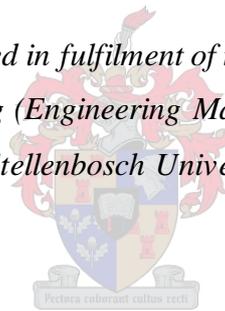


**Assessing causal linkages to identify factors affecting  
Universal Health Coverage outcomes using  
Qualitative Comparative Analysis**

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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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**April 2019**

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## ABSTRACT

Universal Health Coverage (UHC) is one of the Sustainable Development Goals (SDGs). UHC forms part of the targets concerned with population health and well-being under SDG 3. This global call for UHC has led to a number of countries taking the initiative to transition towards UHC. Health financing plays an important role in ensuring the realisation of UHC goals. This calls for robust evaluation tools to inform the health financing policy options that countries embark on. In order for countries to implement effective health financing policies, there is need to understand the causal relationships between the factors that shape the UHC financing landscape. Such an understanding enables countries to develop and plan effective interventions aimed at achieving UHC. UHC, as an intervention to existing health systems, exhibits the complex properties of the health system. As a complementary intervention to health systems, UHC is also affected by contextual factors outside the jurisdiction of the health system. This implies that there is a need to also understand how health financing arrangements interact with the broader context within which the health system operates. These health financing arrangements that have to be considered are: (i) revenue raising; (ii) pooling; (iii) purchasing; and (iv) benefits design.

The aim of this research was thus to identify causal pathways in the UHC financing landscape and their relationships with specific UHC goals. This implies an understanding of the causal relationships between factors that shape the UHC landscape. In order to formulate the requirement specifications for selecting a method to assess causality to inform UHC financing, a literature review was conducted to: (i) identify the dimensions embedded in UHC; and (ii) to identify the key contextual factors affecting UHC, leading to the identification of the key properties that influence UHC. This resulted in the four dimensions that define UHC, namely: (i) the right to healthcare; (ii) access to healthcare; (iii) universal coverage; and (iv) financial protection. The key contextual factors identified were: (i) governance; (ii) fiscal context; (iii) education; (iv) employment; (v) inequality; and (vi) poverty. From further literature analysis it was concluded that UHC exhibits the complexities found in health systems due to the fact that UHC is an intervention to existing health systems. This characterisation led to the development of a list of requirements that the method of causality assessment in the UHC financing landscape must adhere to. A literature, and subsequent comparative analysis, of complex causality methods resulted in Qualitative Comparative Analysis (QCA) - more

specifically the crisp-set QCA variant (csQCA), a mixed-method approach - being deemed an appropriate method to assess causal linkages between factors that influence UHC financing.

QCA is both a research approach and an analytical method. The research approach perspective of QCA involves the identification of the causal conditions (input variables), outcomes (output variables) and scoring based on the performance of each of the conditions and outcomes. Three output variables were considered, namely: (i) health service coverage; (ii) quality of care; and (iv) financial protection. The input variables included: (i) health financing arrangements (i.e. revenue raising, pooling, and purchasing); and (ii) key contextual factors (i.e. fiscal space, education, employment, and inequality). For each variable, a subsequent literature search was conducted to identify indicators for measurement(s) for each of the identified variables. 17 cases were selected for this study, followed by data collection for each case. Composite indices for each of the variables were then created, by means of normalisation and aggregation techniques. Data for each variable was then calibrated and a scoring criterion was established in line with the csQCA variant.

The analytical approach perspective of QCA involves the identification of necessary and sufficient conditions as well as the different causal pathways to achieving UHC outcomes. The results showed that no single condition was necessary nor sufficient to achieving each of the outcomes. However, outcomes are achieved by combinations of conditions. Central to these combinations are the availability of prepaid revenues and the management thereof. Meaning that relationships between health financing arrangements and contextual factors that guarantee sources of revenue are key to achieving UHC goals. The results suggest that it is not sufficient for countries to only focus on policies that view the health system in isolation of the broader context of the country. Rather, countries should address the politics that arise due to the complex nature of the health system and its dependence on the context of the country. Fiscal space and a lack of inequality along with the health financing arrangements are integral to achieving health service coverage. This shows that the existence of prepaid health revenues and the presence of sources of revenue are key factors to achieving health service coverage. Analysis of causal pathways to achieving quality of care showed that employment is a key consideration when attempting to improve the quality of care. Finally, to achieve financial protection, countries need to strengthen their revenue base, meaning that enhancing the sources of revenue and the collection and the management of the revenues, through effective pooling and purchasing practices.

## UITTREKSEL

‘Universal Health Coverage’ (UHC) is een van die Volhoubare Ontwikkelingsdoelwitte (Sustainable Development Goals (SDGs)). UHC maak deel uit van die doelwitte met betrekking tot bevolkingsgesondheid en welsyn onder SDG 3. Hierdie wêreldwye oproep vir UHC het gelei tot 'n aantal lande wat die inisiatief geneem het om 'n oorgang na UHC op te neem. Gesondheidsfinansiering speel 'n belangrike rol om die verwesenliking van UHC-doelwitte te verseker. Dit vereis robuuste evalueringinstrumente om die opsies vir gesondheidsfinansieringsbeleide wat lande ontwikkel, in te lig. Om te verseker dat lande doeltreffende gesondheidsfinansieringsbeleid implementeer, moet die oorsaaklike verband tussen die faktore wat die UHC-finansieringslandskap vorm verstaan word. So 'n begrip stel lande in staat om doeltreffende intervensies te ontwikkel en te beplan wat daarop gemik is om UHC te bereik. UHC, as 'n ingryping vir bestaande gesondheidstelsels, weerspieël die komplekse eienskappe van die gesondheidstelsel. As 'n aanvullende ingryping vir gesondheidstelsels word die UHC ook geraak deur kontekstuele faktore buite die jurisdiksie van die gesondheidstelsel. Dit impliseer dat daar ook 'n behoefte is om die interaksie van gesondheidsfinansieringsreëlings met die breër konteks waarbinne die gesondheidstelsel funksioneer, te verstaan. Hierdie gesondheidsfinansieringsreëlings wat oorweeg moet word, is: (i) inkomsteverhoging; (ii) ‘pooling’; (iii) aankope; en (iv) voordele-ontwerp.

Die doel van hierdie navorsing was dus om oorsaaklike roetes in die UHC finansieringslandskap te identifiseer, asook hul verhoudings met spesifieke UHC-doelwitte. Dit impliseer begrip van die oorsaaklike verwantskappe tussen faktore wat die UHC-landskap vorm. Ten einde die vereiste spesifikasies te formuleer vir die keuse van 'n metode om oorsaaklikheid te assesser om UHC-finansiering te informeer, is 'n literatuuroorsig uitgevoer om: (i) die dimensies wat in die UHC ingebed is, te identifiseer; en (ii) om die sleutel kontekstuele faktore wat UHC beïnvloed, te identifiseer, wat gevolglik lei tot die identifisering van die sleutel eienskappe wat UHC beïnvloed. Dit het gelei tot die vier dimensies wat UHC definieer, naamlik: (i) die reg op gesondheidsorg; (ii) toegang tot gesondheidsorg; (iii) universele dekking; en (iv) finansiële beskerming. Die sleutel kontekstuele faktore wat geïdentifiseer was, is: (i) bestuur; (ii) fiskale konteks; (iii) onderwys; (iv) indiensneming; (v) ongelykheid; en (vi) armoede. Vanuit verdere literatuuranalise is daar bevind dat UHC die kompleksiteit wat in gesondheidstelsels voorkom vertoon as gevolg van die feit dat UHC 'n

ingryping is vir bestaande gesondheidstelsels. Hierdie karakterisering het gelei tot die ontwikkeling van 'n lys vereistes wat die metode van oorsaaklikheidsevaluering in die UHC-finansieringslandskap moet nakom. 'n Literatuur- en daaropvolgende vergelykendeanalise van komplekse oorsaaklikheidsmetodes het gelei tot 'Qualitative Comparative Analysis' (QCA) - meer spesifiek die 'crisp set' QCA-variant (csQCA), 'n gemengde-metode benadering, wat as 'n geskikte metode beskou word om oorsaaklike verband tussen faktore wat UHC finansiering beïnvloed te bepaal.

QCA is beide 'n navorsingsbenadering en 'n analitiesemetode. Die navorsingsbenadering perspektief van QCA behels die identifisering van die oorsaaklike toestande (inset veranderlikes), uitkomste (uitset veranderlikes) en tellings gebaseer op die prestasie van elk van die voorwaardes en uitkomste. Drie uitsetveranderlikes is oorweeg, naamlik: (i) gesondheidsdiens dekking; (ii) gehalte van sorg; en (iv) finansiële beskerming. Die inset veranderlikes sluit in: (i) gesondheidsfinansieringsreëlins (d.w.s. inkomsteverhoging, 'pooling' en aankope); en (ii) sleutel kontekstuele faktore (d.w.s. fiskale ruimte, onderwys, indiensneming en ongelykheid). Vir elke veranderlike is 'n verdere literatuursoektog uitgevoer om aanwysers vir metings vir elk van die geïdentifiseerde veranderlikes te identifiseer. Daar is 17 gevalle vir hierdie studie gekies, gevolg deur data-insameling vir elke geval. Saamgestelde indekse vir elk van die veranderlikes is dan deur middel van normalisasie- en aggregeringstegnieke geskep. Data vir elke veranderlike is dan gekalibreer en 'n tellingskriterium is in lyn met die csQCA-variant bepaal.

Die analitiesemetode perspektief van QCA behels die identifisering van die nodige en voldoende toestande, sowel as die verskillende oorsaaklike roetes om UHC-uitkomstes te bereik. Die resultate het getoon dat geen enkele toestand nodig is, of voldoende is, om elk van die uitkomste te bereik nie. Uitkomstes word egter bereik deur kombinasies van toestande. Sentraal by hierdie kombinasies is die beskikbaarheid van voorafbetaalde inkomste en die bestuur daarvan. Bedoelede dat, verhoudings tussen gesondheidsfinansieringsreëlins en kontekstuele faktore wat inkomstebronne waarborg, is die sleutel tot die bereiking van UHC-doelwitte. Die resultate dui daarop dat dit nie voldoende is vir lande om slegs te fokus op beleide wat die gesondheidstelsel in isolasie van die breër konteks van die land beskou nie. Lande moet eerder die politieke kwessies aanspreek wat ontstaan as gevolg van die komplekse aard van die gesondheidstelsel en die afhanklikheid daarvan van die konteks van die land. Fiskale ruimte en 'n gebrek aan ongelykheid, tesame met die

gesondheidsfinansieringsreëlings, is 'n integrale deel van die dekking van gesondheidsdienste. Dit toon dat die bestaan van voorafbetaalde gesondheidsinkomste en die teenwoordigheid van inkomstebronne belangrike faktore is vir die dekking van gesondheidsdienste. Ontleding van oorsaaklike roetes vir die behaling van gehalte van sorg het getoon dat indiensneming 'n belangrike oorweging is in die poging om die gehalte van sorg te verbeter. Ten slotte, om finansiële beskerming te bewerkstellig, moet lande hul inkomstebasis versterk, wat beteken dat die inkomstebronne en die invordering en bestuur van inkomste deur middel van effektiewe 'pooling'- en aankooppraktyke verbeter kan word.

# ACKNOWLEDGEMENTS

I would like to thank the following:

- i. My supervisors, Imke de Kock and Louzanne Bam for their unending support and guidance throughout the research.
- ii. GSK for financing my studies, much appreciated.
- iii. Dr Boshoff Steenekamp for his guidance during the research.
- iv. Fabian Reck for his support and guidance.
- v. My family and friends for being there for me throughout this process.

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## LIST OF ACRONYMS AND ABBREVIATIONS

ACA	Affordable Care Act
ALAMES	Association Latin American Social Medicine
CBHI	Community Based Health Insurance
CESCR	Committee on Economic, Social and Cultural Rights
CGD	Comptroller General Department
CHIF	Croatian Health Insurance Fund
CHIP	Children's Health Insurance Program
CLI	Commmand Line Interphase
COAG	Council of Australian Governments
CSMABS	Civle Servant Medical Benefits Scheme
csQCA	crisp-set Qualitative Comparative Analysis
DHS	Demographic Health Survey
DRG	Diagnostics-related Groupings
FFS	Fee for Service
fsQCA	fuzzy-set Qualitative Comparative Analysis
FSSHIP	Formal Sector Social Health Insurance
GDP	Gross Domestic Product
GGHE	General Governmant Health Expenditure
GHO	Global Health Obsevatory
GHW	Global Health Watch
GP	General Practitioner
GUI	Graphical User Interphase
HCA	Health Care for All
HEF	Health Equity Fund
HEM	Health Equity Monitor
ICCPR	International Covenant on Civil and Political Rights
ICESCR	International Covenant on Econmic, Social and Cultural Rights
ICT	Information and Communications Technology
ILO	International Labour Organisation
IQTiG	Institution for Quality and Transparency
IQWiG	Institution for Quality and Efficiency

IT	Information Technology
LHN	Local Hospital Network
MBS	Medicare Benefits Scheme
MDG	Millennium Developmental Goals
MHI	Mandatory Health Insurance
MOH	Ministry of Health
mvQCA	multi-value Qualitative Comparative Analysis
NGO	Non-Governmental Organisation
NHI	National Health Insurance
NHIS	National Health Insurance Scheme
NHP	National Health Plan
NHSO	National Health Security Office
NLEM	National List of Essential Medicines
NPISH	Non-profit Institutions Serving Households
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OFATMA	<i>Office d'Assurance Accident du Travail, Maladie et Maternite</i>
ONA	<i>Office National d'Assurance Vieillesse</i>
OOP	Out-of-Pocket
P4P	Pay for Performance
PAHO	Pan American Health Organisation
PBS	Pharmaceutical Benefits Scheme
PHI	Private Health Insurance
PHM	People Health Movement
PPP	Purchasing Power Parity
QCA	Qualitative Comparative Analysis
RESYST	Resilient and Responsive Health Systems
RMNCH	Reproductive, Maternal, Newborn, Child, and Adolescent Health
SDG	Sustainable Development Goal
SHA	A System of Health Accounts
SHA	State Health Agency
SHI	Social Health Insurance
SOA	Special Operating Agencies

SSO	Social Security Office
STEP	Strategies and Tools against Social Exclusion and Poverty
THE	Total Health Expenditure
UCS	Universal Coverage Scheme
UDHR	Universal Declaration of Human Rights
UHC	Universal Health Coverage
UN	United Nations
USAID	United States Agency for International Development
VAT	Value Added Tax
VHI	Voluntary Health Insurance
WHO	World Health Organisation
WHS	World Health Survey

### ***Country abbreviations***

ARM	Armenia
AUS	Australia
BAN	Bangladesh
BOT	Botswana
CAM	Cameroon
CAN	Canada
CMB	Cambodia
CRO	Croatia
CZR	Czech Republic
GER	Germany
HAI	Haiti
ITA	Italy
KOR	Republic of Korea
NIG	Nigeria
THA	Thailand
USA	United States of America

## Chapter 1 INTRODUCTION

This chapter serves as an introduction to the research project. A brief background of the topic in question is presented, followed by a discussion of the problem statement of this research inquiry, which then informs the research aims and objectives. Lastly, the research design and the structure of the thesis are presented.

### 1.1 Background

In the year 2000, the United Nations (UN) established a global partnership with countries and developmental partners to establish eight developmental goals that were to be achieved by the year 2015. These goals were termed Millennium Developmental Goals (MDGs). Below is a list of the MDGs (WHO, 2015a):

- i. Eradication of extreme poverty;
- ii. Achieve universal primary education;
- iii. Promote gender equality and empower women;
- iv. Reduce child mortality;
- v. Improve maternal health;
- vi. Combat HIV/AIDS, malaria and other diseases;
- vii. Ensure environmental sustainability; and
- viii. Develop a global partnership for development.

Three of the goals were health related. The accelerated development towards health, education and the general eradication of poverty since 2000 signifies the success brought about by MGDs. At the UN general assembly of September 2014, the Sustainable Development Goals (SDGs) were integrated into the post 2015 development agenda. The SDGs are 17 goals that integrate the three dimensions of sustainable development (i.e. economic, social and environmental dimensions); with the third SDG focusing specifically on “ensuring healthy lives and promoting wellbeing” (WHO, 2015a), with the proposal being to achieve this through Universal Health Coverage (UHC).” UHC is, however, not a new concept for health systems. According to Wagstaff et al. (2016), a Google books search of “Universal Health Coverage” shows English books from 1945 onwards referring to UHC, and references to the term have increased rapidly in recent years.

UHC forms part of the 13 sub-goals under the “good health and wellbeing theme” as goal number 3.8 (WHO, 2015a). According to the WHO (2010), UHC is defined as “access to promotive, preventative, curative and rehabilitative health interventions for the entire population at an affordable cost, thereby achieving equity in access. Kutzin (2013) states that, though UHC cannot be fully achieved, it is nevertheless imperative for countries to strive towards it. It is argued that UHC can be a tool to bring about equity, improve health outcomes, improve financial wellbeing, political stability and economic growth (Bump *et al.*, 2016). Countries such as Germany, Australia, The United Kingdom, Sweden, Denmark, New Zealand, France, The Netherlands, Thailand and Finland have established a track record of progress towards UHC. Whereas countries such as Qatar, Rwanda, Tunisia, South Africa and Mexico have recently made positive steps towards UHC (Britnell, 2015a).

According to the World Health Organisation (WHO), the definition of UHC has three objectives: (i) equity in the use and distribution of health services; (ii) quality health services; and (iii) financial protection (WHO, 2013a, 2016b). UHC is a complex policy subject that is aimed at improving access to quality health services without financially burdening the population (Boerma *et al.*, 2014). This means that UHC is a complementary intervention to existing health systems, hence the starting point is the current situation of the health system in question. This starting point is influenced by the context of both the country and its health system (Thomson, 2010), and it is therefore important for countries to consider how contextual and other factors within the health system determinants affect the attainment of UHC goals.

Contextual factors are factors outside the jurisdiction of the health system decision makers, with influence on the attainment of health system goals (WHO, 2016b). Examples of these contextual factors include a country’s education levels, fiscal context, employment and income levels (Kutzin, 2013; Steenekamp, 2016; WHO, 2016b). For countries striving towards UHC, it is important to understand how factors that shape the UHC landscape, including factors that fall within the jurisdiction of health system decision makers, and factors that do not, affect UHC goals. Kutzin (2013), refers to the interactions between the health system functions—i.e. the relationship between the broader contextual factors of the country (inputs) and the UHC goals (outputs)—as the “*missing middle*”. An improved understanding of these relationships can help shape the deliberate actions that governments make when moving

towards UHC. According to de Savigny & Adam (2009), health systems comprise of a number of health system building blocks, namely: (i) service delivery; (ii) financing; (iii) human resources; (iv) governance; (v) information; and (vi) medical technologies. Although the other functions of a health system are important, researchers have argued that health financing is especially integral when attempting to move towards UHC (Kutzin, 2013; WHO, 2013a).

The focus of this research inquiry is thus on the relationships between factors that affect the financing building block of health systems, the context within which a health system operates, and the UHC outcomes that are achieved, in order to inform UHC financing policy.

## 1.2 Problem statement

The global community is faced with the challenge of providing access to health care for all citizens. Health financing is of fundamental importance when moving towards UHC. With that notion in mind, countries need to understand how specific health financing components affect UHC goals, taking account of the contextual factors that shape the country. In other words, there is need to understand the causal processes that are linked to specific UHC goals from a health financing perspective.

Understanding the underlying causal processes can help to identify factors that contribute to the failure or success of UHC financing interventions. According to (Gopnik *et al.*, 2004): "Causal knowledge is important for several reasons. Knowing about causal structure permits us to make wide-ranging predictions about future events. Even more important, knowing about causal structures allows us to intervene in the world to bring about new events—often events that are far removed from the interventions themselves".

It is undisputed that health systems are complex and dependent on context; therefore, methodological considerations to inform causality in the UHC financing landscape need to take account of these complexities. The two dominant research paradigms for causal inference are the qualitative and quantitative paradigms. The qualitative approach lacks systematic cross-case comparisons that are essential to causal inference (Maxwell, 2004b; Blackman, 2013), whilst the quantitative approach often fails to take into account the open nature of complex systems (Bennett and Elman, 2006; Blackman, 2013).

### 1.3 Research aim and objectives

The aim of this research is to identify causal pathways in the UHC financing landscape and their relationships with specific UHC goals. To achieve this aim, below are the objectives of this study, accompanied with sub-objectives. The sub-objectives were used as a guide throughout the thesis. The research objectives and sub-objectives are:

- i. Objective 1—Review literature on UHC in order to develop a clear understanding of the construct and to identify the key requirements for causality assessment in the context of UHC. The sub-objectives defined under Objective 1 are:**
  - a. Determine the dimensions embedded in UHC;
  - b. Determine key contextual factors affecting UHC; and
  - c. Determine the requirement specifications for causality in line with UHC.
- ii. Objective 2—To identify methods and approaches for establishing complex causality and select an appropriate method for application in this research. The sub-objectives defined under Objective 2 are:**
  - a. Choose a research approach that meets the requirement specifications obtained in Objective 1; and
  - b. Choose the most appropriate method based on the requirement specifications defined in sub-objective 1(c).
- iii. Objective 3—Identify UHC goals and indicators that can be used to assess performance in terms of these goals. The sub-objectives defined under Objective 3 are:**
  - a. Identify the UHC goals;
  - b. Conceptualise the definition of each identified UHC goal;
  - c. Identify the indicators for measuring performance in terms of each UHC goal; and
  - d. Collect and sort relevant data for each indicator based on the requirements of the method selected under sub-objective 2(b).
- iv. Objective 4—Identify factors that shape the UHC financing landscape as well as contextual factors that affect UHC, including indicators that measure each factor. The sub-objectives defined under Objective 4 are:**

- a. Identify health financing factors and contextual factors that affect UHC;
  - b. Conceptualise the definition of each factor;
  - c. Identify the indicators for measuring each factor; and
  - d. Collect and sort relevant data for each indicator based on the requirements of the method selected under sub-objective 2(b).
- v. **Objective 5—Identify causal linkages between factors that shape UHC financing landscape and contextual factors that affect UHC. The sub-objectives defined under Objective 5 are:**
- a. Determine the relationships between factors shaping UHC financing, specifically in relation to each UHC goal;
  - b. Determine the key relationships between factors that affect UHC, in association with each UHC goal; and
  - c. Determine conditions that are necessary or sufficient to achieve each UHC goal.

#### 1.4 Research design

The research was conducted in the pragmatist research paradigm. In order to get a clear understanding of the concept of UHC and the contextual factors that affect the concept, a qualitative literature study was conducted. The aim was to identify the key properties of UHC that inform the choice of a method when assessing causality in UHC financing. A comprehensive literature review was then conducted on the three main research approaches, namely; qualitative, quantitative and mixed methods research approaches to causality. Based on the requirements specifications for causality assessment in line with UHC, the mixed method approach was deemed appropriate. The choice of the research approach was followed by the choice of Qualitative Comparative Analysis (QCA) as the method for the study.

The research then followed the steps for conducting QCA. QCA involves three major steps; namely design, conditioning and analysis. Designing, involved the definition of conditions (variables), cases and outcomes for the research. For each of the conditions and outcomes (constructs), indicators were then identified through a comprehensive literature search on internationally reported indicators. Data availability and case diversity were the two main criteria for case selection. Data was then collected for the respective indicators for each condition and outcome of the study.

Conditioning involves the conversion of raw data into formats applicable to QCA for analysis. Data from the respective indicators were then processed and converted to a format that is applicable to QCA.

Finally, in the analysis stage, different causal recipes to UHC goals were identified. This included the identification of sufficient and necessary conditions when moving towards UHC and a subsequent discussion of the meaning and strength of the findings.

## **1.5 Thesis structure**

This thesis consists of seven chapters, the contents of each chapter is briefly summarised in the remainder of this section.

### **Chapter 2: Contextualisation**

In this chapter, Objective 1 and partly Objective 4 of the study are addressed. An analysis of several articles that describe the concept of UHC is conducted. Four themes and the contextual factors that have been identified as shaping UHC are also described. The properties of UHC identified in this chapter then led to the definition of requirements for the method to assess causality in UHC financing.

### **Chapter 3: Methods for causality**

In this chapter, the search for the appropriate method for causality assessment in the UHC financing landscape is discussed. This builds on the method requirements defined in Chapter 2. Objective 2 is thus addressed in this chapter.

### **Chapter 4: UHC landscape**

In this chapter, the UHC goals, UHC financing arrangements and contextual factors that affect healthcare are explored. The chapter thus entails the initial part of the application of QCA, in that it includes the identification of QCA causal conditions and outcomes. The focus is on identifying indicators that are used to measure each of the identified contextual factors. Objectives 3 and 4 are addressed in this chapter.

**Chapter 5: Cases and data collection**

The data collection process and the choice of cases that were applied in the study are discussed in this chapter. This work addresses sub-objective 3(d) and 4(d).

**Chapter 6: Results and analysis**

In this chapter, results obtained from the quantitative analysis component of the QCA method are presented and analysed with the aim of identifying causal linkages in the UHC financing landscape. Objective 5 is addressed in this chapter.

**Chapter 7: Conclusions and recommendations**

This chapter concludes the document and includes recommendations on policy implications of the findings of this research and future work to be done.

**1.6 Conclusion: Introduction**

In this chapter, the research background, problem statement, aim, objectives, research design and the contents of each chapter were presented. The rest of the document discusses the topics as highlighted in this chapter.

## Chapter 2 CONTEXTUALISATION

This chapter is dedicated to identifying properties of UHC, with the aim of informing the methodology to be applied to assess causality when moving towards UHC. First, the definition of UHC is conceptualised with the aim of identifying the key dimensions embedded in the concept and the key contextual factors that are drivers of UHC. This is followed by a discussion on the complexity of UHC, with the aim of identifying the requirements for selecting a methodology to assess causality in UHC financing.

### 2.1 UHC definition and contextual factors

According to the WHO (2010), UHC is defined as “access to promotive, preventative, curative and rehabilitative health interventions for the entire population at an affordable cost, thereby achieving equity in access”.

The UHC concept is aimed at providing quality health services to all without exposure to financial adversities (WHO, 2012). UHC is, therefore, a multidimensional concept, which supports universal population health provision. Although UHC is generally aimed at improving population health, there are varied conceptualisations of the idea. In order to gain an understanding of UHC and context-specific factors that affect it, a semi-structured, systematic literature review that grappled with the meaning of UHC was conducted on the Scopus database. The review highlighted the main themes of the concept. The phrase “Universal Health Coverage” was used along with the supporting terms “definition”, “conceptualisation”, “meaning”, “interpretation”, “scope” and “views” on the Scopus database. The search involved keywords, abstracts and titles with inclusion and exclusion criteria based on the topics and scope of the papers and relevance to defining UHC. The search produced 94 research papers, with 16 of these papers deemed relevant to the definition of UHC after manual abstract scanning. The 16 papers were then analysed with the aim of identifying their key themes in line with UHC. The section ends with a summary of the dimensions of UHC and the contextual factors that are drivers of UHC in Table 2.1. and Table 2.2. respectively.

Ooms, Latif, Waris, Brolan, Hammonds, Friedman, Muluma & Forman (2015) interpreted UHC as being embedded in the right to healthcare. This is as per Comment 14 of the

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International Covenant on Economic, Social and Cultural Rights (ICESCR) and will be discussed in Section 2.1.1. After using a comparative normative analysis on various definitions of UHC and its relationship with the right to healthcare, Ooms *et al.* (2015) derived three themes to describe UHC, namely: universal population coverage, financial protection and access to needed care. In their analysis, the major difference between the right to healthcare and UHC is the lack of clarity on the part of UHC, which is a direct confirmation that international support is essential and not optional. Furthermore, UHC is a “practical expression of the concern for health equity and the right to health” (Ooms *et al.*, 2015).

Allotey, Verghis, Alvarez-Castillo & Reidpath (2012) take an equity-based approach in defining the concept of universal coverage. Universal coverage is a vital social factor, and health services and goods that support health have to be accessible to all. The choice of essential health services to be offered and funding mechanisms to be employed is therefore based on context and is of high importance to ensure equity.

According to Noronha (2013), universal coverage is an expression of the extent to which a health intervention reaches the population and is associated with the provision, access, and the use of the health services offered. They argue that coverage means access to effective and quality health services, whenever needed, and that it is not simply an entitlement. To achieve full coverage, systematic barriers to access should then be fully removed, based on the right to healthcare.

O’Connell, Rasanathan & Chopra (2014a) highlight the different names referring to universal health coverage namely, “universal health care”, “universal health-care coverage” and “universal coverage”. In their discussion, they use the phrase “universal health coverage” and describe the meaning of each of the terms separately to come up with a conceptualised meaning of the phrase. The term “universal” refers to the legal obligation for states to provide healthcare to their population with precedence given to disadvantaged groups. So “universal” has a particular focus on equity in access to care. Their description of “health” is based on the UN General Assembly’s resolution which calls for “equitable opportunities for the highest attainable standard of physical and mental health”. “Health” encompasses other social determinants, such as values and beliefs that are expressed in different sectors of the

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population. “Coverage” refers to access to appropriate, essential, quality care, without systematic exclusion and effective utilisation of those services (O’Connell *et al.*, 2014a).

In their effort to address rights issues in sexual and reproductive health, Fried, Khurshid, Tarlton, Webb, Gloss, Paz & Stanley (2013) explore the limitations of the rights-based approach to health in access to reproductive and sexual health. According to their definition of UHC, the phrase “universal coverage” means that nearly the whole population are covered for almost all of their health-care needs no matter the cost. Their definition of universal coverage emphasises that no country has ever achieved 100% coverage. Coverage is therefore primarily the removal of financial barriers by sustainable health financing to reduce out-of-pocket payments for healthcare. Access to healthcare is dependent on varied factors, including service delivery points, equipment and health personnel. Fried *et al.* (2013) label UHC as “a means to an end”, with the end being the realisation of the right to healthcare.

Abihiro & De Allegri (2015) synthesise the multiple perspectives on UHC and emphasise the need to pay close attention to the multidimensional nature of UHC, and the way the dimensions interact. The paper discusses four dimensions of UHC, namely as a human right, an economic concept, a humanitarian social concept and a public health concept. The human right dimension is based on the existence of international laws that mandate governments to provide essential healthcare for all. The economic dimension implies financial protection against the consequences of out-of-pocket payments, which can be curbed by pooled and prepaid financing systems. The humanitarian concept aims to achieve equitable coverage and access to health-related benefits. The public health concept is in line with the health packages that are offered/available to the population, and defines which diseases and interventions need to be prioritised. All of the components of health are part of a greater goal to pursue the right to health as per the international mandate.

In their efforts to identify an indicator that can accurately capture the multiple dimensions of UHC, Ng, Fullman, Dieleman, Flaxman, Murray & Lim (2014) recommend measuring effective coverage, as it unites various distinct facets of UHC. They define effective coverage as the fraction of potential health gain that a health system in its capacity delivers to the population. Effective coverage comprises three components, namely need, use and quality.

According to Shrivastava, Shrivastava & Ramasamy (2016), UHC is much more than achieving health goals by assuring quality essential services to a population without financial impoverishment, instead it represents a pursuit for equity and social cohesion.

Bisht's (2013) conceptualisation of UHC is based on the Alma-Ata Declaration, which was instated to remove inequalities in healthcare. The Alma-Ata Declaration is a moral and intellectual declaration that views health as a fundamental right and advocates health for all. Its philosophy of health for all is backed by incorporating six key factors. *Universalism* forms the basis of the agreement and stresses the notion of *comprehensive* population coverage. *Equality* in healthcare is embedded in the theory of universalism, with emphasis on access to healthcare for everyone. Through *government participation*, financing mechanisms are put into place that fund healthcare so that the population can attain the needed health services. This plays a pivotal role in achieving healthcare goals. Governments were also obliged to promote *community involvement* in the implementation and planning of health service delivery systems with the use of *relevant local technology*. The author concludes that contemporary conceptualisation of UHC only make passive reference to the Alma-Ata Declaration. Bisht also disregards the fundamental principles of it and the fact that this conceptualisation of UHC creates limited value in terms of health promotion.

Waitzkin (2015) highlights the importance of differentiating between UHC and “healthcare for all” (HCA). HCA promises equal health services for the whole population, irrespective of their financial resources. UHC, on the other hand, is a financial reform to extend health insurance coverage to the greater part of the country in varying degrees, with primary focus on extending access to poor ethnic minorities and other marginalised groups. UHC advocates for a multifaceted financing system that will allow for the extension of *some* services to those who need them. UHC allows for mixed competition between the private and public health sectors, in which the private sector is mainly comprised of for-profit insurance corporations. Private healthcare and social security providers are then compensated for their services on a prepaid basis from public trust funds. HCA is based on the rights-based approach to healthcare. This approach supplies different groups with the same level of care and involves a single, public system that provides preventative inpatient and outpatient services. Waitzkin (2015) points out that UHC has received wide criticism from a number of progressive

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organisations such the Association of Latin American Social Medicine (ALAMES), the People Health Movement (PHM) and, Global Health Watch (GHW). Various authors, including Waitzkin (2015), label the concept of UHC as “hegemonic” in global health policy. Their criticism is directed at the following ideological assumptions on which UHC is based:

- i. Efficiency is enhanced if service delivery is separated from financing, implying the generalisation of competition among all subsectors.
- ii. Health costs are best regulated by the market.
- iii. Demand rather than supply is subsidised.
- iv. Efficiency is better in the private sector and the private sector is less corrupt.
- v. User freedom of choice is enhanced by the deregulation of health and social security trust funds.
- vi. Competition between providers in the marketplace ensures the quality of health services.

Without engaging with the definition of UHC, Borgonovi & Compagni (2013) attempt to expand the concept of UHC to sustainability. This allows for the inclusion of additional dimensions to UHC, including the social and political aspects. The paper argues that the debate on UHC has been more focused on economic sustainability, neglecting political and social factors and how they contribute to UHC. The authors define sustainable systems based on the broader definition offered by the Hawke Research Institute in Austria, hence sustainable systems are “equitable, diverse, connected and democratic, and provide a good quality of life”.

According to Jindal (2014), there are three basic prerequisites to achieving UHC, namely: adequate resources to support the requirements of the health services, reduction of financial and other barriers to optimal usage of health services, and a focus on increased capability of the population to utilise the health services. UHC is, therefore, a government-run scheme that is guaranteed to citizens and provides primary, secondary and tertiary healthcare services through a national health package. Packages are dependent on the context of the country, such as a country’s available resources and its healthcare needs.

In their assessment of the future of UHC in Europe, and the global prevalence of UHC in the world, McKee, Balabanova, Basu, Ricciardi & Stuckler (2013) employ a definition of UHC that

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is based on Stuckler, Feigl, Basu & McKee (2010)'s five themes from their systematic review of the relevant literature. These themes are: access to care, coverage, the point of entry to the healthcare system, rights-based approach, and social and economic risk protection. The article argues that the definition offered by the WHO integrates these five themes.

Evans, Martin & Etienne (2012) view UHC as a developmental issue in the sense that healthy individuals are more productive and can contribute to economic growth and that individuals' ability to work lifts them out of poverty. The paper defines a good quality health system as one that offers universal access that protects individuals from illness, fights poverty, and enhances economic growth and social cohesion. A requirement for UHC is that everyone can use the health services they need without the need to pay out of pocket, which is a major cause of impoverishment. The link between sustainable development, health and economic growth is somewhat of a paradox and creates a reinforcing poverty cycle: Using health services impoverishes the poor, but the inability to access healthcare also impoverishes individuals, because they are unable to work (and therefore cannot afford the health services).

Lefran (2015) conceptualise the definition of UHC based on two definitions from the WHO, stating that UHC is:

'[t]he ability of the health system to meet the needs of the population, including the availability of infrastructure, human resources, health technologies (including medicines) and mechanisms of organising and financing sufficient cover to the entire population' and 'access to comprehensive health services at reasonable cost without financial risk by protecting against catastrophic health expenditures to all people who need essential quality health services (prevention, promotion, treatment, rehabilitation and palliation)'.

Lefran (2015) further emphasises that the role of health systems is the realisation of UHC. This means that health systems must be able to meet the demands of the population's health needs and should incorporate scientific and technological know-how. Health is a complex issue that requires careful consideration of the society, economy, leadership and technical ability of the health sector.

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Smith (2013) discusses the effects of user charges and suggests that the correct implementation of a user charge system is crucial to the success of UHC. With reasoning that echoes the poverty cycle mechanism described by Evans *et al.* (2012), Smith (2013) proposes that healthcare costs affect citizens in two ways: Citizens who have access to a health facility suffer a loss of wealth; and those who have no access due to financial reasons suffer catastrophic health losses. The paper suggests that the purpose of any social health insurance programme is three-fold: To enhance access to health services when needed, to promote equity in society through a system of transferring finances from the rich to the poor, and to reduce financial risk burdens for accessing health services.

The literature describes UHC as a complex concept that involves various factors in its conceptualisation. The preceding literature study reveals four related views of UHC, depicted in Figure 2.1, namely UHC as the right to healthcare, UHC as access to healthcare, UHC as universal coverage and UHC as financial protection. Beyond the four dimensions identified for UHC, are two fundamental UHC principles of equity in healthcare. First is the principle of access to health services according to need, rather than the ability to pay. The second principle is that receiving healthcare is not linked to ability to pay, but rather that payment for healthcare should be linked to ability to pay (Wagstaff *et al.*, 2016).

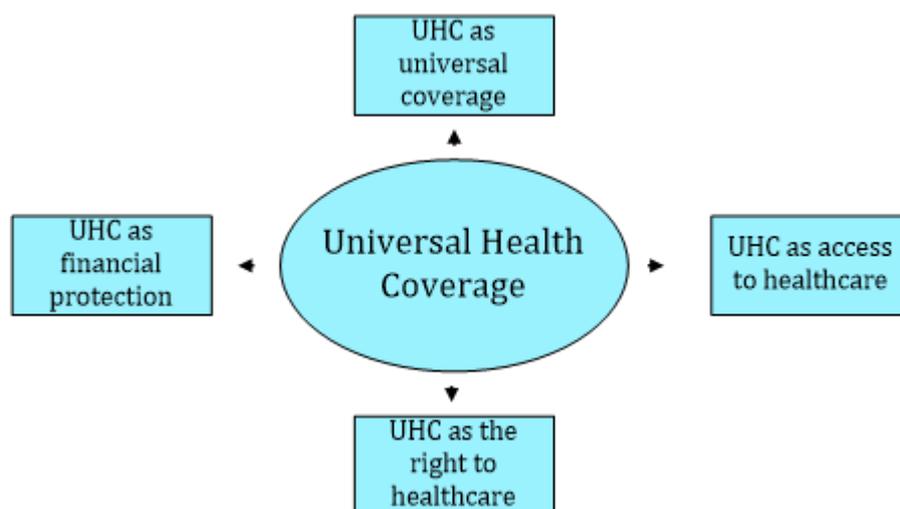
From the literature review, four dimensions of UHC emerged along with key themes as descriptors—these are presented in Table 2.1. Table 2.2 in Section 2.1.5, shows the context-specific factor that have an effect on healthcare and UHC and were highlighted in the literature considered.

Table 2.1: Dimensions and key themes obtained from semi-systematic review.

UHC dimensions	Core themes of dimension	References
The right to healthcare	Government and international obligation	Ooms <i>et al.</i> (2015); Abihiro & De Allegri,(2015); Bisht (2013); Noronha (2013); O'Connell <i>et al.</i> (2014b); Lefran (2015)
	Equity	Bisht (2013); McKee <i>et al.</i> (2013)
	Transparency and accountability	Allotey <i>et al.</i> (2012); Fried <i>et al.</i> (2013)
	Healthcare for all	Bisht (2013); Waitzkin (2015)
	Social solidarity and public intervention	Abihiro & De Allegri (2015); Bisht (2013); McKee <i>et al.</i> (2013)
Access to healthcare	Quality	Shrivastava <i>et al.</i> (2016); Borgonovi & Compagni (2013); Evans <i>et al.</i> (2012)
	Equity	O'Connell <i>et al.</i> (2014b); Abihiro & De Allegri (2015); Shrivastava <i>et al.</i> (2016); Bisht (2013); Waitzkin (2015); Smith (2013)
	Appropriateness	Abihiro & De Allegri (2015)
	Affordability	Evans, Marten & Etienne (2012)
	Availability	Abihiro & De Allegri (2015); Fried <i>et al.</i> (2013)
	Absence of systematic barriers	Fried <i>et al.</i> (2013); Jindal (2014); Allotey <i>et al.</i> (2012)
	Health resource mobilisation	Fried <i>et al.</i> (2013); Jindal (2014); Lefran (2015)
	Acceptability	Evans <i>et al.</i> (2012); Abihiro & De Allegri (2015)
Benefits package	Lefran (2015); Jindal (2014)	
Population coverage	Equity	Ooms <i>et al.</i> (2015); Allotey <i>et al.</i> (2012); Ng <i>et al.</i> (2014); Abihiro & De Allegri (2015)
	Effectiveness	Lefran (2015)
	Quality	Noronha (2013); O'Connell <i>et al.</i> (2014b)
	Comprehensiveness	Lefran (2015); Bisht (2013)
	Social solidarity	Allotey <i>et al.</i> (2012); Lefran (2015)
Financial protection	Prepayment	Abihiro & De Allegri (2015); McKee <i>et al.</i> (2013) Bisht (2013)
	Social solidarity	Shrivastava, Shrivastava & Ramasamy (2016); McKee <i>et al.</i> (2013); Evans <i>et al.</i> ; Smith (2013); Allotey <i>et al.</i> (2012).
	Governance and international assistance	Lefran (2015); Ooms <i>et al.</i> (2015); Bisht (2013); Fried <i>et al.</i> (2013).
	Catastrophic and impoverishment expenditure	Abihiro & De Allegri (2015); McKee <i>et al.</i> (2013); Evans <i>et al.</i> (2012)

Having identified the dimensions that shape UHC, Sections 2.1.1 to 2.1.4 are dedicated to discussing each of the four views of UHC depicted in Figure 2.1. In the remainder of the chapter, some of the contextual factors affecting UHC and complexities in health systems are discussed in relation to UHC, with the aim of identifying the key requirements to inform the selection of an appropriate methodology in Chapter 3.

Figure 2.1. Dimensions of UHC.



### 2.1.1 UHC as the right to healthcare

The right to health is supported by international human rights treaties, the first being the Universal Declaration of Human Rights (UDHR) formulated in 1946. The right to healthcare was further elaborated in two covenants: The International Covenant on Civil and Political Rights (ICCPR) and the International Covenant on Economic, Social and Cultural Rights (ICESCR). Together, these three treaties make up the International Bill of Rights. Progress towards functions in the International Covenant is monitored by the Committee on Economic, Social and Cultural Rights (CESCR). The committee comments on country progress reports and also issues general comments, which are then used to tackle specific issues and to communicate the contents of the covenant. The CESCR General Comment 14 is such an interpretation of the right to healthcare (Melrose, Perroy & Careas, 2011; Ooms *et al.*, 2015).

Article 12 of the ICESCR advocates for the recognition of the enjoyment of the highest attainable standards of physical and mental health (Potts, 2007; United Nations, 2012). In support of the covenant, regional and national constitutions prioritised the right to health (Potts, 2007). All countries have given formal consent to the ICESCR and they are therefore morally bound to ensuring “the highest attainable standard of health, encompassing medical care, access to safe drinking water, adequate sanitation, education, health related information and other underlying determinants of health” (Stuckler *et al.*, 2010; Abihiro & De Allegri, 2015).

The right to the highest attainable health is supported by four interrelated components, namely availability, accessibility, acceptability and quality (Potts, 2007). “Availability” refers to the physical presence of health facilities and the resources that facilitate the operation thereof, for example health workers and medicines. “Accessibility” denotes that everyone, regardless of their economic, physical, or social conditions, should be able to access health facilities and health information. “Acceptability” entails the respectful and ethical treatment of all people at health facilities (Potts, 2007). According to Mainz (2003), health service quality is defined as “the degree to which health services for individuals increase the likelihood of desired health outcomes and are consistent with current professional knowledge”.

The CESCR General Comment 14 highlights six key legal principles that tie in with the right to healthcare (Melorose *et al.*, 2011). According to Sridhar, McKee, Ooms, Beiersmann, Friedman, Gouda, Hill & Jahn (2015) the key legal principles are minimum core obligation, progressive realisation, cost effectiveness, shared responsibility, participatory decision making and prioritising vulnerable or marginalised groups. Governments are obliged to offer at least basic levels of primary care, provide essential drugs and ensure the delivery thereof, ensure access to available health facilities, and have a national plan that addresses health concerns (Melorose *et al.*, 2011; Sridhar *et al.*, 2015). Governments are bound to the principle of progressive realisation of the health goal by making maximum progress with available resources. This requires non-regressive measures for the health goal (Backman *et al.*, 2008; Melorose *et al.*, 2011; Fried *et al.*, 2013; Sridhar *et al.*, 2015). It is important for governments to ensure that available resources are utilised in a cost-effective manner. Expensive curative health services should not be a priority, as they are accessed by a privileged minority. Therefore, primary and preventative care should be prioritised (Sridhar *et al.*, 2015). Countries are also obliged to assist one another in attaining the right to healthcare. This is in accordance with the United Nations Charter and other human rights treaties including the ICESCR. Developed countries have a duty to assist developing countries in realising the right to healthcare, while developing countries are responsible for seeking international assistance and cooperation (Potts, 2007; Melorose *et al.*, 2011; Sridhar *et al.*, 2015). The right to healthcare is strengthened by the obligation of governments to practise inclusive decision making and implementation in health systems (Potts, 2007; Melorose *et al.*, 2011; Sridhar *et al.*, 2015).

The right to healthcare is not restricted to the health system but seeks to place importance on public information, cultural diversity and education (Backman *et al.*, 2008). The rights-based UHC is dependent on strengthened public health systems, good governance, attention to gender, age and geographical location (Fried *et al.*, 2013). It is the state's obligation to create accountability mechanisms to promote fairness and equity in access to high-quality healthcare (Potts, 2007; Backman *et al.*, 2008).

