, they are more to adopt the intervention [Wilhelm *et al.*, 2016]. In Ghana donor funding is pooled into a fund which the MOH distributes, usually in the support of service delivery with the agreement of donors. Some donors ear-mark specific projects outside of this pooling arrangement, the level of involvement of donors therefore plays a big role in the resource allocations within the MOH, the ear-marking of funds is recognised as a constraint during times of emergency as these funds are not flexible to be re-allocated during crises [Asante and Zwi, 2009]. Donors and their funding are needed to help shape health care systems and improve governance [Zeng *et al.*, 2012].

#### 4.4.4 Risk Protection/Environmental Factors: External environment

The setting in which HCOs are assessed is of utmost importance, as this influences the health care system and the population at large which must interact in order to realise improved outcomes. The external environment provides the climate in which the population and system are found in.

##### *Social and Sociocultural Factors*

65 papers listed social or cultural factors as barriers to health care in some way or form, interestingly it was found by and large that these factors were listed but were often not further discussed. Social factors are broad reaching and may be touched on in other sections of the review such as: social networks; stigma; gender norms; beliefs, religion, traditions, and related practices. The link between HIV testing, adherence to antiretrovirals and status disclosure; as well as maternal care, and social support is repeatedly emphasized [Makin *et al.*, 2008][Sofolahan and Airhihenbuwa, 2013][Bhat *et al.*, 2010][Gross *et al.*, 2012][Rutherford *et al.*, 2010]

A study carried out by Rutherford *et al.* [2010] highlighted the need for cultural specific indicators, recognising the importance of cultural differences. When looking at maternal health social and cultural factors play a large role, acknowledging the importance of health roles and decision making within the household, cultural norms affecting exposures to places of delivery [Mrisho *et al.*, 2007][Kok *et al.*, 2015] and decision making which is influenced by social and cultural structural norms as well as income earned. The primary decision maker in the majority of cases is male, thus putting maternal and child health at their mercy, resulting in male decision makers being frequently listed as a barrier to health care [Mrisho *et al.*, 2007][Sejfeskog *et al.*, 2006], or the general lack of decision making autonomy [Sialubanje *et al.*, 2015][Berhane *et al.*, 2001][Kazembe *et al.*, 2007][Katz *et al.*, 2013]. The responsibility of household chores are cited for not seeking maternal care, women have been known to work up until the point of delivery either due to no alternative, or not wanting to be judged by co-wives, for those in polygamous relationships [Lowe *et al.*, 2016].

Women associate childbirth with fulfilling cultural norms, which can be an issue for women living with HIV/AIDS. However if women are tested and know their status this can be better managed, whilst some women avoid testing altogether [Sofolahan and Airhihenbuwa, 2013]. Knowing their status has been found to have positive and negative effects on women planning on having children, which is highly dependant on the support of a partner [Makin *et al.*, 2008]. Pregnancies out of wedlock, whilst schooling or without a socially recognised partner leads to shying away from seeking antenatal care due to the shame of admitting the pregnancy [Mubyazi *et al.*, 2011].

The cultural desire for a large family and lack of understanding of con-

contraceptives as well as the belief that pregnancy is a natural condition, makes the seeking maternal care seen as a sign of weakness [Chi *et al.*, 2015][Mairiga *et al.*, 2010]. In Malawi, Sejfeskog *et al.* [2006] discusses the lack of maternal health seeking attributing it to poor perceptions of danger signs and the traditional views on delivery- seeing caesarian as "lazy" as pregnancy is a natural phenomenon and should not need intervention. [Caulfield *et al.*, 2016] reiterates how tradition plays a role in home births, and specifically within the setting of pastoralist women on Kenya, who believe in unassisted births due to spiritual reasons as well as proving bravery.

HIV/AIDS is affected in a similar way to maternal health in that men are often the primary decision makers, this affects getting tested and using protection. When addressing mother to child transmission of HIV [Nyondo *et al.*, 2014] attributes the lack of male support herein to the services being targeted at women, thus it is thought to undermine his masculinity by being involved. With the idea of men not being involved in women's business found to be a common cultural belief. Buseh *et al.* [2002] acknowledges the effect of polygamy in Swaziland and the way in which it influences the spread of HIV/AIDS.

Ngome and Odimegwu [2014] discusses community norms influencing the use of contraceptives, describing adolescents as being expected to perform reproductive duties once they are sexually active. Interestingly Ngome and Odimegwu [2014] state that variations found across provinces that were [still] not explained by the study were attributed to political and cultural factors that were not covered. This point is found throughout the literature discussing social and cultural barriers to health care, both in terms of geographical differences as well as health areas.

Misunderstanding diseases plays a big role in health seeking and treatment. Epilepsy for example is largely misunderstood in SSA countries causing those with such an ailment to face discrimination and to seek care from traditional or spiritual healers frequently [Mushi *et al.*, 2012]. Traditional and spiritual healing can be a great barrier to health care, as they are known to discourage the use of Western medicine, causing lack of adherence to antiretrovirals, and the seeking of treatment [Winkler *et al.*, 2010][Bezabhe *et al.*, 2014], especially with regards to misunderstood diseases such as epilepsy [Keikelame and Swartz, 2016] and mental health [Mayeya *et al.*, 2004][Abubakar *et al.*, 2013]. Other mental illness such as schizophrenia face discrimination and require social support for optimal stability, however the lack of understanding of these diseases makes this difficult for the HCWs, the patient and the patients' support system [Sariah *et al.*, 2014].

The belief in witchcraft to cause illness, causes patients to seek traditional care delaying appropriate health seeking [Nyasulu *et al.*, 2015]. Whilst the lack of health insurance further exacerbates this problem, but it is thought that putting money aside for health care can be seen as inviting disease in some cultures [Dror *et al.*, 2016].

Bingham *et al.* [2003] discusses prevention of cervical cancer and the sociocultural barriers it faces, as many women do not seek care when they are "feeling healthy" especially with regards to pap smears or sex organ related screening. This is due to the costs incurred, which are seen as unnecessary if nothing is wrong, as well as the stigma or "dirty" perceptions linked to sexual health screening. Women cited if they had more social support and more community members involved in such programs they would then utilise this care.

Certain cultural activities are recognised to expose populations to health risks. For example [Rutto *et al.*, 2013] recognises cleansing rituals, circumcision, marriage practices, appeasing spirits, baptism and traditional medicine as activities which expose the population to tsetse bites, which cause sleeping sickness.

Cultural beliefs pose a large barrier to health care as many cultures have differing ideologies and nuances to their beliefs. This is prevalent in mental illness as mentioned, but several other examples are explored in the literature—for example post mortem examinations on deceased neonates, as it is seen punishment by the gods [Ugiagbe and Osifo, 2012][Lishimpi *et al.*, 2001] or organ donation. Buthelezi and Ross [2011] explores the knowledge and attitudes of organ donation, finding it to have mixed reviews within religious and cultural beliefs, with the initial response to be against organ donation but after some educating for the most groups for this to change.

Fongwa [2002] addresses the health system in Cameroon and lists the extensive number of languages, tribes and dialects found to be a challenge for health care planners to organize and coordinate health care for these diverse groups. Differing geographical, socio-cultural and socio-economic climates are associated with differing opinions and utilisation of maternal health in Zambia [Sialubanje *et al.*, 2015].

In South Africa, the Apartheid era has several direct implications on health especially amongst populations of colour. Health staff and students interested in the black majority health issues were required to explore such matters outside of the formal curriculum. People of colour were also excluded from medical schools making a career in health care for this demographic very difficult [Noble, 2009]. Social factors have been further associated with influencing HCWs decision making and motivation [Agyepong *et al.*, 2004][Lori *et al.*, 2012].

#### *Economic Factors*

The economic climate found in a region often sets the tone for the availability of health care services, as economic downturn exacerbates the issue of inadequate resources [Zeng *et al.*, 2012]. The poorer the economic climate, the less infrastructure, drug supply, equipment and compensation for HCWs are available, creating a bigger reliance on foreign aid and improved efficiencies. The choice to address economic and socio-economic conditions in conjunction is made due to the close link found between the two in the literature reviewed,

it is noted poverty is frequently listed as a barrier and is grouped herein. Zeng *et al.* [2012] acknowledges the economic downturn of 2008, exacerbates the inadequacy of resources available to tackle the HIV/AIDS pandemic.

Of the 90 articles which discuss socio-economic conditions, 29 contain women as the subgroup, with children following by 13 articles, this is a significant portion of articles. The other articles either do not specify a sub-group or do not make a contribution worth discussing at this point. This illustrates on a large scale the lack of empowerment women have with regard to economic independence. Control over financial decision making is a barrier for women seeking care as they need to get permission and financial support from men in order to access care leading to men having ultimate authority over health seeking [Musheke *et al.*, 2013] [Naanyu *et al.*, 2016][Chuma *et al.*, 2010][Bronsard *et al.*, 2008]. Sialubanje *et al.* [2015] attribute women's dependence on their husband for final decisions to socio-cultural beliefs recognising the husband as the head of a household. Regardless of whether women are single or married, access to financial resources for preventative or care in general is cited as a barrier [Hill *et al.*, 2013][Maharaj and Rogan, 2011][Choonara *et al.*, 2015].

Izugbara and Covan [2014] states that the bulk of people who live below the poverty line are women. Women from poor socio-economic backgrounds are more likely to work during pregnancy to provide food and water for their families, these workloads place them at higher risk to adverse maternal HCOs [Caulfield *et al.*, 2016]. The empowerment of women is of importance to recognise, as women are not able to participate in and therefore benefit from a productive economy thus keeping them dependant on male partners [Buseh *et al.*, 2002], the empowerment of women and their economic independence is necessary for the improvement of women's health status [Berhane *et al.*, 2001][Buor, 2004][Blanco *et al.*, 2015][Needham *et al.*, 2001]. Mothers or women are often the first to take action regarding health care decisions but their level of influence over decision making is often low resulting in inaction [Bronsard *et al.*, 2008]. Interestingly Dong *et al.* [2009] found the probability of dropping out of CHI to be higher with female household heads however the greatest reason found in the study for dropping out was attributed to no longer being able to afford it.

In Swaziland, Ethiopia, Ghana, Nigeria and Malawi women in the lower wealth quintiles are less likely to utilise maternal health and childhood immunization services [Tsawe *et al.*, 2015][Gross *et al.*, 2012][Arba *et al.*, 2016][Enuameh *et al.*, 2016][Onah *et al.*, 2006][Tililayo *et al.*, 2015][Pell *et al.*, 2013]. The lower the wealth quintile, the lower the likelihood of delivering at a health facility [Tebekaw *et al.*, 2015][Mrisho *et al.*, 2007], or the likelihood of utilising contraceptives [Lakew *et al.*, 2013][Maticka-Tyndale, 2012]. Lowe *et al.* [2016] states gender inequality is a cause for high maternal and morbidity rates.

From this it is no surprise that maternal health is the highest listed health area, with 23 articles discussing economic factors as a hindrance to maternal health. Figure 4.7 illustrates the full list of health areas discussed in conjunc-

tion with economic barriers and the distribution thereof.

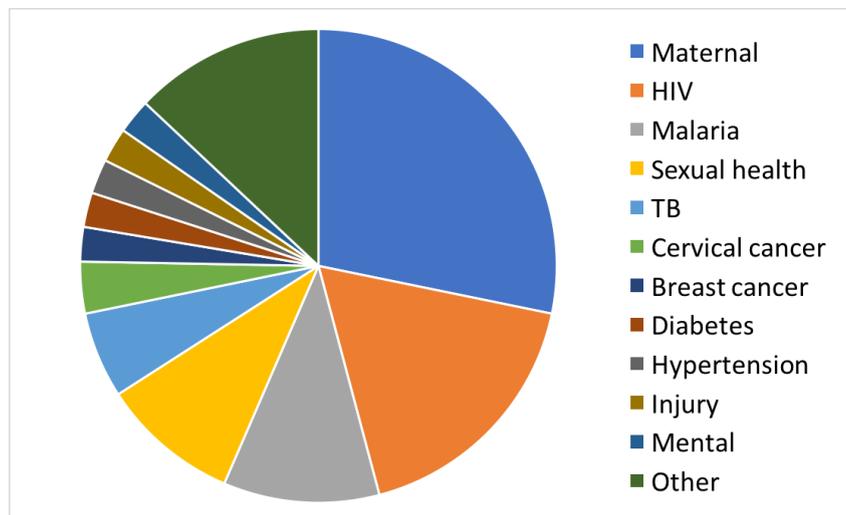


Figure 4.7: Distribution of health care areas which are referenced in articles in conjunction with socio-economic barriers.

The choice to get vasectomy in Tanzania was greatly influenced by the consideration of the affordability of educating ones children, interestingly this was acknowledged predominantly by men and not by women reinforcing the idea that men are economically responsible for families [Bunce *et al.*, 2007][Bagonza *et al.*, 2014]. The utilisation of HIV testing is influenced by economic status, as wealthier men are less likely to fear the financial barriers and implications that could accompany a positive HIV status [De Allegri *et al.*, 2015].

Poverty is repeatedly listed as preventing people from accessing and adhering to care [Chi *et al.*, 2015][Kok *et al.*, 2015][Kruger *et al.*, 2009][Bezabhe *et al.*, 2014][Gebremariam *et al.*, 2010][Layer *et al.*, 2014][Ajala and Adejumo, 2007] [Human *et al.*, 2010][Caulfield *et al.*, 2016] as well as lacking resources to buy or grow healthy or nutritional food [Taylor and Jinabhai, 2001][Ajala and Adejumo, 2007] which also affects medication adherence for example, if medicines increases appetites and food cannot be bought to meet these need, it will result in a discontinuation of the medication [Human *et al.*, 2010][Mabelane *et al.*, 2016]. Economic barriers prolong the delay in accessing care, not only due to the expenses incurred but the opportunity costs incurred from lost wages, trade or labor [Wall, 2012][Buckle *et al.*, 2013][Cambanis *et al.*, 2005][Needham *et al.*, 2001][Njuguna *et al.*, 2016]. Utilisation of more traditional informal care is attributed to the cost, Ariës *et al.* [2007] cite people going to bonesetters, instead of seeking formal care due to cost savings.

Olago *et al.* [2007] cites poverty as making populations more vulnerable to cholera endemics, due to several reasons- the lack of accessible water; sanita-

tion; inadequate or lack of early warning mechanisms and coping strategies for climate induced shocks such as disease or weather extremes; and malnutrition.

Diseases such as diabetes were found difficult to manage in poor economic settings, due to the costs associated with self care such as the specialised eating plans and cost of glucometers and the testing strips [Hapunda *et al.*, 2015][Adeniyi *et al.*, 2015]. Similar findings were made by Iwelunmor *et al.* [2015] with regards to hypertension, the cost of follow up care and regular access to medication to hamper efforts to control blood pressure. Economically deprived individuals are more likely to experience the worst HCOs, and is associated with increased likelihood of multimorbidity [Alaba and Chola, 2013].

Interestingly when looking at the geographical regions which were found to list socio-economic factors as a barrier to health, the result was generally evenly distributed over the regions, with the exception of articles recorded as rural, 19 of the 90 articles discussing socio economic factors were found in rural areas. This shows the strong association of economic factors influence on health in rural areas.

#### *Employment Status*

Cramm and Nieboer [2011] highlight the impacts of social capital, employment and education on health and suggest HCOs can be improved beyond the health system- creating job opportunities, strengthening social capital, bettering educational systems and access thereto. Health inequities are attributed to the circumstances in which people are born, live, work, gender and age including the inadequate health systems which Cramm and Nieboer [2011] are shaped by social and economic forces.

Economic struggles is a big constraint when catering for family members needs [Busza *et al.*, 2014]. When family members fall ill, especially to HIV, healthy family members must find time and energy to care for them, reducing the labour available for food or income production. These drops in income along with the general dependance of women on men's economic support has lead to an increase in women using their sexuality as an economic resource thus pushing them into commercial sex transactions [Singer, 2011]. The problem of poverty is seen to push men to seek employment where they can find it, resulting in labour migration which enhances the demand for commercial sex transactions [Singer, 2011]. The HIV/AIDS pandemic plays a major role on families as they lose loved ones and economically active members [Mayeya *et al.*, 2004].

Economic activities which take place in a region or the industries in which population seek employment play a role in health endemics found in an area, for example the mining industry in South Africa pushing men to work away from home increases the spread of HIV [Singer, 2011], or herding and fishing activities found in Kenya which facilitate the environment for the tsetse fly which transmits *Trypanosma brucei* protoza causing Sleeping sickness [Rutto *et al.*, 2013]. The relationship between economic activities and health endemics is an

area which should receive further research. [Hill *et al.*, 2013] listed employment as a barrier for women seeking maternal health care due to commitments to employers making women put off seeking care. The study by Hill further correlated the used of insecticide treated bed nets with employment within the household. A study by [Jombo *et al.*, 2010] found that health workers, civil servants and teachers/lecturers were more likely to utilise insecticide treated bed nets, showing that not only employment but also profession may influence health behaviours.

Employment has been shown to play a role in the recovery from and maintenance of mental health and substance abuse [Sariah *et al.*, 2014]. This can be attributed to the self esteem that accompanies earning an income and contributing to society and employment keeping people busy. Bhat *et al.* [2010] found employed men to comply more with antiretroviral treatment, speculating that employed men are more motivated with a greater sense of hope and a positive outlook on life.

#### *Physical components*

The environmental factors affecting HCOs in SSA, vary vastly according to the setting such as rural or urban; affluent or areas such as slums; the geographical location experiencing varying climates; or natural or man-made disasters. Unpredictable rain patterns, incur flood or droughts both with devastating effects which often result in displacement of populations. Occurrences such as El Nino and heavy rainfall are associated with cholera outbreaks [Olago *et al.*, 2007]. Flooding not only displaces populations and spreads infectious diseases but makes it difficult to access people [Kok *et al.*, 2015].

Izugbara and Covan [2014] acknowledges the way in which climate change and environmental depletion can cause food shortages and difficult conditions in rural areas, causing populations to move to urban areas such as urban slums which are home to unhealthy environments. Three articles acknowledge food security as an barrier to health. The responsibility of getting food referenced by both Buseh *et al.* [2002] and Blanco *et al.* [2015] belongs to the woman of the household. She is responsible for making trade-offs between food security several household and health seeking responsibilities, as food is not easily available or affordable.

Zaman develops an interesting model using the Solow augmented growth model which considers the effect on health of energy variables, use of land for cereal production and water sanitation.

Water and sanitation is a basic human need which has not yet been met across SSA, improving this supply has a negative and significant relationship with external health resources [Zaman *et al.*, 2015]. Three articles discussed the topic of water and sanitation which is found to be a surprisingly low number as it coincides with the MDGs. Anderson *et al.* [2002] and Buor [2004] recognise the impact water and sanitation has on mortality, predominantly of children, due to water borne diseases or 'dirty water' diseases of which, many

are diarrhoea-associated. Inadequate water supplies have found to directly link with increased health expenditure and decrease life expectancy [Zaman *et al.*, 2015].

Buor [2004] discusses water needs and the affect on women's health bringing to light several interesting relationships between gender roles, family size, population growth, seasons, education, distance and poverty on water supply specifically in Ghana. It is found women's health is severely affected by water supply, especially during dry seasons, which bring water scarcities. The women's role in the home is to retrieve and supply water, travelling far distances to collect this water has found to negatively affect the health of women, especially those who are pregnant. Uneducated women are found less likely to boil or make financial sacrifices in order to purchase sanitary water. The benefits of improving water and sanitation include improved health care, reduced cost of treating diseases, saving water collection time and thereby increasing productivity of work [O'Hare *et al.*, 2004].

Topographical challenges must be overcome by both HCWs and those seeking health care, the further the distance travelled by either party affects both the likelihood of seeking care as well as the performance of care providers [Kok *et al.*, 2015]. It is of interest to note two articles found the population perceived patient satisfaction and quality of care to improve with distance ([Atinga and Baku, 2013], [Kabatooro *et al.*, 2016]).

Distance was referenced by 40 articles as a barrier to seeking or utilizing health care. The problem of distance is difficult to overcome due to the following reasons, made reference to by the respective percentage of articles:

- Distance is too far(75%);
- Cost of transport(68%);
- Availability of transport(40%);
- Time taken to travel(18%);
- Poor roads or difficult terrains(18%);
- Mode of transport(10%); and
- Unsafe routes(3%).

The health care areas affected by distance and the type of care which is being affected is of interest as it gives insight into when distance is significant barrier to specific diseases and outcomes, as illustrated in Figure 4.8. When discussing the barrier distance from health care presents, maternal health is the greatest affected as often time is of the essence and pregnant women do not have the time to travel and find transport too uncomfortable, especially travelling on bad roads, to reach care. The issue of retention and adherence is found to be an issue as it is the travel time and cost is ongoing and can become an unaffordable sacrifice. The difficulty children face is that they

cannot travel the distances alone and must be accompanied, which becomes a problem if there are other family members which also need supervision in households.

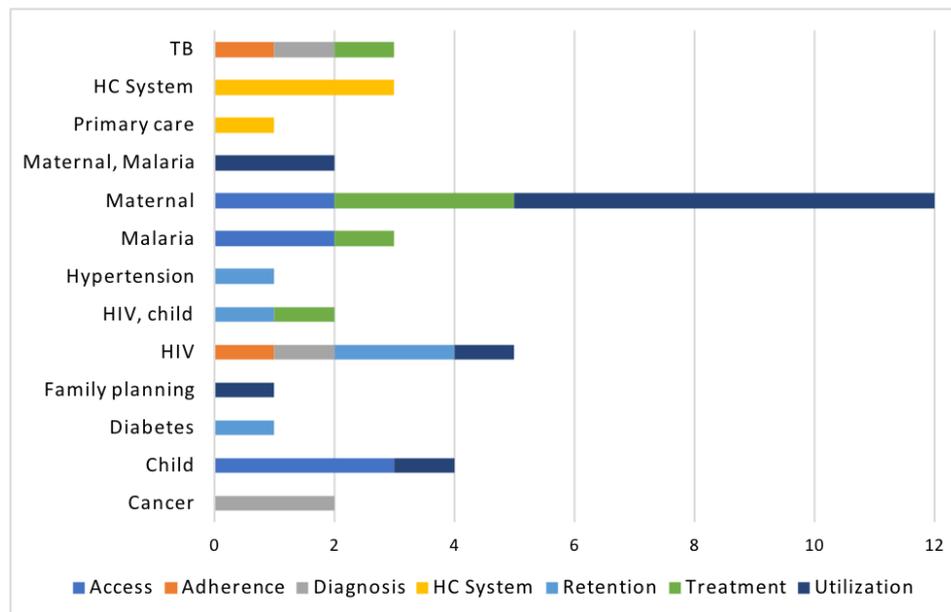


Figure 4.8: Number of articles citing distance as a barrier to health care areas and the use thereof.

### *Political*

The World Bank ranks governments according to certain indicators such as accountability, stability, absence of violence, effectiveness, and control of corruption [Singer, 2011]. The presence of war, terrorism or conflict have devastating effects on HCOs, especially those of women and children [Singer, 2011][Izugbara and Covan, 2014]. Political instability and a long history of military dictatorship is cited by Echebiri [2015] has led to deep rooted political corruption. The presence of corruption amongst African leaders are responsible for health system inefficiencies and the diversion of scarce resources [Izugbara and Covan, 2014][Bagonza *et al.*, 2014].

Politics plays a big role in the investment of resources as politicians dictate where money is spent and will gear this spending in a direction which supports their political ambitions and secures their political agendas, the political environment for health is also heavily influenced by the agendas of international donor organizations [Dare *et al.*, 2016]. The importance of politics is addressed by six articles listing lack of political will as a barrier to achieving health goals [Bagonza *et al.*, 2014][Izugbara and Covan, 2014][Echebiri, 2015][Jordan *et al.*, 2016][Ledikwe *et al.*, 2014][Wall, 2012]. Factors such as power and political decision making can make or break a programme [Simmonds, 2008]. Governments choose what proportion of their funds are spent on health, [O'Hare *et al.*,

2004] gives examples from Benin and Angola, where the percentage spent on health is significantly lower than that of defence.

Dare *et al.* [2016] make use of a conceptual framework for understanding factors shaping political priority for a health issue, which consists of components, descriptions thereof and respective factors shaping national political priority. The components are namely: Actor power, Ideas, Political contexts, and Issue characteristics.

#### 4.4.5 Population

##### *Demographics*

When looking at the population and understanding the demographics thereof the areas of interest to be discussed are age, gender, marital status or family size. The topics of employment, education and religion which align herein are discussed in Section 4.4.4, Section 4.4.8 and Section 4.4.4 respectively. Ethnicity is not discussed as the specificity thereof would not make a meaningful contribution to the findings discussed herein. It must be noted due to the vastness of the area making up SSA many different ethnicities make up the population of this study and although not discussed, should be considered when looking at socio-demographic factors especially in specific locations.

Age is listed as a factor in 35 articles, in association with experience, generally when referring to the household head or primary decision maker. The utilization and access of health care is aligned with that of age as it is found younger populations are less like to utilize health care [Owusu-Ansah *et al.*, 2016][Kisoka *et al.*, 2014]. This is attributed to many different reasons such as less access to financial resources, less authority in decision making, less knowledge or experience of severity of illnesses. [Owusu-Ansah *et al.*, 2016] states those that are youthful, unskilled and jobless pay less attention to their wellbeing.

Both Adebayo *et al.* [2015] and Dror *et al.* [2016] conducted systematic literature reviews analysing CBHI enrolment in low- and middle-income countries and found educated, mature, female headed households to be more likely to enrol in such schemes, stating that gender influences enrolment most, followed by education and age. Findings by Adebayo *et al.* [2015] are more split saying half of the research found men to be more likely to enrol, thus it can be said genders role on CBHI is inconclusive. Dong *et al.* [2009] supported this by listing female household head, household heads age, household heads education, size of household, living in a rural area, lower number of illnesses in the past three months and lower number of children or elderly in the household to have significant influences on the uptake of CBHI. Boateng and Awunyor-Vitor [2013] attributes uptake to gender, marital status, religion and perceived health status. This highlights the influence demographic factors have on health care decision making.

Interestingly it was found that the influence of family size and marital status on enrolment was different in Asia and SSA, with bigger families in SSA more likely to enrol and smaller families more likely to enrol in Asia. Marital status played no role in Africa but had a positive correlation with enrolment in Asia. [Adebayo *et al.*, 2015] found that young individuals were more willing to pay than older individuals, whereas at a household level older ages of household heads were positively associated with enrolment. These variations show it is difficult to pinpoint the influences of demographics as various factors contribute to a demographic and so similar demographics could have different outcomes due to the influence of the other dissimilar factors.

When looking at hypertension, age was the only socio-demographic factor cited to play a significant role, with the risk of hypertension increasing with age according to Mungati *et al.* [2014], however [Taylor and Jinabhai, 2001] noted the average age to be lower in males than females. The study on hypertension carried out by Mungati *et al.* [2014] acknowledges the way in which elderly face increased difficulties accessing health care due to the distances and frequency with which they need to visit facilities.

Age was referenced in nine articles discussing maternal health, finding younger women or women over 40 years to be less likely to access or utilize health care [Okwaraji *et al.*, 2015][Aseweh Abor *et al.*, 2011][Tsawe *et al.*, 2015] [Tebekaw *et al.*, 2015][Pell *et al.*, 2013][Arba *et al.*, 2016][Abeje *et al.*, 2014]. Mrisho *et al.* [2007] states that younger women are more likely to deliver in a health care facility, contradicting previous statement, this reinforces the importance of acknowledging the demographic factors in conjunction with their setting and other influencing factors. Older age was also associated with better awareness of warning signs both with regards to maternal and child health [Duysburgh *et al.*, 2013][Bronsard *et al.*, 2008] which links with the fact that young women are known to have higher pregnancy related mortality and morbidity rates. Aseweh Abor *et al.* [2011] discusses how mothers age could be used as proxy for accumulated knowledge of health care services which may have a positive influence over the use thereof, whilst Okwaraji *et al.* [2015] discusses the way in which younger women may lack the support of a partner which will negatively influence the use thereof. The presence of spousal support at the hospital has found to positively influence the perception of service quality delivered at hospitals during antenatal care, whilst age was found to play an inconclusive role [Atinga and Baku, 2013]. Family size was seen to have a negative affect on the utilization of health care for maternal health attributed to the demands placed on women's time with increased family sizes [Aseweh Abor *et al.*, 2011][Pell *et al.*, 2013], as well as treatment seeking for children who need accompaniment to health facilities [Buckle *et al.*, 2013]. Women with six or more children are less likely to seek either antenatal or postnatal care Tsawe *et al.* [2015]. The fact that older women and women with larger families are less likely to seek care are attributable to the fact that these women have experience and believe they are better equipped to handle

pregnancy Tsawe *et al.* [2015][Tebekaw *et al.*, 2015]. Choonara *et al.* [2015] found older age and marital status to influence uptake of malaria prevention methods during pregnancy.

Tsawe *et al.* [2015] found there to be more women of reproductive age in rural areas than in urban areas in Swaziland, this is an important finding which should be used to help cater for the need of maternal health. It was found in Ethiopia that living in a rural area, being in a polygamous relationship and older age all negatively influenced the use of modern contraceptives [Lakew *et al.*, 2013]. Another study carried out in Ethiopia by Mohammed and Assefa [2016] looked at HIV-positive women and their desire for children and found socio demographic factors namely, age, ethnicity and marital status to have the greatest influence on desire for another child.

When looking at immunization it is found older women (35-49 years) and women with less than six children are less likely to have their children immunized [Tsawe *et al.*, 2015]. When looking at who purchases multi-nutrient feeding supplements it is of interest to note the demographic profile found, taking into consideration the study is set in South Africa, as mostly working, white women, between the ages of 34 and 49 years, and were mostly educated and affluent [Merlin *et al.*, 2008][Sowden *et al.*, 2009]. This is of interest as it describes the nutrition being delivered to the children falling under the demographic. Breastfeeding was found to be associated with older women and women with more children which aligns with the experience that comes with age and family size [Ukegbu *et al.*, 2011].

Two articles interestingly looked at the correlation of age and likelihood of having a cellphone, and the affect cellphones have on health care or adherence, Maqutu *et al.* [2010] also looked at the role of gender on likelihood of being tested for HIV, listing men as less likely to be tested. Zurovac *et al.* [2013] found men as more likely to own cellphones, and 15-19 years adults less likely to have phones than others whilst Maqutu *et al.* [2010] found older people less likely to use cellphones. The use of voluntary counselling and testing for HIV in Zambia was found to not be affected by gender contrary to Maqutu *et al.* [2010], however the younger population were found to be more likely to utilise these services [Fylkesnes and Siziya, 2004], De Allegri *et al.* [2015] supported the influence of younger age on testing from a study carried out looking at males in Burkino Faso.

Gender is referenced by 25 articles as a factor influencing health care. It was found across the studies that the population analysed or discussed was skewed toward women, or had more female responses than males [Kabatooro *et al.*, 2016][Cramm and Nieboer, 2011][Nyondo *et al.*, 2014][Bhat *et al.*, 2010][Taylor and Jinabhai, 2001]. Showing the point of view being put across is somewhat skewed. Masculinity plays a role in health seeking or testing for HIV as men are ought to be more resilient and only seek health care when their bodies can no longer hold out [Mavhu *et al.*, 2010][Musheke *et al.*, 2013]. Nyondo *et al.* [2014] discusses male involvement in prevention of mother to child transmission

of HIV and how a male head of the house may know his wife's suggestion to be involved is right, but does not want to lose his authority and see his wife as controlling thus may not get involved. Colombini *et al.* [2014] found woman of younger age and those without partner support to be less likely to adhere to ARV treatment. Adherence was found to be lower for both men and women who were single or consumed alcohol [Bhat *et al.*, 2010]. Hudelson and Cluver [2015] found the effect of gender on adherence to ARV treatment to be inconclusive as depending on the area it would vary.

Mensah and Kumaranayake [2004] identifies age of household head (being younger) and size of household to positively increase the likelihood of having a malaria patient living in the household. The demographic of the household head plays a role in the health seeking behaviour of the entire family as their knowledge, experiences and access to resources will dictate the health seeking decisions made for the entire family. This is a point which largely affects the health of women and children. Gender inequalities and lack of women empowerment is further discussed in Section 4.4.4. The importance of understanding the demographic of the population of the HCO being addressed is of importance to understand the roles and influences the context of the population plays.

Figure 4.9 illustrates the demographics flagged as factors and the number of articles which they are referenced by respectively. This gives an idea of the more pivotal demographic factors addressed by literature.

#### 4.4.6 Resources

##### *Healthcare Workers*

One of the greatest issues faced in Africa is that of resource shortages, particularly human resources; however drug supply, infrastructure, equipment and financial resources also play a large role. The shortage of skilled professionals or HCW in SSA can be accounted for by the lack of those entering the system year on year as well as those leaving the system.

The shortage of HCWs is a global problem, however most acutely felt in countries which need them the most. In SSA the burden of disease is found to be the highest and the workforce to address this the lowest. 53 (14%) of the review articles acknowledge or address the issue of HCW shortages. Majority of the articles described the shortage under the umbrella term of health staff or health care workers; several articles specified the roles of the human resource shortages, this however was erratic across the literature. It is of interest to note the HCW shortages which are specified, namely:

- Physicians;
- Nurses;
- Midwives;

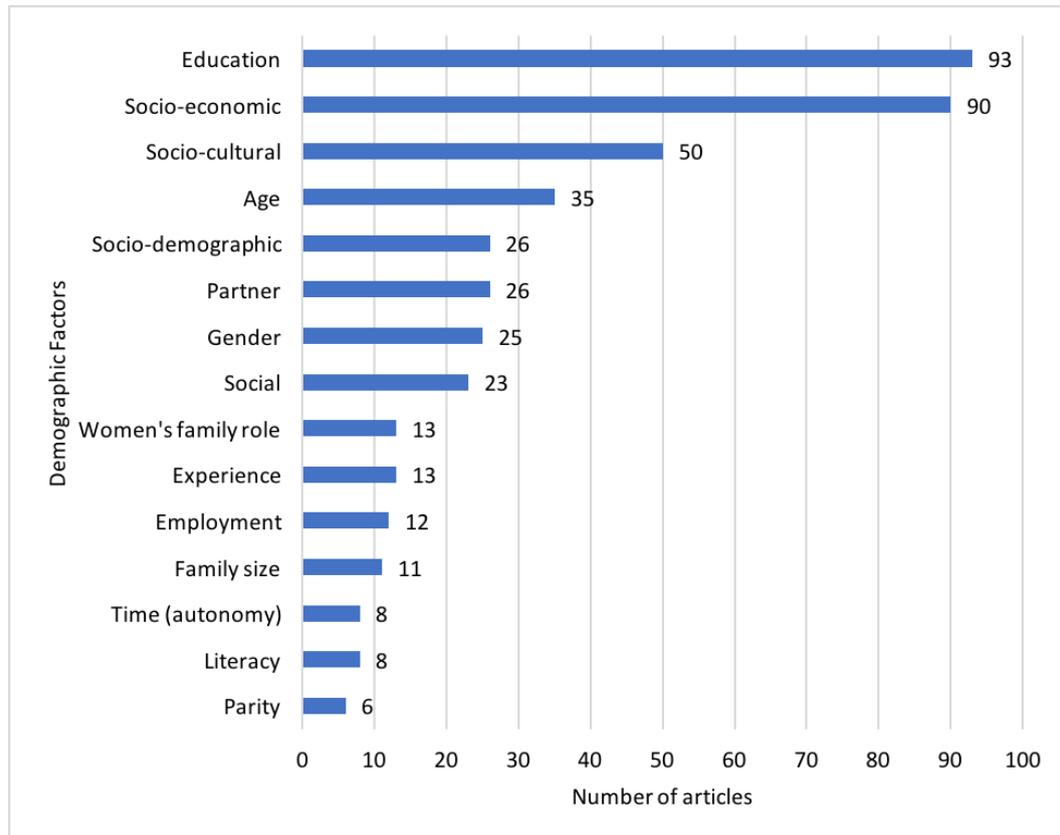


Figure 4.9: Number of times socio-demographic factors are listed as factors in articles.

- Specialists;
- Skilled staff;
- Counsellors;
- Obstetricians;
- Psychiatric staff;
- Pharmaceutical staff;
- Supervisors;
- Administrative and technical managers; and
- Health and Human resource officers.

