EXPLORING KNOWLEDGE TRANSLATION MECHANISMS IN THE WESTERN CAPE PROVINCIAL HEALTH SYSTEM

AMANDA EDWARDS

NCLAMA001

Submitted in partial fulfilment of the requirements for the degree

MASTER OF PUBLIC HEALTH

(Health Systems Specialization)

At

UNIVERSITY OF CAPE TOWN

February 2018

Supervised By:

A/Prof Jill Olivier

Dr Virginia Zweigenthal

PLAGIARISM DECLARATION

I, Amanda Jane Edwards, hereby declare that the work on which this dissertation/thesis is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

I empower the university to reproduce for the purpose of research either the whole or any portion of the contents in any manner whatsoever.

Signature: Signed by candidate

Date: 14 February 2018

ABSTRACT

The persistent gap between health research, policy and practice has led to a burgeoning interest in the field of knowledge translation (KT). However, there remains little clarity on what KT mechanisms work in different contexts, particularly in low and middle-income countries. Using mixed methodology this project explores KT mechanisms, barriers, facilitators and outcomes as they function in South Africa's Western Cape provincial health system. Document review and key informant interviews with health system researchers and provincial health policymakers were synthesised with findings from a random sample of provincial study protocols registered on the National Health Research Database. An evidence-mapping of the literature on KT in African settings complemented this data. Findings indicate variations in the use of health-related research by provincial policymakers and diversity in the mechanisms employed for KT. The important role of organisations, characteristics of available research, relationships and networks play a facilitating role for KT in this context. Resource constraints, system conflicts and politics served as notable barriers. These findings have implications for health researchers and provincial policymakers seeking to 'do' KT in the Western Cape health system – including the need for recognition of the important role of context, of the ethical dilemmas within KT processes, and the need for a more systematic approach to KT that includes embedded learning systems.

ACKNOWLEDGEMENTS

To my enduring and endearing husband. You have the patience of a saint and I love you for it. To my family for the endless laughs, mental breaks and food supply. You have enabled so much of this and so much more - thank you. To Jill and Virginia who have shown me what it is to be a good researcher. I will forever be indebted to you both for your guidance and support on this project.

Thanks must also go to the policymakers, researchers and members of the Health Impact Assessment for their time, insights and access to a veritable wealth of information. This work was generously supported by the National Research Foundation, Cape Higher Education Consortium (CHEC) and Margaret McNamara Education Grant (MMEG).

Soli Deo Gloria

ACRONYMS AND ABBREVIATIONS

AHPSR	Alliance for Health Policy and Systems Research
ANC	African National Congress
BoD	Burden of Disease
CAN	Cochrane African Network
CEBHC	Centre for Evidence-based Health Care
CHEC	Cape Higher Education Consortium
CHEPSAA	Consortium for Health Policy and Systems Analysis in Africa
CIHR	Canadian Institute of Health Research
CPUT	Cape Peninsula University of Technology
DA	Democratic Alliance
ENHRS	Essential National Health Research Strategy
EVIPNet	Evidence-Informed Policy Network
GRAMMS	Good Reporting of A Mixed Methods Study
HIA	Health Impact Assessment
HPSR	Health Policy and Systems Research
HREC	Human Research Ethics Committee
HST	Health Systems Trust
KBs	Knowledge brokers
KT	Knowledge translation
KTPs	Knowledge translation platforms
KTU	Knowledge Translation Unit
LMICs	Low- and middle-income countries
MDGs	Millennium Development Goals
MeSH	Medical index Subject Headings
MRC	Medical Research Council

NDoH	National Department of Health
NGO	Non-government organisation
NHI	National Health Insurance
NHRD	National Health Research Database
NRF	National Research Foundation
ODI	Overseas Development Institute
PDoH	Provincial Department of Health
PHRC	Provincial Health Research Committee
PICO	Population, Intervention, Comparator, Outcome
RAPID	Research and Policy in Development
SDGs	Sustainable Development Goals
SUN	Stellenbosch University
UCT	University of Cape Town
UHC	Universal Health Coverage
UWC	University of the Western Cape
WAHO	West African Health Organisation
WCDoH	Western Cape Department of Health
WHO	World Health Organisation

LIST OF FIGURES AND TABLES

PART A: PROTOCOL

Figure 1: Overview of study design

Figure 2: The RAPID model

Table 1: Summary of key documents for review

Table 2: Schedule of study activities

Table 3: Projected costs of the proposed study

PART B: MAPPING REVIEW

Box 1: Current challenges to KT in LMIC health systems

Figure 1: Global evidence mapping method

Figure 2: Number of publications by year

Figure 3: Distribution of publications by country

Figure 4: Summary map of KT mechanisms, influencing factors and outcomes

Table 1: Characteristics of KT interventions

PART C: JOURNAL ARTICLE

Box 1: Recommendations for improving knowledge translation in the Western Cape provincial health system

Figure 1: Distribution of NHRD sample studies across Western Cape districts

Figure 2: Mapping knowledge flows through the Western Cape provincial health system

Table 1: Summary of expert interview data

Table 2: Timeline of key national and provincial policies relevant to KT in the Western Cape Health System

Table 3: Reports of KT mechanisms across datasets

GLOSSARY OF KEY TERMS

Knowledge translation (KT)	A dynamic and iterative process that includes the synthesis, dissemination, exchange and ethically sound application of knowledge to improve health, provide more effective health services and products, and strengthen the health care system (CIHR 2016).
Knowledge	Implicit understandings of KT refer to knowledge as research-based (Sudsawad 2007). That is, knowledge generated through scientific research (Graham *et al.* 2006). However, the study recognises the role of other forms of knowledge, including tacit and context-specific knowledge (Greenhalgh and Wieringa 2011).
Research	A systematic investigative process employed to increase or revise current knowledge (Langer 2016). This may include critical investigation and evaluation, theory building, data collection, analysis and codification (ODI 2011).
Mechanisms	The formal and informal *processes*, *tools* and *strategies* employed at any stage along the KT pathway. The means by which KT is accomplished.
Implementation or 'know-do' gap	The gap between what we know and how this knowledge is implemented 'on the ground' in policy and practice.
Health policy	The decisions, plans and actions undertaken to achieve specific health goals (WHO 2017). This goes beyond the formal written content of policy documents to include "courses of action (and inaction) that affect the set of institutions, organizations, services and funding arrangements of the health system" (Buse *et al.* 2012, p. 6). For the purposes of this study, health policies will be limited to those generated and implemented in the provincial public health sector as these policies are assumed to be the primary target of provincial KT mechanisms.
Health policymakers	These are individuals positioned within the provincial health system and are formally responsible for health policy decision-making. They may include heads of department, chief directors and directors. Policymakers should be employed by the provincial health department, but may occupy joint appointments between provincial and academic or research institutions.
Health Researchers	These are individuals whose primary role is the conducting of health-oriented research in the province. Their research should cover topics that have clinical, epidemiological, health system, services and policy relevance to the six provincial priorities outlined in the Western Cape's Healthcare 2030 plan. Broadly, these areas include infectious diseases (such as HIV and TB), violence and road injuries, non-communicable diseases, women's health, mental health, ante-natal and child health (WCDoH 2013). Researchers may be based in the provincial health department or external institutions, including academia, research consortia and non-government organisations.

CONTENTS

PLAGIARISM DECLARATION....i
ABSTRACT....ii
Acknowledgements....iii
Acronyms and Abbreviations....iv
List of Figures and Tables....vi
Glossary of Key Terms....vii
Contents....viii
PART A: PROTOCOL....1
Introduction....1
Background....2
The Western Cape health systems context....5
Research aims and objectives....7
Aims:....7
Objectives:....7
Research purpose and level....8
Research question....9
Sub-questions:....9
Sub-study arrangement....10
Methodology....10
Study design....10
Theoretical framework....11
Population....13
Data collection and analysis....14
Data synthesis and interpretation....20
Rigour....20
Ethical considerations....22
Risks and benefits....23
Study limitations....24
Timeframe....24
Budget....25
Dissemination....26

References 27
PART B: STRUCTURED LITERATURE REVIEW 1
Background 1
Method: systematic evidence mapping 4
Results 8
Search results 8
Study characteristics 8
KT interventions employed in African health systems 10
Barriers and facilitators of KT 14
Outcomes of KT 15
Discussion 16
Limitations and implications for evidence map use 19
Conclusion 20
References 21
PART C: JOURNAL ARTICLE 1
From knowledge to health policy: exploring knowledge translation mechanisms in the Western Cape provincial health system 1
Abstract 1
Key Messages 2
Background 3
The Western Cape context 6
Method 8
Findings 12
Role of the local health research system 12
Pathways and mechanisms for KT in the provincial health system 15
The use and impact of research-based knowledge in the Western Cape health system 18
Facilitating factors for increasing KT 20
Barriers to KT 25
Discussion 31
The need for a systematic contextual approach to KT 33
The value of systems thinking in KT 35
The potential of an embedded health systems approach 36
KT as an ethical imperative 37
Conclusion 39

References 41
Appendices 1
Appendix 1 Study information sheet 1
Appendix 2 Informed consent form 5
Appendix 3 Key informant interviews topic guide 7
Appendix 4 List of databases, final search strategies and key terms 12
Appendix 5 Study flow diagram (Source: adapted from Moher (2009)) 13
Appendix 6 Characteristics of KT interventions (all studies) 15
Appendix 7 Documents for Review 23
Appendix 8 Ethical clearance letter 24
Appendix 9 Provincial Department of Health clearance letter 26
Appendix 10 Instructions for authors: Health Policy and Planning 28

PART A: PROTOCOL

Introduction

Improving health globally requires biomedical innovation as well as the necessary health policies and systems to implement them (Hoffman *et al.* 2012). However, progress towards achieving health gains made possible by existing interventions remains frustratingly slow. Constrained health systems and the inability to implement what we already know have been blamed for insufficient progress towards the Millennium Development Goals (MDGs) (Travis *et al.* 2004). This is particularly the case in low and middle-income countries (LMICs) where a lack of knowledge about health system functioning contributes to a widening gap in the research available for use in health care and the ability of health system decision-makers to apply it effectively (de Savigny and Adam 2009). Among other names, this is known as the 'implementation' or 'know-do' gap (van Olmen *et al.* 2012).

Evidence of the gap between research knowledge, policy and practice is well documented and remains a key challenge to health system strengthening (WHO 2007; Bennett and Jessani 2011; Ellen *et al.* 2012; Harris 2015; Langer *et al.* 2016). Not only does it contribute to weak health systems development, but it also has a direct impact on reducing health outcomes (Graham *et al.* 2006; Sheikh *et al.* 2013). The implementation gap is a longstanding and complex health systems issue, further hampered in contexts where health information systems are weak, resources are scarce, costs are high and health needs are diverse (Bosch-Capblanch *et al.* 2012; Avan *et al.* 2016).

Global actors, including the World Health Organisation (WHO), the Alliance for Health Policy and Systems Research (AHPSR) and the Overseas Development Institute (ODI) have recognized the critical need to close the implementation gap between research and policy in local contexts in order to achieve health outcomes (WHO 2007; ODI 2011; AHPSR 2016). In South Africa, the need for health policy and systems research to inform policy decision-making and strengthen local health systems is

acknowledged by both the National Department of Health (NDoH) and provincial legislatures (NDoH 2001; WCDoH 2015). However, in the absence of locally-relevant research, there is a dearth of information on where this implementation gap lies and what factors or mechanisms are contributing to it. As global and local attention shifts towards the Sustainable Development Goals (SDGs), with their emphasis on locally-relevant research, there is an urgent need to address these knowledge gaps so that informed decisions can encourage more rapid and effective progress towards health targets (United Nations 2015).

Background

The need for more effective translation of health-related research and evidence into health policy and practice has led to an expanding body of literature that targets related issues of knowledge translation, knowledge transfer, knowledge exchange, knowledge use, research implementation, research translation, diffusion and dissemination (Graham *et al.* 2006; Straus *et al.* 2009). This somewhat confusing overlap of terminology forms the conceptual foundation for a number of different disciplines, including knowledge translation, implementation science and evidence-based practice (Gervais *et al.* 2016).

For the purposes of this study, the concept of *knowledge translation* (KT) has been selected for its holistic and dynamic approach to closing the implementation gap by moving health research into policy and practice. Use of the word 'knowledge' in this case refers to *research-based knowledge* (Sudsawad 2007). In 2005, the WHO defined KT as "the synthesis, exchange and application of knowledge by relevant stakeholders to accelerate the benefits of global and local innovation in strengthening health systems and advancing people's health" (Ellen *et al.* 2012, p. 6). This definition emerged from the Canadian Institute of Health Research's (CIHR) longstanding framing of KT as "a dynamic and iterative process that includes the synthesis, dissemination, exchange and ethically sound

application of knowledge to improve health, provide more effective health services and products, and strengthen the health care system" (CIHR 2016, p. 1). These definitions are comprehensive in their attempts to describe the complex process of moving health research into policy and practice. This process frequently begins with knowledge creation and moves dynamically towards knowledge application and use (Sudsawad 2007).

The increasingly sophisticated and comprehensive conceptualisations of KT reflect the multifaceted and interactive nature of its mechanisms (Sudsawad 2007). Mechanisms here refer to both the formal and informal processes, tools and strategies employed at any stage along the KT pathway. In essence, they are the means by which KT is accomplished and therefore an essential component to consider when exploring KT in unfamiliar contexts.

Studies have revealed a number of barriers and facilitators to KT mechanisms that influence the 'push' and 'pull' of health research into policy (Bennett and Jessani 2011; Greenhalgh and Wieringa 2011; Oliver *et al.* 2014; Langer *et al.* 2016). Common barriers include research that is too complex, poor local access to relevant research, the cost of producing and distributing usable research, low demand for research by policymakers, lack of timely research output, political and financial reasons for not acting on research evidence, and significant paradigm differences between researchers, policymakers and practitioners.

Harris (2015) highlights this difference by describing how researchers and policymakers exist in separate worlds. Not only do they operate from different value systems, using different languages and time-frames, but they benefit from different incentives and professional ties. For example, researchers in a scientific field tend to use discipline-related jargon that is not easily translated into a coherent message for policymakers. Moreover, many researchers do not see policy engagement as their

responsibility (Datta 2012). Policymakers, on the other hand, are frequently subject to political pressures and bureaucratic obligations that are rarely understood by researchers and that reduce the prioritised use of research and technical advice in decision-making (Agyepong and Adjei 2008; Uzochukwu *et al.* 2016). Consequently, these different paradigms frequently result in miscommunication, misunderstandings and distrust between researchers and policymakers about the social value and potential benefits of health-related research-based knowledge (Delany-Moretlwe *et al.* 2011; Lutge *et al.* 2017).

Furthermore, researchers have highlighted the important role of tacit knowledge in decision-making (Greenhalgh and Wieringa 2011). That is, knowledge that is difficult to write down or transfer, but is often gleaned from the context in which one is placed. In a recent systematic review of evidence use by policymakers, over a third of studies mentioned the use of tacit knowledge as a key source of information for policymakers (Oliver *et al.* 2014). The authors concluded that research-based knowledge is just one source of information for policymakers and that identifying these different types of knowledge will be crucial if research is to influence policy.

Additional themes arising from the literature intersect with strategies found to promote the translation of research (Oxman *et al.* 2009; Delany-Moretlwe *et al.* 2011; Datta 2012; Harris 2015; Uzochukwu *et al.* 2016). Among these strategies are researchers' intent to influence policy with their results; the presence of credible knowledge brokers, opinion leaders and local knowledge champions who can stimulate the demand for research; and the need for incentives to encourage researchers to make their research more accessible and usable to a wider audience.

Central to these strategies is the role of communication and the need for stronger relational networks between health researchers and policymakers (Oxman *et al.* 2009; Oliver *et al.* 2014; Harris 2015).

The nature of researcher-policymaker relationships have been highlighted as critical to understanding and fostering the research translation process (Graham *et al.* 2006; Sudsawad 2007; Straus *et al.* 2009). Additional enabling factors include the availability of research, appropriate packaging of the research into a usable message, political support for implementation and the strategic presence of researchers on local decision-making bodies (King *et al.* 1998; Greenhalgh and Wieringa 2011).

While the above studies have confirmed the existence of various factors in certain settings, none report the same combination across contexts. Therefore, it stands to reason that strategies are unlikely to succeed if applied universally. There is an urgent need to identify and understand the unique package of KT mechanisms, barriers and facilitators in local health contexts so that appropriate decisions can be made and intended health outcomes achieved.

The Western Cape health systems context

In South Africa, the Western Cape provincial health system is characterised by complex disease burdens, low staff morale and weak coordination in health-related research activities (Harrison 2009; WCDoH 2015). These reflect broader constraints in the national health system, including declining national resources for the generation of health research and rising inequalities between private and public health services (Senkubuge and Mayosi 2012). Evolving political alliances in the context of decentralised national health reform have further complicated efforts to coordinate and prioritise health research activities in the province. This has been to the detriment of health systems development and reduced the desired impact of health research activities on the wellbeing of the population (WCDoH 2015).

In addition to these already complex issues, reports have described how South Africa's history of colonialism, racism and inequality in medical research have shaped the relationships between researchers, government, industry and the South African public (Mayosi *et al.* 2009).

Despite these issues, the Western Cape Province boasts a rich variety of health-related research enterprises compared to other provinces (WCDoH 2015). These research efforts are embedded within the Provincial Department of Health (PDoH), but also stem from the presence of high quality tertiary academic institutions, national research institutions, private research consortia, non-government and non-profit organisations in the province (Senkubuge and Mayosi 2012; WCDoH 2015). These institutions invariably have different relationships with the public health system and reflect differing levels of embeddedness in both their institutional position and type of research conducted (Koon *et al.* 2012; Olivier *et al.* 2016). Furthermore, they are subject to a strong national and local research policy framework, including the transformative 2001 Health Research Policy and 2003 National Health Act.

The above policies paved the way for an Essential National Health Research Strategy (ENHRS). This strategy promotes an integrated, multidisciplinary approach to health research in South Africa and highlights health systems management and policy research as one of four key health research priorities (WCDoH 2015). Additionally, the policies legislated the formation of nine Provincial Health Research Committees (PHRC) whose mandate includes the coordination of provincial research activities and advice on the policy implications of completed research (WCDoH 2015).

These policies demonstrate wide recognition of the need for health research to inform policy and practice for the benefit and wellbeing of the South African public. However, to date there remains no national or provincial framework for the translation of research findings into policy, programmes or practice (Senkubuge and Mayosi 2012). This has contributed to the growing gap between what is

known from locally generated research and what is put into policy and practice both within the province and nationally. Furthermore, it has resulted in a dearth of empirical evidence in this context on what KT mechanisms work (or not) and why. This lack of knowledge undermines informed action and inhibits the ability of researchers and policymakers to close the implementation gap.

In its 2016 Strategic Health Plan, the Western Cape PHRC, including researchers and policymakers, reiterated its mandate to "advise on the translation of health research findings into policy development and service provision at all levels of the health care system" (WCDoH 2016a, p. 1). Key challenges to this mandate include the need to develop *research translation* activities for policy, to understand the obstacles to research translation in the province and to develop capacity for this function. This study aims to meet these challenges through expanding understandings of local KT mechanisms and providing recommendations for future action.

Research aims and objectives

Aims:

1. To inform understandings of the knowledge translation system in the Western Cape provincial health system by providing an in-depth situational analysis of these mechanisms.
2. To contribute to a broader study targeting the improvement of health research dissemination systems and products in the province and the increased uptake of research into health policy and practice.

Objectives:

1. To explore the current knowledge translation mechanisms at work in the Western Cape provincial health system.

2. To identify locally-relevant barriers and facilitators for knowledge translation from the perspectives of researchers and health system policymakers based in the Western Cape.
3. To assess the influence of current mechanisms on health policy.
4. To generate context specific recommendations for health policy decision-makers in the Western Cape Province regarding the potential of future knowledge translation choices and mechanisms.

Research purpose and level

The purpose of this study is both exploratory and explanatory (Robson 2002). Firstly, it seeks to explore what KT mechanisms currently exist within the Western Cape provincial health system. By examining KT mechanisms in context, important insights can be gained about their complex and dynamic nature as well as the unique institutional, social, political and cultural forces that influence them. Secondly, it seeks to explain how these mechanisms influence health policy. The WHO defines health policy as the decisions, plans and actions undertaken to achieve specific health goals (WHO 2017). In line with modern conceptualizations, health policy in this study goes beyond the formal written content of policy documents to include "courses of action (and inaction) that affect the set of institutions, organizations, services and funding arrangements of the health system" (Buse *et al.* 2012, p. 6). For the purposes of this study, health policies will be limited to those generated and implemented in the provincial public health sector as these policies are assumed to be the primary target of provincial KT mechanisms.

The exploratory/explanatory purpose of this study recognises the lack of control that the researcher may have over events during the course of the study. It also embraces complex causality in order to obtain a more detailed picture of real world experiences in present day health systems (Robson 2002).

The study primarily targets a macro-level of analysis in attempts to better understand provincial health system organisation and functioning as it relates to KT mechanisms (Sheikh *et al.* 2011). However, there are also cross-cutting elements to this study. By engaging the perspectives of researchers and policymakers, there is a micro-level aspect to the study that considers individual choices in knowledge generation, dissemination and utilization in the province. This micro-level aspect will contribute to understandings about how provincial health policy is shaped by actors' decisions and choices regarding KT mechanisms.