### 2.1.2 UHC as access to healthcare

The aim of UHC is to provide the whole population with access to essential health services including health promotion, prevention, treatment, rehabilitation and palliative care of high quality, without causing a financial burden (WHO, 2010c, 2013a). Quality can be viewed in different ways, ranging from well-trained medical staff, availability of well-functioning equipment and tools, sufficient infrastructure and appropriateness of care (WHO, 2013b; Abihiro & De Allegri, 2015).

Access, therefore, is related to people's use of health facilities and the economic consequences of doing so (Stuckler *et al.*, 2010). People's use of medical facilities does not only refer to their experience at the health facility, but also to other factors that can hinder their access to healthcare. With the assumption of financial insurance, other factors that can deprive members of society from accessing health facilities include: gender, geographic location, age, sex, cultural or social status, income, disability, legality, education and power relations in society (Stuckler *et al.*, 2010; WHO, 2010c, 2012, 2013b).

The above notion brings about three dimensions of access, namely physical accessibility, financial affordability and acceptability. "Physical accessibility" is the availability of quality health services at the time of need within reasonable reach. "Financial affordability" does not only refer to the ability of people to use health facilities without incurring financial hardship; it also includes indirect costs, such as transportation to health facilities (implying restricted healthcare access due to geographical location). "Acceptability" is based on how people perceive the health facility. Factors such as language, age, gender, ethnicity and religion can discourage people from using certain health facilities (Evans, Hsu & Boerma, 2013).

### 2.1.3 UHC as universal coverage

Universal coverage is total *coverage* of the population under the current health plan. This definition alone fails to define the exact services, who will be covered by the services, as well as which services are necessary for coverage (Stuckler *et al.*, 2010). Coverage can be understood in terms of the rights-based approach to UHC, which includes the absence of systematic exclusions in the healthcare system.

Universal coverage can also be understood in terms of two dimensions, namely an aggregate measure in relation to the population, as well as in terms of equity in accessing healthcare. Central to the notion of equity, is the concept of cross-subsidisation between the rich and the poor, and between the healthy and the sick. The healthy subsidise the sick, and the rich do likewise for the poor (Abihiro & De Allegri, 2015). Inequity refers to unnecessary differences that can be avoided and are regarded as unfair or unjust. In other words, the concept of equity refers to justice and is quantified by indicators such as inequalities and inequities (Ooms *et al.*, 2015). Equity is a contextual concept that requires addressing factors that systematically restrict access to certain groups (Allotey *et al.*, 2012).

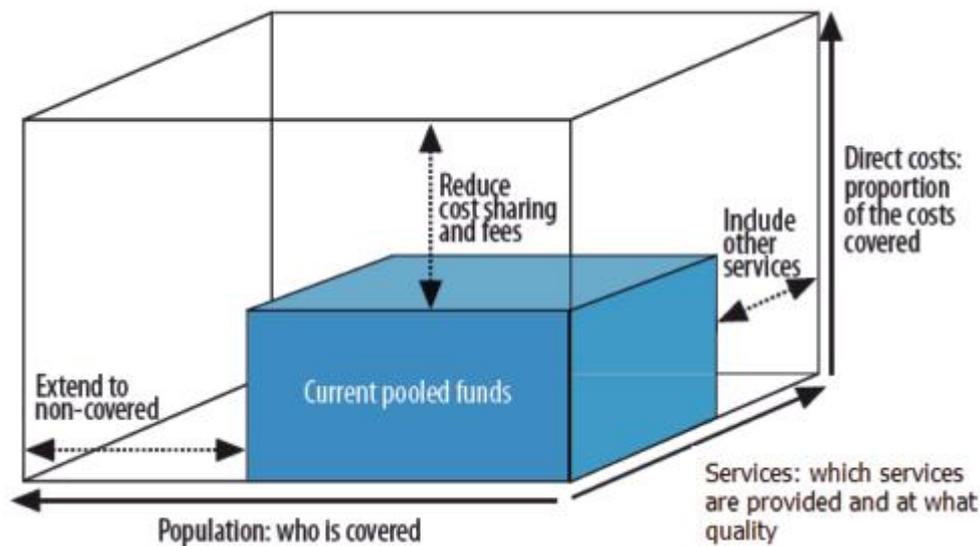
Equity in access can be achieved when individuals are able to obtain good-quality health services, without suffering financial hardship as a result (WHO, 2012). Coverage cannot be viewed in isolation, as it is related to additional factors that shape UHC. Equity in coverage, coverage in financial protection and coverage of essential healthcare services should, therefore, be accounted for when defining coverage (WHO & World Bank, 2014). Access and universal coverage are two interlinked concepts. Coverage builds up from access and without universal access, universal coverage cannot be achieved (Evans *et al.*, 2013).

The concept of “effective coverage” refers to patients who need health interventions receiving them, and, in turn, to the health intervention achieving its purpose (Ng *et al.*, 2014; Wagstaff *et al.*, 2016). In reality, most citizens of a majority of the countries in the world have certain degrees of coverage. The question of coverage is thus not limited to the universalism of the coverage, but extends to the degree of the coverage (Wagstaff *et al.*, 2016).

#### 2.1.4 UHC as financial protection

According to WHO (2010b), health financing systems under UHC should be designed to allow individuals who need it access to health services of sufficient quality, without leading to financial impoverishment and catastrophic expenditure. Financial protection therefore refers to protection against two aspects: (i) impoverishment, thus expenditure on healthcare that pushes households below the poverty line; and (ii) catastrophic expenditure, thus expenditure on healthcare, as a percentage of total household expenditure (in other words, above a set threshold). Impoverishment expenditure therefore refers to out-of-pocket expenditure that results in financial hardship, while catastrophic expenditure measures the exposure to financial risk (Wagstaff, Cotlear, Eozenou & Buisman 2015; Wagstaff *et al.*, 2016).

Abihiro & De Allegri (2015) suggest that effective universal financial protection is in place when the population is insured from: incurring out-of-pocket (OOP) payments, borrowing money and selling valuables to pay for healthcare, fear of delays in the hospital or of detentions, and non-payment of bills because of financial hardships. The financing of UHC plays a central role in moving towards UHC, as it is aimed at improving coverage and has intermediate objectives linked to it, namely: equity in access to healthcare, accountability, efficiency and transparency (Kutzin, 2013; World Health Organization & The World Bank, 2013). Extreme cases of financial exclusion were found in 33, mostly low-income countries. In these countries, out-of-pocket payments for healthcare represented 50% of the health expenditure in 2007 (WHO, 2010c). In order to reduce the risk of direct payments for healthcare, the WHO (2010b) suggests risk pooling and prepayment for healthcare.

**Figure 2.2. Three dimensions considered when moving towards UHC.**

Source: Reproduced from WHO (2010c)

Figure 2.2 shows two cubes. The cube labelled “current pooled funds” represents the amount of pooled revenue in a hypothetical country (WHO, 2010c). The population axis represents the population coverage with both financial protection and needed services. The cost coverage axis is pivotal to financial protection, because the more pooled funds are available, the less direct payments are required from the population. Context is important when interpreting cost coverage and care packages as capacity to pay differs between countries. The service coverage axis refers to the entire population’s ability to acquire high-quality, necessary health services (Kutzin, 2013). The outer cube represents the goal for UHC: The bigger the “current pooled funds” cube, the closer to attaining full UHC. Apart from protection against financial risk in accessing healthcare, the financial dimension of UHC plays an important role in the quest for equity and social cohesion. Financial protection, therefore, entails “access to comprehensive health services at a reasonable cost without financial risk by protecting against catastrophic health expenditures to all people who need essential quality health services (prevention, promotion, treatment, rehabilitation and palliation)” (Lefran, 2015). In order to ensure sustainable financing systems for UHC, government participation in organising financing mechanisms plays an important role.

### 2.1.5 Contextual factors affecting UHC

UHC is a complex policy subject that is aimed at improving access to quality health services without financially burdening the population (Boerma *et al.*, 2014). This means that UHC is a complementary intervention to existing health systems, hence the starting point is the current situation of the health system in question. This starting point is influenced by the historical context of both the country and its health system (Thomson, 2010). In this research inquiry, the phrase “contextual factors” is used to describe factors outside the jurisdiction of the health system that have an influence on the attainment of UHC goals (WHO, 2016b). Bearing in mind that health systems are complex, and that they comprise of interconnected aspects namely financing, service delivery, human resources, governance, information, medicines and technologies (De Savigny & Adam 2009), the implementation of UHC is bound by these complexities, as it is an intervention on the health system itself. Contextual factors emanate from political, social, economic, cultural and environmental factors.

Central to the contextual factors presented in Table 2.2, are the social determinants of health. According to the (WHO, 2017c) *‘The social determinants of health are the conditions in which people are born, grow, live, work and age. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels’*. Social determinants of health not only affects health status that results from the health provision but have far-reaching systemic effects on the healthcare system. It is important to note that the contextual factors identified and presented in Table 2.2 form part of and are related to the social determinants of health. UHC as a concept is highly dependent on social determinants of health. Some of the social determinants include: sanitation, work security, water, nutrition housing and education (Fried *et al.*, 2013; Noronha, 2013; Jindal, 2014; Lefran, 2015).

Table 2.2. Contextual factors that effect healthcare

Contextual factor	Link to UHC	References
Governance	States are obliged to offer the best possible healthcare services relative to their context. This then requires stewardship, transparency, accountability and strategic planning. Two important considerations for governance are structure of public administration and public sector financial management.	Ooms <i>et al.</i> (2015); Allotey <i>et al.</i> (2012); O'Connell, <i>et al.</i> (2014b); Ng <i>et al.</i> (2014); Borgonovi & Compagni (2013); McKee <i>et al.</i> (2013); Lefran (2015); Fried <i>et al.</i> (2013); Abihiro & De Allegri (2015); Jindal (2014); Evans <i>et al.</i> (2012)
Education	Here, general education and health education are differentiated. Health education is one of the social determinants of health, as it fundamental to achieving the right to healthcare. Better education is associated to better salaries, which is associated with the ability to contribute.	Ooms <i>et al.</i> (2015); O'Connell <i>et al.</i> (2014b); Lefran (2015); Evans <i>et al.</i> (2012); Borgonovi & Compagni (2013)
Employment	This also formed part of the social determinants of health. Employment is highly associated with the availability of health revenues.	Ooms <i>et al.</i> (2015); Noronha (2013); Fried <i>et al.</i> (2013); McKee <i>et al.</i> (2013); Abihiro & De Allegri (2015); Borgonovi & Compagni (2013)
Poverty	UHC can contribute to poverty reduction. This is because healthy people are able to work and earn a living. Ill health can further put people into poverty, as they cannot work for themselves.	Shrivastava <i>et al.</i> (2016); Evans <i>et al.</i> (2012); Fried <i>et al.</i> (2013); McKee <i>et al.</i> (2013); Borgonovi & Compagni (2013); Lefran (2015); (Bisht, 2013)
Inequality	Inequalities manifest themselves in and outside the jurisdiction of the health system, and across different social aspects, such as age, gender, race, income and geography.	Allotey <i>et al.</i> (2012) ; Noronha (2013); O'Connell <i>et al.</i> (2014b); Fried <i>et al.</i> (2013); Evans <i>et al.</i> (2012); Ng <i>et al.</i> (2014); Shrivastava <i>et al.</i> (2016); Jindal (2014); McKee <i>et al.</i> (2013); Lefran (2015).
Fiscal context	It is not, however, the only important factor to consider when moving towards UHC-financing also plays a key role. Governments are faced with choices on which sectors to invest in. In that regard, it is important to create capacity, which increases the ability to spend on the population. This includes investments in social services, such as healthcare.	Noronha (2013); Evans <i>et al.</i> (2012); Smith (2013); McKee <i>et al.</i> (2013).

## 2.2 Requirements specification

Causality involves the interaction of elements in a system (causes or inputs), affecting the future state of the system itself and other elements in the system. The effects of the individual

## Chapter 2

behaviours of the system elements on the overall system can cause properties that are dissimilar to the individual system elements. This is called emergence and it is central to the notion of complexity (Blackman, 2013; Ross, 2013). Complexity evolves from the interconnected nature and adaptability (from the ability to change and interconnect according to experience) of system components (De Savigny & Adam, 2009). This implies that one cannot predict the behaviour of a complex system by merely considering separate components of the system (Ross, 2013). The relationship between outputs and causal factors is not fixed, but contingent (Bennett & Elman, 2006), meaning that contextual considerations are important when assessing causality. Central to contingency is path dependence, and over the length of history there is space for different feasible paths. Contingency is due to the influence of random, unaccounted for factors that impact the causal narrative. Alternative paths, therefore, become increasingly less feasible due to the random effect of contingency. Once a path is chosen, all of the actors need to be tied to the chosen path (Bennett & Elman, 2006). This calls for effective, robust causal inference tools to set the right priorities. Transition of the causal potential to an outcome is dependent on the context in which the causal conditions exist (Sager, 2012). Outcomes are often a result of multiple causal conditions operating in combination with one another to effect a change. (Blackman, 2013).

### 2.2.1 Complexity in health systems

This section describes complexities that the health system generally possesses. These complexities will inform the choice of the method to assess causality in UHC financing.

The WHO defines a health system as a system that ‘consists of all organizations, people and actions whose primary intent is to promote, restore or maintain health, with the goals of improving health and health equity in ways that are responsive, financially fair, and make the best, or most efficient use of available resources’ (WHO, 2007; De Savigny & Adam, 2009).

Systems, in general, are groups of elements that are interconnected and interrelated, and are coherently organised to achieve something useful (Blackman, 2013; Ross, 2013). The word “interrelate” is central to this definition, as it describes how system components exist in relation to one another and how these relationships are subject to other relationships in the system. As hinted in the formal definition of health systems, a health system is a complex

## Chapter 2

system that comprises different building blocks centered on serving the population (WHO, 2007).

The concept of health system building blocks was briefly introduced in Chapter 1. Each of the building blocks, as defined by the WHO (2007) and De Savigny & Adam (2009), can be described in slightly more detail as follows:

- i. **Service delivery:** This includes the delivery of good-quality, safe and effective health interventions to those who need them with efficient use of available resources.
- ii. **Health workforce:** This building block entails the availability of a sufficient number of appropriate health workers. The workers are to be responsive, fair and efficient.
- iii. **Health information:** The production/capturing, distribution and use of dependable and well-timed information on health system indicators for performance and status monitoring.
- iv. **Medical technologies:** Medical products and subsequent technologies of good-quality, that are safe, efficient, scientifically sound, and available at cost-effective prices. Central to this is the efficient use of the medical products and technologies.
- v. **Health financing:** Appropriate health financing techniques, including revenue raising, pooling, purchasing and benefit design. The primary aim is to provide the population with the health services they need without causing impoverishment.
- vi. **Leadership and governance:** This strategic policy formulation is backed by regulations, attention to system design, coalition building, effective oversight, transparency and accountability.

The health system building blocks can be viewed as sub-systems of the health system, which each also constitute a host of other systems (Plsek & Greenhalgh, 2001; Golden, Golden & Martin, 2004). These different sub-systems and sub-sub-systems interact to varying extents.

There are different levels of health system interventions. This is dependent on which building block and level of the system an intervention is aiming to influence. An intervention can be targeted at a single hospital or at the entire regional healthcare system. (Craig, Dieppe, MacIntyre & Mitchie, 2008; Grand & Machines, 2008). System level interventions are those that target a whole building block or multiple blocks (De Savigny & Adam, 2009).

Similar to other systems, the health system exhibits the following characteristics:

- i. Self-organisation (De Savigny & Adam, 2009): Together, the components of the health system determine the nature of the system. This is through the dynamism of the interactions between the system's components. For example, weakness in the health information building block affects the financing block, because information is pivotal for health finance strategy, and ineffective leadership and governance affects all the other building blocks.
- ii. Constantly changing (The World Bank, 2007; De Savigny & Adam, 2009): Health systems are dynamic rather than static, developing different behaviors and reacting differently to interventions. The changing nature of health systems makes the evaluation and understanding of new health interventions challenging. An example is an intervention in the hospital sub-system that leads to a reduction in the length of stay for patients but that may, over time, result in increased re-admissions.
- iii. Overseen by feedback (De Savigny & Adam, 2009): Health systems are dependent on feedback loops for monitoring purposes, evaluation and designing new interventions.
- iv. Tightly-linked (De Savigny & Adam, 2009): The connectivity of sub-systems in the health system means that a change in one system has an effect on the others.
- v. Non-linearity (Amorim, Edwards & Adam, 2005; De Savigny & Adam, 2009): System component relationships are complex rather than simple, unpredictable and non-linear.
- vi. Counter-intuitive and resistant to change (De Savigny & Adam, 2009): Solutions that seem to be obviously suitable might fail or have different effects, which is due to the complexity of the health system.
- vii. Historical dependency (De Savigny & Adam, 2009): There are differences in the short-term and long-term effects of health system interventions. A community-based insurance scheme might fail to generate enough funds for the short term, but becomes effective in the long term. Interventions are also dependent on the current state of the health system, which is determined by the history of the health system.

UHC can be viewed as a system-level intervention that involves all of the health system building blocks and seeks to increase coverage of good-quality health services without impoverishment. It is also important to note that the bounds of health systems apply to UHC

policy and UHC interventions must therefore take into account the above-mentioned complex system properties.

In order to understand complex systems, one needs to approach the system in a holistic manner. Systems thinking supports the understanding of the complexities of systems that cannot be understood through the use of conventional scientific methods that apply linear and reductionist thinking (De Savigny & Adam, 2009). Linear approaches view a system as a chain of step-by-step processes in which the next step is dependent on the previous one. Here, reductionist thinking involves the division of a complex system into smaller, understandable components and then combining the components to gain a holistic view. Linear and reductionist thinking are similar in that they involve breaking a system down into its components. Linear thinking is capable of uprooting some of the indirect causal relationships, as it has an undertone of cause and effect. The sequential step-by-step process of linear thinking does not, however, uncover multiple and non-linear causal linkages in complex systems (Ross, 2013). UHC financing is governed by the complex nature of health systems, and therefore needs to be informed by methodologies that consider these complexities.

### 2.2.2 Specifications for methodology considerations

Creswell (2003) outlines considerations that are necessary for choosing a methodology, namely the nature of the research problem, the researcher's personal experiences and the nature of the audience that the researcher is addressing. In this study, the focus is on the nature of the research problem. For the purposes of causal inference when moving towards UHC governed by the nature of health systems and UHC financing, it is proposed that the methodology of choice should be able to:

- i. Capture multiple causal linkages between factors that shape the UHC landscape and respective outputs (Bennett & Elman, 2006).
- ii. Be deeply embedded in the context (Kwamie & Nabyonga-Orem, 2016) for a richer understanding of causal linkages.
- iii. Offer a systematic approach that is repeatable and reproducible to instil confidence in the outcomes (Maxwell, 2004b; De Savigny & Adam, 2009; Blackman, 2013).
- iv. View causality from multiple perspectives (numbers and words) to enrich meaning (Ragin & Rubinson, 2009; Blackman, 2013).

- v. Identify necessary and sufficient conditions for UHC, which contributes to priority setting in UHC policymaking.
- vi. Be transparent and adhere to current knowledge.
- vii. Allow for counterfactual analysis.

The above-mentioned attributes act as guidelines for the discussion on approaches to causality, hence they inform the selection of an appropriate methodology.

### **2.3 Conclusion: Contextualization**

In this chapter, the definition of UHC was conceptualised and the contextual factors that are related to the attainment UHC were identified. The complexities of health systems and, in turn, UHC were also discussed. This discussion then led to the identification of considerations when choosing methodologies to assess causality for UHC. In the following chapter, the different research methods and their applicability to assessing causality in the context of UHC are discussed, with the aim of identifying an appropriate method.

## Chapter 3 METHODS FOR ESTABLISHING CAUSALITY

In this chapter, the requirement specifications for the methodology considerations established in Chapter 2 are discussed in more detail. Firstly, the different research approaches are discussed, namely qualitative, quantitative and mixed method approach, with the aim of identifying the best approach in relation to the requirement specifications. Secondly, a decision is made that leads to mixed method approach being deemed as the most appropriate approach. Through further qualitative review, Qualitative Comparative Analysis (QCA) is, however, deemed to be the most appropriate method. Finally, there is a description of the fit between QCA and the research at hand, followed by a description of QCA and its properties.

### 3.1 Method selection

Three approaches to social research, namely the qualitative, the quantitative and the mixed method approach will be discussed with a consideration of their properties in line with causality inference.

Qualitative studies aim at describing and understanding, as opposed to explaining and predicting phenomena (Babbie & Mouton, 2014). Case-oriented studies (an approach to qualitative studies) allow for detailed examination of each case (countries in terms of UHC), highlighting the uniqueness of each case (context) (Babbie & Mouton, 2014). Qualitative studies are well-suited to theory development, but are not well equipped for theory testing (Ragin & Rubinson, 2009), starting without a hypothesis, and then developing a theory (Babbie & Mouton, 2014). This approach puts emphasis on keeping the natural setting at which events, processes and actions under study occur, which helps in interpreting causality (Maxwell, 2004a, 2004b; Babbie & Mouton, 2014). Qualitative studies take into account context (Maxwell, 2004a), which is integral to causality, because they holistically analyse the sequence of historical events (Bennett & Elman, 2006). Central to qualitative research is a process-oriented approach, which analyses the processes that connect events, leading to conclusions on causality between events (Bennett & Elman, 2006). The researcher has control over the study as the observer and interpreter. This differs from quantitative studies in which

there is systematic control (Babbie & Mouton, 2014). Qualitative case studies, however, fail to answer questions regarding causations in complex phenomena, and findings can fail to provide useful conclusions (Sager, 2012; Blackman, 2013). According to Bennett & Elman (2006), case studies are unable to provide indications of how changes in magnitudes of causal factors will affect the outcomes. Rich qualitative case studies give insight into how events occur. They are, however, limited in the sense that they cannot answer *why* events happen. Therefore, they lack a systematic cross-case comparison process, which is essential in establishing causal relationships (Maxwell, 2004b; Blackman, 2013).

Quantitative studies (variable-oriented) produce numerical evidence, but can be difficult to interpret for practical use and are normally used to test theories (Ragin & Rubinson, 2009). Unlike qualitative methods, quantitative methods focus on counting and quantifying patterns, and utilise that as proxies for understanding behaviour. They analyse variables and their relationships with other variables, detached from their context. This differs from qualitative methods that take an exact approach, preserving the natural setting. The variance approach to causation involves controlled experiments where causal factors assume different values while others are held constant and the effect on the outputs is evaluated (Maxwell, 2004b). For statistical significance of findings, quantitative studies depend on numerous cases and are differentiated from case-oriented studies by a focus on variables (Ragin & Rubinson, 2009), asking questions as to which effects variables have on outcomes (Della Porta, 2008). In cases where homogeneity prevails, there might be strong correlations between cases, and results can be generalised. In order to understand complex causality, in-depth knowledge of cases is, however, more important than generalisations extracted from those cases. Many quantitative studies only examine the linear effects of individual variables on outcomes, without taking into account the open nature of complex systems (Bennett & Elman, 2006; Blackman, 2013). A variable can have different effects on the outcome, depending on the combinations it forms with other variables. Furthermore, these effects can vary between different cases. Variable-based methods are unable to detect, or take into account, the determinants that are on levels that operate beyond individual variables, as they commonly operate with averages (Kelly, 2010; Blackman, 2013). The causal power of a variable is only valid in the contexts/cases in which it is embodied (Blackman, 2013).

Qualitative and quantitative methods can be used together as a mixed method approach to research. Greene, Caracelli & Graham (1989) define mixed methods as approaches that include at least one quantitative method for collecting numbers, and at least one qualitative method for collecting text information. Mixed methods therefore have the intention of combining the strengths of qualitative and quantitative approaches (Meissner, Creswell & Klassen, 2011).

Creswell (2003), outlines three distinct strategies for mixing methods, These strategies generally have several variations. The first variation is a sequential approach in which the researcher starts with either a qualitative or a quantitative approach before using another method to elaborate on findings. The second is concurrent procedures in which both qualitative and quantitative data are collected at the same time during the study; the two paradigms are then integrated during the interpretation stage of the study. Thirdly, transformative procedures require the researcher to use theory to create a framework for topics of interest, outcomes or methods of data collection The information contained in this framework then allows the researcher to choose between a concurrent or sequential approach.

Comparative methods are a form of mixed methods, since as they bridge the gap between qualitative and quantitative methods. At the same time, they are dedicated to studying connections between outcomes and conditions, or combinations of conditions. Comparative methods offer a distinctive approach to understanding social phenomena and sometimes they are referred to as small-N comparison studies (Ragin & Rubinson, 2009). Similar to case-oriented methods, comparative studies are deeply embedded in the cases at hand, and, similar to variable-oriented methods, comparative studies unearth relationships between variables. Fundamental to comparative studies, and what truly makes them distinct, is their view of social phenomena in terms of sets, and set theoretic relations. This allows comparative methods to ask questions related to necessity and sufficiency of causal conditions (variables) in relation to outcomes, which helps to unearth unlikely connections between causal conditions. In quantitative studies, researchers are initially equipped with sensitising concepts about the research topic and then use them to develop theory. In quantitative studies, however, the researcher starts with a clear hypothesis of how variations in a variable affects others (Ragin & Rubinson, 2009). In contrast, comparative researchers generally start with limited knowledge of the cases, concepts and variables that might be relevant to the

study. Research questions in comparative studies are answered by scrutinising the fit between cases, evidence and ideas. This powers comparative studies with the ability to develop, test and revise theory. The two dominant and formalised comparative methods are Mill's methods of agreement and difference, and Qualitative Comparative Analysis (QCA) (Ragin & Rubinson, 2009).

### 3.1.1 Mill's methods

Fundamentally, Mill's methods are designed to identify the cause to a certain outcome, which is occasionally termed "cause and effect". This is done by considering a number of cases ("instances") where the outcome of interest is present or absent. These cases contain conditions ("circumstances") that are either present or absent. Mill's methods will subsequently identify the reasons why certain outcomes happen. There are five different Mill's methods that are based on the same fundamental principles. They are: the method of agreement, the method of difference, the joint method of agreement and difference, the method of residues, and the method of concomitant variation. The methods can also be combined, depending on the aim of the research (Van Heulveln, 2000).

Mill's methods are based on the following assumptions. The first is that the considered conditions hold the cause for the outcome under investigation. The second assumption is that the cases under consideration operate in similar contextual environments, and can be compared to one another (Van Heulveln, 2000). The third assumption is that only one condition triggers the outcome of interest (Van Heulveln, 2000; Ragin & Rubinson, 2009). The third assumption indicates that Mill's methods are not suitable for identifying multiple pathways to producing an outcome. Table 3.1, shows a hypothetical situation in which there are cases of food poisoning amongst students. It can be seen that Thabo and Linda are the two students who experienced food poisoning. There are four conditions namely pork, chicken, beef and beans. Each of the above-mentioned Mill's methods, or combinations thereof, can be used to determine which type of food caused the food poisoning.

**Table 3.1. An example to illustrate the basic principles of Mill's methods**

Student	Food consumed				Outcome
	Pork	Chicken	Beef	Beans	Food poisoning?
Thabo	No	Yes	Yes	Yes	Yes
Linda	Yes	No	No	Yes	Yes
Ben	Yes	Yes	No	No	No
Mazwi	No	Yes	Yes	No	No

Source: Reproduced from Van Heulveln (2000).

### 3.1.2 Qualitative Comparative Analysis (QCA)

QCA is a methodology that is rooted in comparative social science and it builds on Mill's methods in two crucial ways: (i) QCA allows for the analysis of multiple conjunctural causation; and (ii) it allows for counterfactual analysis (Ragin & Rubinson, 2009).

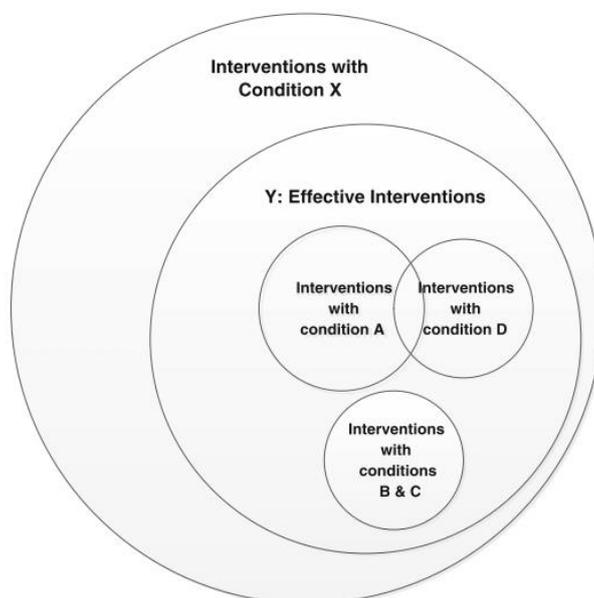
QCA applies set theory to study the relationships between conditions and outcomes, posing the question: *What conditions or combinations of conditions are sufficient to produce a certain outcome?* Set theory, on the other hand, is a mathematical approach that grapples with the nature of relations (Kane, Lewis, Williams & Kahwati, 2014). QCA can also be understood as both a research approach and an analytic tool. The research approach aspect of QCA refers to model specification, data collection, case selection, and the re-conceptualisation of the conditions and the outcomes. The analytical tool involves the identification of empirical patterns in the data, which is usually done with the aid of a computer (Schneider & Wagemann, 2010).

QCA serves to explain how specific outcomes are produced, implying discovering the combination of conditions that activate a specific output (Jordan, Gross, Javernick-Will & Garvin, 2011). This is based on the assumption that outcomes are produced through complex causality between causal factors. The concepts of necessity and sufficiency can be explained using set theory, in particular the concepts of subsets and supersets. A condition is necessary for an outcome if it has to be present for the outcome to occur. In other words, the outcome is a subset of the causal condition—a superset relationship between the causal condition and the outcome. A condition/combination of conditions is sufficient for the outcome, if it can produce the outcome by itself—in other words, it forms a subset relationship with the

outcome (Ford, Duncan & Ginter, 2005; Weiner, Jacobs, Minasian & Good, 2012; Devers *et al.*, 2013; Kane *et al.*, 2014).

Figure 3.1 illustrates the relationship between necessary conditions and sufficient conditions, and their combinations. Condition X is a superset of outcome Y; therefore, it is a necessary condition. That, however, does not mean that X can guarantee the outcome Y, because a case can contain X but still be outside the set Y. On the other hand, conditions A, D, and the combination of B and C are subsets of the outcome Y. Therefore, either A, D or B and C are sufficient to produce outcome Y. Neither A, D or the combination of B and C are necessary to produce outcome Y, but they are sufficient. According to Jordan *et al.* (2011): “Necessary causal conditions must be present, but alone may not be sufficient, to yield an outcome. Similarly, sufficient causal conditions (or, again, combinations thereof) are able by themselves, but may not be necessary, to produce the outcome of interest.” In other words, a condition is sufficient to produce an outcome if the condition being true is enough for the outcome to be true. A condition is also necessary to produce an outcome if the outcome cannot be true unless the condition is true.

**Figure 3.1. Necessary and sufficient conditions and set theoretic relationships.**



Source: Reproduced from Kane *et al.* (2014).

Table 3.2 shows the ability of both Mill's methods and QCA to satisfy the methodological requirement attributes for informing causality when moving towards UHC, as defined in Section 3.1, is contrasted. While Mill's methods certainly show promise in terms of its ability

to perform analyses that would be required to understand causality related to UHC, it lacks QCA's ability to capture multiple causal linkages and cannot perform counterfactual analyses (Ragin & Rubinson, 2009).

**Table 3.2 . Compatibility of Mill's methods and QCA to inform causality for UHC .**

Attribute	Mill's methods	QCA
Captures multiple causal linkages	No	Yes
Is deeply embedded in the context	Yes	Yes
Offers a systematic repeatable approach	Yes	Yes
Views causality from multiple perspectives	Yes	Yes
Identifies necessary and sufficient condition	Yes	Yes
Is transparent and adheres to current knowledge	Yes	Yes
Allows for counterfactual analysis	No	Yes

### 3.2 Compatibility of QCA and UHC

As indicated Section 2.2.1, informing UHC requires methodologies that are capable of addressing the complexities and context dependency of the concept. In this section, the concord of QCA properties and UHC for the purposes of informing UHC financing causality-related policies are discussed. The list of seven attributes for selecting methods to assess causality in complex systems, referred to in this section, was introduced in Section 2.2.1.

QCA has the ability to capture multiple causal linkages by modelling equifinality and conjunctural causation. Equifinality refers to the ability to identify more than a single causal link to an outcome. In some instances, it also refers to the unavailability of an outcome (Kane *et al.*, 2014). Different combinations of causal conditions can lead to the same outcome (Rihoux, 2006), which implies that a causal linkage can be an alternative to an outcome (Schneider & Wagemann, 2010). Many statistical methods, including both additive and linear regression models, have a strictly unifinal perspective on causality and can therefore not identify cases of equifinal causality (Kane *et al.*, 2014). As indicated, health systems comprise different components, namely governance, information, financing, service delivery, human resources, medicines and technology. These systems are interconnected and interrelated (De Savigny & Adam, 2009). Different combinations of the systems can be formed in order to achieve UHC outputs, such as utilisation according to need, quality, and financial protection (WHO, 2016b). There is a need to study different causal pathways and mechanisms that may

enable or hinder UHC (O'Connell *et al.*, 2014b). A causal pathway is a process which brings about an outcome (Gold, Kennedy, Connell & Kawachi, 2002).

QCA identifies conjunctural causation. Certain conditions may need to exist in combination with other conditions in order to exert an effect on the outcome. In fact, it is most often the case that outcomes are produced by combinations of conditions (Rihoux, 2006; Kane *et al.*, 2014). Health system components are tightly linked, implying that a change in a one component can prompt changes in sub-systems that are interlinked with it. UHC as a health system intervention requires systematic frameworks that consider these possible complex system interactions to identify positive and negative effects of components (De Savigny & Adam, 2009).

QCA implies asymmetrical relationships between causal conditions and outcomes. This means that pathways to achieving and not achieving an outcome differ (Kane *et al.*, 2014). This also implies that a causal condition can have a different effect on an outcome in a different context (Rihoux, 2006). QCA follows a generative approach to complex causality, and as a result a constant reference to QCA appears in the cases under study. This allows QCA to be deeply rooted in the context of the cases under study, taking into account the history and other important features of the context. With QCA, relationships between causal factors are not fixed but contingent (Sager, 2012). Blackman (2013) also states that QCA is well suited for bringing contextualised causal process explanations, uprooting reasons as to why interventions work or do not work in different contexts. UHC is a policy subject that does not have a universal formula for success. Rather, a country's path is informed by context (Vega, 2013), implying that contextual knowledge and understanding are key to the success of UHC. Boerma *et al.* (2014) state that UHC is dynamic and contingent, and that history plays a role in the path that a country takes.

QCA allows for the use of multiple perspectives (in other words, numbers and words) for analysis. The unavailability of data for certain causal variables of health systems poses problems for analysis in variable-oriented methods. For example, measures such as transparency, accountability, cultural values and beliefs with regards to health and health-seeking behaviour (Bradley, Curry & Devers, 2007) are not easily quantified. Yet, they could

be represented in terms of their absence or presence using the csQCA variant (Bentahar & Cameron, 2015).

Theoretical and deep empirical knowledge of the field under study plays a crucial role in QCA studies. This is evident from the various QCA decision-making processes (such a case and condition selection) that the researcher has to go through (Sager, 2012). This allows QCA to be rooted in the common standards of the health system. The method goes beyond basing policy practice on quantitative evidence alone. It also encompasses incorporating a mix of complex interpretations, opinions, evaluations and factual statements. This is achieved through the ability to identify the involved mechanisms using practical descriptors that can facilitate decision making (Blackman, 2013).

QCA is a type of comparative method and it possesses the ability to test theories in a transparent and systematic fashion based on actual existing cases, not depending solely on variables (Blackman, 2013). By employing a counterfactual analysis, QCA is able to provide an in-depth analysis of relationships between causal factors (Ragin & Rubinson, 2009).

Finally, QCA enables the identification of what is necessary and what is sufficient (Schneider & Wagemann, 2010). This is particularly useful for a policy intervention such as UHC, as it links directly to priority setting (Blackman, 2013).

However, QCA also has certain drawbacks and limitations. Firstly, the process of choosing cases and conditions for application in the QCA model comes with some downsides. Empirical knowledge and the discretion of the researcher, as well as several other aspects of the process, are key to this aspect of QCA. For example, omission of important variables may lead to the researcher drawing inaccurate conclusions (Jordan *et al.*, 2011; Sehring, 2013). Secondly, QCA lacks a temporal dimension in the sense that analysis can only be done at one particular point in time, which results in a static comparison. This concern can, however, be addressed to some extent by a deep, qualitative analysis of the cases at hand (Jordan *et al.*, 2011). Thirdly, the most popular variant, csQCA, has been criticised for the dichotomisation of data to zeros and ones, which might result in loss of relevant information. The dichotomisation process itself requires the researcher to clearly define thresholds for the absence or presence of

conditions and outcomes (Kane *et al.*, 2014). The validity of this type of QCA mostly relies on the transparency of the researcher during the dichotomisation process, as biases may result in unreliable results. Other QCA variants can be used: For example, fsQCA has the ability to take natural values, although the results from this variant are often difficult to analyse since they do not offer the decisiveness that is offered by csQCA (Blackman, 2013). In the fourth place, the results of the QCA analysis alone cannot be used as causality inference evidence; it is up to the researcher to possess a deep understanding of the cases under study in order to make plausible causality conclusions (Jordan *et al.*, 2011).

### 3.2.1 Variants of QCA

As suggested in the previous section, QCA exists in three variations namely crisp-set QCA (csQCA), fuzzy-set QCA (fsQCA) and multi-value QCA (mvQCA). The first variant of QCA was the csQCA, which requires the conversion of qualitative data into binary variables with a “1” representing high presence and “0” depicting low presence (Jordan *et al.*, 2011). As discussed previously, this variant has been critiqued for its susceptibility to data loss, as it is only capable of presenting total availability and unavailability. An extension of csQCA is the mvQCA, which allows for multi-value conditions where scores are represented by multiple natural, discrete numbers (0, 1, 2, 3...) (Haesebrouck, 2016), where each discrete value is dichotomous (Jordan *et al.*, 2011). An example is a traffic light where “0” can be allocated to red, “1” to orange and “2” to green (Haesebrouck, 2016).

The fsQCA variant allows for the representation of continuous variables between “0” and “1” (Jordan *et al.*, 2011). fsQCA is therefore not based on binary algebra but on fuzzy algebra (Schneider & Wagemann, 2010). One can choose a continuous representation or define anchor points, for example “0” meaning completely eliminated, 0.33 meaning 33% in the set and “1” depicting full-set membership. The selection of these anchor points is entirely dependent on the research in context, and should be motivated based on theory and cases. The fact that fsQCA keeps the general form of the data makes interpretation of the data more complex (Kane *et al.*, 2014). Table 3.3 presents a summary of the different QCA variants and their properties.

Table 3.3. Summary of the QCA variants.

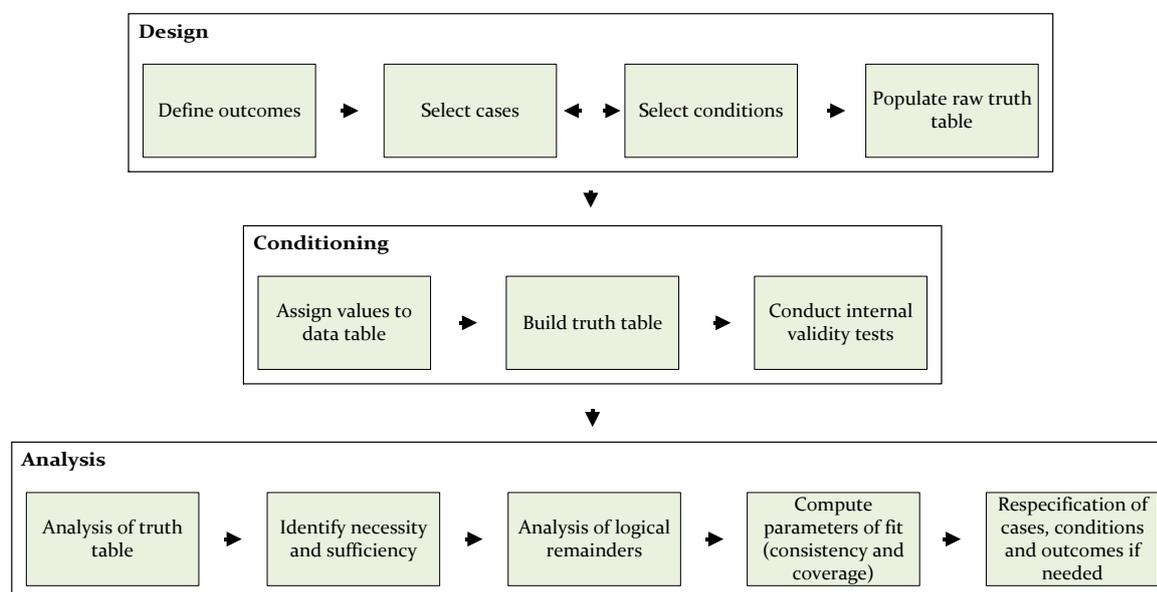
QCA Variant	Variable range	Useful
csQCA	Dichotomous	Variables under research can be approximated in terms of binary values.
mvQCA	Multichotomous	Conditions under study can be divided into a small number of discrete options
fsQCA	Continuous	When the data is sensitive and each variable is assigned along a continuous range.

Source: Adopted from Jordan *et al.* ( 2011).

### 3.2.2 The QCA process

Figure 3.2 shows the QCA research process, three major categories, namely design, conditioning, and analysis, can be seen. Before conducting a QCA study, a key consideration is to identify whether QCA is appropriate for the research question. Research questions that can be answered by QCA should put emphasis on identifying combinations of conditions leading to an outcome. Another up-front consideration is the unit of analysis of the research. This involves defining the case boundaries, examples of units of analyses are countries, regions or companies (Devers *et al.*, 2013).

Figure 3.2. The QCA research process.



A brief explanation of the steps to conducting QCA:

- i. Identification of outcomes: This is the selection of the outcome(s) to be examined in the study. These can be assigned to dichotomous, multichotomous or continuous variables depending on the QCA variant applicable to the study (Jordan *et al.*, 2011).
- ii. Selection of causal conditions: This is a very important part of QCA and it may be an iterative process that should be based on theory (Jordan *et al.*, 2011). The ideal number of conditions is not set for QCA studies, and is mostly discovered through trial and error (Jordan *et al.*, 2011). One should aim for as few causal conditions as possible, since a high number of conditions increase the complexity. This complexity is as a result of the manner in which the QCA method assesses every combination available and is dependent on the QCA variant. For csQCA, the complexity of the model increases by  $2^k$ , where “k” is the number of conditions. For example, if three conditions were selected, a total of eight possible combinations can be established (Kane *et al.*, 2014). The number of cases and conditions should always be balanced. For intermediate-N practice (16-100 cases), approximately 6-7 conditions can be used (Gross, 2010; Kane *et al.*, 2014). Too many conditions may result in limited diversity, were the theoretically available number of combinations of conditions are more than the available combinations from the number of cases being evaluated (Devers, Lalleman, Burton, Kahwati, McCall & Zuckerman, 2013; Kane *et al.*, 2014). There are six strategies that can be used to identify causal conditions, (Gross, 2010; Jordan *et al.*, 2011). They are:
  - a. **The comprehensive approach.** An iterative process that involves all possible factors that are available from existing theory. This process is often iterative.
  - b. **The perspective approach.** Conditions representing two to three theories are verified using the same model.
  - c. **The significance approach.** Conditions are chosen based on their significance.
  - d. **The second look approach.** The researcher includes conditions that were rejected in a previous analysis.

- e. **The conjectural approach.** Conditions are selected based on their interactions with other theories. This suggests possible causal combinations for a certain outcome.
  - f. **The inductive approach.** Conditions are selected in terms of case knowledge rather than existing theories.
  - g. **Selecting cases.** Case studies with heterogeneity of conditions and outcomes allow for the most comprehensive explanation of phenomena. Two aspects to consider are the number and types of cases to be chosen. Cases that exhibit certain conditions and outcomes can be chosen. This does not create bias during the QCA process, since the method is not probabilistic, which means there is no consideration of the number of cases that exhibit certain characteristics. The number of cases is dependent on the QCA variant to be used. The QCA algorithm fills the data table with hypothetical cases (“logical remainders”), with the aim of representing unavailable variable combinations. A large number of possible conditions imply a larger number of cases, real or hypothetical. The problem of limited diversity manifests when the number of logical combinations surpasses the number of cases, implying a lack of richness in the data. This can be avoided by applying a limit in the ratio between cases and causal conditions. Case knowledge is fundamental to QCA studies. Therefore the researcher should always choose a number that sufficient knowledge could feasibly be gathered on, as the researcher needs to be able to detect any contextual sensitivity and crucial causal conditions in creating causal meaning (Gross, 2010).
  - h. **Populate raw data table.** Raw data about the conditions and the cases is collected and compiled in a format that is suitable for QCA analysis. Key considerations in this step are the unit of analysis of the study and the QCA variant to be used (Devers *et al.*, 2013).
- iii. **Assigning values to conditions and outcomes.** Expert knowledge (empirical or theoretical) is required in order to calibrate conditions and outcome scores for QCA, depending on the variant the researcher uses. A number of techniques are available for the purposes of creating anchor points in the data. For qualitative conditions, the

researcher can draw cut-off points from literature-based knowledge of the context under study. Statistical approaches can be used for numerical data (Kane *et al.* 2014). This is regarded as the most time-consuming stage of the QCA process and, as discussed previously in this section, this step requires a high degree of transparency in order for the validity of the QCA findings to be evaluated (Jordan *et al.* 2011).