The largest deficit of staff is found in public sectors or rural areas, as these areas are often found to be less appealing than their private or urban counterparts. In order to better understand this inequity HCW motivation is discussed at a later stage substantiating the employment decisions of HCWs. The issue of limited human resources may be global, however the 53 articles found dis-

cussing human resource constraints covered specific regions. Figure 4.10 shows the number of articles addressing HCW shortages per region.

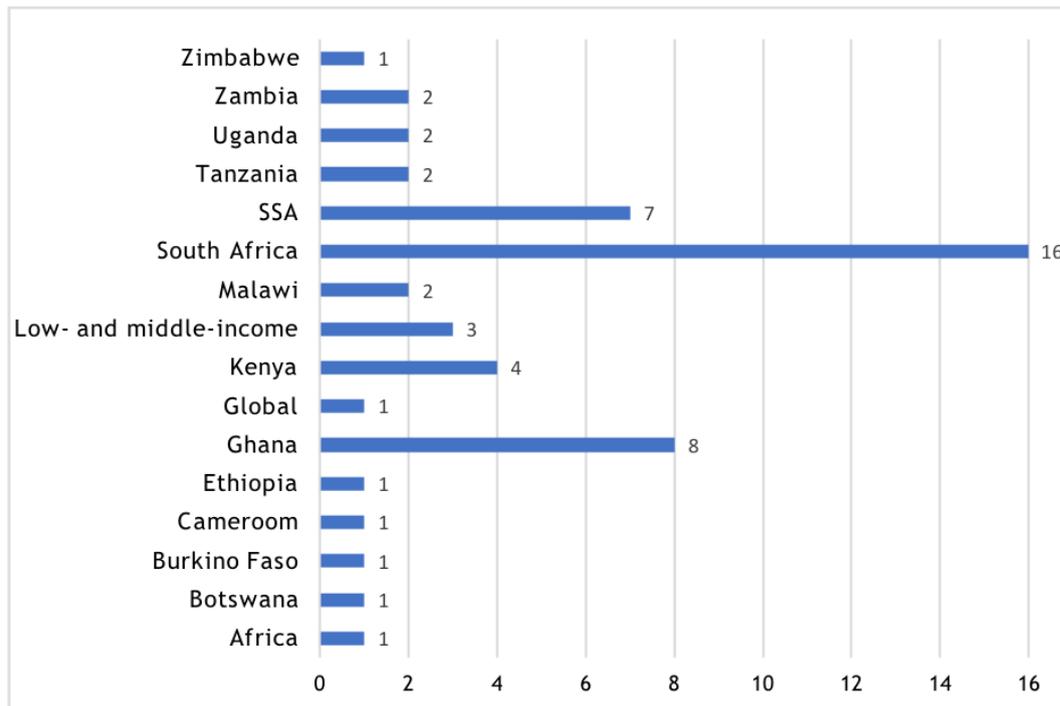


Figure 4.10: Regions of articles discussing human resource constraints.

The areas of health care which are affected by the shortage of HCWs is of interest, to understand the fields of health care which may need further attention when it comes to staffing. Figure 4.11 illustrates the distribution of health care areas discussed in conjunction with HCW shortages from the articles. The high burden of disease in SSA will also play a role in the HCW shortages as illustrated by the high relation between HIV and Malaria to HCW shortages. The category described as 'Health care system' refers to articles which did not explicitly link to a specific area of health care but to the health system as a whole or areas within the health system such as pharmacies or information technology management.

#### *Community health workers*

Literature revealed HCWs do not receive the compensation or as many opportunities for skill development and training in SSA, their work conditions are often stressful and the under staffing and lack of resources create a difficult working environment. As a result community, or informal HCWs are being utilized to fulfil needs especially in rural environments.

Community health workers (CHWs) or community home-based programs making use of volunteers or care facilitators are key interventions for combating

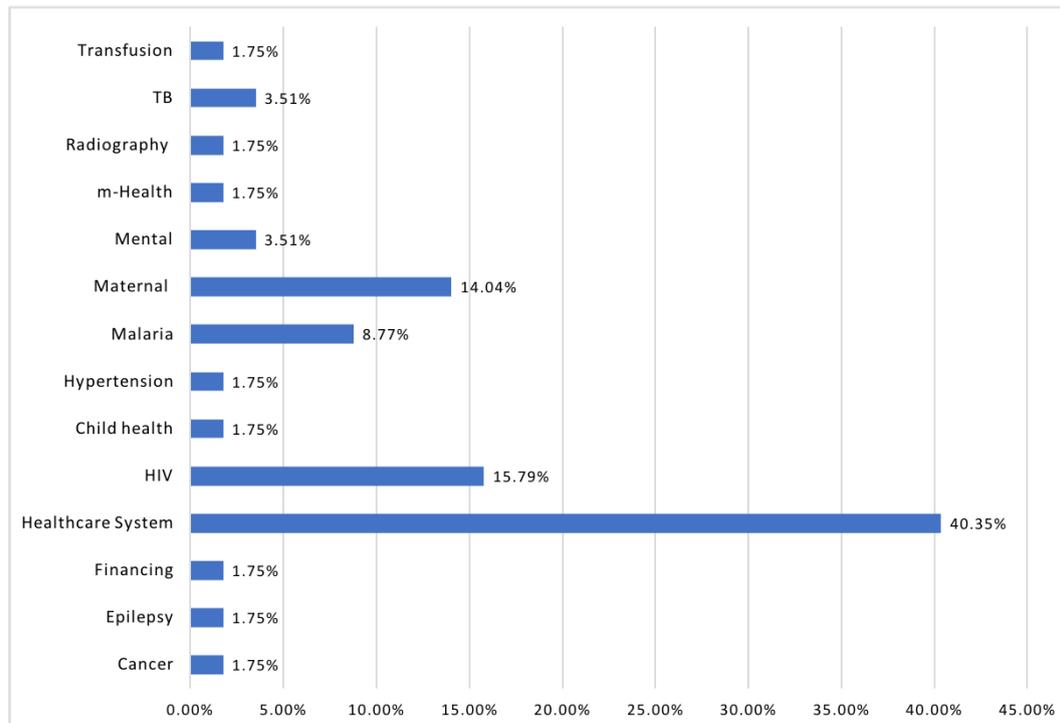


Figure 4.11: Distribution of health care areas of articles discussing human resource constraints.

both the shortage of health professionals and the HIV/AIDS epidemic in many parts of SSA [Osawa *et al.*, 2010]. 15 articles focus on CHWs and the role which they play in health care delivery in SSA. CHWs are members of the community which volunteer to assist in health care management in an area, they do not have medical certification but are trained in some way in the context of the intervention [Kok *et al.*, 2015]. CHWs work in community settings and serve as connectors between health care consumers and providers, promoting health among groups that may have traditionally lacked access to care. CHWs are generally found to be women who lived in the area and are able to understand local concerns and constraints [Taylor and Jinabhai, 2001] and are able to develop innovative solutions and respond to local needs [Haile *et al.*, 2014].

CHWs array of tasks are primarily promotional, but include preventative and curative health care interventions. They are generally equipped with basic drug kits stocked with over the counter pharmaceuticals such as anti-malarial's, oral rehydration salts, paracetamol, zinc, contraceptives, iron supplements, vitamin A supplements, de-worming tablets, polio and tetanus vaccines and first aid kits for wounds or injuries ([Glenton *et al.*, 2013], [Winch *et al.*, 2008]). CHWs primarily make home visits and due to their limited range of supplies, which often run out, must refer sick patients to health professionals. These visits are recognised to strengthen the linkage between communities and health facilities, by communities realising their rights to access of health care [Nzioki

*et al.*, 2015].

The general profile of CHWs is found to be female with the age, marital status and education level thereof found to vary across articles. Remuneration is also found to be inconsistent across articles, but this inconsistency is minor, CHWs are predominantly volunteers or receive very small payments, in some cases CHWs receive an allowance to travel to homes and restock supplies. The predominant motivators highlighted for CHWs is that of religious or moral obligations, prospects of employment and training, previous experience of illness, wishing to avoid idleness and community esteem and support. Performance of CHWs is found to strongly align with that of community support, feedback from health facilities, supervision and a consistent drug supply.

The responsibilities of CHWs is a topic which needs further research, CHWs are not able to distribute antibiotics due to the concern of health professionals. This opinion is changing as health professionals realise the magnitude of child health issues needing to be addressed at community levels, however policy makers are still concerned about the misuse of antibiotic distributions, leading to antibiotic resistance [Juma *et al.*, 2015].

#### *HCW migration*

The migration of health care workers from SSA to developed countries, is a serious issue which needs to be addressed. HCW motivation plays a large role on HCW migration, as when HCW are not satisfied in the workplace, they may look to migrate. 25 articles address the topics of migration(9 articles) and motivation(12 articles) or both(4 articles).

The most prominent factors aligning with both motivation and migration is that of compensation and training which is referred to by 14(56%) and 17(68%) of the articles respectively. In order to retain the current body of HCWs it is imperative to understand their retention and motivating factors. A strong relationship exists between migration and motivation factors as demotivators and motivators in the health system are push and pull factors of HCW migration.

Several estimates have been made as to the number of HCWs have migrated in the last decade, however these figures are found to be inconsistent across articles but can be assumed a significant portion. This is a serious concern as there are already a shortage of HCWs as previously discussed as well as the education capacity of these developing countries not being able to support both out-migration and local supply. For example a case study in Zimbabwe illustrates this, in 2001 there is record of 737 nurses graduating and 473 nurses migrating to the United Kingdom alone according to Vujicic *et al.* [2004]. The shortage of nurses is estimated to be exacerbated by the retirement of baby boomers, whom if retiring at 65, will all have retired by 2029 [Mokoka *et al.*, 2011]. The profile of emigrants are found to be younger than 35 on average [Grant, 2006], this poses a problem for the future of health care especially when looking at nursing where there is decline in the enrolment thereof. The

decline in HCWs is attributed to 'brain drain', retirement, death, change of profession and low outputs from training institutions [Mayeya *et al.*, 2004]. All 12 articles discussing migration acknowledged the dire consequences of 'brain drain' in SSA.

In an attempt to combat 'brain drain' in 2010 WHO published a Code of practice for the International Recruitment of Health Personnel in order to manage recruitment of international HCW to strengthen health systems in developing countries [Blacklock *et al.*, 2014]. In order to better understand the factors for migration literature lists drivers categorised in terms of push and pull as well as barriers hindering migration as depicted in Table 4.1.

Table 4.1: Drivers and barriers of HCW migration

Drivers	Migration Factors	References
Pull Factors	Higher remuneration	[Adzei and Sakyi, 2014] [Blacklock <i>et al.</i> , 2014] [George and Reardon, 2013] [Gray and Johnson, 2009] [Mokoka <i>et al.</i> , 2011] [Poppe <i>et al.</i> , 2016] [Vujicic <i>et al.</i> , 2004]
	Educational and training purposes	[Adzei and Sakyi, 2014] [Blacklock <i>et al.</i> , 2014] [George and Reardon, 2013] [Gray and Johnson, 2009] [Mokoka <i>et al.</i> , 2011] [Poppe <i>et al.</i> , 2016] [Vujicic <i>et al.</i> , 2004]
	Living conditions	[Adzei and Sakyi, 2014] [Bidwell <i>et al.</i> , 2014] [Blacklock <i>et al.</i> , 2014] [George and Reardon, 2013] [Poppe <i>et al.</i> , 2016] [Vujicic <i>et al.</i> , 2004]
	Specialization or to gain experience	[Adzei and Sakyi, 2014] [Bidwell <i>et al.</i> , 2014] [George and Reardon, 2013] [Gray and Johnson, 2009] [Vujicic <i>et al.</i> , 2004]

Table 4.1: Drivers and barriers of HCW migration

Drivers	Migration Factors	References
	Safer living conditions	[Bidwell <i>et al.</i> , 2014] [Blacklock <i>et al.</i> , 2014] [George and Reardon, 2013]
	Better working conditions	[Adzei and Sakyi, 2014] [George and Reardon, 2013] [Vujicic <i>et al.</i> , 2004]
	Family reunification or presence	[Bidwell <i>et al.</i> , 2014] [Poppe <i>et al.</i> , 2016] [Vujicic <i>et al.</i> , 2004]
	Desire for prestige or respect	[Blacklock <i>et al.</i> , 2014] [Gray and Johnson, 2009] [Vujicic <i>et al.</i> , 2004]
	Personal development	[Adzei and Sakyi, 2014] [Bidwell <i>et al.</i> , 2014]
	Higher quality of life	[Blacklock <i>et al.</i> , 2014] [George and Reardon, 2013]
	Stable economy	[George and Reardon, 2013]
	Availability of jobs	[George and Reardon, 2013]
	Manageable workloads	[George and Reardon, 2013]
	Push Factors	Political instability or insecurity
Human resource shortages: High workloads		[Bidwell <i>et al.</i> , 2014] [George and Reardon, 2013] [George <i>et al.</i> , 2013] [Gray and Johnson, 2009] [Mokoka <i>et al.</i> , 2011] [Vujicic <i>et al.</i> , 2004]

Table 4.1: Drivers and barriers of HCW migration

Drivers	Migration Factors	References
	Lack of personal security	[Bidwell <i>et al.</i> , 2014] [Blacklock <i>et al.</i> , 2014] [George and Reardon, 2013] [Mokoka <i>et al.</i> , 2011] [Vujicic <i>et al.</i> , 2004]
	Resource limited health care systems	[Bidwell <i>et al.</i> , 2014] [George and Reardon, 2013] [Gray and Johnson, 2009] [Mokoka <i>et al.</i> , 2011]
	Deteriorating working environments	[George and Reardon, 2013] [George <i>et al.</i> , 2013] [Gray and Johnson, 2009] [Vujicic <i>et al.</i> , 2004]
	Poor working conditions	[Adzei and Sakyi, 2014] [George and Reardon, 2013] [Mokoka <i>et al.</i> , 2011]
	Low salaries	[Adzei and Sakyi, 2014] [George and Reardon, 2013] [Mokoka <i>et al.</i> , 2011]
	Racial or Gender discrimination	[Bidwell <i>et al.</i> , 2014] [George and Reardon, 2013] [Mokoka <i>et al.</i> , 2011]
	HIV/AIDS	[Bidwell <i>et al.</i> , 2014] [Blacklock <i>et al.</i> , 2014] [Gray and Johnson, 2009]
	Occupational hazards	[Blacklock <i>et al.</i> , 2014] [George and Reardon, 2013]
	Poor Management	[Gray and Johnson, 2009] [Mokoka <i>et al.</i> , 2011]
	Deteriorating quality of life and social systems	[George and Reardon, 2013] [Vujicic <i>et al.</i> , 2004]
	Stress	[George and Reardon, 2013] [Vujicic <i>et al.</i> , 2004]

Table 4.1: Drivers and barriers of HCW migration

Drivers	Migration Factors	References
	Absence of professional support and development	[Blacklock <i>et al.</i> , 2014]
	War and internal conflicts	[Poppe <i>et al.</i> , 2016]
Barriers	Cost associated	[George and Reardon, 2013] [Vujicic <i>et al.</i> , 2004]
	Dependents	[George and Reardon, 2013]
	Obligatory work commitments after community service	[George and Reardon, 2013]
	Adjusting to a foreign HC system	[George and Reardon, 2013]
	Certification	[George and Reardon, 2013]
	Foreign government policies	[George and Reardon, 2013]
	Local government policies	[George and Reardon, 2013]
	Acquiring visa's	[George and Reardon, 2013]

There has been a trend emerging of return migration, particularly in Ghana. HCWs have been returning once having saved in order to set up a business or practice back in Ghana, or have acquired more skills which they wish to bring back to share. Table 4.2 summarises the drivers and barriers of return migration found in the literature. Regulated circular migration based on agreements between countries has the potential to contribute to 'brain gain' and the distribution of skill and resources.

Poppe *et al.* [2016] discuss this circular migration and highlights the role national governments and regional institutions and organisations should have in facilitating the effective involvement of migrant HCWs, as well as embassy roles working with diaspora associations to facilitate joint ventures between countries.

#### *HCW Motivation*

In order to motivate and retain doctors 16 studies investigated factors which motivate HCWs. The importance of motivation is not only recognised to retain staff, but to ensure quality of technical care and service to patients is well delivered [Chandler *et al.*, 2009]. The demographic of the HCW can affect their motivation, without the factors being either directly satisfiers or dissatisfiers, such as age, marital status or having young children according to Haile *et al.* [2014]. Franco *et al.* (2002) developed a conceptual model of HCW motivation in low-income and transition country settings as seen in Figure 4.12. The interactions illustrated in the model are of interest when looking at the way in which personal, organisational and external factors influence one another.

Table 4.2: Return migration drivers and barriers according to [Adzei and Sakyi, 2014] and [Poppe *et al.*, 2016]

Drivers	Barriers
Family ties	Family ties
Desire to return to home country	Institutional crises in source country
Emotion driven factors	War or internal conflict in source country
Feeling of responsibility toward home country	Comfort and social ties
More satisfactory working in home country	Re-engagement
Sharing knowledge	Employment
Improved living conditions	Existence of expertise field
Higher remuneration	Quality of life
Financial goal achieved	
Retirement	

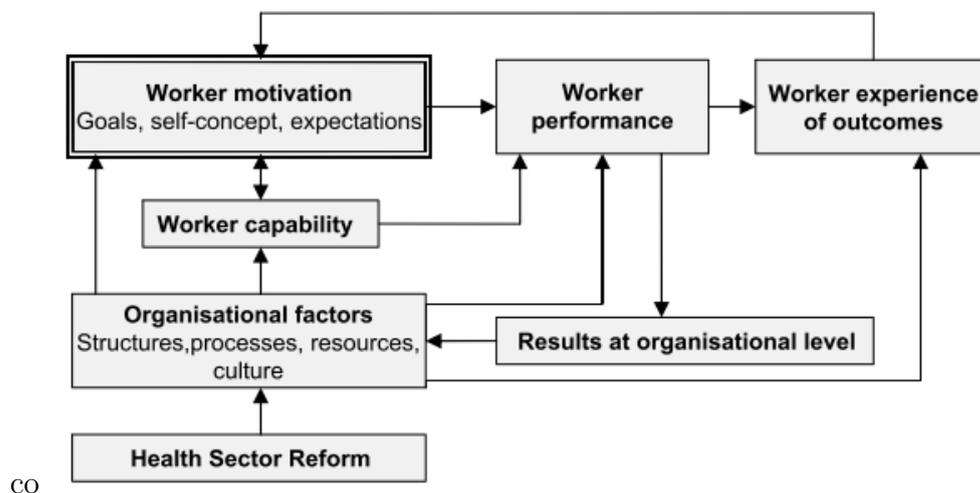


Figure 4.12: A conceptual framework of influences on health care motivation after Franco (2002)

In order to synthesize the findings of motivational factors from the 16 articles, Table 4.3 lists the satisfiers and dissatisfiers which affect motivation and retention of staff, according to organisational, community and personal levels. The most notable findings relating to motivation are remuneration, training and resource availability.

Table 4.3: HCW motivation satisfiers and dissatisfiers at organisational, community and personal levels.

Satisfiers	Disatisfiers
Organisational:	
Salary, Financial incentives, remuneration [Adzei and Sakyi, 2014] [Agyepong <i>et al.</i> , 2004] [Akintola and Chikoko, 2016] [Bradley and McAuliffe, 2009] [Chandler <i>et al.</i> , 2009] [Gonzaga <i>et al.</i> , 2010] [Mokoka <i>et al.</i> , 2011]	Problems with resources [Agyepong <i>et al.</i> , 2004] [Akintola and Chikoko, 2016] [Bradley and McAuliffe, 2009] [George and Reardon, 2013] [Gonzaga <i>et al.</i> , 2010] [Mokoka <i>et al.</i> , 2011] [Osawa <i>et al.</i> , 2010] [Paterson <i>et al.</i> , 2007]
Leadership skill and supervision [Adzei and Sakyi, 2014] [Agyepong <i>et al.</i> , 2004] [Mokoka <i>et al.</i> , 2011] [Osawa <i>et al.</i> , 2010] [Paterson <i>et al.</i> , 2007]	Work over load (human resources) [Agyepong <i>et al.</i> , 2004] [Akintola and Chikoko, 2016] [Bradley and McAuliffe, 2009] [Paterson <i>et al.</i> , 2007] [George and Reardon, 2013] [Mokoka <i>et al.</i> , 2011]
Availability of infrastructure and resources [Adzei and Sakyi, 2014] [Agyepong <i>et al.</i> , 2004] [Gonzaga <i>et al.</i> , 2010]	Work relationships [Agyepong <i>et al.</i> , 2015] [Bradley and McAuliffe, 2009] [Dambisya <i>et al.</i> , 2007] [Mokoka <i>et al.</i> , 2011] [Osawa <i>et al.</i> , 2010] [Paterson <i>et al.</i> , 2007]
Working conditions [Adzei and Sakyi, 2014] [Chandler <i>et al.</i> , 2009] [Mokoka <i>et al.</i> , 2011]	Remuneration [Akintola and Chikoko, 2016] [Dambisya <i>et al.</i> , 2007] [Osawa <i>et al.</i> , 2010] [Paterson <i>et al.</i> , 2007]
Professional development opportunities [Adzei and Sakyi, 2014] [Agyepong <i>et al.</i> , 2004] [Mokoka <i>et al.</i> , 2011]	Poor management [Bradley and McAuliffe, 2009] [Mokoka <i>et al.</i> , 2011] [Osawa <i>et al.</i> , 2010] [Paterson <i>et al.</i> , 2007]
Childcare [Agyepong <i>et al.</i> , 2004] [George <i>et al.</i> , 2013] [Lori <i>et al.</i> , 2012]	Poor communication [Bradley and McAuliffe, 2009] [Mokoka <i>et al.</i> , 2011] [Paterson <i>et al.</i> , 2007]
Medical benefits [Akintola and Chikoko, 2016] [Mokoka <i>et al.</i> , 2011]	Workplace conditions [George and Reardon, 2013] [Lori <i>et al.</i> , 2012] [Mokoka <i>et al.</i> , 2011]

Table 4.3: HCW motivation satisfiers and dissatisfiers at organisational, community and personal levels.

Satisfiers	Disatisfiers
Prospects of gaining employment (CHWs) [Agyepong <i>et al.</i> , 2004] [Osawa <i>et al.</i> , 2010]	Lack of support [Agyepong <i>et al.</i> , 2015] [Bradley and McAuliffe, 2009] [Osawa <i>et al.</i> , 2010]
Food [Bradley and McAuliffe, 2009] [George <i>et al.</i> , 2013]	Working hours [Haile <i>et al.</i> , 2014] [Mokoka <i>et al.</i> , 2011]
Participation in development [Akintola and Chikoko, 2016]	Lack of safety [George and Reardon, 2013] [Mokoka <i>et al.</i> , 2011]
Employee support centres [George <i>et al.</i> , 2013]	Job insecurities [Akintola and Chikoko, 2016]
Employee related insurance [Agyepong <i>et al.</i> , 2004]	Challenges partnering with government [Akintola and Chikoko, 2016]
	Alienation from decision making [Akintola and Chikoko, 2016]
Community:	
Community Appreciation [Adzei and Sakyi, 2014] [Akintola and Chikoko, 2016] [Bradley and McAuliffe, 2009]	Patients respect [Bradley and McAuliffe, 2009] [Chandler <i>et al.</i> , 2009] [Dambisya <i>et al.</i> , 2007] [Mokoka <i>et al.</i> , 2011] [Osawa <i>et al.</i> , 2010]
Community Selection [Haile <i>et al.</i> , 2014]	Problems with transport [Agyepong <i>et al.</i> , 2015] [Agyepong <i>et al.</i> , 2004] [Akintola and Chikoko, 2016] [George <i>et al.</i> , 2013] [Paterson <i>et al.</i> , 2007]
	Patients non adherence [Akintola and Chikoko, 2016]
	Crime prevalent communities [Akintola and Chikoko, 2016]
Personal:	

Table 4.3: HCW motivation satisfiers and dissatisfiers at organisational, community and personal levels.

Satisfiers	Disatisfiers
<p>Living conditions</p> <p>[Adzei and Sakyi, 2014] [Agyapong <i>et al.</i>, 2015]</p> <p>[Agyepong <i>et al.</i>, 2004] [Bradley and McAuliffe, 2009]</p> <p>[George <i>et al.</i>, 2013] [George and Reardon, 2013]</p> <p>[Gonzaga <i>et al.</i>, 2010] [Lori <i>et al.</i>, 2012]</p> <p>[Paterson <i>et al.</i>, 2007]</p>	
<p>Support for educational advancement</p> <p>[Adzei and Sakyi, 2014] [Agyepong <i>et al.</i>, 2004]</p> <p>[Akintola and Chikoko, 2016] [Poppe <i>et al.</i>, 2016]</p> <p>[Bradley and McAuliffe, 2009]</p> <p>[Dambisya <i>et al.</i>, 2007] [Gonzaga <i>et al.</i>, 2010]</p> <p>[Lori <i>et al.</i>, 2012] [Mokoka <i>et al.</i>, 2011]</p>	
<p>Serving the community/Making a difference</p> <p>[Agyapong <i>et al.</i>, 2015] [Akintola and Chikoko, 2016]</p> <p>[Bradley and McAuliffe, 2009] [Chandler <i>et al.</i>, 2009]</p> <p>[Dambisya <i>et al.</i>, 2007] [Lori <i>et al.</i>, 2012]</p> <p>[Poppe <i>et al.</i>, 2016]</p>	
<p>Acquisition of skills</p> <p>[Akintola and Chikoko, 2016]</p> <p>[Bradley and McAuliffe, 2009] [Gonzaga <i>et al.</i>, 2010]</p> <p>[Lori <i>et al.</i>, 2012] [Paterson <i>et al.</i>, 2007]</p>	
<p>Promotion or career development</p> <p>[Akintola and Chikoko, 2016] [Agyepong <i>et al.</i>, 2004]</p> <p>[Bradley and McAuliffe, 2009] [Mokoka <i>et al.</i>, 2011]</p>	
<p>Perception of status</p> <p>[Chandler <i>et al.</i>, 2009]</p>	

### *Resource Allocation*

Resource allocation is one of the most controversial issues found in the health sector. The need for effective resource allocation is a result of scarce resources and the widening inequities in health care access [Asante and Zwi, 2009]. A

Ministry of Health official in Ghana recognised human resources as the main resource constraint. As a result when allocating resources to an area the human resources available are considered and resources are allocated accordingly. Resource allocators are concerned that without staff to utilise resources effectively, they could go to waste. It must be noted that this allocation decision and reasoning is made by at the regional managers and national policy makers level, a level higher than district health managers. This results in rural or understaffed areas receiving less resources, compounding the problem, as HCWs will be discouraged to join health care systems in these areas. The case study of resource allocation in Ghana by Asante and Zwi [2009] presented several interesting ideas regarding factors at play which affect resource allocation. For example, politics must be considered- when allocating funds, the development of a big hospital is seen as superior to several smaller clinics, as it is a more recognisable development. Such a development is perceived to reflect positive growth and development of the government, regardless of the fact that smaller clinics in rural settings may be more needed and will cater to more of the poorer populations with a higher burden of disease.

#### *Drug Supply*

Resource constraints resulting in supply shortages such as drug stock outs or absence of HIV testing kits lead to drop-out, as patients either cannot or will not wait and follow up when supplies are available [Colvin *et al.*, 2014]. Drug supply is cited by 20 articles as a barrier to health care. The issue of drug supply shortages results in patients not receiving the medication they need resulting in HCWs having to either deny treatment or switch to a different drug [Iwelunmor *et al.*, 2015]. Many patients do not receive treatment as they may not be able to return to collect the necessary medicine, especially in rural areas where transport costs play a role. This is particularly a problem in preventative medicine as the immediate need of the medication is not appreciated, thus is not well followed up.

Of the 20 articles 16 articles cited specific cases of drug stock outs relating to specific health areas, eight (50%) focussed on malaria treatment, prevention and diagnosis; four (25%) on HIV diagnosis and treatment; two on maternal treatment; and the final two looking at hypertension and child health treatment respectively. Table 4.4 summarises findings from the literature.

Counterfeit drugs are a problem specifically in less developed countries, where it is estimated 25% of drug supplies are counterfeited according to Alfadl *et al.* [2012]. This study recognised there is a need for further research in the field and relayed results from Sudan. The strongest influences on counterfeit drug purchases are non-accessibility and unaffordability.

A shortage of drug supply, medical equipment, hospital beds, bedding and consumables such as gloves and stationary are frequent barriers faced by health care workers providing care to patients. The stress which the lack of resources places on a health care worker is a significant push factor. Sipsma *et al.* [2013]

describes mother's delivery at health posts in some areas in Ethiopia as not much different to delivering at home due to the dire shortage of drugs and equipment, saying it is just delivery using gloves.

An interesting factor observed as a main finding by Moonasar *et al.* [2007] was the lack of adequate or appropriate storage for medical supplies. Certain drugs, for example rapid diagnostic tests (RDTs), need to be kept in temperature controlled environments. With the current state of infrastructure coupled with the shortage of drugs available this is a concern as even if the drug supply is improved there may still not be access to these drugs, as they may not be usable once at the point of use.

The supply of resources has an impact on decisions made regarding health insurance enrolment, as if there is a reputation for poor drug supply the motivation behind joining health insurance plans is diminished. The service quality linked with poor resources and the unreliability of the health care system will not promote health financing programs.

#### *Intellectual Resources*

Intellectual resources must be utilised, Iwelunmor *et al.* [2015] acknowledged that in South Africa HCWs were not making use of treatment guidelines. By not utilising intellectual resources patients were not being effectively treated. This aligns closely with the difference between policy existence and policy implementation.

An article by McIntyre [2005] acknowledged the lack of data corresponded with a lack of resources, this is a resounding issue in understanding HCOs in low resourced areas. This idea must be kept in mind as it indicates areas unaccounted for do not necessarily have sufficient but may perhaps completely lack resources, or data collecting resources at the least.

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Table 4.4: Impact and affects of drug supply issues according to literature.

Health Area:	Drug use:	Study Findings:
Child Health	Treatment	"Caregivers claimed that as a consequence of inadequate supply or unavailability of drugs at the health facility, they are either given an incomplete dosage of prescribed medicines or are not given at all." [Lungu <i>et al.</i> , 2016]
Child HIV care	Treatment	"Shortage of cotrimoxazole (provided without charge in the National HIV programme) meant that children were given prescriptions requiring purchase from pharmacies. Many families were unable to afford the drug and either borrowed money or reduced the frequency of dosing." [Busza <i>et al.</i> , 2014] "Although, this study was not designed to identify the factors associated with drug exhaustion at home (such as caregivers sharing the drugs with other children needing them), missing one's clinic appointment appears to be a major determinant. Therefore, we recommend that caregivers are made aware that a drug refill could be obtained even after the child/caregiver misses a scheduled clinic appointment." [Iroha <i>et al.</i> , 2010]
HIV	Treatment	"Shortage of drugs was a common challenge at all primary health care facilities. Nurses were faced with having to turn away patients and having them return for their medication on another day. Other patients were given medication for only a week at a time. These patients had to return frequently to collect medication. Some participants travelled to the hospital pharmacy at their own expense to request drugs for their patients." [Layer <i>et al.</i> , 2014]
	Diagnosis and Treatment	"Persistent stock-outs of HIV test kits, which were common throughout Iringa region for the duration of this study, prevented access to HTC services. Service providers noted that they routinely turned clients away, while clients explained that the stock-out had caused many people to give up on HIV testing completely" [Mabelane <i>et al.</i> , 2016]
Hypertension	Treatment	"Drugs such as nifedipine, captopril, methyldopa, propranolol, atenolol, prazosin, and digoxin were in available in small quantities or not available during the study period. Hydrochlorothiazide was available throughout the study period at all hospitals." [Mungati <i>et al.</i> , 2014]
Maternal	Treatment	"All thirty facilities studied, were grossly wanting in terms of staffing, equipment, essential drugs and supplies." " All emergency obstetric drugs were either not in stock or available only in very small quantities." [Rogo <i>et al.</i> , 2001] "Drug availability is strongly associated with quality. The implication is that since maternal care in the country is free, mothers prefer that drugs are readily available anytime they report for antenatal care. The absence of prescribed drugs can affect their experience of service quality." [Atinga and Baku, 2013]
Malaria during pregnancy	Preventive	"A major barrier identified in several studies was periodic stockouts of SP. This results in women either being turned away without being given IPTp or being given a prescription to go and buy the drug from a private drug seller or from a pharmacy at another government facility, and represents a serious missed opportunity, as there is no guarantee that the women will buy and take the drug." "The main barrier at the health care system level cited by pregnant women was the "unavailability" of ITNs. These stock outs can exacerbate the issue of cost in many cases, as women often travel to distribution points to collect the ITN." [Hill <i>et al.</i> , 2013] "periodic shortages of SP- intermittent preventative treatment (IPT) with sulfadoxine-pyrimethamine" [Launiala and Honkasalo, 2007] "ANC staff may also fail to administer SP not necessarily due to loss of interest, but pregnant women may hate taking SP, or due to drug shortages as noted [in literature]." [Mubyazi <i>et al.</i> , 2011]
Malaria	Treatment	"95 (30.0%) of people who visited public health facilities did not get drugs from the hospital pharmacy and were issued with a prescription to buy drugs elsewhere. Of these, only 31 (32.8%) individuals bought the prescribed drugs." Participants reported that these shortages were more serious during the wet season when the number of malaria cases was high and health facilities could not cope with the increased demand in malaria treatment." [Chuma <i>et al.</i> , 2010] "Often, public health facilities do not have the recommended anti-malarials in stock. Lack of medicines in the formal sector contributes to people buying drugs, where the quality of drugs is less controlled and information on dosage is not often provided. Health workers and community members reported that public health facilities suffered from chronic drug shortages due to delays in drugs deliveries from the central level and the failure to adjust drug quantities to suit seasonal fluctuations in disease burden" [Chuma <i>et al.</i> , 2009] "Nearly all health workers indicated that they were rationing the drug because they were not certain of the next supply based on previous stock-outs periods. However, several districts in Kenya are currently moving from the "push" to "pull" drug delivery system where they order AL based on their consumption requirements, which may help to relieve shortages in the long-term." [Wasunna <i>et al.</i> , 2008]
	Diagnosis	"More than half (55%) of the nurses indicated that stock-outs of RDTs occurred. However, they reported that this was rare (one or two times in a season) and contingency plans existed to replace stock from either the nearest clinic or hospital pharmacies. Replacement of stock took place within 24 hours." [Moonasar <i>et al.</i> , 2007]
	Treatment and diagnosis	"Nine of ten health facilities reported RDT stock-outs at some point since their introduction. "running out of ACT for some periods before the next supply is received were also observed in some health facilities, which could be due to overuse of ACT in the treatment of patients with negative RDT results, or health system factors such as delays in procurement or underestimating requirements. This led to the prescription of non-ACT, contrary to national guidelines advocating the use of ACT as first-line anti-malarial drugs." [Mubi <i>et al.</i> , 2013]

### 4.4.7 Technology

The use of technology within the SSA setting is of particular interest when looking at solutions which have been uniquely developed and adapted accordingly.

#### *Mobile Technology*

Four articles make reference to the way in which mobile phones are utilised for health purposes in SSA. The rapid spread of access to mobile phones across Africa has revealed the opportunity for health care to utilise this widespread platform [Zurovac *et al.*, 2013].

Two of these articles addressed adherence and identified forgetfulness as a large barrier, but recognised the use of cell phone reminders and short message services (SMS) as an effective solution to this [Naidoo, 2009][Maqutu *et al.*, 2010]. The use of SMS's have been used to report on facility stock-outs of vital supplies, inform health care workers as well as adherence to follow up appointments [Zurovac *et al.*, 2013]. It was found mobile phone use was universal among HCWs in the study carried out by Zurovac *et al.* [2013] in Kenya, but not necessarily for patients or caregivers, however over 90% of those owning phones are willing to receive health related text messages. 90% of HCWs selected malaria for an SMS case management topic and SMS interventions.

The fourth paper investigates the use of mobile technology by doctors in public health systems, addressing the poor administration and centralized systems. Discussions were held with doctors to establish doctors perceived usefulness and job relevance was established, identifying the benefit of removing paper records, mobility and as a decision support tool. The paper acknowledges the need for doctors to be technologically competent in order to embrace the use of a new mobile technology device [Banderker and Van Belle, 2006].