Research question

What mechanisms are used for knowledge translation by health researchers and provincial health policymakers in the Western Cape provincial health system and how do these mechanisms influence the movement of health-related research into provincial health policy in this context?

Sub-questions:

The following sub-questions will be explored. Although, as is usual in this type of study, these sub-questions may be refined as the study progresses and some may not be fully addressed given the limited scope of the study.

1. What are the formal and informal processes/pathways for knowledge translation in the Western Cape provincial health system?
2. What are the tools/methods used by researchers and provincial health policymakers in translating health-based research in the province?
3. Who are the key health system actors responsible for knowledge translation in the province?
4. To what degree are knowledge translation mechanisms successful in translating health research into policy? (Do they achieve intended outcomes? What are these outcomes? How do they show impact?)

5. What mechanisms are favoured by researchers and health policymakers and why?
6. What are the obstacles and enablers to knowledge translation in the provincial health system?
7. How does the level and type of researcher embeddedness improve (or not improve) knowledge translation in the provincial HS?

Sub-study arrangement

This study forms part of a broader research project requested by the Health Impact Assessment (HIA), a sub-directorate of the PHRC in the Western Cape PDoH. It stems from a local need expressed by researchers and the PDoH to understand current KT practices in the Western Cape Health System. The aim of the overarching project is to improve local research dissemination products and systems so that health research is taken up for implementation in the province. This protocol describes the first of two studies in this project. It targets KT mechanisms as they function at the provincial level of the health system as well as their impact on health policy. It will run concurrently with the second stage of the study which focuses on the knowledge, attitudes and practices of health providers regarding health-related research in Western Cape provincial health facilities.

Methodology

Study design

This is a mixed methods cross-sectional study of KT mechanisms in the Western Cape provincial health system. A mixed methods approach is useful to explore little-understood, complex phenomena, such as KT. It promotes the use of quantitative and qualitative research techniques to allow the collection of more detailed evidence (Robson 2002). Furthermore, combining different research techniques enables the researcher to examine KT mechanisms from multiple perspectives, fostering the triangulation of results. This enhances the production of increasingly valid and contextualized

information as well as the creation of a macro picture of KT in the health system (Ozawa and Pongpirul 2014).

A convergent parallel research design for mixed methods will be used (Creswell 2013). Different data will be collected in parallel (rather than sequentially), analysed separately and then merged to provide a holistic understanding of KT mechanisms and their role in influencing the uptake of research into health policy. Figure 1 provides an overview of the design for this study, including data types, data collection and analysis methods, data synthesis and interpretation of results.

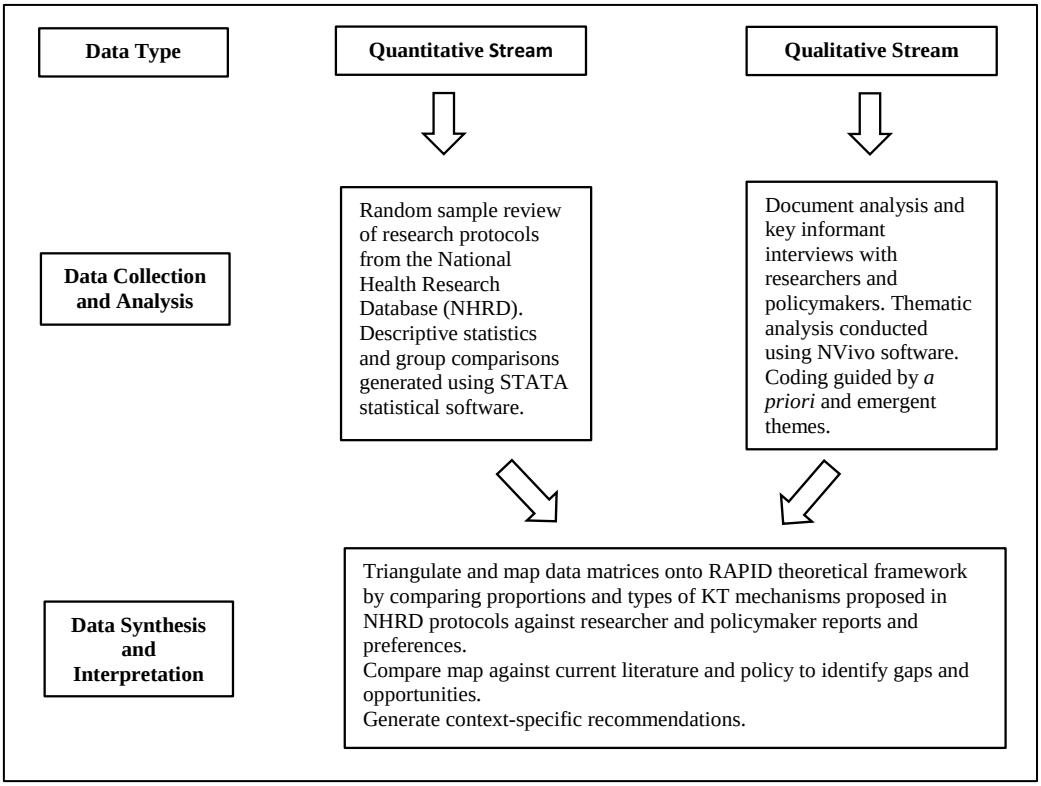


Figure 1 Overview of study design

Theoretical framework

The study design is underpinned by the Research and Policy in Development (RAPID) theoretical framework of KT. Originally developed by the ODI, this framework stems from the need for a systematic understanding of KT in developing contexts (ODI 2011). The model highlights the complex, interactive nature of KT by describing the role of political context, researcher-policymaker

links, the use of evidence and external influences (Court and Young 2003). Figure 2 highlights these key concepts and their relationships.

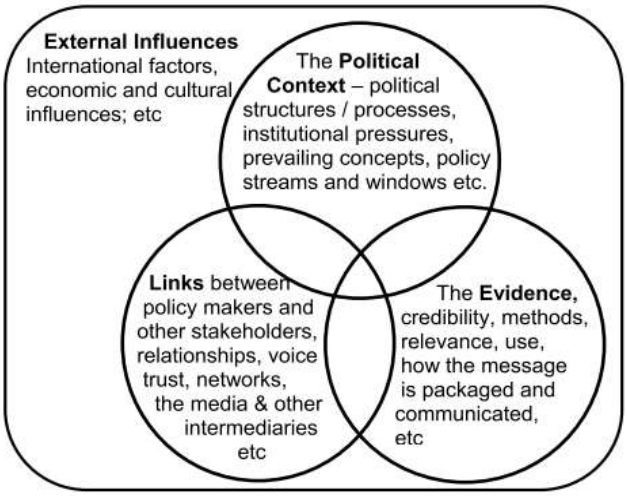


Figure 2 The RAPID Model (Source: ODI 2011)

The *political context* includes the people, institutions and processes involved in policy-making (Young 2005). Policymaking is defined broadly as the process from initial agenda-setting activities and establishing policy documents through to policy implementation. Key factors of interest here are the country's civil and political freedoms, institutional pressures, vested interests and power relations between actors (Ellen *et al.* 2012). The attitudes and incentives amongst officials, their room for manoeuvre and local history further influence the political context and consequently the use of research and policy implementation (ODI 2011; Walt and Gilson 2014).

The *evidence* refers to the specific research knowledge used. Important factors here include the quality and credibility of research, its topical relevance and operational usefulness. Additionally, communication of the evidence is critical and careful judgements should be made about how research messages are packaged, who conveys these messages and who is targeted (ODI 2011).

The *links* between researchers and policymakers emphasize the role of networks and communities of practice that are frequently facilitated by intermediaries, including the media and advocacy groups

(Young 2005; Buse *et al.* 2012). Issues of trust, legitimacy and the need for research translators or knowledge brokers are becoming increasingly important in sustaining healthy links between different actors and fostering policy uptake (ODI 2011; Scott *et al.* 2012).

Finally, *external influences* refer to the role of international and national level factors, including macro-economics, donor funding policies and socio-cultural contexts. These play a critical role in the translation and uptake of research into policy by influencing both research and policymaking processes (Ellen *et al.* 2012).

The RAPID model's strengths lie in its rigorous development and testing as well as its simplicity and generalizability to developing contexts (Young 2005; Ellen *et al.* 2012). Unlike traditional models that tend to view KT as a linear, rational process of moving research into policy, the RAPID model assumes an interactionist approach consistent with modern conceptualizations of KT (ODI 2011). It has been described as a "useful analytical entry-point" for exploring KT (Ellen *et al.* 2012, p. 18) and is therefore an appropriate model for this study.

Furthermore, by drawing on the RAPID model, this study aims to explore and expand on its theoretical and practical relevance to researchers and policymakers in the South African context. This aims to counter the criticism that conceptual understandings of health policy processes in LMICs are "small, fragmented, [and] of limited depth" (Erasmus *et al.* 2014, p. iii36). By adding to the conceptual body of work on KT in health systems, it aims to deepen and consolidate the theoretical foundations of Health Policy and Systems Research in this context and in LMICs more broadly (Gilson 2012).

Population

The population for this study includes two categories of professionals central to KT in the province:

- *Health Researchers:* These are individuals whose primary role is the conducting of health-oriented research in the province. This research should cover public health topics that have clinical, epidemiological, health system, services and policy relevance to the six provincial priorities outlined in the Western Cape's Healthcare 2030 plan. Broadly, these areas include infectious diseases (such as HIV and TB), violence and road injuries, non-communicable diseases, women's health, mental health, ante-natal and child health (WCDoH 2013). Researchers may be based in the PDoH or external institutions, including academia, research consortia and non-government organisations.
- *Provincial Health Policymakers:* These are individuals positioned within the provincial health system and are formally responsible for health policy decision-making in the Western Cape. They may include heads of department, chief directors and directors. Policymakers should be employed by the provincial health department, but may occupy joint appointments between provincial and academic or research institutions.

Data collection and analysis

Qualitative and quantitative data collection will occur in parallel and be analysed iteratively as it emerges. The following strategies are in line with the exploratory/explanatory purposes of the study (Gilson 2012) and are also advocated for in mixed-method research (Ozawa and Pongpirul 2014).

Database review

A retrospective database review will be conducted using the National Health Research Database (NHRD) to review strategies of KT proposed by researchers. The NHRD is the main repository for all health-related research in South Africa and contains all accepted protocols for studies conducted in the Western Cape provincial health system since its inception in 2014. Access to the NHRD will be

obtained via the PDoH following application and approval. A two-stage sampling process will be used to select and screen the studies for review:

- *Stage 1:* A simple random sample of 200-300 studies will be selected from the 500 studies (approximately) registered on the NHRD and conducted at facilities in the Western Cape Province. These studies may be independent to this stage of the research project or include those selected for analysis in the sister study described above.
- *Stage 2:* Application of the following inclusion/exclusion criteria will be used to streamline the selected studies:
    - Studies will be limited to those recorded as approved on the NHRD from September 2014 to September 2016. This provides a sampling timeframe of two years and allows for the review of KT mechanisms that were recently employed by locally conducted studies.
    - Studies may be complete or ongoing. This takes into consideration that KT is a dynamic process that may occur at any stage of the research endeavour.
    - Studies may be single or multisite. To ensure representation, proportional random sampling of single and multisite studies may be employed.
    - Studies may be of a clinical, epidemiological, health system, services and/or policy nature, but should be limited to topics outlined by the provincial priorities described above.
    - Studies should contain a section in their protocols of intended and/or actioned research dissemination activities as well as expected timelines for these activities.

Variables collected from the final sample of studies will be primarily categorical in nature and include each study's location, topic area (e.g. HIV or Public Health), study design, principal investigator, time period, proposed dissemination methods and any explicit policy intentions. Data will be captured in Microsoft Excel and analysed using STATA 14® statistical software. Descriptive statistics, including means, standard deviations, medians and interquartile ranges will be generated to give insight into

central tendencies and dispersions within data categories. Comparisons across categories will be conducted using the chi-squared test.

Key informant interviews

Two groups of locally based health researchers (n=3-5) and provincial health policymakers (n=3-5) will be invited to participate in an in-depth interview process (total n=6-10). These individuals will be purposively selected for their experience in research and policymaking respectively and will serve as key informants to what KT mechanisms are currently used and how these mechanisms influence the movement of health-related research into policy in the province. Typically, small sample sizes for each group will be selected to allow for in-depth probing of KT mechanisms.

Health researchers will be purposively sampled from a group of principal investigators for research projects registered within the last two years on the NHRD. They will be selected to ensure a mix of research institutions, including academia, research consortia (e.g. The South African Medical Research Council) and non-government research institutions. To enhance consistency across research methods, the selected researchers may be engaged with research of public health significance, including clinical, epidemiological, health system, services and/or policy relevance, but should be limited to research topics outlined by provincial priorities.

Additionally, to provide a balancing perspective on KT mechanisms, health policymakers will be purposively sampled from the Western Cape PDoH organogram for senior management service members (WCDoH 2016b). Individuals will be selected based on their experience with the policymaking process and may include the head of department, deputy director general, chief directors and directors for health policy decision-making. Members of the PHRC and HIA may also be included for their links to both provincial research and policymaking processes.

Potential participants will be invited via email to partake in the study. Non-responders will be sent a reminder email after one week and followed up telephonically up to three times. Email addresses will be obtained through the NHRD (for health researchers) and online public portals, including provincial and national health websites (for policymakers). Where necessary, access to potential participants will be facilitated by stakeholders within the PHRC secretariat, the HIA, who commissioned the study. Emails will inform participants about the study, its underlying purpose and any benefits or risks through a comprehensive information sheet (see appendix 1). Copies of ethics approval and informed consent forms will be attached (see appendix 2). All email identifiers will be erased following the study.

Interview times, dates and locations will be scheduled according to participant preferences and availability. Interviews will be conducted by a trained interviewer using an interview topic guide (see appendix 3). The ODI's RAPID model will serve as the theoretical underpinning for this guide. Both health researcher and policymaker interviews will explore the use of KT mechanisms, the perceived impact of these mechanisms and the potential barriers and facilitators to KT in the province. Basic socio-demographic data pertaining to work experience will be collected. Additional information on research knowledge flows, participant preferences, contextual factors and potential knowledge brokers will be explored. Specific interview questions are guided by the study's sub-questions together with Koon et al's (2012) key informant interview guide on research uptake in policy decision-making.

Interviews will last approximately 30-60 minutes and be audio-recorded with participants' permission. When this is not possible, detailed note-taking will take the place of recordings. Interviews will be conducted in English as this is the *lingua franca* of the Western Cape provincial health system. Interviews will be scheduled in person. However, telephonic interviews will also be acceptable for

difficult to access participants. No names will be recorded during interviews and codes will be used to designate institution or department and participant status (i.e. researcher, policymaker or other). Interviews will begin with a verbal and signed consent process, a reminder of the interview's purpose and an opportunity to clarify any concerns or questions about the study. Confidentiality will be assured throughout and participants will be free to terminate the interviews at any time.

Recorded interviews will be transcribed verbatim and reviewed repeatedly by the researcher for common themes using NVivo software. Framework analysis will guide the coding of interview data according to the four *a priori* themes included in the RAPID framework: 1) external influences; 2) political context; 3) evidence and; 4) links between actors (ODI 2011). Emergent themes will be anticipated and the analysis of these themes encouraged. Coded themes will be cross-checked by two research team members. Resulting data will be exported to an excel spreadsheet in preparation for comparison and synthesis with other data sets.

Document analysis

Together with key informant interviews, document analysis will support the identification of knowledge resources and assets currently available in the provincial health system as well as important knowledge gaps and weaknesses in policymaking (Ebener and Khan 2006). Additionally, document analysis will serve as an important point for data triangulation across data collection methods (Ulin *et al.* 2012).

A combination of literature and document review will be used to elicit information on mandated, recommended and actual KT mechanisms. Documents to be included will be national and provincial policies pertaining to KT, records of meetings between researchers and policymakers, DoH annual reports and strategic plans and published materials, including journals and media reports. Where

possible, these documents will be accessed via public platforms, such as provincial and national health websites. Internal documents not publicly available will be sourced with support of the HIA. If time allows, a single health policy will be purposively selected and analysed as a demonstrative case for the role of KT mechanisms in moving research into policy. This policy will be a published provincial health policy and have clinical, epidemiological, governance, services and/or systems relevance.[1] Thematic analysis of documents, including the selected policy, will occur against the backdrop of provincial health priorities and using the RAPID theoretical framework. Table 1 outlines a summary of key documents to be included. To ensure rigour and foster credible interpretations across documents, record of the analysis process will be maintained using a research journal. Themes will be recorded in information matrices in Excel and checked by multiple reviewers.

Table 1 Summary of key documents for review

Document Type	Example	Location and access
Policy Documents	• National Health Research Policy (2001) • National Health Act (2003) • Policy for Approval of Health Research in the Western Cape (2015/16)	• Public access via National and provincial DoH websites, online public portals.
Provincial DoH Documents	• Annual Reports • Minutes of Strategic Planning Workshops • Healthcare 2030: Road to Wellness	• Public access via National and provincial DoH websites, online public portals. • HIA facilitated access
Published literature	• The State of the National Health Research System in South Africa (Senkubuge and Mayosi 2012)	• Online journal database accessed via UCT
Miscellaneous	• Records from provincial research days • Media reports on health policy between 2015-2016	• Public access via National and provincial DoH websites, online public portals. • HIA facilitated access

Informal observations

It is anticipated that opportunities to observe KT mechanisms in action will arise during the course of the study. This may include observations of formal interactions between researchers and provincial

[1] Time constraints prevented analysis of a single policy as part of this study. However, due to the unique nature of knowledge use in individual policies, future research may choose to compare how research-based knowledge is translated in different provincial policymaking processes.

health policymakers at scheduled meetings and research days or during more informal interactions such as journal club gatherings. Due to ethical constraints, these observations will not be formally reported, but used to complement the researcher's understanding of KT mechanisms at work in the province and to guide further engagement.

Data synthesis and interpretation

Analysis of qualitative and quantitative data will be interpreted concurrently where quantitative findings from the NHRD review will be related to quotes from key-informant interviews. Additionally, data matrices generated in the NHRD review, key informant interviews and document analysis will be triangulated and mapped onto the RAPID theoretical framework to provide a visual picture of KT as it currently stands in the Western Cape provincial health system.[2] Key actors, networks, external and political influences and specific KT mechanisms at work in the system will be described together with the barriers and facilitators reported by policymakers and researchers. This map will be compared against recommended KT mechanisms proposed by current literature and local health policy. This comparison will enable the identification of gaps in policy and highlight potential opportunities for change (Ebener and Khan 2006). Finally, context-specific recommendations will be made to enhance KT in the province.

Rigour

Rigour in mixed methods studies is enhanced by justification of the approach to answer specific research questions; clear description of study design stages, including specific methods of data collection, analysis and synthesis; and sensitivity towards study limitations (Gugsa *et al.* 2016; Brown *et al.* 2015). A mixed methods approach is deemed appropriate to answer the *what* and *how* of KT

[2] Note: Due to emerging themes early in the study, it was decided by the researcher and supervisors not to apply the RAPID framework at this stage as originally planned. However, RAPID themes were used to broadly guide the initial coding of qualitative data.

mechanisms in this context due to the previously unexplored nature of KT mechanisms in the Western Cape provincial health system and the need for a comprehensive picture of how KT mechanism currently function. Furthermore, this method promotes the triangulation of data through the collection of both quantitative and qualitative data (Creswell 2013).

Rigour in quantitative data collection from the NHRD review is enhanced through the use of simple random sampling. This sampling strategy prevents selection bias and promotes the generalizability of findings to the national database (Palinkas *et al.* 2013). Additionally, detailed selection criteria, transparent reporting of data variables and clear methods of statistical analyses to be performed promote the validity of findings.

An inherent weakness of the NHRD review is a lack of contextual understanding surrounding quantitative data. This is addressed through the collection of complimentary qualitative data in the form of key informant interviews and documentary analysis. To prevent potential interpretation bias of qualitative data, coding of themes will be repeated twice by the researcher and reviewed by the two supervisors in this study. Themes will be further guided by the RAPID theoretical framework to promote confirmability across datasets.

Data is integrated and interpreted through a convergent design in which datasets are compared and mapped against the RAPID theoretical framework. This process is informed by literature review and will be subject to iterative adaptations following reanalysis of data and member checking. A limitation to this form of data integration may be the loss of flexibility and depth of the original qualitative data (Gugsa *et al.* 2016). To overcome this and capture the richness of qualitative data, direct quotes representative of the findings will be included.

Confirmability will be ensured through thorough documentation and reporting of the final study process that will allow for reduplication of the study in the future. Finally, reflexivity on the part of the researcher will be maintained through reflexive journal keeping and supervisor/peer debriefing (Petty *et al.* 2012).

Ethical considerations

"Ethical research practice requires a consideration of responsibilities to research participants, professional and academic colleagues, research sponsors and the wider public" (Green and Thorogood 2009, p. 62). Ethical considerations for this project seek to ensure standard ethical guidelines are followed when engaging with these stakeholders. The research complies with the Declaration of Helsinki (2013) and includes respect for persons, justice, beneficence, non-maleficence and consideration of both the risks and benefits for all parties (Mayosi *et al.* 2009).