- iv. **Creating truth table.** Once thresholds are set, the truth table can be set up.
- v. **Internal validity testing.** QCA involves a series of decisions that require the researcher to be transparent in the determination of causal conditions, outcomes, cases, raw data sources, thresholds, the truth table and the interpretation of results, amongst others. These decisions include:
  - a. **Case diversity.** The researcher should ensure diversity of cases to be used in the study. It is therefore necessary to re-examine the case selection process. The existence of too many cases that exhibit similar configurations demonstrates lack of case diversity (Jordan *et al.*, 2011).
  - b. **Contradictory configurations.** These are configurations with the same causal conditions but different outcomes. Methods are available to fix these contradictions and if the methods do not work, the researcher can remove the contradicting configurations from the truth table or use a different QCA variant (Jordan *et al.*, 2011).
  - c. **Inter-rater reliability.** This assesses the clarity of the thresholds used in setting up the truth table. This also applies to qualitative data: the researcher has to be clear on the rules for the conversion of qualitative data into values.
- vi. **Output, analysis and interpretation.** Once the truth table has been reviewed, QCA software such as fsQCA, R or Tosmana is used to do the logical reduction (outcome by outcome), focussing on unique configurations rather than on the number of cases that exhibit the same configurations. The result is a formula describing the causal pathways that lead to outcomes, which is expressed in terms of Boolean algebra (Jordan *et al.*, 2011; Kane *et al.*, 2014).

- vii. **Assessment.** Measures are calculated to determine and evaluate QCA outputs. The main measures for assessment are:
- a. **Consistency.** This measures the degree to which a causal condition is a subset of the outcome. In other words, it is the percentage of cases that contain the causal condition that reveals the outcome.
  - b. **Coverage.** Coverage assesses relevance in the sense that it determines the importance of a combination of causes to produce the outcome (Gross, 2010).

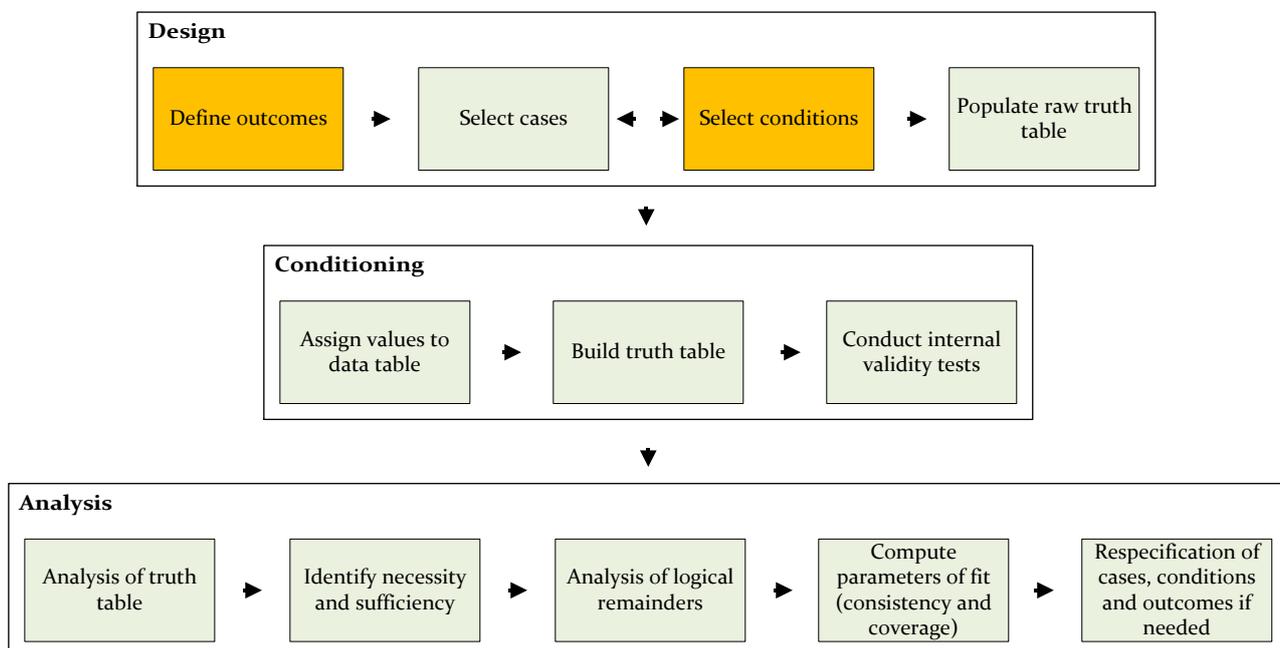
### 3.3 Conclusion: Methods and causality

In this chapter, the different research approaches in terms of their properties were discussed, with the aim of identifying the most suitable method for the requirements described in Chapter 2. QCA, in particular the csQCA variant, was deemed the appropriate method for the purposes of causality assessment in UHC financing. Chapter 4, 5 and 6 are based on the QCA process highlighted in this chapter.

## Chapter 4 THE UHC LANDSCAPE

In this chapter, the focus is on identifying the outcome and input variables that can be used in the study. In Figure 4.1, the QCA steps of defining outcomes and selecting conditions (the input variables) are highlighted. Furthermore, in Figure 4.2, the UHC goals that are considered in this research inquiry are utilisation/need, quality and financial protection. UHC goals therefore represent outcomes for QCA. The input variables (causal conditions), constitute the health financial arrangements (as outlined in Figure 4.2) as well as contextual factors. Contextual factors are not part of the health system, but have an influence in attaining the goals of UHC. In line with the QCA process, the chapter focuses on the definition of outcomes and selection of conditions. The set of indicators presented at the end of each of the sections in this chapter, are the indicators selected to represent each condition (outcomes conditions and causal conditions) and are for the purposes of QCA analysis.

**Figure 4.1. The QCA flow diagram, which highlights the processes that are addressed in this chapter.**

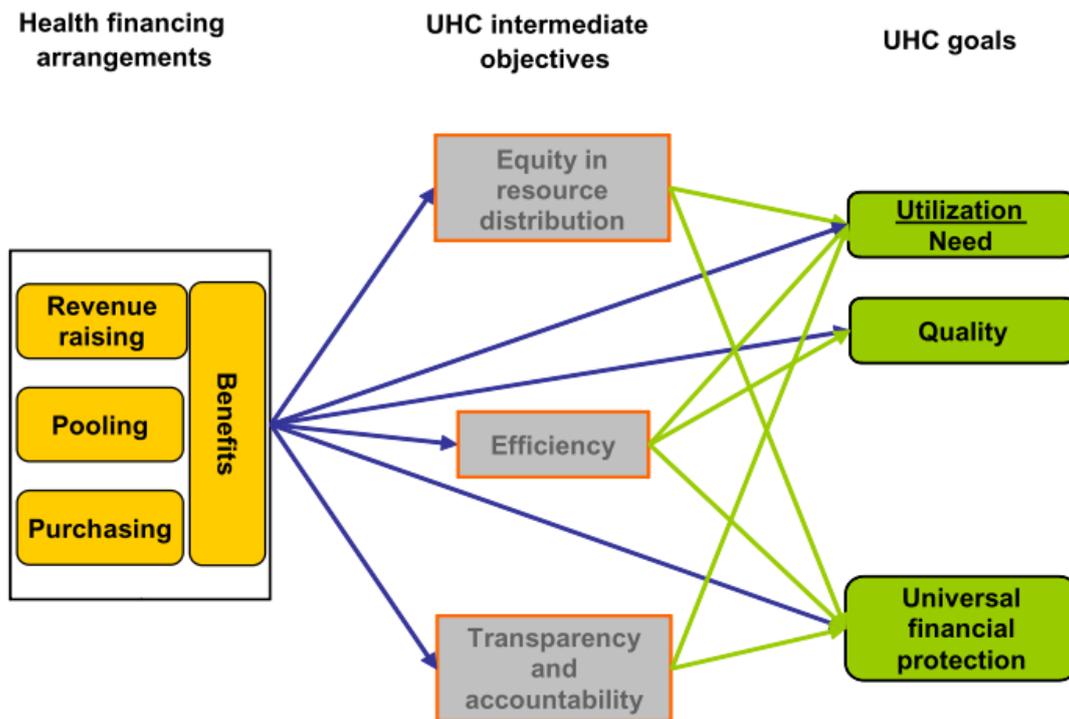


## 4.1 Methodology: Variable selection

The first section of this chapter comprises a discussion of the three UHC goals with the aim of determining the indicators that describe each of these goals and ultimately selecting the indicators that will be used to represent these outcomes as variables in the QCA analysis.

The second section of this chapter comprises a discussion of health financing arrangements (revenue raising, pooling, purchasing and benefits design) with the aim of identifying indicators that characterise each of these aspects of UHC structuring and delivery. This is followed by a discussion of various contextual factors that could be expected to influence UHC, such as the fiscal conditions in a country, and the levels of education and employment. These contextual factors are discussed briefly in Chapter 2 and specified in Table 2.2 in Section 2.1.5 of the same chapter. Again, the aim is to identify indicators that characterise each of these contextual factors. The section concludes with a motivation for the selection of a set of indicators to be used as causal condition variables in the QCA analysis. The key considerations for selecting indicators include the conceptual meaning of the construct and the comprehensiveness of the indicators. The conceptual meaning takes into account the study's unit of analysis (the unit of analysis for this study is country level). The comprehensiveness seeks to eliminate indicators of which the scope is limited to specific groups of countries or individual countries. This is in line with one of the QCA requirements that state that cases need to be as diverse as possible. Finally, the validity of the selected indicators was confirmed by a subject matter expert.

Figure 4.2. UHC goals and objectives that are influenced by health financing.



Source: Reproduced from WHO (2016b).

## 4.2 Identification of outcomes

In this section, the three UHC goals of utilisation/need, quality of care and financial protection are defined and discussed with the aim of identifying comprehensive sets of indicators that measure each goal/construct. These UHC goals are the output conditions for QCA application.

### 4.2.1 Utilisation/need (equity in use of services)

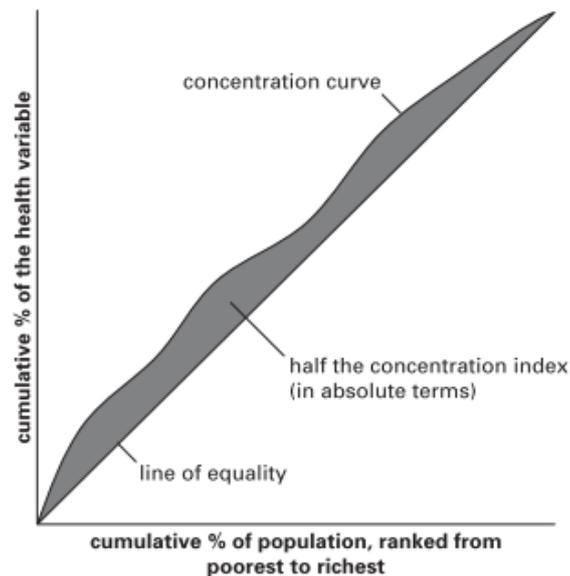
UHC, in part, refers to the use of health services according to need. Equity in the use of health services is closely related to the access dimension of UHC, as access refers to the use of health services according to need. Health status, distribution of resources, expenditures, utilisation and access can be used to assess equity in health systems (Waters, 2000). The challenge is to determine the use in relation to need across socio-economic groups of the population (WHO, 2016b), although need can be measured in terms of self-reported morbidity (Waters, 2000).

There are analytic tools available to assess the utilisation rates of health services from household survey data (WHO, 2016b). An example is O'Donnell, van Doorslaer, Somanathan, Adhikari, Harbianto, Garg, Hanvoravingchai, Huq, Karan, Leung, Ng, Pande, Tin,

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Tisayaticom, Trisnantoro, Zhang & Zhao (2007), who conducted research to determine the dominance of concentration curves and the Lorenz curves on assessing the equity in health service usage across 11 Asian countries. The results obtained using these tools are presented as either a percentage of health service utilisation or as concentration indexes. Concentration curves plot shares of a health system variable against quintiles divided according to household income (O'Donnell, Doorslaer, Wagstaff & Lindelow, 2008).

O'Donnell *et al.* (2008) demonstrate different analytical methods that are used to assess health equity in four different variables. The four focal variables that define health equity are: health outcomes, utilisation, subsidies received from using health services, and the types of payments that populations use to obtain healthcare (O'Donnell *et al.*, 2008). The ADePT software from the World Bank performs the distributional analysis of survey data from households, producing charts and tables for analysis. Several modules for ADePT are available and include modules applied in inequality, labour, social protection, gender and health. ADePT Health focuses on analysis of health outcomes and financing. The health outcomes module of the software is used in the analysis of inequalities in health, health subsidies and patterns in healthcare utilisation in relation to socio-economic status. Analysis is done using the ADePT summary of inequalities using the concentration index, which is derived from concentration curves. As shown in Figure 4.3, the concentration curves are obtained by plotting the x-axis with the ascending order of cumulative living standards percentage rankings. The y-axis is the cumulative percentage of the rate of specific healthcare utilisation, for example inpatient care (Wagstaff, Bilger, Sajaia & Lokshin, 2011). There are extremes according to which the benefits of a health system can be distributed: Pro-rich utilisation, which represents a positive concentration index (maximum of positive 1), and pro-poor utilisation that is signified by a negative concentration index (maximum of negative 1). It is generally assumed that resource utilisation should be pro-poor to achieve equity (WHO, 2016b). Figure 4.3, shows an example of a concentration curve. The line of equality in Figure 4.3, shows healthcare utilisation that is not according to living standards (equity in use). If the concentration curve is below the equality line, it means that utilisation is pro-rich. On the other hand, if the concentration curve is above the equality line, it represents pro-poor utilisation. The concentration index is subsequently calculated as twice the area between the line of equity and the concentration curve (Wagstaff *et al.*, 2011).

**Figure 4.3. An example of a concentration curve**

Source: Reproduced from Wagstaff *et al.* (2011).

#### 4.2.1.1 Discussion: Indicators of utilisation/need

The global list of health indicators that are available to date (WHO, 2015b) does not cover the equity dimension of utilisation of health resources. Table A-1 in Appendix A shows access to care indicators from the global list of health indicators to date. These indicators do not address equity in access, since they only focus on the aggregate measure of access without addressing access according to different socio-economic groups. According to the WHO (2016b), the masking effect of aggregate data must be taken into account when dealing with equity. Data that relate to changes in socio-economic groups should also be taken into account.

For this reason, indicators from other international organisations were considered. The World Bank and the WHO present the most international equity monitoring and reporting. The first set of indicators that were considered was the Health Equity Monitor (HEM) from the WHO. The HEM indicators are summarised in Table A-2 in Appendix A. The HEM forms part of the Global Health Observatory (GHO), which is the dominant statistics source of the WHO. The aim of HEM is to promote and enhance global health equity monitoring for low- to middle-income countries in particular. The HEM contains data that are presented with regards to

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population subgroups (which include education, economic status, place of residence, sex and subnational regions) in relation to specific health topics. At present, the HEM covers 34 indicators relating to reproductive, maternal, neonatal and child health, which are abbreviated as (RMNCH). Data for the HEM are collected from secondary data that are collected from Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS) from the 94 countries that are included in the HEM. For the sake of comparability between different countries, the HEM only makes use of data from DHS and MICS. This is a limitation, because a number of countries do not partake in these surveys, especially upper-middle and high-income countries (Hosseinpoor *et al.*, 2016).

The second set of indicators that were considered is the Health Equity and Financial Protection datasheets from the World Bank. These data sheets assess the levels of equity and financial protection (collectively for the dimensions mentioned below) with specific attention to low- and middle-income countries. Progressiveness of healthcare financing, health inequalities, healthcare utilisation, health behaviour, financial protection and benefit incidence analysis are amongst the topics covered. For these purposes, the World Bank uses the ADePT software, deriving data from DHS, MICS, World Health Surveys (WHS), Living Standards and Measurement Surveys (LSMS), as well as household data. Similar to the limitations of the HEM, the Health Equity and Financial Protection datasheets are limited to low-to-middle-income countries (World Bank, 2012a). This is a major limitation in case selection for QCA purposes, since cases are required to be diverse (Devers *et al.*, 2013). Indicators considered by the World Bank for health equity are summarised in Table A-3 in Appendix A.

The Organisation for Economic Co-operation and Development (OECD) uses a number of indicators for access to healthcare, although some of the indicators do not reflect inequalities in population subgroups. These indicators are summarised in Table A-4 in Appendix A. OECD indicators that reflect population subgroups fall under indicators of geographic distribution of doctors, inequalities in doctor consultations, inequalities in cancer screening, and inequalities in dentist consultations (OECD, 2013). With regards to the geographical distribution of doctors, the OECD only considers physical density of doctors and the comparison in density between urban and rural areas (OECD, 2015). For doctor and dentist consultations, the OECD uses income quintiles to measure equity in different dimensions of equity (OECD, 2013). For cancer screening, the OECD measures cancer screening relative to

income and educational levels. These indicators, however, do not adequately address the equity in use of health resources and are limited to the 35 OECD member countries.

Due to the lack of commonly agreed upon indicators for the measurement of equity in the use of health services, health service coverage<sup>1</sup> was considered. Service coverage comprises two domains, mainly prevention and treatment (Wagstaff *et al.*, 2016). In their effort to create an index to measure progress towards UHC, Wagstaff, Cotlear, Eozenou & Buisman (2015) proposed the indicators summarised in Table 4.1 for the measurement of service coverage using the themes of prevention and treatment.

#### 4.2.1.2 Variable selection: Indicators of utilisation/need

Due to the lack of comprehensive indicators that measure utilisation/need, service coverage indicators were considered (as seen in Table 4.1).

**Table 4.1. Indicators for service coverage.**

Category	Indicator
Prevention	Antenatal care (4+ visits).
	Child full immunization.
	Breast cancer screening (woman aged 40-49).
	Cervical cancer screening (woman aged 18-49).
Treatment	Skilled birth attendant at delivery.
	Child treated for acute respiratory infection.
	Child treated for diarrhea.
	Inpatient admission in the last year.

Source: Adapted from Wagstaff *et al.* (2015).

#### 4.2.2 Quality of care

“Health” is a result of various interdependent factors that include healthcare. This implies that health is a result of both healthcare and non-healthcare determinants. Some of the non-healthcare determinants of health include lifestyle, environment, and human biology.

According to Mainz (2003), health service quality is defined as “the degree to which health services for individuals increase the likelihood of desired health outcomes and are consistent with current professional knowledge”. The definition does not provide guidelines for establishing health quality, therefore quality is assessed in terms of safety, efficiency, patient

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<sup>1</sup> Service coverage measures access to healthcare regardless of the ability to pay—rather, according to need (Wagstaff *et al.*, 2015).

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centeredness, timeliness, accessibility and equity of health interventions. It is important to note that the efficiency and equity dimensions of quality of care are not attributed to individual care, but to quality of care for populations (Campbell, Rowland & Buetow, 2000).

Different views of quality of healthcare exist, depending on the stakeholders in the health system. An example is the view of the national health system, which takes interest in the aggregate outcomes of the health system rather than individual results (Campbell *et al.*, 2002). Quality of care can be viewed on individual and social levels, with the social-level quality of care being an aggregate of individual quality of care. Quality can be assessed with a view on the health system structure, processes or outcomes depending on the stakeholders and their objectives for quality assessment. For example, it can be considered from the viewpoint of health professionals, managers and patients. The health professionals are concerned with health outcomes, efficiency and abiding to professional standards. Managers view quality of care in terms of patient satisfaction, efficiency, accessibility of care and outcomes. Lastly, patients are concerned with clinical performance, attitude and the level of communication (Campbell, *et al.*, 2000; Campbell, Braspenning, Hutchinson & Marshall, 2002).

Structure refers to the organisational characteristics that influence the ability of a health system to deliver for society (Mainz, 2003). Two domains form part of quality of care, namely staff and physical characteristics. The structural elements of quality of care facilitate opportunities for patients to receive quality care and do not necessarily guarantee it (Campbell *et al.*, 2002). The indicators for the structural dimension of healthcare quality include physical and geographical access and effectiveness (Campbell *et al.*, 2002), as well as availability of: required staff, essential drugs, policies related to care and functional equipment (WHO, 2016b).

The process denotes the interaction of health system users within the structure of the health system, and is divided into clinical and inter-personal interactions, as relating to the extent of appropriateness of care to patients. Interpersonal care describes the interaction between the healthcare professionals and the patients (Campbell *et al.*, 2002). Clinical care refers to the application of standard health procedures to the patients by the health professionals and the extent to which set healthcare targets are achieved (Campbell *et al.*, 2000; Campbell *et al.*, 2002; Mainz, 2003).

Outcomes are the consequences of healthcare, which is the change in health status as a result of acquiring healthcare. The indicators for health outcomes are consequences of the structure of the health system, as well as the healthcare provision and/or diagnostic process (Campbell *et al.*, 2000). This implies that both the structure and the process have an effect on the quality outcomes of a health intervention or health system. An example of a manifestation of this is can be observed in the case of cervical cancer. The unavailability of screening services (a structural issue) or misreading a diagnosis report (a process problem), can both affect the quality of the intervention. The quality outcome constitutes both health status and use evaluation. Indicators for the quality outcome are of more interest to healthcare consumers and purchasers of care (Campbell *et al.*, 2000). According to Campbell *et al.* (2002), the main objective of the care that is given to the patients is expressed in the form of outcome indicators, which measure patient satisfaction, morbidity, mortality, quality of life and health status.

#### 4.2.2.1 Discussion: Quality of care

Quality of care measurement involves the use of available health system data with the aim of evaluating the performance of the health system. As highlighted, it is important to have a clear goal of quality attributes to be measured, as they can vary depending on the purpose of the health intervention and the stakeholder in question. Arah, Westert, Hurst & Klazinga (2006), distinguish between healthcare performance and health performance. The former refers to measurements related to the healthcare system, without taking into account the non-health care system determinants of health. Health services are deliberate actions that are aimed at improving health potential, and the actions involve combinations of professional inputs, knowledge and technologies (Papanicolas & Smith, 2013). On the other hand, healthcare performance takes a broader perspective of health by taking into account non-healthcare, healthcare and contextual determinants of health. Healthcare systems are designed to serve the population. With that perspective in mind, the value of healthcare can be defined in terms of health outcomes achieved in relation to costs, implying that value has an efficiency connotation to it. Although process measures are useful for the internal strategy of care providers, they cannot substitute outcome measures. Health outcome measures include both long- and short-term health (Porter, 2010). Porter (2010), describes a three-tiered hierarchy for health outcomes. The first tier represents the health status achieved as a

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consequence of care, which can be attributed to survival and level of health recovery. The second tier involves outcomes in relation to the recovery process, which is in the form of the time taken to recover, as well as unwanted consequences of care. The third and final tier represents the sustainability of health after receiving care.

An important point to note is that the care for a medical condition involves varied layers. Each intervention is dependent on the effectiveness of the other interventions (Porter, 2010; Papanicolas & Smith, 2013). Examples include diabetes, which is a disease that involves care for conditions such as vascular disease, retinal disease and hypertension (Porter & Teisberg (2004), and stroke interventions, which include, general practitioner (GP) services, ambulance services, acute interventions, homecare, hospital stroke units and rehabilitation (Porter & Teisberg, 2004).

As expected, there are various healthcare quality indicators from different organisations. In order to gain perspective, different indicators that reputable health organisations such as the OECD, WHO and the Commonwealth fund report on were evaluated as a starting point. These indicators differ significantly and for this reason, the global reference list of 100 core health indicators was singled out for more detailed consideration (WHO, 2015b).

On the 24<sup>th</sup> of September 2013 in New York, United States of America, a meeting chaired by the director of the WHO, along with representatives from 19 agencies, was conducted to establish a global list of 100 health system indicators. The meeting concluded that there were a large number of uncoordinated indicators that are diverse and fragmented, which resulted in unnecessary, uncoordinated reporting and inefficiency in health information systems. For these reasons, the WHO collaborated with international, national and multilateral agencies in developing the global reference list of 100 core health indicators. The global reference list of 100 core health indicators is by definition “a standard set of 100 indicators prioritized by the global community to provide concise information on the health situation trends, including responses at national and global levels” (WHO, 2015b). These indicators are in line with the MDGs, SDGs, UHC and other issues that relate to the post-2015 developmental agenda.

The quality of care indicators provided by the global reference list of 100 core health indicators of 2015 are summarised in Table 4.2 (WHO, 2015b).

## 4.2.2.2 VARIABLE SELECTION: QUALITY OF CARE

**Table 4.2. Quality of care indicators from the global reference list of 100 core indicators.**

Indicator	Description
Perioperative mortality rate	Deaths prior the discharge of patients that underwent one or more procedure(s) in the operating theatre during their admission time. This indicator is measured per total number of procedures.
Obstetric and gynaecological admissions due to abortion	This is determined by dividing the total number of abortion-related complications by all abortion-related admissions, without taking a planned abortions into account.
Institutional maternal mortality ratio	The ratio between maternal deaths and the total number of deliveries in health institutions.
Maternal death reviews	There is still a need to clearly define what "clear review" means. The indicator, however, measures the ratio of maternal deaths that occur in audited facilities.
ART retention rate	This is the percentage of adults and children who are on antiretroviral therapy (ART) at different times after starting treatment for a specified period of time.
TB treatment success rate	The percentage of successful tuberculosis (TB) treatments. The definition of treatment in this context is "cure" and "completed treatment".

Source: Adapted from WHO (2015b).

## 4.2.3 Financial protection

Financial protection plays an important role when moving towards UHC, and forms part of the four UHC dimensions identified in Chapter 2. As highlighted in Chapter 2, financial protection is linked to service coverage, access equity and social cohesion. the WHO (2016b), discusses two dominant indicators for assessing financial protection, namely:

- i. The number of households that incur catastrophic health expenditure on health services. Russell (1996), defines "catastrophic spending" as a situation where "households must sacrifice other basic needs such as food and education with serious consequences for the household or individuals within it". There are two commonly used thresholds for catastrophic spending (Xu *et al.*, 2003; WHO, 2016b) that include:
  - a. Health expenditure that is out-of-pocket and 25% or more of the total household expenditure.
  - b. Health expenditure that is out-of-pocket and is 40% or more of non-food-related household expenditure.
- ii. The number of households that are impoverished as a result of healthcare expenditure. This indicator is much more difficult to track, as it relies on arbitrary reference points.

A good example is neglecting people who are already below the poverty line yet face out-of-pocket fees or simply cannot acquire health services due to financial reasons (WHO, 2016b).

The World Bank uses the ADePT software (as described in Section 4.2.1) to calculate both financial impoverishment and the levels of catastrophic expenditure.

#### 4.2.3.1 Discussion: Financial protection

In the absence of calculated financial protection measures, high levels of out-of-pocket payments (OOPs) can indicate levels of catastrophic spending. This is evident from a multi-country analysis on catastrophic health expenditure (Xu *et al.*, 2003). According WHO (2016b), a high proportion of OOPs as a percentage of total health expenditure (THE)<sup>2</sup> is indicative of the proportion of households incurring catastrophic expenditure. Out-of-pocket measurements, however, are not a good indication of the level of financial protection, because the proportion of the population that cannot pay OOPs is not accounted for. An example is the difference between Japan, which has one of the best health outcomes with 13.9% of its THE-paid OOP, and South Africa, which has an OOP proportion of 6.5% of THE (WHO, 2017b). A number of international health organisations, including the World Bank, WHO and the OECD use household catastrophic expenditure and impoverishment to measure financial protection. The global reference list of 100 core health indicators (WHO, 2015b) and the health financing diagnostics and guidance from WHO (WHO, 2016b) also recommend these two indicators (as summarised in Table 4.4) for measuring financial protection. Therefore, catastrophic and impoverishment expenditure indicators are selected to measure the level of financial impoverishment in this research.

**Table 4.3. The interpretation of changes in out-of-pocket payments in relation to health service utilisation.**

		Service utilisation	
		Decreases	Increases
OOP spending	Decreases	<b>Hard to interpret.</b> (Lower financial burden, but lower service use.)	<b>Positive change.</b> (Increased service use with lower financial burden.)
	Increases	<b>Undesirable result.</b> (Lower service use and higher financial burden.)	<b>Hard to interpret.</b> (Increased service use but higher financial burden.)

Source: Adapted from WHO (2016b).

<sup>2</sup> OOPs of more than 20% are considered high in some instances, there is however consensus that OOPs exceeding 30-40% are definitely considered high (WHO, 2016b).

Table 4.3 shows the different relationships between service utilisation and the extent of out-of-pocket payments. The desirable outcome would be a decrease in the amount of OOPs coupled with an increased health service utilisation. The undesirable outcome would be an increase in OOPs accompanied by a decrease in resource utilisation. A decrease in both service utilisation and OOP payments is much more complex to interpret, but could signal lack of access to health services. An increase in both service utilisation and OOPs also requires more analysis, but could mean low levels of prepayment in the health system.

#### 4.2.3.2 Variable selection: Financial protection

The financial protection indicators from the global reference list of core health indicators are presented in Table 4.4.

**Table 4.4. Global reference list financial protection indicators.**

Indicator	Description
Headcount ratio of catastrophic health expenditure	This is the proportion of the entire population or a sub population that faces catastrophic health expenditure.
Headcount ratio of impoverishing health expenditure	This is the proportion of the entire population or a sub population that impoverishing health expenditures.

Source: Adapted from WHO (2015b).

#### 4.2.4 Conclusion: Identification of outcomes

In this section, the three UHC goals, which are the outcomes for QCA application, were discussed. These outcomes are utilisation/need, quality of care and financial protection. The main objective in this section was to identify the indicators that measure the different UHC goals, which are shown in Table 4.1, Table 4.2 and Table 4.4.

### 4.3 Causal condition selection: Financial arrangements

Again, this section, discusses the health financial arrangements (revenue raising, risk pooling, purchasing and benefits design) with the aim of identifying the respective indicators that measure them. As highlighted before, they originate from Figure 4.2.

#### 4.3.1 Revenue raising

Revenue raising refers to the manner in which health systems raise money from businesses, governments, external sources and households (Gottret & Schieber, 2006). This involves the identification of sources of funds and the methods according to which funds will be contributed. Furthermore, it involves the collection mechanism to be used, with equity and efficiency considerations being relevant (Carrin Mathauer, Xu & Evans, 2008; Kutzin, Yip & Cashin, 2016a). Sources of funds for health financing include public sources, private sources

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and external aid. The potential and the choice of revenue collection methods rely on several factors, including: absolute income, effectiveness of the tax collection systems, the labour market (formal or informal), social solidarity and cohesion, population size, and revenues from natural resources (Kirigia, Carrin, Mwikisa & Diarra-Nama, 2006).

OECD, Eurostat & the WHO (2011) clearly divide the sources of revenues into defined groups. In their description, these groups are termed “institutional units”. Examples of such institutional units include the government, households, corporations, non-profit organisations supporting households with healthcare, as well as foreign entities. The roles of institutions that collect revenues and those that provide them should be distinguished. An example is the role of governments in National Health Insurance Schemes (NHIS) as a collecting agent, and that of households and companies as the providers. This section discusses the revenue types and the institutions involved in them, as well as their roles. It is important to note that Section 4.3.2.1, which discusses the different risk pooling mechanisms that are available, links the revenue sources as discussed in Section 4.3.2.1 to the four most common risk pooling mechanisms.

### 4.3.1.1 Types of revenue

This section serves to provide clarity on the available types of revenues, as well as how revenues are raised and flow in different health financing schemes. The aim for revenue raising is not only limited to increasing health-related revenues, but it is also to be sustainable and equitable for specific contexts. Classification of different revenues for health financing schemes is of importance, as it enables easy monitoring and evaluation of the financing scheme as far as equity and sustainability are concerned. Each type of revenue category comprises subcategories that describe them according to who or which institution the revenues are from (WHO, 2016b). There have been efforts to systematically collect health financial information globally. Examples of such efforts include: *A System of Health Accounts* (SHA 1.0), published by the OECD in 2000, *the International Classification of Health Accounts* (ICHA), and the *Guide to Producing National Health Accounts* in 2003, which was a joint effort from the World Bank, WHO and USAID. A later development is *A System of Health Accounts 2011* (SHA 2011), which was a joint effort from the OECD, WHO and Eurostat. The purposes of the SHA 2011, as set out by OECD *et al.* (2011), are as follows:

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- a. Provide a framework containing the core relevant aggregates for the international comparisons of health systems and health expenditure patterns.
- b. Provide a tool that produces data for monitoring and analysing health systems and is expandable by different countries.
- c. Define coordinated rules for the purposes of tracking healthcare consumption and expenditure.

The SHA 2011 was used as a point of departure for identifying the different sources of revenue that a country has for healthcare. The abbreviation FS is used in the SHA and stands for the “Classification of Revenues of Health Care Financing Schemes” (OECD, Eurostat & WHO, 2011). The SHA presents seven main sources of finances (FS<sub>1</sub> to FS<sub>7</sub>) that each have sub-categories:

- i. **Transfers from government domestic revenues (FS.1)**. This refers to government domestic funds allocated to healthcare. These funds are decentralised in different public systems, as governments need to have the ability to distribute the funds in an equitable and efficient manner. According to OECD *et al.* (2011) these funds include:
  - a. **Internal transfers and grants (FS.1.1)**. This includes government revenues allocated to healthcare that are transferred from central to local governments, funds transferred between governments bodies of the same level, and funds from a different unit of the government. This function excludes Social Insurance contributions by the government as an employer.
  - b. **Government transfers on behalf of other specified groups (FS.1.2)**. These payments are made by the government for healthcare on behalf of specific groups in society (for example pregnant women, the elderly, the poor and disabled persons). The payments include voluntary health insurance (VHI) payments and social health insurance (SHI) contributions paid by the government. This subcategory does, however, not include any governmental contributions that are made by the government as an employer.
  - c. **Subsidies (FS.1.3)**. This refers to domestic government revenues allocated to institutions other than non-profit institutions and government units. These revenues include subsidies for voluntary and compulsory health insurances that

are managed by private insurers, as well as tax allowances given to households with private insurance.

- d. **Other government transfers (FS.1.4).** Fund transfers from the government to non-profit health organisations with the purpose of covering the costs of the non-profit organisations or direct transfers to households.
- ii. **Foreign funding distributed by governments (FS.2).** Funds originating from outside the country earmarked or not earmarked for healthcare that are distributed by the government. There are two types of transactions from foreign origin: foreign revenues earmarked for health, as well as non-earmarked foreign revenues.
- iii. **Social insurance contributions (FS.3).** The purpose of these contributions are to secure social health insurance (SHI) entitlement from employers on behalf of their employees, and self-employed or non-employed individuals. The types of social health insurance contributions are classified according to the institutions that contribute. This category excludes contributions made by the government on behalf of specific societal groups (classified as FS.1.2) and credited social insurance contributions (OECD *et al.*, 2011).
- iv. **SHI contributions from employees (FS.3.1).** These contributions are made by households and paid directly by the employees or deducted from wages and salaries by the employer on behalf of the employees (OECD *et al.* 2011).
- v. **SHI contributions from employers (FS.3.2).** These contributions are paid directly by employers. The government as an employer falls in this category if the government employees form part of the general SHI scheme. The institutions that are involved in this category are the government, private and public companies and non-profit organisations (ILO, 2008; OECD *et al.*, 2011).
- vi. **SHI contributions from the self-employed (FS.3.3).** These contributions are made by self-employed persons paying for SHI (OECD *et al.*, 2011) and may include OOPs and premiums for private health insurance (including community-based insurance) (ILO, 2008).

- vii. Other SHI contributions (FS.3.4).** This includes contributions that are not included in FS.1.2 and FS.3.1 to FS.3.3, for example SHI contributions from pension funds for the retired.
- viii. Compulsory prepayments (FS.4).** This includes compulsory contributions for healthcare that are not included in FS.3. Included are compulsory prepayments into medical savings accounts and private health insurance. The following are different subcategories of compulsory prepayments (OECD *et al.*, 2011):
- a. Compulsory prepayments for healthcare from individuals (FS.4.1);
  - b. Compulsory prepayments for healthcare from employers (FS.4.2); and
  - c. Other compulsory prepayments from other units other than individuals/households and employers (FS.4.3).
- ix. Voluntary prepayment (FS.5).** According to OECD *et al.* (2011) this includes private health insurance premiums that are made by the following:
- a. Voluntary prepaid revenues from households/individuals (FS.5.1);
  - b. Voluntary prepaid revenues from employers (FS.5.2); and
  - c. Other voluntary revenues apart from individuals and employers (FS.5.3).
- x. Other domestic revenues (FS.6).** These are revenues that are from domestic origins and are not included in FS.1 to FS.5, namely:
- a. **Revenues from households (FS.6.1).** This includes out-of-pocket payments and other voluntary health transfers from households for healthcare, for example transfers to non-profit institutions serving households (NPISH) health programmes (OECD *et al.*, 2011). OOPs can be full payment for health services by the patient, or can be in the form of co-payments. Individuals can pay user fees directly to a public health facility, or uninsured individuals can make payments to private health providers. OOPs and user fees are the least progressive forms of healthcare financing (McIntyre, 2013).
  - b. **Revenues from corporations (FS.6.2).** These revenues are dedicated to healthcare from corporations that are not part of FS.3 and FS.5. Companies can finance health services for their employees with no involvement of health insurance schemes, for example, in the form of occupational health services.

**xi. Direct foreign transfers (FS.7).** These revenues are received from foreign bodies directly by health-financing schemes. Direct foreign transfers can be divided into subcategories (OECD *et al.*, 2011). The subcategories are as follows:

- a. **Foreign finances earmarked for healthcare.** Examples include foreign donations from NGOs, individuals, foreign governments and international grants for the purpose of financing domestic healthcare systems;
- b. **Foreign aid in kind (i.e. healthcare goods and services).** International assistance in cash or kind that includes aid in times of emergency; and
- c. **Bilateral, multilateral aid.** This refers to generic aid that is directly donated but not earmarked for healthcare that can also be used in other sectors.

#### 4.3.1.2 Discussion: Revenue raising

Health revenue can be collected from different institutions and the extent to which revenues are prepaid is of particular importance. Prepaid revenues are more favourable with regards to health financial protection than OOP payments. Tax revenue and health insurance are the two main sources of prepaid health revenue (McIntyre, 2013). The sum of the general government health expenditure (GGHE%THE) and the private prepaid health expenditure (VHI%THE) as a percentage of THE constitutes the total prepaid expenditure (WHO, 2010b; McIntyre, 2013). GGHE%THE consists of all the compulsory prepaid health revenue, including health expenditure through social security and tax funding. Although prepaid sources of revenue consist of both mandatory and voluntary prepayments, the domestic mandatory prepaid funds are of particular interest on the path to UHC. By definition, mandatory sources of revenue are health prepayments that are stipulated by law. Mandatory sources of revenue comprise general revenues from local or central government, earmarked revenues and social health insurance contributions. General government revenues originate from revenue from parastatals, as well as direct and indirect taxes (OECD *et al.*, 2011; WHO, 2016b).

The progressivity of the revenue-raising mechanisms is also of importance. For example, personal income taxes are progressive if the tax rates are incremental according to the level of income. In the case of indirect taxes, such as import duty, VAT and excise taxes which are charged on a flat rate on goods and services, it is important to identify which goods or services are tax exempt. The tax structure is viewed as regressive if a major share of these goods are what the poor groups spend on (WHO, 2016b). Although evidence suggest that mandatory

prepayment (GGHE%THE) is more favourable when moving towards UHC, private prepaid revenues (VHI%THE) were also considered when selecting indicators of revenue raising mechanisms.

Table A-5 in Appendix A contains some of the indicators available for revenue raising, and indicates the various institutions that report on these indicators. The indicators considered for application in QCA are in the form of positive attributes that contribute towards UHC. As mentioned above, they indicate the general level of prepayment (both mandatory and voluntary) and mandatory prepayment, which are presented in Table 4.5.

#### 4.3.1.3 Variable selection: Revenue raising

The revenue raising indicators selected for this study are presented in Table 4.5.

**Table 4.5. Revenue raising indicators when moving towards UHC and their definitions.**

Indicator	Description
General government expenditure on health as % of total health expenditure (GGHE%THE).	This includes capital and recurrent government expenditure on health. These expenditures can be from central and local governments on health and also include external grants and loans, donations from external NGOs and compulsory health contributions.
Private prepaid plans as a percentage of expenditure on health (VHI%THE).	This indicator includes voluntary health contributions that are not mandated by the government. Included in this indicator are expenditures from private bodies, such as not-for-profit organisations, households, mutual and commercial health insurance, as well as quasi and resident corporations aimed at the delivery or financing of healthcare. All revenues from donors, which are channelled through the above-mentioned organisations, are also included.
Per capita government expenditure on health. US\$ adjusted for purchasing power ("purchasing power parity" [PPP] or \$ international.	This is a measure of the level of public spending on healthcare for the population. This indicator measures all of the revenues channelled through government budgets, expenditure by parastatals, extra budgetary units and, most importantly, compulsory health insurance.

Sources: WHO (2017b); World Bank (2017).

#### 4.3.2 Pooling

WHO defines risk pooling as "the practice of bringing several risks together for insurance purposes in order to balance the consequences of the realization of each individual risk" (WHO, 2000). Healthcare revenues are accumulated on behalf of a population to ensure that the whole population has access to sourced funds and that access is not based on ability to pay when healthcare is needed (Murray & Frenk, 2000; Kutzin, Yip & Cashin, 2016b). In

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general, health expenditure has two dimensions, namely the magnitude of lifetime expenditure and the timing of expenditure. Risk pooling helps to reduce the unpredictable nature of the healthcare needed in relation to timing and the magnitude of the necessary expenditure (Smith & Witter, 2004). Funds are pooled to address the unpredictable nature of sickness at individual level, because the inability to mobilise financial resources at the time of need hinders access to healthcare. Therefore, pooling funds spreads the risks over a population over time (McIntyre & Van den Heever, 2011). There are three ways in which redistribution occurs in risk pools (WHO, 2000; Smith & Witter, 2004):

- i. In a risk pool with members who make equal contributions, the pool enables transfer from the healthy to the sick (the risk pooling function);
- ii. In a risk pool that has equal healthcare usage but different levels of financial contribution, the pool enables a transfer from the rich to the poor (the income redistribution function); and
- iii. In a risk pool where members make equal financial contributions and equally make use of health services, the pool enables a transfer made according to age since more risk is assumed as people age.

For sustainable risk pooling, key considerations are the size, diversity and the nature of participation in risk pools, which are intertwined concepts. The risk pool size determines the capacity of cross-subsidisation between different socio-economic groups, improving support towards those in greatest need of healthcare and sustainability (Smith & Witter, 2001, 2004; WHO, 2016b). Larger risk pools are more sustainable than smaller risk pools and larger pools have more opportunities for diversity (McIntyre, 2013). For the purposes of cross-subsidisation, risk pools should be as diverse as possible (WHO, 2016b). The nature of participation in risk pools can be either compulsory or voluntary. Differences and consequences of each form of participation will be discussed below, although compulsory participation is more in line with UHC (WHO, 2016b).

There are four general approaches to risk pooling arrangements, namely: no risk pooling, unitary risk pool, fragmented pools and integrated pools (Smith & Witter, 2004). No risk pooling, as the term implies, is when no risk pools are created. The population pay for their healthcare needs as they occur. Therefore, no risk pooling in its classic form means the population pay for healthcare in the form of OOPs (McIntyre, 2013). This does not take into

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account the unpredictable nature of healthcare need and is associated with a lack of financial protection. Unitary risk pools are when raised revenues are pooled into a single pool for the entire population, regardless of the revenue source. In the case of unitary risk pooling, contribution is mandatory for the entire population or segments of the population with a defined set of health benefits. Developing a unitary risk pool often proves difficult for countries, which is why most countries opt for multiple risk pools.

This leads us to fragmentation. Although it might seem favourable, fragmentation is a predominant manner in which problems in risk pooling arise. It is a result of different pool fragments in the health system and leads to obstacles in the redistributive capacity of pooled resources. This, in turn, results in a low extent of cross-subsidisation in the health system (WHO, 2016b). Population groups might be inclined to choose risk pools based on the nature of employment, geographical location, personal attributes (such as age, gender and ability), and personal choices (such as general preference of specific medical schemes over others). Risk pool membership can either be voluntary or mandatory, depending on the health system arrangements of the country in question. Integrated risk pools are financial arrangements to transfer funds across risk pools in order to curb the problems caused by fragmentation. Risk pool integration is often referred to as risk equalisation, which can be achieved through an assessment of the available risk pools in terms of factors such as gender, age, disability and disease profile (Rice & Smith, 2002; McIntyre, 2013).

### 4.3.2.1 Risk pooling mechanisms

There are four dominant risk pooling mechanisms, namely state-funded systems, social health insurance, community-based health insurance and voluntary health insurance. These mechanisms differ significantly and perform differently in countries, due to contextual differences in factors such as income levels, health needs, employment and administrative capacity (Gottret & Schieber, 2006). In this case, the risk pool mechanisms are described in their classic form, but countries often opt for mixed systems (McIntyre, 2013). These mechanisms are:

#### i. State-funded systems

State funded systems (tax financed systems) are characterised by funding that is predominantly from general revenues through state budget allocations. Health is

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delivered mainly through a network of public providers and covers the whole population. Most of the funding comes from budget allocations by the government, meaning that the source of healthcare revenues is the same as all government revenues. Government sources of revenue include taxes, sale of natural resources, government debt, sales of government assets and public tolls (Gottret & Schieber, 2006). For feasibility of state-funded systems, governments have to consider the revenue-raising capacity of a particular country, as well as the quality of governance, and create more focus on the poor in society (WHO, 2004; Gottret & Schieber, 2006).

The following are some advantages and disadvantages of state funded systems: A positive aspect of state-funded systems, is the fact that service coverage is comprehensive. Therefore, it is simpler to extend coverage to the entire population since the population does not have to make direct contributions. Risk selection problems can be avoided because of larger pools and the comprehensive nature of the system. The dependence of state-financed systems on tax revenues means that there is more room to raise revenues, seeing that the burden can be spread over a large portion of the population. The centrality of state-funded systems makes them easier to manage, thereby reducing the risk of problems related to administrative efficiency. Aside from efficiency, there is more cross-subsidisation between different subpopulation groups, because risks are shared amongst a larger diverse population (Gottret & Schieber, 2006).