#### *Information Technology*

Eight articles discuss information technology, of which five discuss information systems, one discusses internet health resource utilisation [Ajuwon and Popoola, 2015] and the final two uses a computer based conceptual model for capturing and structuring knowledge to support decision making.

A model developed by Ogundele *et al.* [2016] was used to predict and understand interrelationships between factors which influence TB adherence. This is an interesting and useful tool for mapping and understanding health endemics and the populations behaviour, which should be made use of in the SSA setting. Sukums *et al.* [2014] discuss a similar tool, in rural primary health care facilities, which is implemented for the purpose of supporting decision making to bridge the know-do gap of health workers. The same can be said of utilising the internet health resources, as health care professionals can use the internet for continuing medical education and for remote patient care through telemedicine care [Ajuwon and Popoola, 2015]. The uptake and

utilisation of internet and communication technologies (ICT) in SSA has been slow due to the interruption of power supplies, resistance to new technologies, government attitude toward ICT, cost of ICT facilities, inadequate telecommunication infrastructure, lack of maintenance culture and high cost of internet access [Ajuwon and Popoola, 2015].

As discussed in 4.4.1 the implementation of information systems in health systems which have a lack of resources is difficult as the focus is often that patients not processes remain the foremost priority [Igira, 2012]. Gordon and Hinson [2007] acknowledges the issue of sustainability, or continuation of programmes once implemented listing poor infrastructure, approach to systems development-taking a top down approach to decision making, inappropriate donor policies and strategies, uncoordinated donor efforts and human resource capacity. Suggesting improvements of the organizational routine consisting of memory, adaptation, values and rules as pivotal points to be addressed in order to create a solid platform from which to work off. Dyers *et al.* [2016] recommends training, oversight of junior clinicians and co-coordinating competing processes. Kawonga *et al.* [2012] discusses the importance of centralised systems and alignment in order to maximise positive programme synergies, by finding practical ways in which disease-specific and health system functions can interact for optimal health benefit. Both Banderker and Van Belle [2006] and Igira [2012] recognise the importance of acknowledging current health care work practices and communicating with health professionals to ensure they agree with the usefulness and relevance of the system or devices being implemented.

#### 4.4.8 Knowledge and Information

The area of education is referenced in 93 articles making it the most referenced factor, literacy in eight articles and negative perceptions in 19 articles. Education comes into affect in several ways, firstly the lack of education causes patients and decision makers to make poorly informed decisions when it comes to health care and health seeking behaviour. The lack of education is also linked with lack of employment and thus financial resources. Finally education is linked with that of HCWs education, training and knowledge of practices and treatment.

Okwaraji *et al.* [2015] found educated women to live on average 26 minutes closer to a health centre than uneducated women, this is however perhaps more an indication of the provision of services in an area than uneducated women choosing to live further from health centres. It is found women are less educated than men and that rural patients have lower levels of education (these result in delays in seeking health care) [Nyasulu *et al.*, 2015].

CHWs found the level of education of their target group to affect their ability to work as these communities were found to be uncooperative and ignorant [Kok *et al.*, 2015].

Poor adherence and health seeking behaviour were found to be exasperated by low education levels [Kok *et al.*, 2015][Atinga and Baku, 2013][Abekah Nkrumah *et al.*, 2010][Aseweh Abor *et al.*, 2011]. Education influenced the knowledge and awareness of health practices and interventions [Uchenna Onyeonoro *et al.*, 2013]. Aseweh Abor *et al.* [2011]Tebekaw *et al.* [2015] attributed education to enhancing female independence, confidence and capability building which is directly influences decision making regarding women's health, illustrating the abstract influence of being educated. 34 articles which list women as a sub-group list education as a factor influencing health care.

Nakambale *et al.* lists the need to educate communities in order to sensitize them to the importance of seeking advice from qualified health personnel. Oyekale [2014] recommends implementing counselling at health centres to improve women's knowledge on diseases such as malaria. A study by Paul *et al.* [2014] discusses the way in which the HIV epidemic affects a younger demographic and therefore the Department of Education in South Africa have set out to develop comprehensive sexual health and HIV programmes to reach the learners. The importance of improving education levels will directly improve the influence stigma has on HIV testing and status [Apanga *et al.*, 2015].

The link between rural areas and poor levels of education is strong, illustrated by the fact that 21 articles address both rural areas and list education as a factor. Bronsard *et al.* [2008] discusses the lack of empowerment uneducated women in rural areas face, citing the importance of improving awareness through public education (radio) and training of key informants.

Family planning and contraceptives are linked as having higher levels of education are found to have more positive responses. Owusu-Asubonteng *et al.* [2012] found 87% of vasectomy acceptors were found to have a secondary or higher education. Traditional practices such as female genital cutting is directly associated with the improvement of education, Rahlenbeck *et al.* [2010] state that each additional year of schooling the odds of disproving the practice increased by 20%.

#### 4.4.9 Health Status

The need of the population to use health care services, must be understood in order to understand volumes and areas needed for health care use. The need of health care by a population affects the entire health care system especially when looking at capacity planning and resource allocation.

##### *Perceived and evaluated need*

The burden of disease is investigated in order to understand the state of health of a community. This is done The burden of disease is attributed to gain an understanding of the evaluated need in an area, which health services must cater for. SSA is found to have high burdens of disease [Goudge *et al.*, 2009], with SSA has been found to have the highest burden of disease.t The HIV/AIDS

outbreak playing a major role in compounding the already high burden. The geographic climate and lack of sanitation bringing has also meant the region has experienced high levels of Malaria and an acceleration of infectious disease pandemics [Zaman *et al.*, 2015] [Buor, 2004].

The main focus of each article is recorded in terms of the main health care factor addressed as well as the main health care areas. Health care areas can be quantitatively mapped more accurately than factors as no interpretation is necessary. When looking at health care factors it is necessary to interpret certain articles to assign the major factor being addressed, whereas the disease is clearly stated. If the article addresses subjects such as health care systems, health care workers (HCW) or health insurance the health care area is listed as N/A.

The listed areas of health care, in data Table AX, are extensive thus in order to map it, they are categorised according to SDGs. The SDGs contain the following prominent health goals: Universal Health Coverage (UHC); reproductive, maternal, newborn, child and adolescent health; infectious diseases; noncommunicable diseases (NCDs); mental health and substance abuse; and injuries and violence. Whilst the MDGs focused on: reducing child mortality; improving maternal health; combating HIV/AIDS, malaria and other diseases; as well as health being a component of several other MDGs (nutrition, water and sanitation) [WHO, 2015*b*]. The choice to look at the SDG categories is due to the broader spectrum thereof. The use of SDGs is of interest as although a portion of the articles are published prior to 2016 during the MDG time period, an understanding of the SDG areas within SSA can be used moving forward. Figure 4.13 illustrates the proportion of areas of health care of the articles reviewed. It must be noted some articles were categorised in two categories. For example, the treatment of Malaria during pregnancy would be categorised as both an article addressing infectious diseases and maternal health.

It is of interest to note 80% of the occurrences of disease discussions in articles relate to 13 specific areas, namely: HIV; Maternal health; Malaria; TB; Child health; Sexual health; Health; Injury; Cervical cancer; Maternal and child health; Mental health; Hypertension; and Epilepsy as illustrated in Figure 4.14. This is of interest as it further indicates the areas of focus of research and builds on the understanding of disease focus from Figure 4.13. The area of maternal and child health is listed both individually and in conjunction due to the way in which articles address these areas. The focus on HIV, Malaria, maternal and child health align directly with Goal 4: Reduce child mortality; Goal 5: Improve Maternal health and Goal 6: Combat HIV/AIDS, Malaria and other diseases, of the MDG programme over this period [United Nations, 2015].

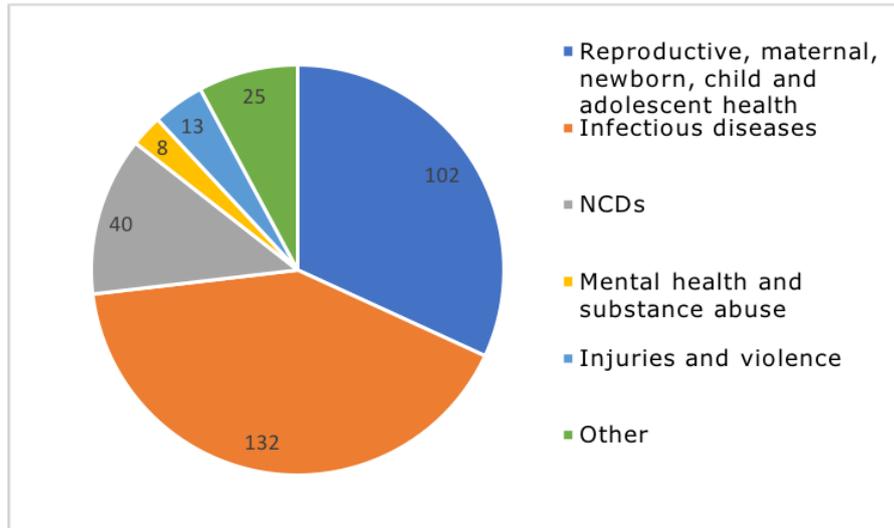


Figure 4.13: Proportion of SDG categories addressed by articles.

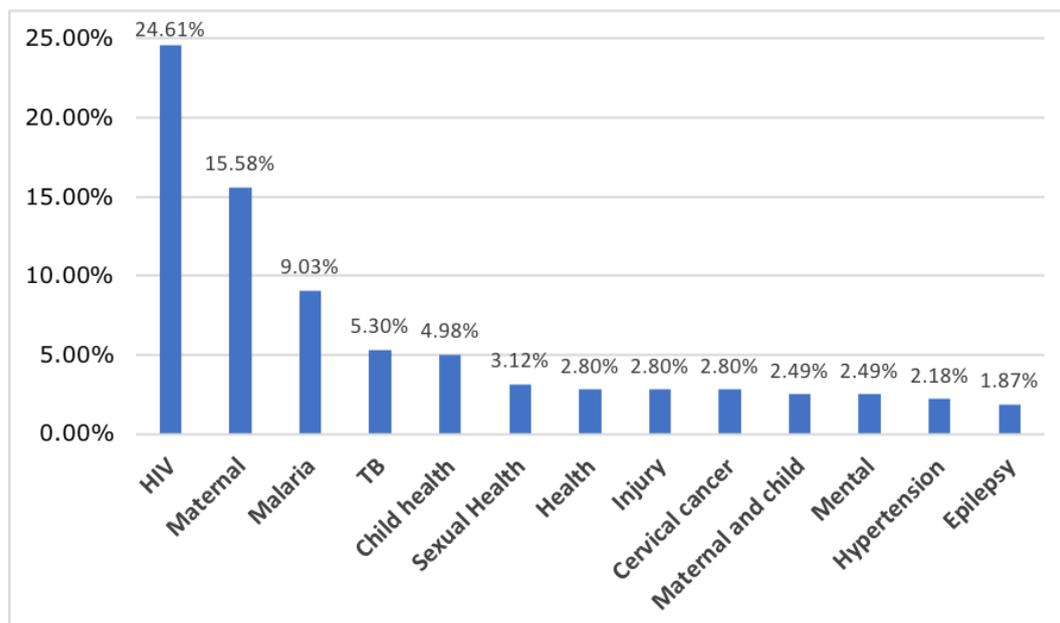


Figure 4.14: Proportion of specific diseases discussed contributing to 80% of the literature.

It is of interest to investigate which regions are investigating which SDG category, in order to get an understanding of the priorities in health care of the area. Figure 4.15 shows each geographic region and the respective areas of focus. It is of interest to note the area of reproductive, maternal, newborn, child and adolescent health is more frequently found to be carried out over more generalised geographic areas in comparison to that of infectious diseases. This is not found to be surprising as infectious diseases, by nature will effect

a specific geographic area and can be studied and combated within this area.

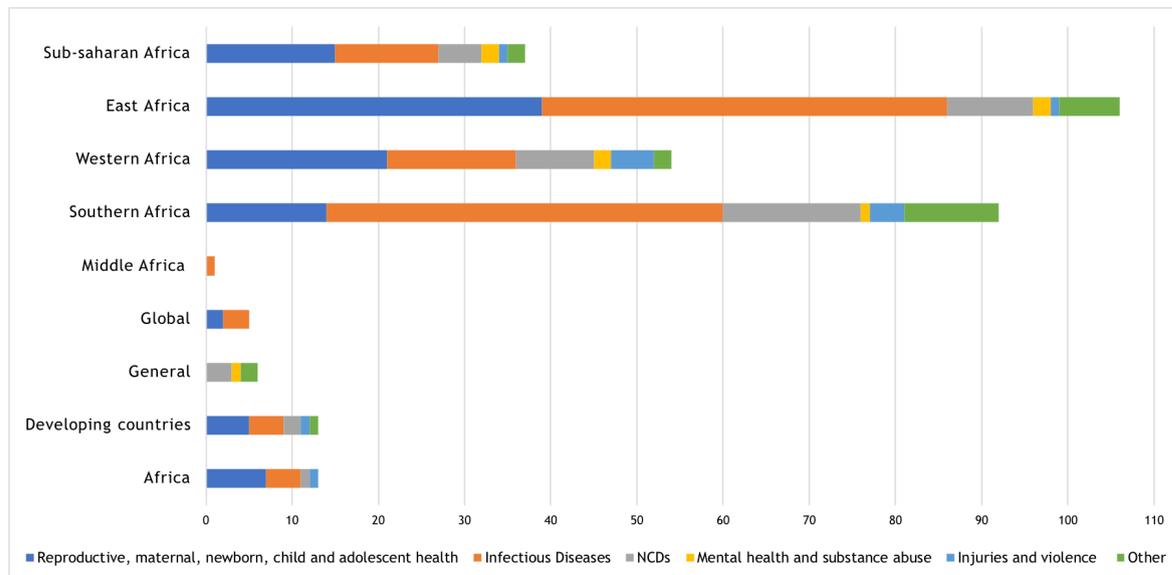


Figure 4.15: Graph showing health care area of focus per geographic region.

The examination of diseases addressed by literature gives an understanding of the perceived need of health care in SSA, however as Figure 4.15 illustrates this is not necessarily the actual disease burdens found in an area, to further quantify this data is needed, not academic interpretations thereof.

## 4.5 Discussion

After the analysis of the above literature a comprehensive understanding of the health system components identified in Chapter Two is established in a SSA setting, according to literature. The components are discussed categorically but the relationships and overlaps must not be ignored. Utilising the Atlas.ti code co-occurrence tool which maps the co-occurrence of factors identified in the articles reviewed the most common links between factors can be identified. Figure 4.16 shows the factors which co-occurred more ten or more times. The link between education and socio-economic factors is of interest showing the relationship between education and earning an income and what an impact this inadvertently has on ones health. Both due to the lack of resources to access health, but the knowledge to.

When considering the diseases, factors, geographic areas and subgroups highlighted in the study the co-occurrence pattern is higher. Figure 4.17 shows only the areas which co-occurred 15 times or more. The relationship between women and maternal is not surprising, however other links such as women and education and socio-economic are of interest.

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Factors:	Key:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Access	1		6	5	4		9	7	13	16	2		1	4	5	1	4	10	4	4	4	10	2	7	4	16	6	5	3	
Adherence	2	6		3	15		4	1	3	9	1			4	2		2	4	2	3	1	5	3	3	4	8	9	2		
Age	3	5	3		2		1	3	12	24	1	7	7	4	1		3	4	1	6	3	6	1	5	5	14	1	1	3	
Antiretrovirals	4	4	15	2			1		3	5				3	2		2	1	5	3	1	4	4	2	5	5	8	1		
Compensation	5									1					4	10	8	4	2		1	1	1				1	1		
Cost	6	9	4	1	1			7	9	12	2	1	3	2	2	1	2	4	3	1	6	7	3	5	2	14	5	6	2	
Delay receiving care	7	7	1	3			7		8	12			2	4			2	4		3	2	5	2	2	4	9	3	4	2	
Distance	8	13	3	12	3		9	8		19	1	4	2	3			1	6	3	4	4	5	1	9	5	26	6	5	8	
Education	9	16	9	24	5	1	12	12	19		3	9	10	11	7	3	16	11	7	15	15	12	8	17	13	40	10	3	10	
Environmental	10	2	1	1			2		1	3				4	2		1	1			2		5	4	2	11	3			
Experience	11			7			1		4	9			2							4	1	1		4	11		1	5		
Family size	12	1		7			3	2	2	10			2		1			1		4	2	3		2	2	7		1		
Gender	13	4	4	4	3		2	4	3	11	4		1				2	3	3	4	1	3	5	10	3	11	4		1	
Governance	14	5	2	1	2	4	2			7	2					4	9	8	9	2	14	7	3	7	1	7	1	1	1	
HCW motivation	15	1				10	1			3					4	10	6	4		4	3	1	1				1	1		
HCW training	16	4	2	3	2	8	2	2	1	16	1			2	9	10		8	11	1	7	5	2	4	2	9	4	4		
HCW	17	10	4	4	1	4	4	4	6	11	1		1	3	8	6	8			9	3	11	10	3	6	4	9	6	3	3
Limited resources	18	4	2	1	5	2	3		3	7			3	9	4	11	9			7	5	4	3	2	6	1	5			
Partner	19	4	3	6	3		1	3	4	15			4	4	4	2		1	3		1	8	3	6	5	13	4		4	
Policy	20	4	1	3	1	1	6	2	4	15	2	1	2	1	14	4	7	11	7	1		8	4	10	4	14	4	1	1	
Service quality	21	10	5	6	4	1	7	5	5	12		1	3	3	7	3	5	10	5	8	8		3	8	3	14	4	6	3	
Social	22	2	3	1	4	1	3	2	1	8	5		5	3	1	2	3	4	3	4	3		8	8	13	6	1			
Sociocultural	23	7	3	5	2		5	2	9	17	4	4	2	10	7	1	4	6	3	6	10	8	8		6	25	4	2	6	
Sociodemographic	24	4	4	5	5		2	4	5	13	2		2	3	1		2	4	2	5	4	3	8	6		11	7	1	2	
Socioeconomic	25	16	8	14	5		14	9	26	40	11	11	7	11	7		9	9	6	13	14	14	13	25	11		12	10	11	
Stigma	26	6	9	1	8	1	5	3	6	10	3		4	1	1	4	6	1	4	4	4	6	4	7	12		2	2		
Transport	27	5	2	1	1	1	6	4	5	3		1	1		1	1	4	3	5		1	6	1	2	1	10	2			
Utilization	28	3		3			2	2	8	10		5		1	1		3			4	1	3		6	2	11	2			

Figure 4.16: The most predominant co-occurrence of factors listed in articles.

	Key:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Disease: HIV	1		9	11	13	5	16	7	13	2	9	9	8	5	9	15	22	12	7	24	10	13
Disease: Maternal	2	9		11	2	9	3	13	24	7	9	12	8	16	14	23	6	8	18	9	10	40
Factors: access	3	11	11		6	5	4	13	16	4	10	4	4	10	7	16	6	4	15	8	5	13
Factors: adherence	4	13	2	6		3	15	3	9	2	4	3	1	5	3	8	9	5	6	10	6	2
Factors: age	5	5	9	5	3		2	12	24	3	4	6	3	6	5	14	1	6	8	2	2	15
Factors: antiretrovirals	6	16	3	4	15	2		3	5	2	1	3	1	4	2	5	8	5	6	14	2	2
Factors: distance	7	7	13	13	3	12	3		19	1	6	4	4	5	9	26	6	7	15	6	3	15
Factors: education	8	13	24	16	9	24	5	19		16	11	15	15	12	17	40	10	18	21	23	5	34
Factors: HCW training	9	2	7	4	2	3	2	1	16		8	1	7	5	4	9	4	12	9	16	16	8
Factors: HCWs	10	9	9	10	4	4	1	6	11	8		3	11	10	6	9	6	8	5	17	15	6
Factors: partner	11	9	12	4	3	6	3	4	15	1	3		1	8	6	13	4	4	5	4	1	18
Factors: policy	12	8	8	4	1	3	1	4	15	7	11	1		8	10	14	4	8	7	13	8	6
Factors: service quality	13	5	16	10	5	6	4	5	12	5	10	8	8		8	14	4	10	10	8	5	11
Factors: socio-cultural	14	9	14	7	3	5	2	9	17	4	6	6	10	8		25	4	2	10	6	3	17
Factors: socio-economic	15	15	23	16	8	14	5	26	40	9	9	13	14	14	25		12	11	19	18	8	29
Factors: stigma	16	22	6	6	9	1	8	6	10	4	6	4	4	4	4	12		6	6	14	7	4
Geography: District	17	12	8	4	5	6	5	7	18	12	8	4	8	10	2	11	6		14	27	12	12
Geography: Rural	18	7	18	15	6	8	6	15	21	9	5	5	7	10	10	19	6	14		16	7	16
Geography: South Africa	19	24	9	8	10	2	14	6	23	16	17	4	13	8	6	18	14	27	16		17	14
Subgroup: HCWs	20	10	10	5	6	2	2	3	5	16	15	1	8	5	3	8	7	12	7	17		7
Subgroup: women	21	13	40	13	2	15	2	15	34	8	6	18	6	11	17	29	4	12	16	14	7	

Figure 4.17: The most predominant co-occurrence of diseases, factors, geographic areas and sub-groups listed.

## **4.6 Conclusion**

This Chapter uses a systematic literature review to retrieve a broad spectrum of articles in order to gain a comprehensive understanding of the health system found in SSA. This review highlights the diversity found within SSA and discusses the factors found to be notable and unique to SSA which play a role on the functionality, existence and utilisation of the health system.

## Chapter 5

# Building an approach: Improving the understanding of health systems

In Chapter 3 an understanding of what comprises a health system is established, thereafter Chapter 4 uses literature to determine the state of the health system found in SSA. Having investigated these areas further clarity on the complexity and variability of mechanisms which affect HCOs is gained. This chapter aims to discuss tools which can be used to develop an approach to be followed in order to understand and identify these mechanisms for any particular study. Having listed the complexities identified in Section 5.1; the theory of change and explanation theory are discussed in Section 5.2 as base models to be used to when aiming to improve HCOs. The tools to be utilised in identifying bottlenecks which hinder the achievement of optimal HCOs are discussed in Section 5.4 along with. Section 5.3 highlights the point in the solution development process which the identification of the resultant bottlenecks would contribute toward.

### 5.1 Health system complexities

A health system, according to Schmetts *et al.* [2016] is defined as "the aggregate of all public and private organizations, institutions, and resources mandated to improve, maintain or restore health. This includes both personal and population services, as well as activities to influence the policies and actions of other sectors to address the political, social, environmental, and economic determinants of health." The complexity of health systems as discussed in Chapter 3, highlights the lack of a comprehensive health system model being widely used and adopted. However each model contributes to a better understanding of health systems, and thereafter the literature further develops ones understanding of the health system in SSA.

It is difficult to model the relationships between components when considering a high level model of the health system due to the complexity of each component. However, it is necessary to map health systems in order for various stakeholders or roleplayers to develop a comprehensive understanding of the system in which they are working or impacting. This allows stakeholders to identify relevant aspects or inefficiencies in the health system, especially indirect, upstream or downstream factors which could be overlooked.

Several challenges have been identified through the analysis of the health system models and the literature. The systematic literature review further illustrated the complexity of health systems by revealing the complexities involved in each topic covered, as well as showing the variation according to different geographical regions. Showing that it is difficult to generalize these challenges due to the diversity of the landscape, the extensive projects being carried out and the unique contextual factors found in SSA. This point is reinforced by Maticka-Tyndale [2012] who states "Synthesising research from a world region as diverse as SSA is a decided challenge. The countries of SSA differ economically, politically, socially and culturally. National boundaries do not enclose similar ethnic and cultural groups, nor do they separate those that are dissimilar." With these factors in mind the following areas have been identified as challenges or bottlenecks when identifying mechanisms which influence HCO:

- Factors which influence HCOs cannot in entirety be comprehensively listed [Tanahashi, 1978], nor the relationships between these, as these relationships have further complexities. The complexity of these factors and their relationships are attributable to several reasons, such as: the number and diversity of HCOs that are of interest, the complexity of anticipating the response of people to changes in the health care system and the number of elements within the service delivery system that need to be considered;
- Mechanisms affecting HCOs are context specific. In order to identify pivotal mechanisms it is necessary to establish boundaries [Papanicolas and Smith, 2013]. Such as selecting a specific HCO to address or target a community or geographical area (such as specifying a district) in which to identify mechanisms;
- Understanding the complexity of the health system in a SSA setting, and having the understanding thereof to challenge the assumptions made by first world health system frameworks;
- The silo mentality, can result in an uncomprehensive view or solution. This lack of acknowledgement of the full system can thus cause the possibility of overlooking areas of the system which should be considered as there are many indirect links between system components [World Economic Forum, 2016];

- Lack of collaboration platforms or tools discourage efforts to leverage off one another thus resources are wasted in the planning and operating of interventions and the development of policies;
- Stakeholders not utilising tools which diagnose the problem, or the ability to effectively recognise which mechanisms are the key problem, thus making poor resource allocation decisions. Diagnosing whether an investment into a certain system component is being fruitful and thereafter having the ability to diagnose where the system bottleneck is;
- Misalignment of stakeholders within the health care system and its broader context, and their competing interests [World Economic Forum, 2016]; and
- Planners being too far removed from the target area and interventions being dictated from authorities but not reaching the intended audience.

The first two objectives of this study aim to introduce an in-depth understanding in order to come to the point in objective five which requires one to identify factors that influence HCOs. However, it has been realized that this cannot be done in a general manner, thus the approach developed aims to be a guideline for identifying mechanisms which influence HCOs to facilitate decision making. The intention of the approach is to allow for decision makers to position themselves within the health system in order to understand the areas which they need to take into consideration for levering and planning purposes as well as to acknowledge for whom and to what degree their intervention will have an effect. Thus, the approach hopes to effectively enable decision makers to identify mechanisms influencing HCOs according to their specific goal or intervention. It is important to recognize that whilst these complexities exist, the existence of each part in this system is essential, which leads to a complexity of a greater magnitude.

## 5.2 Explanation Theory and Theory of Change

In order to improve a HCO the implicit understanding is that change must take place in order to positively influence these outcomes in the immediate, medium or long term. Explanation theory and Theory of Change (TOC) as depicted in Figure 5.1, are seen as useful tools to tackle resolving health care issues. Explanation theory addresses the context surrounding the problem whilst TOC discusses strategies of how to solve this problem coupled with constant planning and evaluation between the two to facilitate a successful intervention. The motivation for choosing explanation theory and TOC are attributed to the fact that in the health system inputs and outcomes will not have a direct and predictable relationship, due to the contextual and human factors involved. These theories take these into consideration, and aim for

eventual impact in place of direct outputs and acknowledge the need for intermittent reassessment of the system. Another consideration for using the TOC is taking an econometric approach, whereby because there are many key components and relationships between components there are many possible confounding factors between inputs and outcomes, not just the contextual factors involved. TOC is commonly used to design and measure public health programmes, as they describe the way in which interventions which have intermediate outcomes following a logical sequence can bring about long term outcome improvements [Maini, 2018].

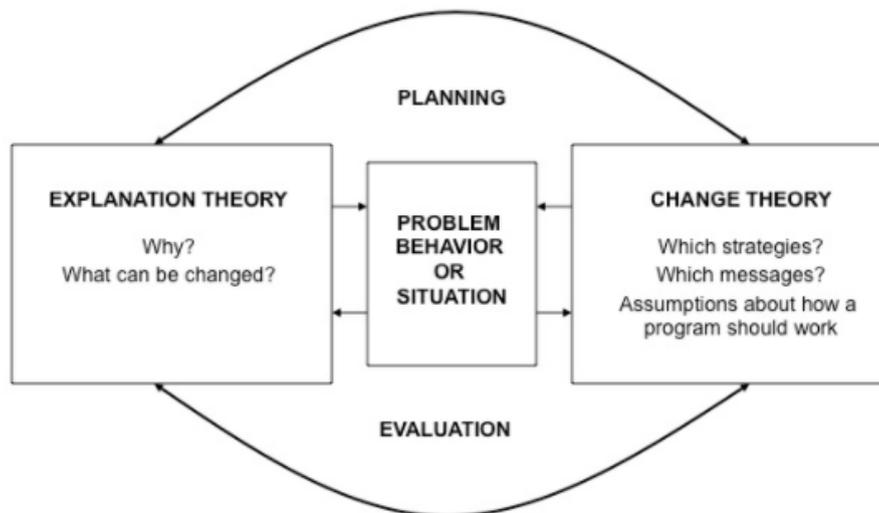


Figure 5.1: Explanation Theory and Change Theory in the process of planning and evaluation (Marketing Partners 2013)

TOC considers the final impact that is desired and works backward to establish the necessary inputs, activities, outputs and outcomes needed to attain it. The inputs and activities assigned toward achieving the desired impact will vary greatly according to the role of the stakeholder hoping to achieve or influence this eventual impact. This is due to the resources available as well as, the level of direct involvement, proximity to the final impact, degree of autonomy and to whom your actions are answerable to or dictated by. Thus stakeholders TOC maps may have the same desired impact but the process to arrive there will vary, in terms of the inputs, activities, outputs and outcomes. An important point to acknowledge is that the outcomes of each stakeholder's TOC will influence the enabling environment considered by downstream parties.

It is important to acknowledge the level of influence when embarking on a change intervention as although the problem may remain consistent, the pivotal factors within the explanation theory or TOC will vastly differ. For example a government looking to tackle HIV nationwide, or a clinic nurse looking to tackle HIV in her work environment will have different TOC chains or

contextual factors to consider. This is important as although these two may be completely different scenarios the clinic nurse finds herself embedded within the government's TOC chain and subject to the changes made by government, whilst the government may consider the clinic nurse as a resource to achieve an outcome. This example illustrates the importance of recognising the levels of influence or positioning of a stakeholder within the health system when facilitating decision making. [Maini, 2018] recognises the importance of the inclusion of a wide set of stakeholders from the outset of project initiation in order to facilitate an effective intervention both at a planning and implementation level.

The utilisation of TOC in conjunction with the knowledge gained from the framework analysis and literature reviewed in Chapters 3 and 4 hopes to support the development of a framework to facilitate decision making. Section 5.2.1 discusses the stakeholders, their level of influence and spheres of involvement, with the intention of these stakeholders being the target audience for the framework developed. Following the TOC thinking, it is imperative to understand the stakeholders, those being influenced by and those influencing the change as well as the landscape in which the change will be taking place, namely determinants of health and service delivery. The process of health care must be clearly described in order to identify the point at which bottlenecks are identified whereby inefficiencies can be identified.

### 5.2.1 Stakeholders, Actors and Levels of Influence

Planning to improve a HCO can come from several different parties or levels of responsibility, the position of this party in relation to the health system affects the level of involvement and thus the manner in which efforts are directed or addressed. Decision makers may aim to target the same issue but can have vastly different outcomes such as development of a policy in comparison to medication administration. The intention for highlighting the list of stakeholders is to understand at what level of the health system the HCO issue being tackled is, taking note that this goes beyond a local or network level, as a local project may have significantly less stakeholders or officials involved. For example, due to the level of involvement of Ministries of Health in comparison to clinic managers, the decisions made by either differ vastly. It is however important to remain cognisant of the implications behind decisions made by ministries of health on clinic managers or more broadly the implications of higher level decisions on each level of the system.

Schalk-Zaitsev [2011] compiled a report for the WHO and USAID which describes stakeholders as individuals who represent organizations that have an interest in health systems. These stakeholders vary from country to country however a list of typical stakeholders includes:

- Ministry of Health;
- Other ministries (Of local government, finance etc);

- Health development partners (USAID, World Bank, DFID);
- Public Service Commissions;
- Professional associations (Of doctors, nurses, etc);
- NGOs;
- Research organizations, academic institutions and other organizations that study and report on the health system; and
- Private sector organizations.

The Social-Ecological Model is also considered as it is said to support a framework which describes individual change within the context of social change [Gregson *et al.*, 2001]. The areas highlighted by this model as "levels of influence" are pivotal as they describe areas wherein change takes place and discuss the context where change will be targeted. The state of these areas and the decisions and changes made within these areas will in return influence stakeholders, as these stakeholders too will find themselves within these spheres. The model developed by McLeroy *et al.* [1988] conceptualizes the social world in five spheres, or levels of influence, namely:

- Social structure, policy and systems;
- Community or Civil Society ;
- Institutional/organization;
- Interpersonal; and
- Individual.

From the list of stakeholders, the Social-Ecological Model and the insights gained from the systematic literature review carried out, Table 5.1 is derived which describes decision makers identified within the health system.

Having identified the levels of responsibility and the primary areas in which decision making takes place a clearer understanding of the system drivers can be developed for each level. Further, by establishing the standing of roleplayers within the system the implications of decisions made either upstream or downstream of these in each particular area of importance can be more clearly recognised. In order to maximize synergies of an intervention, each level of influence needs to be targeted. In order to accurately identify the stakeholders one may need to scale down to a subnational level to reduce the complexities and number of stakeholders involved.

## 5.2.2 Determinants of Health

The effect of curative or clinical care on health is far less significant than what is generally thought, according to Schmetts *et al.* [2016] in the United States of America only 20% of premature deaths are explained by access and quality of

Table 5.1: Description of levels of decision makers

Role Player:	Description:
Governmental	Ministry of Health, Provincial departments, municipal, other departments.
Private	Both non profit and profitable establishments. These are not answerable- but must adhere to the legislation and regulations set by departments and ministries of health. Non profits can aim to establish projects which align with national strategies. There are found to be a broad spectrum of role players herein- pharmaceutical companies, medical aid providers, support services private hospitals and practices, philanthropists, health development partners.
Research Organizations	Academic institutions and other organizations that study and report on health systems.
Organization	Hospitals, clinics, enterprises or NGOs offering health-care services or support services, established either privately or provincially thus answerable to respective stakeholders and policy makers and must adhere to respective policies, budget utilisation, protocols and practices established. Organizations, areX responsible mainly for short term planning.
Functional/Interpersonal	Work force within organizations, answerable to organization management. These actors are client facing, must adhere to protocols and deliver protocol and client feedback. They ultimately utilise resources
Community	Support system to the individual, influences the behaviours and beliefs of the individual; civil society.
Individual	Respond to health care available, respond to intervention, state thereof drives actions of all above;patient; user representative groups.

clinical care. Thus it is important to recognise the other factors which account for the other 80%. The health impact assessment developed by the WHO

recognise that there are several factors beyond service delivery or access which have significant impacts on health [World Health Organization, 2010]. These determinants of health include:

- the social and economic environment;
- the physical environment; and
- the person's individual characteristics and behaviours.

It is found to be of importance to highlight these in order to recognize that by improving equity in health care, service delivery will be subject to factors external to the health system. These determinants of health relative to the SSA setting are discussed in depth in Section 4.4.4 and 4.4.5. The same study described by Schmets *et al.* [2016] suggests that health behaviours and physical environment are shaped by social and economic factors, causing the other 80% to be shaped by the social determinants of health.

Figure 5.2 illustrates the interaction of these determinants with the health system and their respective primary components. Appendix ?? contains the expanded versions of each of these areas. These models do not claim to list all factors comprehensively, but are seen to contribute as useful models for brainstorming or idea generation purposes and to be utilised to check the comprehensiveness of factors considered as determinants influencing HCOs both during bottleneck identification and solution development. These figures are a result of the knowledge gained from the framework analysis in Chapter 3 and the Systematic Literature review carried out in Chapter 4.

### 5.3 Solution development

At this point it is important to define the purpose of the approach developed is to identify the root cause of less than optimal HCOs in order to identify a starting point or focus for solution development. The Figure 5.3 illustrates the process to be followed when trying to make health outcome improvements and highlights the area which the approach developed in this study contributes toward. The Community Health Improvement process (CHIP) is a widely adopted process which is commonly used in conjunction with the TOC [University Of Kansas, 2017] . It must be noted the inclusion of CHIP is solely to position the contribution of the approach to follow. The approach defined can be used for project initiation when choosing an area to investigate, or alternatively, project assessment. It could be seen as a tool to assess current projects, which will have predefined scopes, where the comprehensiveness of a proposed solution or intervention proposal can be evaluated.