Ethics approval will be sought from the University of Cape Town's Human Research Ethics Committee in the Faculty of Health Sciences as well as the Western Cape Department of Health PHRC. As part of this process the study will be registered on the NHRD.

Participation in interviews will be entirely voluntary and recruitment will take place without force or undue influence. Participants' autonomy will be guarded through a process of written informed consent at the beginning of each interview (see appendix 2). Participants may terminate their involvement at any point throughout the study without fear of repercussion or reprisal. No personal identifiers will be collected during interviews to maintain confidentiality and respect for anonymity. Due to the small number of researchers and policymakers included in this study and the likely interaction of these actors outside of the study, participants will be encouraged to refrain from discussing their involvement with colleagues as it may risk their confidentially. Email addresses used to contact participants will not be

linked to interviews and will be deleted following feedback of the interview process. All audio-recordings will be deleted following transcription and all transcriptions stored digitally on a locked hard drive.

Access to sensitive documents (e.g. minutes of meetings) and information on the NHRD will be facilitated by the PHRC. A signed confidentially agreement between the PHRC and the researcher will ensure protection of this data. All study data will be stored digitally and password protected. Documents will be locked following analysis and deleted at the end of the study. Access to raw data will be limited to the primary researcher (myself), a research colleague linked to the sister study (Linda Ndlovu) and the study supervisors (Jill Olivier and Virginia Zweigenthal). All remaining data will be destroyed after three years following completion of the study.

Risks and benefits

This is a low risk study. Risks for participants are limited to the cost of time needed to complete the interviews. There are also no direct benefits to be gained immediately from participation. However, due to the fact that participants (i.e. researchers and health policymakers) are key stakeholders in provincial health KT, there are potential long-term benefits for both. Firstly, findings may be of instrumental use for researchers who will be better informed about how to package and translate their research findings to policymakers in the province. Secondly, policymakers may gain conceptual knowledge about KT mechanisms and who potential knowledge brokers may be. This may inform decision-making processes and assist in the development of a formal KT policy for health research in the province. Together, these benefits will go a long way to ensuring that health research is taken up for implementation in the Western Cape provincial health system.

Study limitations

The study does not claim to be representative outside of the Western Cape provincial health system. Although some statistically generalizable claims may be possible from the quantitative database review, these generalisations are not possible for limited qualitative data samples. However, the use of rich description according to theory and a careful iterative process of comparison and synthesis across qualitative and quantitative data forms should generate insights that have sufficient analytic and theoretical application to similar LMIC settings (Robson 2002; Gilson 2012)

Recall and responder bias in interviews is an additional limitation to this study. This is addressed by encouraging open and honest conversation in interviews and the use of multiple key informants (i.e. researchers and policymakers, not just one or the other). Triangulation of interview data with document analysis and the NHRD review will further limit the effects of this bias on results.

A final constraint to this study is the timeline which is limited to 2017. This may affect the depth of analysis and preclude the ability to answer all research questions posed.

Timeframe

The study is projected to take twelve months from initial protocol design and ethics approval request, through participant recruitment, data collection, analysis, synthesis and write-up to dissemination of findings. Table 2 provides a discrete schedule for these activities.

Table 2 Schedule of study activities

Component	Activity	Date
Protocol Development	Development of research focus	November – December 2016
	Write up of protocol & edits	January – June 2017
Ethics Approval	Submission of protocol & approval process	June – July 2017
Literature Review	Scoping review and refining search strategy	July – August 2017
	Write up of literature review and edits	August 2017
Data Collection	Participant identification and recruitment	July – August 2017
	Database Review	August – September 2017
	Document Analysis	August – September 2017
	Potential observations	August – September 2017
	Policy Analysis	August – September 2017
Data Analysis & Synthesis	Quantitative Analysis	September – October 2017
	Qualitative Analysis	September – October 2017
	Synthesis of Data and Final Analysis	October 2017
Write-up	Drafts and edits	October - November 2017
Final submission	Intent to submit	15 November 2017
	Submission	15 December 2017
Dissemination	Feedback to relevant stakeholders	January – November 2017

Budget

This study has been generously funded by the Cape Higher Education Consortium (CHEC) grant and the National Research Foundation (NRF) of South Africa. This funding covers all incidental costs for the study outlined in table 3. The primary researcher declares no conflict of interest.

Table 3 Projected costs of the proposed study

Category	Item	Total Cost
Stationary	Pens	R100
	Notebooks	R200
Printing	Consent Forms	R40
	Information Sheets	R40
	Interview Sheets	R40
	Dissertation	R300
	Dissemination materials	R1000
	Final report CD	R100
Petrol / Transport		R600
Conference Attendance	Global evidence summit	R7 000
Mobile Phone Costs		R300
Dissertation Registration		R16 870
	TOTAL:	**R26 590**

Dissemination

A study on KT mechanisms would be remiss not to consider a dynamic and flexible approach to dissemination of its own findings. A reflexive and iterative dissemination process will be targeted with stakeholders throughout the study period, not just on completion of the study (see table 2). This will take the form of regular updates via email, face-to-face meetings or telephonic contact with members of the HIA who commissioned the study as well as senior provincial health officials and researchers upon request. In addition, findings and recommendations emanating from the study will be communicated to stakeholders, including participating senior policymakers in the PDoH and researchers from participating institutions. Communication of the findings will take the form of reports, presentations, recommendations, policy briefs and/or publications. Opportunities to disseminate findings to a wider audience will also be explored through participation in relevant health policy and systems related conferences and forums as well as submission to academic journals and online publications.

References

Agyepong I, Adjei S. 2008. Public social policy development and implementation: a case study of the Ghana National Health Insurance scheme. *Health Policy and Planning* **23**: 150–60.

AHPSR (Alliance for Health Policy and Systems Research). 2016. *Strategic Plan 2016-2020: Investing in Knowledge for Resilient Health Systems*. Geneva: World Health Organisation.

Avan B, Berhanu D, Umar N, Wickremasinghe D, Schellenberg J. 2016. District decision-making for health in low-income settings: a feasibility study of a data-informed platform for health in India, Nigeria and Ethiopia. *Health Policy and Planning* **31**: ii3-ii11.

Bennett G, Jessani N (eds). 2011. *The Knowledge Translation Toolkit: bridging the know-do gap: a resource for researchers.* New Delhi: Sage Publications.

Bosch-Capblanch X, Lavis J, Lewin S, *et al.* 2012. Guidance for evidence-informed policies about health systems: rationale for and challenges of guidance development. *PLoS Medicine* **9**: e1001185.

Brown K, Elliott S, Leatherdale S, Robertson-Wilson J. 2015. Searching for rigour in the reporting of mixed methods population health research: a methodological review. *Health Education Research* **30**: 811–39.

Buse K, Mays N, Walt G. 2012. *Making Health Policy*. Maidenhead: Open University Press.

CIHR (Canadian Institutes of Health Research). 2016. Knowledge translation - definition. Accessed 12 December 2016. Online at http://www.cihr-irsc.gc.ca/e/29418.html#2.

Court J, Young J. 2003. Bridging research and policy: insights from 50 case studies. *ODI Working Paper 213*. London: Overseas Development Institute.

Creswell J. 2013. Steps in Conducting a Scholarly Mixed Methods Study. *DBER Speaker Series.* Paper 48. Lincoln: Discipline-Based Education Research Group.

Datta A. 2012. Deliberation, dialogue and debate: why researchers need to engage with others to address complex issues. *IDS Bulletin* **43**: 9–16.

Delany-Moretlwe S, Stadler J, Mayaud P, Rees H. 2011. Investing in the future: lessons learnt from communicating the results of HSV/ HIV intervention trials in South Africa. *Health Research Policy and Systems* **9**: S8.

Ebener S, Khan A. 2006. Knowledge mapping as a technique to support knowledge translation. *Bulletin of the World Health Organization* **84**: 636–42.

Ellen M, de Carvelho I, Beard J, Goodwin J, Panisset U. 2012. *Knowledge Translation Framework for Ageing and Health*. Geneva: World Health Organization.

Erasmus E, Orgill M, Schneider H, Gilson L. 2014. Mapping the existing body of health policy implementation research in lower income settings: what is covered and what are the gaps? *Health Policy and Planning* **29**: 35–50.

Gervais M, Marion C, Dagenais C, Chiocchio F, Houlfort N. 2016. Dealing with the complexity of evaluating knowledge transfer strategies: guiding principles for developing valid instruments. *Research Evaluation* **25**: 62–9.

Gilson L. 2012. *Health Policy and Systems Research: A Methodology Reader*. Geneva: Alliance for Health Policy and Systems Research, World Health Organisation.

Graham I, Logan J, Harrison M, *et al.* 2006. Lost in knowledge translation: time for a map? *The Journal of Continuing Education in the Health Professions* **26**: 13–24.

Green J, Thorogood N. 2009. *Qualitative Methods for Health Research*. London: Sage Publications.

Greenhalgh T, Wieringa S. 2011. Is it time to drop the 'knowledge translation' metaphor? A critical literature review. *Journal of the Royal Society of Medicine* **104**: 501–9.

Gugsa F, Karmarkar E, Cheyne A, Yamey G. 2016. Good Reporting of A Mixed Methods Study (GRAMMS): Newspaper coverage of maternal health in Bangladesh, Rwanda and South Africa: a quantitative and qualitative content analysis. *BMJ Open* **6** (Suppl. 1).

Harris R. 2015. The impact of research on development policy and practice: this much we know. In: Chib A, *et al.* (eds). *Impact of Information Society Research in the Global South*. Singapore: Springer Singapore, 21–43.

Harrison D. 2009. An overview of health and health care in South Africa 1994 – 2010: priorities, progress and prospects for new gains. *Discussion Document: National Health Leaders' Retreat.* Muldersdrift: Henry J Kaiser Family

Foundation, 1–40.

Hoffman S, Røttingen J, Bennett S, Lavis J, Edge J, Frenk J. 2012. *A Review of Conceptual Barriers and Opportunities Facing Health Systems Research to Inform a Strategy from the World Health Organization*. Geneva: Alliance for Health Policy and Systems Research.

King L, Hawe P, Wise M. 1998. Making dissemination a two-way process. *Health Promotion International* **13**: 237–44.

Koon A, Nambiar D, Rao K. 2012. *Embedding of Research into Decision-making Processes*. Geneva: Alliance for Health Policy and Systems Research.

Langer L, Tripney J, Gough D. 2016. *The Science of Using Science: Researching the Use of Research Evidence in Decision-Making*. London: EPPI-Centre, University College London.

Lutge E, Slack C, Wassenaar D. 2017. Defining and negotiating the social value of research in public health facilities: perceptions of stakeholders in a research-active province of South Africa. *Bioethics* **31**: 128–35.

Mayosi B, Dhai A, Folb P, *et al.* 2009. *Consensus Report on Revitalising Clinical Research in South Africa: A Study on Clinical Research and Related Training in South Africa.* Pretoria: Academy of Science of South Africa.

NDoH (National Department of Health). 2001. *Health Research Policy in South Africa*. Pretoria: National Department of Health.

ODI (Overseas Development Institute). 2011. *The RAPID Framework for Assessing Research-Policy Links.* Accessed 10 September 2016. Online at https://www.odi.org/sites/odi.org.uk/files/odi-assets/events-documents/2764.pdf.

Oliver K, Innvar S, Lorenc T, Woodman J, Thomas J. 2014. A systematic review of barriers to and facilitators of the use of evidence by policymakers. *BMC Health Services Research* **14**: 2.

Olivier J, Scott V, Molosiwa D, Gilson L. 2016. Embedded systems approaches to health policy and systems research. In: de Savigny D, Blanchet K, Taghreed A (eds). *Applied Systems Thinking for Health Systems Research: A Methodological Handbook.* Maidenhead Berkshire: Open University Press.

van Olmen J, Criel B, Van Damme W, *et al.* 2012. Analysing health system dynamics: a framework. *Studies in Health Services Organization & Policy* **28**: 1–117.

Oxman A, Vandvik P, Lavis J, Fretheim A, Lewin S. 2009. SUPPORT Tools for evidence-informed health policymaking (STP) 2: improving how your organisation supports the use of research evidence to inform policymaking. *Health Research Policy and Systems* **7**: 1–10.

Ozawa S, Pongpirul K. 2014. 10 Best resources on…Mixed methods research in health systems. *Health Policy and Planning* **29**: 323–7.

Palinkas L, Horwitz S, Green C, Wisdom J, Duan N, Hoagwood K. 2015. Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research* **42**: 533–44.

Petty N, Thomson O, Stew G. 2012. Ready for a paradigm shift? Part 2: introducing qualitative research methodologies and methods. *Manual Therapy* **17**: 378–84.

Robson C. 2002. *Real World Research: A resource for social scientists and practioner-researchers*. Oxford: Blackwell Publishing.

de Savigny D, Adam T. (eds). 2009. *Systems Thinking for Health Systems Strengthening*. Alliance for Health Policy and Systems Research. Geneva: WHO.

Scott V, Mathews V, Gilson L. 2012. Constraints to implementing an equity-promoting staff allocation policy: understanding mid-level managers' and nurses' perspectives affecting implementation in South Africa. *Health Policy and Planning* **27**: 138–46.

Senkubuge F, Mayosi B. 2012. The state of the national health research system in South Africa. *South African Health Review*: 141–9.

Sheikh K, Gilson L, Agyepong IA, Hanson K, Ssengooba F, Bennett S. 2011. Building the field of health policy and systems research: framing the questions. *PLoS Medicine* **8**: e1001073.

Sheikh K, Saligram P, Prasad L. 2013. *Mapping the Regulatory Architecture for Health Care Delivery in Mixed Health Systems in Low- and Middle-Income Countries. Working Paper 26.* Melbourne: Nossal Institute for Global Health.

Straus S, Tetroe J, Graham I. 2009. Defining knowledge translation. *Journal of the Canadian Medical Association* **181**: 165–8.

Sudsawad P. 2007. *Knowledge Translation: Introduction to Models, Strategies, and Measures*. Austin: Southwest Educational Development Laboratory, National Center for the Dissemination of Disability Research.

Travis P, Bennett S, Haines A, *et al.* 2004. Overcoming health-systems constraints to achieve the Millenium Development Goals. *Lancet* **364**: 900–6.

Ulin P, Robinson E, Tolley E. 2012. *Qualitative Methods in Public Health: A Field Guide for Applied Research*. New York: John Wiley & Sons, Ltd.

United Nations. 2015. *Transforming Our World: The 2030 Agenda for Sustainable Development.* Resolution adopted by the General Assembly 70/1.

Uzochukwu B, Onwujekwe O, Mbachu C, *et al.* 2016. The challenge of bridging the gap between researchers and policy makers: experiences of a health policy research group in engaging policy makers to support evidence informed policy making in Nigeria. *Globalization and Health* **12**.

Walt G, Gilson L. 2014. Can frameworks inform knowledge about health policy processes? Reviewing health policy papers on agenda setting and testing them against a specific priority-setting framework. *Health Policy and Planning* **29 Suppl 3**: 6–22.

WCDoH (Western Cape Department of Health). 2013. *Healthcare 2030: The Road to Wellness*. Cape Town: Western Cape Department of Health.

WCDoH (Western Cape Department of Health). 2015. *Policy for Approval of Health Research in the Western Cape 2015/16*. Cape Town: Western Cape Department of Health.

WCDoH (Western Cape Department of Health). 2016a. *Executive summary of the 2016 Western Cape Provincial Health Research Committee Strategic Planning (Strat Plan) Workshop*. Cape Town: Western Cape Department of Health.

WCDoH (Western Cape Department of Health). 2016b. *Annual Report 2015/16*. Cape Town: Western Cape Department of Health.

WHO (World Health Organisation). 2007. *Everybody's business: Strengthening Health Systems to Improve Health Outcomes*. Geneva: World Health Organisation.

WHO (World Health Organisation). 2017. *Health Policy*. Geneva: World Health Organisation.

Young J. 2005. Research, policy and practice: Why developing countries are different. *Journal of International Development* **17**: 727–34.

PART B: STRUCTURED LITERATURE REVIEW

Evidence Map of Knowledge Translation Mechanisms, Outcomes, Facilitators and Barriers in African Health Systems

Background

The need for research-based knowledge to inform health policy and practice is a chronic global public health concern (Green and Bennett 2007; Conalogue *et al.* 2017). Knowledge generated through health research has the potential to improve health outcomes, promote service delivery and strengthen health systems functioning (El-Jardali *et al.* 2014; Langlois *et al.* 2016; Barratt *et al.* 2017). However, a consistent finding from the health services literature has been the failure to translate research findings into health policy and practice (Grimshaw *et al.* 2012). Despite burgeoning interest in this area, the translation process remains slow, haphazard and unpredictable resulting in reduced health gains *vis-á-vis* societies' investment in research (Tetroe *et al.* 2008; van Olmen *et al.* 2012). In low-resource, high-disease settings, such as those found in many African countries, the consequences of ineffective knowledge translation are amplified, emphasizing the need for health system decision-makers to justify their decisions based on high quality evidence (de Savigny and Adam 2009; Shroff *et al.* 2015).

In recent years, efforts to increase the uptake of health research into policy have intensified globally (King *et al.* 1998; Brownson *et al.* 2006; Sudsawad 2007; Bosch-Capblanch *et al.* 2012; Harris 2015; Langer *et al.* 2016). From this growing body of literature, several factors have been found to influence the use of research in policymaking. In an updated systematic review, Oliver *et al.* (2014) identified a number of barriers and facilitators to evidence uptake by policymakers. The most frequently reported barriers indicate that poor access to good quality, *relevant* research and a lack of *timely* research output greatly decreases the potential for research to influence policy. While collaborations between researchers and policymakers, skills-building with policymakers and improved relationships tend to enhance research use. The review focused on policymaking across different areas, including criminal

justice, education and food policy. However, 126 of 145 included studies related specifically to health policymaking. Focusing only on health policy, Lavis *et al.* (2009a) further emphasize the importance of engaging with research users to enhance the uptake of evidence in health policy decision-making.

Oliver *et al.* (2014) go on to describe the importance of informal evidence in decision-making, including the use of local data and tacit knowledge. These authors conclude that research-based knowledge is just one source of information for policymakers and that identifying these different types of knowledge is a crucial step in getting research to influence policy, a finding increasingly recognised by others (Greenhalgh and Wieringa 2011; Langlois *et al.* 2016; Kothari and Wathen 2017). Additionally, research *institutions* that demonstrate capacity for generating high quality, reputable research and close connections with policymakers have been shown to have greater embeddedness in the policymaking process and therefore a greater influence in translating their research into policy (Koon *et al.* 2012).

Knowledge translation (KT) is a common term used to describe the complex process of moving research-based evidence into policy and practice (Graham *et al.* 2006; McKibbon *et al.* 2010; Gervais *et al.* 2016). In this project our understanding of KT aligns with the Canadian Institute of Health Research (CIHR) who define KT as 'a dynamic and iterative process that includes the synthesis, dissemination, exchange and ethically sound application of knowledge to improve health, provide more effective health services and products, and strengthen the health care system' (CIHR 2016, p. 1). Critics consider this too limited a definition for modern conceptualizations of knowledge, preferring *knowledge exchange, knowledge interaction* or, more recently, *integrated knowledge translation* to demonstrate the central role of knowledge users and their influence on the knowledge translation process (Sudsawad 2007; Greenhalgh and Wieringa 2011; Kothari and Wathen 2013; Engebretsen *et al.* 2017). Based on increasing evidence that co-produced knowledge has a greater chance of being

implemented, these terms emphasize the need for researchers and policymakers to work collaboratively at all stages of the research process from the generation of research questions to the dissemination and implementation of results (Conalogue *et al.* 2017; Kothari and Wathen 2017). For the purposes of this article and to promote clarity across the broader research project, KT will be used as the overarching term and these expanded definitions will be viewed as implicitly important to the original definition.

While various mechanisms[1], such as policy briefs, collaborative workshops and KT platforms, have been proposed to enhance KT (Nutley *et al.* 2007; Sudsawad 2007; Lavis *et al.* 2009a, 2009b; Oxman *et al.* 2009; Bennett and Jessani 2011) evidence of their effectiveness remains limited (Grimshaw *et al.* 2012; Langlois *et al.* 2016). Possible reasons for this include difficulties identifying what outcomes should be measured, the need to strengthen the validity of measurement instruments and the inherently complex ways in which KT can occur (Gervais *et al.* 2016; Kothari and Wathen 2017). A key criticism from the literature has been the failure of current KT mechanisms to account for this complexity, including the specificity of the policymaking process, its power dynamics, differing timelines and unique contextual considerations, especially in low- and middle-income countries (LMICs) (Greenhalgh and Wieringa 2011; Murphy and Fafard 2012; Nabyonga Orem *et al.* 2012; Moat *et al.* 2013)**.** Thus, the optimal choice of KT mechanisms as they vary by context remains

Box 1 Current challenges to KT in LMIC health systems

- Access to good quality relevant research
- Unknown effectiveness/impact of KT mechanisms
- Difficulty identifying clear outcomes of KT activities
- Need to strengthen valid instruments to measure KT
- Complex nature of KT including its power dynamics, differing timelines and unique contexts
- Unclear choice of KT mechanisms as they vary by contexts
- Complex systems issues, including historically weak relationship between health and research systems
- Limited local funding and research capacity

[1] In the absence of a universal taxonomy, 'mechanisms' may also be referred to as interventions, strategies, processes, techniques, approaches or activities.

unclear (Tricco *et al.* 2016). Furthermore, researchers have highlighted the weak relationship between health and research systems, recognising the need to consider complex systems issues and their influence on the adoption of new knowledge (Caffrey *et al.* 2016; Kirigia *et al.* 2016). Box 1 summarizes the central challenges to KT in LMIC settings identified by current literature.