On the downside, the dependence of state-funded systems on budget allocations and their direct government involvement, makes them vulnerable to political pressure – meaning, funding is less stable and more unpredictable. This is a major problem, especially in low-income countries with smaller tax bases where different ministries have to compete for the limited resources (WHO, 2004). Although risk pooling is executed centrally and the entire population is entitled to specific health benefits, the reality is that resource utilisation is more inclined towards higher income, predominantly urban households. There have been concerns over the efficiency of service delivery in countries that operate under state-financed systems, because they can fail to effectively influence delivery (Gottret & Schieber, 2006).

## ii. Social health insurance (SHI)

The first SHI originated in Germany as a result of industrialisation and the subsequent development of large companies. The workers in these firms started to developing sickness funds as a way to improve access to healthcare amongst themselves. This was in turn supported by employers who realised the benefits of having healthy workers (Normand & Busse, 2002).

SHI is also referred to as “national health insurance” (NHI). However, SHI and NHI differ slightly in their structure. In the case of SHI, only certain groups of the population are required to be on insurance, or only those that make contributions have coverage entitlement. NHI, on the other hand, covers the entire population. Its coverage includes individuals who do not make contributions, although it is mandatory for specific groups (mostly employers and employees) of the population to make contributions. SHI and NHI are often used interchangeably, but a more inclusive term is “mandatory insurance”. It is often difficult to differentiate between state-funded systems and mandatory insurance, because they are both, in principle, funded through payroll taxes (McIntyre, 2013). There is no strict definition of SHI, but the dominant features are that the insured make regular payments that are normally wage-based payments and there is the involvement of independent or quasi-independent insurance bodies that manage the risk pools. This is the key distinction between SHI and state-funded systems. In the case of the latter, the pooling function is also implemented publically (Normand & Busse, 2002; McIntyre, 2013). SHI clearly defines the benefits that the insured population are entitled to. Most of the SHI schemes are run by sickness funds, which are independent and are often operated by not-for-profit organisations. Providers are either part of the sickness funds, or they can be public or private entities (Gottret & Schieber, 2006).

Aside from the dominant features, SHI funds can be structured in different ways (Normand & Busse, 2002):

- a. SHI can be compulsory for the whole population, or portions of the population.
- b. There are generally four ways in which risk pools are organised in SHI. There can be one risk pool for the entire population and risk pools can be organised

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so as to serve populations in different geographical locations. Risk pools can also be designed to compete or not compete for insurees in the same geographic areas.

- c. Governments often contribute to the risk pools in order to cover people who cannot contribute.

SHI is generally viewed as a simple way of collecting revenues for healthcare. The transparent nature of SHI, with defined benefits and a clear destination of funds, creates more willingness to pay from the population. In cases where there are constraints in revenue sources, countries can resort to diverse earmarked revenues for health. Reliance on budgetary negotiations could, however, leave the system more vulnerable to political pressure. State funding is mainly required to cover students, the unemployed, the poor, and other vulnerable groups. The pay-as-you-go nature of most SHI systems allows for the accumulation of funds for future retirees. The decreased dependency on state funds that is typically associated with SHI makes it more resilient to political pressure. Most of the available SHI systems have a high redistributive nature, which is due to the cross-subsidisation between the rich and the poor and from low-risk to high-risk individuals. The level of health risk associated with the population does not influence contributions and dependants of contributors are often covered with no increase in levels of premiums. In countries with a long history of SHI, such as Germany, the population strongly trust and have a somewhat emotional attachment to the system. Furthermore, SHI has been a means of fostering solidarity in many countries (Gottret & Schieber, 2006).

Unfortunately, SHI can also lead to the exclusion of the poor groups of the population. SHI systems generally start by incorporating formal workers from large companies. This leaves out the informal sector and, notably, the poor in society. Payroll contributions can occasionally have a negative impact on the economy (Gottret & Schieber, 2006). In theory, payroll contributions are the employees' responsibility. In more competitive labour markets, employers cannot, however, risk reducing employee wages as a result of increase in payroll contributions. This results in employers incurring more costs to cover payroll contributions, leading to high labour costs and eventually unemployment. SHI involves complex interactions

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of different stakeholders, which in turn increase administrative costs. Countries with weak regulation and low health efficiency have had slow progress towards SHI, which is evident in most Latin American countries. Similar to state funded systems, SHI can lead to increases in unnecessary health service usage as services are greatly subsidised. The political nature of SHI, with a large number of stakeholders, can make it difficult to take radical cost containment measures. The sense of ownership that comes with the nature of contribution to SHI makes it rather difficult to reduce benefits, making it easier to keep the same benefits and increase contributions, creating no incentive for efficiency (Gottret and Schieber, 2006).

### **iii. Community-based health insurance (CBHI)**

The term “CBHI” is often used to describe a diverse group of health-financing mechanisms that are motivated by various interests. Central to this is the idea of community. Community is not restricted to geographical proximity, but includes CBHI schemes with members from different types of communities that are not covered by market-based and government health-financing mechanisms. CBHI schemes can be made up of members who share a religion, craft, profession, or have any other type of affiliation and are motivated by financial protection (Jakab & Krishnan, 2001; Gottret & Schieber, 2006). Revolving drug funds, rural health insurance, mutual health organisations, community health funds, micro-insurance, and the involvement of a community in user fees for healthcare have all been referred to under the umbrella of CBHI (Jakab & Krishnan, 2001).

In their systematic literature review, Jakab & Krishnan (2004), identified three common features of CBHI: (i) members are involved in designing of rules of engagement, collection of revenues, pooling, and resource allocation; (ii) although the community is involved, most of the existing schemes are owned by governments, NGOs and health providers (Gottret & Schieber, 2006); and (iii) members of CBHI schemes are sub-populations that are excluded from other health-financing mechanisms in the country. Members of these risk pools often share a common set of social values and membership is voluntary in nature and driven by solidarity amongst poorer groups in society.

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From their systematic review, including over 45 reports, Jakab & Krishnan, (2001) concluded that CBHI plays an important role in improving access to healthcare for low-income groups. CBHI is a good complementary financing mechanism to extend coverage to more vulnerable groups in society, but cannot serve as the sole financing mechanism to provide coverage for the entire population. CBHI generally offers low capacity for financial protection and, while the sizes of CBHI schemes vary, the majority of the risk pools are small (ILO & STEP, 2002). When individuals choose not to participate in CBHI, it can generally be attributed to a lack of trust in pool managers and a general lack of education with regards to the need for health insurance (Gottret & Schieber, 2006). As highlighted above, the nature of CBHI means that pools are often amongst population segments with a common background, which is why these pools are vulnerable to covariant risks. Moreover, the voluntary nature of CBHI means that they are susceptible to adverse selection problems, which affect financial sustainability (Gottret & Schieber, 2006). Benefits are seldom properly defined, which leads to people with existing conditions joining the pools without sustainability measures in place. These issues can be addressed by combining funds from different CBHI schemes to create larger and more stable pools. The poorest in society are often excluded from participation, as they cannot afford the smallest contributions and are therefore excluded (Preker *et al.*, 2004). The reason for this is the (often) flat-rate nature of the CBHI contribution, which is regressive. With regards to provision of care, CBHI has little to no effect on quality and efficiency of care (Gottret & Schieber, 2006).

### iv. Voluntary health insurance (VHI)

VHI is occasionally referred to as Private Health Insurance (PHI), and is more prominent in high income countries as a supplement to the publically financed systems (Gottret & Schieber, 2006), and dominant amongst the wealthier population groups (McIntyre, 2013). VHI can be a substitute for existing publically provided services, as a complement to public services that are not offered by the state (Mossialos & Thomson, 2002) or can be the primary source of health insurance. These different taxonomies lead to the complexity of VHI, as it is involved in various forms of interactions with public health coverage (OECD, 2004). Although CBHI and VHI are both voluntary in nature, their key difference

lies in the fact that VHI is provided by private, for-profit organisations (OECD, 2004; Gottret & Schieber, 2006).

VHI plays a pivotal role in improving financial protection and access, as well as promoting innovation and coverage for services that are not publically offered. VHI contributes to a country's savings rate through their ability to accumulate capital, which fosters the development of financial markets (Gottret & Schieber, 2006).

On the downside, VHI mechanisms are generally subject to high administrative costs, which can lead to adverse selection and “cream skimming” (Gottret & Schieber, 2006). Adverse selection occurs when the vulnerable groups of the population have a higher likelihood of seeking health insurance. Cream skimming is when insurers actively deny the less healthy insurance in favour of low-risk (healthy) individuals. This is often done by setting high premiums for high-risk individuals, or restricting benefits for pre-existing conditions (McIntyre, 2013). Due to fragmentation, VHI mechanisms often promote dissimilar access to healthcare, especially between high- and low-income groups.

#### 4.3.2.2 Discussion: Pooling

Countries can structure their risk pooling mechanisms depending on their context. Many countries, however, have mixed pooling arrangements where they employ a combination of the above-mentioned risk pooling mechanisms. In order to select indicators to assess risk pooling mechanisms, the key considerations for risk pooling that were taken into account are: the pool size, diversity, the level of fragmentation, and the nature of participation in risk pools (voluntary or compulsory). Small risk pools are generally not sustainable. For example, it is difficult to predict future healthcare needs and small risk pools are limited in their cross-subsidisation capability. In most cases where multiple risk pools exist, the majority of the pools are voluntary. Voluntary risk pools are more susceptible to adverse selection, cream skimming and high transaction costs (Smith & Witter, 2004).

The health financing diagnostics and guidance document from the WHO (2016b), highlights the important aspects to consider for risk pooling. Firstly, the market structure of risk pooling has to be considered. This specifically refers to the ratio between OOPs and prepaid revenue. Prepaid revenue can be in the form of voluntary or mandatory revenues. Of importance to pooling are the prepaid revenues. Secondly, there needs to be an assessment of the level of

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fragmentation of risk pools. As highlighted in Section 4.3.2, fragmentation of risk pools is a major problem in risk pooling. In the case of multiple risk pools in a country, both Carrin & James (2004) and the WHO (2016b) recommend assessing whether risk equalisation measures are in place to curb fragmentation. Thirdly, with regards to performance, Carrin & James (2004) suggest that there should be incentives for efficiency in risk pooling. Finally, since the sole purpose of risk pooling is for financial protection when care is needed due to the unpredictable nature of the need for healthcare, it is important to assess the number and diversity of population groups that are covered by some form of risk pool. Table 4.6. shows the considered indicators for assessing risk-pooling mechanisms.

### 4.3.2.3 Variable selection: Pooling

The selected indicators for pooling are presented in Table 4.6.

**Table 4.6. Considered indicators for assessing risk pooling mechanisms.**

Reason	Indicators
The level of prepayment	<p>This refers to the market structure of pooling arrangements, the mix between mandatory prepayment, voluntary prepayment and OOP. Of interest is the proportion of prepaid revenue, both mandatory and voluntary.</p> <p>The level of (GGHE%THE) and VHI%THE) indicate the level of prepayment in a country. The former indicates mandatory prepayment, while the latter represents voluntary prepayment.</p>
Fragmentation in risk pools	<p>Countries often opt for a mix of different risk pools. In the case of a country having multiple risk pools, a qualitative analysis of the level of fragmentation in a country's risk pooling can be conducted. If multiple risk pools exist, there is a need to assess whether risk equalisation between the pools exist, to allow for cross-subsidisation between different social groups.</p>
Management of risk pools	<p>For either multiple or single risk pool systems, it is important for risk pool managers to be financially responsible. This is because financial responsibility affects health systems' technical efficiency. For these reasons, it is important to determine whether there are financial incentives for efficient risk pool management. Without adequate regulation, risk pool incentives for efficiency can, however, result in cream skimming.</p>
What proportion of the population do the available risk pools cover?	<p>One important feature that improves access to healthcare, is promoting use of healthcare according to need. It is therefore important to assess if access to pooled revenues is based on the ability to pay or on need. If a low percentage of the population is covered by risk pools, it means that OOPs and catastrophic expenditures are highly likely (USAID &amp; HFG, 2015).</p>

Sources: Carrin & James (2005); WHO (2016b).

### 4.3.3 Purchasing

Purchasing involves the transfer of pooled funds to health service providers (private or public) on behalf of the population (McIntyre & Van den Heever, 2011; Kutzin *et al.*, 2016a). Purchasing differs from procurement, as the latter only refers to the buying of medical supplies and medicines (RESYST, 2014). This function involves benefit design policies, healthcare provider payment mechanisms, the organisational structure and governance of the purchaser (WHO, 2016b). Purchasing contributes to health system performance (Robinson, Jakubowski &

Figueras, 2005), which is aligned with improved equity, better quality care, efficiency, transparency, and change in the health sector (Thomson, 2010).

In a nutshell, health purchasing organisations are responsible for three main decisions (Robinson *et al.*, 2005; RESYST, 2014; Honda *et al.*, 2016):

- i. The selection of health services to be purchased according to population needs, cost efficiency and national importance (benefits design).
- ii. The selection of service providers under considerations of equity, quality and efficiency.
- iii. Determining how the purchasing function is organised, which includes contracting and provider payment mechanisms.

#### 4.3.3.1 Benefit design and rationing

This function describes the services that can be purchased for a specific group of the population from the pooled funds. Two objectives for benefits design are cost containment and providing access to necessary health service (Normand & Weber, 2009). Benefits packages take the form of health entitlements possessed by population groups, and can be specified as a positive list of entitlements and a negative list of services that are not included in the package (“benefit rationing”) (WHO, 2016b). When designing the benefits package, the types of services being offered, type of providers, the state of service delivery infrastructure, affordability and sustainability are key considerations (McIntyre, 2013).

The first consideration is the types of services to be offered. There are generally two types of services: low-frequency, high-cost services and high-frequency, low-cost services. The former includes hospital care, long-term care and terminal illness interventions, while the latter includes primary care interventions such as chronic care and acute care. The services offered should aim to give financial protection to the population, and should also ensure that the costs associated with the packages are contained (McIntyre, 2013). Information is key to determining the types of services to be considered in a benefits package. The purchaser should continuously gather epidemiological information about the population in order to establish awareness of their need (Kutzin, 2001a; Normand & Weber, 2009). Secondly, the purchaser should make decisions as to which providers the beneficiaries can use. The purchaser ensures that the providers meet specific sets of standards, provide sufficient quality of care, offer an adequate range of services and are cost effective. The third consideration points to the

affordability and sustainability of the benefits package. The benefit package is dependent on the available resources, as well as the forecasted resources. This leads to a trade-off between the services that are covered and the amount of individuals covered, which are respectively referred to as “the depth” and “the breadth”. Lack of clarity when designing health benefits leads to uncontrollable expenditure, making the financing mechanism unsustainable (Normand & Weber, 2009; McIntyre, 2013). Finally, there should be adequate infrastructure that is accessible to cater for the services that are defined in the benefits package (McIntyre, 2013).

#### 4.3.3.2 Payment, organisational structure and governance

In the purchasing function, it is not sufficient to design benefits packages for the population without also designing the associated payment mechanisms (WHO, 2016b), which leads to the distinction between passive and strategic purchasing. “Passive purchasing implies a predetermined budget or simply paying bills when presented. Strategic purchasing involves a continuous search for the best ways to maximise health system performance by deciding which interventions should be purchased, how and from whom” (Musgrove, Creese, Preker, Anell & Prentice, 2000; WHO, 2016b).

**Table 4.7. Key differences between strategic and passive purchasing.**

<b>Passive purchasing</b>	<b>Strategic purchasing</b>
Bills paid once presented.	Payment systems with deliberate incentives.
Minimal to no selection of providers.	Active selection of providers based on service quality, efficiency and equity.
Minimal to no quality monitoring.	Active quality monitoring with rewards for good practise.
Simply based on available quality and prices.	Sets quality and price standards by using levers to influence provider behaviour.

Purchasers are involved in a three-way (principal-agent) relationship with the government, health system consumers, and healthcare providers (Robinson, Jabukowski & Figueras, 2005; RESYST, 2014), in line with strategic purchasing. An agent in this context means a body that acts as representative of another (the principal). Figure 4.4 shows the relationships between purchasers and the rest of the ecosystem. Table 4.8 shows the key purchasing actions in relation to purchasers, consumers, governments and providers in line with strategic purchasing. In the relationship between purchasers and providers, the purchasing organisation acts as the principal. This involves the use of contracting, regulation, financial,

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and monitoring mechanisms as controls to ensure that the provided services are adequate, of good quality and are priced as agreed. The second set of relationships involves the government and purchasing organisation, where the purchaser acts as an agent to the government. In this relationship, the government has a role of stewardship. The last relationship is the purchaser-citizen relationship, where the purchaser is an agent that purchases care on behalf of the insured population. Key to this relationship is the extent to which the purchaser represents the needs of the healthcare consumer (Robinson *et al.*, 2005; RESYST, 2014).

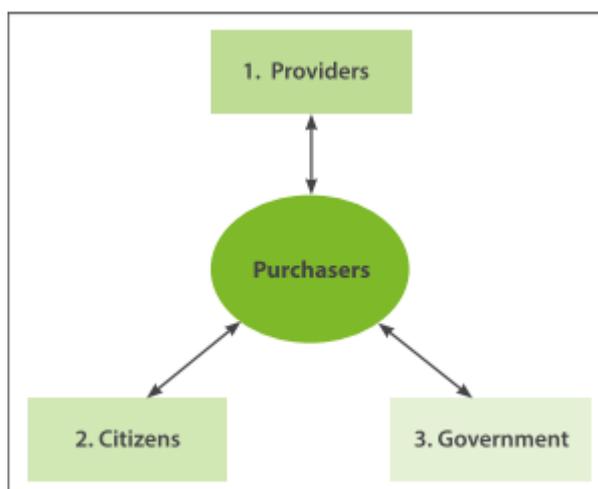
It is important to note that the health providers are agents who are hired to deliver health services to defined populations on behalf of a principal. In this context, the principal is the purchaser who hires health providers on behalf of an insured population. Several problems can arise depending on how the principal-agent relationship between purchasers and providers is structured, these include (Lagarde, Powell-Jackson & Blaauw, 2010):

- i. Providers can act in their own interest for a given level of payment, compromising the quality and volume of healthcare delivered.
- ii. In the presence of financial incentives that are targeted at cutting costs, providers can avoid services that are resource-intensive, therefore opting for cheaper services with the aim of cutting costs. This leads to cream skimming, which in turn hinders equity in access to healthcare.
- iii. When purchasers require providers to produce good quality health services at the most cost efficient price, it can lead to issues related to cost-efficiency if providers do not bear the costs of services they provide.
- iv. When providers receive financial incentives for the volume of clinical procedures they deliver, it can lead to the overproduction of health services. This is referred to as “provider-induced” demand and is associated with low-cost efficiency.

**Table 4.8. Key strategic purchasing actions in relation to providers, government and the population.**

Player	Responsibility
Government	Develop frameworks that are clear for both purchasers and providers.
	Develop and provide infrastructure necessary for service delivery.
	Ensure that enough resources are mobilised with the purpose of meeting service demand.
	Enforce accountability of the purchasers.
Providers	Ensuring that providers are chosen on the grounds of location, quality and variety.
	Develop service arrangements.
	Develop standards for the delivery of services.
	Determine payment rates.
	Gather and protect information regarding the provided services.
	Auditing of provider claims.
	Performance monitoring and acting in cases of poor performance.
	Monitor for fraud and corruption.
	Regular provider payment.
	Equitable allocation of resources.
	Develop and monitor consumer payment policies.
	Development, management and use of information systems.
Consumer	Needs assessment, taking account of the values of the population.
	Raising awareness of the population's entitlements and obligations.
	Create mechanisms to communicate with the population with regards to complaints.
	Reporting of performance and resource usage.

Source: RESYST (2014).

**Figure 4.4. Relationships between purchasers, citizens, government and providers.**

Source: RESYST (2014).

Purchasing organisational structures can be divided into two groups, namely vertical purchasing and horizontal purchasing. These organisational structures are influenced by the unique and complex social, economic, historical and cultural settings of a country. In turn, these factors drive the sources of funds and jurisdictions (such as religion and geographical

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location), which influence the purchasing function (Robinson *et al.*, 2005). Vertical organisation means that the central (“macro”), regional (“meso”) and local (“micro”) levels of government have the purchasing power, depending on the context. Macro-level purchasing implies a single insurance fund for the entire population and purchasing is done centrally. In most cases local and regional authorities are involved in revenue collection. With regards to meso-level purchasing, purchasing arrangements are executed by either regional government health purchasing organisations or general health funds that are connected to the region. The term “meso” is not restricted to geographical location, but to devolved purchasing arrangements that cater to a population of 100 000 to 500 000 people. Micro-level purchasing is when the decision-making is done locally. Health revenues can be raised locally or devolved to local organisations that then allocate funds to providers. This is common amongst Nordic countries, where local governments hold responsibility for their communities (Robinson *et al.*, 2005). Horizontal purchasing, on the other hand, refers to a market-based system that encourages competition between different purchasers (Robinson *et al.*, 2005).

### 4.3.3.3 Provider payment mechanisms

Provider payment mechanisms are the methods which are used to transfer funds from the purchasers to health providers (McIntyre, 2013). The manner in which providers are paid plays an important role in influencing the way that providers behave in the principal-agent relationship. Key questions include which services are offered, how they are delivered and what mix of inputs providers use. Good incentives drive providers to behave in line with the health system goals such as good quality care, improving access to care, enhanced responsiveness to patients and the efficient use of health resources (Cashin *et al.*, 2015). Provider behaviour is driven by a number of factors, including, ethics, competition, financial incentives, regulation, training, reputation and humanity (Lagarde *et al.*, 2010). In order to effectively influence provider behaviour, it is preferable to have as few purchasing organisations as possible. A large number of purchasers makes it difficult to influence provider behaviour, simply because they have options due to competition (McIntyre, 2013).

There are different provider payment mechanisms and countries often depend on a combination of mechanisms, depending on their context. Each provider payment mechanism creates different incentives on service quality, efficiency and cost-containment, and has different administrative requirements. Combinations of provider payment mechanisms often

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create a different set of incentives that may complement different payment mechanisms (Normand & Weber, 2009).

The potential benefits and drawbacks associated with each of the provider payment mechanisms make it is more favourable to use combinations in a health system, depending on the context (Carrin & James, 2004). The main provider payment mechanisms are described in Table 4.9, which also highlights their main advantages and disadvantages. One provider payment mechanism that was not included in Table 4.9, is “pay for performance” (P4P), because there is no accepted definition of the payment mechanism and no well-defined models for its application (Lagarde *et al.*, 2010; Cromwell, Trisolini, Pope, Mitchell & Greenwall, 2011). This has led to mixed results from P4P payment mechanisms (Lagarde *et al.*, 2010; Serumaga *et al.*, 2011; Werner *et al.*, 2011; Eijkenaar, Emmert, Scheppach & Schöffski, 2013).

**Table 4.9. The main provider payment methods and their incentives.**

Payment method	Description	Advantages	Disadvantages
Capitation (per capita payment)	Providers are paid in advance for the defined health benefits package for each person. This amount is paid for the fixed duration that the person is insured for.	Creates incentives for technical efficiency, administrative efficiency and the promotion of preventative care.	Promotes underservice, susceptible to cream skimming and cost shifting (providers tend to refer patients to other providers).
Case-based (diagnostics-related groupings (DRG))	A fixed amount is paid to hospitals depending on factors such as diagnosis, where the patient was admitted, as well as the patient and clinical characteristics.	Creates incentives for operational efficiency.	May reduce the quality of services, increases administration costs, costs are unpredictable and there are chances for cream skimming.
Fee-for-service (tariffs or fixed fee schedule)	Tariffs for health services are fixed beforehand for each basket of services. Providers are then paid for each service that they deliver.	In the case of a fixed fee schedule, it creates incentives for technical efficiency. Providers are inclined to overproduce services; this is called supplier-induced demand.	Associated with high administration costs, overprovision of services and increases in costs.
Global budget	A fixed amount is paid to providers per specific period to provide a specified set of services. The budget is dependent on combinations of inputs and outputs, or individually. Then, providers can allocate funds as they see fit.	Administration costs are low and expenditure can be forecasted.	There are little incentives to promote efficiency, unless payment is according to performance.
Line-item budget	Health providers receive fixed amounts for a stipulated period for the purpose of covering health inputs such as medicines and salaries. The budget is fixed and should follow the line item.	Low administrative costs.	There is a general tendency to spend all funds before the year ends, no incentive and mechanisms for efficiency and more referrals to other providers.
<i>Per diem</i>	Hospitals are paid a fixed amount per day for each admitted patient. The rates vary depending on factors that include types of patients and clinical characteristics.	There is little incentive for technical efficiency.	Allows for the increase in admissions and length of stay.
Salary	Payment of salaries to health providers. This is in the form of contractual agreements between the provider (staff) and the insurance fund.	Minimises administrative costs and expenditure is predictable.	There are no incentives for efficiency and productivity if payment is not linked to performance. There is a risk of under provision of health services or poor quality care.

Sources: (Kutzin, 2001b; Carrin and Hanvoravongchai, 2003; Normand and Weber, 2009; McIntyre, 2013; Boachie, 2014; Cashin *et al.*, 2015).

#### 4.3.3.4 Discussion: Purchasing

Purchasing is a key strategic link between mobilised resources for the purposes of UHC to the delivery of quality care in an efficient manner. Purchasing can be performed in one of three ways according to WHO (2010b). The first approach is integrated purchasing and provision where governments allocate budgets directly for healthcare, from government health revenues. The second approach entails organisations that are separate from the government, purchasing healthcare on behalf of the insured population. Lastly, health consumers can purchase healthcare directly in the form of OOPs. Purchasing organisation can either be passive or strategic, with strategic purchasing being favourable when moving towards UHC (Robinson *et al.*, 2005; Normand & Weber, 2009; McIntyre, 2013; Cashin *et al.*, 2015; WHO, 2016b). With that notion in mind, health systems should therefore strive to perform strategic purchasing, as it maximises the influence of purchasing arrangements mainly in terms of equity, quality of care, efficiency and cost-containment. The key considerations when evaluating health purchasing arrangements as proposed in the WHO's Health Financing Diagnostics and Guidance (WHO, 2010c), as well as by Carrin & James (2004), were used as bases when selecting factors for analysing health purchasing arrangements that can be used in the QCA analysis. The proposed qualitative indicators for assessing a country's benefits design are summarised in Table 4.10, while indicators of the extent of strategic purchasing are summarised in Table 4.11.

#### 4.3.3.5 Variable selection: Purchasing

The selected indicators for benefits design are presented in Table 4.10, where the selected indicators for strategic purchasing are presented in Table 4.11.

Table 4.10. Benefit design indicators.

Reason	Indicator
Efficiency and equity considerations	Are benefit packages designed with regards to equity and efficiency considerations? This seeks to assess the fundamental principles behind benefits design and whether benefits are designed according to need or ability to pay. Additionally, this indicator seeks to assess whether efficiency considerations are taken into account when designing benefits for the population.
Priority setting organisation.	Do priority setting authorities exist for benefit design (Carrin & James, 2005)? This indicator seeks to identify whether a country has organisations that are involved in priority setting for the benefits that the population might attain. This is important for cost-containment purposes.
Monitoring mechanisms.	Mechanisms for patient appeals that include claim rights, claims reviews and a committee for peer reviews. Monitoring is important, as it ensures compliance in purchasing.

Sources: Carrin &amp; James (2005); WHO (2016b).

Table 4.11. Strategic purchasing indicators.

Reason	Indicators
Do purchasers influence payments rates?	A qualitative review of the provider-purchaser relationship, with the aim of identifying how prices are set. In general, purchasing organisations hold more price negotiation power when there are as few of them as possible. In cases of multiple purchasing organisations, providers can be involved in setting prices and cost shifting. In cases where there are different purchasers e.g., different purchasing organisations in primary and tertiary care, there might be tendencies of referring to other purchasers to avoid costs. This indicator assesses the purchasing dynamics with the aim of identifying whom influences payment rates. It is favourable for purchasers to have a dominating effect in price setting (WHO, 2016b).
Do robust information systems exist to support strategic purchasing?	A qualitative review of the nature of health information systems of cases, as these systems are key to the ability to implement strategic purchasing (WHO, 2016b).
Do provider performance reviews exist?	A qualitative analysis for the existence of performance reviews. Performance reviews on providers are important to ensure that providers are acting accordingly, especially in terms of quality of care. This also seeks to ask if action is taken when there is poor performance.
Do accountability systems exist between providers and purchases?	A qualitative analysis of the level of accountability between providers and purchasers, in terms of regular public reporting of performance indicators.
Provider payment mechanisms.	A qualitative study investigating the provider payment mechanisms that are in place, addressing whether they encourage the provision of appropriate care (Carrin & James, 2005). As seen in Table 4.9, each provider payment mechanism exhibits strengths and weaknesses. For those reasons, countries tend to employ a combination of provider payment mechanisms. Carrin & James (2005) only consider the overproduction or underproduction of services when analysing the effects of provider payment mechanisms. Here, the appropriate level of care, the effects of payment mechanisms on quality of care, and cost containment are considered (Normand & Weber, 2009).

Sources: Carrin & James (2005); Normand & Weber (2009); WHO (2016b).

#### 4.4 Causal condition selection: Contextual factors

This section discusses the contextual factors that have an influence on UHC and that are briefly discussed in Chapter 2. They form part of the causal conditions (variables) for QCA application. The aim of the section is, once again, to identify comprehensive indicators to measure each of the contextual factors. It is important to note that the structure of public administration and public sector financial management forms part of the governance aspect of the contextual factors as highlighted in Chapter 2. These were omitted, however, due to unclear indicators for assessment.

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Contextual differences affect all four components of health system financing (revenue raising, pooling, purchasing and benefits design). For example, differences in available sources of funds in countries can affect the strategy that a country chooses for UHC. The same applies for pooling, where some countries are faced with a choice between having multiple risk pools or a unitary risk pool for the population (Smith & Witter, 2001). Complex historical, economic, social and cultural settings influence the choice between horizontal and vertical purchasing strategies. An example of how contextual differences affect UHC can be observed in Ghana, where the National Health Insurance Scheme (NHIS) was introduced in 2004. Similar to many low-to-middle income countries, Ghana faced problems in co-opting the fraction of the population that is in the informal working sector (Abihiro & McIntyre, 2012). This was a major topic of discussion at the second African Health Economics and Policy Association Conference held in Saly, Senegal, in March 2011. Contextual issues discussed ranged from the sources of revenues that were suitable to this region, suitable pooling mechanisms and ways of improving health system quality (Atim, 2011). Different ways of achieving UHC exist and a country pursues a path that is appropriate to its context. Experience from countries that have been successful in achieving UHC are useful sources of knowledge for other countries moving towards UHC, and this knowledge can guide countries that are pursuing UHC. A selection of prominent contextual factors that affect UHC, or the attainment thereof, are discussed in more detail in the remainder of this section in order to enable the selection of indicators that can be used to represent these causal conditions in the QCA analysis.

### 4.4.1 Fiscal context

Fiscal context refers to the will and ability of governments to raise revenues that allow them to spend on public services, including healthcare. A large fiscal capacity creates potential for governments to spend on healthcare (or any other government programme), thereby reducing or eliminating financial barriers to healthcare (WHO, 2016b). Fiscal space is the term that is commonly used to articulate the budgetary room that a government has to finance a purpose they desire, without harming the sustainability of their financial position (Heller, 2005; WHO, 2016b). Sustainability in the context of fiscal space relates to the ability and capacity of a government to finance desired programs, pay debts and to ensure future solvency (Heller, 2005). The indicators that give insight into the fiscal context, as defined in the WHO's health financing diagnostics and guidance (WHO, 2016b), are summarised in Table 4.12.

Table 4.12. Indicators for fiscal space.

Reason	Indicator
What is the level of government spending?	This is a reflection of the public sector in the economy. In general, a governmental expenditure of less than 15% reflects very low fiscal capacity, 15%-20% is low, 20%-25% is low to medium, 25%-35% is medium, 35%-45% is medium to high and above 45% is very high (WHO, 2016b).
What space is available to increase government revenue?	<b>Tax to GDP ratio</b> This indicates the tax capacity of the government. It is important to know if the government spending by applying the rules indicated above as to establish if the ratio is low or high (WHO, 2016b).
How is government spending aligned with the long-term capacity to spend?	<b>Debt to GDP ratio</b> The debt to GDP ratio is used when a government has been operating in a budget deficit over a significant period of time, interest rates charged to pay off the debt and the debt itself and the GDP growth rates will need to be taken into account. The International Monetary Fund (IMF) advises a debt to GDP ratio of 60% for high income countries and for developing of low-middle-income countries, a debt to GDP ratio of 40% (IMF, 2010; WHO, 2016b).  <b>Government budget deficit</b> This indicates if the revenue that a government generates is exceeded by the expenditure hence it is in line with fiscal sustainability, such a situation would mean that the government find difficulty in expending in other sectors including health (WHO, 2016b).
What capacity is available from overseas, mainly for developing countries?	<b>Gross National Income per capita PPP</b> GNI is the sum of value added by all producers who are residents of a country including any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income (compensation of employees and property income) from abroad.

Source: WHO (2016b).

#### 4.4.2 The structure of public administration

Decision-making is one of the core facilitators of UHC reforms and goals. The manner in which political-administrative decision making responsibilities at diverse levels are structured and the extent to which the government is decentralised, are therefore important. This influences priority making at different sectors especially in public spending. Healthcare system inequalities across regions in a country at national and sub-national levels can be indicative of the effects of the public administration structure. Fragmentation in pooling arrangements can be influenced by the extent to which the government influences redistribution and equalisation through geographies in the healthcare sector and public financing at large. The way that public administration is structured influences the central health financing system, especially pooling arrangements (WHO, 2016b). Examples can be

seen in Canada where each province is responsible for delivering healthcare to its population. Fragmentation is a serious issue in Canada, because funds are distributed by the central government according to the population sizes of the provinces as opposed to the need for healthcare. This has led to provinces merging to form larger regional risk pools to mitigate the effects of fragmentation (Britnell, 2015a). Italy also collects health revenues centrally and then redistributes them to the country's regions. The country has faced inequality in the regions where the southern parts of the country generally has poor healthcare compared to the northern parts. Italy has made efforts to reduce the inequalities in the form of a risk equalisation fund (*Fondo Perequativo Nazionale*; Osborn & Sarnak, 2017).

#### 4.4.3 Public sector financial management

Public financial arrangements (PFM) are the rules and processes that govern the public sector's expenditure reporting, budgeting, financial control and distribution. They have important implications for health system reforms. It is important to understand the budgeting process with regards to the actors, their powers, roles and responsibilities. On the health sector level, it is important to assess the extent of autonomy that health sector managers have, as it is a crucial determinant of efficiency that allows them to implement new initiatives at facility level (WHO, 2016b).

#### 4.4.4 Education

Education and health are key to human capital (Groot & Van den Brink, 2006) as they have significant effects on productivity. Groot & Van den Brink (2006) describe the three ways in which education and health are involved in a positive relationship. Firstly, the healthier people are, the more they invest in education. Secondly, both education and health are similarly affected by factors such as wealth and social status. Thirdly, education translates into good health. Van der Heide *et al.* (2013), studied the relationship between education and health by using health literacy as a proxy for education and concluded that poor health is related to poor education. In a policy brief for the National Poverty Centre based at the University of Michigan, Ford (2007) highlights the relationship between education and health, stating that strengthening educational policies would in turn have a positive impact on health. Table 4.13 shows the indicators for education that are considered for use in the QCA analysis. These indicators consider the level of education in a country, as well as the level of investment that the country makes in education.

**Table 4.13. Indicators for country education.**

Indicator	Description
Adult literacy rate, population 15+ years, both sexes.	The percentage of the population aged 15 and above that is able to read and write. They should also be able to comprehend a simple statement about their daily life.
Educational attainment, at least Bachelor's or equivalent, population 25+, total (%) (cumulative).	The percentage of people above the age of 25 that have attained a Bachelor's or the equivalent.
Government expenditure on education total (% of GDP).	General government expenditure on health, including transfers from international organisations for the purpose of education as a percentage of the country's GDP.

#### 4.4.5 Employment

Section 4.3.2.1 discusses the dominant risk pooling mechanisms for healthcare, namely state funded-systems, SHI, CBHI and VHI. They are predominantly financed through payroll contribution and general government taxes. Employment therefore plays a vital role in creating capacity to collect health revenues. Low employment levels (or high unemployment) means that a large portion of the population are not able to contribute to healthcare funding. Low availability of funds leads to inequality in the use of health services, as well as shortages in available resources for healthcare (Steenekamp, 2016). In a policy brief, targeted at the effects of the ageing population on the health systems in Europe, the two dominant factors affecting healthcare were determined to be expenses in relation to long-term care and a declining working population.

The employment indicators that are considered for use in the QCA analysis are given in Table 4.14.

**Table 4.14: Indicators for the level of employment.**

Indicator	Description
Employment to population (15+ years), total (estimated ILO)	This is the proportion of the working population (15+), who have been involved in for profit activities to produce goods or services for at least an hour.
Unemployment, total (% of total labour force) (modelled ILO estimate)	This is the proportion of the working population (labour force) that is looking for employment, available and seeking.

Source: World Bank, 2017).

#### 4.4.6 Poverty and inequality

Poverty leads to the deprivation of five basic human capabilities:

- i. **Economic deprivation.** This includes income levels, livelihood and decent jobs.
- ii. **Human capabilities.** This includes education and health. Poverty deprives people politically as they are less empowered with regards to their voices and rights.
- iii. **The socio-cultural dimension.** This includes status and dignity.
- iv. **Protection.** Poverty has negative effects on security, risk and vulnerability. Regarding healthcare, the poor in society generally have the worst health statistics, including high mortality rates, disease prevalence and low access to healthcare. The poor are the most vulnerable to the unpredictable nature of the need for healthcare because, in most cases, they are unable to make prepaid contributions for future health needs. WHO & OECD (2003) and Pickett & Wilkinson (2015) conducted a literature review with the aim of unpacking the causal relationships between income inequality and health, concluding that income inequality has significant effects on health and wellbeing.

**Table 4.15. Indicators for poverty and inequality.**

Indicator	Description
Poverty headcount ratio at \$3.10 a day (PPP) (% of population).	This is the proportion of the population that live on less than US\$3.10 a day.
The Gini Index.	The Gini Index is a measure of income distribution in a country or consumption expenditure. A Gini Index of 100 represents total inequality and 0 represents perfect equality.

Source: World Bank (2017).

### 4.5 Conclusion: UHC landscape

In this chapter, the outcome and causal conditions for QCA were defined and discussed. The outcome conditions manifested as UHC goals, which are utilisation/need, quality of care and financial protection. The causal conditions were divided into health financing arrangements and contextual factors. The health financing arrangements under consideration included revenue raising, pooling, purchasing and benefits design. The contextual factors included fiscal space, employment, education, poverty and inequality.

In this chapter, the main objective was to identify comprehensive indicators for the purposes of measuring each of the conditions (constructs). This work then flows into Chapter 5, where

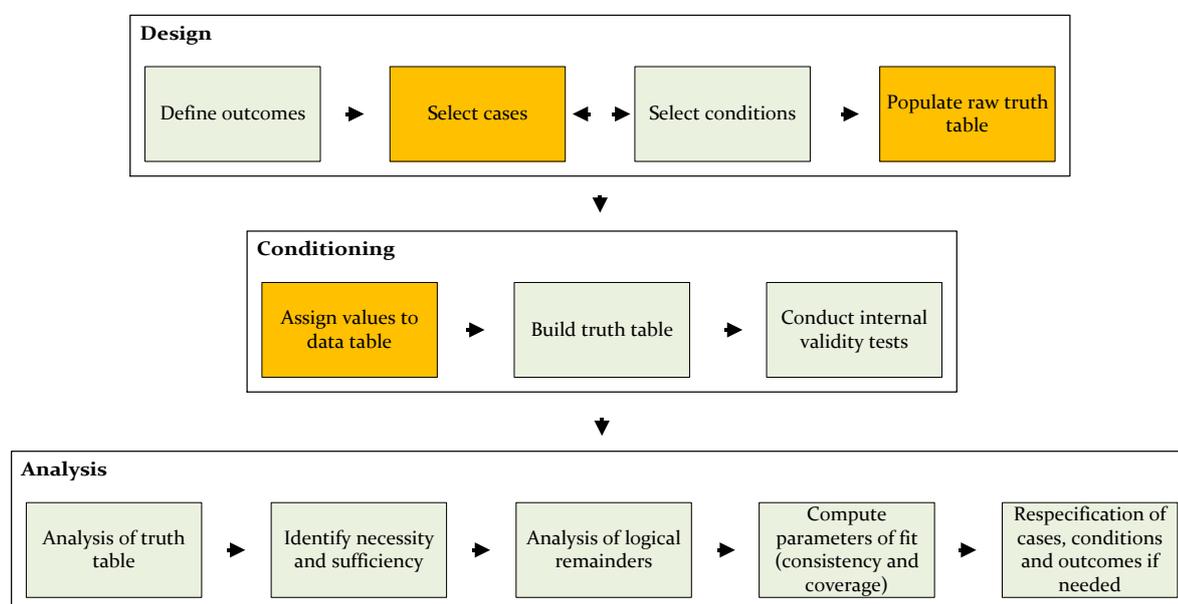
## Chapter 4

cases for QCA are selected, respective data is collected and the set membership scores are obtained for QCA purposes.

## Chapter 5 CASES AND DATA PROCESSING

In this chapter, the data collection and processing are discussed with the aim of creating the set membership scores<sup>3</sup>, in line with QCA. The highlighted processes in Figure 5.1 are also addressed in line with QCA. For this study, the csQCA variant was selected. This is not only because it resonates with the nature of decision making (in the context of priority setting), but also because it offers clarity, compared to continuous values (Blackman, 2013). Finally, because parts of the constructs are defined in terms of qualitative indicators, there is a preference for the dichotomous nature of csQCA to reduce ambiguity.

**Figure 5.1. QCA flow diagram, which shows the processes addressed in this chapter.**



The chapter begins with a description of the case selection process and the key considerations. This is followed by a discussion on the data gathering, including data sources and inclusion and exclusion of indicators discussed in Chapter 4. Thirdly, the quantitative data (for pooling and purchasing constructs) is presented. Then, the standardisation methods considered to create the constructs are discussed, namely service coverage, quality of care, financial protection, revenue raising, pooling, purchasing, fiscal space, employment, education and

<sup>3</sup> This is the definition of thresholds between values in QCA (Sehring, 2013). For csQCA, there is full set membership (represented by a binary 1) and no membership (represented by a binary 0). This is articulated in Section 3.2.1.

inequality. Finally, there is a discussion on how the set membership scores for csQCA were determined, together with a presentation of the set membership scores.

## 5.1 Cases and data collection

This section discusses the data collection process, with motivations for including and excluding certain cases and indicators. As mentioned in Section 3.1.2, a key consideration for selecting cases is the number of causal conditions under consideration (Gross, 2010). For the csQCA variant of QCA applied in this study, the minimum number of cases amounts to  $2^k = 2^4 = 16$  cases.

Another key consideration was the variety of configurations in the conditions (health financial arrangements and contextual factors) and outcomes (UHC goals). According to Bergschlosser & De Meur, (2009), it can be viewed as inappropriate for a researcher to select cases they would like to include and exclude in the study. It is, however, acceptable in QCA studies, because QCA research seeks to determine whether certain combinations of conditions and outcomes exist, rather than to investigate the frequency of occurrences of certain characteristics (QCA is not probabilistic). In the case of QCA, a more heterogeneous set of outcomes and conditions is more favourable as it produces rich explanations for phenomena (Gross, 2010; Jordan *et al.*, 2011).

The unit of analysis in this study was a country, meaning that the cases to be considered are countries, hence country-level data was considered. Figure 5.2 shows the process of case selection in a linear form. It is important to note that this process was iterative but is presented in linear form for the sake of clarity of the narrative. The first step in case selection was to collect data relating to the outcomes of interest, as outlined in Section 4.2, namely service coverage, quality of care and financial protection. A total of 100 countries (at different developmental levels) as shown in Table B-6 in Appendix B were considered. Data were also collected as per the indicators in Table 5.1. Table B-6 in Appendix B also shows data for the indicators for the QCA outcome conditions, namely service coverage, quality of care and financial protection. For case selection; data availability and a focus on a combination of well- and poorly-performing cases were used as filters. The first consideration was the availability of data on the three outcome constructs (service coverage, quality of care and financial protection). Then, cases with missing data from any of the indicators representing the

## Chapter 5

outcome variables were removed. This filtering process reduced the cases to a total of 59 countries, as shown in Figure 5.2. The 59 cases are presented in Table B-9 in Appendix B.

Secondly, z-score transformations, which are discussed in Section 5.4, were applied to the data relating to the three QCA outcomes. The reason for this was to be able to clearly distinguish between well- and poorly-performing cases. Cases with z-scores above the mean were considered to be well-performing, whereas cases with z-scores below the mean were considered to be poorly-performing. The primary motivation for this is that the nature of QCA requires a combination of well-performing and poorly-performing cases (Jordan *et al.*, 2011). The third filter in the process was to select cases based on the availability of quantitative data for the input variables, namely revenue raising, fiscal space, employment, inequality and education. After this process, a total of 40 cases were available. They are presented in Table B-10 in Appendix B. The final filter was to consider the availability of qualitative data (for pooling and purchasing). This filter reduced the cases to 17, as presented in Table B-11 in Appendix B, which also shows the abbreviations that were used for these countries' names.

The 17 countries that were selected for inclusion as cases in this research are Australia, Botswana, Cameroon, Croatia, Czech Republic, Haiti, India, Italy, Thailand, Nigeria, Bangladesh, Cambodia, Germany, the Republic of Korea, Armenia, the United States of America and Canada.

Table 5.1, shows how the different constructs were formed, the indicators considered, the indicators applied, their data sources, and descriptions of how the constructs were developed. The constructs are the variables for the QCA analysis and are formed through the construction of composite indices from the indicators that represent them. The indicators tab shows the indicators identified in Chapter 4. The indicator inclusion/exclusion tab shows the indicators that were applied. Changes or exclusions were due to data unavailability or lack of comprehensiveness. The data source tab shows the sources where data were gathered and the nature of the data (qualitative or quantitative). The variable processing tab describes how each construct was constructed from its respective indicators.