The process which should be followed in order to improve the bottleneck area defined can follow a TOC chain. Blas and Kurup [2005] discusses developing plans with the goal of making an actionable agenda, and lists the following general considerations to be made when implementing interventions:

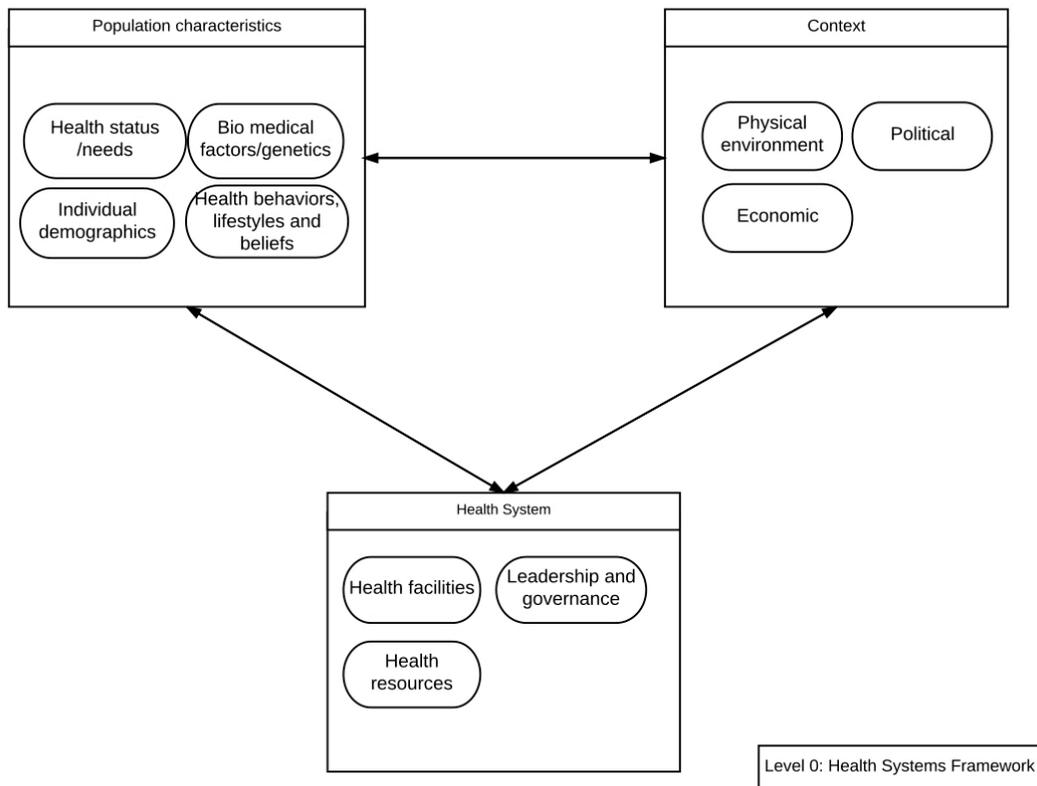


Figure 5.2: Interaction of health determinants

- Replicability;
- Sustainability;
- Scalability;
- Political Feasibility;
- Economic Feasibility; and
- Technical Feasibility.

However the solution development is not the goal of the bottleneck analysis proposed in this study but would be the next step. The two are not explored in conjunction as this scope is thought to be too large and extensive work on solution development has been carried out. Therefore the aim of this approach is merely to carry out the initial project analysis and direct intervention or project focus.



Figure 5.3: Adaptation of the Institute of Medicines Community Health Improvement Process(CHIP) highlighting where the recommended approach should be utilised

## 5.4 Review of methods used to identify bottlenecks in health care systems

In order to improve HCOs the reach of the health system needs to be understood. When looking at improving efficiencies within the health system the need to reduce the need for funding and the way in which the financing of the health system is run is generally thought of as the immediate expected gain. However the focus can be shifted to utilising the same resources in a different manner to make equity or outcome gains, known as allocative efficiency. In order to establish a method by which to identify where existent bottlenecks are, and where efficiency gains can be made, three models are analysed, namely the Tanahashi, Tugwell and Piot-Fransen models. The Tanahashi model proposes a method by which to identify bottlenecks in health care coverage, whilst Tugwell attempts to address effectiveness. An interesting approach taken by Blas and Kurup [2005] is to consider the Tanahashi-Tugwell method, which combines analysis of coverage and effective coverage. This study proposes to utilise the Tanahashi-Tugwell method with an adaptation to the Bergman *et al.* [2011] process of care along with the Piot-Fransen model as resources to analyse health system bottlenecks. The use of the four models collectively is

due to the manner in which they correspond and expand on one another thus ensuring a wholesome understanding of how, in this study, a bottleneck is to be identified. An overarching motivation for the selection of each model is due to the fact that these models, when looking at effectiveness and efficiencies, are advocated for by the WHO who are seen as a world leader in terms of shaping health systems thinking [O'Connell and Sharkey, 2013] [Tanahashi, 1978] [Hudson, 2001].

The sections to follow outline the Tanahashi-Tugwell method (Section 5.4.1), the health care process (Section 5.4.2) and the Piot-Fransen model (Section 5.4.3), to be utilised when carrying out the bottleneck analysis. A large amount of work has been done on developing tools and processes to reduce inefficiencies in the health system, but this tool hopes to improve allocative efficiencies in achieving specific HCOs. This tool effectively hopes to serve as a quantitative or formalized measure by which to identify a starting point to focus efforts when addressing specific HCOs. The resultant approach aims to do this by establishing the point at which the bottleneck in the health care process is found. Thereafter the weaknesses in the health system can be addressed relative to this bottleneck. This approach is taken due to extensive existent work done on identifying inefficiencies in the health system. It is thought to be a valuable contribution to establish a way in which to identify the specific point in the health care process where weaknesses can be improved upon. It must be noted that eliminating inefficiencies or waste and improving efficiency is not necessarily the same, this must be kept in mind when addressing factors surrounding the bottleneck identified.

### 5.4.1 Tanahashi-Tugwell Model

Tanahashi defines five stages, from the perspective of service delivery, that lead to a successful health intervention, namely: availability coverage, accessibility coverage, acceptability coverage, contact coverage and effectiveness coverage [Tanahashi, 1978]. The aim of the model is to propose an approach by which to evaluate coverage and thus address the stage at which bottlenecks can be identified, in terms of the five stages of coverage defined. In order to do this Tanahashi classified measurements of coverage and suggested there to be a cascade of coverage, as illustrated in Figure 5.4.

The figure includes easy to understand phrases of each of the five stages as termed by Tanahashi. Coverage is generally defined as the proportion of the target population which can receive the service. With potential coverage being the number of people for whom the service can be provided, whilst actual coverage is the number of people whom received the service. It must be noted this can refer to specific coverages which will define the target population as determined by the specific service being analysed.

Tugwell *et al.* [2006] looks at efficacy, being how well an intervention can work in ideal circumstances, and four factors where the population can be lost

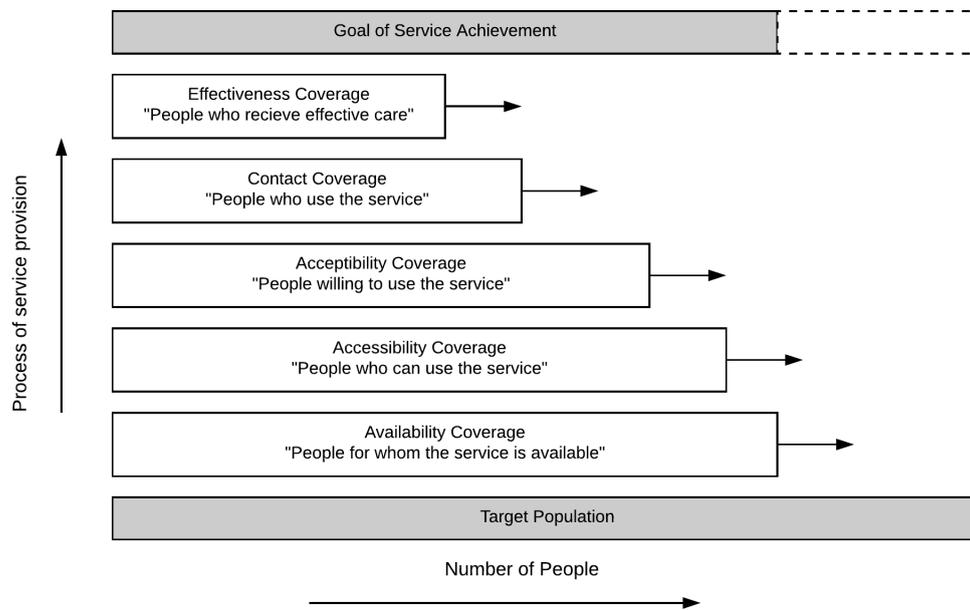


Figure 5.4: Coverage diagram- illustrating relationships between the process of service provision and coverage measurements [Tanahashi, 1978]

Figure 5.5: Decreasing effectiveness across four factors using hypothetical estimates adapted from Tugwell *et al.* [2006]

at each step, namely: access; diagnostic accuracy; provider compliance; and consumer adherence as illustrated in Figure 5.5. The Tugwell model illustrates how there is a staircase effect by which a percentage of the population are lost at each step between factors. Tugwell cites this effect to be significantly worse amongst poorer populations, to illustrate this, Tugwell analyses malaria and osteoarthritis and compares the outcomes of each wealth quintile, illustrating the way in which wealth quintiles impact health equity [Tugwell *et al.*, 2006]. The Tugwell method uses a simple multiplicative model, which assumes that individual factors are not highly correlated, whilst the Tanahashi method uses a cascade (a percentage conditional on a previous proportion).

The Tugwell-Tanahashi model is developed by using the Tanahashi and Tugwell models in conjunction. Where Tanahashi cites effectiveness and Tugwell cites access do the two merge to add a level of detail to the analysis as illustrated in Figure 5.6 [Blas and Kurup, 2005]. The Tanahashi-Tugwell model is in effect an all inclusive analysis of a health system as it analyses both health coverage and coverage effectiveness.

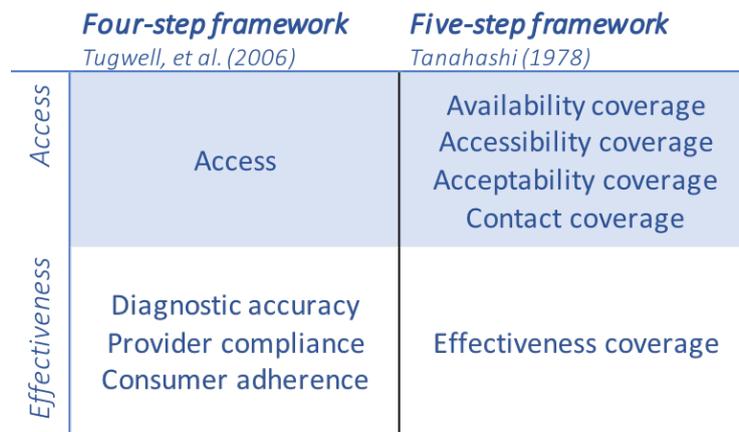


Figure 5.6: Tanahashi-Tugwell model [Blas and Kurup, 2005]

### 5.4.2 Healthcare processes

Bergman *et al.* [2011] cited five main processes in health care from a citizen perspective. The Bergman *et al.* [2011] model is chosen as this was the only high level process for that of the health system found, and this model aligns closely with that of the Tugwell and Piot-Fransen models. The choice to investigate these processes is made to aid strategic planning for HCO by outlining a process wherein bottlenecks can be identified. In other more specific health care process flows the added details and feedback loops takes away from the clear depiction of the process flow as given by Bergman *et al.* [2011]. In order to address HCOs it is important all steps in the health care process are targeted and supported by actors and the health system. The process developed by Bergman *et al.* [2011] is made up of: Keeping healthy; Detecting health problems; Diagnosing diseases; Treating diseases; and Providing for a good end of life as illustrated in Figure 5.7. The primary motivation for discussing the Bergman model is to illustrate the process flow to allow for a clear understanding of the impact of improving a bottleneck in this process, the Tugwell model is much the same however does not use a process flow in the same way Bergman does. It is thought the process flow depiction allows for a clearer visualisation and understanding of identifying a bottleneck, as bottlenecks are generally associated with process flows.

Figure 5.7: Processes in health care [Bergman *et al.*, 2011]

### 5.4.3 Piot-Fransen Model

When utilising the process of care to understand the health system and the treatment the population are accessing or utilizing, the Piot-Fransen model is an interesting model to reference and can be seen as a hybrid model of the models discussed in Sections 5.4.1 and 5.4.2 respectively. The Piot-Fransen model is very case specific and can be utilised to identify the outcomes of each process of health care, the example included from the WHO 2001 bulletin shows the results for STIs [Hudson, 2001]. This model can be used to understand at which point in the health system patient outcomes are poorest, or where the biggest losses occur. In a perfect model all those with STIs should receive effective treatment, however this is never the case therefore this model assists in visualising the actual outcomes. This model illustrates the outcomes in respect to the preceding process of care population thus shows the loss from one phase to the next. The use of the Piot-Fransen model is advocated for as it is a useful tool for clearly illustrating final outcomes and results of a specific ailment.

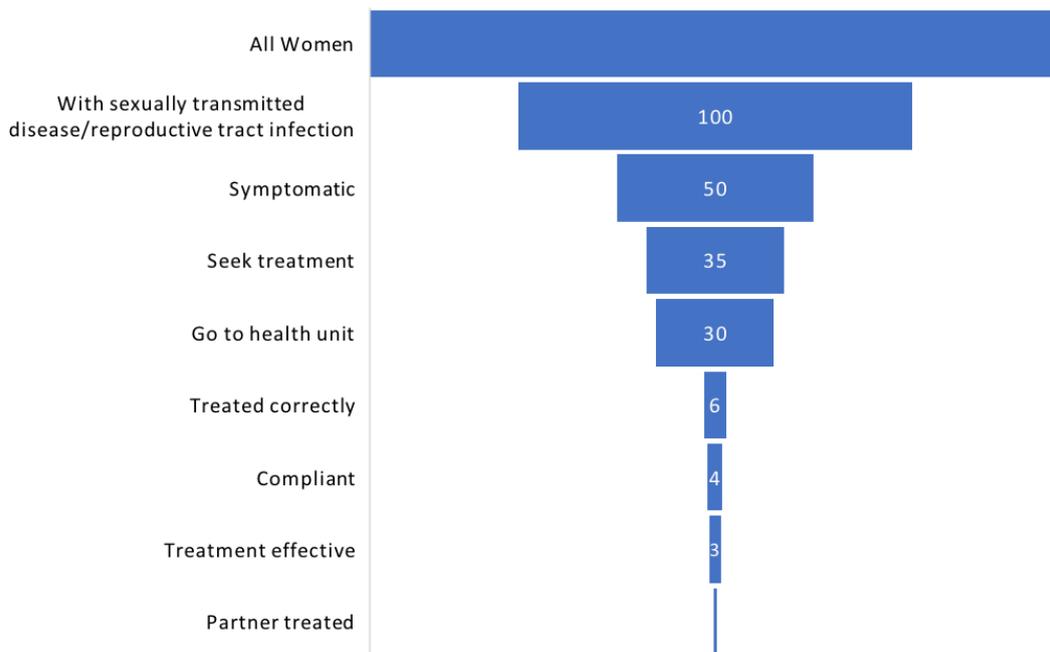


Figure 5.8: Example of the Piot-Fransen Model looking at STIs [Hudson, 2001]

## **5.5 Conclusion: Building an approach: Improving the understanding of health systems**

The need for an approach to interpret and understand health systems and their complexities is introduced in this chapter. TOC and the components of a health system, such as stakeholders and health determinants are elaborated on in order to establish factors to consider when making outcome improvements. The point in the CHIP process where the resultant approach aims to contribute toward is highlighted. Thereafter the methods to be utilised to analyse efficiencies in health systems and the process in which bottlenecks will be identified are discussed and the parallels between these methods are made evident. The chapter to follow describes the resultant approach to be followed in order to identify bottlenecks in health systems.

## Chapter 6

# Health Systems analysis approach

In order to utilise the identification of factors influencing health systems in a useful manner the following approach has been designed to identify the point at which the health system at a district level is failing. The insights gained from the above mentioned models are utilised to develop the following approach, as summarised in Figure 6.1.

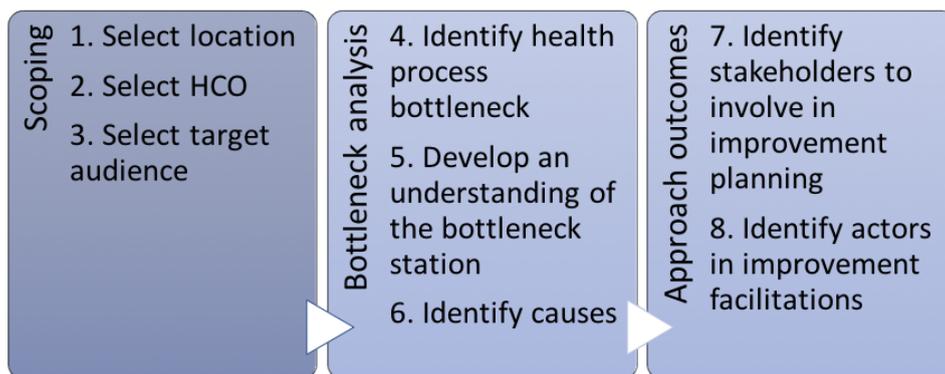


Figure 6.1: Health systems analysis approach.

### 6.1 Select a physical area or location

This step allows for scoping in order to define the boundaries of the study to allow for contextual factors to be investigated. By reducing the study to a province and her districts it makes for a more manageable study due to the smaller data set and thus the improved ability to interpret the data. This focus also reduces the diversity of contextual factors found, or at least the ability to identify diversities or inequalities in a more manageable way by interpreting and understanding the dynamics of the districts.

## 6.2 Select Healthcare outcome or area

Selecting the HCO or area of interest is arguably responsible for shaping the study more so than selecting the physical area or location. The HCO selected will fall into one of the six SDG categories discussed in Section 3.4.9, namely: Infectious diseases; Reproductive, Maternal, Newborn, Child and adolescent health; NCDs; Mental health and substance abuse; Injuries and violence; and Other. With other being the catch-all, where ideas such as health security falls in. Selecting a specific ailment, cause of death or disease is recommended as it allows one to process a more manageable data set as well as reducing the system complexities and diversity found. This allows for one to more accurately identify areas which may be influencing the HCO being discussed.

When selecting a specific disease or healthcare area two reasons are identified to mould this decision, namely: the purpose of the study; or the data available. Some studies are carried out with a sole focus on a specific disease and thus can proceed as planned, collecting data as necessary or making room for the fact that there may be a lack of data and working this into findings. Whilst others, with more general purposes, such as investigating a SDG category, the availability of data may shape the focus of your study. O’Connell and Sharkey [2013] discuss the idea of a tracer intervention which, in order to make a study more manageable and systematic, addresses an intervention which is a representative of a set of interventions. In this case a tracer can be seen as a specific disease to be investigated as a representative of the SDG category of interest. Furthermore a tracer can be an indicator within a disease area that can be used to represent the whole disease as there are many aspects and services to deal with the same type of issue. Due to the quality and availability of data found in SSA, the tracer can then be preselected and data can be collected or the tracer can be selected according to the data available. By selecting a specific healthcare outcome you are essentially facilitating the establishment of an understanding of health system components in terms of this outcome.

## 6.3 Identify population at risk and process of care

By narrowing the scope according to the above two steps it allows for one to identify the population at risk of contracting the said ailment and further understanding and establishing the process of care linked thereto. Identifying the population at risk is of importance specifically when it comes to gender specific areas of investigation or relating to children. In some instances when addressing a community outlining the specific target demographic may be necessary. By outlining the process of care the areas which need to be investigated can be tackled with more clarity by having an established process and structured

manner by which to investigate what influences the final outcome of the disease. It must be noted at this point the process of care is merely acknowledged and not discussed. The grouping of target population and process of care are due to the fact that the target population will change at each step of care, as summarised in Table 6.1. Grouping the target population and process of care follows the Piot-Fransen Model which assess the way in which the target population changes for each step of care [Hudson, 2001]. The process of care is adapted from Figure 5.7 and includes: prevention or keeping healthy; contact with care; diagnosis; treatment; and adherence or follow up. Again it must be noted that the process of care analyzed can be subject to the data that exists and that is measurable.

Table 6.1: Population associated with step of care.

<b>Process of Care</b>	<b>Target Population</b>
Prevention/Keeping Healthy	Population able to contract illness. (ie Cervical Cancer will consider the female population)
Contact with care	All Population
Diagnosis	Population which accessed care
Treatment	Population diagnosed with illness going on to receive treatment
Adherence/Follow up	Population which leave treatment who require follow up care or medication

## 6.4 Interpret available data to identify bottlenecks

The availability and quality of data found in SSA is not found to be fully reliable thus it is recommended to collect the data available and relevant to the scope identified in the preceding steps and thereafter establish a method by which to interpret the data in a meaningful way. A basic rule to follow would be to access data which aligns with the health care process discussed and use this to identify which area of the process is performing the most poorly and delve into this. Having established the data set available relating directly to the topic at hand, complementary data may be used, if available, to support arguments or describe the context further. However at this point it is recommended to analyse specifically data linked to the healthcare process, as often the specificity of it may be more difficult to come by than complementary contextual data. It is at this point that the Tanahashi-Tugwell or Piot-Fransen models can be followed if deemed of interest with respective data availability.

The choice to not stipulate the data analysis method to be followed is due to the unreliability of data availability.

## 6.5 Discuss process of care identified as the bottleneck

In order to understand the bottleneck identified in the previous section, further analysis of data surrounding the bottleneck identified is recommended. The investigation of data not only directly relating to the bottleneck identified but data relating to the population or geographic area (contextual factors) should be evaluated. It is imperative an indepth understanding of the process of care where the bottleneck has been evaluated is comprehensively understood in order to best identify factors attributing to the poor performance. In some cases data interpreted to identify the bottleneck may have been summarised in order to give a higher level result or comparison, therefore the original data set should be analysed with regards to the said bottleneck. The process of care identified as the bottleneck needs to be understood at a deeper level in order to be understood in relation to its standing in the context which it is found. The manner in which this understanding is gained is variable and will largely rely on the data available, it is therefore difficult to make a set recommendation of how to process data at this point in the approach. The purpose of this phase to be understood is merely the elaboration of available data on the selected bottleneck to ensure the best possible understanding of the process of care selected is gained. For example, where data estimates and averages have been used until this point, where possible use the data sets which supplied these averages. As seen in the case study to follow, provincial data was used to identify the bottleneck thereafter district data for the bottleneck was analysed to give a more accurate result of the state of the system.

## 6.6 Discuss factors which could be the cause of poor performance of the identified bottleneck

Using the health care framework analysis done in Chapter Two identifying health care components Table 6.2 is developed. This table lists the health care components which are found to be common barriers to the respective healthcare process step. The synthesis of this table is made from looking at the health care frameworks and the systematic literature review, in Chapter Three. It is important to note that when areas such as poor facility management is listed in order to fully unpack this topic a framework which addresses facilities such as the Organizational Assessment by Lusthuas *et al.* [2002] should be

consulted. It can be said the responsibility of screening, prevention, contact with care and adherence falls mostly with the population and are affected more by determinants of health. Whilst diagnosis and treatment are influenced more so by health system factors or structural elements. It is important to acknowledge that in the health process described down stream factors need to be considered as they will have an influence on the upstream results, for example not taking preventative care measures would influence the number of those falling ill and seeking care.

When determining factors causing poor performance supporting data is a useful resource to make use of to make inferences therefrom. However some factors may not be able to be proved by supporting data but may be listed as areas to investigate. It would be of the researchers best interest to understand the area which they are investigating, for example rural and urban, or the primary industry found. These can give an idea of factors to consider such as in the mining areas levels of HIV/Aids may be higher due to the number of men living away from their wives [Singer, 2011].

As a closing comment to this section, it is difficult to prove any such causes from data sets alone, thus the purpose of this section is to direct further investigations. This section hopes to give stakeholders a starting point of areas to investigate and an indication of what questions they should be asking and to who.

Table 6.2: Common barriers associated with respective stages in the health care process

Stage	Common barriers	Frameworks to consider
Prevention or Screening	<p><u>Social and economic environment:</u>  Education  Economic status and resources  Physical environment:  Exposure to risks (ie malaria area)  Healthy environment  <u>Individual characteristics and behaviours:</u>  Demographics such as gender, age or marital status  Self care  Health behaviours and beliefs  Availability and nature of screening or preventative services  Prevention and screening strategies and policies  <u>Other:</u>  Disease specific initiatives</p>	<p><u>Sub-Frameworks, specifically those relating to health behaviour and health promotion (refer to Section 2.2.2):</u>  Framework for health promotion [Epp, 1987]  The health belief model [Rosenstock, 1974]  DPAS [WHO, 2008]  These frameworks give an idea of the behaviours that influence prevention and keeping healthy behaviour.  <u>Health System frameworks (refer to Section 2.2.1):</u>  Framework for assessing behavioural healthcare [Aday <i>et al.</i>, 1999]  A behavioural model of health services use [Andersen, 2008]  WHO Health Systems performance [Murry and Evans, 2003]  Strengthening Health Services Framework [Peters <i>et al.</i>, 2009]  A sub-Framework informing change in primary health service delivery [WHO, 2008]</p>

<p>Contact with care (Utilization)</p>	<p><u>Social and economic environment:</u>  Healthcare funding and financing  Economic resources  Autonomy  Gender (decision making rights)  Family size  Physical environment:  Access (physical)  <u>Individual characteristics and behaviours:</u>  Gravity of illness/symptoms  Faith in treatment  Health beliefs</p>	<p><u>Resource related frameworks (refer to Section 2.2.4):</u>  The framework comparing health spending and health outcomes in 15 EU countries  [Nixon and Ulmann, 2006]  Capacity Framework  [Mills <i>et al.</i>, 2006]  <u>Sub-Frameworks, specifically those relating to health behaviour (refer to Section 2.2.2):</u>  The choice making model [Young, 1981]  The health belief model [Rosenstock, 1974]  <u>Health System Frameworks (refer to Section 2.2.1):</u>  Framework for assessing behavioural healthcare [Aday <i>et al.</i>, 1999]  A behavioural model of health services use [Andersen, 2008]</p>
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Diagnosis	<p><u>Structural Elements:</u>  Type of facility (clinic, primary, secondary or tertiary, public, private)  Facility management and policies  HCW education, training and burden  Medical Resource availability (equipment available, technology being utilised)</p>	<p>Diagnosis relates more to expertise and technology available however quality of care and other indirect factors which could influence diagnosis may be considered.  <u>Hospital Frameworks (refer to Section 2.2.5):</u>  IDB and IDRC  Institutional and Organizational Assessment [Lusthuas <i>et al.</i>, 2002]  Baldrige Framework [Goldstein and Schweikhart, 2002]  WHO Euro Hospital Performance PATH [Veillard <i>et al.</i>, 2005]  <u>Health System Frameworks (refer to Section 2.2.1):</u>  Health System Building Blocks [WHO, 2007]  Framework for assessing behavioural healthcare [Aday <i>et al.</i>, 1999]  A behavioural model of health services use [Andersen, 2008]</p>
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Treatment	<p><u>Structural Elements:</u>  Type of facility (clinic, primary, secondary or tertiary, public, private)  Facility management and policies  HCW education, training and burden  Medical Resource availability (equipment available, technology being utilised)  Financing  Treatment policies and protocols</p> <p><u>Individual characteristics and behaviours:</u>  Gravity of illness</p>	<p><u>Resource-related Frameworks</u>  (refer to Section 2.2.4):  Capacity Framework [Mills <i>et al.</i>, 2006]  Healthcare framework efficiencies and institutions [Joumard <i>et al.</i>, 2010]  Hospital Frameworks (refer to Section 2.2.5):  IDB and IDRC Institutional and Organizational Assessment [Lusthuas <i>et al.</i>, 2002]  Baldrige Framework [Goldstein and Schweikhart, 2002]  WHO Euro Hospital Performance PATH [Veillard <i>et al.</i>, 2005]  <u>Health System Frameworks</u>  (refer to Section 2.2.1):  Health System Building Blocks [WHO, 2007]  Framework for assessing behavioural healthcare [Aday <i>et al.</i>, 1999]  A behavioural model of health services use [Andersen, 2008]</p>
Adherence	<p><u>Social and economic environment:</u>  Education  Financing  Autonomy</p> <p><u>Physical environment:</u>  Access (physical distance)</p> <p><u>Individual characteristics and behaviours:</u>  Individual characteristics (substance abuse)  Health beliefs (traditional medicine/spiritual healing)</p> <p><u>Structural Elements:</u>  Structures in place to encourage adherence (cellphone reminders)  Quality of service</p>	<p><u>Sub-Frameworks, specifically those relating to health behaviour</u> (refer to Section 2.2.2):  The health belief model [Rosenstock, 1974]</p>

## 6.7 Identify role players to involve in planning and change management

From the analysis of the identified bottleneck, making recommendations and planning for improvement have various constraints such as resources, in terms of funding, time and expertise. Thus it is thought that a more useful and applicable output would be to map whom should be held accountable or approached to plan for and implement improvements and tackle the bottleneck at hand. Similarly to Section 6.3 each stage of the process of care will have different members to hold accountable for the change, for example adherence is largely in the populations hands , whilst diagnosis is directly in the hands of HCWs or technology available. Table 6.3 links the role players listed in Table 4.1 to the processes of care to be used as a guide for acknowledging primary role players. It must be noted that this table is a guideline and stakeholders will vary (such as the governments role in prevention due to their involvement in taxing systems to discourage unhealthy habits such as smoking, or incentivized immunization projects). It is thought that governmental and private role players can be seen as secondary role players in most scenarios as they inadvertently control the other downstream role players. The role players can be placed on a scale of facilitation of the services and ownership or responsibility of the ailment.

Table 6.3: Role players associated with respective areas of care

<b>Process of Care</b>	<b>Primary Role players</b>
Prevention/Keeping Healthy	Individual, Community, Organizations (offering health promotion or prevention methods)
Contact with care	Individual, Community, Organizations, Private and Governmental
Diagnosis	Organizations, Functional/Interpersonal
Treatment	Organizations, Functional/Interpersonal
Adherence/Follow up	Individual, Organizations

## 6.8 Linking the approach to the health system complexities identified

The approach outlined to identify barriers influencing healthcare outcomes is seen to address the challenges highlighted in Section 4.1, Table 6.4 illustrates the steps in which the challenge is if not necessarily resolved, taken into consideration.

Table 6.4: Relation between challenges and the approach.

<b>Section:</b>	<b>4.4.1</b>	<b>4.4.2</b>	<b>4.4.3</b>	<b>4.4.4</b>	<b>4.4.5</b>	<b>4.4.6</b>	<b>4.4.7</b>
Challenge 1: The inability to comprehensively list factors influencing HCOs in a general manner.	X	X			X		
Challenge 2: Mechanisms affecting HCOs are context specific.	X	X					
Challenge 3: Understanding the complexity of SSA health care systems and challenging assumptions made in health care frameworks.						X	
Challenge 4: The silo mentality, not considering the full system.					X	X	
Challenge 5: Lack of collaboration in order to leverage efforts.							X
Challenge 6: Difficulty diagnosing the system bottleneck to effectively allocate resources and direct efforts.				X	X		
Challenge 6: Misalignment of stakeholders.							X
Challenge 7: Planners being too far removed.							X

## 6.9 Conducting Case Studies

The book written by Yin (2006), *Case Study Research: Design and Methods*, covers the topics of research strategy selection, case study design, data collection, collecting evidence, analysing evidence and reporting. This section follows the Yin logic by establishing an understanding of each topic and justifying, adapting and adopting methods to complete the case studies to follow.

Case studies are carried out in order to cover contextual conditions, finding

these conditions highly pertinent to the phenomenon of the study [Yin, 2006]. In the study at hand the contextual conditions are found to mould the results to a large extent thus justifying the use of case studies as a research strategy. Case studies additionally serve the purpose of applying a theoretical framework or methodology to a real-world instance, which is key to understanding the issues at hand by illustrating what the theory refers to in a tangible circumstance. Whilst Case studies are useful when results vary widely between settings they also are useful to gather evidence that is uniform across case studies which can then be used to generalise across cases.

In order to illustrate the applicability of the approach recommended in Section 6, an illustrative case study is carried out to populate and present examples of the outcomes of the approach. Yin [2006] states the distinctive need of case studies arises out of a desire to understand complex social phenomena and when there is no control over behavioural events. In this case a case study is used to understand the complexities of health systems, the context in which they are found and the way in which populations respond thereto.

Case studies rely on multiple sources of evidence with the convergence of data resulting in a meaningful output derived from the convergence, and benefit from prior development of theoretical propositions to guide data analysis. These points directly align with the methods, components investigated and outputs of the health system analysis approach described in Section 6.

In order to carry out a case study a five stage research model has been presented by Stuart *et al.* [2002]. This process is illustrated in Figure 6.2, with the adaptation of where each step in this process has been followed in this study, and how they address Yin's case study components. The five components of research design according to Yin [2006] have very clear links to that of Stuart's model.

In order to judge and manage the quality of case studies Yin [2006] defines the following four tests:

- Construct validity: establishing correct operational measures for the concepts being studied- supported by the health system frameworks reviewed;
- Internal validity: establishing a casual relationship, whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relations- combated by the restricted focus on speculation and the focus on encouraging stakeholders discussions, ie the focus on asking the right questions over establishing the final answers;
- External validity: establishing the domain to which a study's findings can be generalized;
- Reliability: demonstrating that the operations of a study such as the data collection procedures can be repeated, with the same results- managed

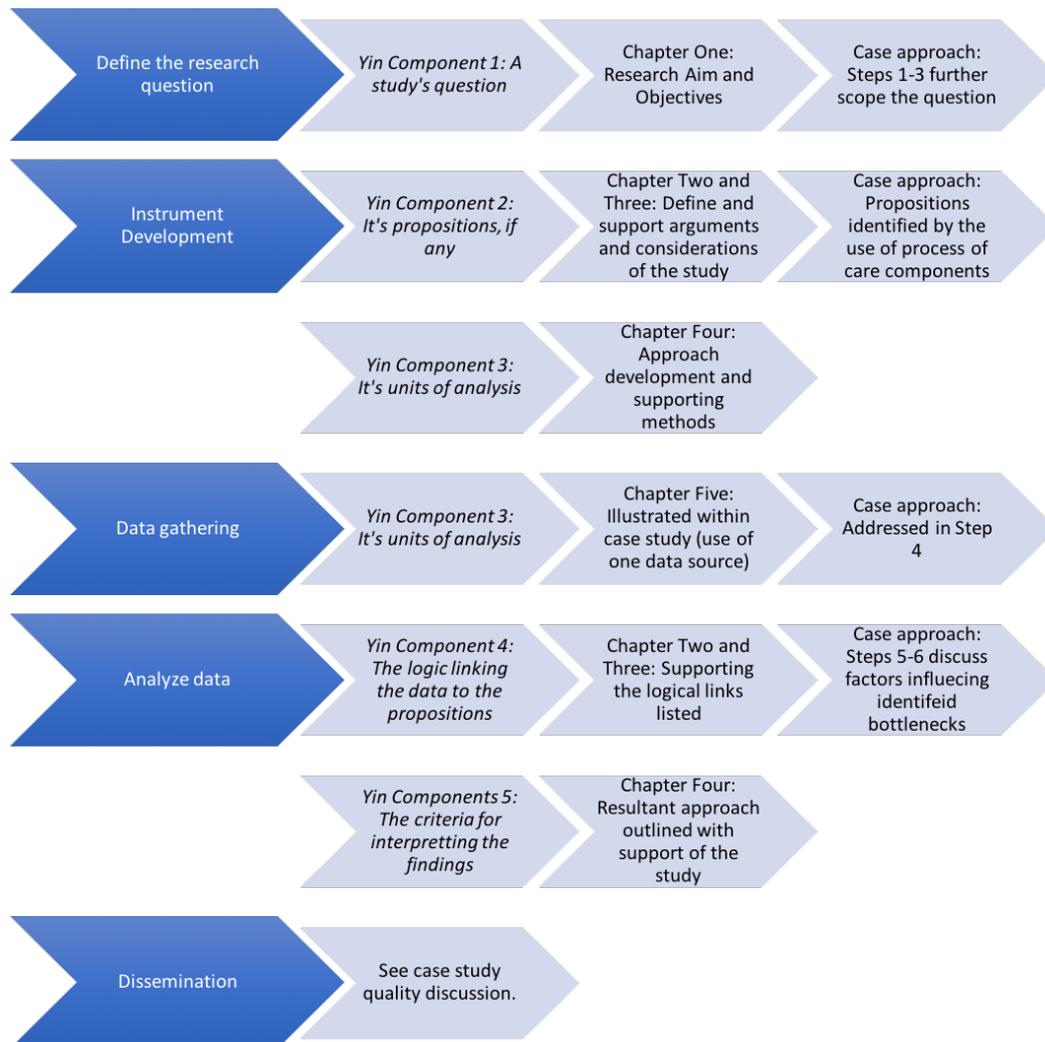


Figure 6.2: Stuart's research model process, supporting the case study design

by the approach outlined and use of the same data set if doing a multiple case studies.