In Africa, where more than 50 percent of the world's LMICs are found, there remains a particular paucity of research on KT strategy selection and activities that promote the use of research by health policymakers (Tricco *et al.* 2016; Uzochukwu *et al.* 2016). Exacerbated by limited funding availability and institutional research capacity to generate locally-relevant research (Shroff *et al.* 2015; Kirigia *et al.* 2016), there is an urgent need to seek out cross-country learning opportunities that boost understandings of KT mechanisms in this context.

The primary objective of this paper is to provide a mapping review of the literature on KT mechanisms, their outcomes, barriers and facilitators in African health systems with an emphasis on southern African countries. In doing so, it aims to position the current research project in the Western Cape provincial health system within the broader field of KT. Additionally, this review aims to generate a user-friendly evidence map for health system researchers and policymakers that can be used for local health system decision-making in KT policy and practice. Finally, the map aims to identify gaps in current knowledge and areas for potential future research on local KT mechanisms in Africa.

Method: systematic evidence mapping

Evidence mapping is an emerging method of synthesis that provides a systematic overview of the literature on a specific topic (Grant and Booth 2009). Similar to full systematic reviews, evidence mapping employs methods that are reproducible and transparent, applying explicit search procedures and robust inclusion/exclusion criteria (Clapton *et al.* 2009; Randall and James 2012). However, while

systematic reviews target specific research questions, evidence mapping focuses on the nature, volume and characteristics of the literature in order to identify, describe and categorise what is known (Bragge *et al.* 2011). Evidence mapping is distinguished from scoping review methodology in the level of stakeholder involvement in the mapping process, rigor in the search strategy and the nature or usability of the final product or map (Miake-lye *et al.* 2016).

For the purposes of this paper, a systematic evidence mapping process was adapted from the Global Evidence Mapping Initiative (Bragge *et al.* 2011). Figure 1 outlines this process and the three core tasks involved, including 1) setting the boundaries and contexts of the map; 2) searching and selecting relevant studies; and 3) reporting on yield and study characteristics. The final report presented here forms the evidence map of research on KT mechanisms across African health systems.

The three-step mapping process was conducted between July and October 2017 in collaboration with stakeholders from the Western Cape Department of Health and the primary supervisors for this project. The boundary of the evidence map was expanded beyond South African experiences of KT to include all African countries. This encouraged cross border learning experiences in the context of limited locally-relevant research. The overarching research question was used to inform an initial selection of key terms including *knowledge translation, health researchers* and *health policymakers*. These terms were supplemented with Medical Index Subject Headings (MeSH) and search filters for African countries (Pienaar *et al.* 2011). The need to capture KT literature relevant to health research and policymaking was balanced against the field's large overlapping nomenclature (Straus *et al.* 2009; Gervais *et al.* 2016). Final KT search terms were limited to those described by Graham and colleagues (2006) and identified by McKibbon *et al.* (2010) as highly sensitive for discriminating between KT and non-KT literature. These include *knowledge translation, knowledge transfer, knowledge exchange, research utilization, implementation, dissemination* and *diffusion.* Groups of terms were linked using

the Boolean operator 'AND' then trialled in PubMed with the assistance of an experienced medical librarian. Following a preliminary search, *evidence-based decision making* was added to this list to compliment search results. The final search strategy and list of key terms is presented in appendix 4.

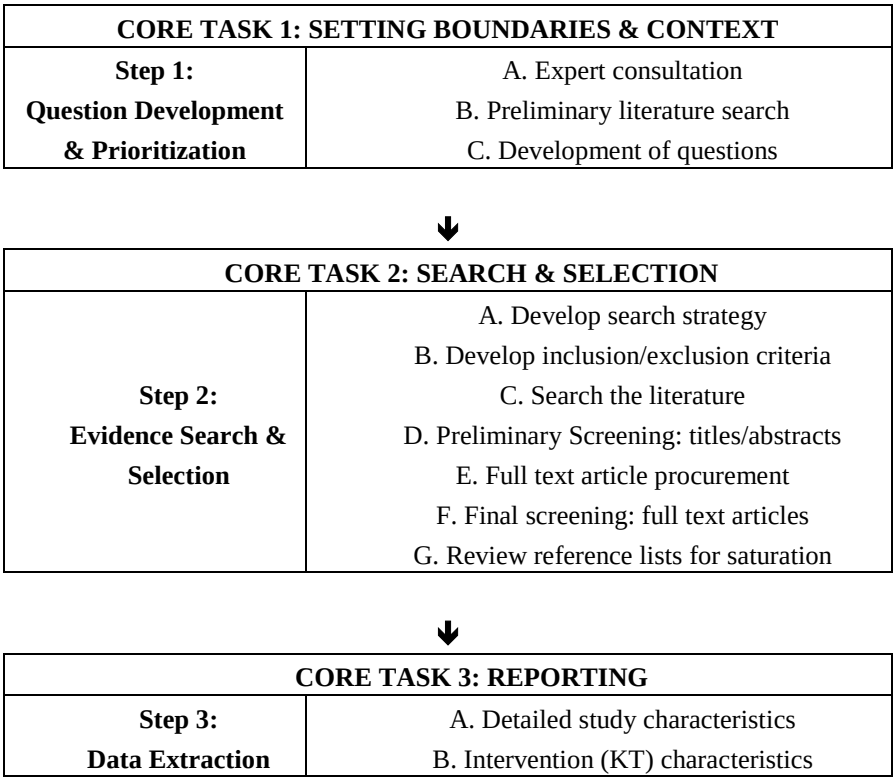


Figure 1 Global evidence mapping method (Source: adapted from Bragge et al. 2011)

Eligibility criteria were generated using the PICO (Population, Intervention, Comparator, Outcome) framework. Eligible *populations* included health researchers and public health policymakers involved in management, executive or policy-level decision-making about health programmes or services. Other knowledge users, such as non-government organisations (NGOs), healthcare providers and patients, were excluded in-line with the policymaking scope of the evidence map. *Interventions* included any activity designed to facilitate the use of research-based knowledge in public health policymaking. Both active KT mechanisms (for example, KT platforms, collaborative workshops) and passive KT mechanisms (including dissemination of reports or journal publications) were included. Studies that

focused on whole policy analysis and policy implementation processes were excluded, refining included studies to KT mechanisms employed before or during the policy development stage of the policy process. Any or no *comparator* between KT mechanisms were eligible for inclusion. Studies that identified KT mechanisms, barriers or facilitators, outcomes and contextual considerations were included. *Outcomes* of KT mechanisms included, but were not limited to, changes in knowledge, attitude, beliefs, behaviour, networks and partnerships. Papers were excluded if they focused on theoretical and conceptual developments of KT, terminology debates and KT mechanisms employed in non-health related fields (for example, in economic, agricultural, or criminal justice fields). Eligible *study designs* included randomised controlled trials, observational studies, surveys, qualitative research, case studies and mixed-methods research. Only primary empirical research was included. This excluded all analytical studies and research syntheses, such as systematic reviews. Since no synthesis studies were found that focused only on African countries, this was deemed an appropriate exclusion criterion. Multinational studies that involved African and non-African countries and met all other criteria were included if results could be traced to specific countries.

Four reference databases were searched using the advanced search tools in each database and the guidance of a second medical librarian. Databases included PubMed, CINAHL (via EbscoHost), Web of Science and Scopus. The search was limited to studies published in English between the years 2000-2017, inclusive, to capture modern KT mechanisms at work in African countries. Due to the large number of results obtained in PubMed, the 'best match' function was used to further limit search results for this database. Final search results were collated in EndNoteX8™ and supplemented via hand searches of Google Scholar and the Cochrane Library. A Dropbox database established opportunistically by the research team in September 2016 for the purposes of the broader research project was also included. This database contains a combination of relevant empirical studies and grey literature.

Following the removal of duplicates and a preliminary screening of study titles and abstracts, full texts of remaining studies were procured and a final screening was conducted using the established inclusion/exclusion criteria. In an iterative search process that promoted saturation, reference lists of final key texts were mined for additional relevant studies. Data was extracted on study author(s), title, year of publication, publication type, study design, location, underlying theory, funding source, sample size, participant populations, KT mechanisms employed, content focus and type of these mechanisms, reported barriers, facilitators, outcomes and contextual considerations. A searchable database containing this data was compiled using a Microsoft Access file. Frequency and thematic analysis were used to report study characteristics and to establish the final evidence map of KT mechanisms, barriers, facilitators and outcomes.

Results

Search results

Initial search results identified a total of 1,665 potential studies. Following removal of duplicates (*n*=231) and screening of titles/abstract (*n*=1,182), the total number of studies was reduced to 252. Screening of full text items excluded an additional 196 studies. Reference mining of the final 56 studies presented an additional six studies for inclusion. This resulted in a total of 62 studies eligible for systematic mapping (see appendix 5 for a full study flow diagram).

Study characteristics

Included studies were published between 2005 and 2017 with a slight, but general increase in publications over time (see Figure 2). Studies were widely distributed across the African region with the most studies published in South Africa and Uganda (15 studies each), followed by Nigeria (11 studies) and Malawi (10 studies). Just over half (32/62) of the included studies were multinational

involving more than one African country, other LMICs, or a combination of upper, lower and middle-income countries. Figure 3 displays the geographical spread of included studies, as well as the large number of countries for which no research was found.

Overall, multiple case studies were the most popular study design, with 31 studies reporting its use. This was followed by qualitative designs (12), mixed methods (6), descriptive studies (5), surveys (3), modified 'before and after' study designs (2), retrospective cohort designs (1), social network analysis (1) and structured reflection (1). Funding for studies originated predominantly from international multilateral funders and foreign donor agencies (81%) with only six studies reporting local funding support as their primary source. Although a variety of content areas were the focus of KT mechanisms, four broad areas account for over half of the included studies: maternal and child health (21%); governance, health information and systems issues (18%), malaria (10%) and HIV/AIDS (8%).

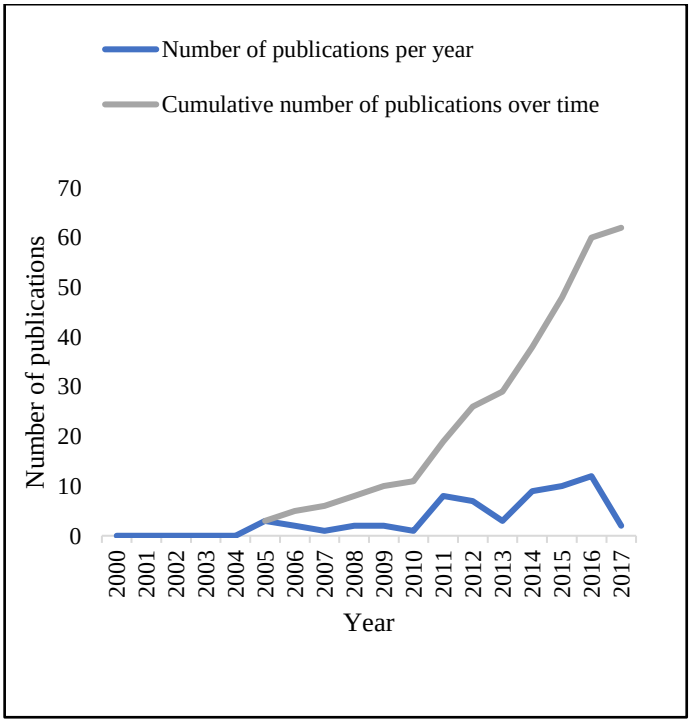


Figure 2 Number of publications by year

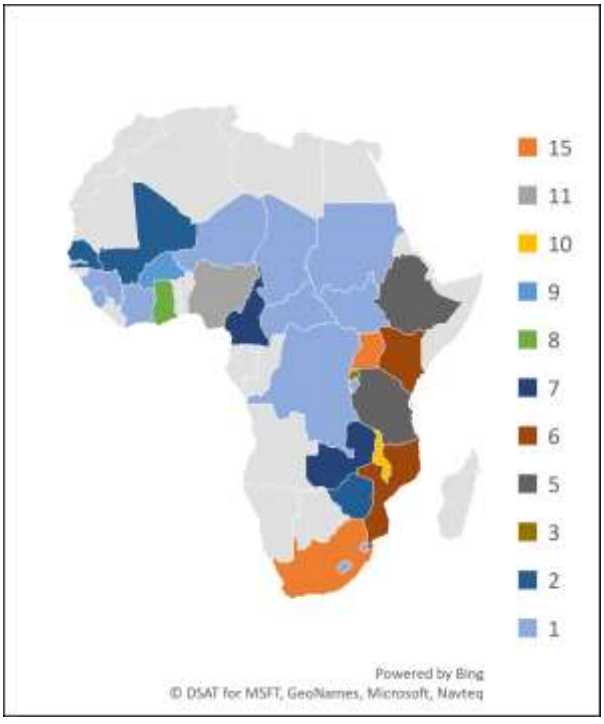


Figure 3 Distribution of publications by country

KT interventions employed in African health systems

Table 1 summarizes the characteristics of KT interventions from an extract of four eligible studies. A comprehensive table containing the same information for all 62 studies is presented in appendix 6. The commentary here reflects all included studies. Figure 4 maps the KT mechanisms, different influencing factors and outcomes found across studies. The use of theory was reported in over half the studies (33) and varied widely from research utilization models, such as, Carol Weiss' model of research use (Rodríguez *et al.* 2015) to theories of planned behaviour (Moat *et al.* 2014). Many studies reported the use of more than one theory, while no studies reported use of the same theory. This reflects the inherent heterogeneity in perspectives within the field (Sudsawad 2007).

Table 1 Characteristics of KT interventions (sample extract of four eligible studies - see appendix 6 for a complete list)

Study	Country	Underlying Theory	KT Intervention Type*	KT Mechanisms	Participants	Personnel	Reported Contextual Factors
Bennett *et al.* 2012	Multinational - Ghana, South Africa, Uganda	NR[Φ]	Integrated Efforts	Research reports and publications (indirect) Verbal briefings Policy briefs Conducting policy-relevant research and analysis Providing policy advice and technical assistance in policy formulation and evaluation Conducting policy dialogues at national level	Policymakers, donors, NGO	Members of research institutes	NR
Delany-Moretlwe *et al.* 2011	South Africa	NR	Exchange Efforts	Building credibility through linkages - Community Advisory Boards, community consultation workshop, monthly meetings Multiple means of communication - drama, music, radio and community events SMS Face-to-face meetings, telephonically, email (especially with policymakers) Interdisciplinary workshops	Researchers	NR	Disease burden, health system organisation, socio-political context of South Africa.
Guieu *et al.* 2016	Multinational - Kenya, Mozambique, South Africa, Burkina Faso, Malawi	NR	Exchange Efforts	A 'work package' of translation activities, including strong involvement of stakeholders through: inviting policymakers to open meetings key-informant interviews with policymakers workshops with policymakers fora for policymaker feedback on research projects policy advisory boards at each site stakeholder workshops policy recommendations in format adapted to policymaker needs	Researchers	NR	Importance of context noted, but not described, LMIC settings - resource constrained.
Hennink and Stephenson 2005	Multinational - Malawi, Tanzania	Models of research utilization - rational, incremental and political models	Push Efforts	Workshops Research report distributed Academic channels (journals, conference presentations)	Health researchers, policymakers, and practitioners	NR	NR

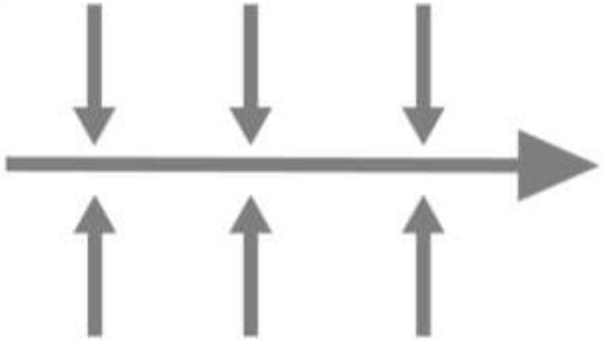
*According to Lavis et al. (2006) push-pull-integrated-exchange model

Φ Not reported (NR)

Reported Contextual Factors
Epidemiological profile
Health system organisation
Socio-political & economic factors, including language & culture
Donor aid

Top 10 Reported KT Mechanisms	
Push efforts *(n)*	**Pull efforts *(n)***
Policy briefs *(15)* Journal publications *(10)* Conferences *(10)* Media campaigns *(8)* Research reports *(7)* Presentations *(6)* Conducting systematic reviews *(5)* Advocacy *(4)* Fact sheets *(1)* Memo distribution *(1)*	Policy dialogues *(11)* Formation of steering committee, including policy advisory committee *(5)* Technical working groups *(5)* Policymaker conducts research *(1)*
Exchange efforts *(n)*	**Integrated efforts *(n)***
Capacity building workshops *(13)* Meetings with communities of practice *(11)* Participatory planning workshops *(8)* Joint priority setting exercises, including stakeholder mapping and situation analysis *(8)* Stakeholder forums *(6)* Research and policy networks *(6)* Verbal briefings/personal contacts *(4)* Teaching and mentorships *(4)* Forming partnerships *(3)* Group & plenary discussions *(2)*	Online clearinghouse/ sharing platform *(9)* Use of a Knowledge Broker (KB) *(5)* Knowledge Translation Platforms (KTPs) *(5)* Rapid response service *(3)* Monitoring & evaluation of research use *(1)* Institutional embeddedness *(1)* Completing joint grant applications *(1)* Joint protocol development *(1)*

Top 10 Reported Barriers		
Mutual Barriers *(n)*	**Policymaker Barriers *(n)***	**Researcher Barriers *(n)***
Insufficient skills/capacity for KT *(21)* Time constraints *(16)* Insufficient resources *(15)* Funding constraints *(12)* Political factors *(11)* Lack of skilled staff *(10)* Lack of infrastructure (especially Internet access) *(8)* Lack of standardised processes/ institutional support for KT *(7)* Need for engagement with diverse stakeholder groups *(5)* Sustainability of KT initiatives (mainly due to funding limitations) *(5)*	Access to relevant, reliable research *(12)* Lack of locally applicable quality research *(10)* Use of technical language/jargon *(7)* Mismatch in timelines between policymaker needs and research *(6)* Lack of specific guidelines/recommendations for implementation *(4)* Contextual threats (e.g. political instability) *(4)* Competition for policy attention *(3)* Clarity of research results *(3)* Language constraints *(3)* Hierarchical power dynamics between actors within the health system prevents local policy decisions *(3)*	Poor communication with decision-makers *(13)* Policymaker attitudes and willingness to use research (including their motivation, personal interests, values and ideas) *(13)* Limited awareness of need for KT *(7)* High turnover of government staff *(6)* Donor influences (e.g. on priorities through funding) *(5)* Context specificity *(4)* Negative/conflicting research results *(4)* Resistance to change *(4)* Weak institutional and personal links with stakeholders *(3)* Lack of support from public authorities *(2)*



Top 10 Reported Outcomes of KT *(n)*
Not reported *(27)*
Changes in knowledge/attitudes/practice *(15)*
Presence of results in policy *(5)*
Increased awareness of importance for evidence-based policy *(4)*
Strengthened relationships between researchers, policymakers *(4)*
Production of action plans *(3)*
Changes in interests/ideas *(3)*
Increased demand for KT products by policymakers *(3)*
Increased access to research-based evidence *(3)*
Identification of gaps/conflicts/errors in policy and proposals *(2)*

Top 10 Reported Facilitators		
Mutual Facilitators *(n)*	**Policymaker Facilitators *(n)***	**Researcher Facilitators *(n)***
Capacity to generate, understand and use research *(17)* Strong institutional and personal links/networks *(15)* Partnerships and collaborations *(12)* Use of knowledge brokers/local champions *(12)* Formalised organisational processes/ structures for KT *(11)* Trust between researchers and policymakers *(10)* Opportunities for mutual learning and building networks *(7)* Wide range of stakeholders engaged (including the media) *(7)* Alignment of research with local priorities *(7)* Financial resources *(5)*	Availability of quality research relevant to the local context *(21)* Leadership and political will for KT *(9)* Presence of technical support and expertise *(5)* Regular clear communication using a common language *(4)* Organisational culture that favours the use of research *(3)* Access to guidelines and academic journals *(2)* Clear and comprehensive recommendations *(2)* Policymakers prior experience with research *(2)* Mentorship *(1)* Framing of evidence as a policy issue *(1)*	Early and sustained engagement of stakeholders over time *(14)* Credibility (of results, researchers, research organisations and networks) *(13)* Targeted communication plan using diverse methods *(9)* Policymakers highly value research results *(4)* Timing of research *(4)* Access to policymakers *(3)* Researcher characteristics (including their skills, motivation, time, credibility, understanding of the policy environment) *(3)* Research characteristics (e.g. positive results, clear policy benefits) *(3)* Understanding of local context *(2)* Continuous monitoring and prompt reaction to emerging issues *(2)*

Figure 4 Summary map of KT mechanisms, influencing factors and outcomes
Note: arrows indicate direction of influence for factors on the KT process

Using Lavis et al.'s (2006) framework for linking research to action, studies were categorised as employing 'push', 'pull,' 'integrated' or 'exchange' type mechanisms for KT. Integrated and exchange mechanisms appeared most common with 21 and 18 studies using these respectively, followed by push mechanisms (16 studies) and pull mechanisms (only 3 studies). Four studies did not report specific KT mechanisms as their focus was establishing barriers and facilitators to the KT process. Within these types, policy briefs (15 studies), capacity building workshops (13 studies), policy dialogues (11 studies) and meetings between and within communities of practice (11 studies) were reported most frequently. Traditional mechanisms, such as conference presentations and journal publications, remain popular (10 studies each). While the use of novel mechanisms such as online clearing houses/sharing platforms for research, media campaigns, knowledge translation platforms (KTPs) and knowledge brokers (KBs) also appear to be gaining ground. KTPs, specifically, demonstrate opportunities for the integrated use of KT mechanisms to foster collaboration and build capacity for research use. For example, with the assistance of the WHO's Evidence-Informed Policy Network (EVIPNet), a KTP in Malawi has been attributed with hosting stakeholder mapping exercises, capacity building workshops and structured dialogues between national-level policymakers, researchers and policy implementers as well as producing evidence briefs, facilitating the formation of a multidisciplinary steering committee and holding meetings between different communities of practice (Berman *et al.* 2015).