Figure 5.2. Case selection process, presented in a linear form.

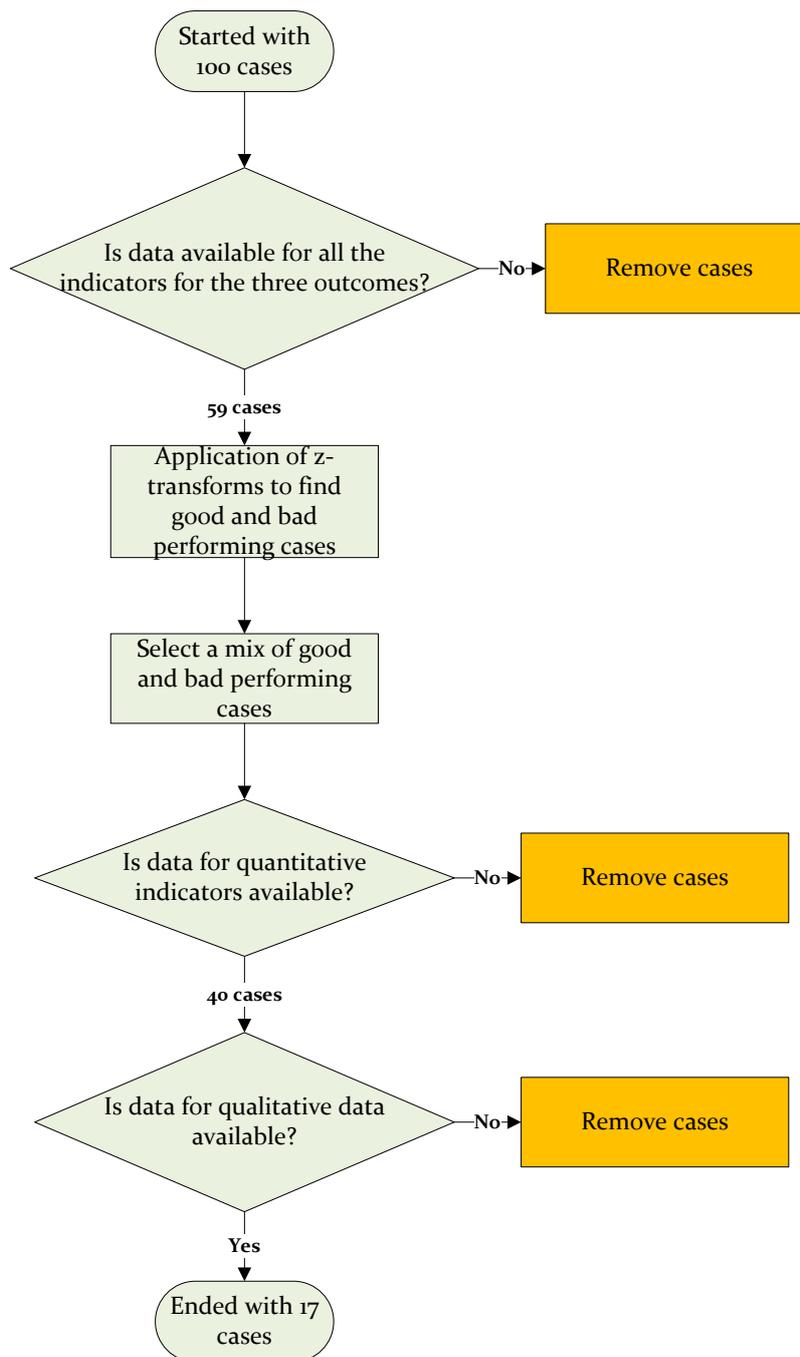


Table 5.1. Construct formation.

Construct	Indicators	Indicator inclusion/exclusion <sup>4</sup>	Data source <sup>5</sup>	Variable processing
Service coverage	Antenatal care (4+ visits)	Antenatal care coverage; at least four visits (%)	Data was quantitative, and originated from (WHO, 2017b).	Z-scores were calculated for each of the indicators with the purpose of standardisation. The resulting z-scores were then added to form a composite z-score. In order to form the set memberships, z-scores above zero were valued at binary "1". Z-scores below zero were valued at binary "0".
	Child full immunisation	Diphtheria tetanus toxoid and pertussis (DTP <sub>3</sub> ) immunisation coverage among one year olds (%)	Data was quantitative, and originated from (WHO, 2017b).	
		Measles-containing-vaccine first-dose (MCV <sub>1</sub> ) immunisation coverage among one year olds (%)	Data was quantitative, and originated from WHO (2017b)	
		Polio (Pol <sub>3</sub> ) immunisation coverage among one year olds (%)	Data was quantitative, and originated from WHO (2017b)	
	Breast cancer screening (women aged 40-49)	N/A	N/A	
	Cervical cancer screening (women aged 18-49)	N/A	N/A	
	Skilled birth attendant at delivery	Births attended by skilled health staff (% of total)	Data was quantitative, and originated from World Bank (2017), in collaboration with the United Nations Children's Fund (UNICEF), <i>State of the World's Children</i> , <i>ChildInfo</i> and demographic and health surveys (DHS)	
	Child treated for acute respiratory infection	N/A	N/A	
	Child treated for diarrhoea	N/A	N/A	

<sup>4</sup> N/A means that the data was not available.<sup>5</sup> N/A means that the data was not available.

Table 5.1. continued...

Construct	Indicators	Indicator inclusion/exclusion	Data source	Variable processing
Service Coverage	Inpatient admission in the last year	N/A	N/A	Z-scores were calculated for each of the indicators with the purpose of standardisation. The resulting z-scores were then added to form a composite z-score. In order to form the set memberships, z-scores above zero were valued at binary "1". Z-scores below zero were valued at binary "0".
Quality of care	Perioperative mortality rate	N/A	N/A	
	Obstetric and gynaecological admissions owing to abortion	N/A	N/A	
	Institutional maternal mortality ratio	Maternal mortality ratio (modeled estimate per 100 000 live births)	Data was quantitative and originated from World Bank (2017) in collaboration with WHO, UNICEF, United Nations Fund for Population Activities (UNFPA) and United Nations Population Division (UNPD)	
	Maternal death reviews	N/A	N/A	
	ART retention rate	N/A	N/A	
	TB treatment success rate	Tuberculosis treatment success rate (% of new cases)	Data was quantitative, and originated from World Bank (2017)	
Financial protection	Headcount ratio of catastrophic health expenditure	Risk of catastrophic expenditure for surgical care (% of people at risk)	Data was quantitative and originated from <i>The Lancet Commission</i> (2015) via World Bank (2017)	
	Headcount ratio of impoverishing health expenditure	Risk of impoverishing expenditure for surgical care (% of people at risk)	Data was quantitative and originated from <i>The Lancet Commission</i> (2015) via World Bank (2017).	
Revenue raising	General government expenditure on health as % of total health expenditure (GGHE%THE)	General government expenditure on health as % of total health expenditure (GGHE%THE)	Data was quantitative and originated from WHO, (2017a) via World Bank (2017).	

Table 5.1. continued...

Construct	Indicators	Indicator inclusion/exclusion	Data source	Variable processing
Revenue raising	Private prepaid plans as a percentage of expenditure on health (VHI%THE)	Private prepaid plans as a percentage of private expenditure on health	Data was quantitative, and originated from WHO (2017b)	Z-scores were calculated for each of the indicators with the purpose of standardisation. The resulting z-scores were then added to form a composite z-score. In order to form the set memberships, z-scores above zero were valued at binary "1". Z-scores below zero were valued at binary "0".
	Per capita government expenditure on health, US\$ adjusted for purchasing power ("purchasing power parity" [PPP]) or \$ International	Per capita government expenditure on health, US\$ adjusted for purchasing power ("purchasing power parity" [PPP]) or \$ International	Data was quantitative, and originated from WHO (2017b)	
Fiscal space	The ratio of government spending to GDP (fiscal envelope)	General government final consumption expenditure (% of GDP)	Data was quantitative, and originated from World Bank (2017)	
	Tax to GDP ratio	Tax revenue (% of GDP)	Data was quantitative, and originated from World Bank (2017)	
	Debt to GDP ratio	Central government debt, total (% of GDP)	Data was quantitative, and originated from World Bank (2017)	
	Gross National Income per capita PPP	GNI per capita, PPP (current international \$)	Data was quantitative, and originated from World Bank (2017)	
Education	Adult literacy rate, population 15+ years, both sexes	Government expenditure on education, total (% of GDP)	Data was quantitative, and originated from United Nations Educational, Scientific, and Cultural Organisation (UNESCO) Institute for Statistics via World Bank (2017)	
	Educational attainment, at least Bachelor's or equivalent, population 25+, total (%) (cumulative)			
	Government expenditure on education, total (% of GDP)			
Employment	Employment to population (15+ years), total (estimated ILO)	Employment to population (15+ years), total (estimated ILO)	Data was quantitative, and originated from World Bank (2017)	

Table 5.1. continued...

Construct	Indicators	Indicator inclusion/exclusion	Data source	Variable processing
Employment	Unemployment, total (% of total labour force) (modelled ILO estimate)	Unemployment, total (% of total labor force) (modeled ILO estimate)	Data was quantitative, and originated from International Labor Organization via World Bank (2017)	Z-scores were calculated for each of the indicators with the purpose of standardisation. The resulting z-scores were then added to form a composite z-score. In order to form the set memberships, z-scores above zero were valued at binary "1". Z-scores below zero were valued at binary "0".
Poverty and inequality	Poverty headcount ratio at \$3.10 a day (PPP) (% of population)	N/A	N/A	
	The Gini Index	Gini index (World Bank estimate)	Data was quantitative, and originated from World Bank (2017) and Statistica (2017).	
Pooling	The level of prepayment	The level of prepayment	Qualitative sources. (The data sources will be presented in Section 5.3.)	Each of the indicators was first evaluated according to presence or absence, meaning that, good performance was awarded with a one ("1") and poor performance was awarded with a zero ("0"). A total score was calculated for each country by adding the respective indicator scores. Z-scores were then calculated for each country, from the total scores. These were then used to determine, well- and poorly-performing cases. A positive z-score means above average performance, relative to the other countries (a score of "1"). A negative z-score means below average performance (a score of "0").
	Fragmentation in risk pools	Fragmentation in risk pools		
	Management of risk pools	N/A	N/A	

Table 5.1. continued...

Construct	Indicators	Indicator inclusion/exclusion	Data source	Variable processing
Pooling	What proportion of the population do the available risk pools cover?	What proportion of the population do the available risk pools cover?	Qualitative sources. The data sources will be presented in Section 5.3.	Each of the indicators was first evaluated according to presence or absence, meaning that, good performance was awarded with a one ("1") and poor performance was awarded with a zero ("0"). A total score was calculated for each country by adding the respective indicator scores. Z-scores were then calculated for each country, from the total scores. These were then used to determine, well- and poorly-performing cases. A positive z- score means above average performance, relative to the other countries (a score of "1"). A negative z-score means below average performance (a score of "0").
Purchasing	Do purchasers influence payments rates?	Do purchasers influence payments rates?		
	Do robust information systems exist to support strategic purchasing?	Do robust information systems exist to support strategic purchasing?		
	Do provider performance reviews exist?	Do provider performance reviews exist?		
	Do accountability systems exist between providers and purchases?	Do accountability systems exist between providers and purchases?		
	Provider payment mechanisms	Provider payment mechanisms		
Benefits design	Efficiency and equity considerations?	N/A	N/A	
	Priority setting organisation	N/A	N/A	
	Monitoring mechanisms	N/A	N/A	

## 5.2 Quantitative data

This section presents the quantitative data and clarifies the inclusion and exclusion of the indicators presented in Table 5.1. The quantitative data gathered for this study are presented in Table B-6 and Table B-7 in Appendix B.

### i. Service coverage

The first construct is service coverage. According to WHO (2001) and Lakew, Bekele & Biadgilign (2015), full immunisation coverage constitutes BCG vaccination against tuberculosis, three doses for the prevention of diphtheria, pertussis and tetanus (DPT<sub>3</sub>), at least three doses of the polio vaccine (Pol<sub>3</sub>) and at least a dose of a measles vaccine (MCV<sub>1</sub>). BCG vaccination was not considered, due to the lack of data. Breast and cervical cancer screening indicators were not considered because of the lack of credibility of the available data from the WHO (2017b). Child treatment for acute respiratory infection was not considered, because the available data were on deaths caused by the disease, rather than the treatments offered (WHO 2017b). Child treatment for diarrhoea was not included in the study, as it is dependent on the context. The need for diarrhoea treatment is more prevalent in developing countries than developed countries (WHO, 2017a). Lastly, the lack of available and comprehensive data led to the omission of inpatient admissions as an indicator.

### ii. Quality of care

TB treatment success rate and institutional maternal mortality ratio were applied for the quality of care construct. It is important to note that a proxy was used for the institutional maternal ratio that was used for the maternal mortality ratio, due to insufficient data for the former. The two differ slightly in their definition: institutional maternal mortality ratio refers to maternal mortality in health institutions (WHO, 2015b), whereas maternal mortality refers to maternal mortality in the case of both maternal mortality in and outside of health institutions (World Bank, 2017). The rest of the indicators were not included due to insufficient global-level and comprehensive data.

### **iii. Financial protection**

For financial protection, two proxy indicators were considered due to the unavailability of data for headcount ratio of impoverishing health expenditure and headcount ratio of catastrophic health expenditure. The proxy indicators were risk of catastrophic expenditure for surgical care (% of people at risk), as well as risk of impoverishing expenditure for surgical care (% of people at risk). Note that the fundamental principle of the indicators still holds, but the applied indicators measure the risk of catastrophic expenditure and impoverishment only for surgical care.

### **iv. Fiscal space**

In the case of fiscal space, data were gathered for all of the proposed indicators.

### **v. Education**

Data were gathered for the adult literacy rate in the population (15+ years) for both sexes and for the level of education (at least Bachelor's or equivalent) in the population (25+). The total percentages (cumulative) were not comprehensive across countries and were therefore not included.

### **vi. Employment**

For this construct, all data were obtained.

### **vii. Poverty and inequality**

Data for the poverty headcount ratio at \$3.10 a day (PPP) (% of population) and the poverty headcount ratio at \$1.90 a day (2011 PPP) (% of population) were not comprehensive across countries and were therefore not included. Only data for the Gini coefficient were included, which reduced this construct to inequality. Note that, from this point onwards the construct will be referred to as "inequality" as only the Gini coefficient, which is a measure of inequality, was considered.

#### **5.2.1 Conclusion: Quantitative data**

In this section, the data collected for this study were presented, including explanations for including and excluding certain indicators. The data was further processed in Section 5.5 to calculate set membership scores.

### 5.3 Qualitative data

In this section, qualitative information for the pooling and purchasing constructs is presented. The information was collected from readily available literature sources through an exploratory literature search. Here, indicators for benefits design were not included due to the lack of comprehensive data across countries.

#### 5.3.1 Pooling

The data for the pooling construct is presented here. Due to the lack of meaningful data, the management of risk pools indicator was omitted. In order to distinguish between good and poor performance, a score was awarded for each of the qualitative criteria. Table 5.2 shows the calibration criteria for risk pooling indicators. For the risk pooling indicators, as for all other indicators for which qualitative data was considered, a score of “1” was awarded for good performance and “0” for poor performance for each indicator.

**Table 5.2. Calibration criteria for risk pooling indicators.**

Indicator	Scoring
The level of prepayment.	For this indicator, the key consideration was the level of prepayment in a country's health system. A score of “1” was awarded if the majority of the health revenue in a country was from prepaid revenue. According to Mathauer & Carrin (2010), the level of prepayment should be above 70% of the total health Expenditure (THE).
Fragmentation in risk pools.	The existence of multiple risk pools was investigated here. If a country had a unitary risk pool, a score of “1” was awarded. In the event of multiple risk pools with risk equalisation mechanisms in place, a score of “1” was also awarded. A score of “0” was awarded if a country had multiple risk pools without risk equalisation between the different pools.
What proportion of the population do the available risk pools cover?	If access to pooled revenues was according to ability to pay and a generally low level of prepayment existed, then a score of “0” was awarded. A score of “1” was awarded if the access was not according to ability to pay and a general high level of prepayment existed.

Qualitative data on the risk pooling arrangements for each of the 17 cases is summarised in Table 5.3 – Table 5.19. The accompanying score awarded for each indicator is also indicated in each table.

Table 5.3. Risk pooling arrangements for Australia.

Australia		
The level of prepayment	Fragmentation in risk pools	Proportion covered
Government expenditure on healthcare accounts for 67% of THE in Australia for the years 2014-2015, whereas PHI accounted for 8.7% of THE (Osborn & Sarnak, 2017).	<p>Medicare, which is funded by the federal government and provides universal access to all Australian citizens, enrolled New Zealand's citizens and other residents holding permanent visas.</p> <p>There are differences in care between rural and urban areas in Australia. This is evident through the publicly funded <i>Public Health Development Unit</i>, which was established in 1999 and publishes differences in access to healthcare between rural and urban areas. These disparities are mainly between the Aboriginal and Torres Strait Islander population and the rest of the country.</p> <p>Although PHI is supplementary to the universal Medicare. There are over 30 PHI funds in Australia (Australian Governemnt, 2017). There are differences in access to PHI across socioeconomic groups. Only 22.1 % of the most economically disadvantaged quintile has access to PHI compared to 57.2% of the advantaged quintile (Osborn and Sarnak, 2017).</p>	<p>The federal government offers universal access to all Australian citizens, permanent visa holders and New Zealand citizens who are enrolled for Medicare.</p> <p>PHI, on the other hand, provides more choice of providers, refunds for specific health services and provides quicker access to non-emergency health services. PHI offers general treatment coverage, hospital care and ambulance services. Patients have an option to use public or private treatment for hospital services, with full coverage offered for public care and 75% fee coverage when accessing private care (Osborn and Sarnak, 2017).</p>
1	0	1

Table 5.4. Risk pooling arrangements for Botswana.

Botswana		
The level of prepayment	Fragmentation in risk pools	Proportion covered
General government expenditure on healthcare accounts for 57.1% of THE, whereas private pooled funding accounts for 39% of THE. OOP expenditure accounts for 5.4% of THE (Health Policy Project, 2016b).	<p>The main source for a healthcare in Botswana is the publicly funded system, which is operated by the Ministry of Health and covers above 80% of the population (Cali &amp; Avila, 2016). The country is making efforts to increase access to healthcare through the implementation of PHI.</p> <p>17% of the population in Botswana are covered via PHI. There are nine PHI pools in the country, but three of the nine cover 88% of the population under PHI. This means that the other risk pools are insufficiently small for sustainable risk pooling. In addition, the PHI mainly serves individuals with formal employment, primarily medium-to-high-income individuals in urban areas (Health Policy Project, 2016b).</p>	The publically financed system provides most of the health coverage, and covers over 80% of the population and only 5.4% of OOP payments. The government-financed system is open to all, but disparities exist in rural areas where there need to be improvements in access and quality of health services (Health Policy Project, 2016b).
1	0	1

Table 5.5. Risk pooling arrangements for Cameroon.

Cameroon		
The level of prepayment	Fragmentation in risk pools	Proportion covered
<p>General tax revenues account for 33% of THE. CBHI schemes cover about 1.3% of the population. PHI covers about 190 408 individuals, which is approximately 1% of the population (Wright, Bhuwanee, Patel, Holtz, Bastelaer &amp; Eichler, 2017).</p>	<p>Access to healthcare in Cameroon is provided through government-subsidised services (<i>Régime d'Assistance Sociale</i>), CBHI, PHI, social security and OOPs. The country has 16 registered private health insurances, which are affordable to wealthy groups in the country.</p> <p>PHI is mostly purchased by employers on behalf of their employees, and covers only 1% of the population. Members in these private insurances are subject to co-payments that are approximately 25% of the cost of care.</p> <p>There are about 158 CBHI schemes in the country that cover approximately 1.3% of the population. Disparities can be observed in the premiums for PHI and CBHI where the average annual premiums for the former is (US \$265 per year per adult) and the latter is (US \$ 26 per year per adult) (Wright <i>et al.</i>, 2017).</p>	<p>There are generally low levels of prepayment in Cameroon with the largest proportion of prepaid revenues originating from General tax revenues at 33% of THE. Both PHI and CBHI cover as little as 2.3% of the population and access to them is based on the ability to pay.</p> <p>The bulk of the health expenditure is OOPs, signifying a low level of population coverage and access to healthcare in the country (Wright <i>et al.</i>, 2017).</p>
o	o	o

Table 5.6. Risk pooling arrangements for Croatia.

Croatia		
The level of prepayment	Fragmentation in risk pools	Proportion covered
<p>The key sources of health finance in the Croatian health system are the state budget (tax revenue) allocation and the Croatian Health Insurance Fund (CHIF). The CHIF contributes approximately 75% of health expenditure. The State budget allocation contributes approximately 15% of the CHIF's revenues. The CHIF is a quasi-public body, which is responsible for administering the universal health care system in Croatia. It is the primary source of health financing in the country.</p> <p>Mandatory prepayments for healthcare in Croatia originate from the employed population, employers, the self-employed and farmers (Džakula, Sagan, Pavić, Lončarek &amp; Sekelj-Kauzlarič, 2014).</p>	<p>Croatia's health financing system is based on funds from both private and public sources. The public sources are from both mandatory insurance and tax revenues where public sources are PHI and OOPs.</p> <p>Mandatory insurance contributions constitute the majority of the health revenues and are collected via the State treasury accounts. The CHIF is also responsible for collecting revenues from VHI contributions although other private insurers exist. These revenues are however separate to the Mandatory Health Insurance (MHI) revenue.</p> <p>VHI contribution in the Croatian health system acts as complementary cover and is mainly used to cover co-payments. OOPs are also used to cover co-payments.</p> <p>The CHIF represents a consolidated risk pool for the entire Croatian population, this was in effect from 2002 (Džakula <i>et al.</i>, 2014).</p>	<p>Virtually, the whole Croatian population and foreigners holding permanent residence are covered according to the Croatian Health Care Act through the MHI system.</p> <p>Only about a third of the Croatian population, who are those who are economically active are mandated to make contributions in the MHI. Vulnerable population groups are exempted from making contributions. These include the disabled, war veterans and military personnel, low income groups, the unemployed, old aged, people under the age of 18, and students between the ages of 18 and 26.</p> <p>The main purpose of the only supplementary health insurance (collected via private insurers and the CHIF) is to cover user charges in the MHI system. Although supplementary insurance is voluntary, only the disabled, organ donors, blood donors students between 18 and 26 years old and people who earn less than 45.59% of the government defined salary base, have the right to free supplementary health insurance (Džakula <i>et al.</i>, 2014).</p>
1	1	1

Table 5.7. Risk pooling arrangements for Czech Republic.

Czech Republic		
The level of prepayment	Fragmentation in risk pools	Proportion covered
<p>The SHI financing mechanisms (wages and general taxation) contribute the majority of health expenditure. The other two main sources of finances are from state and territorial budgets (general taxation) and private expenditure.</p> <p>Public expenditure on health as a percentage of THE in Czech Republic is about 84%, whereas private prepaid expenditure on health is about 1% of THE. OOPs contribute about 14% of THE (Alexa <i>et al.</i>, 2015).</p>	<p>All of the SHI contributions are redistributed according to a risk adjustment formula with the aim of reducing the chances of risk selection. A capitation formula, which takes into account age and gender across five-year categories, was introduced in 2014, which resulted in 36 groups. In Czech Republic, health insurance funds are quasi-public entities that operate independently and are subject to the law of the country. These funds are not allowed to make profit and all legally qualifying applicants are entitled to insurance. The government prohibits any form of risk selection and cream-skimming behaviour (Alexa <i>et al.</i>, 2015).</p>	<p>All permanent residents of Czech Republic are entitled to benefit from SHI contribution. Access is therefore not based on the ability to contribute and virtually everyone in the population are covered (Alexa <i>et al.</i>, 2015).</p>
1	1	1

Table 5.8. Risk pooling arrangements for Haiti.

Haiti		
The level of prepayment	Fragmentation in risk pools	Proportion covered
<p>Haiti's government expenditure on healthcare has decreased dramatically over the years. In 1995 government expenditure on health was at about 41% of THE, compared to only 7% in 2013. Some of the changes can also to a certain extent be attributed to the earthquake that devastated the country in 2010.</p> <p>Currently, donor funding contributes the largest proportion of THE, 64%. OOPs contribute 30% of THE (<i>Health Policy Project, 2016c</i>).</p>	<p>Publically, the <i>Office d'Assurance Accident du Travail, Maladie et Maternite</i> (OFATMA) offers health insurance and social protection to employees in the private and the public sectors. Contribution to OFATMA is mandatory for formal employees and voluntary for those in the informal sector. OFATMA however only covers 2% of the population.</p> <p>The elderly and disabled are covered through the <i>Office National d'Assurance Vieillesse</i> (ONA), which covers less than 1% of the population.</p> <p>The country has nine private health insurances, which cover only approximately 4% of the population and are largely fragmented.</p> <p>Both public and private companies provide health insurance to their employees and their dependants, this has led to small fragmented risk pools (<i>Health Policy Project, 2016c</i>).</p>	<p>Approximately 90% of Haiti's health budget is spent on paying health workers. This is one of the major hindrances to access, leaving little to no revenue allocated to improving access to healthcare. Risk pooling in Haiti is close to non-existent, with the major pooling agents OFATMA, ONA and private insurances, covering less than 10% of the population (<i>Health Policy Project, 2016c</i>).</p>
o	o	o

Table 5.9. Risk pooling arrangements for India.

India		
The level of prepayment	Fragmentation in risk pools	Proportion covered
Evidence suggests that less than 20% of the Indian population had any form of health coverage by 2014. OOPs contribute the bulk of India's health expenditure at about 69% (Osborn & Sarnak, 2017).	<p>India has at least 16 publically funded insurance schemes. The Rashtriya Swasthya Bima Yojana (RSBY) was introduced in 2008 with the aim of improving access to healthcare and reducing the high levels of OOPS in the country.</p> <p>The health system is highly fragmented with the Employees State Insurance Scheme designed for factory workers. The Central Government Health Scheme is for civil servants. Railway and defence forces employees also have their own separate risk pools and individual states run risk pools for their employees as well.</p> <p>Uptake for VHI has generally been slow amongst Indians, with the majority of the population opting for OOPs other than VHI (<i>Health Policy Project</i>, 2016a; Osborn &amp; Sarnak, 2017).</p>	In principle, all Indian citizens have health insurance that is financed via the tax financing system. Several bottlenecks in the public health system has, however, led to the majority of the population seeking private care, hence high levels of OOPs (Osborn & Sarnak, 2017).
o	o	o

Table 5.10. Risk pooling mechanisms for Italy.

Italy		
The level of prepayment	Fragmentation in risk pools	Proportion covered
<p>About 75% of Italy's THE is publically financed. The bulk of public health financing is from corporate tax. Public health revenues are pooled nationally and are then reallocated back to the respective regions of collection, typically according to the proportions of contribution. Private health insurance only covers 1% of THE. An estimated 6 million people (approximately 10% of the population) in Italy make use of some form of VHI (Osborn &amp; Sarnak, 2017).</p>	<p>The regional nature of the health contributions for healthcare, lead to interregional gaps in the capacity to raise health revenue. The gaps are more evident in the differences in cooperate tax each of the regions are able to raise (corporate tax contributes the bulk of the funding).</p> <p>The government also allows regions to raise additional health revenues for themselves, which leads to more disparities as some regions have higher capacity compared to others.</p> <p>The government created a risk equalisation fund called the <i>Fondo Perequativo Nazionale</i>, which aims at mitigating the financial inequalities between the 17 regions in the country. The capitation-based formula used by Ministry of Economy and Finance is adjusted for demographics in the form of age and gender (Osborn &amp; Sarnak, 2017).</p>	<p>All Italian citizens and legal foreign residents have universal coverage. Since the year 1998 all undocumented immigrants could access urgent healthcare (Osborn &amp; Sarnak, 2017).</p>
1	1	1

Table 5.11. Risks pooling arrangements for Thailand.

Thailand		
The level of prepayment	Fragmentation in risk pools	Proportion covered
An estimated 77% of THE comes from public health expenditure in Thailand. There has been a significant jump from 2002 when the same proportion was about 63% of THE. In the same period, there have been notable changes OOPs as a percentage of THE as well, from about 27% to about 12%. Prepaid private revenues for healthcare have also been increasing over the years and are currently around 45% of THE (Jongudomsuk <i>et al.</i> , 2015).	<p>The major pooling agencies in Thailand are the Comptroller General Department (CGD) for Civil Servant Medical Benefit Scheme (CSMBS), the Social Security Office (SSO) for SHI, the National Health Security Office (NHSO) for UHC and private insurance companies for VHI.</p> <p>The above-mentioned agencies are responsible for both pooling and purchasing arrangements. The public insurers in the above list do not compete for members as each has a defined set of beneficiaries. This is because coverage on the CSMBS and SHI are based on employment, whereas the rest are covered under the Universal Coverage Scheme (UCS) (Jongudomsuk <i>et al.</i>, 2015).</p>	Coverage in Thailand is Universal to all regardless of ability to pay (Jongudomsuk <i>et al.</i> , 2015).
1	0	1

Table 5.12. Risk pooling arrangements for Nigeria.

Nigeria		
The level of prepayment	Fragmentation in risk pools	Proportion covered
The bulk of Nigeria's health revenues originates from private sources, making up approximately 76.1% of THE. However, approximately 95 % of the private expenditure originates from OOPs. General government expenditure on health only make up about 24% of THE (USAID, 2016).	<p>The National Health Insurance Scheme (NHIS) is a single pool that only pools revenues for about 4% of the Nigerian population. The NHIS covers formally employed people with the majority being employees of the federal government. The NHIS was established by law in 1999 and launched in 2005 and was due to efforts from the government to achieve UHC.</p> <p>The implementation of the NHIS started through the Formal Sector Social Health Insurance Programme (FSSHIP), which is only available to formally employed individuals (Usoroh, 2012; Onoka, Onwujekwe, Uzochukwu &amp; Ezumah, 2013; USAID, 2016). The bulk of the Nigerian population depend on OOPs for healthcare access, with over 70% of the population not under health insurance (USAID, 2016).</p>	Only about 5% of the Nigerian population has health coverage. The majority are those under formal population (Usoroh, 2012).
o	o	o

Table 5.13. Risk pooling arrangements for Bangladesh.

Bangladesh		
The level of prepayment	Fragmentation in risk pools	Proportion covered
OOPs constitute the bulk of THE in Bangladesh as about 64% of THE. About 27% of THE originates from general government revenues, with prepaid private revenues playing a minute part in the country's health expenditure (Ahmed <i>et al.</i> , 2015).	The main risk-pooling agent is the government through the country's state-financed system. There are public and private risk pooling funds that play a minor role (Ahmed <i>et al.</i> , 2015).	Although the constitution of Bangladesh stipulates that access to healthcare is not based on the ability to pay (Ahmed <i>et al.</i> , 2015), the majority of the population pay for healthcare via OOPs at about 66% of THE. The government only covers approximately 34% of THE (Islam & Biswas, 2014).
o	o	o

Table 5.14. Risk pooling arrangements for Cambodia.

Cambodia		
The level of prepayment	Fragmentation in risk pools	Proportion covered
<p>The majority of health expenditure in Cambodia is through OOPs, which comprises approximately 60% of THE. Both government expenditure and official developmental assistance (ODA) comprise approximately 20% of THE each. PHI contributes less than 0.3% of THE (Annear <i>et al.</i>, 2015).</p>	<p>There are low levels of risk pooling in the country, because of the high OOPs. The majority of the risk pooling is from the Health Equity Fund (HEF) (Annear <i>et al.</i>, 2015).</p> <p>HEFs are a mechanism that is aimed at promoting access to healthcare, which make use of demand-side financing for improved equity. HEFs are mainly dependent on donor funding. Their primary aim is to cover full or partial health costs for the needy, which includes other expenses related to acquiring care, such as transportation (Peat, 2013). In essence, HEFs are not regarded as risk pools, since their primary aim is to subsidise user fees, hence more of a risk equalisation measure (Annear <i>et al.</i>, 2015).</p> <p>The country has few and quite small PHI and CBHI funds (Annear <i>et al.</i>, 2015).</p>	<p>As the main source of health cover, the HEF only cover about 16% of the population. PHI and CBHI coverage only cover a small proportion of the population (Annear <i>et al.</i>, 2015).</p>
o	o	o

Table 5.15. Risk pooling arrangements for Germany.

Germany		
The level of prepayment	Fragmentation in risk pools	Proportion covered
<p>Through the SHI system, health insurance is compulsory in Germany. Approximately 72% of THE in Germany originates from public sources, whereas PHI contributes about 9% of THE (Britnell, 2015a).</p>	<p>Health insurance is in the form of sickness funds, which are not for profit, competing non-governmental health funds, and PHI, which acts as a substitute. There are 132 sickness funds (Britnell, 2015a) and 42 PHI companies (24 of the PHI companies are for profit)(Osborn &amp; Sarnak, 2017).</p> <p>People who are exempt from SHI (civil servants, self-employed and those who opt out of SHI and earn above a certain amount) of income are allowed to join PHI funds. PHI is used as both complementary and supplementary insurance (Busse &amp; Blümel, 2014; Osborn &amp; Sarnak, 2017). It is compulsory for individuals who are employed and earn less than US\$71 564 per year to be part of the SHI system (Osborn &amp; Sarnak, 2017).</p> <p>Each sickness fund collects health revenues and transfers them to the Central Reallocation Pool, which then redistributes funds according to risk profiles of the individual risk pools (Busse &amp; Blümel, 2014; Osborn &amp; Sarnak, 2017).</p>	<p>The publically financed SHI allows access to all legal residents of Germany. This includes refugees and undocumented immigrants, as well as excludes visitors.</p> <p>The strong sense of solidarity in the German SHI system allows all eligible individuals to access the same level of care, regardless of their ability to pay (Osborn &amp; Sarnak, 2017).</p>
1	1	1

Table 5.16. Risk pooling arrangements for The Republic of Korea.

The Republic of Korea		
The level of prepayment	Fragmentation in risk pools	Proportion covered
<p>The Republic of Korea utilises the NHI financing mechanism, which covers the entire population. Public expenditure on healthcare is about 55% of THE, whereas VHI only contributes about 5% of THE. OOPs make up about 35% of THE (Kwon, Lee, Kim &amp; Kwon, 2015).</p>	<p>Before the year 2000, the country had three different types of health insurance:</p> <ol style="list-style-type: none"> <li>i. The first type was a single pool for teachers, civil servants and their dependants.</li> <li>ii. The second type comprised approximately 140 risk pools, and was dedicated to industrial workers and their dependants.</li> <li>iii. The third type was for self-employed individuals and those employed by small firms. These comprised some 230 risk pools and were termed “regional health insurance”.</li> </ol> <p>Currently, the pooling function is performed by a single insurance entity for the entire population (Kwon <i>et al.</i>, 2015).</p>	<p>The NHI covers the entire population in the Republic of Korea and it is mandatory for individuals who earn above a certain income to contribute. Impoverished individuals are exempted from making contributions and any co-payments they are required to make at the point of care (Kwon <i>et al.</i>, 2015).</p>
0	1	1

Table 5.17. Risk pooling arrangements for Armenia.

Armenia		
The level of prepayment	Fragmentation in risk pools	Proportion covered
<p>OOPs are the dominant source of health revenues, contributing about 57% of THE, whereas general government expenditure is about 36% of THE (Richardson, 2013).</p>	<p>OOPs are high in Armenia and have led to a number of households in the country facing catastrophic and impoverishing expenditures on health. OOPs represent high levels of fragmentation (Richardson 2013).</p>	<p>The OOPs in Armenia are in the form of formal and informal payments. Informal payments in the health system are due to varied and rather complex reasons. The high levels of OOPs have a detrimental effect on the breadth and depth of health coverage in Armenia. Approximately 82% of the Armenian population is excluded from access to the nominal basic benefits package (BBP) (Richardson 2013).</p>
0	0	0

Table 5.18. Risk pooling arrangements for the United States of America.

United States of America		
The level of prepayment	Fragmentation in risk pools	Proportion covered
<p>General government expenditure on health is about 48% of THE. About 32% of THE originates from private prepaid revenue (WHO, 2017b).</p>	<p>The USA introduced the Affordable Care Act (ACA), which is rooted in the principle of shared responsibility between individuals, government and employers, with the aim of providing all American citizens access to healthcare. Yet, the American health system remains fragmented, comprising a number of both private and public risk pools.</p> <p>Medicare, Medicaid and the Children's Health Insurance Program (CHIP) are the three main public sources of cover. Medicare is a federal program that is designed for individuals who are 65 and older, including some with disabilities. Medicaid and CHIP are a collection of federal state programs that are tailored for specific low income groups (Osborn &amp; Sarnak, 2017).</p>	<p>During the first quarter of 2016, approximately 8.6% of the American population did not have health insurance. This was an improvement on the state of the coverage at the beginning of the ACA's major coverage expansion programmes in 2014.</p> <p>This expansion in coverage is likely to stall due to the new congress and administration to repeal and replace ACA (Osborn &amp; Sarnak, 2017).</p>
1	0	0

Table 5.19. Risk pooling arrangements for Canada.

Canada		
The level of prepayment	Fragmentation in risk pools	Proportion covered
Public sources contribute 69.8% of Canada's THE, whereas 12% of THE comes from PHI (Osborn & Sarnak, 2017).	<p>Canada's health system is based on a statutory health insurance model. Each province and territory has the responsibility to provide universal coverage to its population.</p> <p>Authorities in these territories and provinces are responsible for the funding and delivery of care.</p> <p>The majority of health funds in Canada originate from these provincial and territorial revenues (Osborn &amp; Sarnak, 2017).</p> <p>Fragmentation is a major problem in Canada's health system. The problem stems from the nature in which the health revenues are distributed. In a nutshell, the federal government distributes revenues for the purposes of healthcare according to the population of the respective regions, rather than the need attributed to each province. Provinces have made efforts to integrate provincial pools to form regional pools as a form of risk equalisation (Britnell, 2015a).</p>	Essentially, everyone, including immigrants, have coverage for necessary care. Coverage is based on need for care and not the ability to pay. This stems from Canada's principle of comprehensiveness under the Canada Health Act (Marchildon, 2013).
1	0	1

### 5.3.2 Purchasing

The data for the purchasing construct is presented here. A lack of meaningful data meant that the administrative efficiency indicator was omitted. Indicators for benefits design as shown in Table 5.1 were also not included, due to the lack of comprehensive information for all countries considered. Table 5.20 shows the calibration criteria used for purchasing indicators. For each indicator, a score of one (“1”) was awarded for good performance and zero (“0”) for poor performance.

**Table 5.20. Calibration criteria for purchasing indicators.**

Indicator	Scoring
Do purchasers influence payment rates?	This indicator assesses the provider, government and provider relationship discussed in Section 4.3.3. A score of one was awarded when the purchaser and government controlled pricing for health services and products. A score of zero was awarded when the providers has more effects on the pricing.
Do robust information systems exist to support strategic purchasing?	For this indicator, a value of one was awarded when the health system’s information system was electronic and had some level of integration. A zero was awarded when the system was not integrated and not electronic.
Do provider performance reviews exist?	Here, a score of one was awarded if the purchasing organisations conducted a performance review and took action when poor service was provided. A score of zero was awarded if the purchasing organisations merely paid bills without reviewing the performance of their respective providers.
Do accountability systems exist between providers and purchases?	A score of one was awarded when either the government or the purchasers required the providers to report performance information. A zero was awarded if no system of accountability existed.
Provider payment mechanisms.	The scoring criteria for this indicator will be discussed in Section 5.3.2.1.

Qualitative data on the purchasing indicators for each of the 17 cases is summarised in Table 5.21–Table 5.37. The accompanying score awarded for each indicator is also indicated in each table.

Table 5.21. Purchasing arrangements for Australia.

Australia				
Do purchasers influence payment rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchases.	Provider payment mechanisms
<p>The Australian federal government controls the health expenditure growth through the Medicare Benefits Scheme (MBS) and the Pharmaceutical Benefits Scheme (PBS). The government has an expert panel that is responsible for controlling expenditure growth in the MBS. The panel is also responsible for reporting the entire health plan for budgetary purposes.</p> <p>The federal government influences the price of pharmaceuticals through the PBS by negotiating with suppliers, as well as through priority setting for essential pharmaceuticals and supports the professional programmes that deal with the whole supply chain. The government also reduces costs by putting constraints on the health system. An example is reducing the number of health workers (Osborn &amp; Sarnak, 2017).</p>	<p>8900 providers in Australia use the interoperable national e-health information system, with two-thirds of the usage existing among primary health facilities. To date, about 4 million patients are part of the system, which records medical notes, referrals, diagnostic and imaging reports, and prescriptions. Furthermore, the system allows patients to enter any allergy information, adverse reactions to treatment and their suggestions for the system (Osborn &amp; Sarnak, 2017).</p>	<p>Measures of equity, effectiveness and efficiency are reported through a national reporting framework. This reporting framework was agreed upon by the Council of Australian Governments (COAG), which comprises the prime minister and first ministers of each state in Australia.</p> <p>The reporting body is the National Performance Authority and it reports data originating from public and private hospitals, local hospital networks (LHNs) and other important health providers (Osborn &amp; Sarnak, 2017).</p>	<p>The discussion on provider performance reviews also serves as proof of the existence accountability systems (Osborn &amp; Sarnak, 2017).</p>	<p>Australia utilises DGRs, FFS and global budgets as payment mechanisms (Healy &amp; Sharman, 2006; Osborn &amp; Sarnak, 2017).</p>
1	1	1	1	1

Table 5.22. Purchasing arrangements for Botswana.

Botswana				
Do purchasers influence payment rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchasers?	Provider payment mechanisms
<p>Botswana mainly utilises FFS and line item budgets as provider payment mechanisms (<i>Health Policy Project, 2016b</i>). These two payment mechanism require a fixed price for both goods and service. This price is set by the purchasing organisation. For example, with regards to FFS, the purchaser sets tariffs for each health service beforehand and then pays for each service that is provided by the provider.</p>	<p>The Ministry of Health in Botswana has made efforts to improve the use of Information and Communications Technology (ICT). This was evident through the implementation of patient management systems in some hospitals in the country. A few hospitals have an Integrated Patient Management System, and national referral hospitals are now equipped with tele-radiology technology.</p> <p>There is, however, limited interoperability amongst the few systems that are available (<i>Seitio-kgokgwe, Gauld, Hill &amp; Barnett, 2014</i>).</p>	<p>According to Mogwe (2014), only a handful of hospitals in Botswana report any quality management activities. The lack of clinical governance structures and strategies was also evident.</p>	<p>The health inspectorate plays the role of regulation in the country's health system. The inspectorate's mandate is to inspect health personnel and facilities with the aim of quality improvement.</p> <p>The inspectorate has the capacity to impose accountability in the health system but although the National Health Plan (NHP) of 2011 highlighted that accountability is key to the success of the health system. The Plan does not mention accountability in the aims and objectives of the NHP (<i>Adekunle, 2015</i>).</p>	<p>Botswana utilises FFS and line item budgets.</p>
1	0	1	1	0

Table 5.23. Purchasing arrangements for Cameroon.

Cameroon				
Do purchasers influence payment rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchasers?	Provider payment mechanisms
<p>The high OOPs in the health system make households the main purchaser in the health system (about 52% of THE) (Wright <i>et al.</i>, 2017). High OOPs represent a fragmented system and reduces the power of the purchaser (Mcintyre, 2013).</p>	<p>As is the case with the majority of African countries, health system records are paper-based and fragmented (Ngwakongnwi, Atanga &amp; Quan, 2014).</p> <p>Cameroon's health system is dysfunctional with minimum levels of vertical and horizontal diffusion of information.</p> <p>The government and development partners are, however, making an effort to clearly map the health information system. They are still to create a clear framework for action (IFORD &amp; World Bank, 2013).</p>	<p>Although the government is increasing performance-based financing through the support of the World Bank and the Global Financing Facility, there is little evidence of performance-based financing (Wright <i>et al.</i>, 2017).</p> <p>The high levels of OOPs in the country can further support this.</p>	<p>The main issues in the Cameroonian health system result from inefficient health financing. These issues are systematic.</p> <p>Due to poor governance and corruption, the impact of the available finances is undermined. The corruption also stems as far as the pharmaceutical industry, which in turn has contributed to low levels of access and quality of care.</p> <p>Approximately 10% of health payments made by households are for informal payments (IFORD &amp; World Bank, 2013).</p>	<p>Cameroon utilises global budgets and P4P payment mechanisms (Wright <i>et al.</i>, 2017).</p>
o	o	o	o	o

Table 5.24. Purchasing arrangements for Croatia.

Croatia				
Do purchasers influence payment rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchasers?	Provider payment mechanisms
The Croatian government's National Health Plan (NHP) stipulates guidelines according to which contracts are designed, as well as mechanisms for ensuring conformity to the above-mentioned. Providers have to compete for contracts through the CHIF. In turn, the CHIF has the responsibility of paying for health services as per contractual agreement (Džakula <i>et al.</i> , 2014).	The Official Statistics Act of 2003 sets the requirements on how data should be collected and which data is reported in Croatia. For example, it is mandatory for primary care facilities and specialists who are treating diabetes to report data to the Vuk Vrhovac Clinic for diabetes, endocrinology and metabolic diseases at the Medical Faculty at Zagreb University.  The Croatian healthcare system has about 60 registers for information. The registers are however not integrated, nor standardised, and the bulk of the data is based on manual entry (Džakula <i>et al.</i> , 2014).	The CHIF is responsible for the supervision of compliance to contractual agreements from suppliers, pharmaceuticals, medical insurance, health institutions and private medical professionals (Džakula <i>et al.</i> , 2014).	According to Džakula <i>et al.</i> (2014), Croatia's health system lacks transparency and accountability.	Croatia utilises capitation, DRGs, FFS, <i>per diem</i> , salaries and P4P payment mechanisms (Džakula <i>et al.</i> , 2014).
1	0	1	0	1

Table 5.25. Purchasing arrangements for the Czech Republic.