Yin [2006] cites there to be four case study designs, single case and multiple case with each having either holistic (one unit of analysis) or embedded (several units of analysis). The cases at hand are defined as embedded case studies as each case considers process or subunits to be analysed, not only the overall singular unit.

The choice to carry out a single or multiple case study needs to be made and justified accordingly. The case studies to be carried out are intended as purely illustrative and not seen to develop theories or concepts therefore a single case or multiple cases could be considered.

Multiple case studies are seen to be more compelling and a more robust research method. Multiple case studies can be carried out in order to make

comparisons; for theory justification; or when there are more than one locations to be considered [Yin, 2006]. The choice of each case to be carried out should be selected carefully to serve the overall purpose of the study. When utilising multiple case studies effectively the results of the studies must be discussed in relation to supporting or opposing the proposed study framework.

The illustrative cases to be carried out may be used to illustrate the manner in which results may vary supporting the lack of a solid theoretical framework being developed. Thus it is proposed the case studies have differing contextual settings, and disease foci in order to illustrate the manner in which approach outcomes can vary, thus justifying the choice to develop an approach over that of a framework. A common concern for carrying out case studies is that of the little basis to provide for generalization, in this case that is the reason for carrying out case studies Yin [2006], due to the fact that generalizations should not be made and that each situation should be treated as unique.

## 6.10 Conclusion

The need for an approach to interpret and understand health systems and their complexities is introduced in this chapter. Thereafter the methods and logic used to develop the necessary approach is outlined and discussed resulting in the final approach suggested. The manner in which the approach will be illustrated and an understanding of carrying out strong case studies is established, which serves as a support to the approach validation. The chapter to follow will make use of an illustrative case study to demonstrate the outcomes of following the health systems analysis approach designed.

## Chapter 7

# Factors influencing the incidence, management and YLL to TB in the Western Cape, South Africa

A case study is carried out in order to address the high burden of TB in the Western Cape using data available in the 2016/17 District Health Barometer (DHB), an analysis is done to establish an understanding of these TB outcomes. The analysis follows the approach outlined in Chapter 4, and is thus detailed in the sections to follow. By using data strictly from the DHB [Massyn *et al.*, 2017] it is thought that continuity is established, at this point it is important to establish that the emphasis of the study should not be placed on the data presented but on the questions it leads one to ask, the areas it leads one to investigate and the inferences that can be made there from. The data is thus used to justify the arguments made and areas discussed but not seen as a focal point of the study.

### 7.1 Select physical area or location: Cape Town

The Western Cape is made up of six districts, namely: Cape Town Metro: CPT; West Coast: DC1; Cape Winelands: DC2; Overberg: DC3; Eden: DC4; and Central Karoo: DC5. Table 7.1 lists the districts along with the Total population found in 2017, the population density (persons per km<sup>2</sup>), wealth quintile and medical scheme coverage found in said district. This data set is selected in order to give a general overview of the district, in order to understand the setting, when necessary at a later stage other pertinent data will be investigated. The choice to list population and population density allows for the establishment of scale of the district and thus resultant reliance on health systems as well as a rough lay of the land, in terms of urban, rural as indicated by density. Highlighting the wealth quintile is of importance as

it is suggestive of the standard of living and resources available in the area. Finally the medical scheme coverage allows one to gain an understanding of what percentage of populations found are freely able and willing to access and utilise healthcare. At this point it is important to acknowledge that this data set is chosen to give a general understanding of the setting, and will not give a complete indication of the diversities and inequities which may be found in each district.

Table 7.1: Western Cape district demographic data.

District	Total population	Population Density	Wealth Quintile	Medical Scheme Coverage
CPT	4 070 914	1667.3	5	23.9%
DC1	447 580	14.4	5	16.3%
DC2	864 555	40.3	5	15.9%
DC3	292 494	23.9	5	16.8%
DC4	615 400	26.4	4	17.5%
DC5	74 453	1.9	4	13.3%

From the data set above CPT is clearly the most populated area, reflecting the fact that it is a metropolitan, with DC5 having a very low population density of 1.9 persons per km<sup>2</sup>. The population of DC5 is found to have the smallest district population in South Africa. The fact that all districts are found in the highest two wealth quintiles, in the South African context, is of great significance to the study, as this illustrates the study is not addressing the most poor or resource restricted districts of South Africa which will shape the outcomes of the study and must be kept in mind. However with this being said, the large income disparities are found in the Western Cape must be mentioned, thus it cannot be assumed that the populations' found within the district are in the wealth quintile classification of the said district. Finally the medical scheme coverage values are low across the board, being a province in the highest wealth quintile in South Africa this gives an indication of the poor coverage that can be found across the country. It is of interest to note the DC4 is currently a pilot district for the implementation of NHI. Furthermore these indicators can be said to be control variables. Control variables are necessary when doing a quantitative analysis as these are used in order to take into account the differences in the outcomes between the regions or can be attributable for specific outcomes within them.

## 7.2 Select healthcare outcome or area: TB

The choice to investigate TB is made for several reasons, firstly that although HIV/AIDS may be the leading cause of years of life lost (YLL) in most districts

of the Western Cape, TB comes a close second as illustrated in Figure 7.2, adapted from the DHB by Massyn *et al.* [2017]. The topic of HIV/AIDS is found to be somewhat saturated, as proven in Section 3.4.9, showing that nearing 25% of articles addressed HIV/AIDS whilst just over 5% of articles discussed TB thus influencing the choice to investigate TB over HIV/AIDS. A further reason to consider TB is the high comorbidity of people found with the overlap between TB and HIV. The choice to investigate TB over areas such as NCDs, which has lower coverage than that of TB is due to the data available. The data set addressing TB is found to be closer to a complete set of data and includes data found to be pertinent to the study at hand. It is also found of interest to study TB as the data sets are found to be two fold, as they are recorded for both TB and drug resistant TB (DRTB), thus the analysis can utilise two sets of data as a manner of validation or safeguarding of poor or inaccurate data sets.

### **7.3 Identify target population and process of care**

Having selected TB in the Western Cape, the scope is defined and the target audience is identified as the population of the Western Cape and due to the nature of TB, does not exclude any population groups, acknowledging that some groups may be affected more than others. The process of care relating to TB and DR TB in the Western Cape following the prevention, contact with care, diagnosis, treatment, adherence process map is adapted and assigned the respective population groups in Table 7.3.

### **7.4 Interpret available data to identify bottleneck**

The 2016/17 DHB lists the following data sets pertaining to the topic of TB:

- TB symptom 5 years and older screened in facility rate
- TB client initiated on treatment rate
- TB/HIV co-infected client on ART rate
- TB client treatment success rate
- TB client loss to follow-up rate
- TB death rate
- TB rifampicin resistance confirmed client rate

CHAPTER 7. FACTORS INFLUENCING THE INCIDENCE, MANAGEMENT AND YLL TO TB IN THE WESTERN CAPE, SOUTH AFRICA 123

Table 7.2: Ranking of 20 Leading causes of YLLs in the Western Cape, 2015 adapted from Massyn *et al.* [2017]

Cause of YLLs	District					
	CPT	DC2	DC5	DC4	DC3	DC1
HIV/AIDS	1	1	1	1	3	2
TB	3	2	2	2	1	1
Lower respiratory infections	10	11	8	8	9	8
Cerebrovascular disease	6	4	6	4	5	3
Diarrhoeal diseases	18	17	18			
Ischaemic heart disease	4	3	7	3	2	4
Diabetes mellitus	9	9	10	10	11	9
Road injuries	16	16	3	9	7	
Accidental gunshot	2	13			18	12
Hypertensive heart disease	17	19	13	15	14	14
Interpersonal violence	5	5	5	7	6	5
Nephritis/nephrosis	11	10	11	11	13	13
Accidental threats to breathing	12	8	12	12	10	11
Preterm birth complications	14	18	16	13	17	19
COPD						
Meningitis/encephalitis	20					
Septicemia				18		
Endocrine nutritional, blood			20			
Asthma			15	20		18
Epilepsy						
Sepsis/other newborn infections						
Peptic ulcer						20
Prostate						
Malaria						

- TB rifampicin resistant confirmed treatment start rate
- Drug-resistant TB treatment success rate
- Drug-resistant TB client loss to follow-up rate
- Drug-resistant TB client death rate

The data for the most part lists a target amount, the amount in South Africa as a whole, the value for each province and then is further given per district. This data is sorted graphically to illustrate the provinces and districts which are performing from best to worst and illustrate which provinces are meeting the targets. Due to the fact that the Western Cape only meets the target for TB death rate it is found unuseful to use targets to direct the focus

Table 7.3: Population associated with the TB Process of care

Step in process	Target Population
Prevention (Screening or keeping healthy)	Population at large
Contact with care	Population with TB like symptoms
Diagnosis	Population with TB like symptoms whom accessed healthcare
Treatment	Population diagnosed with TB or DRTB and their strains
Adherence (Loss to follow up)	Population which initiated treatment

of the study, therefore benchmarking against other South Africa provinces is used to gauge performance. Due to the fact that there are 9 provinces they are split into three bands consisting of three provinces each, namely the: top performers, mid performers and poor performers, the performance rankings of the Western Cape is illustrated in Table 7.4.

Table 7.4: Performance of the Western Cape TB indicators

Performance Band	Indicator
Poor Performer	Drug-resistant TB treatment success rate
	Drug-resistant TB client loss to follow-up rate
	TB client loss to follow-up rate
	TB/HIV co-infected client on ART rate
Mid performer	TB client initiated on treatment rate
	TB client treatment success rate
	TB rifampicin resistant confirmed treatment start rate
Top performer	TB death rate
	Drug-resistant TB client death rate
	TB rifampicin resistance confirmed client rate

Note: The indicator "TB symptom 5 years and older screened in facility rate" had no data available for the Western Cape, this does not lead to the assumption that it is a bottom performer but to the recommendation that such data need be collected in the future.

From this classification it is interesting to note that although TB is one of the highest causes of YLL in the Western Cape it is found to have the lowest death rates of TB nationwide. This could be as a direct result of the high loss to follow up results, as the death rate is the number of patients that died

whilst on treatment. Thus the patients lost to follow up are not represented in this death rate.

### 7.4.1 Piot Fransen Analysis of TB

As described in Section 5.4.3, the Piot-Fransen Model is used to identify where the greatest drop off is, or where in the system do the most patients fall out of the system, or the most unsatisfactory results are found based on the process of care found prior. This helps give an understanding to the statistics presented as it shows the results with respect to the previous step of care. The Piot-Fransen models in figure 7.1 and 7.2 are derived from the data available in the 2016/17 DHB.

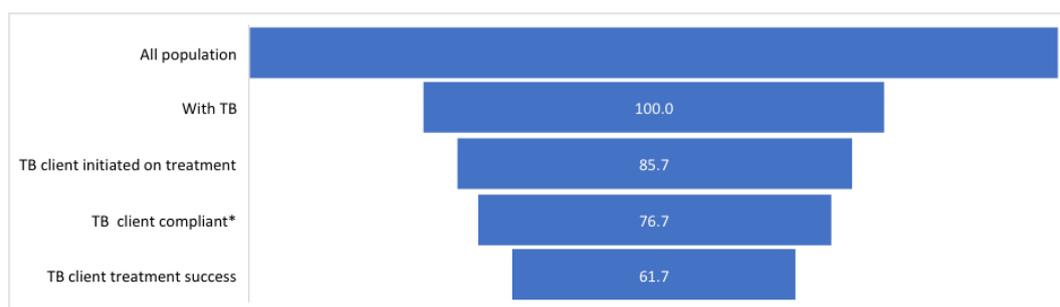


Figure 7.1: Piot Fransen Model of TB in the Western Cape

### Piot Fransen Analysis of DRTB

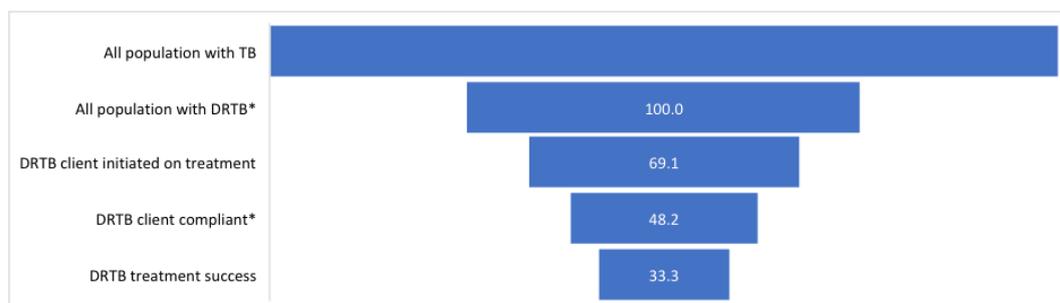


Figure 7.2: Piot Fransen Model of DR TB in the Western Cape

\*TB client compliant, this is the inverse of loss to follow up and is calculated by:  $(\text{TB client initiated on treatment}) \times (1 - \text{Loss to follow up percentage})$

\*\*It must be noted that only 5% of Mycobacterium TB cases carried out are found to test positive for DR TB. Therefore it must be noted for the purpose of the Piot-Fransen model to illustrate the drop off between phases the initial population found with DR TB is 100%; however it must be remembered that

this is only 5% of people which have Mycobacterium TB .

From the Piot-Fransen models; the area which experiences the highest drop off is between the total population with TB or DR TB and the initiation of treatment. Whilst the drop-off between client compliance and treatment success are not as large as treatment initiation they are still found to be significant. Appendix D includes the Piot-Fransen Models for the results found overall for South Africa, as well as the target results. Interestingly the target results anticipate the greatest drop off to be treatment success, this is in part due to the fact that the client initiated on treatment target was not given and is therefore assumed to be 100%. When looking at the South African Piot-Fransen model the greatest drop off is also found to be initiation of treatment.

As discussed in Section ?? the interpretation of the data available will not always be subject to a single method of analysis as the data available will not be consistent over all fields, especially when existing data is being used in the absence of specifically collected data. For the purpose of this case study the decision is made to investigate the areas highlighted as the poorest performers when compared to the other districts. This choice is made as the aim is to recognise bottlenecks specific to the area being analysed. The fact that client treatment initiation is found to be the bottleneck country wide this can be investigated at a country level, whilst the treatment initiation found in the Western Cape is also found to be poor compared to other areas in the country it is seen as a mid performer in this area (as listed in Table 7.4).

## **7.5 Discuss process of care identified as the bottleneck**

From the poor performer indicators identified the decision is made to investigate loss to follow up as it appears as a problem for both TB and DR TB, as well as DR TB treatment success rate. Another avenue which would be of interest to investigate is that of prevention or screening, as the lack of data is a red flag, however due to the lack of data this will be discussed more so than analysed.

### **7.5.1 DR TB treatment success rate**

This indicator illustrates the number of patients, with drug resistant TB, which completed treatment or were cured. Figure 7.3 graphically illustrates the results of the districts found in the Western Cape, this shows that half of the districts are nearing on meeting the target whilst Overberg, the West Coast and Eden fall far below meeting the target.

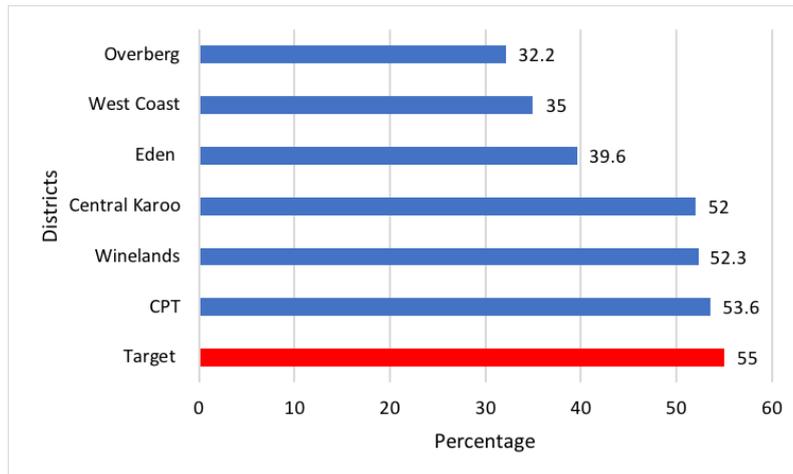


Figure 7.3: DR TB Treatment success rate

### 7.5.2 Loss to Follow up

This is the proportion of TB patients whom sought treatment, who interrupted treatment for two or more consecutive months. It is vital to minimise loss to follow up in order to minimise TB transmission and the development of DR TB. The loss to follow up proportions found in five of the six districts are significantly greater than the target proportion, with Central Karoo performing the worst with almost three times the proportion of loss to follow up, as illustrated in Figure 7.4.

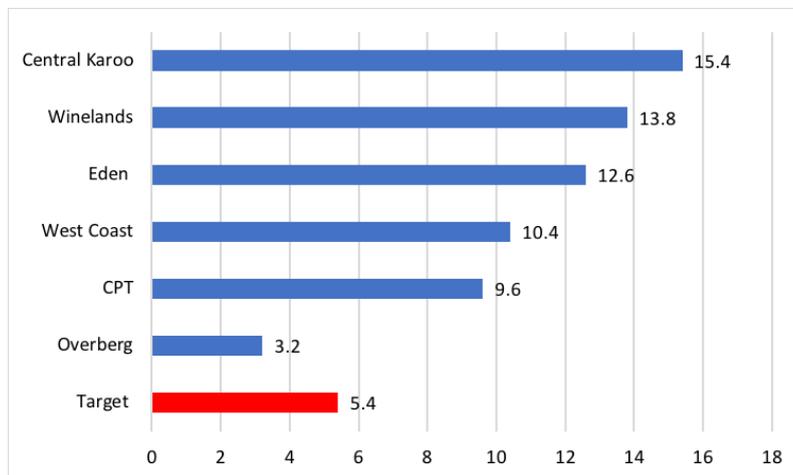


Figure 7.4: Loss to Follow up

### 7.5.3 DR TB Loss to Follow up

This is the proportion of DR TB patients who interrupted treatment for two or more consecutive months. In Figure 7.5 one can see that all districts are significantly greater than the target and thus need improvement, with Overberg being the poorest performing district having double the proportion of the target.

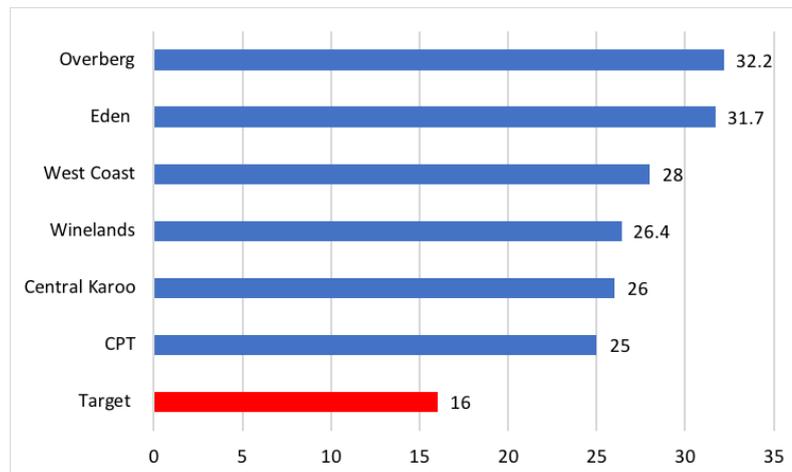


Figure 7.5: DR TB Loss to follow up

At this point it must be noted that an alternative analysis to be followed could have been to analyse the most populated district, namely the Cape Town Metropolitan, and discuss the areas which it is not meeting the targets. This approach would be done as it would possibly have a larger improvement impact due to the higher volume of patients found in these areas. However in the case of TB where most indicators do not meet targets it is more difficult to identify the bottlenecks effectively.

## 7.6 Possible factors causing poor performance of the identified bottlenecks

In order to improve the results presented in Section 7.5 to take the Western Cape out of the poor performance band compared to other South African provinces one needs to discuss the possible causes behind these poor results.

### 7.6.1 DR TB Treatment Success rate in the Overberg District

In order to understand the treatment success rate requires one to analyse the facilities present in the Overberg District and the medicines being used to treat

TB, data for which is unavailable from the DHB dataset.

#### *Health System Factors*

The Overberg district is found to have 4 district hospitals and 18 clinics in the area with 255 community health workers. When utilising CHWs it is important to ensure they have received some training. Interestingly Overberg is found to be in the top 10 country wide when it comes to expenditure on PHC and district health.

#### *Social Determinants*

When looking at the contextual factors, it is difficult to understand why patients completing treatment would not be cured. HCWs at the clinics found in the Overberg district should be interviewed to hear their hypothesis for why treatment may be unsuccessful in their experience.

One reason which can be taken from the DHB report is that of comorbidity with HIV/AIDS. The TB/HIV on ARVs in Overberg is found to be the highest country wide. The points to note are that patients adhering to the DR TB treatment regime and not being successfully treated, thus the treatment plans and medicines being used must be investigated. Education of HCWs should be investigated to ensure they are trained to treat DR TB effectively.

It is possible that patients reach health systems once they are too sick, or do not take the necessary care of themselves whilst on the treatment. When looking at the burden of disease graphics in the DHB report, TB is only listed as affecting those between the ages of 15-24 and 25-64 years of age, this is of interest as it shows the disease is not found to affect infants or the elderly in this area. One final comment to note is that the treatment success rate for DR TB was only collected for the years 2014 and 2015 thus the need to continually collect this data is raised.

### **7.6.2 Loss to Follow up in the Central Karoo District**

When analysing the Central Karoo profile supplied by the DHB the areas of interest to consider for loss to follow up are: economic status, education, employment and access, as these areas are both listed as common barriers and have data presented in the DHB report.

#### *Health System Factors*

When looking at access, looking at the distribution of facilities found in Central Karoo the reason for loss to follow up becomes clear, there are very few facilities and they are spread far and wide over the province, thus are possibly not easily accessible to all TB patients. There are 8 clinics, 4 district hospitals and one other hospital found in this region, it is important to recognise the low density and population found in this area, thus the solution may not be to build more or new clinics but to look into innovative ideas such as a travelling pharmacy.

With 40.8% female headed households, it could be compounding the loss to follow up problem as women may not have the necessary resources at their disposal to revisit the health centres, or may not have the autonomy to revisit the health centres.

Central Karoo is found to be in the lowest 10 districts when it comes to health expenditure per capita, this is particularly poor seeing that Central Karoo has such a low population, thus showing how little budget is being utilised on health in the district. This lack of investment into health is further compounded by the fact that the medical scheme coverage is found to be the lowest in the province at 13.3%. These figures indicate the need to increase investment in the district.

#### *Social Determinants*

Central Karoo is in the fourth wealth quintile, the unemployment rate is 23.1% , population with a Matric is 29.5%. None of these is alarmingly poor, however education should be higher.

### **7.6.3 DR TB Loss to Follow up in the Overberg District**

#### *Health System Factors*

The estimated medical scheme coverage in the area is found to be 16.8% which is very poor, thus could be a barrier to people pursuing healthcare after their initial interaction. The Overberg district is found in the highest socio-economic quintile, and has some of the highest PHC expenditure country wide, therefore funding should not be an issue.

#### *Social Determinants*

The level of education (27.7%) and female headed households (31.9%) are not found to be particularly suggestive of why the loss to follow up rates are so poor. Thus the primary sector in Overberg is investigated, this being Agriculture, Forestry and Fishing. This sector could be suggestive of unequal distribution of wealth in the area, but also of the lay of the land and the accessibility of health centres. When looking at the Swellendam and Cape Agulhus sub-districts, the health centres are spread far and wide, making them more difficult to access.

Finally the lack of successful treatments of DR TB could be seen as a barrier to the follow up of DR TB as, if the population do not see the value in receiving treatment they will not prioritise or make efforts toward accessing follow up care.

The data found in the Overberg district raises some concern as DR TB treatment success rate; DR TB client loss to follow up; DR TB client death rate are all three recorded as 32.2 which whilst it is possible it is suspected as inaccurate as it makes Overberg to perform the worst in two out of the three categories. This is not and confirmed but it does raise room for concern.

## **7.7 Identify stakeholders to involve in planning and change management**

The Overberg and Central Karoo districts are identified to have some of the poorest results when it comes to TB, as discussed in preceding sections. In order to remedy these outcomes the state and contextual factors of the districts are discussed and areas to be investigated as possible problems are highlighted. In order to correct these stakeholders and role-players within the system are identified.

### **7.7.1 Overberg**

The Overberg district struggles with successful treatments and loss to follow up, therefore the ownership is found to lie with the patients and their supporting networks whilst there are system factors at play which need to facilitate the improvement of the system to allow for patients to effectively utilise and access it. Figure 7.6 illustrates the role-players and where they fit on the scale of ownership and facilitation of care.

### **7.7.2 Central Karoo**

The Central Karoo District faces large loss to follow up results, thus putting the responsibility largely with the TB patients. It is important to note the role-players whom facilitate follow up care in order to establish who should be involved in helping those whom are responsible for seeking follow up care. Figure 7.7 lists these role-players and positions them according to their role as facilitators or primary owners of seeking follow up care.

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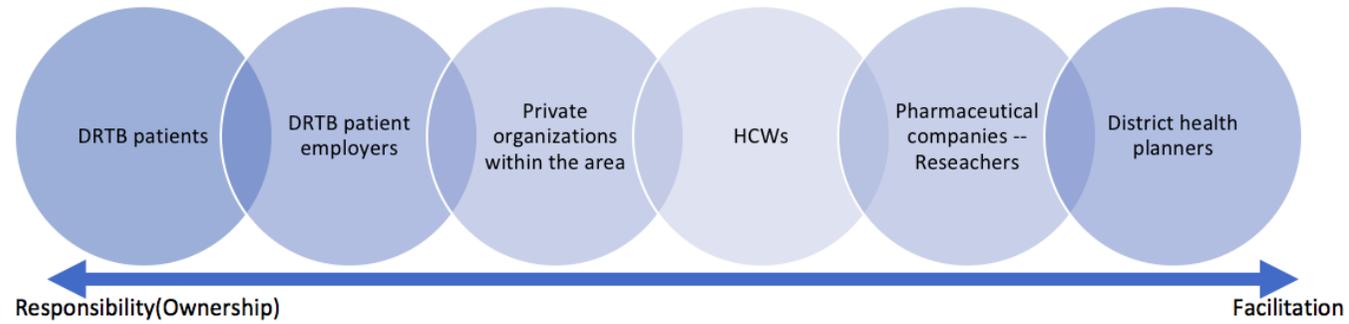


Figure 7.6: Responsibility and facilitation role-players of TB in the Overberg district

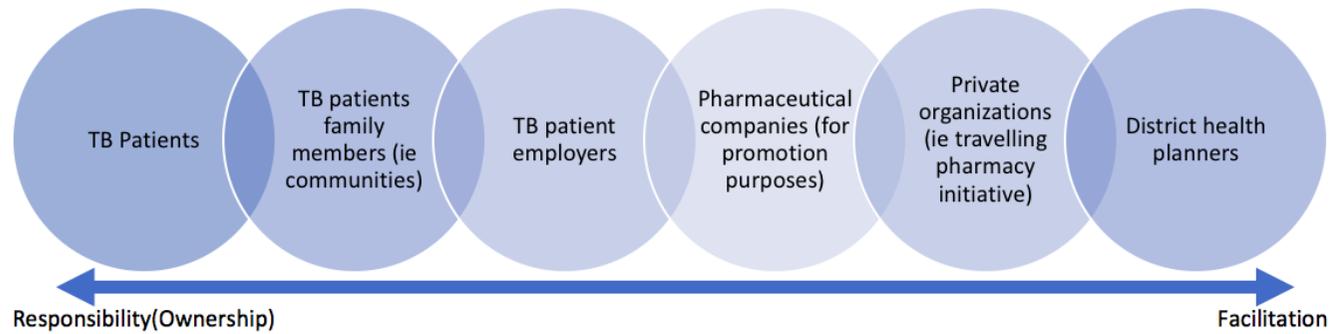


Figure 7.7: Responsibility and facilitation role-players of TB in the Central Karoo district

## 7.8 Case Study Reflections

It must be reiterated that the completion of this study is purely for illustrative purposes. In order to comprehensively complete the approach mapped out it is recommended that there be a team working toward populating the phases of the approach. The collection of data for mapping the intervention to be analysed should be planned for in advance and collected prior to completing the study allowing the approach to utilise higher quality data, as well as being able to specify the data to be collected. Discussions surrounding the process of care identified as the bottleneck, as well as the identification of stakeholders should be a result of a group discussion, consulting with several current active stakeholders or project planners and analysts. This group discussion should include those which have an understanding and familiarity with the area being investigated in order to contribute insightful ideas. Sections ?? to ?? will differ the most significantly in a real world example, as these sections will need to be planned for in order to collect the data required as well as the utilisation of workshops and discussions allowing the issues highlighted to be discussed, the results will ideally be more comprehensive and may be done iteratively involving discussions with multidisciplinary inputs, and even in some cases interviews with the stakeholders identified in Section ??.

A significant point to note in the completion of this case study is that of the way on which the data is analysed. The Piot-Fransen model is populated, however the decision is made to not pursue the results from this model. This is important to note as although the model comes highly recommended it is important to note that the full dataset need be analysed in order to establish where the greatest contribution can be made. The greatest contribution is a relative term as it will depend on what the direct aim of the study is, for example are you pursuing "quick wins" or "big impacts. For the purpose of this particular study, it can be said that "quick wins" was the focus as the population size was not considered as well as the results from the Piot-Fransen model. The focus was on areas which were performing poorly in comparison to other areas, showing that the ability to improve performance is attainable as it is being done so by other districts. Whereby the areas highlighted by the Piot-Fransen model will have a greater impact over a larger population, they are significantly more difficult to rectify as there is need for improvements across all districts. National planning is needed to rectify these areas over district planning.

## 7.9 Conclusion

From this case study the district health systems of the Western Cape have been analysed in order to find the resultant bottlenecks in the health process. This is done in order to identify at which point in the system the poorest

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AND YLL TO TB IN THE WESTERN CAPE, SOUTH AFRICA* **134**

performance is occurring and thus give direction as to where improvements and focus should take place. From the areas identified the role-players to be included and addressed when trying to make improvements are identified. Through the completion of this case study the lack of reliable and detailed data found is a continuous issue faced by decision makers.

# Chapter 8

## Conclusions

### 8.1 Research Summary

The aim of the research seeks to develop an understanding of health systems in order to make improvements toward HCOs in SSA. In SSA it is found the provision of care is largely bound to a lack of resources and poor management, with the topic of seeking care found to be more complex with less research. In order to improve HCOs in SSA health coverage needs to be improved.

Through the analysis of existing health system frameworks a holistic view of the components of health systems and what contributing factors should be considered, both in terms of health provision and health seeking practices. The framework analysis synthesized a collection of frameworks in order to gain an understanding of overarching categories found in the health system, according to the existent frameworks, as well as sharing a brief insight into which frameworks are used for which purpose. The systematic literature review carried out establishes an understanding of the previously identified health system components in the SSA context. This is structured by populating the overarching categories found in the contextual framework analysis with information found from the broad range of literature returned in the review.

From these studies the complexities of health systems are exemplified, leading to the development of an approach which aims to allow for a systems approach by which to improve the efficiencies of a health system. The approach leads one to identify bottlenecks in health systems, more specifically in the health care process, and thus hopes to give direction to areas for improvement. The mechanisms affecting these bottlenecks must be analyzed in the context which they are found in order to address the root causes to facilitate improvements.

The study concludes by sharing an approach which decision makers could apply to analyze an area of interest and establish the areas which are in need of improvement in order to motivate and direct improvement strategies. There exists a large body of work on health systems and health systems performance,

thus this tool aims to reduce complexities of health systems by introducing scoping in order to understand the state of the health system from the specific angle of interest.

## 8.2 Objective Conclusions

In order to address the research aim, the following objectives were identified in Chapter 1:

1. Analyse existing conceptual frameworks relating to health care systems and identify pivotal points thereof;
2. Systematically review existing literature to develop an understanding of the health care system in SSA, according to literature, in alignment with the identified points of interest;
3. Map out a series of tools which could potentially be utilized in order to combat the challenges identified;
4. Develop a method by which to identify factors that may be expected to influence specific HCOs;
5. Develop a method by which to identify factors that are expected to influence specific HCOs;
6. Make recommendations regarding the focus of future research.

### 8.2.1 Objective 1

Through the analysis, in Chapter 3, of existing frameworks relating to health care several general health system components are recognized. These components are seen as elements or performance measures. The health system elements are namely:

- Service provision;
- Financing;
- Leadership and governance;
- Risk protection (or contextual factors);
- Populations;
- Management and organization;
- Resources;
- Technology;

- Knowledge and Information; and
- Access.

With the health system performance measures found to be categorized into:

- Quality or Customer Satisfaction;
- Efficiency, Effectiveness or safety;
- Equity;
- Responsiveness; and
- Health status.

Having identified these components, a heat map is then developed to illustrate which components are most frequently included in which health system frameworks. This illustrates which components are of greater importance when looking at specific health system frameworks. Thereafter the comprehensiveness of each framework is established by illustrating the percentage of components covered by each framework. The identification of these elements gives a good understanding of the overarching aspects of a health system which need to be considered.

### 8.2.2 Objective 2

From the systematic literature review carried out a comprehensive view of the literature available pertaining to factors influencing HCOs in SSA is achieved through the extensive number of articles reviewed. The review reveals that the majority of literature available on the topic comes from East or Southern Africa which must be kept in mind throughout the findings of the study. An understanding of each of the components identified in Objective 1 is established. The study illustrates the importance of considering contextual factors and the influence they have on health systems, both in terms of health seeking behaviours and service provision. The resource management or restrictions found in SSA are identified as the root cause to almost all factors influencing poor HCOs. Finally, the need for greater women empowerment, improved education and better resource management practices are seen as the general take away from the review. Due to the extent of the review it is seen as a valuable tool when utilised in conjunction with the health system components and should be used to reference and understand health system components as and when necessary.

### 8.2.3 Objective 3

In order to make improvements to HCOs at a root cause level, and due to the broad scope of the project overarching challenges faced by health systems are identified. The identification of these challenges in the health system came about through the conceptual framework analysis and the completion of the systematic literature review. They are namely:

- Factors which influence HCOs cannot in entirety be comprehensively listed [Tanahashi, 1978] , nor the relationships between these, as these relationships have further complexities. The complexity of these factors and their relationships are attributable to several reasons, such as: the number and diversity of HCOs that are of interest, the complexity of anticipating the response of people to changes in the health care system and the number of elements within the service delivery system that need to be considered;
- Mechanisms affecting HCOs are context specific. In order to identify pivotal mechanisms it is necessary to establish boundaries [Papanicolas and Smith, 2013]. Such as selecting a specific HCO to address or target a community or geographical area (such as specifying a district) in which to identify mechanisms;
- Understanding the complexity of the health system in a SSA setting, and having the understanding thereof to challenge the assumptions made by first world health system frameworks;
- The silo mentality, can result in an uncomprehensive view or solution. This lack of acknowledgement of the full system can thus cause the possibility of overlooking areas of the system which should be considered as there are many indirect links between system components [World Economic Forum, 2016];
- Lack of collaboration platforms or tools discourage efforts to leverage off one another thus resources are wasted in the planning and operating of interventions and the development of policies;
- Stakeholders not utilising tools which diagnose the problem, or the ability to effectively recognise which mechanisms are the key problem, thus making poor resource allocation decisions. Diagnosing whether an investment into a certain system component is being fruitful and thereafter having the ability to diagnose where the system bottleneck is;
- Misalignment of stakeholders within the health care system and its broader context, and their competing interests [World Economic Forum, 2016]; and
- Planners being too far removed from the target area and interventions being dictated from authorities but not reaching the intended audience.

Having established these challenges the study aims to design an approach which acknowledges these and utilizes this information in order to make efficiency improvements to maximise HCOs.