Despite clear information about who was targeted by KT mechanisms, few studies provided specific details about the duration, frequency or timing of events (27 studies) or the personnel required to conduct activities (14 studies). In studies that did report this information, details varied significantly. In one study involving seven southern African countries, authors describe three week-long residential workshops facilitated by four researchers and include details on workshop duration and content (Stewart *et al.* 2005). While in another multinational study, a three-year grant period is described in which activities occurred (Shroff *et al.* 2015). Similarly, reports of contextual factors were diverse,

ranging from discussions of health system organisation, policy environment and epidemiological profile (de Carvalho *et al.* 2015) to socio-political and economic contexts, including levels of decentralization (Ashford *et al.* 2006), legislative processes (Hyder *et al.* 2011) and the influence of donor aid (Behague *et al.* 2009). Only three studies reported cultural factors, all of which referred to issues of language (Albert *et al.* 2007; Shearer *et al.* 2014; Dagenais *et al.* 2015). Fourteen studies made no reference to contextual factors, while six noted these factors as important, but did not provide further details.

Barriers and facilitators of KT

A list of the top 10 barriers and facilitators reported across studies is provided in figure 4. Studies reported both facilitators and barriers (52 studies), only facilitators (4 studies) or only barriers (5 studies). One study did not report barriers or facilitators, but focused on the outcomes of implementing a health policy advisory committee as a knowledge translation platform in Nigeria (Uneke *et al.* 2015b). A total of 46 barriers and 46 facilitators were identified and further categorised into those affecting policymakers, researchers or both. The top barriers affecting policymakers include access to relevant, reliable research (12 studies) and a lack of locally applicable research (10 studies). For researchers, poor communication with policy decisionmakers and policymaker attitudes towards using research were reported as the most common barriers (13 studies each). Limited awareness of the need for KT and a high turnover of government staff were further barriers to this group (7 and 6 studies, respectively). Mutual barriers affecting researchers and policymakers ranked highest overall and include insufficient skills and capacity to conduct KT activities (21 studies), time constraints (16 studies) and insufficient resources (15 studies). The most common resource constraint reported was funding (12 studies).

Regarding facilitators, the availability of quality research relevant to local contexts was reported by policymakers as the greatest support to using research (21 studies). This was followed by consistent leadership and political will for KT (9 studies) and the presence of technical support and expertise (5 studies). Contrastingly, researchers were supported when they engaged with stakeholders early and sustained this engagement over time (14 studies). Credible research results, researchers and research organisations or networks were further noted to facilitate researcher efforts at KT (13 studies). Credibility is closely linked to trust between researchers and policymakers and can serve as either a facilitator (10 studies) or a barrier (2 studies). Mutual facilitators once again highlight the importance of capacity to generate, understand and use research results (17 studies), demonstrating that the presence of KT skills are potentially as important as its absence. Furthermore, strong institutional links and networks (15 studies), partnerships and collaborations (12 studies) and the use of knowledge brokers or local champions (12 studies) highlight the significance of interactions between researchers and policymakers in getting research to influence policy.

Outcomes of KT

Figure 4 lists the top 10 outcomes of KT mechanisms reported across studies. Twenty-seven studies (45%) did not report any outcomes for the KT mechanisms used. In the remaining 35 studies, there was little overlap and most outcomes appeared study specific. For example, one study focused on the activity output of a knowledge broker specifically employed for KT (Dagenais *et al.* 2015), while others reported the creation of a research repository (Uzochukwu *et al.* 2016) and a database of researchers and policymakers (Mbonye and Magnussen 2013) as direct outcomes of KT processes. The most frequently reported outcomes were changes in knowledge, attitudes and practices (15 studies), such as improved understanding of the health policymaking process (Uneke *et al.* 2012). Studies that attempted to categorise outcomes employed three types of knowledge use: symbolic use, conceptual use and instrumental use. These types were reported in nine studies. The large number of

studies neglecting to report study outcomes, and the heterogeneous outcomes in those that did, reflect persisting difficulties in the identification and reporting of KT outcomes, an issue that has been well documented (Gervais *et al.* 2016). Three studies noted this difficulty specifically, recognising the often unclear and long-term impacts of KT mechanisms on research use (Nabudere *et al.* 2013; Guieu *et al.* 2016; Vargas *et al.* 2016).

Discussion

The literature on KT in African countries is widely distributed and growing, tracking similar trends in health research more broadly (Uthman *et al.* 2015). However, significant disparities exist between countries and many countries are without evidence of research related to KT (see figure 4). This highlights an on ongoing need to boost local research capacities in many Africa countries (Green and Bennett 2007; MacDonald *et al.* 2014). High levels of foreign donor funding (80% of studies in this case) certainly create opportunities for conducting local research, particularly in resource-constrained settings. However, the extent to which this is sustainable and allows local researchers and policymakers to direct the research agenda is debatable (Hasnida *et al.* 2017).

Together with Uganda, South Africa demonstrates a relatively established research base compared to other African nations, ranking the highest generators of KT research on the continent. In South Africa, the presence of historically strong research institutions that house platforms for KT is a likely contributor to this base. For example, the Centre for Evidence-based Healthcare (CEBHC) at Stellenbosch University and the Knowledge Translation Unit (KTU) at the University of Cape Town's Lung Institute both actively target the production, synthesis and use of health research in policy and practice (CEBHC 2016; KTU 2017). The South African Medical Research Council (MRC), a nationally funded research organisation, is another housing the Cochrane African Network (CAN 2017). These institutions are located within the Western Cape province, providing a rich support

system for KT in the region. However, despite local and international efforts, the research conducted to date is by no means sufficient to meet the demands of diverse African contexts. There remains an 'inadequate evidence base for doing evidence-based KT' in health policy (Mitton *et al.* 2007).

Filling this research 'gap' requires consideration of factors beyond how to increase research quantity across geographical areas. A central finding from the mapping process was the need for *high quality* evidence that is *relevant* to local health system's context. Although context specificity is a key challenge to KT research production, research that meets local demands and aligns with local priorities is more likely to be translated into policy (McPake *et al.* 2017). Furthermore, to develop KT research quality, study designs that extend beyond case studies and descriptive work should be encouraged. Pragmatic trials, impact evaluations, implementation research and participatory action research are thought to hold particular promise for developing, assessing and implementing the social interventions inherently associated with KT (Bonell *et al.* 2012; Gilson 2012; Panisset *et al.* 2012; Westhorp 2014). These designs offer opportunities for increased scientific rigour and better consideration of contextual differences, including knowledge and power imbalances, to understand what works, for whom and under what circumstances.

The diverse pool of KT mechanisms identified in this review demonstrate a variety of options available to researchers and policymakers when attempting to 'do' KT. The combined use of policy briefs, workshops, policy dialogues and meetings with communities of practice hold particular promise, as these are widely used and likely familiar to both researchers and policymakers. However, the time, effort and resources involved in these activities should not be underestimated. Conducting KT requires investment if research-based knowledge is to be communicated appropriately and with the best chance of influencing its intended audience (Tulloch *et al.* 2011). Furthermore, the overwhelming preference for integrated and exchange type mechanisms in this review highlights the increasing awareness that,

to influence policy, these audiences need to be targeted early and in multiple ways, leveraging personal and professional networks that facilitate the bidirectional flow of knowledge. This is in line with findings from upper-income countries that emphasize the need for early and sustained engagements between stakeholders to facilitate KT (Dobbins *et al.* 2009; Haynes *et al.* 2012; West *et al.* 2015; Conalogue *et al.* 2017).

The diversity in mechanisms may be appealing at first as it reflects options that can be shaped to different contexts. However, this diversity has been criticized for demonstrating uncoordinated and fragmented efforts to narrow the knowledge gap in Africa (Kebede *et al.* 2014). The wide variations in theories and outcomes identified here support this conclusion and contribute to a persistently unclear pathway of change between research, KT mechanisms and policy. Furthermore, the lack of uniformity and clarity on KT outcomes makes it almost impossible to compare different interventions or to measure progress. There is an urgent need to improve theories and methods that rigorously assess KT interventions in real time and identify relevant outcomes that are sensitive to the short and long-term effects of KT activities. This issue is not unique to the African context and reflects concerns expressed in the broader literature (Gough and Boaz 2011; Moore *et al.* 2011; Grimshaw *et al.* 2012; Gagliardi *et al.* 2016; Gervais *et al.* 2016; Milat and Li 2017).

A final point arising from this mapping process concerns issues of capacity. Knowledge and skills in prioritising, generating, synthesising and applying research were identified as the most common KT barrier and facilitator for both researchers and policymakers. Capacity constraints have also been identified as one cause of the know-do gap and a key priority for addressing health in LMICs (Green and Bennett 2007). To date, individual capacity has largely been the focus of efforts to improve research production and use in policy. However, recognising the need for broader system strengthening, tools that focus on improving organisational capacity for research use are on the rise

(Lavis *et al.* 2009c; Rodríguez *et al.* 2017). Additionally, regional and international partnerships are supporting many countries to develop capacity to analyse their own health systems and develop locally appropriate KT strategies. For example, EVIPNet in Malawi and Uganda (Ongolo-Zogo *et al.* 2014; Berman *et al.* 2015), the West African Health Organisation (WAHO) in Burkina Faso, Nigeria, Senegal and Sierra Leone and (Keita *et al.* 2017) and the Consortium for Health Policy and Systems Analysis in Africa (CHEPSAA) in South Africa, Tanzania, Ghana, Kenya and Nigeria (Lê *et al.* 2012). These capacity-building efforts strengthen local research and policy communities while promoting collaboration, the formation of KT support networks and the equitable distribution of knowledge.

Limitations and implications for evidence map use

The broad search criteria and diverse search terms employed in the construction of this evidence map reflect the complexity of KT. While the final set of included studies indicate the breadth of research on the African continent, there is a need to refine these criteria and appraise the quality of resulting studies in a more detailed systematic review. A potential focus for further research may be to trace KT mechanisms, outcomes, barriers and facilitators through specific countries to provide more contextualised theories of change.

Furthermore, time and resource constraints precluded a comprehensive search of the literature. Few databases and hand searches of key sites only mean important studies may have been omitted from the final list of studies. Expanded searches of the grey literature and inclusion of additional databases should complement and enhance the current map. However, given the scoping nature of the evidence map, this was deemed appropriate for the broader purposes of the study.

Finally, it is important to recognise that an evidence map is a cross-section of studies conducted within a specific timeframe. The result is a snapshot of KT mechanisms, their outcomes, barriers and

facilitators. The dynamic influence of contexts on KT interventions, especially in Africa, mean that this map should serve only as a starting point. A detailed contextual analysis prior to its application and use is recommended.

Conclusion

This review aimed to provide an overview of the literature on KT in African health systems by mapping the mechanisms, outcomes, barriers and facilitators at work across different countries. In doing so, it provides a useful summary for health policymakers and researchers seeking to conduct KT activities in local contexts. Additionally, it highlights important evidence gaps, including the need for:

- increased research on KT mechanisms, barriers, facilitators and outcomes that includes a greater geographical scope, both within and across national borders;
- greater variety in research approaches to KT, including more evaluative designs and increased emphasis on contextual descriptions and outcomes of KT interventions;
- exploration into the impact of donor funding on KT and its outcomes;
- further testing, development and application of theoretical frameworks that enhance understandings of KT in African settings.

Future research targeting these areas will not only contribute towards filling important knowledge gaps, but also aid our understanding of KT's role in strengthening health systems locally and abroad.

References

Aaserud M, Lewin S, Innvaer S, *et al.* 2005. Translating research into policy and practice in developing countries: a case study of magnesium sulphate for pre-eclampsia. *BMC Health Services Research* **5**: 68.

Albert M, Fretheim A, Maïga D. 2007. Factors influencing the utilization of research findings by health policy-makers in a developing country: the selection of Mali's essential medicines. *Health Research Policy and Systems* **5**: 2.

Ashford L, Smith R, de Souza, Fikree F, Yinger N. 2006. Creating windows of opportunity for policy change: incorporating evidence into decentralized planning in Kenya. *Bulletin of the World Health Organization* **84**: 669–72.

Avan B, Berhanu D, Umar N, Wickremasinghe D, Schellenberg J. 2016. District decision-making for health in low-income settings: a feasibility study of a data-informed platform for health in India, Nigeria and Ethiopia. *Health Policy and Planning* **31**: ii3-ii11.

Ayah R, Jessani N, Mafuta EM. 2014. Institutional capacity for health systems research in East and Central African schools of public health: knowledge translation and effective communication. *Health Research Policy and Systems* **12**: 20.

Barratt H, Shaw J, Simpson L, Bhatia S, Fulop N. 2017. Health services research: building capacity to meet the needs of the health care system. *Journal of Health Services Research & Policy* **22**: 243–9.

Beesley M, Cometto G, Pavignani E. 2011. From drought to deluge: how information overload saturated absorption capacity in a disrupted health sector. *Health Policy and Planning* **26**: 445–52.

Behague D, Tawiah C, Rosato M, Some T, Morrison J. 2009. Evidence-based policy-making: the implications of globally-applicable research for context-specific problem-solving in developing countries. *Social Science & Medicine* **69**: 1539–46.

Bennett G, Jessani N (eds). 2011. *The Knowledge Translation Toolkit: bridging the know-do gap: a resource for researchers.* New Delhi: Sage Publications.

Bennett S, Corluka A, Doherty J, *et al.* 2012. Influencing policy change: the experience of health think tanks in low- and middle-income countries. *Health Policy and Planning* **27**: 194–203.

Beran D, Miranda J, Cardenas M, Bigdeli M. 2015. Health systems research for policy change: lessons from the implementation of rapid assessment protocols for diabetes in low- and middle-income settings. *Health Research Policy and Systems* **13**: 41.

Berman J, Mitambo C, Matanje-Mwagomba B, *et al.* 2015. Building a knowledge translation platform in Malawi to support evidence-informed health policy. *Health Research Policy and Systems* **13**: 73.

Blau J, Faye P, Senouci K, *et al.* 2012. Establishment of a national immunization technical advisory group in Côte d'Ivoire: process and lessons learned. *Vaccine* **30**: 2588–93.

Bonell C, Fletcher A, Morton M, Lorenc T, Moore L. 2012. Realist randomised controlled trials: A new approach to evaluating complex public health interventions. *Social Science & Medicine* **75**: 2299–306.

Bosch-Capblanch X, Lavis J, Lewin S, *et al.* 2012. Guidance for Evidence-Informed Policies about Health Systems: Rationale for and Challenges of Guidance Development. *PLoS Medicine* **9**: e1001185.

Bragge P, Clavisi O, Turner T, Tavender E, Collie A, Gruen RL. 2011. The Global Evidence Mapping Initiative: scoping research in broad topic areas. *BMC Medical Research Methodology* **11**: 92.

Brownson R, Royer C, Ewing R, McBride T. 2006. Researchers and policymakers: travelers in parallel universes. *American Journal of Preventive Medicine* **30**: 164–72.

Caffrey L, Wolfe C, McKevitt C. 2016. Embedding research in health systems: lessons from complexity theory. *Health Research Policy and Systems* **14**: 54.

CAN (Cochrane African Network). 2017. *Cochrane South Africa*. Cape Town: South African Medical Research Council. Accessed 12 December 2017. Online at http://www.mrc.ac.za/cochrane/can.htm.

de Carvalho I, Byles J, Aquah C, *et al.* 2015. Informing evidence-based policies for ageing and health in Ghana. *Bulletin of the World Health Organization* **93**: 47–51.

CEBHC (Centre for Evidence-based Health Care). 2016. *Annual Report*. Cape Town: Faculty of Medicine & Health Sciences, Stellenbosch University.

CIHR (Canadian Institutes of Health Research). 2016. Knowledge translation - definition. Accessed 12 December 2016. Online at http://www.cihr-irsc.gc.ca/e/29418.html#2.

Clapton J, Rutter D, Sharif N. 2009. SCIE systematic mapping guidance. *Using Knowledge in Social Care, Research Resource 03*. London: Social Care Institute for Excellence.

Cole D, Nyirenda L, Fazal N, Bates I. 2016. Implementing a national health research for development platform in a low-income country – a review of Malawi's Health Research Capacity Strengthening Initiative. *Health Research Policy and Systems* **14**: 24.

Conalogue D, Kinn S, Mulligan J, McNeil M. 2017. International consultation on long-term global health research priorities, research capacity and research uptake in developing countries. *Health Research Policy and Systems* **15**: 24.

Dagenais C, Queuille L, Ridde V. 2013. Evaluation of a knowledge transfer strategy from a user fee exemption program for vulnerable populations in Burkina Faso. *Global Health Promotion* **20**: 70–9.

Dagenais C, Somé T, Boileau-Falardeau M, McSween-Cadieux E, Ridde V. 2015. Collaborative development and implementation of a knowledge brokering program to promote research use in Burkina Faso, West Africa. *Global Health Action* **8**: 26004.

Daniels K, Lewin S. 2008. Translating research into maternal health care policy: a qualitative case study of the use of evidence in policies for the treatment of eclampsia and pre-eclampsia in South Africa. *Health Research Policy and Systems* **6**: 12.

Daniels K, Lewin S. 2011. The growth of a culture of evidence-based obstetrics in South Africa: a qualitative case study. *Reproductive Health* **8**: 5.

Delany-Moretlwe S, Stadler J, Mayaud P, Rees H. 2011. Investing in the future: lessons learnt from communicating the results of HSV/ HIV intervention trials in South Africa. *Health research policy and systems* **9**: S8.

Dobbins M, Robeson P, Ciliska D, *et al.* 2009. A description of a knowledge broker role implemented as part of a randomized controlled trial evaluating three knowledge translation strategies. *Implementation Science* **4**: 23.

El-Jardali F, Lavis J, Moat K, Pantoja T, Ataya N. 2014. Capturing lessons learned from evidence-to-policy initiatives through structured reflection. *Health Research Policy and Systems* **12**: 2.

Engebretsen E, Sandset T, Ødemark J. 2017. Expanding the knowledge translation metaphor. *Health Research Policy and Systems* **15**: 19.

Fiankor DK Akussah H. 2012. Information use and policy decision making by district assembly members in Ghana. *Information Development* **28**: 32–42.

Gagliardi A, Berta W, Kothari A, Boyko J, Urquhart R. 2016. Integrated knowledge translation (IKT) in health care: a scoping review. *Implementation science* **11**: 38.

Gervais M, Marion C, Dagenais C, Chiocchio F, Houlfort N. 2016. Dealing with the complexity of evaluating knowledge transfer strategies: guiding principles for developing valid instruments. *Research Evaluation* **25**: 62–9.

Gilson L. 2012. *Health Policy and Systems Research: A Methodology Reader*. Geneva: Alliance for Health Policy and Systems Research, World Health Organisation.

Gough D, Boaz A. 2011. Complexities of making use of research. *Evidence & Policy: A Journal of Research, Debate and Practice* **7**: 247–9.

Graham I, Logan J, Harrison M, *et al.* 2006. Lost in knowledge translation: time for a map? *The Journal of Continuing Education in the Health Professions* **26**: 13–24.

Grant M, Booth A. 2009. A typology of reviews: an analysis of 14 review types and associated methodologies. *Health Information and Libraries Journal* **26**: 91–108.

Green A, Bennett S. 2007. *Sound Choices: Enhancing Capacity for Evidence-Informed Health Policy*. Geneva: Alliance for Health Policy and Systems Research.

Greenhalgh T, Wieringa S. 2011. Is it time to drop the 'knowledge translation' metaphor? A critical literature review. *Journal of the Royal Society of Medicine* **104**: 501–9.

Grimshaw J, Eccles M, Lavis J, Hill S, Squires J. 2012. Knowledge translation of research findings. *Implementation Science* **7**: 50.

Guieu A, Zhang W-H, Lafort Y, *et al.* 2016. Practical lessons for bringing policy-makers on board in sexual and

reproductive health research. *BMC Health Services Research* **16**: 649.