Czech Republic				
Do purchasers influence payment rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchasers?	Provider payment mechanisms
The Ministry of Health is responsible for facilitating the negotiations between providers and purchasers. The payment rates for both goods and services in the health system are based on the agreement between purchasers and providers with the supervision from the ministry (Alexa <i>et al.</i> , 2015).	The majority of the health care providers make use of digital electronic systems. There is, however, minimal exchange of information between different healthcare system stakeholders (Alexa <i>et al.</i> , 2015).	The Ministry of Health sets minimum requirements regarding medical staff's qualifications and the quality of medical equipment available. Lack of continuous compliance to the above, leads to the providers forfeiting their licences.  The above-mentioned are the only categories in which the government sets quality standards, which means that there is no comprehensive system for quality measurement and accreditation (Alexa <i>et al.</i> , 2015).	Providers are obliged to follow specific rules and standards of providing care. Despite this, the accountability in the Czech health system is low (Alexa <i>et al.</i> , 2015).	Czech Republic utilises capitation, DRGs, FFS, global budgets and <i>per diem</i> payment mechanisms (Alexa <i>et al.</i> , 2015).
1	1	0	0	1

Table 5.26. Purchasing arrangements for Haiti.

Haiti				
Do purchasers influence payment rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchases.	Provider payment mechanisms
<p>The Haitian government spends most of its health budget on curative care, with the bulk being spent on pharmaceuticals and medical products. OFATMA, ONA and private insurers are the main purchasers in Haiti, covering only 5% of the population.</p> <p>Although 29.7% of health payments is from OOPs, with about 95% of the population without coverage, it is evident that there is lack of access due to the inability to pay (<i>Health Policy Project, 2016c</i>).</p> <p>Due to the high levels of the uninsured population, Haiti's purchasing organisations do not have enough power to influence payment rates (<i>McIntyre, 2013</i>).</p>	<p>Haiti's health system involves a number of stakeholders, making it difficult to create a centralised information system. This was amplified when the country suffered an earthquake in 2010.</p> <p>Available health information is rather inaccurate, not timely, incomplete and fragmented (<i>PAHO &amp; WHO, 2011</i>).</p>	<p>NGOs are a major source of health finances in Haiti and they implement performance-based financing (<i>Eichler et al., 2013; Health Policy Project, 2016c</i>).</p>	<p>About 90% the health budget in Haiti is used to pay salaries. Health workers are paid low salaries with limited facilities, which is trumped up by weak accountability systems in the healthcare system (<i>Durham et al., 2015</i>).</p>	<p>Haiti makes utilises salaries and P4P payment mechanisms (<i>PAHO &amp; WHO, 2011; Eichler et al., 2013</i>).</p>
0	0	1	0	0

Table 5.27. Purchasing arrangements for India.

India				
Do purchasers influence payment rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchasers?	Provider payment mechanisms
The Indian health system generally makes little to no effort to contain costs or improve efficiency. A number of studies have reported inefficiencies in hospitals across the country (Osborn & Sarnak, 2017).	In 2008, India launched the Health Management Information system for monitoring purposes. Of the 667 districts in the country, 633 report data by facility. Surveys are also occasionally conducted on district, state and national levels.  Private and public providers' health information systems are, however, fragmented. This has led to the proposal to create a National eHealth Authority for the purposes of setting up regulations and standards (Osborn & Sarnak, 2017).	India's health system lacks a coherent system to ensure quality of care. The country does not have a quality assurance authority (Osborn & Sarnak, 2017). The problem is evident in both the private and public sectors, as both have weak regulatory systems, quality assurance and cost containment structures (USAID, 2015).	One of the main hindrances to access to care to the Indian population are the high levels of mismanagement, corruption and bureaucracy in the health system (Britnell, 2015a).	India utilises FFS, global budgets and salaries as payment mechanisms (Osborn & Sarnak, 2017).
0	1	0	0	0

Table 5.28. Purchasing arrangements for Italy.

Italy				
Do purchasers influence payment rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchasers?	Provider payment mechanisms
<p>Prices for pharmaceuticals and medical equipment are set according to studies conducted by the National Committee for Medical Devices and the National Drugs Agency.</p> <p>Prices for reimbursable drugs are set through negotiations between the government and pharmaceutical companies, whereas the market determines the prices of non-reimbursable drugs.</p> <p>The National Pharmaceutical Formulary makes drug coverage decisions based on cost and clinical effectiveness (Osborn &amp; Sarnak, 2017).</p> <p>The country is largely following a cost-cutting programme, which has resulted in reduced wages for health workers, reduced payments for supplies and vacancy freezes (Britnell, 2015a).</p>	<p>The <i>Nuovo Sistema Informativo Sanitario</i>, which can be translated as “The New Health Information System”, was established in 2002 and implemented incrementally. The goal was to create an electronic system that connects all the levels of care.</p> <p>The biggest achievement thus far is the implementation of a universal clinical coding system called <i>mattoni</i>, which translates as “bricks”. This system allows for sharing of information between national and regional authorities.</p> <p>By the end of 2014, approximately 80% of all prescriptions were made using the electronic system.</p>	<p>It is mandatory for all public healthcare providers to present information (through health service charts) regarding patients’ complaints, waiting times, quality of care indicators, service performance and quality assurance strategies. This information should be presented on a yearly basis.</p> <p>Private providers are also required to present service charts and this forms part of accreditation. This is as per National legislation (Osborn &amp; Sarnak, 2017).</p>	<p>The country has high levels of corruption, which is evident from the frequency of bribing with the aim of skipping waiting lists, the outsourcing of contracts, fraudulent accreditation, and prices for drugs and healthcare devices, amongst others (Britnell, 2015a).</p>	<p>The country utilises capitation, DRGs, FFS, global budgets and P4P (Osborn &amp; Sarnak, 2017).</p>
1	1	1	0	1

Table 5.29. Purchasing arrangements for Thailand.

Thailand				
Do purchasers influence payment rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchasers?	Provider payment mechanisms
<p>There are no set mechanisms to control retail and set prices and margins. Price negotiation, however, occurs daily at different levels of the health system. The levels include the Subcommittee for the Development of the National List of Essential Medicines (NLEM), the National Health Security Office (NHSO) and the Pharmacy and Therapeutic Committee in individual hospitals.</p> <p>The NLEM's subcommittee, the National Drug System Development, sets the reference price for drugs. This reference price only applies to drugs that are purchased by government hospitals (Jongudomsuk <i>et al.</i>, 2015).</p>	<p>The country makes use of electronic records, but there is a lack of health information system standards. For example, health facilities under the Ministry of Public Health report data on both 12 and 18-file standards of electronic data.</p> <p>An effort is however being made to create universal electronic data reporting standards (Jongudomsuk <i>et al.</i>, 2015).</p>	<p>For all the public health facilities, the local government is responsible for regulation in that region. All the public facilities are not subject to licencing, although 77% of the hospitals are public entities.</p> <p>Private health institutions must be relicensed annually under the Medical Premises License Act of 1998, under specific quality and health standards (Jongudomsuk <i>et al.</i>, 2015).</p>	<p>From 1990 to 2002, increasing demand for accountability by the public led to the formation of the Universal Coverage Scheme (UCS). The UCS involves different stakeholders and was a good response to problems in relation to accountability (Jongudomsuk <i>et al.</i>, 2015).</p>	<p>Thailand utilises capitation, DRGs and FFS (Jongudomsuk <i>et al.</i>, 2015).</p>
1	0	0	1	1

Table 5.30. Purchasing arrangements for Nigeria.

Nigeria				
Do purchasers influence payments rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchasers?	Provider payment mechanisms
Nigeria has low levels of financial protection with the bulk of health payments originating from OOPs. The NHIS pool only covers 3% of the population (USAID, 2016). According to (McIntyre, 2013), purchasing organisations lose their power to influence providers. High OOPs represent a fragmented health financing and less power for purchasers.	Nigeria is plagued by insufficient electricity supply, little technological development and corruption. These are the some of the reasons behind a poor health information system in the country (Benson & Bch, 2011).	Health providers in Nigeria often underperform, which lead to poor quality health services. The health workforce in Nigeria is in need of proper training and capacity building. The country's health providers lack knowledge, which can be observed in 42% diagnostic accuracy and 11% of maternal and neonatal care resulting in complications (Kress <i>et al</i> , 2016).	The country has widespread levels of corruption. The corruption is evident in fraudulent drugs, intentional misdiagnosis, inflation of contracts, favouritism in treatment based on political patronage (Obansa, 2013).	Nigeria utilises capitation and FFS as their payment mechanisms (USAID, 2016).
o	o	o	o	o

Table 5.31. Purchasing arrangements for Bangladesh.

Bangladesh				
Do purchasers influence payments rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchasers?	Provider payment mechanisms
<p>The National Drug Policy of 1982 managed to control drug prices of quality essential drugs. This led to the creation of a committee that was formed of different stakeholders. The committee's duty was to decide on prices for both local and imported drugs. The policy managed to keep drug prices low, with only an increase of 20% in prices from 1981 to 1991. This trend was then discontinued with the revision of the essential drugs list in 1993. From that point onwards, there was more involvement from pharmaceutical companies, which led to inflated drug prices. The government also imposes a 15% VAT on all pharmaceuticals (Ahmed <i>et al.</i>, 2015).</p>	<p>The Management Information System-Health (MIS-Health) is responsible for measuring and reporting health information. They report data in publications that include the <i>Health Bulletin</i>, <i>Year Book on Health</i> and the <i>Voice of MIS-Health</i>.</p> <p><i>MIS-Health</i> places emphasis on measuring supply side data. This includes information on the input that facilities used and what they have done. Data from the MIS-Health are often not used for planning, also the data are of poor quality regarding timeliness, accuracy and completeness (Ahmed <i>et al.</i>, 2015).</p>	<p>The Ministry of Health and Welfare (MOHFW) are both the purchaser and provider of health services, which means that there is no purchaser-provider split.</p> <p>Salaries from the MOHFW are fixed to both the health workers and MOHFW personnel. For those reasons, there are no opportunities to make performance based payments (Ahmed <i>et al.</i>, 2015).</p>	<p>The current structure and management does not account for accountability. This is evident from the high levels of corruption, doctor absenteeism, poor service quality and poor performing providers.</p> <p>The problem also stems from poor performance in fundamental aspects of management. These include poor monitoring systems, inaccurate job descriptions and subjective performance evaluation (Ahmed <i>et al.</i>, 2015).</p>	<p>Bangladesh utilises FFS and global budgets as payment mechanisms.</p>
o	o	o	o	o

Table 5.32. Purchasing arrangements for Cambodia.

Cambodia				
Do purchasers influence payments rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchasers?	Provider payment mechanisms
<p>In 2009 the MOH decentralised healthcare governance to the districts and now function as Special Operating Agencies (SOAs).</p> <p>The SOA gives more autonomy to the Cambodian district health managers with regards to decision making and financing. SOAs play a vital role in the MOH and are designated to service delivery.</p> <p>They manage contractual agreements. The contractual agreements include quality (the SOAs expect specific results for resources used) and service delivery, as well as organisation (which includes monitoring, control and evaluation) (Annear <i>et al.</i>, 2015).</p>	<p>The Health Management Information System (HMIS) of the MOH was launched in 2010 and reports health information on web based platforms. 24 of the country's provincial hospitals, 55 referral hospitals, eight national hospitals, two NGO hospitals and all the Operational District (OD) officers manually enter data on the internet. Currently, 163 private providers and NGO facilities also submit their respective data. Some of the health centres that do not have access to electricity; they record their data on paper and then complete their reports. Submission rates have been close to 100%.</p> <p>The HMIS focuses on standardisation, integration, simplicity, incorporation of new information, reliability, and computerisation of all health facilities. On a routine basis, it receives reports from all centres and each one is expected to maintain recorded aggregated data for outpatient consultations, referrals and hospitalisations, immunisations, birth spacing, prenatal consultations, deliveries and laboratory examinations (Annear <i>et al.</i>, 2015).</p>	<p>Only the HEF makes performance-based payments, but contributes little to the THE (Annear <i>et al.</i>, 2015).</p>	<p>The Cambodian health system suffers from lack of transparency and accountability. Systems of accreditation and the enforcement of standards are still in the initial stages of development.</p> <p>The private health providers are also unaccountable, working in self-interests rather than the demand of the population (Annear <i>et al.</i>, 2015).</p>	<p>Cambodia utilises capitation, FFS and line item budgets as payment mechanisms (Annear <i>et al.</i>, 2015).</p>
1	1	0	0	0

Table 5.33. Purchasing arrangements for Germany.

Germany				
Do purchasers influence payments rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchasers?	Provider payment mechanisms
<p>The Institute for Quality and Efficiency (IQWiG), which is a foundation responsible for cost efficiency of drugs and therapeutic benefits, as well as the Institute for Quality and Transparency (IQTiG), which is responsible for quality assurance, supports that Federal Joint Committee. The Federal Joint Committee comprises 13 members, each with the right to vote. Five from the Federal Association of Sickness Funds, two each from the Federal Association of SHI Physicians and the German Hospital Federation, one from the Federal Association of SHI Dentists and three with no affiliation. There are five patient representatives who have no voting right but rather an advisory role. These bodies play different roles to ensure that priorities are set for essential drugs and reduced prices for drugs in the health system (Osborn &amp; Sarnak, 2017).</p>	<p>From 2015, all individuals ensured by the SHI were issued medical chip cards that carry information that includes the person's name, address, date of birth, the name of their sickness fund and information regarding their coverage.</p> <p>As of 2015, the Federal Cabinet passed a bill as way of improving data security. Physicians will be incentivised for transmitting electronic medical records, collecting and documentation (Osborn &amp; Sarnak, 2017).</p>	<p>The IQTiG has set indicators that all hospitals are required to report on for comparison and system improvement purposes. At the same time, it is mandatory to report on certain measurements of quality regarding process and outcome quality attributes.</p> <p>Under the new Hospital Care Structure Reform Act, there will be a focus on quality related payment and accreditation for hospitals.</p>	<p>All the hospitals in Germany are required by the IQTiG to publish their findings concerning specific health indicators. The IQTiG also monitors if the hospitals do not exceed the volume threshold for certain complex health procedures.</p>	<p>Germany utilises DGRs and FFS as payment mechanisms.</p>
1	1	1	1	0

Table 5.34. Purchasing arrangements for the Republic of Korea.

Korea Republic				
Do purchasers influence payments rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchasers?	Provider payment mechanisms
<p>In the single payer system, no selective contracting is practiced. Once contracted, providers are guaranteed a contract unless they commit serious misconduct. The government enforces all fee schedules for providers.</p> <p>The NHIS and associations representing providers negotiate annually for the pricing of health services that are contained in the benefits package. In cases where no agreement is reached, the Health Insurance Deliberation Policy Committee decides on the fee schedule. The NHI also negotiates prices of pharmaceuticals with manufacturers (Kwon <i>et al.</i>, 2015).</p> <p>The Korean health system is, however, dependant on high OOPs made at FFS bases and no chance to negotiate prices. For those reasons, prices for patient costs have been increasing (Britnell, 2015a).</p>	<p>The Government has made considerable investments in IT, leading to outstanding achievements in the NHI's electronic records.</p> <p>The country has a centralised database that contains every person's comprehensive information, including employment, payrolls and all insurance claims (Kwon <i>et al.</i>, 2015).</p>	<p>As indicated, there is no selective contracting in the single payee system. The government automatically offers contracts to current providers, unless they commit serious misconduct.</p> <p>There are no criteria to consider quality and cost performance.</p> <p>All providers are mandated to attend to patients on the SHI system (Kwon <i>et al.</i>, 2015).</p>	<p>General social pressure and the government itself have driven for transparent policy making in the health sector. This has led to the National Assembly taking a stronger stance in enforcing transparency and accountability.</p> <p>In addition, the National Assembly is watched closely by Civil society organisations, which go as far as evaluating individual performance of National Assembly publicly.</p> <p>Civil organisations are also involved in the decision making process as advisors on a discretionary role (Kwon <i>et al.</i>, 2015).</p>	<p>Korea Republic utilises DRGs, FFS and salaries as payment mechanisms (Kwon <i>et al.</i>, 2015).</p>
1	1	0	1	0

Table 5.35. Purchasing arrangements for Armenia.

Armenia				
Do purchasers influence payments rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchasers?	Provider payment mechanisms
<p>The majority of pharmaceuticals are purchased by individuals through OOP payments. The MOH makes global budget payments for global drugs and fixed prices for these items.</p> <p>A limited range of these essential drugs is available for vulnerable groups such as children, the elderly and individuals with specific diagnosis. The MOH fixes expenditure of each group without equalisation between the groups (Richardson, 2013).</p>	<p>The country suffers from serious data gaps and limitations, hindering the use of the planning and development of health information.</p> <p>Presently, the use of IT is limited to vertical programmes with little coordination of the different health information systems in the country. Parts of the health system are not yet integrated with IT. Therefore, electronic health records are not widely used (Richardson, 2013).</p>	<p>The State Health Agency (SHA) is responsible for monitoring the effective utilisation of health resources. Its role includes the allocation of health financial resources on the basis of contractual agreements.</p> <p>However, the SHA remains a payer and not an active purchaser of health services (Richardson, 2013).</p>	<p>The prevalence of informal health payments is a key challenge for transparency and accountability in the Armenian health system.</p> <p>Informal transactions, however, stem from a broader issue in the country's context. 11.2% of GDP originates from informal activities, since a portion the Armenian population depends on informal activity to supplement their formal income.</p> <p>There has been increased focus on improving transparency and accountability through the National Health Strategy. The strategy seeks to facilitate monitoring performance and strengthening accountability (Richardson, 2013).</p>	<p>The country utilises capitation, FFS and global budgets as payment mechanisms (Richardson, 2013).</p>
1	0	0	0	1

Table 5.36. Purchasing arrangement for the United States of America.

United States of America				
Do purchasers influence payments rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchasers?	Provider payment mechanisms
<p>The USA has the highest health expenditures in the world. Some interventions to reduce healthcare costs have been put in place by the payers through selective provider selection, managed care, price negotiations and controls and value based financing (Osborn &amp; Sarnak, 2017). Some of the reasons for the high expenditures include administration costs, fraud, abuse, less focus on prevention and excessive prices (Britnell, 2015a). Through the ACA, the government has attempted to curb the high healthcare costs through rewarding efficiency. Some of the reforms implemented include using the P4P payment mechanism, shared savings, global budgets and the integration of healthcare providers (Osborn &amp; Sarnak, 2017). Less than 20% of the changes made by the ACA are, however, reflective of the changes it proposes (Britnell, 2015a).</p>	<p>The use of electronic records has been on the rise in the USA. The Electronic Incentive program has managed to increase the use of electronic records, resulting in 84% of physicians and 76% of hospitals using some form of electronic record as of 2015 (Osborn &amp; Sarnak, 2017).</p>	<p>The Centres of Medicare and Medicaid Services (CMS) have driven public reporting of provider performance information. An example of such an initiative is the Hospital Compare service, which reports measures of patient experience, process and outcome quality attributes for over 4 000 hospitals. The intention is to improve both quality of care and transparency.</p> <p>In addition, individual states and consumer led groups, and the Leapfrog group has also implemented public reporting systems for quality of care and safety (Osborn &amp; Sarnak, 2017).</p>	<p>According to Britnell (2015a), fraud is one of the major reasons for excessive healthcare costs in the USA's health system. This signals low accountability levels.</p>	<p>The USA utilises capitation and FFS payment mechanisms (Osborn &amp; Sarnak, 2017).</p> <p>The dominant payment mechanism is FFS, but the government is incentivising more quality-based payment mechanisms through the ACA.</p>
0	1	1	0	0

Table 5.37. Purchasing arrangements for Canada.

Canada				
Do purchasers influence payments rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchasers?	Provider payment mechanisms
<p>Healthcare costs are mostly controlled through the single payer system. Some the measures used to control costs are mandatory health budgets, fee schedules for providers, technology assessment and resource restriction. The latter includes restriction in new technology and equipment. The Federal Patented Medical Review Board, an independent, quasi-judicial body, regulates prices of patented medicines.</p> <p>Provinces are responsible for controlling generic medicines and purchasing for public drugs. Occasionally, this leads to disparities in provincial prices.</p>	<p>Individual territories and provinces are responsible for developing their own electronic health systems. These systems are supported by Canada Health Infoway, but the country does not have a national plan for comprehensive electronic health records.</p> <p>Canada Health Infoway reports that provinces have implemented electronic records national, but patient identifiers do not yet exist. This is due to low levels of interoperability in the system.</p> <p>In 2014, 42% of GPs reported that they exclusively used electronic records to enter and access patient data, 87% reported that their patients were not able to retrieve their information and only 6% reported that their patients could make online appointments.</p>	<p>The bulk of performance monitoring takes place through agencies on both territorial and provincial levels. Performance monitoring is prevalent in many provinces.</p> <p>National-level organisations mainly aim to support good performance by disseminating information that supports providers, rather than performance monitoring.</p> <p>There is also revalidation programmes for physicians, including peer reviews and requirements for education.</p>	<p>The Canadian Patient Safety Institute is responsible for promoting best practices and the development of new tools and strategies. The Canadian agency for Drugs and Technologies in Health recommends appropriate prescribing practices, purchasing and medication use. The Canadian Institute for Health Information regularly publishes health performance reports. However, to date, no doctor performance data has been published. The Canadian Foundation for Healthcare Improvement helps provinces and territories to improve performance. Accreditation Canada, a not-for-profit organisation, offers non-compulsory provider accreditation services to about 1 200 providers in Canada's health system.</p> <p>There are no real accountability measures, but provider support is prevalent.</p>	<p>The country utilises FFS and global budgets as payment mechanisms (Osborn &amp; Sarnak, 2017).</p>
1	0	1	1	0

### 5.3.2.1 Provider payment mechanisms scoring

In this section, the scoring criteria that was applied for country payment mechanisms will be discussed. The scoring criteria focus on the properties of provider payment mechanisms used by the countries, and not the proportions in which they are applied in the countries. For example, countries make use of certain payment mechanisms more than others.

This elaborates on what was presented Table 4.9 in Section 4.3.3.3, which shows the main provider payment mechanisms, and also takes into account P4P (discussed in Section 4.3.3.3). The latter is a less prominent payment mechanism, but is used by some countries including Croatia and Czech Republic (Džakula *et al.*, 2014; Alexa *et al.*, 2015). Due to lack of evidence, P4P mechanisms were scored based on the results from systematic reviews from Lagarde *et al.* (2010); Cromwell *et al.* (2011); Serumaga *et al.* (2011); Werner *et al.* (2011); and Eijkenaar *et al.* (2013).

In their framework to analyse the key performance considerations related to health financing, Carrin & James (2005) recommend analysing whether the payment mechanisms encourage the appropriate level of care. In their framework, they consider the dimension of over- or underproduction of health services across the available payment mechanisms. The importance of healthcare costs and quality of care means that, in this case, dimensions of quality and cost control were also included in the analysis of the appropriate level of care. The dimensions of quality and cost containment were derived from Normand & Weber (2009). Table 5.38, shows the implications of each of the provider payment mechanisms on service provision, cost containment and quality. As mentioned above, over- and underproduction represent the service provision dimension, whereas “poor”, “good” and “fair” are representative of both cost containment and quality.

**Table 5.38. Provider payment mechanisms and their effects on service provision, cost containment and quality of care.**

Payment mechanism	Service provision	Cost containment	Quality
Capitation (per capita payment)	Underproduction	Good	Fair
Case-based (Diagnostics related Groupings (DRG))	Overproduction	Good	Fair
Fee-for-service (tariffs or fixed fee schedule)	Overproduction	Poor	Good
Global budget	Underproduction	Good	Fair
Line-item budget	Underproduction	Good	Fair
<i>Per diem</i>	Overproduction	Fair	Poor
Salary	Underproduction	Fair	Fair
Pay for performance	Underproduction (Lagarde <i>et al.</i> , 2010; Serumaga <i>et al.</i> , 2011; Eijkenaar <i>et al.</i> , 2013)	Good (Eijkenaar <i>et al.</i> , 2013)	Fair (Lagarde <i>et al.</i> , 2010)

Sources: Carrin &amp; James (2005); Normand &amp; Weber (2009)

Table 5.39 shows the scoring criteria for country provider payment mechanisms. In the assessment it was assumed that a combination of under- and overproduction is preferable. It was also assumed that overproduction perpetuates the unnecessary use of health services, which in turn raises costs. On the other hand, underproduction was assumed to limit access to healthcare. For those reasons, a score of one (“1”) was allocated to mechanisms that promoted a certain degree of under- and overproduction. With regards to cost containment, scores of negative one (“-1”), zero (“0”), and positive one (“1”) were allocated to poor, fair and good performance, respectively. The same scoring criteria was applied for effects of payment mechanisms on quality of care as well. Table 5.40. shows the results of applying the proposed scoring criteria to the 17 cases, as well as the calibrated result. Note that the “score” was calculated using the criteria in Table 5.39. For the “calibration” value, a value of one was awarded if the score was three and above (zero was awarded to scores below three). This was because the highest attainable score was six.

Table 5.39. Scoring criteria for provider payment mechanisms.

	Service provision		Cost containment			Quality			Highest possible total	
	Underproduction	Overproduction	Poor	Fair	Good	Poor	Fair	Good		
Capitation (per capita payment)	A score of 1 was given for a combination of under- and overproduction. A score of 0 will be given for mechanisms that perpetuate only over- or underproduction.				1		0			
Case-based (diagnostics-related groupings [DRG])					1		0			
Fee-for-service (tariffs or fixed fee schedule)			-1					1		
Global budget					1		0			
Line-item budget					1		0			
<i>Per diem</i>				0			-1			
Salary				0			0			
Pay for performance					1		0			
Total			1		-1	0	5	-1		0

Table 5.40. Scores and calibration for country provider payment mechanisms.

	AUS	BOT	CAM	CZR	CRO	HAI	IND	ITA	THA	NIG	BAN	CMB	GER	KOR	ARM	USA	CAN
Capitation (per capita payment)				1	1			1	1	1		1			1	1	
Case-based (diagnostics-related groupings [DRG])	1			1	1			1	1			1	1	1			
Fee-for-service (tariffs or fixed fee schedule)	0	0		0	0		0	0	0	0	0	0	0	0	0	0	0
Global budget	1		1		1		1	1			1				1		1
Line-item budget		1										1					
<i>Per diem</i>				-1	-1												
Salary				0		0	0							0			
pay for performance			1	1		1		1									
<b>Score</b>	3	2	2	3	3	1	2	5	3	2	2	4	2	2	3	2	2
<b>Calibration</b>	1	0	0	1	1	0	0	1	1	0	0	1	0	0	1	0	0

### 5.3.3 Conclusion: Qualitative data

In this section, the indicators for pooling and purchasing were discussed and the scoring criteria applied. The result can be seen in Table 5.41. Also included in the table, are the resultant scores that were obtained by summing the individual scores. These will be used to formulate the set membership scores for QCA in Section 5.5.

## 5.3.3 Scoring: qualitative data

The scores allocated for pooling and purchasing are presented in Table 5.41.

**Table 5.41. Scores for pooling and purchasing.**

	Pooling				Purchasing					
	The level of prepayment.	Fragmentation in risk pools.	Proportion covered.	Cumulative score for pooling arrangements.	Do purchasers influence payments rates?	Do robust information systems exist to support strategic purchasing?	Do provider performance reviews exist?	Do accountability systems exist between providers and purchasers?	Provider payment mechanisms.	Cumulative score for purchasing arrangements.
AUS	1	0	1	2	1	1	1	1	1	5
BOT	1	0	1	2	0	1	1	1	0	3
CAM	0	0	0	0	0	0	0	0	0	0
CZR	1	1	1	3	1	1	0	0	1	3
CRO	1	1	1	3	1	0	1	0	1	3
HAI	0	0	0	0	0	0	1	0	0	1
IND	0	0	0	0	0	1	0	0	0	1
ITA	1	1	1	3	1	1	1	0	1	4
THA	1	0	1	2	1	0	0	1	1	3
NIG	0	0	0	0	0	0	0	0	0	0
BAN	0	0	0	0	1	1	0	0	0	2
CMB	0	0	0	0	1	1	0	0	0	2
GER	1	1	1	3	1	1	1	1	0	4
KOR	0	1	1	2	1	1	0	1	0	3
ARM	0	0	0	0	1	0	0	0	1	2
USA	1	0	0	1	0	0	1	1	0	2
CAN	1	0	1	2	1	0	1	1	0	3

## 5.4 Construction of composite indices

In Chapter 4, the QCA causal conditions and outcomes are described, including the indicators that represent them. Here, the aim was to create a composite index for all the causal conditions and outcomes from their respective indicators. Each causal condition and outcome is formed by a set of indicators that are measured at different scales. The first reason for normalisation, is that it helps to convert the indicators to comparable standards, by converting them to pure numbers that are dimensionless. The second reason for normalisation, is polarity of indicators (Mazziotta & Pareto, 2013). For example, for the employment construct, unemployment has negative polarity, whereas employment has positive polarity.

There are a number of normalisation methods available, including: Min-Max, distance to a reference, indicators above or below the mean, methods of cyclical indicators and percentage of annual difference over consecutive years, standardisation (z-scores) (OECD & European Commission, 2008), and averages and ranking (Du Plessis, 2016). The normalisation technique that suits the context of this study should not distort the data when aggregating, and should be easily transformed according dichotomous values for csQCA.

Table 5.42, shows the common normalisation methods and includes descriptions for each to show their main features.

Table 5.42. Common normalisation methods.

Normalisation technique	Description
Re-scaling (Min-Max)	<p>The numerator is the subtraction between the value and the minimum value of the dataset, where the denominator is the distance between the maximum and minimum value of the dataset. This results in a value between zero and one.</p> <p>This technique is more useful when there are small intervals in the dataset, to create a wider range. The disadvantage with this technique is that it may produce distorted outcomes when the data contains outliers.</p>
Distance to a reference	<p>This involves the use of a benchmark value as a reference. When dealing with positive values, the value in the dataset is divided by a reference value, preferably a value that normalises the dataset between zero and one. For negative values, the inverse is applied.</p> <p>The definition of benchmarks is based on targets in a specific field, set targets, regulations and values reported in the specific field.</p>
Indicators above or below a mean	<p>Here an arbitrary proportion around the mean of the dataset is defined. If a value in the dataset is above the defined threshold above the mean, then a value of one is assigned. If a value is below the defined threshold, then a value of negative one is assigned. Lastly if the value lies in the region defined around the mean, then a zero is assigned.</p> <p>One of the major critiques of this method is the loss of raw data integrity and arbitrary nature of the threshold.</p>
Methods of cyclical indicators	This technique applies to time series data, in which the mean is subtracted from the value in the dataset and the dividing by the mean of the difference of the values from the mean.
Percentage of annual difference over consecutive years	For time series data, data is normalised by subtracting the value at the previous data point and then dividing by the value of the indicator.
Standardisation (z-scores)	<p>This calculates the average and standard deviations for a specific indicator across cases. The normalised value is then the difference between each indicator raw value and the average and then dividing by the standard deviation across cases.</p> <p>The normalised values will have a common scale with an average of zero and a standard deviation of one. Having a mean at zero, avoids distortion when aggregating which are as a result of difference in the means of the individual indicators. Dividing by the standard deviation allows the normalised value to reward good performing cases.</p>
Averages	Averages involve the division of each indicator by the average over a period of time.
Ranking	This allows for the ranking of indicator values across cases. One major drawback is that, it allows for the loss of information, which makes it hard to make conclusions in analysis.

Sources: OECD & European Commission (2008); Du Plessis (2016)

From the considered normalisation methods, z-scores were deemed appropriate for this study. In line with QCA, and specifically the csQCA variant, which is applied in this study, z-scores provide a favourable method of calibration that is transparent. As mentioned in Section 3.2.1, in csQCA, a condition is either present (binary one) or absent (binary zero). Since z-scores have a mean of zero and a standard deviation of one, values above the mean

## Chapter 5

can be considered as well-performing, whereas values below the mean can be considered poorly-performing (OECD & European Commission, 2008). As indicated in Table 5.42, dividing by the standard deviation rewards good performance, which is ideal for the application in this study, as the distinction between “good” and “poor” performance is key. Due to the nature of this study, z-scores are also advantageous when aggregating the normalised values.

Aggregation can be compensatory, non-compensatory or partially compensatory. Compensation implies that indicators forming a construct can be substituted by another. The choice between compensatory and non-compensatory aggregation methods stems from the nature of the selected indicators. Indicators can be substitutable or non-substitutable. Substitutable means that a shortage in an indicator can be compensated for by an excess in another (Mazziotta & Pareto, 2013).

The other key concern when aggregating, is the allocation of weights. The reason for weighing is to express different levels of importance of the individual indicators, which can be subjective or objective. Some of the ways in which subjective weighing can be conducted, are by consulting subject matter experts and through social surveys. Objective weighing uses methods that assign weights according to the erraticism of an indicator (indicators that vary less are weighed less) (Mazziotta & Pareto, 2013).

To avoid bias and to allow for fair comparability for the purposes of QCA, equal weights were applied, and compensation<sup>6</sup> between indicators that form the same construct was allowed. The reason for this is because countries tend to focus on different options due to context. An example is with the revenue-raising construct: Here, it is inappropriate to award different weights to private and public expenditure on healthcare, because countries opt for an option (or a combination) that works in their context. In the context of revenue raising, the important concept, rather, is the level of prepayment. With regards to weights, Mazziotta & Pareto (2013) also state that, in the case where equal weights are awarded to all indicators, z-scores are the most appropriate normalisation method, because they produce values with the same variance.

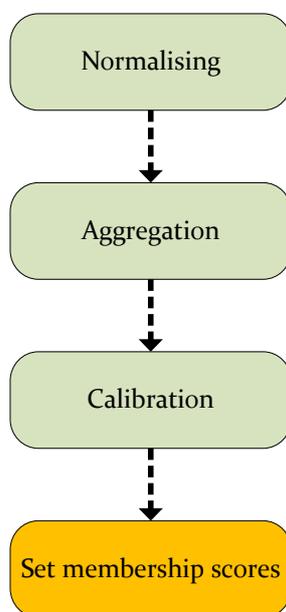
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<sup>6</sup> To further motivate the choice of compensatory aggregation (Mazziotta and Pareto 2013) state that “if the phenomenon to be measured is according to different dimensions that are each represented by a subset of individual indicators, it is possible to adopt a compensatory approach”.

## 5.5 Set membership score calculation

This section describes the process of creating the set membership scores for QCA purposes.

**Figure 5.3. The process of obtaining the set membership scores**



The first step was to normalise data, since indicators for constructs were not on the same scale. As illustrated, the formula for calculating z-scores is:

$$z = \frac{x - \mu}{\delta} \quad (5.5.1).$$

where  $z$  is the resulting normalised value,  $\mu$  is the mean of the sample and  $\delta$  is the sample standard deviation. First, z-scores were calculated for each indicator. Secondly, the aggregation was calculated by adding the indicators of the resulting z-scores to form composite indices. This is possible, since values were now on a normalised scale (the result is shown in Table 5.43)

Figure 5.4 illustrates the aggregation process and the formation of constructs. It is important to note that constructs are the QCA causal conditions and outcomes as discussed in Chapter 4. The third step was to calibrate the composite z-scores in order to create csQCA membership scores. Z-scores have a mean of zero and a standard deviation of one, which means that a negative value is a certain number of units below the sample mean (OECD & European

Commission, 2008). A positive value is also a certain number of points above the mean. For the purposes of csQCA, z-scores were calibrated to logic one for positive z-scores and zero for negative z-scores. This conversion resulted in the set membership scores presented in Table 5.44.

**Figure 5.4. A diagram showing how composite indicators for constructs were formed.**

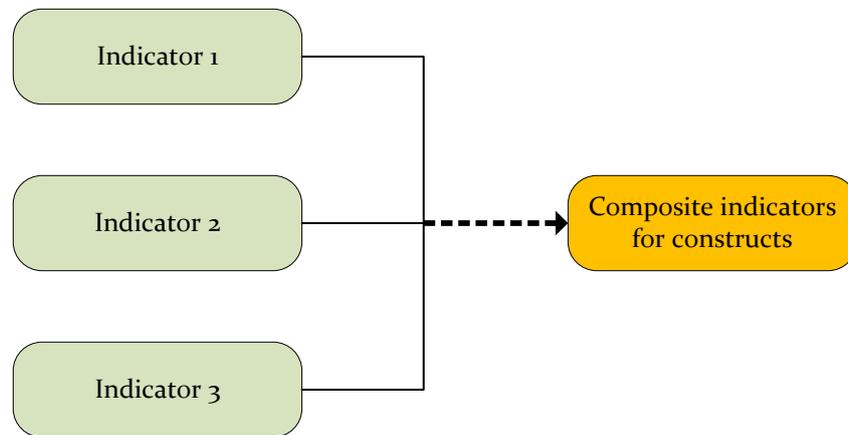


Table 5.43. Total z-scores for all the constructs.

	Revenue raising	Pooling	Purchasing	Fiscal space	Employment	Inequality	Education	Service coverage	Quality of care	Financial protection
AUS	1.805711425	0.508747	1.886484	3.1046137	0.442491916	-0.23576132	0.57306117	2.76598	0.511162	1.794247
BOT	2.079152172	0.508747	0.428746	3.02101915	-1.625397893	2.236029217	2.860068099	1.504896	-0.27878	-0.5339
CAM	-2.871304692	-1.063744	-1.75786	-0.758269	1.924445498	0.887779831	-0.56610945	-4.24586	-1.3403	-2.03936
CZR	0.85462206	1.2949924	0.428746	1.55660988	0.337793554	-1.08907146	-0.016553029	4.555242	0.121352	1.85972
CRO	1.922727304	1.2949924	0.428746	0.56913271	-2.659187832	-1.08907146	0.239037277	2.856054	-0.5596	1.346894
HAI	-3.03428711	-1.063744	-1.02899	-1.777603	-1.258697149	2.267992026	-1.580992796	-8.8713	-1.12657	-1.41431
IND	-2.503335081	-1.063744	-1.02899	-2.3681231	-0.097728696	-0.21542135	-0.144539934	-2.546	-0.86897	-2.20326
ITA	0.997559513	1.2949924	1.157615	0.31652635	-2.562706519	-0.21445278	-0.021310944	2.108946	-0.14421	1.743665
THA	1.161497024	0.508747	0.428746	0.99099732	2.433764389	0.046092535	0.004124475	2.7001	0.584255	0.643906
NIG	-2.70387097	-1.063744	-1.75786	-3.37511	-0.201820002	0.542000355	-0.548576548	-14.1702	-1.87136	-2.28544
BAN	-2.726522571	-1.063744	-0.30012	-3.0400312	0.61999558	-0.50792948	-1.138725116	-3.47898	1.645306	-3.05982
CMB	-2.957480118	-1.063744	-0.30012	-2.3820377	3.564669138	-0.64062357	-1.151370207	-1.21296	1.709256	-2.84817
GER	3.453014115	1.2949924	1.157615	1.63007025	0.360307457	-0.70164347	0.431329015	3.791506	-1.6133	1.960316
KOR	-0.254171537	0.508747	0.428746	0.91235034	0.581504363	-0.71423488	0.483175683	4.575489	0.755404	1.842579
ARM	-1.768168928	-1.063744	-0.30012	0.20732547	-2.431861045	-0.570888653	-0.678390042	3.611397	0.29738	-0.48898
USA	3.616209568	-0.277498	-0.30012	-0.29753	0.386949936	0.357003493	0.653716106	3.239992	1.27373	1.815174
CAN	2.928647825	0.508747	0.428746	1.69005895	0.185477306	-0.35780114	0.602056241	2.815682	0.905236	1.866745

Table 5.44. Set membership scores.

	Causal conditions						UHC goals			
	Revenue raising	Pooling	Purchasing	Fiscal space	Employment	Inequality	Education	Service coverage	Quality	Financial protection
AUS	1	1	1	1	1	0	1	1	1	1
BOT	1	1	1	1	0	1	1	1	0	0
CAM	0	0	0	0	1	1	0	0	0	0
CZR	1	1	1	1	1	0	0	1	1	1
CRO	1	1	1	1	0	0	1	1	0	1
HAI	0	0	0	0	0	1	0	0	0	0
IND	0	0	0	0	0	0	0	0	0	0
ITA	1	1	1	1	0	0	0	1	0	1
THA	1	1	1	1	1	1	1	1	1	1
NIG	0	0	0	0	0	1	0	0	0	0
BAN	0	0	0	0	1	0	0	0	1	0
CMB	0	0	0	0	1	0	0	0	1	0
GER	1	1	1	1	1	0	1	1	0	1
KOR	0	1	1	1	1	0	1	1	1	1
ARM	0	0	0	1	0	0	0	1	1	0
USA	1	0	0	0	1	1	1	1	1	1
CAN	1	1	1	1	1	0	1	1	1	1

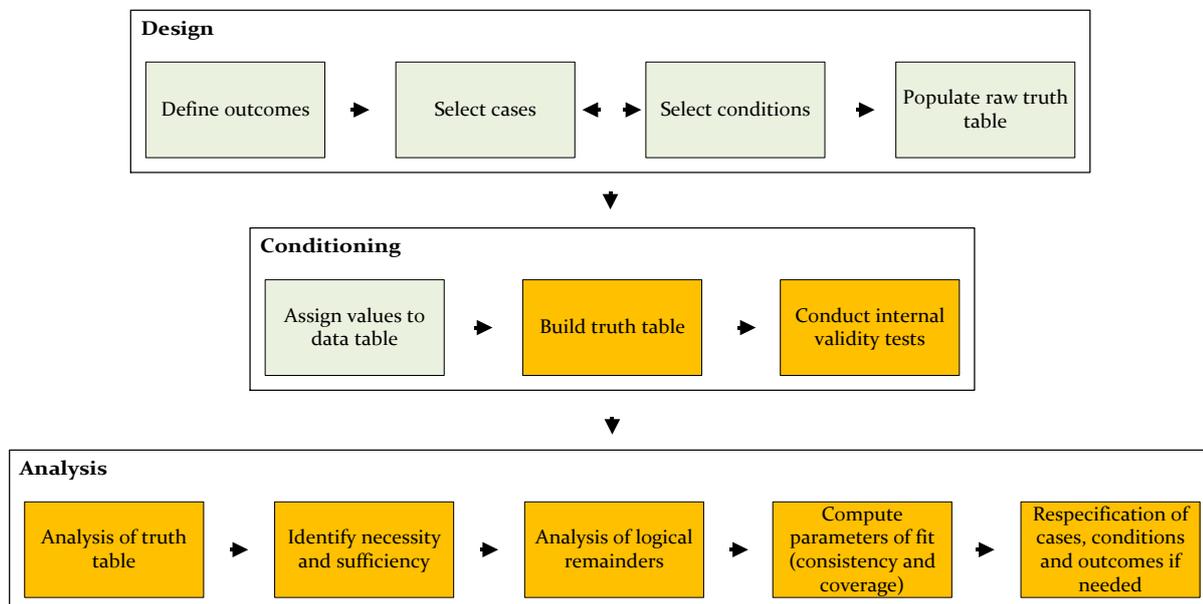
## 5.6 Conclusion: Cases and data collection

In this chapter, the case selection and data collection process were discussed. The chapter also presented the data used in the study and revealed the set membership scores for QCA purposes. The work in Chapter 6 is based on the set membership scores presented in this chapter. These set membership scores are instrumental in creating the truth tables for analysis.

## Chapter 6 RESULTS AND ANALYSES

The three outcomes identified in Section 4.2 included service coverage, quality of care and financial protection. The outcomes stem from the UHC goals as articulated in Section 4.2. In this chapter, the casual pathways<sup>7</sup> to two UHC goals (as outcomes) are discussed, namely quality of care and financial protection. The third goal, namely utilisation/need, is replaced with health service coverage because of the reasons articulated in Chapter 4. The causal conditions that are considered are financial arrangements and contextual factors. Financial arrangements are specific to health system financing, whereas contextual factors describe the broader country-specific factors that are outside the jurisdiction of the health system. The financial arrangements that are investigated are: (i) revenue raising; (ii) pooling; and (iii) purchasing. The contextual factors that are investigated are: (i) fiscal space; (ii) employment; (iii) inequality; and (iv) education. The set membership scores table in Chapter 5—Table 5.44, was applied into QCA-related software for analysis. Figure 6.1 highlights the QCA processes addressed in this chapter.

**Figure 6.1. QCA flow diagram, highlighting the processes addressed in this chapter.**



Software for QCA analysis can be used in order to obtain the causal pathways. There are a number of software programs available for conducting QCA analysis. Each differs in their capabilities in relation to the QCA variants and procedures that they are able to perform, as

<sup>7</sup>As defined in Section 3.2, a causal pathway is a process that brings about the outcome.

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well as the types of solutions that they offer. Of the six main software programs, three offer a graphical user interface (GUI) and three are based on a command line interface (CLI). The programs that offer GUI include: (i) Tosmana; (ii) fs/QCA; and (iii) KirqST (Dusa & Thiem, 2012; Thiem & Du, 2013). QCA software programs can be found on Compasss (2017). The programs that are based on a CLI include: (i) Fuzzy; (ii) QCA3; and (iii) QCA. In general, all of the available programs are capable of running the csQCA variant, which was applied in this study. The fs/QCA<sup>8</sup> software package was chosen for this study, as it offers a GUI and is the most commonly used software amongst researchers (Thiem & Du, 2013).

The first step in the QCA analysis, is the identification of necessary conditions, followed by the identification of causal pathways to the outcome. The three outcomes (service coverage, quality of care and financial protection) are initially discussed separately, followed by a holistic discussion of the findings. The second step in the analysis was to identify and analyse the different causal pathways to the above-mentioned outcomes.