#### 8.2.4 Objective 4

In order to combat the challenges identified in Objective Three, tools which can be utilized to facilitate the process needed to make improvements to HCOs are discussed. These tools begin by investigating what necessitates change, and how to recognise areas which need to be considered when establishing changes that need to be made. Further a demonstration of where the study approach aims to contribute toward is included in order to introduce a clear understanding of at what level the study is contributing toward, using the CHIP model. Finally the methods which aid in identifying the bottleneck in the health system are discussed, namely: Tanahashi-Tugwell Model, Healthcare processes, and Piot-Fransen Model.

#### 8.2.5 Objective 5

An approach is developed by which one is able to more effectively identify factors influencing HCOs. This approach acknowledges the complexities of health systems and the influence contextual factors have on both health seeking practices and service provision. The approach attempts to reduce complexities by narrowing the focus to allow for a holistic view to be taken of the specific area of analysis. This approach acknowledges the theory of change necessary in order to facilitate improvements to the HCO analysed, and therefore the necessity to involve stakeholders in considerations made for improvements. The approach positions itself prior to any action plans or actions are made, as a tool by which decision makers can effectively analyse the root causes and areas for improvement. An adaptation of the CHIP model is used to illustrate the point at which this approach finds its place.

#### 8.2.6 Objective 6

The study brought to light many areas of interest for future work pertaining to health systems in SSA. The encouragement of cross disciplinary projects is encouraged in order to broaden the perspective which health systems are analysed. Section 8.3 lists several areas of interest to be addressed in future studies.

### 8.3 Future Work

Over the duration of this study, several areas for future study were highlighted which would make an interesting contribution to the understanding of health systems particularly in respect to SSA.

#### *The influence of industries on health care*

A study on the effects industries have on health care, evaluating the primary sector in an area and the direct and indirect health related issues that are found common place in conjunction with that. Addressing industries such as mining or seasonal work and the influence on the health of not only the employees but employeesâ families which may be situated off site. This study would be of interest as it is in one manner a way of filtering the diversity found within the SSA landscape, and to hold industries more accountable for their staff and developing specific action plans to combat these issues.

#### *Stakeholder Alignment*

A paper on stakeholder involvement and strategies on how to map out and align stakeholders in projects or intervention planning and whom needs to be considered, specifically in an SSA setting would be beneficial. In this case the term stakeholder includes all role players in the health system being analysed. The lack of autonomy, unique political and resource restrictions found in SSA require all stakeholders or role players to be acknowledged in order to identify whom should be held accountable or approached when developing and implementing strategies. The importance of understanding not only the hierarchy of stakeholders but at which point in the stream of stakeholders does change need to take place to facilitate changes for any other point in the system is critical.

#### *Social factors*

Future studies on the indirect, behavioural factors and health beliefs which influence populations in specific areas accessing health would be of use. The mapping of health beliefs and behavioural factors can allow for projects to consider these factors and incorporate them into their intervention planning. Having a tool to map the social factors relating to health care would be of use as it could allow planners to map these and utilise this understanding to enhance the success of projects.

#### *Investor decision making tool*

The development of a tool by which investors can analyse project proposals and intervention strategies in a systematic manner. A tool which outlines the process which project planners should follow, for example the CHIP model, and the considerations which should be made at each level as well as the methods, data or level of detail recommended for each step. This tool would address all

factors influencing HCOs by ensuring project planners have considered health system components pertaining to their project at hand. This tool would allow investors to compare proposals as well as direct questions and make recommendations for project improvements.

#### *Multidisciplinary collaboration tool*

Projects in the health system often span over several multidisciplinary teams, each analysing a specific segment of the system. These teams are made up of specialists coming from a variety of backgrounds and can be investigating a variety of aspects which make up the health system. The information sharing across the varying platforms seems to be poor. There thus appears to be a need for a tool which could be used to facilitate the collaboration between the multidisciplinary working groups in order to improve the depth of understanding and improve the richness of study results by leveraging knowledge between working parties.

## 8.4 Shortcomings and Limitations

One of the biggest issues faced when analysing SSA health care is the lack of data. With this in mind the study was found to be restricted by the quality of data available. Specific and accurate data is found to be difficult to come by and needs to be planned for prior to a study in order to roll out data collection projects on the topic of interest. In order to cater for this the illustrative case study is utilised. The vastness of the area over which the study aimed to cover made it difficult to contribute an accurate and meaningful conclusion, or map out relationships of components contributing to HCOs, however this led to the development of the approach above the development of a standard solution. The systematic literature review carried out should perhaps have initially been done as a rapid review and from the results thereof carried out a more focused literature review, however the broadness of the literature review allows for a comprehensive and diverse array of literature to be analysed. As a whole the study contributed an interesting broad view of the health system, however would have benefited from further scoping in order to contribute a more unique or meaningful body of literature. The broadness of the scope made for a very general overview and synthesis of existing opinions. Nonetheless, this provides a strong foundation for future work in the field, in particular it serves as a starting point for multi-disciplinary project discussions. Furthermore, this project provides a point of departure for discussion relevant to the work of the CHSS as was the initial brief.

## 8.5 Personal Reflection

In the pursuit of this study, the knowledge and understanding gained was greater than ever would be expected and reaches significantly further than what is shared in this study. The experiences this field of study brought me exceeded all expectations, from sitting at the WHO in Geneva where policies are written to going out into the field in rural Zimbabwe, I have truly had the benefit of seeing both ends of the spectrum. Having had a taste for the infinite complexity found in health systems, coupled with the vast room for growth in SSA health systems, I believe the field of health systems strengthening in Africa is in its infancy. In the years to come from the grounding I received in this study I hope to play a role in facilitating these changes and look forward to playing a part in furthering the multidisciplinary nature of health system strengthening. When starting out this study I was overwhelmed by the endless amount of literature available on health systems and have finally come to a point where I can appreciate the reason behind this – understanding that each health system needs to be considered in context, and depending on what you are looking at within the health system requires a framework on its own. In concluding this study, I would like to reiterate that this is the beginning of a long journey, as I can appreciate, from completing such a high-level study the amount of work which is still required on the SSA health system.

## 8.6 Conclusion: Conclusions

In bringing the study to a close, this chapter gives a summarised description of the findings in this research piece. Thereafter the study objectives are addressed and the way in which they are met in the study is highlighted. Work which through the process of the study is recognised to be valuable for future study is described and , finally shortcomings or limitations experienced in this study are discussed. and finally a brief personal reflection is shared.

# Appendices

# Appendix A

## Health System Frameworks

### A.1 Health System Framework Components

(this is the wrong table, the right table needs to be added still. )

Table A.1: List of Elements considered by each conceptual framework.

Framework	Reference	Elements
Actors Framework	Evans (1981)	consumer patients, first-line providers, second-line providers , insurers and governments
Lalonde health field framework	Lalonde (1981)	Human biology, environment, health, lifestyle, health care organization (relationships of people and resources in the provision of health care. It includes medical practice, nursing, hospitals, nursing homes, medical drugs, public and community health care services, ambulances, dental treatment, and other health services such as optometry, chiropractics, and podiatry.)

Model of a national health system its structures and functional interrelationships	Kleszczowski et al. (1984)	physical and social environment, populations groups, families and individuals in need of care or at risk, (promotion of health, prevention of illness, health education),(Diagnosis and treatment of disease, rehabilitation, care of the profoundly disabled and incurable), delivery of health care, organized arrangement of resources, development of health resources, economic support, management
The five main interacting components of national health systems	Roemer (1991)	resources (human resources, facilities, commodities and knowledge), organization (principal authority of government, other governmental agencies with health functions, voluntary health agencies, enterprises, private health care market), management (health planning, administration, regulation and legislation), economic support (governmental tax revenues, social insurance, voluntary insurance, charity and personal households) and delivery of services (primary health care, secondary care and tertiary care)
Reform Framework	Frenk (1994)	Exchanges between health care providers, the population (community participation), the state, organizations that generate resources(human resources, payment mechanisms, scientific information, technology) and other sectors that produce services with health effects at systemic (institutional arrangements), programmatic (setting priorities), organizational (production of services) and instrumental (intelligence generating) levels constitute reform processes; Potential personnel, money, data.
Kissicks Iron triangle	Kissick (1994)	cost, equity, access, population health, quality, value
A framework informing change in Latin American health care reform	Londono and Frenk (1997)	financing, delivery, modulation (setting transparent and fair rules of the game) and articulation (managing and organizing transactions between groups).

EGIPSS (Integrated Performance Model for the health care system)	Sicotte et al. (1998)	two internal functions (maintaining values and stabilizing production) and two external functions (adapting to the environment to acquire the necessary resources and attaining the valued goals of the system); strategic alignment; contextual alignment; allocation alignment; operational alignment; tactical alignment; legitimisation alignment
EGIPSS (Integrated Performance Model for the health care system)	Sicotte et al. (1998)	two internal functions (maintaining values and stabilizing production) and two external functions (adapting to the environment to acquire the necessary resources and attaining the valued goals of the system); strategic alignment; contextual alignment; allocation alignment; operational alignment; tactical alignment; legitimisation alignment
Framework for assessing behavioral healthcare	Aday et al. (1998)	Based on type and extent of affected groups participation in formulating and implementing policies and programs, availability and utilization of services and flows of payment; measures effectiveness (how structure, process or both contribute to outcomes of healthcare at the community, system, institution or patient level), equity (participation and freedom of choice) and efficiency (the combination of goods and services with the highest attainable total value be produced given limited resources and technology) are identified within the health system
Health Systems Assessment Framework: functions and goals	Murray and Frenk (2000)	resource generation, financing, service provision and stewardship; three central goals: health, responsiveness and financial protection
A framework informing change in health systems reform for low- and middle- income countries	Mills and Ranson (2001)	Key players: governments, populations, financing agents and providers; key areas for reform: regulation, financing, resource allocation and the provision of services
A conceptual framework to measure performance of the public health system	Handler et al. (2001)	macro context, public health system, PHS mission and purpose, Structural capacity (information resources, organizational resources, physical resources, human resources, fiscal resources), Processes, outcomes(effectiveness, efficiency, equity)

WHO Health System Performance	Murray and Evans (2003)	stewardship(oversight), financing(pooling, collecting, purchasing), creating resources(investment, training), delivering services(provision), responsiveness, fair financial contribution, health (quality and equity)
Public health functions framework	Khaleghian and Das Gupta (2004)	EPHFs include disease surveillance, health education, monitoring and evaluation, workforce development, enforcement of public health laws and regulations, public health research, and health policy development.
OMC (EU open method of coordination)	European Commission (2005)	Working arrangements: supporting more mutual learning, involvement of actors and governance, indicators; Guarantee access for all to adequate health and long-term care and ensure that the need for care does not lead to poverty and financial dependency. Address inequities in access to care and in health outcomes.; Promote quality in health and long-term care and adapt care to the changing needs and preferences of society and individuals, notably by establishing quality standards reflecting best international practice and by strengthening the responsibility of health professionals and of patients and care recipients.; Ensure that adequate and high quality health and long-term care remains affordable and sustainable by promoting healthy and active life styles, good human resources for the care sector and a rational use of resources, notably through appropriate incentives for users and providers, good governance and coordination between care systems and institutions.
A framework informing change in British Columbia's public health renewal efforts	MoH Services British Columbia (2005)	Core programs: long-term programs representing the minimum level of services provided, public health strategies: strategies to implement core programs, lenses: population and inequality lenses to ensure health needs for all are met, system capacity: information systems, staff training, quality assessment, etc.

Core goals and priorities for performance improvement	The Commonwealth Fund (2006)	Goal of system: to deliver effective, safe, well-coordinated, patient-centred care for long, healthy and productive lives of the population; Core goals: High quality care; access and equity for all; efficient care; system and workforce innovation and improvement; long healthy and productive lives.
The WHO Health Systems Framework	WHO (2007)	Six building blocks: service delivery, health workforce, information, medical products, vaccines and technologies, financing, stewardship; system goals: improved health, responsiveness, social and financial risk protection, improved efficiency
A framework for understanding the key components of well-functioning health systems	The Global Fund (2007)	Components that are key to building a well-functioning health system: effective healthcare delivery system, health workforce, health information system, equitable access, financing system and leadership and governance
A framework evaluating health systems performance using 11 essential public health functions	Ramagem and Ruales (2008)	indispensable set of actions, under the primary responsibility of the state that are fundamental to achieving public health; three goals: strengthen public health practice, improve capacity of the national health authority to execute the EPHF and develop public health infrastructure
A behavioural model of health services use	Andersen (2008)	Contextual Characteristics: Predisposing(Demographic, social, beliefs), enabling(health policy, financing, organization), need(environmental, population health indices); Individual characteristics: Predisposing(demographic, social, beliefs), enabling(financing, organization), need(percieved, eavaluated); Health Behaviour: health practices, process of medical care, use of personal health services; Outcomes: percieved health, evaluated health, consumer satisfaction
Monitoring and evaluation of health systems strengthening	IHP (2009)	Six guiding principles: collective action, alignment with country processes, balance between country participation and independence, harmonized approaches to performance assessment, capacity building and health information system strengthening, adequate funding

Strengthening Health Services Framework	Peters et al. (2009)	macro environment, Health sector environment: Government (Governance-leadership, stewardship, planning, legislation, regulation; Financing-revenue, pooling, allocation, payment; Information-disclosure, research, evaluation) People(Nonpoor/Poor (communities, advocacy groups, consumer protection groups) Provider organizations (Management systems and inputs- human resources, financial management, information systems, drugs and medical supplies (logistics), medical technology, maintenance and buildings, auxiliary services) Enabling and Inhibiting Factors, Strategy to strengthen health services (country context, health sector, institution, strategy) Purpose: Health status, Financial protection, trust in health system. Health Services: Provision, Quality, Utilization, Coverage, Efficiency, Equity.
Reforms framework (Policy cycle, control knobs)	Roberts et al. (2009)	financing, payment, regulation, organization and behaviour; intermediate performance measures: efficiency, quality and access; and goals: health status, customer satisfaction and risk protection
A framework for understanding how governance parameters exist at all levels of the WHO Building Blocks model	Mikkelsen-Lopez et al. (2010)	Builds on the WHO Building Blocks approach, adding governance dimensions to each block. Governance inputs (participation, strategic vision, consensus orientation), attributes (control of corruption, accountability, transparency) and outcomes (responsiveness, equity, efficiency) are presented
A framework for comparing health system performance across countries	Rechel et al. (2010)	Template consists of nine chapters: introduction, organization and governance, financing, physical and human resources, provision of services, principal health reforms, assessment of health system, conclusions and appendices
The health system dynamics framework	van Olmen et al. (2010)	Ten elements: goals and outcomes, values and principles, service delivery, the population, the context, leadership and governance and the organisation of resources (finances, human resources, infrastructure and supplies, and knowledge and information)

Sub-Frameworks:		
The health belief model	Rosenstock (1974)	Perceived -susceptability-seriousness to disease; demographic variables, sociopsychological variables, cues to action, likelihood of action
Framework for health promotion	Epp (1987)	achieving health for all; Health challenges: reducing inequities, increasing prevention, enhancing coping; Health promotion mechanisms: self care, mutual aid, healthy environments; Implementation strategies: fostering public participation, strengthening community health services, coordinating healthy public policy
A sub-framework informing change in primary health care service delivery	WHO (2008)	Four broad policy areas for essential changes: moving towards universal coverage, putting people at the centre of service delivery, integrating health into public policies across sectors and providing inclusive leadership for health governance
Framework for implementation at country level	WHO (2008)	national strateic leadership, supportive policies, environment, programmes, behavoiur change, social, environmental, health, economic
A sub-framework informing change in health communications technology through a grid-based health information network	Savel et al. (2010)	Interconnects public health departments, regional health information organizations, providers and federal agencies; fosters an open collaborative effort involving the public health information network community, clinical partners, academia and industry to provide scientific and public health rigor, collaborative (and well-defined) governance/oversight and long term return on investment
A sub-framework evaluating health system approaches to maternal, neonatal and child health as it relates to the broader health system	Ergo et al. (2011)	Three essential components: the health care sector (governance and service delivery), the community (physical and social environments) and households (household characteristics and individual factors); four control knobs represent the types of âtools available to address weaknesses in the system: financing, organization, regulation and communication
Hospital Frameworks:		

IDB and IDRC Institutional and Organizational Assesment (Organizations)	Lusthaus et al. (2002)	Organizational capacity: financial- process- program- management, inter-organizational linkages, strategic leadership, human resources, infrastructure, structure Organizational performance: effectiveness, efficiency, relevance, financial viability Organizational motivation: culture, history, mission, incentives/rewards External Environment: administrative/legal, political, social/cultural, economic, technological, stakeholder, ecological
WHO Euro Hospital Performance PATH	Veillard et al. (2005)	clinical effectiveness, safety, efficiency, patient centeredness, staff, responsive governance
Baldrige Framework	Goldstein and Schweikhart (2005)	Leadership, strategic planning, focus on patients other customers and markets, staff focus, process management, organization performance results, information and analysis,
Adapted EFQM based on PATH	Vallejo et al. (2006)	clinical effectiveness, safety, customer focus, staff, responsive governance, results orientation, Leadership and constancy of purpose, management by processes and facts, continuous learning improving and innovation
Resource related Frameworks:		
Distributional aspects of national health insurance benefits and finance	Feldstein et al. (1972)	Structure of insurance coverage (deductibles, coinsurance rates, etc.), income and family composition, mix of revenue sources (income-related premiums, payroll tax, general tax revenue, etc.)
Health Manpower Planning: An Econometric Approach	Yett et al. (1972)	Health service institutions: Health manpower
The Effect of National Health Insurance on the Price and Quantity of Medical Care	Feldstein and Friedman (1976)	health care expenditures of a group of families with the same demographic composition, income, and insurance coverage; formulas for expenditure distribution, net out-of-pocket expenses, etc.; quantities and prices of hospital and medical care

A sub-framework for understanding the insurance function of health systems	Kutzin (2001)	revenue collection, pooling of funds, purchasing of services and the provision of services
A sub-framework comparing the relationship between health spending and health outcomes in 15 EU countries	Nixon and Ulmann (2006)	Inputs: lifestyle, environmental and occupational factors; outputs: life expectancy and infant mortality Analysis considers health spending and outcomes
Capacity framework (system restraints)	Mills et al. (2006)	Seven key constraints: financial, physical inaccessibility, poorly skilled staff, poorly motivated staff, weak planning and management, lack of intersectoral action/partnership, poor quality care in private sector
Health Care systems Efficiency and institutions	Joumard et al. (2010)	Measuring efficiency: Health care spending; health care acceptability, accessibility, effectiveness, (cost) efficiency, equity, public satisfaction, quality of treatment, responsiveness to individuals preferences, safety, sustainability and timeliness.
Quality Frameworks:		
Quality improvement- Donabedian model	Donabedian (1966)	logical and economic efficiency
Maxwell Expanded	Maxwell (1984)	Access to services, Relevance to need (for the whole community), Effectiveness (for individual patients), Equity (fairness), Social acceptability, Efficiency and economy
Balanced scorecard	Kaplan and Norton (1996)	financial, customer, learning and growth, internal business processes, vision and strategy
UK Performance Assessment Framework	Ferlie and Shortell (2001)	Leadership, organizational culture, team microsystems development, information technology,

European Foundation for quality management (EFQM)	EFQM (2012)	leadership, people, strategy, partnerships and resources, processes products and services; People results, customer results, society results, business results
Supra-Frameworks:		
A supra-framework for comparing and informing change for health sector reform in developing countries	Cassels (1995)	the state, service providers, resource institutions, institutional purchasers, other sector agencies that produce health benefits indirectly and populations.
OECD HCQI	Arah et al. (2006)	Four tiers: health, non-health care determinants of health, health care system performance, health system design/context; core quality dimensions: effectiveness, safety and responsiveness/patient-centeredness
Healthy Development	The World Bank (2007)	improve system performance, financial protection from poverty, financial sustainability, governance and accountability; five directions: renew focus, support client-country efforts to strengthen health systems, balance systems strengthening with priority disease interventions and foster strategic engagement.
A supra-framework for understanding how health status affects the macro economy	Hsaio et al. (2008)	Health status of population, microeconomic variables (labour productivity, poverty rates, demand for medical care), macroeconomic variables (inflation rate, wage and exchanges rates), demands on health care system, government policies
A framework for analysing health systems and the context	Atun and Menabde (2008)	Four levers available to policy-makers managing the health system: stewardship and organizational arrangements, financing, resource allocation and provider payment systems and service provision; intermediate goals: equity, efficiency (technical and allocative efficiency), effectiveness and choice; system goals: health, financial risk protection and consumer satisfaction

A supra-framework evaluating national health systems by tracing the impact of donors' health system strengthening expenditures	Shakarishvili et al. (2011)	harmonization of conceptual and operational understanding of what constitutes HSS, development of a common set of criteria to define health expenditures as contributors to HSS, development of a common HSS classification system and harmonization of HSS programmatic and financial data for inter-agency comparative analyses
A supra-framework for understanding the concept of stewardship and its applications to the health sector	Veillard et al. (2011)	Six stewardship functions: define the vision and strategy for better health, exert influence across all sectors for better health, govern health systems in a way that is consistent with prevailing values, ensure system design is aligned with health system goals, leverage available legal and regulatory instruments and compile, disseminate and apply intelligence
Comparisons:		
Fund flows and payment framework	Hurst (1991)	Health expenditure of GDP, consultations with general practitioners and specialists, medicines prescribed per capita, acute hospital admissions, perinatal mortality
A supra-framework comparing health care resource profiles across multiple national health systems	Anell and Wills (2000)	Measured health expenditures: percent GDP, expenditures per capita, drug expenditures per capita, MRI units per capita, CT scanners per capita, number of hospital beds per capita, health care employment per capita, number of physicians per capita, number of nurses per capita, and health care employment as percentage of total employment
Performance Measurement and Performance Management in OECD Health Systems	Hurst and Jee-Hughes (2001)	Three goals: health improvement and outcomes; responsiveness and access; and financial contributions and health expenditure; each goal has two components of assessment: the average level and the distribution of each goal
A supra-framework comparing health system reforms across OECD countries	Docteur and Oxley (2003)	Policy goals: ensuring access to needed health-care services; improving the quality of health care and its outcomes; allocating an appropriate level of public sector and economy-wide resources to health care (macroeconomic efficiency); and ensuring that services are provided in a cost-efficient and cost-effective manner (microeconomic efficiency)

A supra-framework comparing the impact of health worker density on health outcomes across multiple countries	Anand and Barnighausen (2004)	Dependent variables: maternal mortality rate, infant mortality rate, and under-five mortality rate; independent variables across sets: aggregate density of human resources for health; doctor and nurse densities separately; controlled variables: income, female adult literacy, and absolute income poverty
A supra-framework comparing ten principles for health systems governance assessment across countries in the Eastern Mediterranean region	Siddiqi et al. (2009)	Ten principles for HSG: strategic vision, participation and consensus orientation, rule of law, transparency, responsiveness, equity and inclusiveness, effectiveness and efficiency, accountability, intelligence and information and ethics

## A.2 Population Attributes

### Attributes of Populations Included in the Model

#### *Attributes of individuals:*

Age  
Sex  
Ethnic group  
Marital status  
Residence  
Health insurance status

#### *Illnesses and conditions:*

Infective and parasitic  
Respiratory  
Digestive  
Injuries  
Other acute  
Maternity and newborn  
Good health

#### *Attributes of physicians:*

Specialty  
Age  
Career status (e.g., intern or resident, practitioner)  
Foreign or domestic medical graduate  
Type of employment (e.g., salaried, self-employed)

#### *Attributes of nurses and allied health professionals:*

Age  
Sex  
Marital status  
Length of training

#### *Attributes of students:*

Age  
Sex  
Ethnic group  
Marital status  
Type of previous education

#### *Attributes of health service institutions:*

Physicians' offices  
Specialty  
Size  
Nature of payment

Hospital clinics

#### *Hospitals*

Length of stay  
Ownership or control  
Size  
Medical school affiliation  
Nature of payment

Skilled nursing homes

Size  
Medicare certification

#### *Attributes of medical schools:*

Size  
Ownership  
University affiliation

#### *Attributes of nursing and allied health schools:*

Size  
Length of program  
Ownership

### A.3 Conceptual Framework components

Table A.2: Attributes of the population included in the Yett *et al.* [1972] Model

Framework	Reference	Service Provision	Financing	Leadership and Governance	Risk Protection	Populations	Management and Organization	Resources	Technology	Knowledge and information	Access	Other	Quality/Customer Satisfaction	Efficiency/Effective/Safety	Equity	Responsiveness	Health Status
Health System Frameworks		red!257474%	474%	63%	33%	37%	41%	70%	30%	19%	30%	26%	26%	26%	33%	19%	56%
Actors Framework	Evans (1981)		x	x		x		x									
Lalonde health field framework	Lalonde (1981)				x	x											x
Model of a national health system its structures and functional inter-relationships	Kleszczowski et al. (1984)		x		x	x	x	x		x							x
The five main interacting components of national health systems	Roemer (1991)	x	x				x	x									x
Reform Framework	Frenk (1994)	x	x	x		x		x	x			x					
Kissicks Iron triangle	Kissick (1994)		x			x					x		x		x		x

Table A.2 continued from previous page

A framework informing change in Latin American health care reform	Londono and Frenk (1997)	x	x	x			x										
EGIPSS (Integrated Performance Model for the health care system)	Sicotte et al. (1998)	x		x	x		x	x									
Framework for assessing behavioral healthcare	Aday et al. (1998)	x	x	x										x	x		x
Health Systems Assessment Framework: functions and goals	Murray and Frenk (2000)	x	x	x				x								x	x
A framework informing change in health systems reform for low- and middle- income countries	Mills and Ranson (2001)	x	x			x		x									
A conceptual framework to measure performance of the public health system	Handler et al. (2001)	x			x		x	x	x			x		x	x		

Table A.2 continued from previous page

WHO Health System Performance	Murray and Evans (2003)	x	x	x				x					x		x	x	x
Public health functions framework	Khaleghian and Das Gupta (2004)			x				x		x		x					
OMC (EU open method of coordination)	European Commission (2005)		x	x			x	x			x		x		x		
A framework informing change in British Columbia's public health renewal efforts	MoH Services British Columbia (2005)	x		x		x		x	x						x		
Core goals and priorities for performance improvement	The Commonwealth Fund (2006)						x	x			x	x	x	x	x		x
The WHO Health Systems Framework	WHO (2007)	x	x	x	x			x	x	x	x			x		x	x
A framework for understanding the key components of well-functioning health systems	The Global Fund (2007)	x	x	x				x	x		x						

Table A.2 continued from previous page

A framework evaluating health systems performance using 11 essential public health functions	Ramagem and Ruales (2008)	x		x													
A behavioural model of health services use	Andersen (2008)		x		x	x	x					x	x				x
Monitoring and evaluation of health systems strengthening	IHP (2009)	x	x						x			x					x
Strengthening Health Services Framework	Peters et al. (2009)	x	x	x	x	x	x	x	x	x	x		x	x	x		x
Reforms framework (Policy cycle, control knobs)	Roberts et al. (2009)	x	x	x	x		x				x		x	x		x	x
A framework for understanding how governance parameters exist at all levels of the WHO Building Blocks model	Mikkelsen-Lopez et al. (2010)	x	x	x				x	x		x			x	x	x	x

Table A.2 continued from previous page

A framework for comparing health system performance across countries	Rechel et al. (2010)	x	x				x	x				x					
The health system dynamics framework	van Olmen et al. (2010)	x	x	x	x	x		x		x							x
Sub-Frameworks:		50%	17%	83%	50%	33%	17%	0%	0%	33%	17%	50%	17%	0%	17%	0%	50%
The health belief model	Rosenstock (1974)					x				x							x
Framework for health promotion	Epp (1987)	x		x	x							x			x		x
A sub-framework informing change in primary health care service delivery	WHO (2008)	x		x							x		x				
Framework for implementation at country level	WHO (2008)			x	x							x					x

Table A.2 continued from previous page

A sub-framework informing change in health communications technology through a grid-based health information network	Savellet al. (2010)			x						x							
A sub-framework evaluating health system approaches to maternal, neonatal and child health as it relates to the broader health system	Ergo et al. (2011)	x	x	x	x	x	x					x					
Hospital Frameworks:		0%	0%	100%	25%	0%	75%	75%	0%	50%	0%	50%	75%	75%	0%	50%	0%
IDB and IDRC Institutional and Organizational Assessment (Organizations)	Lusthaus et al. (2002)			x	x		x	x				x		x			
WHO Euro Hospital Performance PATH	Veillard et al. (2005)			x				x					x	x		x	





Table A.2 continued from previous page

European Foundation for quality management (EFQM)	EFQM (2012)	x		x		x		x				x	x				x
Supra-Frameworks:		38%	23%	38%	23%	8%	0%	15%	0%	0%	8%	23%	15%	23%	8%	15%	23%
A supra-framework for comparing and informing change for health sector reform in developing countries	Cassels (1995)	x		x				x				x					
OECD HCQI	Arah et al. (2006)	x			x								x	x		x	x
Healthy Development	The World Bank (2007)	x	x	x								x		x			
A supra-framework for understanding how health status affects the macro economy	Hsaio et al. (2008)	x		x	x	x					x					x	x
A framework for analysing health systems and the context	Atun and Menabde (2008)	x	x	x	x			x					x	x	x		x



Table A.2 continued from previous page

Performance Measurement and Performance Management in OECD Health Systems	Hurst and Jee-Hughes (2001)		x														
A supra-framework comparing health system reforms across OECD countries	Docteur and Oxley (2003)							x			x		x	x			
A supra-framework comparing the impact of health worker density on health outcomes across multiple countries	Anand and Barnighausen (2004)		x		x			x									x
A supra-framework comparing ten principles for health systems governance assessment across countries in the Eastern Mediterranean region	Siddiqi et al. (2009)			x						x		x		x	x	x	



# Appendix B

## Health care indicators

### B.1 100 core health indicators

Health status	Risk Factors	Service Coverage	Health systems
<p><b>Mortality by age and sex</b></p> <p>Life expectancy at birth</p> <p>Adult mortality rate between 15 and 60 years of age</p> <p>Under-five mortality rate</p> <p>Infant mortality rate</p> <p>Neonatal mortality rate</p> <p>Stillbirth rate</p> <p><b>Mortality by cause</b></p> <p>Maternal mortality ratio</p> <p>TB mortality rate</p> <p>AIDS-related mortality rate</p> <p>Malaria mortality rate</p> <p>Mortality between 30 and 70 years of age from cardiovascular diseases, cancer, diabetes or chronic respiratory diseases</p> <p>Suicide rate</p> <p>Mortality rate from road traffic injuries</p> <p><b>Fertility</b></p> <p>Adolescent fertility rate</p> <p>Total fertility rate</p> <p><b>Morbidity</b></p> <p>New cases of vaccine-preventable diseases</p> <p>New cases of IHR-notifiable diseases and other notifiable diseases</p> <p>HIV incidence rate</p> <p>HIV prevalence rate</p> <p>Hepatitis B surface antigen prevalence</p> <p>Sexually transmitted infections (STIs) incidence rate</p> <p>TB incidence rate</p> <p>TB notification rate</p> <p>TB prevalence rate</p> <p>Malaria parasite prevalence among children aged 6–59 months</p> <p>Malaria incidence rate</p> <p>Cancer incidence, by type of cancer</p>	<p><b>Nutrition</b></p> <p>Exclusive breastfeeding rate 0–5 months of age</p> <p>Early initiation of breastfeeding</p> <p>Incidence of low birth weight among newborns</p> <p>Children under 5 years who are stunted</p> <p>Children under 5 years who are wasted</p> <p>Anaemia prevalence in children</p> <p>Anaemia prevalence in women of reproductive age</p> <p><b>Infections</b></p> <p>Condom use at last sex with high-risk partner</p> <p><b>Environmental risk factors</b></p> <p>Population using safely managed drinking-water services</p> <p>Population using safely managed sanitation services</p> <p>Population using modern fuels for cooking/heating/lighting</p> <p>Air pollution level in cities</p> <p><b>Noncommunicable diseases</b></p> <p>Total alcohol per capita (age 15+ years) consumption</p> <p>Tobacco use among persons aged 18+ years</p> <p>Children aged under 5 years who are overweight</p> <p>Overweight and obesity in adults (Also: adolescents)</p> <p>Raised blood pressure among adults</p> <p>Raised blood glucose/diabetes among adults</p> <p>Salt intake</p> <p>Insufficient physical activity in adults (Also: adolescents)</p> <p><b>Injuries</b></p> <p>Intimate partner violence prevalence</p>	<p><b>Reproductive, maternal, newborn, child and adolescent</b></p> <p>Demand for family planning satisfied with modern methods</p> <p>Contraceptive prevalence rate</p> <p>Antenatal care coverage</p> <p>Births attended by skilled health personnel</p> <p>Postpartum care coverage</p> <p>Care-seeking for symptoms of pneumonia</p> <p>Children with diarrhea receiving oral rehydration solution (ORS)</p> <p>Vitamin A supplementation coverage</p> <p><b>Immunization</b></p> <p>Immunization coverage rate by vaccine for each vaccine in the national schedule</p> <p><b>HIV</b></p> <p>People living with HIV who have been diagnosed</p> <p>Prevention of mother-to-child transmission</p> <p>HIV care coverage</p> <p>Antiretroviral therapy (ART) coverage</p> <p>HIV viral load suppression</p> <p><b>HIV/TB</b></p> <p>TB preventive therapy for HIV-positive people newly enrolled in HIV care</p> <p>HIV test results for registered new and relapse TB patients</p> <p>HIV-positive new and relapse TB patients on ART during TB treatment</p> <p><b>Tuberculosis</b></p> <p>TB patients with results for drug susceptibility testing</p> <p>TB case detection rate</p> <p>Second-line treatment coverage among multidrug-resistant tuberculosis (MDR-TB) cases</p> <p><b>Malaria</b></p> <p>Intermittent preventive therapy for malaria during pregnancy (IPTp)</p> <p>Use of insecticide treated nets (ITNs)</p> <p>Treatment of confirmed malaria cases</p> <p>Indoor residual spraying (IRS) coverage</p> <p><b>Neglected tropical diseases</b></p> <p>Coverage of preventive chemotherapy for selected neglected tropical diseases</p> <p><b>Screening and preventive care</b></p> <p>Cervical cancer screening</p> <p><b>Mental Health</b></p> <p>Coverage of services for severe mental health disorders</p>	<p><b>Quality and safety of care</b></p> <p>Perioperative mortality rate</p> <p>Obstetric and gynecological admissions owing to abortion</p> <p>Institutional maternal mortality ratio</p> <p>Maternal death reviews</p> <p>ART retention rate</p> <p>TB treatment success rate</p> <p>Service-specific availability and readiness</p> <p><b>Access</b></p> <p>Service utilization</p> <p>Health service access</p> <p>Hospital bed density</p> <p>Availability of essential medicines and commodities</p> <p><b>Health workforce</b></p> <p>Health worker density and distribution</p> <p>Output training institutions</p> <p><b>Health information</b></p> <p>Birth registration coverage</p> <p>Death registration coverage</p> <p>Completeness of reporting by facilities</p> <p><b>Health financing</b></p> <p>Total current expenditure on health (% of gross domestic product)</p> <p>Current expenditure on health by general government and compulsory schemes (% of current expenditure on health)</p> <p>Out-of-pocket payment for health (% of current expenditure on health)</p> <p>Externally sourced funding (% of current expenditure on health)</p> <p>Total capital expenditure on health (% current + capital expenditure on health)</p> <p>Headcount ratio of catastrophic health expenditure</p> <p>Headcount ratio of impoverishing health expenditure</p> <p><b>Health security</b></p> <p>International Health Regulations (IHR) core capacity index</p>

Table B.1: 100 Core Health Indicators (WHO 2015)

# Appendix C

## Systematic Literature review data

### C.1 Landscape of literature found in SSA

## APPENDIX C. SYSTEMATIC LITERATURE REVIEW DATA

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Year of first publication	First author	Title	Country	Setting	Subgroup	Study type	Health outcome
2005	Aaserud, M	Translating research into policy and practice in developing countries: a case study of magnesium sulphate for pre-eclampsia	Low- and middle-income		women	interviews, observational	Eclampsia, Maternal
2011	Abbas, UL	Factors Influencing the Emergence and Spread of HIV Drug Resistance Arising from Rollout of Antiretroviral Pre-Exposure Prophylaxis (PrEP)	South Africa	Public			HIV/AIDS