Harris R. 2015. The impact of research on development policy and practice: this much we know. In: Chib A, *et al.* (eds). *Impact of Information Society Research in the Global South*. Singapore: Springer Singapore, 21–43.

Hasnida A, Borst R, Johnson A, Rahmani N, van Elsland S, Kok M. 2017. Making health systems research work: time to shift funding to locally-led research in the South. *The Lancet Global Health* **5**: e22–4.

Hawkes S, Aulakh B, Jadeja N, *et al.* 2016. Strengthening capacity to apply health research evidence in policy making: experience from four countries. *Health Policy and Planning* **31**: 161–70.

Haynes A, Derrick G, Redman S, *et al.* 2012. Identifying trustworthy experts: how do policymakers find and assess public health researchers worth consulting or collaborating with? *PLoS ONE* **7**: e32665.

Hennink M, Stephenson R. 2005. Using research to inform health policy: barriers and strategies in developing countries. *Journal of Health Communication* **10**: 163–80.

Hunsmann M. 2012. Limits to evidence-based health policymaking: policy hurdles to structural HIV prevention in Tanzania. *Social Science & Medicine* **74**: 1477–85.

Hutchinson E, Droti B, Gibb D, *et al.* 2011. Translating evidence into policy in low-income countries: lessons from co-trimoxazole preventive therapy. *Bulletin of the World Health Organization* **89**: 312–6.

Hyder A, Corluka A, Winch P, *et al.* 2011. National policy-makers speak out: are researchers giving them what they need? *Health Policy and Planning* **26**: 73–82.

Kebede D, Zielinski C, Mbondji P, Piexoto M, Kouvividila W, Lusamba-Dikassa P. 2014. The way forward – narrowing the knowledge gap in sub-Saharan Africa to strengthen health systems. *Journal of the Royal Society of Medicine* **107**: 10–2.

Keita N, Lokossou V, Berthe A, Sombie I, Johnson E, Busia K. 2017. The West African experience in establishing steering committees for better collaboration between researchers and decision-makers to increase the use of health research findings. *Health Research Policy and Systems* **15**: 50.

King L, Hawe P, Wise M. 1998. Making dissemination a two-way process. *Health Promotion International* **13**: 237–44.

Kirigia J, Pannenborg C, Amore L, Ghannem H, IJsselmuiden C, Nabyonga-Orem J. 2016. Global Forum 2015 dialogue on 'From evidence to policy – thinking outside the box': perspectives to improve evidence uptake and good practices in the African Region. *BMC Health Services Research* **16**: 215.

Kok M, Gyapong J, Wolffers I, Ofori-Adjei D, Ruitenberg J. 2016. Which health research gets used and why? An empirical analysis of 30 cases. *Health Research Policy and Systems* **14**: 36.

Koon A, Nambiar D, Rao K. 2012. *Embedding of Research into Decision-making Processes*. Geneva: Alliance for Health Policy and Systems Research.

Kothari A, Wathen CN. 2013. A critical second look at integrated knowledge translation. *Health Policy* **109**: 187–91.

Kothari A, Wathen CN. 2017. Integrated knowledge translation: digging deeper, moving forward. *Journal of Epidemiology and Community Health* **71**: 619–23.

KTU (Knowledge Translation Unit). 2017. *Knowledge Translation Unit: Programmes*. Cape Town: University of Cape Town Lung Institute. Accessed 20 November 2017. Online at http://knowledgetranslation.co.za/programmes/.

Kwamie A, Nabyonga-Orem J. 2016. Improved harmonisation from policy dialogue? Realist perspectives from Guinea and Chad. *BMC Health Services Research* **16**: 222.

Lairumbi G, Molyneux S, Snow R, Marsh K, Peshu N, English M. 2008. Promoting the social value of research in Kenya: examining the practical aspects of collaborative partnerships using an ethical framework. *Social Science & Medicine* **67**: 734–47.

Langer L, Tripney J, Gough D. 2016. *The Science of Using Science: Researching the Use of Research Evidence in Decision-Making*. London: EPPI-Centre, University College London.

Langlois E, Becerril Montekio V, Young T, Song K, Alcalde-Rabanal J, Tran N. 2016. Enhancing evidence informed policymaking in complex health systems: lessons from multi-site collaborative approaches. *Health Research Policy and Systems* **14**: 20.

Lavis J, Guindon G, Cameron D, *et al.* 2010. Bridging the gaps between research, policy and practice in low- and middle-income countries: a survey of researchers. *Canadian Medical Association Journal* **182**: E350–61.

Lavis J, Lomas J, Hamid M, Sewankambo NK. 2006. Assessing country-level efforts to link research to action. *Bulletin of the World Health Organization* **84**: 620–8.

Lavis J, Oxman A, Lewin S, Fretheim A. 2009a. SUPPORT Tools for evidence-informed health policymaking (STP)3: setting priorities for supporting evidence-informed policymaking. *Health Research Policy and Systems* **7**: S3.

Lavis J, Oxman A, Lewin S, Fretheim A. 2009b. SUPPORT Tools for evidence-informed health policymaking (STP)1: what is evidence-informed policymaking? *Health Research Policy and Systems* **7**: S1.

Lavis JN, Oxman AD, Lewin S, Fretheim A. 2009c. SUPPORT Tools for evidence-informed health Policymaking (STP). *Health Research Policy and Systems* **7**: I1.

Lê G, Mirzoev T, Green A, Kalliecharan R. 2012. *Consortium for Health Policy & Systems Analysis in Africa: Comparative Results of Capacity Needs Assessments in African partner institutions. CHEPSAA report.* Leeds: Consortium for Health Policy & Systems Analysis in Africa.

MacDonald N, Bortolussi R, Kabakyenga J, *et al.* 2014. MicroResearch: finding sustainable local health solutions in East Africa through small local research studies. *Journal of Epidemiology and Global Health* **4**: 185–93.

Mbonye A, Magnussen P. 2013. Translating health research evidence into policy and practice in Uganda. *Malaria Journal* **12**: 274.

McSween-Cadieux E, Dagenais C, Somé P, Ridde V. 2017. Research dissemination workshops: observations and implications based on an experience in Burkina Faso. *Health Research Policy and Systems* **15**: 43.

McKibbon K, Lokker C, Wilczynski N, *et al.* 2010. A cross-sectional study of the number and frequency of terms used to refer to knowledge translation in a body of health literature in 2006: a Tower of Babel? *Implementation Science* **5**: 16.

McPake B, Jensen C, Jones A. 2017. *Learning Across Health Systems: Literature Review of International Health Policy Transfer Processes*. Oxford: Oxford Policy Management.

Miake-lye I, Hempel S, Shanman R, Shekelle P. 2016. What is an evidence map? A systematic review of published evidence maps and their definitions, methods, and products. *Systematic Reviews* **5**: 28.

Mijumbi R, Oxman A, Panisset U, Sewankambo N. 2014. Feasibility of a rapid response mechanism to meet policymakers' urgent needs for research evidence about health systems in a low-income country: a case study. *Implementation Science: IS* **9**: 114.

Milat A, Li B. 2017. Narrative review of frameworks for translating research evidence into policy and practice. *Public Health Research & Practice* **27**: e2711704.

Mirzoev T, Omar M, Green A, *et al.* 2012. Research-policy partnerships - experiences of the Mental Health and Poverty Project in Ghana, South Africa, Uganda and Zambia. *Health Research Policy and Systems* **10**: 30.

Mitton C, Adair C, Mckenzie E, Patten S, Perry B. 2007. Knowledge transfer and exchange: review and synthesis of the literature. *Milbank Quarterly* **85**: 729–68.

Moat K, Lavis J, Abelson J. 2013. How contexts and issues influence the use of policy-relevant research syntheses: a critical interpretive synthesis. *Milbank Quarterly* **91**: 604–48.

Moat K, Lavis J, Clancy S, El-Jardali F, Pantoja T. 2014. Evidence briefs and deliberative dialogues: perceptions and intentions to act on what was learnt. *Bulletin of the World Health Organization* **92**: 20–8.

Moher D, Liberati A, Tetzlaff J, Altman D. 2009. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *BMJ* **339**: 1–8.

Moore G, Redman S, Haines M, Todd A. 2011. What works to increase the use of research in population health policy and programmes: a review. *Evidence & Policy* **7**: 277–305.

Murphy K, Fafard P. 2012. Taking power, politics, and policy problems seriously the limits of knowledge translation for urban health research. *Journal of Urban Health* **89**: 723–32.

Mwendera C, de Jager C, Longwe H, Phiri K, Hongoro C, Mutero C. 2016. Facilitating factors and barriers to malaria research utilization for policy development in Malawi. *Malaria Journal* **15**: 512.

Nabudere H, Asiimwe D, Amandua J. 2013. Improving access to skilled attendance at delivery: a policy brief for Uganda. *International Journal of Technology Assessment in Health Care* **29**: 207–11.

Nabyonga-Orem J, Ssengooba F, Macq J, Criel B. 2014a. Malaria treatment policy change in Uganda: what role did evidence play? *Malaria Journal* **13**: 345.

Nabyonga-Orem J, Ssengooba F, Mijumbi R, Kirunga Tashobya C, Marchal B, Criel B. 2014b. Uptake of evidence in policy development: the case of user fees for health care in public health facilities in Uganda. *BMC Health Services Research* **14**: 639.

Nabyonga Orem J, Kaawa Mafigiri D, Marchal B, Ssengooba F, Macq J, Criel B. 2012. Research, evidence and policymaking: the perspectives of policy actors on improving uptake of evidence in health policy development and implementation in Uganda. *BMC Public Health* **12**: 109.

Naude C, Zani B, Ongolo-Zogo P, *et al.* 2015. Research evidence and policy: qualitative study in selected provinces in South Africa and Cameroon. *Implementation Science* **10**: 126.

Nutley S, Walter I, Davies H. 2007. *Using evidence: how research can inform public services*. Bristol: The Policy Press.

Oliver K, Innvar S, Lorenc T, Woodman J, Thomas J. 2014. A systematic review of barriers to and facilitators of the use of evidence by policymakers. *BMC Health Services Research* **14**: 2.

Oliver S, Dickson K. 2016. Policy-relevant systematic reviews to strengthen health systems: models and mechanisms to support their production. *Evidence & Policy: A Journal of Research, Debate and Practice* **12**: 235–59.

van Olmen J, Criel B, Van Damme W, *et al.* 2012. Analysing health system dynamics: a framework. *Studies in Health Services Organization & Policy* **28**: 1–117.

Ongolo-Zogo P, Lavis J, Tomson G, Sewankambo N. 2014. Initiatives supporting evidence informed health system policymaking in Cameroon and Uganda: a comparative historical case study. *BMC Health Services Research* **14**: 612.

Onwujekwe O, Uguru N, Russo G, *et al.* 2015. Role and use of evidence in policymaking: an analysis of case studies from the health sector in Nigeria. *Health Research Policy and Systems* **13**: 46.

Oxman A, Vandvik P, Lavis J, Fretheim A, Lewin S. 2009. SUPPORT Tools for evidence-informed health policymaking (STP) 2: Improving how your organisation supports the use of research evidence to inform policymaking. *Health Research Policy and Systems* **7**: 1–10.

Panisset U, Koehlmoos T, Alkhatib A, *et al.* 2012. Implementation research evidence uptake and use for policy-making. *Health Research Policy and Systems* **10**: 20.

Pienaar E, Grobler L, Busgeeth K, Eisinga A, Siegfried N. 2011. Developing a geographic search filter to identify randomised controlled trials in Africa: finding the optimal balance between sensitivity and precision. *Health Information & Libraries Journal* **28**: 210–5.

Pittman P. 2006. Beyond the sound of one hand clapping: experiences in six countries using health equity research in policy. *Journal of Health Politics, Policy & Law* **31**: 33–49.

Randall N, James K. 2012. The effectiveness of integrated farm management, organic farming and agri-environment schemes for conserving biodiversity in temperate Europe - A systematic map. **1**: 1–21.

Rehfuess E, Durão S, Kyamanywa P, Meerpohl J, Young T, Rohwer A. 2016. An approach for setting evidence-based and stakeholder-informed research priorities in low- and middle-income countries. *Bulletin of the World Health Organization* **94**: 297–305.

Rispel L, Doherty J. 2011. Research in support of health systems transformation in South Africa: the experience of the Centre for Health Policy. *Journal of Public Health Policy* **32**: S10–29.

Rodríguez D, Hoe C, Dale E, *et al.* 2017. Assessing the capacity of ministries of health to use research in decision-making: conceptual framework and tool. *Health Research Policy and Systems* **15**: 65.

Rodríguez D, Shearer J, Mariano A, Juma P, Dalglish S, Bennett S. 2015. Evidence-informed policymaking in practice: country-level examples of use of evidence for iCCM policy. *Health Policy and Planning* **30**: ii36-ii45.

Rosenbaum S, Glenton C, Wiysonge C, *et al.* 2011. Evidence summaries tailored to health policy-makers in low- and middle-income countries. *Bulletin of the World Health Organization* **89**: 54–61.

de Savigny D, Adam T. (eds). 2009. *Systems Thinking for Health Systems Strengthening*. Alliance for Health Policy and Systems Research. Geneva: WHO.

Shearer J, Dion M, Lavis J. 2014. Exchanging and using research evidence in health policy networks: a statistical network analysis. *Implementation Science* **9**: 126.

Shroff Z, Aulakh B, Gilson L, Agyepong I, El-Jardali F, Ghaffar A. 2015. Incorporating research evidence into decision-making processes: researcher and decision-maker perceptions from five low- and middle-income countries. *Health*

Research Policy and Systems **13**: 70.

Ssengooba F, Atuyambe L, Kiwanuka S, Puvanachandra P, Glass N, Hyder A. 2011. Research translation to inform national health policies: learning from multiple perspectives in Uganda. *BMC International Health and Human Rights* **11**: S13.

Stewart R, Wiggins M, Thomas J, Oliver S, Brunton G, Ellison GT. 2005. Exploring the evidence-practice gap: a workshop report on mixed and participatory training for HIV prevention in southern Africa. *Education for Health* **18**: 224–35.

Straus S, Tetroe J, Graham I. 2009. Defining knowledge translation. *Journal of the Canadian Medical Association* **181**: 165–8.

Sudsawad P. 2007. *Knowledge Translation: Introduction to Models, Strategies, and Measures*. Austin: Southwest Educational Development Laboratory, National Center for the Dissemination of Disability Research.

Tetroe J, Graham I, Foy R, *et al.* 2008. Health research funding agencies' support and promotion of knowledge translation: an international study. *The Milbank Quarterly* **86**: 125–55.

Tricco A, Zarin W, Rios P, Pham B, Straus S, Langlois E. 2016. Barriers, facilitators, strategies and outcomes to engaging policymakers, healthcare managers and policy analysts in knowledge synthesis: a scoping review protocol. *BMJ Open* **6**: e013929.

Tulloch O, Mayaud P, Adu-Sarkodie Y, *et al.* 2011. Using research to influence sexual and reproductive health practice and implementation in sub-Saharan Africa: a case-study analysis. *Health Research Policy and Systems* **9**: S10.

Uneke C, Ezeoha A, Ndukwe C, Oyibo P, Onwe F. 2012. Promotion of evidence-informed health policymaking in Nigeria: bridging the gap between researchers and policymakers. *Global Public Health* **7**: 750–65.

Uneke C, Ezeoha A, Uro-Chukwu H, *et al.* 2015a. Enhancing the capacity of policy-makers to develop evidence-informed policy brief on infectious diseases of poverty in Nigeria. *International Journal of Health Policy and Management* **4**: 599–610.

Uneke C, Ndukwe C, Ezeoha A, Uro-Chukwu H, Ezeonu C. 2015b. Implementation of a health policy advisory committee as a knowledge translation platform: the Nigeria experience. *International Journal of Health Policy and Management* **4**: 161–8.

Uthman O, Wiysonge C, Ota M, *et al.* 2015. Increasing the value of health research in the WHO African region beyond 2015--reflecting on the past, celebrating the present and building the future: a bibliometric analysis. *BMJ Open* **5**: e006340–e006340.

Uzochukwu B, Onwujekwe O, Mbachu C, *et al.* 2016. The challenge of bridging the gap between researchers and policy makers: experiences of a health policy research group in engaging policy makers to support evidence informed policy making in Nigeria. *Globalization and Health* **12**. 67.

Vargas E, Becerril-Montekio V, Gonzalez-Block M, *et al.* 2016. Mapping the use of research to support strategies tackling maternal and child health inequities: evidence from six countries in Africa and Latin America. *Health Research Policy and Systems* **14**: 1.

West R, House A, Keen J, Ward V. 2015. Using the structure of social networks to map inter-agency relationships in public health services. *Social Science & Medicine* **145**: 107–14.

Westhorp G. 2014. *Realist Impact Evaluation: An Introduction*. London: Overseas Development Institute.

Woelk G, Daniels K, Cliff J, *et al.* 2009. Translating research into policy: lessons learned from eclampsia treatment and malaria control in three southern African countries. *Health Research Policy and Systems* **7**: 31.

Zachariah R, Guillerm N, Berger S, *et al.* 2014. Research to policy and practice change: is capacity building in operational research delivering the goods? *Tropical Medicine & International Health* **19**: 1068–75.

PART C: JOURNAL ARTICLE

From knowledge to health policy: exploring knowledge translation mechanisms in the Western Cape provincial health system

Amanda Edwards[1]

Targeted Journal: *Health Policy and Planning*[2]

Abstract

The persistent gap between public health research, policy and practice has led to a burgeoning interest in the field of knowledge translation (KT). However, there remains little clarity on what KT mechanisms work in different contexts, particularly in low and middle-income countries. Using mixed methodology this paper explores the KT system, including its mechanisms, barriers, facilitators and outcomes, as it functions in the context of South Africa's Western Cape provincial health system. A mapping of the literature on KT in African settings was synthesized with a review of key policy documents and nine expert interviews with high-level health system researchers and provincial health policymakers. Core themes were merged with information from a random sample of provincial study protocols registered on the National Health Research Database. Findings indicate variations in the use of health-related research by provincial policymakers and diversity in the mechanisms employed for KT. The important role of organisations, characteristics of available research, relationships and networks appear to play a facilitating role for KT in this context. Resource constraints, system conflicts and politics served as notable barriers. These findings raise important issues for health researchers and provincial policymakers seeking to 'do' KT in the Western Cape health system. Issues include recognising the important role of context, greater organisational embeddedness, the view of KT as an ethical imperative, and the need for a more systematic approach to KT that fosters sustainable 'learning health systems'.

[1] For the purpose of this thesis, the student is the sole and first author of this article.

[2] Instructions for authors in appendix 10

Keywords

Knowledge translation; health policymaking; mixed-methods; Western Cape; provincial health system; organisational embeddedness; learning health systems

Key Messages

- The gap between health research and policymaking is an enduring health systems problem, especially in LMIC settings.
- The Western Cape provincial health system presents a particular health systems context in sub-Saharan Africa with mature research institutions engaged in diverse public health research, skilled health policymakers and relatively low staff turnover in the Provincial Department of Health.
- Despite this rich support base, there remains a persistent gap between available public health research and what is implemented in provincial health policy.
- Variations in research use, mechanisms employed and unclear outcomes highlight the dynamic and contextual nature of knowledge translation (KT) in this setting.
- Resource constraints, system conflicts and politics surrounding KT are important barriers in the Western Cape. While relationships, organisational capacity, culture, process and leadership have helped overcome these barriers, important issues remain.
- Ongoing challenges include the need to consider context and systems issues for KT as well as the view of KT as an ethical imperative. Embeddedness and a greater emphasis on learning health systems are thought to hold the key to closing the gap between health research and policy in the provincial health system.

"*With the right level of support and interaction between researchers and decision-makers, the translation of research findings into actionable policy and programmatic guidance is an achievable goal*" (HSG Thematic Working Group on Translating Evidence to Action 2018)

Background

Effective public health policymaking necessitates the use of relevant high-quality research-based knowledge to strengthen health systems and achieve intended health outcomes (WHO 2004a; Lavis *et al.* 2006; Moat and Lavis 2013). For more than a decade, repeated calls for research to inform health policy have been made at the 2004 Ministerial Summit on Health Research in Mexico, the 2008 Bamako Call to Action on Research for Health and the 2012 World Health Organisation's Strategy on Health Policy and Systems Research (WHO 2004b, 2012; The Lancet 2008). More recently, the 2017 *World Report on Health Policy and Systems Research* (HPSR) re-emphasized the need to increase the production of policy-relevant research to foster the uptake of research in health policymaking (WHO 2017). However, despite these ongoing calls, there remains an estimated seventeen-year delay in translating known health innovations into policy and practice (Morris *et al.* 2011). This has resulted in reduced health gains relative to societies' investment in health research (Tetroe *et al.* 2008; van Olmen *et al.* 2012) and directly impeded the achievement of health targets (Grimshaw *et al.* 2012). As the global health community shifts towards the laudable goals of universal health coverage (UHC) and increasing health equity in the post-2015 development era, there is an urgent need to understand and minimise the gap between health research and policy (El-Jardali *et al.* 2014; Kirigia *et al.* 2016b).