Two parameters of fit, consistency and coverage, were used evaluate the strength of the findings. As highlighted in Section 3.2.2, consistency measures to what extent the cases support the existence of set relationships between conditions and outcomes (Devers *et al.*, 2013). This has a similar statistical significance (Siebrits, 2014). High consistency scores indicate that more cases involved in a causal pathway were equally successful in producing the outcome. On the other hand, low consistency scores indicate that the cases involved in a causal pathway were, to some extent, successful in producing the outcome (Kane *et al.*, 2014). In the case of csQCA, consistency can be calculated as:

$$\text{Consistency} = \frac{\text{number of cases where both condition and outcome are present}}{\text{number of cases where outcome is present}}. \quad (5.6.1)$$

Values of consistency range from zero to one, with one (“1”) representing high consistency and zero (“0”) being associated with no consistency. Consistency scores of at least 0.9 are recommended for necessity assessment, and at least 0.8 for sufficiency (Jordan *et al.*, 2011; Devers *et al.*, 2013). In this study, the consistency threshold is therefore set at 0.9 for necessity and 0.8 for sufficiency.

The other parameter of fit is coverage, which assesses the relevance of causal recipes. In other words, it is the extent to which outcomes are accounted for by configurations of causal

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<sup>8</sup> Note that, fs/QCA refers to a software package, which is different to the fsQCA QCA variant.

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conditions. Coverage allows for the identification of conditions, or combinations thereof, that are empirically important when compared to others. Similar to consistency scores, coverage scores/measures also range from zero to one, with one representing full coverage and zero, or low scores, representing low coverage (Devers *et al.*, 2013; Siebrits, 2014). The formula for coverage for csQCA is:

$$\text{Coverage} = \frac{\text{number of cases where condition(s) and outcome are present}}{\text{number of cases where outcome is present}}. \quad (5.6.2)$$

In summary, consistency measures inclusion and coverage measures relevance (Dusa, 2017).

In the following sections, terminology that is specific to the analysis is used. These terms and their definitions are summarised in Table 6.1 .

**Table 6.1 A brief overview of selected terms and their definitions.**

<b>Term</b>	<b>Definitions</b>
Consistency	Measures to what extent the cases support the existence of set relationships between conditions and outcomes.
Coverage	Measures the relevance of findings.
Frequency threshold	The minimum number of cases allowed for in a configuration.
Solution	An expression containing all the causal pathways to an outcome.
Configuration	Combination of multiple dimensions.
Complex solution	Originates from configurations that are represented by the cases in the study.
Parsimonious solution	Includes counterfactual configurations that are generated by the QCA software.
Intermediate solution	Utilises counterfactuals to populate configurations, but the researcher inputs the counterfactuals.
Causal pathway	A process that brings about the outcome.
Presence	Binary “1” in csQCA terms or full membership.
Absence	Binary “0” in csQCA terms or full non-membership.
Necessity	A cause is necessary for an outcome if it has to be present for the outcome to occur.
Sufficiency	A causal is sufficient if, it can produce the outcome by itself.
Condition	The input variable under study.
Outcome	The output variable under study.
Service coverage	One of the three outcomes under investigation.
Quality of care	One of the three outcomes under investigation.
Financial protection	One of the three outcomes under investigation.
Revenue raising	One of the input variables and forms part of the UHC financial arrangements.
Pooling	One of the input variables and forms part of the UHC financial arrangements.
Purchasing	One of the input variables and forms part of the UHC financial arrangements.
Fiscal space	One of the input variables and forms part of the contextual factors affecting UHC.
Employment	One of the input variables and forms part of the contextual factors affecting UHC.
Education	One of the input variables and forms part of the contextual factors affecting UHC.
Inequality	One of the input variables and forms part of the contextual factors affecting UHC.

## 6.1 Identification of necessary conditions

The identification of necessary conditions is the first step in the QCA analysis, and the aim is to identify the key conditions that are linked to the outcomes defined in Section 4.2. As highlighted in Section 3.2, a cause is necessary for an outcome if it has to be present for the outcome to occur. In other words, the outcome is a subset of the causal condition, thus a superset relationship exists between the causal condition and the outcome (Ford, Duncan & Ginter, 2005; Weiner *et al.*, 2012; Devers *et al.*, 2013). In Table 6.2, the results from the necessity analysis, which was conducted using the fs/QCA software, are presented.

**Table 6.2. Necessary conditions for the outcomes coverage, quality and financial protection.**

Causal Condition	Coverage		Quality		Financial protection	
	Consistency	Coverage	Consistency	Coverage	Consistency	Coverage
Revenue raising	0.818182	1.000000	0.555556	0.555556	0.888889	0.888889
Pooling	0.818182	1.000000	0.555556	0.555556	0.888889	0.888889
Purchasing	0.818182	1.000000	0.555556	0.555556	0.888889	0.888889
Fiscal space	0.909091	1.000000	0.666667	0.600000	0.888889	0.800000
Employment	0.636364	0.700000	0.888889	0.800000	0.777778	0.777778
~Inequality	0.727273	0.727273	0.777778	0.636364	0.777778	0.636364
Education	0.727273	1.000000	0.555556	0.625000	0.777778	0.777778

With regards to service coverage output, revenue raising, risk pooling and purchasing have high consistency values, but do not surpass the recommended consistency threshold of 0.9. Fiscal space exhibits a stronger superset relationship with service coverage and has a value of 0.91. Revenue raising, risk pooling and purchasing all have consistency scores of 0.82.

From the cases that were evaluated and/or selected and discussed in Chapter 5, Australia, Botswana, Czech Republic, Croatia, Italy, Thailand, Germany and Canada have a strong revenue raising, risk pooling and purchasing consistency that correlates with the presence of service coverage.

These country references originate from the set membership scores in Table 5.44 presented in Chapter 5. On the other hand, Armenia, the Republic of Korea and the USA scored high on coverage, despite not scoring high on all of the four constructs (fiscal space, revenue raising, risk pooling and purchasing). Armenia relies heavily on OOPs for their health financing, which accounts for about 57% of THE (Richardson, 2013). The country's economy leans heavily on the informal sector. This is related to the high prevalence of informal payments for healthcare, which comprises approximately 45% of THE (Richardson, 2013). The Republic of Korea scores high on pooling and purchasing, and low on revenue raising. The single risk pool in the country covers the entire population and it is mandatory for individuals who are above a certain income bracket to contribute. Individuals who are unable to pay for health services are exempt from making contributions and any co-payments at the point of care (Kwon *et al.*, 2015). This contributes to the high levels of coverage in the Republic of Korea. There have been major reforms to improve service coverage of health services in the USA through the Affordable Care Act (ACA). This includes mandating most of the American population to

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purchase health insurance, promoting access to health insurance markets that subsidise premiums for those in need and expansion programmes for Medicaid (Osborn & Sarnak, 2017). The robust superset relationships between service coverage and revenue raising, risk pooling, and purchasing and fiscal space, respectively, highlight the importance of these constructs when improving population health service coverage. These findings are consistent with the health financing diagnostics and guidance document from the WHO (2016b).

For the quality of care construct, employment and ~inequality (the opposite of inequality), scored closest to the consistency threshold at 0.89 and 0.78, respectively. This shows a more robust superset relationship between employment and quality of care compared to ~inequality.

The results for Australia, Czech Republic, Bangladesh, Cambodia, the Republic of Korea showed the presence of employment and ~inequality<sup>9</sup>, which resulted in the presence of quality of care. Thailand, Armenia and the USA, on the other hand, showed the presence of quality, but with different configurations in relation to employment and ~inequality. Thailand showed high inequality levels and high employment levels. Armenia showed lack of employment and high inequality. The USA showed a presence of employment and high inequality levels. Both Soares (2007) and Nikoloski & Mossialos (2013) found evidence of a relationship between inequality and the quality of care. For example, in a study to determine the effect of health care quality on economic inequality across regions in Italy, Soares (2007) concluded that regions with income inequalities had lower quality of care.

For financial protection, all of the causal conditions (revenue raising, pooling purchasing, fiscal space, employment, ~inequality and education) had consistency scores that were above the threshold. At 0.89, revenue raising, pooling and purchasing had the highest consistency scores, which highlights the robust superset relationships. Fiscal space had a consistency score of 0.8, with employment, ~inequality and education scoring 0.78, respectively. These findings suggest that it is important to focus on improvements on the above constructs for financial protection. However, it is more important to establish health financial arrangements and fiscal space, due to higher consistency scores. These constructs also had high coverage scores:

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<sup>9</sup> ~Inequality refers to the lack of inequality.

Each of the financial arrangements received 0.89 and fiscal space scored 0.8, which suggest that the findings have a high empirical importance.

## 6.2 Pathways to outcomes

In this section, sets of pathways that can lead to the outcomes (service coverage, quality of care and financial protection) are identified.

The pathways to the outcomes (service coverage, quality of care and financial protection) when moving towards UHC are presented and discussed. Firstly, financial arrangements are applied as causal conditions with the purpose of obtaining a solution. Secondly, the contextual factors are applied as causal conditions, with the aim of obtaining a solution. Lastly, following the logic outlined in Figure 6.2, the conditions in the best-performing pathways (in terms of pathway consistency and coverage scores, and with consistency taking priority) are selected for further analysis.

The term “evaluation”, is given for each analysis, with a set of causal conditions. Solutions are then obtained for these conditions, with the aim of investigating how contextual factors and financial arrangements interact in relation to the outcomes (service coverage, quality of care and financial protection). Consistency and coverage scores are presented for each solution. They indicate the significance of the above findings and are discussed in the preceding section. Figure 6.2, shows the procedure followed for analysing solutions for each of the three outcomes (service coverage, quality of care and financial protection). The resulting permutations are presented in Table 6.3.

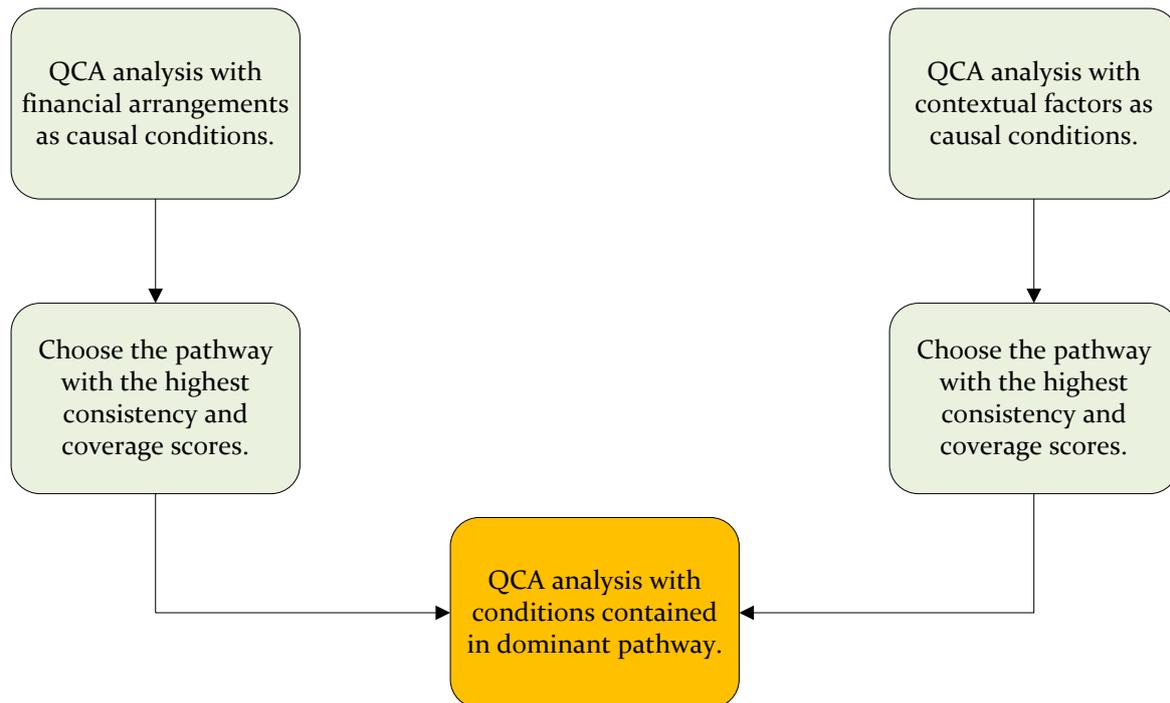
**Figure 6.2. Breakdown of the analysis procedure for each outcome.**

Table 6.3. The evaluations resulting from the analysis procedure.

Evaluation	Causal conditions								Outcomes		
	Contextual factors					Financial arrangements					
	Fiscal space	Inequality	Education	Employment	~Inequality	Pooling	Purchasing	Revenue raising	Service coverage	Quality of care	Financial protection
1						x	x	x	x		
2	x	x	x	x	x				x		
3	x				x			x	x		
4	x				x	x	x		x		
5						x	x	x		x	
6	x	x	x	x						x	
7				x	x			x		x	
8				x	x	x	x			x	
9						x	x	x			x
10	x	x	x	x							x
11	x			x	x			x			x
12	x		x		x			x			x
13	x			x		x	x				x
14			x	x		x	x				x

Each QCA analysis involves the creation of a truth table. The truth tables were constructed from the set membership scores in Table 5.44. All of the truth tables are presented in Appendix C. A truth table is a summary of the relationships that exist between the causal conditions and outcomes, and thus also groups together similar configurations (Ford, Duncan & Ginter, 2005).

From the truth table, an analysis of contradicting conditions was conducted. Contradictions are when the presence of a particular combination of causal conditions invokes both the presence and absence of an outcome. No contradicting configurations were found present in all the iterations. The second step is the preparation of the truth table for analysis, using the fs/QCA software. This involves the use of frequency thresholds and consistency. Frequency is the number of times that a set of combinations is exhibited from the cases. For Small-N studies, the recommended frequency threshold is one or two. A frequency threshold of one

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was applied in this analysis, meaning that configurations with zero frequencies were omitted. Configurations with consistency score of 0.75 and above were considered, subsets of the outcome (Ragin, 2008).

The fs/QCA software produces three different solutions: (i) complex; (ii) parsimonious and (iii) intermediate.

- i. The complex solution originates from configurations that are represented by the cases in the study. In other words, only solutions with consistency scores of 0.8 and above are taken into consideration;
- ii. The parsimonious solution includes counterfactual configurations that are generated by the fs/QCA software. The software's program makes the assumption that each causal condition can lead to the production of the outcome, whether it is present or not; and
- iii. The last solution is the intermediate solution, which also makes use of counterfactuals to populate configurations.

The difference between the intermediate and parsimonious solution is that the intermediate solution's assumptions regarding how the causal conditions affect the outcome, are provided by the researcher based on theoretical evidence (Siebrits, 2014). For this study, only the complex and intermediate solutions were considered. The reason for this is that, when case-orientated research is applied, as was done in this study, it is preferable to consider solutions that explain the cases at hand (Ragin & Sonnett, 2005).

Regarding the intermediate solution, the following assumptions were made, based on the description of the constructs<sup>10</sup> as discussed in Chapter 4:

- i. Revenue raising, pooling purchasing, employment, education and fiscal space were considered to positively affect the outcomes (Service coverage, quality of care and financial protection); and
- ii. Inequality, however, was assumed to have a negative impact on the outcomes and therefore based on the consistency and coverage scores, with consistency as the priority indicator.

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<sup>10</sup> This includes revenue raising, pooling, purchasing, fiscal space, employment, education and inequality.

### 6.2.1 Service coverage

As indicated in Figure 6.2, two evaluations were used to analyse the pathways to achieving coverage towards UHC. The first evaluation takes the financial arrangements (revenue raising, pooling and purchasing) into account, while the second evaluation takes the four contextual factors (fiscal space, employment, inequality and education) into account. The solution pathways with the highest consistency and coverage scores from the above-mentioned solutions were then used to determine supplementary solutions.

#### 6.2.1.1 Evaluation 1: Solutions for service coverage with financial arrangements as causal conditions

As indicated in Table 6.4, the solution for the evaluation with service coverage and financial arrangements as causal conditions is:

$$\text{servicecoverage} = \text{pooling} *^{11} \text{purchasing} +^{12} \text{revenue raising}. \quad (6.2.1)$$

As discussed in Section 6.2, when faced with a choice between the complex and the intermediate solution, the intermediate solution was selected, due to superior coverage scores. The two solutions were, however, identical.

**Table 6.4. Solutions for the truth table analysis of service coverage, with financial arrangements as causal conditions.**

complex solution		
	consistency	coverage
expression: $\text{servicecoverage} = \text{pooling} * \text{purchasing} + \text{revenue raising}$		
pathway terms:		
pooling*purchasing	1	0.82
revenue raising	1	0.091
solution	1	0.91
parsimonious solution		
expression: $\text{servicecoverage} = \text{revenue raising} + \text{pooling} + \text{purchasing}$		
pathway terms:		
revenue raising	1	0.82
pooling	1	0.82
purchasing	1	0.82
solution	1	0.91
intermediate solution		
expression: $\text{servicecoverage} = \text{pooling} * \text{purchasing} + \text{revenue raising}$		
pooling*purchasing	1	0.82
revenue raising	1	0.82
solution	1	0.91

<sup>11</sup> \* Represents logic *and* Boolean algebra.

<sup>12</sup> + Represents logic *or* Boolean algebra.

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The solution scored a consistency score of 1 and an impressive coverage score of 0.91. As is evident in the solution, there are two possible pathways towards achieving coverage. The first pathway comprises a combination of *pooling* and *purchasing* with a consistency score of 1 and coverage of 0.82. This pathway highlights the importance of prepayment when moving towards UHC. Furthermore, it emphasises that good pooling arrangements should be accompanied by good purchasing arrangements as per the definitions in Sections 4.3.2 and 4.3.3. The second pathway is *revenue raising*, which has the same consistency and coverage scores as the first pathway. The solution in equation (6.2.1), suggests that “good” revenue raising (as per the definition in Section 4.3.1) is sufficient but not necessary for coverage, because, while it is capable of producing coverage, it is not the only cause that can guarantee the outcome.

### 6.2.1.2 Country discussion: Service coverage, Evaluation 1

Evaluation 1's outcome was service coverage and financial arrangements as causal conditions. Eleven of the countries in the study showed the presence of coverage and nine showed the presence of revenue raising, namely Australia, Botswana, Czech Republic, Croatia, Italy, Thailand, Germany, USA and Canada. Only Armenia and the Republic of Korea achieved the presence of health service coverage with an absence of revenue raising as per definitions of the concepts in Chapter 4. This is evident from the set membership scores in Table 5.44, in Section 5.5.

During the 1990s, Armenia faced numerous economic, social and political issues. After the country gained independence from the Soviet Union in 1991, it adopted the Semashko-style health system, which was a centralised health system for the Soviet Union. The country enjoyed some economic growth at the start of the new millennium, which resulted in improvements in the health system. Unfortunately, Armenia's economic growth was stunted by the 2008 global financial crisis. It is estimated that 22-40% of the Armenian population emigrated between 1990 and 2005, which led to high remittances. Although there was some return migration, the diaspora contributes to a large extent to the country's GDP (about 19% as of the year 2011). The bulk of health payments are through OOPs. The lack of adequate documentation of healthcare funding originating from donors and the diaspora, has led to possible underestimations of health expenditure from these groups. The country employs the Basic Benefits Package (BBP), a publically funded benefits package that is designed for those in need. Maternity services, primary care, treatment for selected diseases, sanitary services

and emergency services are some of the services included in the BBP (Richardson, 2013). Certain factors have helped to improve coverage in the Armenian health systems, despite the lack of raising revenues practices that satisfy the standards applied in this study.

According to Britnell (2015a), the Republic of Korea achieved UHC in 1989 within only 12 years. This achievement can be attributed to industrialisation over the same period. In 2000, the country created the National Health Insurance System (NHIS), which involved merging all of the health insurances into one comprehensive, single-payer system. The main contributors to the NHIS system are employers, employees and government subsidies. The country faces high OOPs that comprise the bulk of the 46% of health finances that originate from private sources. As indicated, the country's health system benefited greatly from the single-minded nature of the government and industrial growth was re-invested into social services. The country, however, fell into the same pitfall of overreliance on hospitals as Western countries, which has led to high costs and, in return, high OOPs. Hospitals are dominant in the system, which leads to a fragmented system. Conversion of the system to interlinked primary, secondary, tertiary and community care can significantly reduce healthcare costs and therefore decrease OOPs (Britnell, 2015a).

### 6.2.1.3 Evaluation 2: Solutions for service coverage with contextual factors as causal conditions

The second solution is shown in Table 6.5 and the intermediate solution is:

$$\begin{aligned} \text{servicecoverage} = & \text{fiscalspace} * \sim\text{inequality}^{13} + \\ & \text{fiscalspace} * \text{education} + \text{employment} * \text{education}. \end{aligned} \quad (6.2.2)$$

The solution consistency and coverage received 1 each. All of the three pathways to the solution have high consistency scores and non-zero coverage scores. The first pathway, *fiscalspace* \* *~inequality*, had consistency and coverage scores of 1 and 0.73, respectively. The second pathway, *fiscalspace* \* *education*, had consistency and coverage scores of 1 and 0.64, respectively. The final pathway, *employment* \* *education*, had consistency and coverage scores of 1 and 0.55, respectively. The necessity analysis in Section 6.1 shows robust set relationships with the coverage outcome, which indicates that fiscal space is key to coverage. This can be deduced from the first two pathways, which have the highest two coverage scores and where fiscal space is identified as a significant causal condition in combination with a

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<sup>13</sup> ~ Is a Boolean negation of the construct, *~inequality* is the opposite of inequality, as stated in Footnote 9.

lack of inequality and education, respectively. Of the 11 countries that exhibited a presence in coverage, only the USA had an absence of fiscal space.

**Table 6.5. Solutions for the truth table analysis of service coverage, with contextual factors as causal conditions.**

complex solution		
	consistency	coverage
expression: servicecoverage = fiscalspace*~inequality + fiscal*education + employment*inequality*education		
fiscalspace*~inequality	1	0.73
fiscalspace*education	1	0.64
employment*inequality*education	1	0.18
solution	1	1
parsimonious solution		
expression: servicecoverage= fiscalspace + education		
fiscalspace	1	0.91
education	1	0.73
solution	1	1
intermediate solution		
expression: servicecoverage = fiscalspace*~inequality + fiscalspace*education + employment*education		
fiscalspace*~inequality	1	0.73
fiscalspace*education	1	0.64
employment*education	1	0.55
solution	1	1

#### 6.2.1.4 Country Discussion: Service coverage, Evaluation 2

The USA's debt is considered to be unsustainable (The White House, 2010), with current values of over 97% of GDP as per 2015 (World Bank, 2017). Since 2010, the federal government has spent nearly 24% of GDP, with a tax-to-GDP ratio of approximately 15%, which equates to a budget deficit of approximately 9%. Healthcare is the largest contributor to the USA's fiscal challenges over the long term. Current projections state that healthcare spending will reach 20% of the country's GDP by 2023 (The White House, 2010). This can be attributed to the high inefficiencies that are prevalent in the healthcare system. Some of the sources of inefficiencies are administrative costs, unnecessary and inefficient services, overpricing, abuse, fraud, and a lack of focus on preventative measures. It is estimated that US\$765 billion is lost in the system, with the bulk (US\$360) arising from administration costs (Britnell, 2015a). Administrative costs are mainly due to the presence of multiple payers and providers in the system, which, in return, results in high transaction costs. Payers also predominantly make payments based on FFS, rather than value (Britnell, 2015a). However, the USA is able to cover approximately 37% of its vulnerable population through Medicare and Medicaid, which are public

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programmes for the elderly and low-income earners (Osborn & Sarnak, 2017). This has contributed to the observed population coverage coupled with insufficient fiscal space.

From Evaluation 1, it can be deduced that both pathways (*revenue raising* and *pooling \* purchasing*) had identical consistency and coverage scores. Further two QCA solutions were therefore determined by combining each of the conditions with the highest performing consistency and coverage scores in evaluation 1 with those in Evaluation 2. In Evaluation 2 it is evident that the pathway (*fiscal space \* ~inequality*), had the highest consistency and coverage scores, which were 1 and 0.73, respectively.

### 6.2.2 Coupling financial arrangements and contextual factors

In this section, financial arrangements are coupled with contextual factors, with service coverage as the outcome.

#### 6.2.2.1 Evaluation 3: Solutions for service coverage with revenue raising, fiscal space and inequality as causal conditions

The solutions for Evaluation 3 are shown in Table 6.6, and were obtained by applying the causal conditions (*revenue raising, fiscal space and inequality*). In this instance, the intermediate solution

$$\text{service coverage} = \text{revenue raising} + \text{fiscal space} * \sim \text{inequality}. \quad (6.2.3)$$

was selected, because the superior parameters of fit (consistency and coverage) were present.

This solution shows two different pathways leading to the outcome of service coverage. It is important to note that the existence of sources of revenues (which are represented by revenue raising and fiscal space), are fundamental to both pathways that lead to the presence of health service coverage.

**Table 6.6. Solutions for the truth table analysis of service coverage, with revenue raising, fiscal space and inequality as causal conditions.**

complex solution		
	consistency	coverage
expression: $servicecoverage = fiscalspace * \sim inequality + revenueraising * inequality$		
pathway terms:		
fiscalspace*~inequality	1	0.73
revenueraising*inequality	1	0.27
solution	1	1
parsimonious solution		
expression: $servicecoverage = revenueraising + fiscalspace$		
pathway terms:		
revenueraising	1	0.82
fiscalspace	1	0.91
solution	1	1
intermediate solution		
expression: $servicecoverage = revenueraising + fiscalspace * \sim inequality$		
revenueraising	1	0.82
fiscalspace*~inequality	1	0.73
solution	1	1

#### 6.2.2.2 Evaluation 4: Solutions for service coverage with pooling, purchasing, fiscal space and inequality as causal conditions

The solutions for Evaluation 4 are presented in Table 6.7. The conditions were pooling, purchasing, fiscalspace and inequality and yielded the following solution:

$$servicecoverage = fiscalspace * \sim inequality + pooling * purchasing * fiscalspace. \quad (6.2.4)$$

Note that the intermediate solution was selected because of its high consistency and coverage scores compared to the complex solution. From the solution in Equation (6.2.4), it is evident that fiscal space holds a necessity relationship with the outcome coverage. The consistency scores of 1 indicate that all of the cases on the two pathways also produced coverage. The results therefore suggest that fiscal space is a necessary condition for service coverage.

**Table 6.7. Solutions for the truth table analysis of coverage, with revenue raising, fiscal space and inequality as causal conditions.**

complex solution		
	consistency	coverage
expression: servicecoverage = pooling*purchasing*fiscalspace + ~pooling*~purchasing*fiscalspace*~inequality		
pathway terms:		
pooling*purchasing*fiscalspace	1	0.82
~pooling*~purchasing*fiscalspace*~inequality	1	0.091
solution	1	0.91
parsimonious solution		
expression: servicecoverage = fiscalspace		
pathway terms:		
fiscalspace	1	0.91
solution	1	1
intermediate solution		
expression: servicecoverage = fiscalspace*~inequality + pooling*purchasing*fiscalspace		
fiscalspace*~inequality	1	0.82
pooling*purchasing*fiscalspace	1	0.73
solution	1	1

### 6.2.2.3 Conclusion: Service coverage

It is evident from these results that revenue raising and fiscal space are the two crucial factors when improving service coverage in a health system. It is important to note that the pooling and purchasing functions have to be performed together in order to successfully achieve health service coverage, and they are only effective in the presence of good fiscal health. Another robust relationship that was identified, is the one between fiscal space and the lack of inequality, which is a driver of health coverage (as deduced from Evaluation 3 and 4). From both the parsimonious solutions (which contains the core conditions and combinations) and the results of the necessity analysis, it is evident that fiscal space is fundamental in achieving health service coverage. This can be deduced from Evaluation 4, where fiscal space holds a necessity relationship with the outcome. This is not, however, the case in the presence of other contextual factors, nor in the presence of revenue raising.

### 6.2.3 Quality of care

In this subsection, the pathways to quality of care when moving towards UHC is discussed and presented. Firstly, in order to arrive at a solution, financial arrangements were applied as causal conditions. Secondly, the contextual factors were applied as causal conditions. Thirdly, the conditions in the best-performing pathways (in terms of pathway consistency and coverage scores) were chosen for further analysis, following the logic set out in Figure 6.2.

Solutions were then obtained for these conditions, with the aim of investigating how contextual factors and financial arrangements interact in relation to quality.

### 6.2.3.1 Evaluation 5: Solutions for quality of care, with financial arrangements as causal conditions

The complex and intermediate solutions for pathways to quality of care, with financial arrangements as causal conditions were identical and is shown in Equation (6.2.5). The solution is identical to the solution for service coverage (discussed Evaluation 1).

$$\text{quality of care} = \text{revenue raising} + \text{pooling} * \text{purchasing}. \quad (6.2.5)$$

The solution consistency and coverage scores are shown in Table 6.8. The solution consistency score was accompanied by a solution coverage score of 0.22. Both solution pathways had consistency and coverage scores of 1 and 0.11, respectively. It is observed that, although the coverage scores are not trivial, they are rather low, which indicates Evaluation 5's solution has a low empirical importance and/or relevance. This will be clarified in subsequent parts of this section, with the introduction of contextual factors as causal conditions.

**Table 6.8. Solution for quality of care, with financial arrangements (revenue raising, pooling and purchasing) as causal conditions.**

complex solution		
	consistency	coverage
expression: quality of care = pooling*purchasing + revenue raising		
pathway terms:		
pooling*purchasing	1	0.11
revenue raising	1	0.11
solution	1	0.22
parsimonious solution		
expression: quality of care = revenue raising + pooling + purchasing		
pathway terms:		
revenue raising	1	0.11
pooling	1	0.11
purchasing	1	0.11
solution	1	0.22
intermediate solution		
expression: quality of care = pooling*purchasing + revenue raising		
pooling*purchasing	1	0.11
revenue raising	1	0.11
solution	1	0.22

### 6.2.3.2 Evaluation 6: Solutions for quality of care, with contextual factors as causal conditions

The solution pathway with contextual factors as causal conditions is shown in Table 6.9. In this instance, the intermediate solution was selected due to the presence of superior, consistency and coverage scores, and the solution was:

$$\text{quality of care} = \text{employment} * \sim\text{inequality} + \text{employment} * \text{education}. \quad (6.2.6)$$

**Table 6.9. Solutions for quality of care as the outcome, with contextual factors as causal conditions.**

complex solution		
	consistency	coverage
expression: quality of care = fiscalspace*employment*education + employment*inequality*education + employment*~inequality		
pathway terms:		
fiscalspace*employment*education	0.8	0.44
employment*inequality*education	1	0.22
employment*~education	1	0.33
solution	0.89	0.89
parsimonious solution		
expression: quality of care = employment*~inequality + employment*education		
pathway terms:		
employment*~inequality	0.86	0.67
employment*education	0.83	0.56
solution	0.89	0.89
intermediate solution		
expression: quality of care= employment*~inequality + employment*education		
employment*~inequality	0.86	0.67
employment*education	0.83	0.56
solution	0.89	0.89

### 6.2.3.3 Country discussion: Quality of care

The analysis shows that employment has a necessity relationship with quality of care, as it is present in all of the pathways to quality. This is also evident in the necessity analysis presented in Section 6.1. In the case of necessity, the threshold for consistency scores should be greater or equal to 0.90. The outlier cases are Armenia, Cambodia and Germany. Armenia revealed an absence of employment and a presence of quality, whereas Cambodia and Germany displayed employment and a lack of good quality care. This can be deduced from the set memberships presented in Table 5.44 in Section 5.5.

As indicted in the Section 6.2.1, Armenia has a significant informal sector (Richardson, 2013), which partly explains the low employment rates. A contributor to quality of care in the country is the prevalence of the private healthcare sector, which is regarded superior to the

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public healthcare sector in Armenia in terms of quality of care. As of 2009, private expenditure was 1.2 times higher than public expenditure. In 2011, co-payments were introduced for health services, with the purpose of increasing salaries for health workers and investing in the improvement of the quality of care. However, the bulk of the Armenian population are unable to pay the co-payments (Richardson, 2013).

The low quality of care levels in Germany can be attributed to the corporatism culture in the health system (Britnell, 2015a), which provides 11% of all the employment in the country. There is no competition between providers and sickness funds in the health system. The private sector merely covers 12% of the population, meaning that it provides little to no competition for the public sector. This lack of competition is one of the main reasons for the low health quality levels in Germany's health system (Britnell, 2015a).

The poor quality of care in the Cambodian health system can be attributed to numerous causes that range from poor infrastructure, a lack of quality equipment, low levels of competences for health providers and insufficient medical supplies (Annear *et al.*, 2015). The issues with quality are present in both the private and public sectors. The shortage of adequate clinical skills are evident amongst medical staff in Cambodia (World Bank, 2014), specifically amongst staff who are aged between 45 and 60 (Annear *et al.*, 2015). Approximately 50% of the health providers in the rural areas of Cambodia are informal. Approximately 66% of the population receive primary care through private providers, but there have been quality concerns regarding, for example, incorrect prescriptions and injections (Annear *et al.*, 2015).

### 6.2.4 Coupling financial arrangements and contextual factors

In this section, financial arrangements are coupled with contextual factors, with quality of care as the outcome.

#### 6.2.4.1 Evaluation 7: Solutions for quality of care, with employment, revenue raising and inequality as causal conditions

Subsequently, further analysis was conducted by assessing the relationships between the conditions from high-performing pathways identified in the solutions that were presented in Evaluation 5 and 6. In other words, the solutions where financial arrangements and contextual factors were causal conditions. It can be deduced from Evaluation 5 that both pathways (*revenue raising and pooling \* purchasing*) had identical consistency and coverage scores, and therefore two QCA solutions were determined by combining each of the solutions with

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the highest performing causal pathways in the solution in Evaluation 6. The first iteration was with the revenue raising performing pathway ( $employment * \sim inequality$ ), which had a consistency score of 0.86 and a coverage score of 0.67 and led to the solution in Table 6.10. The intermediate solution was chosen, because superior consistency and coverage scores were present, and is as follows:

$$\begin{aligned} quality\ of\ care &= employment * \sim inequality \\ &+revenue\ raising * employment * inequality. \end{aligned} \quad (6.2.7)$$

In Table 6.10, it is evident that all of the solutions score the same across consistency and coverage. Both solution pathways have consistency scores of 1. The coverage scores are 0.33 and 0.22, respectively. The overall solution consistency and coverage scores are 1 and 0.55 respectively. The solution suggests that employment is necessary for quality, because it is present in both causal pathways. This result can be attributed to the fact that, when the population is employed, it increases the ability of the population to contribute towards healthcare.

**Table 6.10. Solutions for the quality outcome with revenue raising, employment and inequality as causal conditions.**

complex solution		
	consistency	coverage
expression: $quality = employment * \sim inequality + revenue\ raising * employment * inequality$		
pathway terms:		
employment*~inequality	1	0.33
revenue\ raising*employment*inequality	1	0.22
solution	1	0.55
parsimonious solution		
Expression: $quality = employment * \sim inequality + revenue\ raising * employment * inequality$		
Pathway terms:		
employment*~inequality	1	0.33
revenue\ raising*employment*inequality	1	0.22
solution	1	0.55
intermediate solution		
expression: $quality = employment * \sim inequality + revenue\ raising * employment * inequality$		
employment*~inequality	1	0.33
revenue\ raising*employment*inequality	1	0.22
solution	1	0.55

### 6.2.4.2 Evaluation 8: Solution for quality of care, with employment, inequality, pooling and purchasing as causal conditions

The second iteration was conducted with pooling, purchasing, fiscal space and inequality as causal conditions. The resulting solutions are shown in Table 6.11. In this instance, the

intermediate solution was considered, because superior consistency and coverage scores were present, and is as follows:

$$\begin{aligned} \text{quality of care} = & \text{employment} * \sim \text{inequality} + \\ & \text{pooling} * \text{purchasing} * \text{employment}. \end{aligned} \quad (6.2.8)$$

As indicated, employment, again, holds a necessity relationship.

**Table 6.11. Solutions for quality, with pooling, purchasing, employment and inequality as causal conditions.**

complex solution		
	consistency	coverage
expression: quality of care = pooling*purchasing*employment + ~pooling*~purchasing*employment*~inequality		
pathway terms:		
pooling*purchasing*employment	0.83	0.56
~pooling*~purchasing*employment*~inequality	1	0.22
solution	0.88	0.78
parsimonious solution		
expression: quality of care= employment*~inequality + pooling*employment + purchasing*employment		
pathway terms:		
employment*~inequality	0.86	0.67
pooling*employment	0.83	0.56
purchasing*employment	0.83	0.56
solution	0.88	0.78
intermediate solution		
expression: quality of care = employment*~inequality + pooling*purchasing*employment		
employment*~inequality	0.86	0.67
pooling*purchasing*employment	0.83	0.56
solution	0.88	0.78

### 6.2.4.3 Conclusion: Quality of care

In conclusion, the results indicate that employment is an important determinant of the quality of health services. Employment has important interactions with the financial arrangement to promote quality of health services. This evident in Evaluations 7 and 8. From these findings, it could be concluded that employment is necessary for quality of healthcare. However, from the necessity analysis, it is evident that the consistency score for employment was 0.89, which is lower than the threshold of 0.9 for necessity. Nevertheless, these findings demonstrate the importance of employment to quality of care, as it is the driver for revenue raising, the capacity for pooling and the purchasing function, as revenues mainly originate from taxes. Employment increases the tax base. It is also important to note the relationship between employment and the lack of inequality. Again, this can be explained by considering

the broadening of the revenue source base, as a lack of inequality suggests that more people are able to contribute to prepaid revenue.

### 6.2.5 Financial protection

In this subsection, the results from the analysis of causal pathways to financial protection are discussed. As with the analysis relating to the service coverage and quality of care outcomes, the criteria that are outlined in Figure 6.2 were followed. Firstly, to obtain a solution, financial arrangements were applied as causal conditions. Secondly, the contextual factors were applied as causal conditions. Thirdly, the conditions in the best-performing pathways (in terms of pathway consistency and coverage scores) were selected for further analysis. Solutions were then obtained for these conditions, with the aim of investigating how contextual factors and financial arrangements interact in relation to financial protection.

#### 6.2.5.1 Evaluation 9: Solutions for financial protection, with financial arrangements as causal conditions

The solution for pathways to financial protection with financial arrangements as causal conditions is the same as the one for coverage:

$$\textit{financial protection} = \textit{revenueraising} + \textit{pooling} * \textit{purchasing}. \quad (6.2.9)$$

In this instance, the complex and the intermediate solutions were identical, with differences in the consistency and coverage scores for the individual solution pathways (as presented in Table 6.12). The consistency score for the pathway for the complex solution (pooling \* purchasing) is 0.89, with a coverage score of 0.89. The other pathway is revenueraising, with a consistency score of 1 and coverage score of 0.11. The coverage scores for both solutions are not trivial, although the revenueraising pathway scores low. The results show that a country can either put emphasis on pooling adequate revenues or on strengthening their risk pooling and purchasing functions in order to achieve financial protection. Again, the solution suggests that good revenue raising is sufficient, but not necessary for coverage, as it is capable of leading to coverage, although it is not the only cause that can guarantee the outcome. From the necessity analysis in Section 6.1, it can be deduced that all of the causal conditions considered in this study have strong set relationships with financial protection, as evident from the consistency scores that exceed 0.75.

**Table 6.12. Solutions for financial protection with financial arrangements as causal conditions.**

complex solution		
	consistency	coverage
expression: financial protection = pooling* purchasing + revenue raising		
pathway terms:		
pooling* purchasing	0.89	0.89
revenue raising	1	0.89
solution	1	0.9
parsimonious solution		
expression: financial protection = revenue raising + pooling + purchasing		
pathway terms:		
revenue raising	0.89	0.89
pooling	0.89	0.89
purchasing	0.89	0.89
solution	1	0.9
intermediate solution		
expression: financial protection = pooling* purchasing + revenue raising		
pooling* purchasing	0.89	0.89
revenue raising	0.89	0.89
solution	1	0.9

### 6.2.5.2 Country Discussion: Solutions for financial protection, Evaluation 9

Of the 17 countries discussed/selected in Chapter 5, 9<sup>14</sup> showed the presence of the sufficient condition of revenue raising. Only Botswana had good revenue raising but did not have the presence of financial protection. The Republic of Korea had an absence of revenue raising, but a presence of financial protection. Only Botswana had the presence of both pooling and purchasing, but did not achieve financial protection. Lastly, the USA had the presence of financial protection, with an absence of both pooling and purchasing.

Botswana has made significant progress towards UHC, which is evident from the promotion of Private Health Insurance (PHI) (*Health Policy Project, 2016b*). The country spends over 17% of its annual budget on healthcare, which is more than the Abuja target of 15%. About 84% of the country live within 5km radius from health centres (Mbogo & McGill, 2016). However, the public sector still dominates the healthcare system. Access to quality care has been slow in the country's rural areas (*Health Policy Project, 2016b*). Low levels of OOPs (about 4.2%) in the health system raise red flags for the utilisation of health services that are pro-rich, as less fortunate individuals might not seek care because they lack the financial means to do so. The bulk of the population in Botswana rely on the public system and only 17% of the population

<sup>14</sup> Australia, Czech Republic, Croatia, Italy, Thailand, Germany, United States of America, Canada and the Republic of Korea.

have coverage from PHIs. The government, however, spends the finances unequally: Approximately 53% of the government's expenditure on health is allocated to curative care. This leaves the poor population vulnerable to the lack of financial protection because other healthcare needs are less catered for. This issue originates from not addressing the WHO's three-dimensional UHC conceptual goals as discussed in Section 2.1.4. In sub-Saharan Africa, only Rwanda and Ghana have incorporated the conceptual goals in their designs towards UHC (Mbogo & McGill, 2016).

The presence of financial protection without "good" revenue raising for the Republic of Korea can be attributed to the reasons articulated in Section 6.2.1.

Through its public programmes for the elderly and low income earners, Medicare and Medicaid, the USA covers approximately 37% of its vulnerable population. Medicare covers services that include hospitalisation, prescription drugs and physician services (Osborn & Sarnak, 2017). This sheds light on the presence of some level of financial protection in the country despite weak pooling and purchasing arrangements.

### 6.2.5.3 Evaluation 10: Solutions for financial protection, with contextual factors as causal conditions

As indicated in Table 6.13, the complex and the intermediate solutions for financial protection are identical when only contextual factors were considered as causal conditions:

$$\begin{aligned} \text{financialprotection} = & \text{fiscalspace} * \text{employment} * \sim\text{inequality} + \\ & \text{fiscalspace} * \sim\text{inequality} * \text{education} + \\ & \text{employment} * \text{inequality} * \text{education}. \end{aligned} \quad (6.2.10)$$

The solution has consistency and coverage scores of 1 and 0.89 (as shown in Table 6.13). The table also shows the consistency and coverage scores for all of the pathways to financial protection. The importance of fiscal space is highlighted by its presence in two of the causal pathways in combination with a lack of ~inequality and education, which has the highest coverage scores of 0.56, respectively. Thailand and the USA have high inequalities, but also have financial protection. In the case of the USA, this can be credited to Medicare and Medicaid (discussed in the preceding section), which offer protection to the poor and elderly.

**Table 6.13. Solutions for financial protection as the outcome, with contextual factors as causal conditions.**

complex solution		
	consistency	coverage
expression: financial protection = fiscalspace*employment*~inequality + fiscalspace*~inequality*education + employment*inequality*education		
pathway terms:		
fiscalspace*employment*~inequality	1	0.56
fiscalspace*~inequality*education	1	0.56
employment*inequality*education	1	0.22
Solution	1	0.89
parsimonious solution		
expression: financial protection = ~inequality*education + fiscalspace*employment + employment*education		
pathway terms:		
~inequality*education	1	0.56
fiscalspace*employment	1	0.66
employment*education	1	0.66
solution	1	0.89
intermediate solution		
expression: financial protection = fiscalspace*employment*~inequality + fiscalspace*~inequality*education + employment*inequality*education		
pathway terms:		
fiscalspace*employment*~inequality	1	0.56
fiscalspace*~inequality*education	1	0.56
employment*inequality*education	1	0.22
solution	1	0.89

#### 6.2.5.4 Country Discussion: Financial protection, Evaluation 10

Thailand experiences challenges with poverty and income inequality (Asian Development Bank, 2011). The country has, however, made significant efforts to alleviate poverty, reducing it from over 33% in 1988 to approximately 9% as of 2008. 40% of the poorest of the Thai population are concentrated in the country's northeastern regions. The wealthiest 20% of the country earn approximately 50% of the total household income in Thailand and own approximately 70% of the country's financial assets. There are also inter-regional inequalities in the country, with approximately 90% of the poor population residing in rural areas. Poor Thai households tend to be engaged in the informal sector, where there is no real growth in terms of earnings. In contrast, those in the formal sector enjoy sustained growth in earnings (Asian Development Bank, 2011). Thailand has, however, made significant strides in improving their health system. This can be credited to the existence of commitment and continuity in the health system, amongst other factors. The country has had nine consecutive five-year health plans, led by charismatic leaders, highly influential technocrats and leaders in the medical field. This sustained vision had its roots in improving health for the poor in the

society. This implies a focus on the poor, rural communities in the country. Examples of such efforts include the Royal Health projects, which focussed on rural development in healthcare and other sectors (Patcharanarumol *et al.*, 2011).

A number of deliberate and continued policies were implemented in Thailand with regards to financial protection in the healthcare system. The first, which was implemented in 1975, was waiving user fees for low-income groups. This was a tax-based public system and later extended to other population groups, such as people with disabilities, children under 12 and the elderly. In 1984, those in the informal sectors could obtain health insurance through CBHI schemes, which were later developed into a VHI scheme. In 1991, this was followed by the creation of a compulsory SHI for private sector employees and employers, which the government also contributed towards. Although the country still suffers from inequalities, the government has made efforts to improve financial protection for its citizens, which explains the simultaneous presence of inequality and financial protection (Patcharanarumol *et al.*, 2011).

Further analysis was then conducted by assessing the relationships between the conditions from high-performing pathways between the first and second solutions, which are the solutions where financial arrangements were causal conditions and contextual factors were causal conditions. From the solutions in Evaluations 9 and 10, it is evident that both pathways (*revenue raising and pooling \* purchasing*) had identical consistency and coverage scores of 0.89. It can also be deduced that the solution pathways (*fiscal space \* ~employment \* ~inequality*) and (*fiscal space \* ~inequality \* education*) had identical consistency and coverage scores of 1 and 0.56, respectively.

Four further solutions were obtained by combining the highest-performing pathways in Evaluation 9 and 10, as stated above.