2014	Abeje, G	Factors associated with Institutional delivery service utilization among mothers in Bahir Dar City administration, Amhara region: a community based cross sectional study	Ethiopia		women	multivariable logistic regression, cross sectional	Maternal
2010	Abekah-Nkrumah, G	Assessing the implementation of Ghanas Patient Charter	Ghana	District		survey	N/A
2014	Abor, PA	The effects of healthcare governance and ownership structure on the performance of hospitals in Ghana	Ghana			multiple regression	N/A
2011	Abor, PA	The socio-economic determinants of maternal health care utilization in Ghana	Ghana		women	Probit and ordered Probit	Maternal
2013	Abubakar, A	Socio-Cultural Determinants of Health-Seeking Behaviour on the Kenyan Coast A Qualitative Study	Kenya				Child Health

2015	Adebayo, E	A systematic review of factors that affect uptake of community-based health insurance in low-income and middle-income countries	Low- and middle-income	Community	households	systematic review	N/A
2015	Adeniyi, OV	Diabetic patients perspectives on the challenges of glycaemic control	South Africa	District, rural	patients	thematic content analysis	Diabetes
2015	Adjei, KK	A comparative study on the availability of modern contraceptives in public and private health facilities in a peri-urban community in Ghana	Ghana	Peri-urban	women	qualitative, quantitative, cross sectional	Sexual Health
2012	Adzei, F	Motivation and retention of health workers in Ghana's district hospitals: Addressing the critical issues	Ghana	District, public	HCWs	systematic review	N/A

2014	Adzei, F	Drivers of return migration of Ghanaian health professionals: perspectives from doctors and nurses in urban Ghana	Ghana	Urban	HCWs	qualitative exploratory, study	ex-case	N/A
2009	Afolabi, MO	Determinants of adherence to antiretroviral drugs among people living with HIV/AIDS in the Ife-Ijesa zone of Osun State, Nigeria	Nigeria	District	patients	interviews		HIV/AIDS
2015	Agyapong, VIO	Factors influencing the career choice and retention of community mental health workers in Ghana	Ghana	Community	CHWs	interviews		Mental health
2004	Agyepong, IA	Health worker (internal customer) satisfaction and motivation in the public sector in Ghana	Ghana	Public	HCWs	interviews		N/A

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2008	Ajala, AS	Cultural Determinants of Care and Support for People Living with AIDS in Yoruba Communities of Ibadan and Ilesa, Nigeria	Nigeria		patients	interviews, case study	HIV/AIDS
2014	Ajuwon, GA	Influence of motivational factors on utilization of Internet health information resources by resident doctors in Nigeria	Nigeria		HCWs	survey	N/A
2016	Akintola, O	Factors influencing motivation and job satisfaction among supervisors of community health workers in marginalized communities in South Africa	South Africa	District	CHWs	interviews	N/A
2008	Akinyoola, AL	Factors influencing the outcome of elective paediatric orthopaedic operations in Ile-Ife, Nigeria	Nigeria		children		Surgery

2013	Alaba, O	The social determinants of multimorbidity in South Africa	South Africa		adults	multinomial logistic regression	Multimorbidity
2012	Alfadi, AA	Consumer behaviour toward counterfeit drugs in a developing country	Developing countries			structured equation modelling	N/A
2002	Anderson, BA	Environment, Access to Health Care, and Other Factors Affecting Infant and Child Survival Among the African and Coloured Populations of South Africa, 1989 to 94	South Africa		children		Child health
2015	Apanga, PA	Factors influencing uptake of voluntary counselling and testing services for HIV/AIDS in the Lower Manya Krobo Municipality (LMKM) in the Eastern Region of Ghana: a cross-sectional household survey	Ghana	District	households	cross sectional survey	HIV/AIDS

2016	Arba, MA	Institutional Delivery Service Utilization among Women from Rural Districts of Wolaita and Dawro Zones, Southern Ethiopia; a Community Based Cross-Sectional Study	Ethiopia	District, rural	women	cross sectional survey	Maternal
2007	Aries, MJH	Fracture treatment by bone-setters in central Ghana: patients explain their choices and experiences	Ghana		patients	interviews	Injury
2015	Asampong, E	Health seeking behaviours among electronic waste workers in Ghana	Ghana		waste workers	interviews	Injury
2013	Asampong, E	Back to My Roots: A Study of "Returning" Emigrated Health Professionals in the Greater Accra Region of Ghana	Ghana		HCWs		N/A

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2009	Asante, AD	Factors influencing resource allocation decisions and equity in the health system of Ghana	Ghana				qualitative, interviews	N/A
2016	Ashokcoomar, P	An analysis of inter-healthcare facility transfer of neonates within the eThekweni Health District of KwaZulu-Natal, South Africa	South Africa	District	children		quantitative analysis	Child health
2013	Asonganyi, E	Factors Affecting Compliance with Clinical Practice Guidelines for Pap Smear Screening among Healthcare Providers in Africa: Systematic Review and Meta-Summary of 2045 Individuals	Africa		women		systematic review, meta-analysis	Cervical cancer
2013	Atinga, R	Determinants of antenatal care quality in Ghana	Ghana		women		interviews	Antenatal

## APPENDIX C. SYSTEMATIC LITERATURE REVIEW DATA

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2014	Aziato, L	Breast Cancer Diagnosis and Factors Influencing Treatment Decisions in Ghana	Ghana		women	qualitative	Breast cancer
2013	Azu, OO	Choice of specialty amongst first-year medical students in the Nelson R. Mandela School of Medicine, University of KwaZulu-Natal	South Africa		healthcare students	cross sectional survey	N/A
2004	Bach, O	Musculo skeletal trauma in an East African public hospital	Malawi	Rural	patients		Injury
2014	Bagonza, J	Performance of community health workers managing malaria, pneumonia and diarrhoea under the community case management programme in central Uganda: a cross sectional study	Uganda	Community	CHWs	interviews, cross sectional	Malaria, pneumonia, diarrhoea

2006	Banderker	Mobile technology adoption by doctors in public healthcare in South Africa	South Africa		HCWs		N/A
2013	Barnett, W	Perceived adherence barriers among patients failing second-line antiretroviral therapy in Khayelitsha, South Africa	South Africa	Urban	patients	qualitative, interviews	HIV/AIDS
2009	Baume, CA	Factors associated with use and non-use of mosquito nets owned in Oromia and Amhara Regional States, Ethiopia	Ethiopia		households	multivariate analysis, survey	Malaria
2016	Bawate, C	Factors affecting adherence to national malaria treatment guidelines in management of malaria among public healthcare workers in Kamuli District, Uganda	Uganda	District, public	HCWs	cross sectional survey	Malaria

2007	Bendeck, MA	National Vitamin A Supplementation Coverage Survey among 6 to 59 Months Old Children in Guinea (West Africa)	Guinea		children	cross sectional survey	Child health
2001	Berhane, Y	Womens health in a rural setting in societal transition in Ethiopia	Ethiopia	Rural	women	cross sectional survey	Womens health
2014	Bezabhe, WM	Barriers and Facilitators of Adherence to Antiretroviral Drug Therapy and Retention in Care among Adult HIV- Positive Patients: A Qualitative Study from Ethiopia	Ethiopia		patients	qualitative, interviews	HIV/AIDS
2010	Bhat, VG	Factors associated with poor adherence to anti-retroviral therapy in patients attending a rural health centre in South Africa	South Africa	Rural	patients	interviews	HIV/AIDS

2014	Bidwell, P	Security and skills: the two key issues in health worker migration	South Africa	HCWs	interviews	N/A
2003	Bingham, A	Factors affecting utilization of cervical cancer prevention services in low-resource settings	South Africa, Kenya	women		Cervical cancer
2010	Bird, P	Increasing the priority of mental health in Africa: findings from qualitative research in Ghana, South Africa, Uganda and Zambia	Zambia, Uganda, South Africa, Ghana			Mental health
2004	Bishai, D	Determinants of personal demand for an AIDS vaccine in Uganda: contingent valuation survey	Uganda		multivariate analysis, survey	HIV/AIDS
2013	Blacklock, C	Exploring the migration decisions of health workers and trainees from Africa: A meta-ethnographic synthesis	Africa	HCWs	ethnographic, meta-analysis	N/A

2015	Blanco, AJ	Loss to Follow-Up Among HIV-Exposed Children in an HIV Clinic in Beira, Mozambique	Mozambique	City	children	qualitative, interviews	HIV/AIDS
2014	Bloomfield, GS	HIV and Non-Communicable Cardiovascular and Pulmonary Diseases in Low- and Middle-Income Countries in the ART Era: What We Know and Best Directions for Future Research	Low- and middle-income			review	HIV/AIDS, Cardiovascular, Pulmonary
2013	Boateng, D	Health insurance in Ghana evaluation of policy holders perceptions and factors influencing policy renewal in the Volta region	Ghana	District	households	cross sectional survey	N/A

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2016	Bonenberger, M	Factors influencing the work efficiency of district health managers in low-resource settings: a qualitative study in Ghana	Ghana	District	HCWs	qualitative, interviews	N/A
2006	Boon, K	Clinical practice guidelines: a critical review	General			review	N/A
2007	Bowman, RJC	Outcomes of Bilateral Cataract Surgery in Tanzanian Children	Tanzania		children	statistical analysis	Optometry
2011	Boyles, TH	Factors Influencing Retention in Care after Starting Antiretroviral Therapy in a Rural South African Programme	South Africa	Rural	patients		HIV/AIDS
2009	Bradley, S	Mid-level providers in emergency obstetric and newborn health care: factors affecting their performance and retention within the Malawian health system	Malawi		maternal and child	qualitative, exploratory	Maternal and child health

2012	Briand, V	Individual and institutional determinants of caesarean section in referral hospitals in Senegal and Mali: a cross-sectional epidemiological survey	Mali		women	cross sectional survey	Maternal
2008	Bronsard, A	Why are Children Brought Late for Cataract Surgery? Qualitative Findings from Tanzania	Tanzania		children	qualitative, interviews	Optometry
2013	Buckle, GC	Factors influencing time to diagnosis and initiation of treatment of endemic Burkitt Lymphoma among children in Uganda and western Kenya: a cross-sectional survey	Kenya, Uganda		children	interviews	Cancer
2007	Bunce, A	Factors Affecting Vasectomy Acceptability in Tanzania	Tanzania	District	men	interviews	Vasectomy

2003	Buor, D	Water needs and womens health in the Kumasi metropolitan area, Ghana	Ghana	Urban	women	interviews	Womens health
2012	Burchett, HED	New vaccine adoption: qualitative study of national decision-making processes in seven low- and middle-income countries	Low- and middle-income			qualitative	Child health
2002	Buseh, AG	Cultural and gender issues related to HIV/AIDS prevention in rural Swaziland: A focus group analysis	Swaziland	Rural	adults	qualitative, interviews	HIV/AIDS
2014	Busza, J	"I dont want financial support but verbal support. How do caregivers manage childrens access to and retention in HIV care in urban Zimbabwe?"	Zimbabwe	Urban	informal caregivers, children	conceptual framework, formative research, interviews	HIV/AIDS

2011	Buthelezi, N	Gift of Life or Cultural Taboo: Effects of an Educational Pamphlet on Young Adults' Knowledge and Attitudes Regarding Organ Donation	South Africa		adolescents	interviews	Organ Donation
2005	Cambanis, A	Rural poverty and delayed presentation to tuberculosis services in Ethiopia	Ethiopia	Rural	patients	interviews	TB
2005	Carrin, G	Community-based health insurance in developing countries: a study of its contribution to the performance of health financing systems	Developing countries	Community	households		N/A
2014	Cates, W	Family planning since ICPD how far have we progressed?	Africa		adults		Sexual Health
2016	Caulfield, T	Factors influencing place of delivery for pastoralist women in Kenya: a qualitative study	Kenya		women	qualitative, interviews	Maternal

2013	Chakkalakal, RJ	Implementing clinical guidelines in low-income settings: A review of literature	Low- and middle-income			review	N/A
2004	Chakraborty, R	Infections and other causes of death in HIV-infected children in Africa	Kenya	children			HIV/AIDS
2009	Chandler, CIR	Motivation, money and respect: A mixed-method study of Tanzanian non-physician clinicians	Tanzania	HCWs		interviews	N/A
2016	Charalambous, S	Clinic-level factors influencing patient outcomes on antiretroviral therapy in primary health clinics in South Africa	South Africa	patients		quantitative analysis	HIV/AIDS
2016	Chauvin, J	A survey of the governance capacity of national public health associations to enhance population health	Global			survey	N/A

2015	Chi, PC	A qualitative study exploring the determinants of maternal health service uptake in post-conflict Burundi and Northern Uganda	Uganda, Burundi		women	interviews	Maternal
2001	Chirenje, ZM	Situation analysis for cervical cancer diagnosis and treatment in East, Central and Southern African countries	Resource limited countries		women	interviews	Cervical cancer
2015	Chitete, L	What Health Service Provider Factors Are Associated with Low Delivery of HIV Testing to Children with Acute Malnutrition in Dowa District of Malawi?	Malawi	District	children	interviews	HIV/AIDS
2015	Choonara, S	Factors influencing the usage of different types of malaria prevention methods during pregnancy in Kenya	Kenya		women	multivariable logistic regression	Malaria, Maternal

2010	Chuma, J	Barriers to prompt and effective malaria treatment among the poorest population in Kenya	Kenya		households	interviews, cross sectional	Malaria
2009	Chuma, J	Reviewing the literature on access to prompt and effective malaria treatment in Kenya: implications for meeting the Abuja targets	Kenya			systematic review	Malaria
2009	Claeye, F	Project Delivery in HIV/AIDS and TB in Southern Africa: The Cross-cultural Management	Southern Africa				HIV HIV/AIDS
2015	Coetzee, B	Imperative Barriers and facilitators to paediatric adherence to antiretroviral therapy in rural South Africa: a multi-stakeholder perspective	South Africa	Rural	children	interviews	HIV/AIDS

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2016	Coetzee, B	Video observations of treatment administration to children on antiretroviral therapy in rural KwaZulu-Natal	South Africa	District	children	observational	HIV/AIDS
2013	Colombini, M	Factors affecting adherence to short-course ARV prophylaxis for preventing mother-to-child transmission of HIV in sub-Saharan Africa: a review and lessons for future elimination	sub-Saharan Africa		maternal and child	review	Maternal, HIV/AIDS
2014	Colvin, CJ	A Systematic Review of Health System Barriers and Enablers for Antiretroviral Therapy (ART) for HIV-Infected Pregnant and Postpartum Women	Global		women	systematic review	Maternal, HIV/AIDS

2010	Cooke, GS	Population uptake of antiretroviral treatment through primary care in rural South Africa	South Africa	District, rural	patients		multivariable logistic regression	HIV/AIDS
2011	Cramm, JM	The influence of social capital and socio-economic conditions on self-rated health among residents of an economically and health-deprived South African township	South Africa	Community	households		multivariate analysis, survey	Health
2007	Dambisya, YM	Factors influencing the distribution of pharmacy graduates of the university of the North, South Africa	South Africa		healthcare students		survey	Pharmacy
2016	Dare, AJ	Prioritizing Surgical Care on National Health Agendas: A Qualitative Case Study of Papua New Guinea, Uganda, and Sierra Leone	Uganda, Sierra Leone				qualitative, interviews, case study	Surgery

2015	De Allegri, M	Factors Affecting the Uptake of HIV Testing among Men: A Mixed-Methods Study in Rural Burkina Faso	Burkina Faso	Rural	men	qualitative, interviews	HIV/AIDS
2013	De Meyer, CF	Perceived justice in South African airline and hospital industries: measurement model	South Africa			survey	N/A
2016	de Vasconcellos, K	Hypoxaemia on arrival in a multidisciplinary intensive care unit	South Africa				Emergency care
2016	Delil, RK	Magnitude of Malaria and Factors among Febrile Cases in Low Transmission Areas of Hadiya Zone, Ethiopia: A Facility Based Cross Sectional Study	Ethiopia	Public	patients	cross sectional survey	Malaria

2013	Devanathan, R	Overweight and obesity amongst Black women in Durban, KwaZulu-Natal: A disease of perception in an area of high HIV prevalence	South Africa	Urban	women	interviews	Obesity
2011	Dickson, KE	Voluntary Medical Male Circumcision: A Framework Analysis of Policy and Program Implementation in Eastern and Southern Africa	sub-Saharan Africa		men		Circumcision
2012	Diop, W	From Government Policy to Community-Based Communication Strategies in Africa: Lessons from Senegal and Uganda	Senegal, Uganda				HIV/AIDS

2010	Do, NT	Psychosocial Factors Affecting Medication Adherence Among HIV-1 Infected Adults Receiving Combination Antiretroviral Therapy (cART) in Botswana	Botswana		adults	survey	HIV/AIDS
2011	Dodd, PJ	Periodic Active Case Finding for TB: When to Look?	Global				TB
2012	Dodoo, A	Risk Perception and Communication in Sub-Saharan Africa	sub-Saharan Africa		HCWS		N/A
2009	Dong, H	Drop-out analysis of community-based health insurance membership at Nouna, Burkina Faso	Burkina Faso	Community	households	multivariate analysis, survey	N/A

2016	Dror, DM	What Factors Affect Voluntary Uptake of Community-Based Health Insurance Schemes in Low- and Middle-Income Countries? A Systematic Review and Meta-Analysis	Low- and middle-income		households	systematic review, analysis	re-meta-	N/A
2003	Durrheim, DN	Beyond evidence: a retrospective study of factors influencing a malaria treatment policy change in two South African Provinces	South Africa	District, public		interviews		Malaria
2005	Duxbury, J	The use of physical restraint in mental health nursing: An examination of principles, practice and implications for training	General		HCWS			Mental health

2013	Duysburgh, E	Counselling on and womens awareness of pregnancy danger signs in selected rural health facilities in Burkina Faso, Ghana and Tanzania	Burkina Faso, Ghana, Tanzania	Rural	women	interviews, cross sectional, observational, negative binomial regression	Maternal
2016	Dyers, RE	Are central hospitals ready for National Health Insurance? ICD coding quality from an electronic patient discharge record for clinicians	South Africa				N/A
2004	Dzator, J	A study of malaria care provider choice in Ghana	Ghana		households		Malaria
2014	Echebiri, VC	The factors affecting Nigerias success toward implementation of global public health priorities	Nigeria	Public			Health

2016	Enuameh, YAK	Factors Influencing Health Facility Delivery in Predominantly Rural Communities across the Three Ecological Zones in Ghana: A Cross-Sectional Study	Ghana	Rural, community	women, children	multivariable logistic regression	Maternal and child health
2007	Ezeome, ER	Use of complementary and alternative medicine by cancer patients at the University of Nigeria Teaching Hospital, Enugu, Nigeria	Nigeria		patients	interviews	Cancer
2011	Finnie, RKC	Pilot study to develop a rapid assessment of Tuberculosis care-seeking and adherence practices in rural Limpopo Province, South Africa	South Africa			interviews, pilot study	TB
2002	Fongwa, MN	International Health Care Perspectives: The Cameroon Example	Cameroon				N/A

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2004	Fylkesnes, K	A randomized trial on acceptability of voluntary HIV counselling and testing	Zambia	Urban	adults	survey	HIV/AIDS
2016	Ganle, JK	Challenges Women with Disability Face in Accessing and Using Maternal Healthcare Services in Ghana: A Qualitative Study	Ghana	District	women	qualitative	Mental, Maternal
2014	Gebremariam, A	Intention to use long acting and permanent contraceptive methods and factors affecting it among married women in Adigrat town, Tigray, Northern Ethiopia	Ethiopia		women	qualitative, interviews, case study, multivariate logistic regression	Sexual Health
2010	Gebremariam, MK	Barriers and facilitators of adherence to TB treatment in patients on concomitant TB and HIV treatment: a qualitative study	Ethiopia		patients	qualitative, interviews	TB

2015	George, G	Understanding the factors influencing health-worker employment decisions in South Africa	South Africa		HCWs	cross sectional survey	N/A
2014	George, G	Barriers and facilitators to the uptake of voluntary medical male circumcision (VMMC) among adolescent boys in KwaZulu Natal, South Africa	South Africa	District	men, adolescents	qualitative, interviews	Circumcision
2012	Georgeu, D	Implementing nurse-initiated and managed antiretroviral treatment (NI-MART) in South Africa: a qualitative process evaluation of the STRETCH trial	South Africa	District	patients	interviews	HIV/AIDS

2013	Gessese, D	The practice of complementary feeding and associated factors among mothers of children 6-23 months of age in Enemay district, Northwest Ethiopia	Ethiopia	District	women, children	cross sectional survey	Maternal and child health
2002	Geyer, N	Legislative Issues Impacting on The Practice of The South African Nurse Practitioner	South Africa		healthcare workers		N/A
2015	Gillham, A	Uptake of Genetic Counselling, Knowledge of Bleeding risks and Psychosocial Impact in a South African Cohort of Female Relatives of People with Haemophilia	South Africa		women	interviews	Haemophilia
2012	Gilson, L	Using stakeholder analysis to support moves towards universal coverage: lessons from the SHIELD project	South Africa, Tanzania				N/A

2010	Glatman-Freedman, A	Factors Affecting the Introduction of New Vaccines to Poor Nations: A Comparative Study of the Haemophilus influenzae Type B and Hepatitis B Vaccines	Africa			qualitative comparative	com-	Hep B, Hib
2013	Glenton, C	Barriers and facilitators to the implementation of lay health worker programmes to improve access to maternal and child health: Qualitative evidence synthesis	Low- and middle-income		maternal and child	review		Maternal and child health
2009	Gonzaga, MA	Factors influencing students choices in considering rural radiography careers at Makerere University, Uganda	Uganda		healthcare students	interviews, exploratory	ex-	Radiography

2007	Gordon, AN	Towards a sustainable framework for computer based health information systems (CHIS) for least developed countries (LDCs)	Developing countries				literature survey	N/A
2009	Goudge, J	Illness-related impoverishment in rural South Africa: Why does social protection work for some households but not others?	South Africa	Rural	households		qualitative, quantitative	N/A
2006	Grant, H	From the Transvaal to the Prairies: The Migration of South African Physicians to Canada	South Africa			HCWs		N/A
2008	Gray, J	Intentions and Motivations of Nurses to Migrate: A Review of Empirical Studies	Global			HCWs	review	N/A

2010	Gray, S	Longitudinal Weight Gain of Immunized Infants and Toddlers in Moroto District, Uganda (Karamoja Sub region)	Uganda	District	children		Child health
2002	Green, A	A shared mission? Changing relationships between government and church health services in Africa	Africa				N/A
2012	Gross, K	Timing of antenatal care for adolescent and adult pregnant women in south-eastern Tanzania	Tanzania		women	qualitative, explorative, interviews	Antenatal
2014	Haile, F	Assessment of non financial incentives for volunteer community health workers the case of Wukro district, Tigray, Ethiopia	Ethiopia	District	CHWs	quantitative analysis, cross sectional	N/A

2015	Hapunda, G	Living with type 1 diabetes is challenging for Zambian adolescents: qualitative data on stress, coping with stress and quality of care and life	Zambia	adolescents	interviews	Diabetes
2016	Hasiso, TY	Adherence to Treatment and Factors Affecting Adherence of Epileptic Patients at Yirgalem General Hospital, Southern Ethiopia: A Prospective Cross-Sectional Study	Ethiopia	patients	cross sectional survey	Epilepsy
2016	Hategekimana, C	Correlates of Performance of Healthcare Workers in Emergency, Triage, Assessment and Treatment plus Admission Care (ETAT+) Course in Rwanda: Context Matters	Rwanda	HCWs	linear and logistic regression	N/A

2013	Hattingh, TS	An unlikely suitor: Industrial engineering in health promotion	South Africa				N/A
2016	Hazemba, AN	Promotion of exclusive breast-feeding among HIV-positive mothers: an exploratory qualitative study	Zambia	maternal and child	and	qualitative, explorative, interviews	Maternal, HIV/AIDS
2011	Heunis, JC	Patient- and delivery-level factors related to acceptance of HIV counselling and testing services among tuberculosis patients in South Africa: a qualitative study with community health workers and program managers	South Africa			interviews	TB

2013	Hill, J	Factors Affecting the Delivery, Access, and Use of Interventions to Prevent Malaria in Pregnancy in Sub-Saharan Africa: A Systematic Review and Meta-Analysis	sub-Saharan Africa		women	systematic review	Malaria, Maternal
2014	Hodgson, I	A Systematic Review of Individual and Contextual Factors Affecting ART Initiation, Adherence, and Retention for HIV-Infected Pregnant and Postpartum Women	sub-Saharan Africa		women	systematic review	Maternal, HIV/AIDS
2012	Holt, K	Assessment of Service Availability and Health Care Workers Opinions about Young Womens Sexual and Reproductive Health in Soweto, South Africa	South Africa	Urban	women	interviews	Sexual Health

2015	Honda, A	Analysis of agency relationships in the design and implementation process of the equity fund in Madagascar	Madagascar			case study	N/A
2015	Hudelson, C	Factors associated with adherence to antiretroviral therapy among adolescents living with HIV/AIDS in low- and middle-income countries: a systematic review	Low- and middle-income		adolescents	systematic review	HIV/AIDS
2010	Human, SP	Factors influencing Tuberculosis treatment interruptions	South Africa		patients	quantitative analysis, survey	TB
2012	Igira, FT	The dynamics of healthcare work practices: Implications for health management information systems design and implementation	Tanzania			review	N/A

2010	Iroha, E	Adherence to antiretroviral therapy among HIV- infected children attending a donor-funded clinic at a tertiary hospital in Nigeria	Nigeria		children		HIV/AIDS
2014	Ishijima, H	Factors influencing national rollout of quality improvement approaches to public hospitals in Tanzania	Tanzania	Public		interviews	N/A
2011	Issah, K	Maternal and neonatal survival and mortality in the Upper West Region of Ghana	Ghana	District	women, children		Maternal and child health
2015	Iwelunmor, J	A Concept Mapping Study of Physicians Perceptions of Factors Influencing Management and Control of Hypertension in Sub Saharan Africa	sub-Saharan Africa				Hypertension

2015	Iwelunmor, J	A Narrative Synthesis of the Health Systems Factors Influencing Optimal Hypertension Control in Sub-Saharan Africa	sub-Saharan Africa			narrative synthesis	Hypertension
2014	Izugbara, CO	Research on Womens Health in Africa: Issues, Challenges, and Opportunities	Africa	women		editorial	Womens health
2005	Johns, B	Costs of scaling up health interventions: a systematic review	Global			systematic review	N/A
2012	Johnston, V	Second-Line Antiretroviral Therapy in a Workplace and Community-Based Treatment Programme in South Africa: Determinants of Virological Outcome	South Africa	patients		Poisson regression	HIV/AIDS

2010	Jombo, GTA	Socio-cultural factors influencing insecticide treated bed net utilization in a malaria endemic city in north-central Nigeria	Nigeria	Urban	Households	Interviews quantitative and qualitative analysis Epi Info 6 statistical software	Malaria
2016	Jordan, K	Barriers and Facilitators to Scaling Up the Non-Pneumatic Anti-Shock Garment for Treating Obstetric Haemorrhage: A Qualitative Study	Ethiopia, Zimbabwe, Nigeria		women	qualitative	Maternal
2013	Joseph, C	Activity limitations and factors influencing functional outcome of patients with stroke following rehabilitation at a specialized facility in the Western Cape	South Africa	District	patients		Stroke
2015	Juma, PA	Integrated community case management for childhood illnesses: explaining policy resistance in Kenya	Kenya		children	interviews, review	Child health

2016	Kabatooro, A	Patient satisfaction with medical consultations among adults attending Mulago hospital assessment centre	Uganda		patients	quantitative analysis, cross sectional	N/A
2012	Kamau, TM	The effectiveness of social resource intervention to promote adherence to HIV medication in a multidisciplinary care setting in Kenya	Kenya		patients	cross sectional survey	HIV/AIDS
2013	Katz, IT	A Qualitative Analysis of Factors Influencing HPV Vaccine Uptake in Soweto, South Africa among Adolescents and Their Caregivers	South Africa	Urban	adolescents	interviews	Sexual Health, cervical cancer
2012	Kawonga, M	Aligning vertical interventions to health systems: a case study of the HIV monitoring and evaluation system in South Africa	South Africa	District, public		interviews	HIV/AIDS

2007	Kazembe, L	Choice of treatment for fever at household level in Malawi: examining spatial patterns	Malawi		households	multinomial logistic regression	Malaria
2016	Keikelame, MJ	It is always HIV/AIDS and TB: Home-based carers perspectives on epilepsy in Cape Town, South Africa	South Africa	Urban	CHWs	interviews	Epilepsy
2012	Keikelame, MJ	Lost opportunities to improve health literacy: Observations in a chronic illness clinic providing care for patients with epilepsy in Cape Town South Africa	South Africa		patients		Epilepsy

2016	Keikelame, MJ	The others look at you as if you are a grave: a qualitative study of subjective experiences of patients with epilepsy regarding their treatment and care in Cape Town, South Africa	South Africa		patients	interviews	Epilepsy
2004	Kinoti, SN	How research can affect policy and programme advocacy: Example from a three-country study on abortion complications in sub-Saharan Africa	sub-Saharan Africa		women	interviews	Abortion
2014	Kisoka, WJ	Factors Influencing Drug Uptake during Mass Drug Administration for Control of Lymphatic Filariasis in Rural and Urban Tanzania	Tanzania	Rural, urban	adults	interviews	Lymphatic Filariasis

2012	Kizito, J	Improving access to health care for malaria in Africa: a review of literature on what attracts patients	Africa				systematic review	Malaria
2014	Kohler, PK	Shame, Guilt, and Stress: Community Perceptions of Barriers to Engaging in Prevention of Mother to Child Transmission (PMTCT) Programs in Western Kenya	Kenya	Rural	maternal and child		multivariable logistic regression, cross sectional	HIV/AIDS
2015	Kohler, RE	Developing a discrete choice experiment in Malawi: eliciting preferences for breast cancer early detection services	Malawi		women		review	Breast cancer

2015	Kok, MC	How does context influence performance of community health workers in low- and middle-income countries? Evidence from the literature	Low- and middle-income	Community	CHWs	systematic review	N/A
2009	Kruger, A	Health care seeking behaviour of newly diagnosed HIV infected people from rural and urban communities in the North-West Province of South Africa	South Africa	Community	patients	interviews	HIV/AIDS
2013	Krumpkamp, R	Health Care Utilization and Symptom Severity in Ghanaian Children, a Cross-Sectional Study	Ghana	Rural	children	Poisson regression, re-cross sectional	Disease (Diarrhoea, fever)

2013	Lakew, Y	Geographical variation and factors influencing modern contraceptive use among married women in Ethiopia: evidence from a national population based survey	Ethiopia		women	multivariate analysis, survey	Sexual Health
2005	Landau, A	Liver injuries in children: The role of selective non-operative management	South Africa		children		Injury
2007	Lara, AM	Laboratory costs of a hospital-based blood transfusion service in Malawi	Malawi	Rural			Transfusion
2007	Launiala, A	Ethnographic study of factors influencing compliance to intermittent preventive treatment of malaria during pregnancy among Yao women in rural Malawi	Malawi	Rural	women	ethnographic, interviews	Malaria, Maternal

2014	Lawani, LO	Dual method use for protection of pregnancy and disease prevention among HIV infected women in South East Nigeria	Nigeria	women	cross sectional survey	HIV/AIDS
2014	Layer, EH	Multi-Level Factors Affecting Entry into and Engagement in the HIV Continuum of Care in Iringa, Tanzania	Tanzania		interviews, observational	HIV/AIDS
2013	Ledikwe, JH	Evaluation of a Well-Established Task-Shifting Initiative: The Lay Counsellor Cadre in Botswana	Botswana	HCWs	interviews, observational	HIV/AIDS
2014	Ledikwe, JH	Scaling up voluntary medical male circumcision, what have we learned?	Africa	men	review	Circumcision

2015	Lewallen, S	Factors affecting cataract surgical coverage and outcomes: a retrospective cross-sectional study of eye health systems in sub-Saharan Africa	sub-Saharan Africa			survey, ANOVA	Optometry, surgery
2012	Lewis-Wall, L	Preventing Obstetric Fistulas in Low-Resource Countries: Insights from a Haddon Matrix	Resource limited countries		women		Maternal
2001	Lienhardt, C	Factors affecting time delay to treatment in a tuberculosis control programme in a sub Saharan African country: the experience of The Gambia	Gambia		patients	interviews	TB
2015	Likwa, RN	Building capacity for public health and population policy-making: perspectives from Zambia	Zambia	Public			N/A

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2001	Lishimpi, K	Necropsies in African children: consent dilemmas for parents and guardians	Africa			children		Child health
2013	Liverani, M	Political and Institutional Influences on the Use of Evidence in Public Health Policy. A Systematic Review	Global	Public			systematic review	N/A
2012	Lori, JR	Factors influencing Ghanaian midwifery students willingness to work in rural areas, A computerized survey	Ghana	Rural	healthcare students		multivariable logistic regression, interviews	N/A
2012	Lori, JR	Perceived barriers and motivating factors influencing student midwives acceptance of rural postings in Ghana	Ghana	Rural	healthcare students		qualitative, explorative, interviews	Maternal
2013	Louw, VJ	Factors affecting the current status of transfusion medicine education in South Africa	South Africa				review	Transfusion

2016	Lowe, M	Social and Cultural Factors Affecting Maternal Health in Rural Gambia: An Exploratory Qualitative Study	Gambia	Rural	women	interviews	Maternal
2015	Lund, C	Generating evidence to narrow the treatment gap for mental disorders in sub-Saharan Africa: rationale, overview and methods of AFFIRM	sub-Saharan Africa		patients		Mental health
2016	Lungu, EA	Healthcare seeking practices and barriers to accessing under-five child health services in urban slums in Malawi: a qualitative study	Malawi	Urban	children	qualitative, interviews	Child health
2013	Lusignani, LS	Factors associated with patient and health care system delay in diagnosis for tuberculosis in the province of Luanda, Angola	Angola		patients	cross sectional survey	TB

2013	Lygizos, M	Natural ventilation reduces high TB transmission risk in traditional homes in rural KwaZulu-Natal, South Africa	South Africa	District, rural	households	multivariable logistic regression	TB
2015	Mabelane, T	Factors affecting the implementation of nurse-initiated antiretroviral treatment in primary health care clinics of Limpopo Province, South Africa	South Africa	District		quantitative analysis, survey	HIV/AIDS
2012	Macha, J	Factors influencing the burden of health care financing and the distribution of health care benefits in Ghana, Tanzania and South Africa	South Africa, Tanzania, Ghana		adults	interviews	N/A
2010	Maharaj, P	Missing opportunities for preventing unwanted pregnancy: a qualitative study of emergency contraception	South Africa		women	qualitative, interviews	Maternal

2010	Mairiga, AG	Sociocultural factors influencing decision-making related to fertility among the Kanuri tribe of north-eastern Nigeria	Nigeria	Community	women	qualitative	Maternal
2008	Makin, JD	Nigeria Factors Affecting Disclosure in South African HIV-Positive Pregnant Women	South Africa		women	survey	Maternal, HIV/AIDS
2015	Mannava, P	Attitudes and behaviours of maternal health care providers in interactions with clients: a systematic review	Low- and middle-income	Public	HCWs	systematic review	Maternal
2010	Maqutu, D	Factors affecting first-month adherence to antiretroviral therapy among HIV-positive adults in South Africa	South Africa		patients		HIV/AIDS
2011	Marschall, P	Efficiency of primary care in rural Burkina Faso. A two-stage DEA analysis	Burkina Faso	Rural		data Envelopment Analysis	N/A

2008	Martin, C	Dietitians perceptions of the continuing professional development system in South Africa	South Africa		HCWs	qualitative, quantitative	N/A
2007	Mathauer, I	Extending social health insurance to the informal sector in Kenya. An assessment of factors affecting demand	Kenya		adults	survey	N/A
2006	Mathews, C	Factors associated with teachers implementation of HIV/AIDS education in secondary schools in Cape Town, South Africa	South Africa	Urban, city	adolescents	survey	HIV/AIDS
2012	Maticka-Tyndale, E	Condoms in sub-Saharan Africa	sub-Saharan Africa		adults		Sexual Health
2010	Mavhu, W	Chronic cough and its association with TB HIV co-infection factors affecting help-seeking behaviour in Harare, Zimbabwe	Zimbabwe	Urban, city	patients	cross sectional survey	HIV/AIDS, TB
2004	Mayeya, J	Zambia mental health country profile	Zambia			interviews	Mental health