In recognition of this, efforts to increase the uptake of research into health policymaking have intensified (King *et al.* 1998; Brownson *et al.* 2006; Sudsawad 2007; Bosch-Capblanch *et al.* 2012; Harris 2015; Langer *et al.* 2016). This has focused attention on the role of *knowledge translation* (KT), defined as "the dynamic and iterative process that includes the synthesis, dissemination, exchange and ethically sound application of knowledge to improve health, provide more effective health services

and products, and strengthen the health care system" (CIHR 2016, p. 1). KT is a growing field of inquiry, particularly in its application and relevance to low- and middle-income countries (LMICs) (Sudsawad 2007; Greenhalgh and Wieringa 2011; Kothari and Wathen 2013; Engebretsen *et al.* 2017). In a recent review, Kothari and Wathen (2017) examined the role of *integrated* KT highlighting the importance of engaging with knowledge users at all stages of the research process. Others have also emphasised the relational, and therefore political, nature of KT recognising that research is just one consideration amongst many in the policy decision-making process (Greenhalgh and Russell 2006; Nabyonga-Orem and Mijumbi 2015; Parkhurst 2016). The power dynamics and contested nature of KT have motivated researchers and policymakers to advocate for greater equity and partnership in knowledge management, production and use (Frizelle 2009; Datta 2012; Murphy and Fafard 2012).

Additional issues from the KT literature demonstrate the need for alignment between research and policy processes, including the relevance and timing of research and between organisational environments (Hegger *et al.* 2015). Organisational and individual capacity have also been recognised as essential to improving KT (WHO 2012; Rodríguez *et al.* 2017), particularly in LMICs where institutional fragility and the influence of individual leaders play a significant role in the research-to-policy process (Shroff *et al.* 2015). Moreover, the dynamics and specificity of local contexts is a frequently acknowledged, but rarely detailed issue in determining the "realm of the possible" when designing KT strategies that influence policymaking (Contandriopoulos *et al.* 2010, p. 465; Moat *et al.* 2013). Finally, systems issues, including a historically weak relationship between health and research systems, have been shown to hinder the adoption of new research-based knowledge in policy (Caffrey *et al.* 2016; Kirigia *et al.* 2016b).

This extensive literature base has resulted in a shopping basket of KT mechanisms[3], strategies, processes, tools and techniques that aim to more effectively and efficiently translate research-based knowledge into policy (Sutcliffe and Court 2006; Bennett and Jessani 2011; Moat and Lavis 2013). While traditional 'push' mechanisms remain popular, including journal publications and conference presentations, there appears to be growing interest in the use of 'integrated' strategies, particularly in African settings (see Part B).[4] These strategies promote the use of multiple, targeted dissemination methods and emphasise the importance of engagement and network formation between researchers and policymakers at multiple stages of research and policymaking processes (Lavis *et al.* 2006; Ellen *et al.* 2012).

Despite the increasingly prolific nature of KT research, there remains little clarity on how KT systems function in different contexts (Tricco *et al.* 2016). This has contributed to fragmented and uncoordinated efforts in narrowing the knowledge gap, particularly in Africa (Kebede *et al.* 2014). The adverse consequences of limited local understandings of KT are emphasized in settings where disease burdens are extensive and resources limited (de Savigny and Adam 2009; van Olmen *et al.* 2012; Shroff *et al.* 2015). Therefore, there is an urgent need for locally generated health research focused on local KT and health system issues. In recognition of this, the Western Cape Provincial Department of Health (PDoH) in South Africa established a project to improve how research-based knowledge informs health policy in the province. This study forms the initial objective of that project. The primary aim of the study is to explore and map the local KT 'system', including its mechanisms, barriers, facilitators, evidence of impact and key contextual considerations. The study purpose is both exploratory and explanatory, targeting a macro-level of analysis, but also explores cross-cutting elements that consider individual choices in knowledge generation, dissemination and use.

[3] In the absence of a universal taxonomy, 'mechanisms' may also be referred to as interventions, strategies, processes, techniques, approaches or activities that foster the uptake of research-based knowledge.

[4] Note: references to Part B of the thesis will be adapted suitably prior to submission of Part C for journal publication

The Western Cape context

The Western Cape Province forms one of nine legislated provinces in the Republic of South Africa. In a three-tiered system of governance, provincial government has substantial sway over policy processes, but remains subject to national policy and funding decisions (Constitution of the Republic of South Africa 1996). The province consists of five rural districts and one metropolitan district (the densely urbanised City of Cape Town), where all provincial tertiary public health services and research institutions are situated. Since 2009, the province has been governed by the Democratic Alliance (DA), creating a political disconnect with national government which has been under the control of the African National Congress (ANC) since 1994 (Grootes 2016).

The Western Cape provincial health system has been subject to ongoing reform since the 1990's (Gilson *et al.* 2017). This has resulted in a rich, but complex legislative environment with over 100 policies relevant to PDoH functioning (WCDoH 2016a). A list of the key policies related to KT are presented in Table 2. This reform is rooted in attempts to redress the consequences of a racially oppressive apartheid government prior to 1994 and develop a health system based on principles of equity, social justice and quality healthcare for all (Coovadia *et al.* 2009; Mayosi *et al.* 2012). Foundationally, the 2001 *National Health Research Policy* was designed to "provide an enabling framework for the conduct of research that improves human health and wellbeing in South Africa" (NDoH 2001, p. 7). A core theme throughout this document is the need for, and value of, research that informs policy. This policy paved the way for an *Essential National Health Research Strategy*, nine Provincial Health Research Councils (PHRC) and the development of a National Health Research Database (NHRD). The PHRC in the Western Cape is tasked with oversight and facilitation of health research in the province and mandated to advise on the policy implications of completed health research (Naledi *et al.* 2010; WCDoH 2015).

Table 2 Timeline of key national and provincial policies relevant to KT in the Western Cape Health System

Date	Policy
1994	Provincial Health Plan (1994-2002)
2001	National Health Research Policy in South Africa
2003	National Health Act
2003	Healthcare 2010 - Comprehensive Service Package (2003-2013)
2013	Healthcare 2030: The Road to Wellness (2013-current)
2015	White Paper on National Health Insurance for South Africa
2015	Policy for Approval of Health Research in the Western Cape (2015/16)
2017	National Public Health Institute of South Africa Bill

Additionally, the 2003 *National Health Act* initiated changes towards a decentralised health system based on principles of equity, efficiency, sound governance and internationally recognised standards of research (NDoH 2003). More recently, the National Department of Health (NDoH) instituted the 2015 white paper on *National Health Insurance* (NHI), a health financing system based on international principles of UHC. This represents another substantial shift in national health policy and will require whole-scale restructuring of the public and private healthcare system (NDoH 2015). Part of this process has been the initiation of the *National Public Health Institute in South Africa*, a public health body with strong research, governance and policy guidance mandates (NDoH 2017). Despite the passing of this most recent bill, the NHI has experienced numerous political and economic hurdles since its inception that have largely stalled implementation (Surender *et al.* 2015).

Since 1994, the Western Cape PDoH has leveraged many of these national policies to inform three waves of provincial policy strategies, including the *1995 Provincial Health Plan*, *Healthcare 2010* and *Healthcare 2030*. In a recent analysis of these strategies, Gilson et al. (2017) state that they have "consistently strengthen[ed]" Primary Health Care and the District Health System in the province in order to "develop a coherent and unitary provincial health system offering accessible, equitable, good-quality, efficient and financially sustainable services for all" (p.63).

Despite the coherence between national and provincial policies over time, the Western Cape PDoH continues to face significant challenges. Persisting fragmentation of Primary Health Care services, particularly in the Cape Metropolitan Health District, result in inefficiencies that weaken the district health system despite attempts to integrate these authorities (WCDoH 2016b). Significant disease burdens in the province, including rising non-communicable diseases, place increasing pressure on services (Mayosi *et al.* 2012). While ageing health infrastructure and medicine supply shortages pose further risk to service delivery (WCDoH 2016b). These challenges occur against the backdrop of widening inequity and mounting budgetary constraints that reflect a depressed fiscal climate both locally and nationally (NDoH 2015). Moreover, despite the presence of a rich legislative framework, there remains no formal national or provincial policy that specifically guides the translation of health research into policy and practice (Senkubuge and Mayosi 2012).

Method

This study employed a convergent parallel mixed methods design. Quantitative and qualitative data were collected in parallel, analysed separately and merged to provide a holistic understanding of how KT mechanisms influence the uptake of research into health policy in this context. Mixed methods design provides a pragmatic approach for examining KT mechanisms from multiple perspectives and fosters the triangulation of study results (Brown *et al.* 2015). The value of this design in public health research is recognised for combining "the power of stories and the power of numbers" to motivate changes in policy (Pluye and Hong 2014, p. 30). In this study, *public health research* refers to any investigation of clinical, epidemiological, health services and or health policy and systems relevance.

Quantitative data collection

Quantitative data was obtained from a retrospective database review of the NHRD to examine KT mechanisms proposed by local health researchers. The NHRD is the main repository for health-related research in South Africa and contains all accepted protocols for studies conducted in the Western Cape provincial health system since its inception in 2014. A random sample of 300 protocols was selected from a total of 1008 studies registered on NHRD in the Western Cape. This was to ensure sufficient power for statistical analysis. Application of inclusion/exclusion criteria and deletion of duplicates (n=4) reduced the total number of protocols to 100. Numerical data was limited to descriptive analysis only. Protocols were included if registered as approved on the NHRD between September 2014 (the inception of the database) to September 2016 (inclusive) and contained a full or partial protocol attached to their NHRD application. Variables extracted from protocols included the study title, topic area (e.g. health systems or clinical research), design, location, principal investigator, duration, proposed dissemination methods and any explicit policy intentions. Data was captured in Microsoft Excel and analysed using STATA 14® statistical software. Study sites were fairly evenly distributed between single site (n=52) and multisite (n=48) studies. A total of 89 out of 100 studies registered full protocols. The average duration of studies was 1.2 years with the shortest study registered only a few months and the longest study nearly 6 years. Seventeen different study designs were recorded of which the top three were descriptive (n=30); cohort design (n=13) and randomised controlled trials (n=12). Study distribution was uneven across districts with the highest concentration of health research conducted in the City of Cape Town Metropolitan Municipality (see Figure 1).

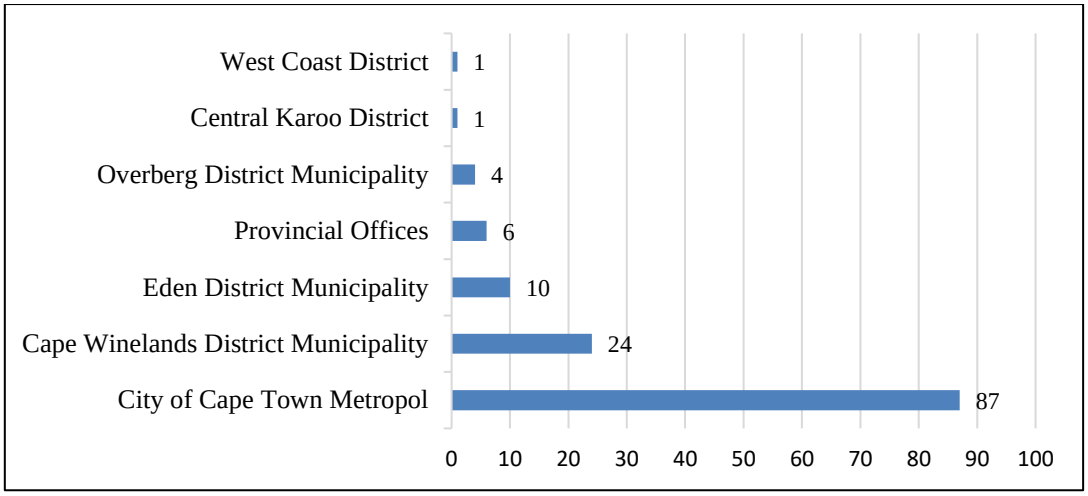


Figure 1 Distribution of NHRD sample studies across Western Cape districts (n=100)

Qualitative data collection

A mapping review of the literature on KT in African settings was synthesized with a detailed review of 17 relevant policy documents, grey literature and journal publications (see appendix 7). This was supplemented by nine purposively selected expert or *elite*[5] interviews with high-level provincial health policymakers (*n=4*) and HPSR managers and directors of local research institutions (*n=5*). A more diverse range of health researchers was initially targeted, but poor response rates limited the researchers interviewed to those embedded in the field of HPSR, albeit across a range of institutions. Interviews explored the use of KT mechanisms in the provincial health system, the perceived impact of these mechanisms, their barriers and facilitators. Additional information was also gathered on research knowledge flows, participant preferences for KT, contextual factors and potential for knowledge brokers. A summary of interviewee data is presented in Table 1 (see appendices 1-3 for interview guides and consent forms). Interviews were recorded, transcribed verbatim and, together with summaries of key documents and literature, hand coded for common themes (Green and Thorogood 2009). Coding by the original researcher was rigorously tested with and discussed by the

[5] *Elite interviews* have been used in the social and political sciences literature to describe the acquisition of information from specialist or highly positioned individuals holding unique knowledge about a specific process, event and context (Bogner *et al.* 2009; Hochschild 2009; Harvey 2011). In this study, the policymakers and researchers were purposively selected for their 'elite' positions within the health and research systems and the unique information that they possess about KT processes in the province.

study supervisors involved. Resulting data was stored in MS Word in preparation for comparison and synthesis with quantitative data.

Table 1 Summary of expert interview data

Code	Position	Institution	Experience in current position	Experience in the health system
P1	Senior Management	Provincial Department of Health (PDoH)	1 year 9 months	28 years
P2	Senior Policymaker	PDoH	2 years 6 months	22 years
P3	Senior Policymaker	PDoH	5 years	18 years
P4	Senior Policymaker	PDoH	2 years 6 months	25 years
R1	Research Director	Non-government organisation (NGO)	6 years 10 months	19 years
R2	Research Director	Government Research Institution	>20 years	>20 years
R3	Specialist Researcher	Government Research Institution	16 years	16 years
R4	Research Manager	Academic Research Institution	9 years	>30 years
R5	Research Director	Academia Research Institution	18 years	18 years

Note: codes above are used to attribute quotations reported in the results to policymakers (P) or researchers (R)

Data analysis and integration

Quantitative and qualitative data were analysed separately then integrated by cross-referencing document extracts, literature and interviews with results from the NHRD analysis. A narrative account of integrated data was constructed to reflect the key findings. Guidelines for the Good Reporting of a Mixed Methods Study (GRAMMS) were applied to ensure rigor for the study (O'Cathain *et al.* 2008).[6] To compliment and contrast quantitative findings and to ensure that the richness of qualitative data was not lost, illustrative quotes were drawn directly from interviews and documents (Gugsa *et al.* 2016). Additionally, while NHRD protocol data indicates researchers' intentions for KT, it is important to note that the *extent* to which these KT activities were carried out is unknown. Therefore, document review and key informant interviews provide more detailed insight into actual KT mechanisms,

[6] GRAMMS guidelines include: 1) justification for using a mixed methods approach to the research question; 2) description of the design in terms of the purpose, priority and sequence of methods; 3) description of each method in terms of sampling, data collection and analysis; 4) description of where integration has occurred, how it has occurred and who has participated in it; 5) description of any limitations of one method associated with the presence of the other method; 6) description of any insights gained with mixing or integrating methods

strategies and processes employed by local health researchers and policymakers. This provides a more realistic picture of the state of the KT system in the Western Cape province.

Ethical clearance for this study was obtained from University of Cape Town's Human Research Ethics Committee (HREC reference: 476/2017). Written permission from the Western Cape Provincial Health Department was also received as required for all local health-related studies.[7] All interviewed participants signed consent forms following explanation of the study and every attempt was made to ensure confidentiality. Access to the NHRD was facilitated by the study supervisors and only documents that currently exist in the public domain were utilised.

Findings

The findings presented here describe elements of the KT system at work in the Western Cape province. Specific attention is given to the role of the local health research system, the pathways and mechanisms at work, the use and impact of research-based knowledge, specific facilitating factors and barriers to KT.

Role of the local health research system

The 'health research system'[8] in South Africa exists at the intersection between the health system managed by the Department of Health and the research system governed by the Departments of Science and Technology and Higher Education and Training (Senkubuge and Mayosi 2012). A core function of this system is the generation and utilisation of knowledge to improve health and equity. The Western Cape has a sophisticated and extensive health research system uncommon in many African countries, especially at a provincial level such as this (Kebede *et al.* 2014; Uthman *et al.* 2015; WCDoH 2015;

[7] Ethical and provincial clearance letters provided in Appendix 8 and 9.

[8] The term 'health research system' has been popularised by the WHO and others since 2001and is commonly taken to mean "a system for planning, coordinating, monitoring and managing health research resources and activities; and for promoting research for effective and equitable national health development" (WHO 2002, p. 6).

Kirigia *et al.* 2016a; Rehfuess *et al.* 2016). This resource was recognised by all provincial health policymakers interviewed:

> *We [are] pretty fortunate in the Western Cape … [In other settings] they don't have what we have. I mean we have four Higher Education Institutions in Cape Town, we have the Health System's Trust [HST] and we have the MRC [Medical Research Council]. So, you have six entities that we can work with.* (Senior policymaker P2, PDoH)

The translation of this "academic health capital" (Gilson *et al.* 2017, p. 60) into provincial policy is enhanced by research institutions specifically geared towards the synthesis and use of research findings. This study identified three such institutions in the Western Cape, including the South African Cochrane Centre housed at the Medical Research Council (MRC), the Knowledge Translation Unit at the University of Cape Town (UCT) and the Centre for Evidence-based Healthcare at Stellenbosch University (SUN). Together with the PHRC, these institutions create a dense network of experienced researchers and policymakers with much capacity to foster KT in the province. Figure 2 maps the sources of local research-based knowledge and its pathways through the provincial health system. (Note the influence in the right-hand column is the reported influence *on policy-makers* and not influence on the health systems more broadly.)

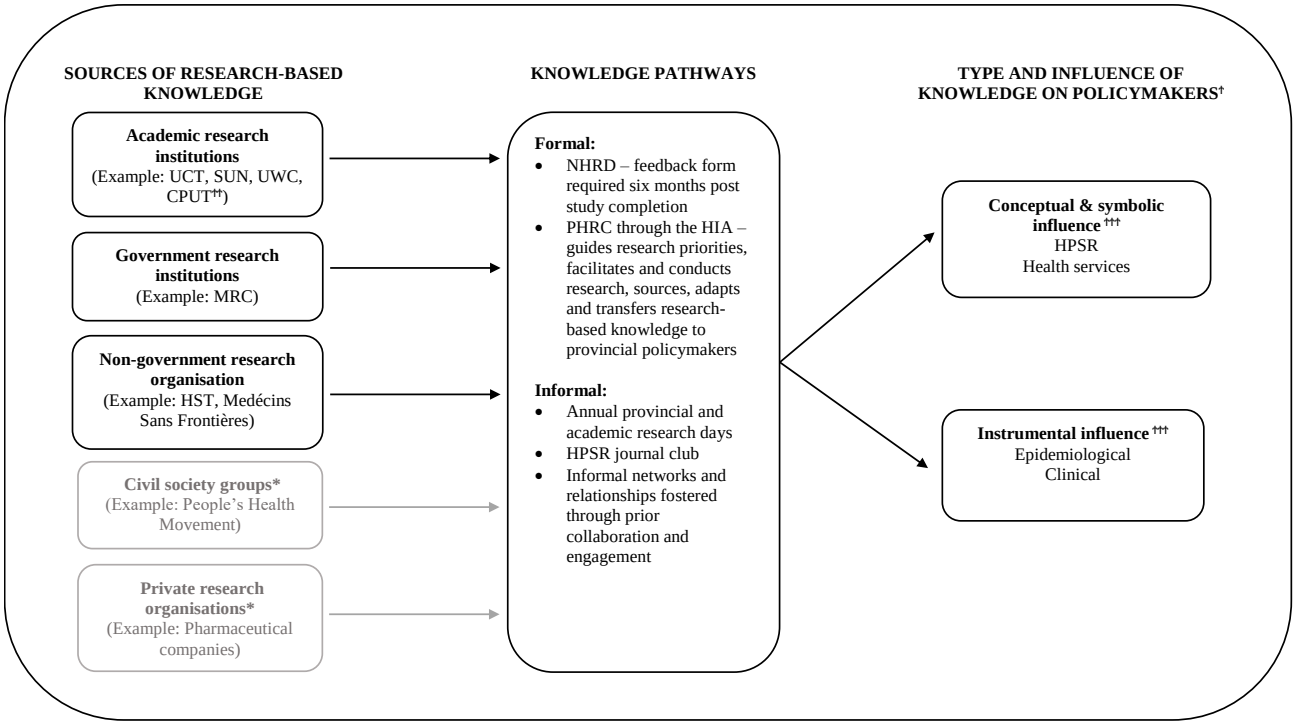


Figure 2 Mapping knowledge translation in the Western Cape provincial health system (source: author)

* Groups in greyscale were not included in the study, but are acknowledged as additional sources of knowledge and influence in the provincial health system.