#### **6.2.5.5 Evaluation 11: Solutions for financial protection, with revenue raising, employment, inequality and fiscal space**

In the first solution revenue raising, fiscal space, employment and inequality were the causal conditions, as presented in Table 6.14. The intermediate solution was selected, because it revealed superior coverage scores for individual solution pathways. This solution is presented in Equation (6.2.11).

$$\begin{aligned}
 \text{financialprotection} = & \text{revenueraising} * \text{employment} + \\
 & \text{revenueraising} * \text{fiscalspace} * \sim\text{inequality} + \\
 & \text{fiscalspace} * \text{employment} * \sim\text{inequality}.
 \end{aligned}
 \tag{6.2.11}$$

From observing Equation (6.2.11) and Table 6.14, it is evident that revenue raising is present in two of the three pathways. In this instance, consistency values were not considered, because all of the pathways have optimal consistency values. Firstly, it is important to note that, in as much as revenue raising is an important condition, it cannot produce financial protection alone: It needs to exist in combination with other conditions. In the first pathway, revenue raising is combined with employment, whereas in the second pathway it is combined with both fiscal space and the absence of inequality. Both of these solutions highlight the importance of sources of revenue for successful revenue raising. It can be observed that none of the conditions, or combinations thereof, are necessary nor sufficient in producing financial protection. A condition is necessary if it has to be present for the outcome to occur. Sufficiency implies that a condition is capable of producing the outcome by itself.

**Table 6.14. Solutions for financial protection, with revenue raising, fiscal space, inequality and employment as causal conditions.**

complex solution		
	consistency	coverage
expression: financial protection = $\text{revenueraising} * \text{fiscalspace} * \sim\text{inequality} + \text{fiscalspace} * \text{employment} * \sim\text{inequality} + \text{revenueraising} * \text{employment} * \text{inequality}$		
pathway terms:		
$\text{revenueraising} * \text{fiscalspace} * \sim\text{inequality}$	1	0.67
$\text{fiscalspace} * \text{employment} * \sim\text{inequality}$	1	0.56
$\text{revenueraising} * \text{employment} * \text{inequality}$	1	0.22
solution	1	1
parsimonious solution		
expression: financial protection = $\text{revenueraising} * \sim\text{inequality} + \text{fiscalspace} * \text{employment} + \text{revenueraising} * \sim\text{fiscalspace} + \text{revenueraising} * \text{employment}$		
pathway terms:		
$\text{revenueraising} * \sim\text{inequality}$	1	0.67
$\text{fiscalspace} * \text{employment}$	1	0.67
$\text{revenueraising} * \sim\text{fiscalspace}$	1	0.11
$\text{revenueraising} * \text{employment}$	1	0.67
solution	1	1
intermediate solution		
expression: financial protection = $\text{revenueraising} * \text{employment} + \text{revenueraising} * \text{fiscalspace} * \sim\text{inequality} + \text{fiscalspace} * \text{employment} * \sim\text{inequality}$		
pathway terms:		
$\text{revenueraising} * \text{employment}$	1	0.67
$\text{revenueraising} * \text{fiscalspace} * \sim\text{inequality}$	1	0.67
$\text{fiscalspace} * \text{employment} * \sim\text{inequality}$	1	0.55
solution	1	1

### 6.2.5.6 Evaluation 12: Solutions for financial protection, with revenue raising, fiscal space, inequality and education as causal conditions.

The second solution was between revenue raising, fiscal space, inequality and education:

$$\begin{aligned} \text{financial protection} = & \text{revenue raising} * \text{fiscal space} * \sim \text{inequality} + \\ & \text{revenue raising} * \text{education} + \text{fiscal space} * \text{education} * \sim \text{inequality}. \end{aligned} \quad (6.2.12)$$

Equation (6.2.12) and Table 6.15 reveal that the two best-performing pathways are (*revenue raising \* fiscal space \* ~inequality*) and (*fiscal space \* ~inequality \* education*). Both has consistency scores of 1 and coverage scores of 0.67 and 0.57, respectively. An interesting observation is the combination of fiscal space and the lack of inequality. This combination is consistent with both Equation (6.2.11) and (6.2.12). Again, no condition is necessary or sufficient to produce financial protection. A condition is necessary if it has to be present for the outcome to occur. Sufficiency implies that a condition is capable of producing the outcome.

**Table 6.15. Solutions for financial protection, with revenue raising, fiscal space, inequality and education as causal conditions.**

complex solution		
	consistency	coverage
expression: financial protection = revenue raising*fiscal space*~inequality + fiscal space*~inequality*education + revenue raising*~fiscal space*inequality*education		
pathway terms:		
revenue raising*fiscal space*~inequality	1	0.67
fiscal space*~inequality*education	1	0.56
revenue raising*~fiscal space*inequality*education	1	0.11
solution	1	0.89
parsimonious solution		
expression: financial protection = revenue raising*~inequality + ~inequality*education + revenue raising*fiscal space		
pathway terms:		
revenue raising*~inequality	1	0.67
~inequality*education	1	0.56
revenue raising*~fiscal space	1	0.11
solution	1	1
intermediate solution		
expression: financial protection = revenue raising*fiscal space*~inequality + revenue raising*~fiscal space*education + fiscal space*~inequality*education		
pathway terms:		
revenue raising*fiscal space*~inequality	1	0.67
revenue raising*~fiscal space*education	1	0.11
fiscal space*~inequality*education	1	0.56
solution	1	0.89

### 6.2.6 Coupling financial arrangements and contextual factors

In order to arrive at the third and fourth solutions, the pathways in the parsimonious solution from Table 6.13 were selected. This was because the number of conditions if the complex and intermediate solutions are chosen, surpass the threshold for the QCA with five conditions being taken into consideration. To clarify, the solutions in Evaluation 13 and 14 are as a result of the (*pooling \* purchasing*) pathway from Equation (6.2.9) under Evaluation 9 and the (*fiscalspace \* employment \* ~inequality*) and (*fiscalspace \* ~inequality \* education*) pathways from Evaluation 10, presented in Equation (6.2.10). It can be observed that the number of causal conditions would surpass the threshold, given the number of cases in the study.

The study considers 17 cases, meaning that only a maximum of 4 conditions (resulting in  $2^4 = 16$ , possible configurations) can feasibly be considered. If 5 conditions were applied, then a minimum of  $2^5 = 32$  cases would be required. Each pathway in the parsimonious solution holds a maximum of two conditions. This means that a total of four possible configurations are considered, which is comfortably within the allowable range of conditions when using seventeen cases, as in this study.

The solutions that were obtained from combining financial arrangements and contextual factors as causal conditions are displayed in Table 6.16 and Table 6.17.

#### 6.2.6.1 Evaluation 13: Solutions for financial protection, with pooling, purchasing, fiscal space and employment

As presented in Table 6.16, the complex and the intermediate solutions are identical. The complex solution is:

$$\textit{financial protection} = \textit{pooling} * \textit{purchasing} * \textit{fiscalspace} * \textit{employment}. \quad (6.2.13)$$

When observing the solution presented in Equation (6.2.13) and Table 6.16, only one pathway is evident. This highlights the dependence of pooling and purchasing on fiscal space and employment, as they are the sources of healthcare revenues. Once again, none of the causal conditions are necessary or sufficient for financial protection.

**Table 6.16. Solutions for financial protection, with pooling, purchasing, fiscal space and employment as causal conditions.**

complex solution		
	Consistency	Coverage
expression: financial protection = pooling*purchasing*fiscalspace*employment		
pathway terms:		
pooling*purchasing*fiscalspace*employment	1	0.67
solution	1	0.67
parsimonious solution		
expression: financial protection = pooling*~inequality + purchasing*~inequality + pooling*employment + purchasing*employment		
pathway terms:		
pooling*employment	1	0.67
purchasing*employment	1	0.67
fiscalspace*employment	1	0.67
solution	1	0.67
intermediate solution		
expression: financial protection = pooling*purchasing*fiscalspace*employment		
pathway terms:		
pooling*purchasing*fiscalspace*employment	1	0.67
solution	1	0.67

#### 6.2.6.2 Evaluation 14: Solutions for financial protection, with pooling, purchasing, employment and education as causal conditions

The fourth and final solution indicates pooling, purchasing, employment and education as causal conditions. This is presented in Table 6.17 and the complex solution is presented in Equation (6.2.14).

$$\begin{aligned}
 \text{financial protection} = & \text{pooling} * \text{purchasing} + \\
 & \text{pooling} * \text{purchasing} * \text{employment} + \\
 & \text{employment} * \text{education}.
 \end{aligned}
 \tag{6.2.14}$$

Equation (6.2.14) indicates that there are three pathways. All of the solution pathways have consistency scores of 1, but, as indicated in Table 6.17, the (pooling \* purchasing \* employment) pathway scored the highest coverage at 0.67. This solution is therefore empirically more significant than the (pooling \* purchasing) and the (employment \* education) pathways, which have relatively low coverage values of 0.22 and 0.11, respectively. It is, however, important to note the close relationship between pooling and purchasing, as these causal conditions always exist in combination with one another to achieve the financial protection outcome. This relationship is also articulated in Chapter 4, Section 4.3.2 and 4.3.3. When comparing the (pooling \* purchasing) and the (pooling \* purchasing \* employment)

pathways according to coverage scores, it is evident that the pooling and purchasing fiscal conditions must exist in combination with another causal condition that guarantees a source of revenue. In this instance, employment guarantees a source of revenue, because the population have a relative ability to prepay for healthcare. This phenomenon can also be observed in Equation (6.2.13), where pooling and purchasing exist in combination with both fiscal space and employment.

**Table 6.17. Solutions for financial protection, with pooling, purchasing, employment and education as causal conditions.**

complex solution		
	consistency	coverage
expression: financial protection = pooling*purchasing*~education + pooling*purchasing*employment + employment*education		
pathway terms:		
pooling*purchasing	1	0.22
pooling*purchasing*employment	1	0.67
employment*education	1	0.11
solution	1	0.89
Parsimonious solution		
Expression: financial protection = employment*education + pooling + purchasing		
Pathway terms:		
employment*education	1	0.67
pooling	1	0.22
purchasing	1	0.22
Solution	1	0.89
intermediate solution		
Expression: financial protection = employment*education + pooling*purchasing		
Pathway terms:		
employment*education	1	0.67
pooling*purchasing	1	0.22
solution	1	0.89

### 6.2.6.3 Conclusion: Financial protection

In conclusion, no condition is necessary nor sufficient to produce financial protection. To succeed, the health system's financial arrangements must exist in combination with conditions that guarantee sources of revenue. This explains the importance of good fiscal space and the availability of employment in a country when it comes to ensuring financial protection. Furthermore, an interesting combination was that of fiscal space and the absence of inequality. According to Odusola (2017), fiscal policies are vital to the reduction of poverty and inequality, because they influence taxes, government spending and transfers. Odusola (2017) further states that fiscal space, alone, has led to approximately 16.5% of the poverty reduction in Africa. His work is based on the initial work of Kuznets (1955), which theorises

that the early stages of economic growth promote inequality and eventually close the inequality gap.

### 6.3 Discussion

The first theme that originates from the results is that, although it is important to have good financial arrangements (revenue raising, pooling and purchasing) in the healthcare system, they need to be supported by the broader contextual factors that are not part of the healthcare system. In the case of all three of the outcomes investigated in this study, when only financial arrangements were taken as causal conditions, the solution that emerged was:

$$\text{outcome}^{15} = \text{revenue raising} + \text{pooling} * \text{purchasing}. \quad (6.2.15)$$

The results suggest that revenue raising (amongst the financial arrangements) is sufficient for coverage, quality and financial protection. From this, it can also be concluded that pooling and purchasing should exist in combination to achieve each of the three UHC goals. Countries that had the presence of revenue raising, also had strong public investment in healthcare, with values ranging from 55%-84% of THE. The only exception to this was the USA, which invests 48%. UHC financing is highly dependent on the level of public health spending (Smith, 2013; Abihiro & De Allegri, 2015), because public sources of health revenues are prepaid.

Coupling the financial arrangements and contextual factors in which the health system operates as potential causal conditions, brings more insight as to how the country's context affects the outcomes.

In broader strokes, the level of prepayment and the capacity to do so, were key drivers of coverage, quality and financial protection. Although the presence of revenue raising, alone, was sufficient to achieve coverage according to Equation (6.2.5), the results show that fiscal space also plays an important role in achieving population coverage. Employment is a key factor in achieving quality of care, as highlighted in Equations (6.2.6), (6.2.7) and (6.2.8). Employment is present in each of the pathways to achieving good quality care, suggesting that it is a sufficient condition. No conditions were neither sufficient nor necessary in achieving financial protection, but the results show that the capacity to raise health revenues through high employment and fiscal capacity coupled with good financial arrangements, are key

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<sup>15</sup> The word outcome was used to represent all the three outcomes investigated in the study—service coverage, quality of care and financial protection.

## Chapter 6

drivers of financial protection. Financial arrangements alone are not adequate in achieving financial protection: Success is achieved when they are coupled with contextual factors that guarantee sources of finance. Countries with high public spending on healthcare performed well with regards to financial protection. This can be attributed to the presence of mandatory revenues and the fact that public risk pools are sustainably large and diverse enough to promote adequate cross-subsidisation amongst different groups.

## Chapter 7 CONCLUSIONS AND RECOMMENDATIONS

In this concluding chapter, a concise summary of the research conducted throughout this study is presented, including: (i) a revision of the stated objectives; (ii) how such objectives were addressed; and (iii) an overview of the key findings. The limitations of this study are highlighted, and the chapter concludes with recommendations for future continuation of this research topic.

### 7.1 Research summary

The aim of this research inquiry was to identify causal pathways in the UHC financing landscape and their relationships with specific UHC goals. To achieve this aim, Objectives 1 to 5 listed in Chapter 1 were addressed as discussed in the following paragraphs.

In Chapter 2, a literature study was conducted in order to gain an understanding of the properties of UHC. This unearthed the key dimensions embedded in the conceptual definition of UHC namely: (i) UHC as the right to healthcare; (ii) UHC as access to healthcare; (iii) UHC as universal coverage; and (iv) UHC as financial protection. Along with these key dimensions of UHC, the key contextual factors that affect UHC were also identified. The contextual factors identified are deeply rooted in the social determinants of health and health care service provision; the identified contextual factors include: (i) governance; (ii) employment; (iii) inequality; and (iv) fiscal context. When considering the social determinants of health, the WHO (2017) states that: *‘The social determinants of health are the conditions in which people are born, grow, live, work and age. These circumstances are shaped by the distribution of money, power, and resources at global, national and local levels’*. The identification of the key dimensions of UHC and the identification of contextual factors that are likely to impact UHC was preceded by a discussion of health systems and the concept of UHC in general. Key considerations for methodology selection when assessing causality in the UHC landscape were also defined. The required characteristics and functionalities that the method of choice should have include: (i) capture multiple causal linkages between contextual factors influencing the UHC landscape and respective outputs; (ii) be deeply embedded in the context for a richer understanding of causal linkages; (iii) offer a systematic approach that is repeatable and reproducible to instil confidence in the findings; (iv) view causality from

multiple perspectives (quantitative and qualitative) to enrich understanding of the phenomena (v) identify necessary and sufficient conditions for UHC; (vi) be transparent and adhere to current knowledge; and (vii) allow for counterfactual analysis. Objective 1 of this research inquiry was thus addressed in Chapter 2. Objective 1 was to review literature on UHC in order to develop a clear understanding of the construct and to identify the key requirements for causality assessment in the context of UHC.

The requirement specifications that was developed in Chapter 2 was subsequently used to guide the method selection process, and to ultimately select an appropriate method for causality assessment in this research. The method analysis and selection process is discussed in Chapter 3, addressing Objective 2 (to identify methods and approaches for establishing complex causality and select an appropriate method for application in this research). The three key research approaches, namely (i) qualitative-, (ii) quantitative-, and (iii) mixed method approaches, were explored in order to evaluate the applicability of each approach with reference to the requirements specification defined in Chapter 2. The mixed method approach, in general, and comparative methods in particular, were deemed most appropriate. Qualitative Comparative Analysis (QCA) and Mill's methods are the two most prominent, formalised comparative methods available. Based on the method requirement specifications, QCA was deemed the most appropriate method to assess causality in this research. Specifically, the crisp-set variant of QCA (csQCA), because of its dichotomous nature, this was favourable because both qualitative and quantitative indicators were used in the study. Hence csQCA is more favourable when calibrating qualitative data. A QCA analysis is conducted in three stages, namely: (i) design; (ii) conditioning; and (iii) analysis. Following the comprehensive discussion of QCA and csQCA, these QCA stages were systematically executed in Chapters 4, 5 and 6.

In Chapter 4, the outcomes and conditions (variables) of the study were identified, with the aim of identifying the indicators to measure each of the outcomes and conditions. The chapter thus addressed part of the design stage of the QCA process. The three outcomes identified as part of the UHC goals, and as defined by the WHO, include (i) utilisation/need; (ii) quality of care; and (iii) financial protection. The conditions (variables) that were identified comprised of (i) health financial arrangements; and (ii) contextual factors affecting UHC. The health financial arrangements are (i) revenue raising; (ii) pooling; (iii) purchasing; and (iv) benefits

design. The contextual factors stemmed from the factors identified through the semi-structured literature review conducted in Chapter 2; the identified contextual factors include: (i) the fiscal context; (ii) the structure of public administration; (iii) the public sector financial management; (iv) education; (v) employment; (vi) poverty; and (vii) inequality. Indicators for each variable (i.e. conditions and outcomes) were then identified, based on the definition of each outcome, and on the indicators reported by international organisations such as the World Bank and the WHO. Due to the lack of comprehensive indicators for the utilisation/need outcome, this outcome was replaced with health service coverage. The contextual factors (i) structure of public administration; (ii) public sector financial management; (iii) poverty and (iv) one health financial arrangement factor (benefits design), were also excluded from the study, due to a lack of comprehensive, publically available information. Objectives 3 and 4 (a, b and c); of the study were addressed in Chapter 4. Objective 3 was to identify UHC goals and indicators that can be used to assess performance in terms of these goals. With Objective 4 being to identify factors that shape the UHC financing landscape as well as contextual factors that affect UHC, including indicators that measure each factor.

The last part of the of the design phase of the QCA and part of the conditioning stages were conducted in Chapter 5, Objectives 3(d) and 4(d) were addressed in this chapter, these were to collect and sort relevant data for each indicator based on the requirements of the method selected. Firstly, data for the for each of the conditions and outcomes was collected. A total of 17 countries were subsequently selected as cases for the study based on data availability and a focus on a mix of 'poor' and 'high' performing cases as per QCA requirements. Australia, Botswana, Cameroon, Croatia, Czech Republic, Haiti, India, Italy, Thailand, Nigeria, Bangladesh, Cambodia, Germany, the Republic of Korea, Armenia, the United States of America and Canada were the selected cases for the study. Composite indices were then created for each of the conditions and outcomes identified. The composite indices were then calibrated to form membership scores for csQCA, with binary '0' representing minimal membership and '1' representing full membership.

The last parts of the conditioning phases of QCA and the analysis steps were conducted in Chapter 6, addressed Objective 5 of the study. Objective 5 was to identify causal linkages between factors that shape UHC financing landscape and contextual factors that affect UHC.

In Chapter 6, the causal pathways to the UHC outcomes were identified with the aid of the fs/QCA software. In keeping with the mixed methods approach employed in this research, the quantitative results obtained from the analysis were interpreted. The results indicated key policy considerations for countries when moving towards UHC. No single conditions were necessary nor sufficient to achieve the UHC goals. The overarching findings are that both contextual factors outside the jurisdiction of the health system and prepayment towards healthcare, play an integral role when moving towards UHC. In addition, the analysis found that only addressing health financial arrangements (which form part of the health system) is not sufficient for achieving UHC. Factors outside the health system play a driving role in achieving UHC. For health service coverage, fiscal space and the absence of inequality along with the health financing arrangements are central to achieving health service coverage. Employment, which illustrates the availability of revenue sources is a key component to achieving quality of care in health systems. To achieve financial protection, countries need the availability of revenue sources in the form of fiscal space and employment combined with good financial arrangements. Overall, the findings suggest that countries can follow different policy options to achieve UHC, however health policy without addressing other factors that are drivers of the social determinants of health is not adequate to achieving UHC. Social cohesion, in the form of cross-subsidisation between different socio-economic groups, was also found to be key to achieving UHC.

## 7.2 Limitations

A number of limitations played a role in this study. The first limitation is the unavailability of comprehensive country-level data. This problem manifests due to the fragmentation of the measured indicators across countries, as indicators measured by countries are not often aligned. This meant that some of the variables were represented by a limited number of indicators, which poses the risk of a lack true representation of the variables under study. The unavailability of data also limited the scope of the cases used in the study, implying limitations in the analysis of the findings. Another limitation comes with the use of the csQCA variant of QCA, which dichotomises the data when calibrating. Although it allows for easily understandable results for interpretation, dichotomisation causes nuances in the data to be lost.

### 7.3 Recommendations for future research

The recommendations for future research are primarily oriented towards (i) the inclusion of a fsQCA analysis; (ii) the inclusion of additional cases; and (iii) theoretical inference, possibly extending to policy analysis and policy recommendations as it relates to UHC. These recommendations for future research are elaborated on below.

In order to further verify the findings of this research, multiple regression analysis, coupled with the fsQCA variant of QCA are proposed. The fsQCA variant allows one to keep more nuances in the data as compared to the csQCA variant. This will allow for refinement of the findings, and is envisaged to aid the process of identifying specific policy recommendations as they relate to UHC.

The inclusion of additional cases would allow for more input variables to be included in the study; this then allows for the inclusion of other determinants of health for analysis. For example, in the context of csQCA, 32 cases would allow for analysis with 5 variables at a time and 64 cases would allow for 6 variables at a time. This is because of the nature of csQCA, which allows for  $2^k$  cases, where  $k$  is the number of variables. It is also recommended that countries be selected from a country-specific perspective; thus, to consider cases that, given certain country characteristics, are similar to South Africa. Continuing the research with an increased number of cases, and cases with specific country characteristics, would also serve to inform policy recommendations more robustly.

Ultimately, further research allows for the findings to be applied in policy analysis as policy recommendations, based on the causal relationships identified. By allowing for abstraction, this will subsequently be considered from a theoretical perspective in order to infer causality between factors that affect UHC.

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## APPENDIX A: UHC LANDSCAPE

**Table A-1: Access of care indicators from the global reference list of 10 core indicators.**

Indicator	Description
Service utilization	The number of outpatient department visits as a percentage of the population.
Health service access	The number of health facilities per 10000 population.
Hospital bed density	The total number of hospital beds as a percentage of the population.
Availability of essential medicines and commodities	The proportion of health facilities with essential medicines including lifesaving commodities

Source: (WHO, 2015b).

**Table A-2 : Indicators from the HEM per category.**

Category	Indicator
Reproductive health interventions	Contraceptive prevalence – modern methods (%).
	Contraceptive prevalence –modern and traditional methods.
	Demand for family planning satisfied (%).
Maternal health interventions	Pregnant women sleeping under insecticide-treated nets (%).
	Antenatal care coverage - at least one visit (in the two or three years preceding the survey) (%).
	Antenatal care coverage - at least one visit (in the five years preceding the survey) (%).
	Antenatal care coverage - at least four visits (in the two or three years preceding the survey) (%).
	Antenatal care coverage - at least four visits (in the five years preceding the survey) (%).
	Births attended by skilled health personnel (in the two or three years preceding the survey) (%).
	Births attended by skilled health personnel (in the five years preceding the survey) (%).
	Births by caesarean section (in the two or three years preceding the survey) (%).
Births by caesarean section (in the five years preceding the survey) (%).	
New-born child health interventions	Early initiation of breastfeeding (in the two or three years preceding the survey) (%).
	Early initiation of breastfeeding (in the five years preceding the survey) (%)
	Children aged 6-59 months who received vitamin A supplementation (%).
	Children aged < 5 years sleeping under insecticide-treated nets (%).
	BCG immunization coverage among one-year-olds (%).
	Measles immunization coverage among one-year-olds (%).
	Polio immunization coverage among one-year-olds (%).
	DTP <sub>3</sub> immunization coverage among one-year-olds (%).
	Full immunization coverage among one-year-olds (%).
	Children aged < 5 years with diarrhoea receiving oral rehydration salts (%).
	Children aged < 5 years with diarrhoea receiving oral rehydration therapy and continued feeding (%).
Children aged < 5 years with pneumonia symptoms taken to a health facility (%).	

Source: (WHO, 2016a).

**Table A-3: Indicators for inequality in healthcare utilization from the World Bank.**

Category	Indicator
Maternal and child health interventions	Full immunization
	Treatment of diarrhoea
	Medical treatment of ARI
	Skilled antenatal care (4+ visits)
	Skilled birth attendance
	Contraceptive prevalence
Adult preventive care	TB screening
	Breast cancer screening
Adult curative care	Inpatient or outpatient (12 months)
	Inpatient (12 months)
	Inpatient (5 years)
	Outpatient (12 months)
Utilization of public facilities	Outpatient health centre and health post
	Outpatient hospital
	Inpatient hospital

Source: (World bank, 2012; World Bank, 2012a, 2012b, 2012c, 2012d, 2012e).

**Table A-4: OECD Access to care indicators.**

Category	Indicator
Out of Pocket medical expenditure.	Out-of-pocket medical spending as a share of final household consumption.
	Shares of out-of-pocket medical spending by services and goods.
Geographical distribution of medical doctors.	Physician density, by Territorial Level 2 regions.
	Physicians density in predominantly urban and rural regions.
Inequalities in doctor consultations.	Unmet care needs for medical examination by income level.
	Horizontal inequity indices for probability of a doctor visit in the past 12 months.
Inequalities in dentist consultations.	Out-of-pocket dental expenditure.
	Probability of a dental visit in the past 12 months, by income group.
	Unmet need for a dental examination, by income quintile.
Inequalities in cancer screening.	Cervical cancer screening in past three years by income level.
	Breast cancer screening in past two years by income level.
	Colorectal cancer screening once in lifetime by educational level.
Waiting times for elective surgery	Waiting times for elective surgery. Cataract surgery, waiting times from specialist assessment to treatment.
	Hip replacement, waiting times from specialist assessment to treatment.
	Knee replacement, waiting times from specialist assessment to treatment.

Source: (OECD, 2013, 2015).

**Table A-5: Healthcare expenditure indicators from various organisations.**

Indicator	Organisation
Total expenditure on health as % of GDP (THE%GDP).	USAID, WHO, Commonwealth fund 100 Core Health Indicator list.
General government expenditure on health as % of GDP (GGHE%GDP).	WHO, World Bank.
Per capita government expenditure on health, US\$ adjusted for purchasing power (“purchasing power parity” [PPP] or \$ International).	WHO, World Bank.
General government expenditure on health as % of total general government expenditure (GGHE%GGE).	WHO, USAID, OECD, KPMG.
General government expenditure on health as % of total health expenditure (GGHE%THE).	WHO,USAID,KPMG, World Bank.
Private expenditure on health as % of total health expenditure (PHE%THE).	WHO, USAID, KPMG.
External resources for health as % of total health expenditure (EXT%THE)	WHO, USAID, 100 Core Health Indicator list.
Out-of-pocket expenditure as % of total expenditure on health (OOPS%THE).	WHO, KPMG, 100 Core Health Indicator list.
Private prepaid plans as % of total expenditure on health (VHI%THE).	WHO.
Private prepaid plans as a percentage of private expenditure on health.	WHO.
Number of technical resources developed with project assistance to support an increase in revenues for health.	USAID.
Evidence of use of project-supported technical resources to inform revenue generation decisions.	USAID.
Per capita total expenditure on health.	USAID.
Health expenditure per capita.	OECD, Commonwealth fund.
Annual average growth rate in per capita health expenditure.	OECD.
Current health expenditure by function of health care (in terms of inpatient, outpatient, long term, medical goods care and collective goods).	OECD.
Growth rates of health spending for selected functions per capita.	OECD.
Expenditure on health by type of financing (general government, social security, private OOP, private insurance and other sources).	OECD.
Health expenditure as share of total government expenditure.	OECD.
Growth of health spending by financing, OECD average (in terms of social security financing, OOP and private insurance).	OECD.
Share of hospital inpatient expenditures by main diagnostic category	OECD.
Share of current health spending by age group.	OECD.
Expenditure per hospital discharge for two diagnostic categories.	OECD.
Gross fixed capital formation in the healthcare sector as a share of GDP.	OECD.
Health expenditure per capita (purchasing power parity)	KPMG, World Bank, WHO.
OOP health expenditure (% of private expenditure on health).	KPMG, WHO.
Current expenditure on health by general government and compulsory schemes (% of current expenditure on health).	100 Core Health Indicator list
Total capital expenditure on health (% current + capital expenditure on health).	100 Core Health Indicators list
Average annual growth rate of real healthcare spending per capita.	Commonwealth fund
Out-of-pocket health care spending per capita.	Commonwealth fund
Hospital spending per capita.	Commonwealth fund
Spending on pharmaceuticals per capita.	Commonwealth fund
Private health expenditure, as a percentage of GDP.	World Bank

## APPENDIX B: CASES AND DATA COLLECTION

Table B-6 : Raw data for QCA outcomes.

Countries	Coverage						Quality of care		Financial protection	
	Diphtheria tetanus toxoid and pertussis (DTP3) immunization coverage among 1-year-olds (%).	Antenatal care coverage - at least four visits (%).	Births attended by skilled health staff (% of total).	TB treatment coverage	Measles-containing-vaccine first-dose (MCV1) immunization coverage among 1-year-olds (%).	Polio (Pol3) immunization coverage among 1-year-olds (%)	Maternal mortality ratio (modeled estimate, per 100,000 live births).	Tuberculosis treatment success rate (% of new cases).	Risk of catastrophic expenditure for surgical care (% of people at risk) (2014).	Risk of impoverishing expenditure for surgical care (% of people at risk).
AUS	93	85	99.3	87	95	94	6	79	4.5	0.6
BOT	95	73.3	99.9	62	97	96	129	77	27.3	50
CAM	84	58.8	64.7	53	78	83	596	84	64	57
CZR	99	98.8	99.8	93	98	96	4	76	2.9	0.3
CRO	94	93.3	99.9	87	90	93	8	71	15.3	2.8
HAI	60	67.3	48.6	79	53	56	359	78	30.8	74.5
IND	87	49.7	81.1	59	88	86	174	74	59.6	67.3
ITA	93	86.5	99.9	87	85	93	4	74	5.5	1.1
THA	99	93.4	99.6	53	99	99	20	80	11.9	29.4
NIG	56	51.1	35.2	15	51	49	814	87	63.7	65.3
BAN	94	31.2	42.1	57	94	97	176	93	73.6	79.1
CAM	89	75.6	89	59	81	87	161	93	74	71.8
GER	96	99.3	98.5	87	97	94	6	63	0.3	0
KOR	98	96.8	100	94	98	98	11	81	3.3	0.4
ARM	94	92.8	99.8	89	97	96	25	78	49.7	23.1
USA	95	96.6	98.5	87	92	94	14	85	3.2	1.4
CAN	91	98.9	98.4	90	90	91	7	82	2.7	0.3

Table B-7: Raw data for QCA causal conditions.

	Revenue raising			Fiscal context				Employment		Inequality	Education
	General government expenditure on health as % of total health expenditure (GGHE%THE).	Private prepaid plans as % of private expenditure on health	Per capita government expenditure on health, US\$ adjusted for purchasing power ("purchasing power parity" [PPP] or \$ International).	General government final consumption expenditure (% of GDP)	Tax revenue (% of GDP)	Central government debt, total (% of GDP)	GNI per capita, PPP (current international \$)	Employment to population (15+ years), total (estimated ILO)	Unemployment, total (% of total labor force) (modeled ILO estimate)	GINI index (World Bank estimate)	Government expenditure on education, total (% of GDP)
AUS	67.03875378	25.36	2921.05	17.96313543	22.205661	47.388123	45320	60.89199829	5.737999916	34.94	5.22533989
BOT	59.01483571	79.92	513.92	17.42199855	26.4072139	18.850314	15510	63.22900009	18.37299919	60.46	9.632920265
CAM	22.87302171	1.72	27.89	11.79120108	14.168238	19.9	3070	72.66100311	4.506999969	46.54	3.029900074
CZR	84.53719019	1.04	1814.44	19.5334183	13.3400957	36.738056	31550	57.0019989	4.045000076	26.13	4.089019775
CRO	81.86709815	38.2	1352.54	19.67542503	19.2886639	84.2	22380	45.12900162	13.47599983	26.13	4.581600189
HAI	20.64038902	0	27.01	9.998294102	13.1	33.5	1760	57.75	13.18500042	60.79	1.073989987
IND	30.03652267	2.54	80.32	10.32562941	10.9985774	50.297887	6030	51.9129982	3.457999945	35.15	3.84236002
ITA	75.61324789	3.71	2449.03	18.9341028	23.6885364	134.84615	37010	42.70800018	11.54100037	35.16	4.079850197
THA	77.83350722	37.78	466.88	17.24605936	16.4526809	30.196348	15520	70.76399994	0.625999987	37.85	4.12887001
NIG	25.14542956	3.09	54.53	6.688120383	1.48253367	10.500313	5810	53.59600067	5.005000114	42.97	3.063689947

Table B-7 continued...

	Revenue raising			Fiscal context				Employment		Inequality	Education
	General government expenditure on health as % of total health expenditure (GGHE%THE).	Private prepaid plans as % of private expenditure on health	Per capita government expenditure on health, US\$ adjusted for purchasing power ("purchasing power parity" [(PPP)] or \$ International).	General government final consumption expenditure (% of GDP)	Tax revenue (% of GDP)	Central government debt, total (% of GDP)	GNI per capita, PPP (current international \$)	Employment to population (15+ years), total (estimated ILO)	Unemployment, total (% of total labor force) (modeled ILO estimate)	GINI index (World Bank estimate)	Government expenditure on education, total (% of GDP)
BAN	27.901132	0.1	24.57	5.404240738	8.96237578	27.2	3560	59.68199921	4.065999985	32.13	1.926339984
CMB	22.04231295	0.23	40.39	5.397979837	14.168238	32.96	3300	80.73899841	0.264999986	30.76	1.901970029
GER	76.98713648	38.8	3989.56	19.24611418	11.4688969	52.233356	49090	57.66999817	4.31099987	30.13	4.952189922
KOR	54.05109462	12.67	1367.8	15.21470507	13.997556	39.884786	34810	58.61000061	3.65199995	30	5.052110195
ARM	42.98239827	6.1	155.65	13.11785225	20.9792395	42.23	8770	52.90000153	16.75900078	31.48	2.813509941
USA	48.2972776	64.2	4541.17	14.44231212	11.4157963	97.839138	57540	58.94200134	4.906000137	41.06	5.38078022
CAN	70.93041505	43.4	3291.84	21.03169229	12.0105146	54.70707	43580	60.77799988	7.072999954	33.68	5.281219959

**Table B-8: 100 cases initially applied in the study.**

Algeria	Haiti	Singapore	Cote d'Ivoire
Argentina	Honduras	Slovakia	Djibouti
Australia	Hungary	Spain	Eritrea
Austria	Iceland	Sri Lanka	Estonia
Bangladesh	India	Sweden	Ethiopia
Belgium	Iran	Switzerland	Georgia
Botswana	Israel	Thailand	Guinea
Brazil	Italy	Turkey	Guinea Bissau
Bulgaria	Japan	Ukraine	Indonesia
Cambodia	Kenya	United Arab Emirates	Jamaica
Cameroon	Korea republic	United Kingdom	Kyrgyzstan
Canada	Luxembourg	United States of America	Lesotho
China	Malaysia	Yemen	Madagascar
Colombia	Mexico	Zambia	Mongolia
Croatia	Namibia	Zimbabwe	Morocco
Cuba	Netherlands	Afghanistan	Nigeria
Czech Republic	New Zealand	Antigua and Barbuda	Pakistan
Denmark	Panama	Armenia	Paraguay
Ecuador	Peru	Azerbaijan	Somalia
Egypt	Philippines	Bahamas	Togo
Finland	Poland	Benin	Trinidad and Tobago
France	Qatar	Bosnia and Herzegovina	Uganda
Germany	Rwanda	Burundi	United Republic of Tanzania
Ghana	Saudi Arabia	Burkina Faso	Uruguay
Greece	Senegal	Chad	Vietnam

**Table B-9: 59 Cases left after first filtering process.**

Algeria	India	Afghanistan	Lesotho
Australia	Italy	Armenia	Mongolia
Bangladesh	Korea republic	Azerbaijan	Morocco
Botswana	Namibia	Benin	Nigeria
Brazil	Panama	Bosnia and Herzegovina	Pakistan
Cambodia	Peru	Burundi	Paraguay
Cameroon	Philippines	Burkina Faso	Togo
Canada	Qatar	Cote d'Ivoire	Trinidad and Tobago
Croatia	Rwanda	Eritrea	Uganda
Cuba	Senegal	Ethiopia	United Republic of
Czech Republic	Thailand	Georgia	Tanzania
Ecuador	Ukraine	Guinea	Vietnam
Egypt	United States of America	Guinea Bissau	Sri Lanka
Germany	Yemen	Jamaica	Haiti
Ghana	Zambia	Kyrgyzstan	

**Table B-10: 40 cases left after second filtering process.**

Algeria	Italy	Bosnia and Herzegovina	Uganda
Australia	Namibia	Burundi	United Republic of
Botswana	Panama	Burkina Faso	Tanzania
Cameroon	Peru	Cote d'Ivoire	Bangladesh
Croatia	Qatar	Eritrea	Cambodia
Cuba	Thailand	Guinea	Germany
Czech Republic	Yemen	Guinea Bissau	Korea republic
Egypt	Afghanistan	Lesotho	Armenia
Haiti	Armenia	Morocco	USA
India	Azerbaijan	Nigeria	Canada

**Table B-11: 17 cases included in the study and their abbreviations.**

Country	Abbreviation
Australia	AUS
Botswana	BOT
Cameroon	CAM
Croatia	CRO
Czech Republic	CZR
Haiti	HAI
India	IND
Italy	ITA
Thailand	THA
Nigeria	NIG
Bangladesh	BAN
Cambodia	CMB
Germany	GER
Korea republic	KOR
Armenia	ARM
United States of America	USA
Canada	CAN

## APPENDIX C: RESULTS AND ANALYSIS

In this Appendix, the truth tables for the QCA solutions in Chapter 6 are presented.

### Truth table for Evaluation 1

Figure C-1: Truth table for Evaluation 1.

REVENUE RAISING	POOLING	PURCHASING	number	COVERAGE	raw consist.	PRI consist.	SYM consist.
1	1	1	8	1	1	1	1
1	0	0	1	1	1	1	1
0	1	1	1	1	1	1	1
0	0	0	7	0	0.142857	0.142857	0.142857

### Truth table for Evaluation 2

Figure C-2: Truth table for Evaluation 2.

FISCALSPACE	EMPLOYMENT	INEQUALITY	EDUCATION	number	COVERAGE	raw consist.	PRI consist.	SYM consist.
1	1	0	1	4	1	1	1	1
1	0	0	0	2	1	1	1	1
1	1	0	0	1	1	1	1	1
1	0	0	1	1	1	1	1	1
1	0	1	1	1	1	1	1	1
0	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
0	1	0	0	2	0	0	0	0
0	0	1	0	2	0	0	0	0
0	0	0	0	1	0	0	0	0
0	1	1	0	1	0	0	0	0

### Truth table for Evaluation 3

Figure C-3: Truth table for Evaluation 3.

REVENUERAISING	FISCALSPACE	INEQUALITY	number	COVERAGE	raw consist.	PRI consist.	SYM consist
1	1	0	6	1	1	1	1
0	1	0	2	1	1	1	1
1	1	1	2	1	1	1	1
1	0	1	1	1	1	1	1
0	0	0	3	0	0	0	0
0	0	1	3	0	0	0	0

### Truth table for Evaluation 4

Figure C-4: Truth table for Evaluation 4.

POOLING	PURCHASING	FISCALSPACE	INEQUALITY	number	COVERAGE	raw consist.	PRI consist.
1	1	1	0	7	1	1	1
1	1	1	1	2	1	1	1
0	0	1	0	1	1	1	1
0	0	0	1	4	0	0.25	0.25
0	0	0	0	3	0	0	0

## Truth table for Evaluation 5

Figure C-5: Truth table for Evaluation 5.

REVENUERAISING	POOLING	PURCHASING	number	QUALITY	raw consist.	PRI consist.	SYM consist
1	0	0	1	1	1	1	1
0	1	1	1	1	1	1	1
1	1	1	8	0	0.5	0.5	0.5
0	0	0	7	0	0.428571	0.428571	0.428571

## Truth table for Evaluation 6

Figure C-6: Truth table for Evaluation 6.

FISCALSPACE	EMPLOYMENT	INEQUALITY	EDUCATION	number	QUALITY	raw consist.	PRI consist.	SYM consist
0	1	0	0	2	1	1	1	1
1	1	0	0	1	1	1	1	1
0	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	0	1	4	0	0.75	0.75	0.75
1	0	0	0	2	0	0.5	0.5	0.5
0	0	1	0	2	0	0	0	0
0	0	0	0	1	0	0	0	0
0	1	1	0	1	0	0	0	0
1	0	0	1	1	0	0	0	0
1	0	1	1	1	0	0	0	0

### Truth table for Evaluation 7

Figure C-7: Truth table for Evaluation 7.

Edit Truth Table - □ ×

File Edit

REVENUE RAISING	EMPLOYMENT	INEQUALITY	number	QUALITY	raw consist.	PRI consist.	SYM consist
0	1	0	3	1	1	1	1
1	1	1	2	1	1	1	1
1	1	0	4	0	0.75	0.75	0.75
0	0	0	2	0	0.5	0.5	0.5
1	0	0	2	0	0	0	0
0	0	1	2	0	0	0	0
1	0	1	1	0	0	0	0
0	1	1	1	0	0	0	0

Reset Cancel Specify Analysis Standard Analyses

### Truth table for Evaluation 8

Figure C-8: Truth table for Evaluation 8.

Edit Truth Table - □ ×

File Edit

POOLING	PURCHASING	EMPLOYMENT	INEQUALITY	number	QUALITY	raw consist.	PRI consist.	SYM consist
0	0	1	0	2	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	0	5	1	0.8	0.8	0.8
0	0	0	0	2	0	0.5	0.5	0.5
0	0	1	1	2	0	0.5	0.5	0.5
1	1	0	0	2	0	0	0	0
0	0	0	1	2	0	0	0	0
1	1	0	1	1	0	0	0	0

Reset Cancel Specify Analysis Standard Analyses

## Truth table for Evaluation 9

Figure C-9: Truth table for Evaluation 9.

REVENUERAIISING	POOLING	PURCHASING	number	FINANCIALPROTEC	raw consist.	PRI consist.	SYM consist
0	1	1	1	1	1	1	1
1	0	0	1	1	1	1	1
1	1	1	8	1	0.875	0.875	0.875
0	0	0	7	0	0	0	0

Buttons: Reset, Cancel, Specify Analysis, Standard Analyses

## Truth table for Evaluation 10

Figure C-10: Truth table for Evaluation 10.

FISCALSPACE	EMPLOYMENT	INEQUALITY	EDUCATION	number	FINANCIALPROTEC	raw consist.	PRI consist.	SYM consist
1	1	0	1	4	1	1	1	1
1	1	0	0	1	1	1	1	1
1	0	0	1	1	1	1	1	1
0	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	0	0	0	2	0	0.5	0.5	0.5
0	1	0	0	2	0	0	0	0
0	0	1	0	2	0	0	0	0
0	0	0	0	1	0	0	0	0
0	1	1	0	1	0	0	0	0
1	0	1	1	1	0	0	0	0

Buttons: Reset, Cancel, Specify Analysis, Standard Analyses

### Truth table for Evaluation 11

Figure C-11: Truth table for Evaluation 11.

REVENUERAISING	EMPLOYMENT	INEQUALITY	FISCALSPACE	number	FINANCIALPROTEC	raw consist.	PRI consist.	SYM consist
1	1	0	1	4	1	1	1	1
1	0	0	1	2	1	1	1	1
1	1	1	0	1	1	1	1	1
0	1	0	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
0	1	0	0	2	0	0	0	0
0	0	1	0	2	0	0	0	0
0	0	0	0	1	0	0	0	0
0	1	1	0	1	0	0	0	0
0	0	0	1	1	0	0	0	0
1	0	1	1	1	0	0	0	0

### Truth table for Evaluation 12

Figure C-12: Truth table for Evaluation 12.

REVENUERAISING	FISCALSPACE	INEQUALITY	EDUCATION	number	FINANCIALPROTEC	raw consist.	PRI consist.	SYM consist
1	1	0	1	4	1	1	1	1
1	1	0	0	2	1	1	1	1
0	1	0	1	1	1	1	1	1
1	0	1	1	1	1	1	1	1
1	1	1	1	2	0	0.5	0.5	0.5
0	0	0	0	3	0	0	0	0
0	0	1	0	3	0	0	0	0
0	1	0	0	1	0	0	0	0

### Truth table for Evaluation 13

Figure C-13: Truth table for Evaluation 13.

POOLING	PURCHASING	FISCALSPACE	EMPLOYMENT	number	FINANCIALPROTEC	raw consist.	PRI consist.	SYM consist
1	1	1	1	6	1	1	1	1
1	1	1	0	3	0	0.666667	0.666667	0.666667
0	0	0	1	4	0	0.25	0.25	0.25
0	0	0	0	3	0	0	0	0
0	0	1	0	1	0	0	0	0

### Truth table for Evaluation 14

Figure C-14: Truth table for Evaluation 14.

POOLING	PURCHASING	EMPLOYMENT	EDUCATION	number	FINANCIALPROTEC	raw consist.	PRI consist.	SYM consist
1	1	1	1	5	1	1	1	1
1	1	0	0	1	1	1	1	1
1	1	1	0	1	1	1	1	1
0	0	1	1	1	1	1	1	1
1	1	0	1	2	0	0.5	0.5	0.5
0	0	0	0	4	0	0	0	0
0	0	1	0	3	0	0	0	0