2000	Mayhew, SH	Integration of STI Services into FP/MCH Services: Health Service and Social Contexts in Rural Ghana	Ghana	Rural				Sexual Health
2005	Mayhew, SH	Donor agencies involvement in reproductive health, Saying one thing and doing another? The impact of human immunodeficiency virus on human papillomavirus transmission in heterosexually active couples	Zambia, Kenya, South Africa, Ghana					Sexual Health
2013	Mbulawa, ZZA	Maternal Health and HIV	South Africa			heterosexuals		HIV/AIDS
2005	McIntyre, J	Recruiting and retaining rural students: evidence from a faculty of dentistry in South Africa	Resource limited countries South Africa			women		Maternal, HIV/AIDS
2012	McMillan, WJ	Malaria incidence in rural Benin: does economics matter in endemic area?	Benin	Rural		healthcare students	interviews	Dental
2003	Mensah, OA			Rural		households		Malaria

2008	Merlin, T	Factors influencing womens decisions to purchase specific childrens multi-nutrient supplements in the Gauteng Province (South Africa)	South Africa	District	women, children	interviews	Child health
2016	Mijovic, H	What does the literature tell us about health workers experiences of task shifting projects in sub to Saharan Africa? A systematic, qualitative review	sub to Saharan Africa		HCWs	systematic review, qualitative	N/A
2016	Mohammed, F	Determinants of Desire for Children among HIV-Positive Women in the Afar Region, Ethiopia: Case Control Study	Ethiopia	District	women	case study	HIV/AIDS

2011	Mokoka, KE	Factors influencing the retention of registered nurses in the Gauteng Province of South Africa	South Africa	District	HCWs	survey	N/A
2015	Moodley, J	Understanding pathways to breast cancer diagnosis among women in the Western Cape Province, South Africa: a qualitative study	South Africa	District	women	qualitative, interviews	Breast cancer
2007	Moonasar, D	An exploratory study of factors that affect the performance and usage of rapid diagnostic tests for malaria in the Limpopo Province, South Africa	South Africa	District		cross sectional survey	Malaria
2006	Moore, AR	Stress, social support and depression in informal caregivers to people with HIV/AIDS in Lomé, Togo	Togo		patients	interviews	HIV/AIDS

2013	Morgan, R	Aligning faith-based and national HIV/AIDS prevention responses? Factors influencing the HIV/AIDS prevention policy process and response of faith-based NGOs in Tanzania	Tanzania	Urban		qualitative	HIV/AIDS
2015	Morton, D	Support for volunteer caregivers and its influence on the quality of community home-based care in the Eastern Cape, South Africa	South Africa	District	CHWs	interviews	HIV/AIDS
2015	Mponela, MJ	Post exposure prophylaxis following occupational exposure to HIV: a survey of health care workers in Mbeya, Tanzania, 2009-2010	Tanzania	District, public	HCWs	cross sectional survey	HIV/AIDS

2007	Mrisho, M	Factors affecting home delivery in rural Tanzania	Tanzania	Rural	women	interviews, cross sectional, observational, negative binomial regression	Maternal
2013	Mubi, M	Malaria diagnosis and treatment practices following introduction of rapid diagnostic tests in Kibaha District, Coast Region, Tanzania	Tanzania	District	patients	interviews	Malaria
2008	Mubyazi, GM	Implementing Intermittent Preventive Treatment for Malaria in Pregnancy: Review of Prospects, Achievements, Challenges and Agenda for Research	Tanzania		women		Malaria, Maternal
2005	Mudokweny-Rawdon, C	Factors influencing post abortion outcomes among high-risk patients in Zimbabwe	Zimbabwe		women		Abortion

2008	Mulder, AA	Healthcare seeking behaviour for Buruli ulcer in Benin: a model to capture therapy choice of patients and healthy community members	Benin		adults	interviews	Buruli Ulcer
2014	Mungati, M	Factors affecting diagnosis and management of hypertension in Mazowe District of Mashonaland Central Province in Zimbabwe: 2012	Zimbabwe	District	HCWs	analytic, cross section, interviews	Hypertension
2013	Musheke, M	A systematic review of qualitative findings on factors enabling and deterring uptake of HIV testing in Sub-Saharan Africa	sub-Saharan Africa			systematic review, ethnographic, meta-analysis	HIV/AIDS
2012	Mushi, D	Perceptions, social life, treatment and education gap of Tanzanian children with epilepsy: A community-based study	Tanzania	Community	children	interviews	Epilepsy

2014	Mutasa Apollo, T	Patient Retention, Clinical Outcomes and Attrition Associated Factors of HIV-Infected Patients Enrolled in Zimbabwe's National Antiretroviral Therapy Programme, 2007 to 2010	Zimbabwe		patients	retrospective review	HIV/AIDS
2014	Mutero, CM	Factors influencing malaria control policy-making in Kenya, Uganda and Tanzania	Kenya, Uganda, Tanzania			interviews	Malaria
2015	Naanyu, V	Barriers Influencing Linkage to Hypertension Care in Kenya: Qualitative Analysis from the LARK Hypertension Study	Kenya	Rural	patients	qualitative, interviews	Hypertension

2013	Naidoo, K	Survey of ethical dilemmas facing intensivists in South Africa in the admission of patients with HIV infection requiring intensive care	South Africa		HCWs	quantitative analysis, cross sectional, survey	HIV/AIDS
2009	Naidoo, P	Factors influencing HAART adherence among private health care sector patients in a suburb of the Ethekweni Metro	South Africa	Private	patients	cross sectional survey	HIV/AIDS
2014	Nakambale, A	Affecting Utilization of Skilled Birth Attendants by Women in Northern Zambia	Zambia	District	women	interviews	Maternal
2009	Nattabi, B	A Systematic Review of Factors Influencing Fertility Desires and Intentions Among People Living with HIV/AIDS: Implications for Policy and Service Delivery	sub-Saharan Africa		women	systematic review	HIV/AIDS

2015	Ndhlovu, M	Antibiotic prescribing practices for patients with fever in the transition from presumptive treatment of malaria to confirm and treat in Zambia, a cross-sectional study	Zambia	patients	cross sectional survey	Malaria
2001	Needham, DM	Socio-economic, gender and health services factors affecting diagnostic delay for tuberculosis patients in urban Zambia	Zambia	adults	interviews	TB
2014	Ngome, E	The social context of adolescent womens use of modern contraceptives in Zimbabwe, a multilevel analysis	Zimbabwe	women, adolescents	multivariable logistic regression	Sexual Health
2008	Ngowu, R	Reducing child mortality in Nigeria: A case study of immunization and systemic factors	Nigeria	children	multivariable logistic regression	Child health

2013	Ngxongo, T	Factors influencing successful implementation of the basic antenatal care approach in primary health care facilities in eThek-wini district, KwaZulu-Natal	South Africa	District	women	quantitative analysis	Antenatal
2005	Niba, MBI	Major factors influencing HIV/AIDS project evaluation	South Africa			interviews, case study	HIV/AIDS
2016	Njuguna, F	Factors influencing time to diagnosis and treatment among paediatric oncology patients in Kenya	Kenya		children	interviews	Cancer
2013	Nkosi, D	Factors influencing specialist care referral of multidrug- and extensively drug-resistant tuberculosis patients in Gauteng/South Africa: a descriptive questionnaire-based study	South Africa	District, urban	patients	survey	TB

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2009	Noble, V	A Medical Education with a Difference, A History of the Training of Black Student Doctors in Social, Preventive and Community Oriented Primary Health Care at the University of Natal Medical School, 1940s to 19601	South Africa	District	healthcare students		N/A
2015	Nostlinger, C	Factors influencing social self-disclosure among adolescents living with HIV in Eastern Africa	Kenya, Uganda, Kampala		adolescents	multivariable logistic regression, interviews	HIV/AIDS
2014	Ntsepe, Y	Perceptions about the acceptability and prevalence of HIV testing and factors influencing them in different communities in South Africa	South Africa		adults	interviews	HIV/AIDS

2005	Nuwaha, F	Predictors of compliance with community-directed ivermectin treatment in Uganda: quantitative results	Uganda	District		cross sectional survey	Parasitic
2000	Nuwaha, F	Psychosocial determinants for sexual partner referral in Uganda: qualitative results	Uganda		adults	interviews	Sexual Health
2008	Nwadiaro, HC	Determinants of Patronage of Traditional Bone Setters in the Middle Belt of Nigeria	Nigeria			interviews	Injury
2015	Nyamunyekunge, KK	The relative patient costs and availability of dental services, materials and equipment in public oral care facilities in Tanzania	Tanzania	Public		interviews	Dental

2016	Nyasulu, P	Factors Influencing Delayed Health Care Seeking Among Pulmonary Tuberculosis Suspects in Rural Communities in Ntcheu District, Malawi	Malawi	Rural, community	commu- patients		interviews	TB
2014	Nyondo, AL	Stakeholders perceptions on factors influencing male involvement in prevention of mother to child transmission of HIV services in Blantyre, Malawi	Malawi	Urban	maternal and child	and	qualitative, interviews	HIV/AIDS
2015	Nzioki, JM	Efficiency and factors influencing efficiency of Community Health Strategy in providing Maternal and Child Health services in Mwingi District, Kenya: an expert opinion perspective	Kenya	District			qualitative	Maternal

2005	OHare, B	Child health in Africa: 2005 a year of hope?	Africa		children		Child health
2015	Odetola, TD	Health care utilization among rural women of child-bearing age: a Nigerian experience	Nigeria	Rural	women	descriptive study	Maternal
2014	Odeyemi, IAO	Community-based health insurance programmes and the national health insurance scheme of Nigeria: challenges to uptake and integration	Nigeria			review	N/A
2014	Oduwo, E	A systematic review of factors affecting childrens right to health in cluster randomized trials in Kenya	Kenya		children	systematic review	Child health
2016	Ogundele, OA	An ontology for factors affecting tuberculosis treatment adherence behaviour in sub-Saharan Africa	sub-Saharan Africa			review	TB

2015	Okwaraji, YB	Barriers in physical access to maternal health services in rural Ethiopia	Ethiopia	Rural	women	cross sectional survey	Maternal
2007	Olago, D	Ethiopia Climatic, Socio-economic, and Health Factors Affecting Human Vulnerability to Cholera in the Lake Victoria Basin, East Africa	Kenya, Uganda, Tanzania				Cholera
2006	Onah, HE	Factors associated with the use of maternity services in Enugu, south-eastern Nigeria	Nigeria		women	interviews	Maternal
2013	Onyeonoro, UU	Effect of TB behaviour change communication (BCC) intervention in Enugu state, southeast Nigeria	Nigeria	District	adults	cross sectional survey	TB

2010	Osawa, E	Motivation and sustainability of care facilitators engaged in a community home-based HIV/AIDS program in Masvingo Province, Zimbabwe	Zimbabwe	District	CHWs	cross sectional survey	HIV
2006	Osterholt, DM	Predictors of treatment error for children with uncomplicated malaria seen as outpatients in Blantyre district, Malawi	Malawi	District	children	multivariable logistic regression	Malaria
2016	Owusu-Ansah, FE	Access to health in city slum dwellers: The case of Sodom and Gomorrah in Accra, Ghana	Ghana	Urban	slum dwellers	interviews	Health
2012	Owusu-Asubonteng, G	Trend, client profile and surgical features of vasectomy in Ghana	Ghana		men		Vasectomy

2014	Oyekale, AS	Maternal Factors Influencing Timeliness of Seeking Treatment for Fever in Children under Five and Healthcare Preferences in Malawi	Malawi		children	Poisson regression, re- Logit regression	Malaria
2015	Papali, A	A three delays model for severe sepsis in resource limited countries	Low- and middle-income		adults	review	Sepsis
2005	Parkhurst, JO	Health systems factors influencing maternal health services: a four-country comparison	South Africa, Uganda			comparison	Maternal
2002	Paterson, M	Probability of assertive behaviour, interpersonal anxiety and self-efficacy of South African registered dietitians	South Africa		HCWs	interviews	N/A
2007	Paterson, M	Running before we walk: How can we maximize the benefits from community service dietitians in KwaZulu-Natal, South Africa?	South Africa	District	HCWs	interviews	N/A

2014	Paul, B	Influence of HIV Testing on Knowledge of HIV/AIDS Prevention Practices and Transmission among Undergraduate Youths in North-West University, Mafikeng	South Africa	District	adolescents		HIV
2011	Pell, C	Social and Cultural Factors Affecting Uptake of Interventions for Malaria in Pregnancy in Africa: A Systematic Review of the Qualitative Research Factors Affecting Antenatal Care Attendance: Results from Qualitative Studies in Ghana, Kenya and Malawi	Africa		women	systematic review, qualitative	Malaria, Maternal
2013	Pell, C	Social and Cultural Factors Affecting Antenatal Care Attendance: Results from Qualitative Studies in Ghana, Kenya and Malawi	Ghana, Kenya, Malawi		women	qualitative, interviews, observational	Antenatal

2011	Peltzer, K	Sexual dissatisfaction and associated factors in a sample of patients on antiretroviral treatment in KwaZulu-Natal, South Africa	South Africa	District	patients	survey	HIV
2014	Petersen, M	Observational Research on NCDs in HIV-Positive Populations: Conceptual and Methodological Considerations	sub-Saharan Africa				HIV, Cardiovascular, Pulmonary, NCD
2016	Pillay, V	How Do Patients Choose Their Spectacles in the Public Sector of South Africa?	South Africa	District, public	patients	interviews	Optometry
2016	Poppe, A	The views of migrant health workers living in Austria and Belgium on return migration to sub-Saharan Africa	sub-Saharan Africa		HCWs	interviews, case study	N/A

2015	Ports, KA	Integrating cervical cancer prevention initiatives with HIV care in resource-constrained settings: A formative study in Durban, South Africa	South Africa	District	women	interviews	HIV/AIDS, Cervical cancer
2016	Rachilis, B	Facility-Level Factors Influencing Retention of Patients in HIV Care in East Africa	Kenya, Uganda, Tanzania		patients		HIV/AIDS
2010	Rahlenbeck, S	Female genital cutting starts to decline among women in Oromia, Ethiopia	Ethiopia		women		Female genital cutting
2007	Rampanjato, RM	Factors influencing pain management by nurses in emergency departments in Central Africa	Africa		HCWs	survey	Injury

2002	Raviola, G	HIV, disease plague, demoralization and burnout: Resident experience of the medical profession in Nairobi, Kenya	Kenya	City	HCWs	interviews	HIV/AIDS
2016	Rees, CP	Factors Affecting Access to Healthcare: An Observational Study of Children under 5 Years of Age Presenting to a Rural Gambian Primary Healthcare Centre	Gambia	Rural	children	observational	Child health
2013	Rehfuess, EA	Diagram-based Analysis of Causal Systems (DACS): elucidating interrelationships between determinants of acute lower respiratory infections among children in sub-Saharan Africa	sub-Saharan Africa		children	Diagram-based analysis	Respiratory
2006	Rennie, S	AIDS Care and Treatment in Sub-Saharan Africa	sub-Saharan Africa				HIV

2014	Rispel, LC	Factors influencing agency nursing and moonlighting among nurses in South Africa	South Africa		HCWs	survey	N/A
2012	Robyn, PJ	Health insurance and health-seeking behaviour: Evidence from a randomized community-based insurance rollout in rural Burkina Faso	Burkina Faso	Rural	households		N/A
2001	Rogo, KO	Maternal Mortality in Kenya: The state of health facilities in a rural district	Kenya	District, rural	women	qualitative, interviews	Maternal
2007	Rowe, AK	Evaluating the impact of malaria control efforts on mortality in sub-Saharan Africa	sub-Saharan Africa		children		Malaria

2015	Rukundo, GZ	Antenatal services for pregnant teenagers in Mbarara Municipality, South-western Uganda, health workers and community leaders views	Uganda	District	women, adolescents	adoles-	cross sectional survey	Antenatal
2010	Rutherford, ME	How access to health care relates to under-five mortality in sub-Saharan Africa: systematic review	sub-Saharan Africa		children		systematic review	Child health
2013	Rutto, JJ	Socio Economic and Cultural Determinants of Human African Trypanosomiasis at the Kenya Uganda Trans-boundary	Uganda				cross sectional survey	Sleeping sickness
2015	Sacks, E	Factors influencing modes of transport and travel time for obstetric care: a mixed methods study in Zambia and Uganda	Zambia, Uganda	Rural	women		quantitative analysis, survey	Obstetric

2014	Sariah, AE	Risk and protective factors for relapse among individuals with schizophrenia: a qualitative study in Dar es Salaam, Tanzania	Tanzania	Urban	patients	qualitative	Mental
2010	Sarna, A	Access to Antiretroviral Therapy for Adults and Children with HIV Infection in Developing Countries: Horizons Studies, 2002-2008	sub-Saharan Africa		patients		HIV/AIDS
2016	Saso, A	Vaccination against respiratory syncytial virus in pregnancy: a suitable tool to combat global infant morbidity and mortality?	Global		women	review	Maternal, Respiratory
2015	Schoevers, J	Factors influencing specialist outreach and support services to rural populations in the Eden and Central Karoo districts of the Western Cape	South Africa	District	HCWs	Delphi	Health

2011	Scott, V	Constraints to implementing an equity promoting staff allocation policy, understanding mid level managers and nurses perspectives affecting implementation in South Africa	South Africa		HCWs		N/A
2008	Seedat, M	The Use of Public Health Research in Stimulating Violence and Injury Prevention Practices and Policies	South Africa			case study	Injury
2006	Seljeskog, L	Factors Influencing Womens Choice of Place of Delivery in Rural Malawi-An explorative study	Malawi	District, rural	women	explorative, interviews	Maternal
2015	Shah, K	Factors Affecting the Academic Performance of Optometry Students in Mozambique	Mozambique		Healthcare students	interviews	Optometry

2014	Shattuck, D	Who chooses vasectomy in Rwanda? Survey data from couples who chose vasectomy, 2010-2012	Rwanda		men	cross sectional survey	Vasectomy
2015	Sialubanje, C	Improving access to skilled facility-based delivery services: Womens beliefs on facilitators and barriers to the utilization of maternity waiting homes in rural Zambia	Zambia	Rural	women	interviews	Maternal
2009	Simba, DO	Factors influencing adherence to referral advice following pre-referral treatment with artesunate suppositories in children in rural Tanzania	Tanzania	Rural	children	interviews	Malaria
2007	Simmonds, S	Institutional factors and HIV/AIDS, TB and Malaria	Africa				Malaria, HIV/AIDS, TB

2011	Singer, M	Toward a critical biosocial model of ecohealth in Southern Africa: The HIV/AIDS and nutrition insecurity syndemic	Southern Africa				HIV/AIDS
2013	Sipsma, H	Preferences for home delivery in Ethiopia: Provider perspectives	Ethiopia		women	qualitative, interviews	Maternal
2011	Sissolak, D	TB infection prevention and control experiences of South African nurses - a phenomenological study	South Africa		HCWs	qualitative, interviews	TB
2014	Slingers, N	Evaluation of the effect of the introduction of a hypertension club on the management of hypertension at a community health centre in the Cape Town Metropole	South Africa	Urban	adults	systematic review	Hypertension
2004	Smakman, N	Factors affecting outcome in penetrating oesophageal trauma	South Africa		patients		Injury

2012	Smith-Hall, C	People, plants and health: a conceptual framework for assessing changes in medicinal plant consumption	General			systematic review	Health
2013	Sofolahan, YA	Cultural Expectations and Reproductive Desires: Experiences of South African Women Living With HIV/AIDS (WLHA)	South Africa		women	interviews	HIV/AIDS
2009	Sowden, M	Factors influencing high socio-economic class mothers decision regarding formula-feeding practices in the Cape Metropole	South Africa	District	women, children		Child health
2013	Stanford, J	Conversations Worth Having: The Perceived Relevance of Advance Care Planning among Teachers, Hospice Staff, and Pastors in Knysna, South Africa	South Africa				Advanced care

2015	Stellenberg, EL	Prevalence of and factors influencing postnatal depression in a rural community in South Africa	South Africa	Rural, community	women	cross sectional survey	Maternal, Mental
2016	Stellenberg, EL	Knowledge of midwives about hypertension disorders during pregnancy in primary healthcare	South Africa	District	women	survey	Maternal, Hypertension
2013	Stewart, KA	Traumatic Injuries in Developing Countries: Report from a Nationwide Cross-Sectional Survey of Sierra Leone	Sierra Leone		households	cross sectional survey	Injury
2015	Strauss, M	A qualitative analysis of the barriers and facilitators of HIV counselling and testing perceived by adolescents in South Africa	South Africa	District, rural	adolescents	interviews	HIV/AIDS
2013	Sudenga, SL	Knowledge, Attitudes, Practices, and Perceived Risk of Cervical Cancer Among Kenyan Women	Kenya		women	cross sectional survey	Cervical cancer

2012	Sukums, F	Promising adoption of an electronic clinical decision support system for antenatal and intrapartum care in rural primary healthcare facilities in sub-Saharan Africa: The QUALMAT experience	sub-Saharan Africa	Rural			Antenatal
2009	Talmage, G	An exploratory mixed-method study to determine factors that may affect satisfaction levels of athletes receiving chiropractic care in a nonclinical setting	South Africa		athletes	explorative, interviews	Chiropractic care
2012	Taylor, KD	Explanatory models of hypertension among Nigerian patients at a University Teaching Hospital	Nigeria		patients	interviews	Hypertension

2001	Taylor, M	Working with community health workers to improve nutrition in rural KwaZulu-Natal	South Africa	Rural	CHWs	survey	Health
2015	Tebekaw, Y	Factors Influencing Womens Preferences for Places to Give Birth in Addis Ababa, Ethiopia	Ethiopia	Urban	women	quantitative analysis, cross sectional	Maternal
2015	Titilayo, A	Knowledge of Causes of Maternal Health Seeking Behaviour in Nigeria	Nigeria		women	multivariable logistic regression	Maternal
2009	Trapido, EJ	Critical factors influencing the establishment, maintenance and sustainability of population-based cancer control programs	Resource limited countries				Cancer
2015	Tsawe, M	Factors influencing the use of maternal health-care services and childhood immunization in Swaziland	Swaziland		women, children	explorative and descriptive	Maternal and child health

2010	Twikirize, JM	Why Ugandan rural households are opting to pay community health insurance rather than use the free healthcare services	Uganda	Rural	households	survey	N/A
2013	Uebel, K	Integrating HIV care into nurse-led primary health care services in South Africa: a synthesis of three linked qualitative studies	South Africa		HCWs	qualitative	HIV/AIDS
2012	Ugiagbe, EE	Post-mortem Examinations on Deceased Neonates: A Rarely Utilized Procedure in an African Referral Centre	sub-Saharan Africa		children		Child health
2011	Ukegbu, AU	Determinants of breastfeeding patterns among mothers in Anambra State, Nigeria	Nigeria	District	women, children	interviews	Maternal and child health

2013	Upadhyay, RP	Need to Focus Beyond the Medical Causes: A Systematic Review of the Social Factors Affecting Neonatal Deaths	Africa		children	systematic review, meta-analysis	Child health
2005	van Kooten Niek-erk, NKM	The First 5 Years of the Family Clinic for HIV at Tygerberg Hospital: Family Demographics, Survival of Children and Early Impact of Antiretroviral Therapy	South Africa		children	retrospective review	HIV/AIDS
2002	Vardas, E	Viral hepatitis in South African healthcare workers at increased risk of occupational exposure to blood-borne viruses	South Africa		HCWs		Hep B

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2008	Varga, C	Factors Influencing Teen Mothers Enrolment and Participation in Prevention of Mother to Child HIV Transmission Services in Limpopo Province, South Africa	South Africa	District	women, adolescents	adolescents	interviews	Maternal, HIV/AIDS
2015	Verusia, C	Satisfaction and adherence of patients with amputations to physiotherapy service at public hospitals in KwaZulu-Natal, South Africa	South Africa	District, public	patients		cross sectional survey	Amputations
2015	Vogel, JP	How women are treated during facility based childbirth, development and validation of measurement tools in four countries phase 1 formative research study protocol	Ghana, Nigeria, Guinea		women		qualitative, interviews	Maternal

2016	Vonasek, BJ	Do maternal knowledge and attitudes towards childhood immunizations in rural Uganda correlate with complete childhood vaccination?	Uganda	Rural	children		Maternal and Child health
2004	Vujicic, M	The role of wages in the migration of health care professionals from developing countries	Africa		HCWs		N/A
2012	Wamai, RG	Assessing the Effectiveness of a Community-Based Sensitization Strategy in Creating Awareness About HPV, Cervical Cancer and HPV Vaccine Among Parents in North West Cameroon	Cameroon			multivariable logistic regression, cross sectional	Cervical cancer

2011	Wambura, M	Acceptability of medical male circumcision in the traditionally circumcising communities in Northern Tanzania	Tanzania		men	cross sectional survey	Circumcision
2008	Wasunna, B	Why dont health workers prescribe ACT? A qualitative study of factors affecting the prescription of artemether-lumefantrine	Kenya	District, rural	HCWs	interviews	Malaria
2012	Watson-Jones, D	Reasons for Receiving or Not Receiving HPV Vaccination in Primary School-girls in Tanzania: A Case Control Study	Tanzania		women, adolescents	interviews, case study	Cervical cancer
2014	Welniak, TJ	Chronic obstructive pulmonary disease: Emergency care in acute exacerbation	Africa				Pulmonary, Respiratory

2016	Wilhelm, DJ	A qualitative study assessing the acceptability and adoption of implementing a results based financing intervention to improve maternal and neonatal health in Malawi	Malawi			cross sectional survey	Maternal
2008	Winch, PJ	Operational Issues and Trend Pilot Introduction of Zinc for Childhood Diarrhoea in Bougouni District, Mali	Mali	District	children	quantitative analysis, survey	Diarrhoea
2010	Winkler, AS	Attitudes towards African traditional medicine and Christian spiritual healing regarding treatment of Epilepsy in a rural community of Northern Tanzania	Tanzania	Rural		interviews	Epilepsy

2009	Woelk, G	Translating research into policy: lessons learned from eclampsia treatment and malaria control in three southern African countries	Zimbabwe, South Africa, Mozambique			qualitative, interviews, case study	Malaria, Maternal
2015	Woldesenbet, SA	Missed Opportunities for Early Infant HIV Diagnosis: Results of A National Study in South Africa	South Africa	children		cross sectional survey	HIV/AIDS
2012	Yawson, AE	Effects of consumer and provider moral hazard at a municipal hospital out patient department on Ghanas National Health Insurance Scheme	Ghana			survey	N/A
2010	Yeap, AD	Factors influencing uptake of HIV care and treatment among children in South Africa a qualitative study of caregivers and clinic staff	South Africa	children		qualitative	HIV/AIDS

2011	Zain, ME	Impact of mycotoxins on humans and animals	General					Mycotoxins
2016	Zaman, K	Environmental Factors Affecting Health Indicators in Sub-Saharan African Countries: Health is Wealth	sub-Saharan Africa					Health
2012	Zeng, W	How much can we gain from improved efficiency? An examination of performance of national HIV/AIDS programs and its determinants in low- and middle-income countries	Low- and middle-income				Data Envelopment Analysis	HIV/AIDS
2013	Zurovac, D	Ownership and use of mobile phones among health workers, caregivers of sick children and adult patients in Kenya: cross-sectional national survey	Kenya	Public	HCWs		cross sectional survey	N/A

2008	Zurovac, D	Translation of artemether lumefantrine treatment policy into paediatric clinical practice, an early experience from Kenya	Kenya	District	children	cross sectional survey	Malaria
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Year of first publication	First author	Title	Country	Setting	subgroup	Primary factor	health outcome	Study type	Article type
2005	Aaserud, M	Translating research into policy and practice in developing countries: a case study of magnesium sulphate for pre-eclampsia	low- and middle-income		women	policy	Eclampsia, Maternal	interviews, observational	research
2011	Abbas, UL	Factors Influencing the Emergence and Spread of HIV Drug Resistance Arising from Rollout of Antiretroviral Pre-Exposure Prophylaxis (PrEP)	South Africa	public		treatment	HIV		
2014	Abeje, G	Factors associated with Institutional delivery service utilization among mothers in Bahir Dar City administration, Amhara region: a community based cross sectional study	Ethiopia		women	utilization	Maternal	multivariable logistic regression, cross sectional	research
2010	Abekah-Nkrumah, G	Assessing the implementation of Ghana's Patient Charter	Ghana	District		policy	N/A	survey	research
2014	Abor, PA	The effects of healthcare governance and ownership structure on the performance of hospitals in Ghana	Ghana			governance	N/A	multiple regression	research
2011	Abor, PA	The socio-economic determinants of maternal health care utilization in Ghana	Ghana		women	socio-economic, utilization	maternal	Probit and ordered Probit	research
2013	Abubakar, A	Socio-Cultural Determinants of Health-Seeking Behavior on the Kenyan Coast: A Qualitative Study	Kenya			Social	health		
2015	Adebayo, E	A systematic review of factors that affect uptake of community-based health insurance in low-income and middle-income countries	low- and middle-income	community	households	Health insurance	N/A	systematic review	research
2015	Adeniyi, OV	Diabetic patients' perspectives on the challenges of glycemic control	South Africa	District, rural	patients	social	diabetes	thematic content analysis	
2015	Adjei, KK	A comparative study on the availability of modern contraceptives in public and private health facilities in a peri-urban community in Ghana	Ghana	peri-urban	women	family planning	sexual Health	qualitative, quantitative, cross sectional	research
2012	Adzei, F	Motivation and retention of health workers in Ghana's district hospitals: Addressing the critical issues	Ghana	District, public	HCWs	HCWs retention	N/A	systematic review	research
2014	Adzei, F	Drivers of return migration of Ghanaian health professionals: perspectives from doctors and nurses in urban Ghana	Ghana	Urban	HCWs	HCWs migration	N/A	qualitative exploratory, case study	research
2009	Afolabi, MO	DETERMINANTS OF ADHERENCE TO ANTIRETROVIRAL DRUGS AMONG PEOPLE LIVING WITH HIV/AIDS IN THE IFE-IJESA ZONE OF OSUN STATE, NIGERIA	Nigeria	District	patients	adherence	HIV	interviews	original article
2015	Agyapong, VID	Factors influencing the career choice and retention of community mental health workers in Ghana	Ghana	community	CHWs	HCWs retention	mental	interviews	research
2004	Agyepong, IA	Health worker (internal customer) satisfaction and motivation in the public sector in Ghana	Ghana	public	HCWs	HCWs retention	N/A	interviews	
2008	Ajala, AS	Cultural Determinants of Care and Support for People Living with AIDS in Yoruba Communities of Ibadan and Ilesa, Nigeria	Nigeria		patients	social	HIV	interviews, case study	
2014	Ajuwon, GA	Influence of motivational factors on utilization of internet health information resources by resident doctors in Nigeria	Nigeria		HCWs	IT	N/A	survey	research
2016	Akintola, O	Factors influencing motivation and job satisfaction among supervisors of community health workers in marginalized communities in South Africa	South Africa	District	CHWs	HCWs retention	N/A	interviews	research
2008	Akinyoola, AL	Factors influencing the outcome of elective pediatric orthopedic operations in Ile-Ife, Nigeria	Nigeria		children	challenges	surgery		
2013	Alaba, O	The social determinants of multimorbidity in South Africa	South Africa		adults	Social	Multimorbidity	multinomial logistic regression	research

Figure C.1

## C.2 List of Diseases

Table C.2: Table of Diseases found in the Systematic Literature Review

<b>List of Medical Conditions/Topical areas</b>	
Abortion	Malaria
Amputation	Maternal
Antenatal	Mental
Breast cancer	Multimorbidity
Buruli ulcer	Musco skeletal
Cardiovascular disease	Disease: Obesity
Cervical cancer	Oncology
Cholera	Optometry
Chronic	Organ donation
Circumcision	Parasitic (river blindness)
Dental	Penetrating oesophageal trauma
Depression	Physiology
Diabetes	Pneumonia
Diarrhoea	Pulmonary
Disability	Radiography
Emergency procedures	Respiratory
Epilepsy	Severe sepsis
Female genital cutting	Sexual health
Hemophilia	Sleeping sickness
Hepatitis	Stroke
HIV/Aids	Surgical
Hypertension	TB
Injury	Transfusion
Liver	Viruses (unspecified)
Lymphatic	

# Appendix D

## Piot-Fransen Models

### D.1 Piot-Fransen Models

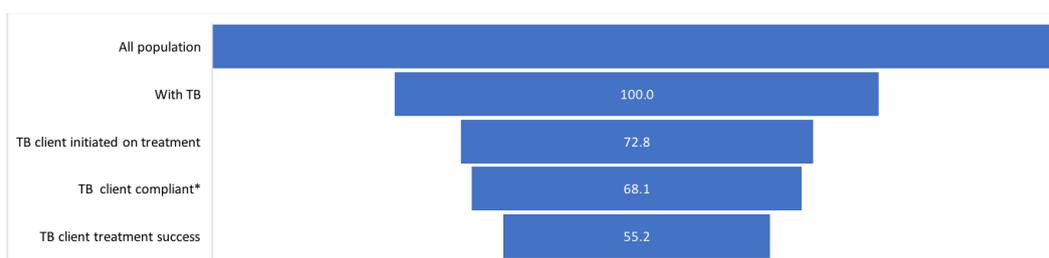


Figure D.1: Piot Fransen Model of TB in South Africa

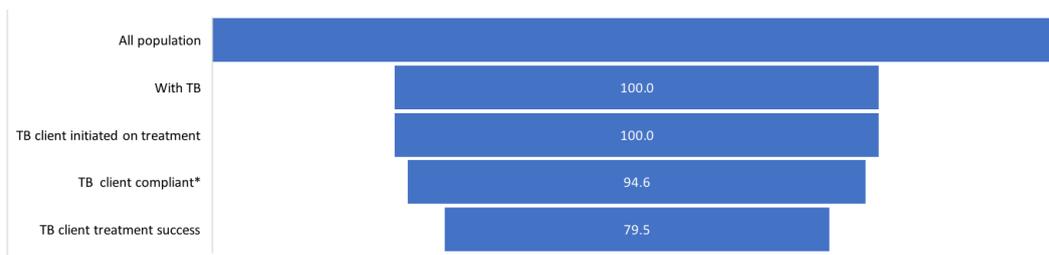


Figure D.2: Piot Fransen Model of targetted TB outcomes

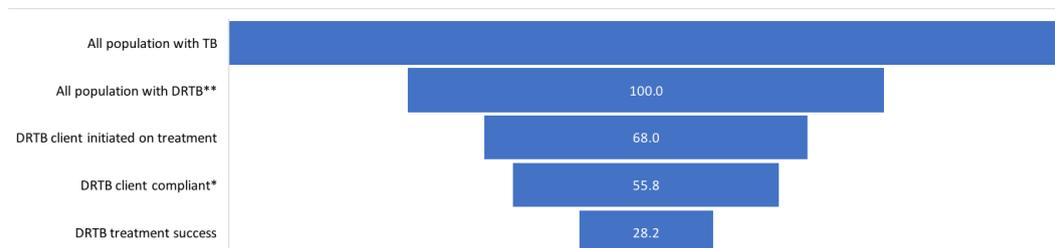


Figure D.3: Piot Fransen Model of DR TB in South Africa

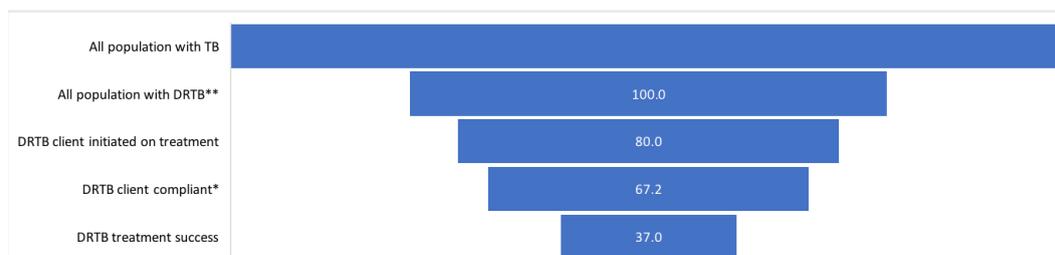


Figure D.4: Piot Fransen Model of targetted DR TB outcomes

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