† As reported by expert interviews

†† UWC: University of the Western Cape; CPUT: Cape Peninsula University of Technology

††† Conceptual, symbolic and instrumental influences adapted from Carol Weiss' (1979) models of research use

However, challenges to the local health research system remain. Persisting hierarchical and siloed research system organisation, heavy reliance on donor funding and continued orientation towards biomedical perspectives continue to impede health researchers' ability to respond to local needs (Mayosi *et al.* 2009; Senkubuge and Mayosi 2012). These challenges undermine the progress of many African health systems by maintaining local knowledge gaps (Kebede *et al.* 2014; MacDonald *et al.* 2014; Zielinski *et al.* 2014). Additionally, public Higher Education Institutions in South Africa are facing ongoing challenges regarding their financial viability and operation following persistent calls for free higher education and a 'decolonised' academia (Badat 2010; Davids and Waghid 2016).

Despite these challenges, the Western Cape Province holds much potential for the generation and translation of research-based knowledge for health. Diverse and experienced research institutions and

a rich legislative framework governing the PDoH create a conducive health systems context that fosters the use of knowledge in decision-making.

Pathways and mechanisms for KT in the provincial health system

Findings across datasets indicate diverse pathways and mechanisms for KT in the Western Cape provincial health system (see Figure 2). The use of formalised KT pathways is highlighted in both national and provincial policy documents, including the 2001 *National Health Research Policy* and the 2015/16 *Policy for Approval of Research in the Western Cape.* These documents recommend journal publications, research briefs, databases, presentations and workshops as potential KT mechanisms, while also acknowledging the importance of collaborative networks and alliances in improving communication (NDoH 2001). At minimum, researchers are requested to fulfil reporting requirements "within a negotiated time period from completion of the study," usually six months (WCDoH 2016b, p. 13). Similarly, registered studies on the NHRD are requested to provide electronic feedback using a standardised form to the provincial research coordinator within six months of research completion.

Variation in the pathways and recommended KT mechanisms in formal documents is consistent with findings from NHRD sample protocols, stakeholder interviews and the broader literature (see Part B). Table 3 contains a list of the mechanisms reported across datasets. The study identified over 40 different mechanisms in the mapping of KT literature in Africa, 34 different mechanisms proposed by researchers in the NHRD protocols and 24 different mechanisms in expert interviews. Mechanisms that were common across datasets included research briefs and bulletins, executive summaries, leveraging networks, peer reviewed journal publications, presentations and research days.

Table 3 Reports of KT mechanisms across datasets

KT Mechanism *(alphabetic list)*	**NHRD Protocols**	**Policy Document Review**	**Researcher Interviews**	**Policymaker Interviews**
Abstracts, academic dissertation and theses	x			x
Books	x	x		
Briefs and bulletins	x	x	x	x
Co-creation and collaboration			x	x
Conference presentations	x			
Deliberative dialogues and consultations	x		x	x
Databases		x	x	
Email (including listservs)	x		x	x
Executive summaries	x	x	x	x
Face-to-face meetings	x		x	x
Fact sheets	x			
Forums (online and face-to-face)	x			
Journal club			x	x
Knowledge brokers		x	x	x
Leveraging networks	x	x	x	x
Non-specific publications	x	x		
Official letter	x			
Open access publications online	x		x	x
Peer-reviewed journal publications	x	x	x	x
Posters	x	x		
Presentations	x	x	x	x
Press releases/Media engagement	x			
Rapid reviews			x	x
Regular newsletters	x	x		
Reports and manuscripts	x		x	
Research days	x	x	x	x
Scholarly media	x			
Teaching case	x			
Organisational interventions	x			
Websites and social media	x		x	x
White paper	x			
Working paper	x		x	
Workshops	x	x	x	

Source: author

Within the NHRD protocol sample, publication in peer-reviewed journals were the most commonly reported KT mechanism (31 studies) followed by presentations (24 studies), reports and manuscripts (18 studies) and conferences (17 studies). Mechanisms that focused on engagement and collaboration

were prioritised less with face-to-face meetings reported in only 14 studies, leveraging networks in four studies, public fora in three studies and deliberative dialogues in two studies. This contrasts strikingly with reports by both senior provincial policymakers and health researchers in the province who *all* strongly emphasized the need for interpersonal (relational) connections as a mechanism to enhance KT.

> *I think its connections between researchers and policymakers. I guess it's those individual connections and the involvement together in research…* (Research director R2, Government research institution)

> *I must say, there's nothing that beats conversation. You know, it's one thing to read a paper. It's another to sit and discuss*. (Senior policymaker P3, PDoH)

Given the strong preference for interpersonal connections in expert interviews, it is interesting that these were the least reported mechanisms in the reviewed sample of NHRD study protocols. Furthermore, only 64 of these protocols included reference to a dissemination plan. This means that more than a third of the reviewed studies did not explicitly consider how findings would be shared in the planning phase of the research process. These findings suggest a need to develop greater accountability and awareness on the part of health researchers in developing, reporting and implementing dissemination plans that consider the relational nature of KT in the province.[9]

[9] No immediately discernible pattern was found to suggest prioritisation of KT plans by particular types of researcher, study or public health discipline.

The use and impact of research-based knowledge in the Western Cape health system

The extent to which research-based knowledge informs health policy in the Western Cape province is unclear. Currently, there is no distinct outcome or clear impact measurement for knowledge use indicated by either the NHRD or local policy documents. Additionally, none of the 100 NHRD protocols reviewed included measurement of research impact or follow up of dissemination activities. Four out of the five high-level researchers interviewed were unsure about the impact of their research on policy.

> *I can't comment on what happened to the information beyond the directorate … I don't know whether the executive management of the department actually engaged with the information and used it specifically.* (Research director R1, NGO)

> *… whether or not it eventually will influence policy, I don't know*. (Specialist researcher R3, Government research institution)

Unclear knowledge use and a lack of distinct outcomes for KT strategies was a common finding in KT studies across Africa (see Part B) and reflects ongoing concerns in the broader literature regarding measurement and monitoring of research impact on policy (Lewin *et al.* 2012; Gervais *et al.* 2016; Kothari and Wathen 2017).

Carol Weiss' (1979) model of conceptual, symbolic and instrumental use was the most commonly reported model for categorising research use in the mapping of KT literature across Africa (see Part B) and across expert interviews. Senior researchers and policymakers referenced this model when describing the various ways in which different types of public health research influenced policymakers (see Figure 2). For example, two senior researchers (R1, R2) and one policymaker (P4) noted the

instrumental use of clinical and epidemiological research in translating clinical research into clinical guidelines. While conceptual and symbolic uses of health policy and systems research were described as "enlightening" policy dialogues (R3) and "infusing" policymakers' thinking (R5). Applying this model to the list of reviewed policy documents indicated only one policy, the *2015 White Paper on National Health Insurance,* that showed instrumental use of health economics research through explicit references, despite interviewees describing various other documents, including *Healthcare 2030*, has being rooted in research evidence. These findings suggest variations in the influence of different types of public health research on policy-makers and therefore policymaking, but also potentially different efforts by researchers to translate their research. They also highlight the variable and often complex outcomes that research-based knowledge can have on policymaking and, therefore, the need to consider the unique demands of different decision-making contexts.

Despite the unclear impact of research-based knowledge in the province, knowledge generated through health research appears to be valued as an important input to provincial policymaking processes across expert informants and reviewed documents. Both the 2001 *National Health Research Policy* and 2015/16 *Policy for Approval of Health Research in the Western Cape* have chapters dedicated to the communication and reporting of health research to ensure that "the benefits of research are systematically and effectively translated into practice" (NDoH 2001, p. 14). Four interviewees further agreed that the Western Cape PDoH is open and intentional about the use of research in policymaking.

> *The Western Cape, more than most, does make an effort to use evidence to inform their decision-making. There certainly is intent and will.* (Research director R1, NGO)

The value of research in provincial policymaking reflects the broader value placed on health research in Africa since the early 2000s (Uthman *et al.* 2015). Increased research availability, including KT-

related research, in the province and the country is likely an additional contributing factor as South Africa ranks the highest producer of KT research on the continent (see Part B).

Facilitating factors for increasing KT

Using thematic analysis and inductive reasoning, KT facilitators in the province were categorised into three core themes: 1) organisational capacity, culture, process and leadership; 2) characteristics of available research and 3) relationships and networks for KT.

Organisational capacity, culture, process and leadership

Organisational capacity to demand, generate, understand and apply research-based knowledge is recognised as critical to evidence-based policymaking (Green and Bennett 2007; Hamel and Schrecker 2011; Uneke *et al.* 2011; Kasonde and Campbell 2012; Barratt *et al.* 2017). Additionally, it has been shown to significantly affect the knowledge absorption capacity of governments in LMICs (Biesma *et al.* 2012). In Africa, the capacity to generate and use research is recognised as the most common factor affecting KT (see Part B). A recent study of eight LMICs identified South Africa as having the highest level of organisational capacity to use research (Rodríguez *et al.* 2017).

In the Western Cape, senior health policymakers and managers have strategically targeted the development of PDoH *organisational capacity* to demand, generate and use research (Lutge and Mbatha 2007; WCDoH 2016a). Through a multidisciplinary *process* that leveraged national and provincial policies, the PDoH created the Health Impact Assessment (HIA), a research directorate responsible for epidemiology and surveillance, health research, programme impact evaluation and quality assurance (Naledi *et al.* 2010). Through this process, public health professionals and registrars (public health medicine specialists in training) are also ‘seeded’ within the department enhancing

capacity to coordinate public health resources and conduct large collaborative research projects. The impact of this process on organisational capacity was acknowledged by most interviewees.

> *We've tried to streamline where we get our evidence from internally by having a Health Impact Assessment unit … So, we turn to HIA and say: "Guys where's the evidence? We want to make a decision. What do you think?" … and they source it.* (Senior policymaker P2, PDoH)

> *They've got people in the province who are specialists … They've created the platform … They often go in. They don't even need to go out [for research] … and these are very smart, experienced people.* (Research director R1, NGO)

Organisational capacity in the province has been aided further by capable and motivated *leadership* at multiple levels of the health system. These individuals are not only highly experienced (see table 1 for examples), but have sustained their positions over time resulting in a cumulative capacity to manage the health system and make health policy:

> *The Western Cape has a very strong and a very coherent senior leadership team, senior policymaker team … The other thing is that there has been a lot of stability in the senior levels and just below simply in terms of personnel.* (Research director R5, Academic research institution)

This combination of "people and process" (P4) has created a strong pull from within the PDoH for research-based knowledge. This was confirmed by elite interviews and a 2015 Barrett Value Survey

of the PDoH that identified an *organisational culture* of pro-learning, alignment to employee values of teamwork and cooperation and openness to the use of research in policy (WCDoH 2016b).

> *It's perhaps also the culture of our organisation … that we are pro-learning and that people find it stimulating so more people are willing to learn and not get stuck … We [have] worked quite hard on our organisational culture of teamwork, of working across siloes … I think that definitely helped a lot.* (Senior policymaker P4, PDoH)

Characteristics of available research

Analysis across sources revealed several characteristics of the available research that facilitate KT in the province. Firstly, credible research generated by trustworthy and experienced researchers was acknowledged as an important factor in research uptake in five of the nine expert interviews and various policy documents, including the 2001 *National Research Policy*, the *Policy for Approval of Health Research in the Western Cape* and the strategic *Healthcare 2030* plan. Similarly, credibility was identified as a key facilitator of KT for health researchers across Africa and was closely linked to trust between researchers and policymakers (see Part B). Although the importance of credibility has been a longstanding theme in the broader KT literature, it remains a critical issue in health policymaking (Sutcliffe and Court 2006; Kothari *et al.* 2011; Grimshaw *et al.* 2012; Haynes *et al.* 2012; Parkhurst 2016).

The second characteristic relates to the importance of packaging and communicating the research message to a targeted audience (Sudsawad 2007; Dobbins *et al.* 2009; Bennett and Jessani 2011). This was observed clearly in the variety of KT mechanisms employed by researchers in the NHRD protocols (see table 3). Interestingly, targeted messaging was noted by more researchers than policymakers in

interviews and the mapping of KT literature. This demonstrates researchers' awareness of the need to shape research messages for intended audiences.

> *…attempts over the years to streamline [research], make it more digestible … You know, to create policy briefs, to generate questions for systematic reviews, to creating knowledge translation units which we can work with … those are all the things that's made it easier.* (Research director R2, Government research institution)

Thirdly, an accumulative body of research that can demonstrate consistently strong positive effects and feasible solutions is more likely to influence policymaking (Delany-Moretlwe *et al.* 2011). This was recognised as a key factor in the KT literature in Africa (see Part B). As one senior researcher noted: "you really have to try and influence with a body of knowledge" (Specialist researcher R3, Government research institution).

Lastly, the motivation of researchers and their responsiveness to policymakers' needs was identified by some of the interviewed experts. However, this was strongly emphasised in the literature as an essential step in providing research that was contextually-relevant and, therefore, more likely to be used in policy (Brownson *et al.* 2006; Datta 2012; Roman *et al.* 2017).

Relationships and networks for KT

The uptake of research into policy hinges on cooperative and mutually trusting relationships between researchers and policymakers, collaborative fora for researchers to engage in mutual dialogue with decision-makers and the formation and endurance of research networks (Mayosi *et al.* 2009; Oliver *et al.* 2014). The development of cooperative and mutually trusting relationships between researchers and policymakers was identified as a key strength of the PHRC in the Western Cape (WCDoH 2016a).

This committee includes provincial health policymakers and members of local research institutions with a mandate that specifically targets the development of links across institutions. As such, it is well positioned to build cooperation and foster trust with multiple stakeholders. The emergent nature of these relationships was a common thread across expert interviews as a shift from previous suspicion and mutual misunderstanding towards beneficial partnerships and consistently trustworthy interactions has taken place over time.

> *There is a level of trust now that has been built carefully over a long period of time. Strategically and, I think, ultimately a fair amount of goodwill on both sides. And determination.* (Research director R5, Academic research institution)

Creating spaces for mutual engagement and collaboration between researchers and policymakers is increasingly recognised as an integral aspect of KT (Gagliardi *et al.* 2016; Langlois *et al.* 2016; Uzochukwu *et al.* 2016; Kothari and Wathen 2017). Important fora for this in the province include a monthly journal club targeting HPSR and annual research days presented by academic institutions and the province (see table 3). In particular, the Western Cape HPSR journal club was repeatedly acknowledged by expert interviewees for its unique approach to facilitating connections and collaborations between researchers and policymakers, despite its absence in formal policy documents and the broader literature. The journal club acts as a closed 'safe space' and was recognised for its potential as a "brokering opportunity" (R3), a space for "learning and co-creation" (P2) and "discussion and engagement" (P3). The journal club has also bred several 'off-shoot' collaborative research activities, following joint problem identification, and resulting in co-created research outputs (for example, see Gilson *et al*. 2017). Recognising the value of the journal club for influencing policy and nurturing personal development, one policymaker noted that:

> *For us the journal club has worked well … we benefit from it. We learn so much … The things that we learn there find themselves into policy documents. They find themselves into the way we do things. So, it kind of feels like its's our time to go and just learn. It's a development thing.* (Senior policymaker P3, PDoH)

This research was not intended to assess the collaborative involvement at lower levels of the health system (for example, whether local service providers are involved in problem identification and research formation).[10] However, the need for different levels of engagements and types of collaborations - at different stages of the research process - was recognised by all senior policymakers and researchers. This speaks to the broader need in Africa for sustained relationships that extend beyond individual research projects, and for layered approaches to KT (Ongolo-Zogo *et al.* 2014; Berman *et al.* 2015; Keita *et al.* 2017). In the Western Cape province, layered collaborations and cooperation has resulted in a dense network of connections between health researchers and policymakers. These networks span institutional boundaries and are observable in both the functioning of the PHRC, the HPSR journal club and the establishment of joint employment agreements between the PDoH and local universities (Naledi *et al.* 2010). Enduring personal networks have also developed as a result of these ongoing engagements and policymakers report being able to "pick up the phone" (P1) to speak to colleagues in different institutions regarding research and evidence needs.

Barriers to KT

Among the barriers reported by policymakers and researchers, resources constraints, system conflicts and political issues were the most prevalent.

[10] A parallel research project that is part of the same research group, is conducting research on similar questions at a facility level and will supplement this analysis of KT at the more macro provincial policy level (see Ndlovu 2018).

Resource constraints

There is evidence across datasets that highlights resource constraints as a critical barrier to KT. Resource constraints, including limited time, staff and funding, were ranked as the second most significant barrier to KT after capacity constraints in African settings (see Part B). In South Africa, the need for greater efficiency is emphasized in all policy documents as policymakers recognise the need to achieve more with less (WCDoH 2013, 2016a, NDoH 2015, 2017). Resource constraints, particularly funding and time, were reported across expert interviews as impeding local ability to generate and use research-based knowledge in provincial policymaking. Furthermore, only five of the 100 reviewed NHRD study protocols included KT costs in their budgets, four of which were allocated to the costs of poster printing and journal publication. These findings confirm that, without investment, resource constraints will continue to plague African health systems and impede efforts to bridge the know-do gap (Young 2005; Sumner *et al.* 2011; Tulloch *et al.* 2011; Grimshaw *et al.* 2012; Guieu *et al.* 2016).

> *Most of the time [the research] is in a controlled setting and there's enough resources and bodies and money … And you get to our setting then there's not enough resources, not enough people, not enough many things … then you would have to start compromising … I call it ethical compromising.* (Senior manager P1, PDoH)

> *Most of the research comes from funding that we procure … mostly internationally … we don't have a lot of resources floating around to respond to government requests for giving answers to questions.* (Research director R2, Government research institution)

For research institutions, resource constraints mean greater competition for available resources which can inhibit the sharing of knowledge, relationships and opportunities for collaboration between

research-generating institutions while also potentially fragmenting engagements with policy-makers (WHO 2007; van Olmen *et al.* 2012).

Moreover, resource constraints mean local research institutions are more reliant on donor funding, despite this potentially reducing their responsiveness to policymakers' needs. Notably, 63 of the 100 NHRD study protocols reviewed indicated financial support from donors while only 18 included explicit policy intentions. Donor requirements were recognised as the fifth greatest barrier to KT in African health systems despite 81% of studies receiving donor support (see Part B). These findings demonstrate the difficult position in which many local health researchers find themselves as they wrestle to maintain financial viability, meet the demands of donors, guide the research agenda and produce high-quality relevant research for policymakers. Furthermore, these findings highlight important questions about donor influences on local research agendas and the need for local research funding to facilitate policy-relevant research and a more equitable production of knowledge (Frizelle 2009; Crane *et al.* 2017; Hasnida *et al.* 2017).

System and priority misalignment

Despite longstanding efforts and many successes in building links across institutional boundaries (see above), the provincial health and research systems remain mismatched in terms of their priorities, incentives and timelines. Researchers and policymakers in the PHRC are mandated to facilitate the research priority-setting process and ensure better alignment of priorities to meet local needs (WCDoH 2016a). However, access to contextually-relevant research was reported as the second greatest barrier for senior policymakers in the province and the greatest barrier for policymakers in Africa (see Part B). While there appears to be an abundance of research activity in the province, senior policymakers expressed concern about its relevance.

> *…for us it's not so much [about] having access to [research]. We have access to too much of it. It's about what is relevant and how do we engage this richness of ability and streamline it into something that meets the needs much more effectively.* (Senior policymaker P2, PDoH)

Furthermore, researcher incentives to generate and translate research are frequently dictated by funders' demands that require publication in formal research journals as a measure of outcome (Harris 2015; Gagliardi *et al.* 2016; Kirigia *et al.* 2016b). Paradoxically, journal publications are a key measurement outcome for government funded research institutions in South Africa despite few policymakers having direct access to journals (South African Medical Research Council Act 1991). This has resulted in researchers prioritising journal publications over potentially more effective methods of KT as evidenced in both the NHRD protocols and researcher interviews.

> *We are chasing publications. It influences our budget the next year … we get a bigger budget if we publish more … so all eyes are on publications.* (Research director R2, Government research institution)

Research such as randomised controlled trials sponsored by pharmaceutical companies appear to face particularly significant dissemination barriers that seek to protect intellectual property rights and discourage widespread circulation of findings, slowing down and limiting possible KT. For example, one study registered on the NHRD funded by an American pharmaceutical company was required to meet four different criteria prior to dissemination of research results, including prior review of publications and consent to withhold or withdraw information deemed confidential by the company. So long as funders' demands command "the pipe and the tune that [researchers] dance to" (P2) there

will continue to be a mismatch in priorities and incentives that result in less production and translation of contextually-relevant research.

Lastly, mismatched timelines were a commonly reported barrier across interviews and a key barrier for policymakers across Africa (see Part B). Both senior researchers and policymakers bemoaned the time-consuming nature of the research process in a context where decisions often need to be made immediately. Despite conflicting timelines remaining an intractable barrier to KT, novel methods are emerging that promote faster access to quality research, including the use of rapid reviews and local research repositories (Mijumbi *et al.* 2014; Oliver *et al.* 2014; Haby *et al.* 2016; Barratt *et al.* 2017).

Politics, values and priorities in KT

The development and implementation of public health policy is a political process (Buse *et al.* 2012; Gilson 2016). Researchers and policymakers across Africa recognise that politics can hinder the use of research in policy (see Part B). This finding is now widely recognised and highlights the frequently contested nature of knowledge production and use (Datta 2012; Murphy and Fafard 2012; Koch and Weingart 2016; Parkhurst 2016). In the Western Cape PDoH, as elsewhere, political dynamics rooted in issues of resource distribution, governance and personal capacity combine with individual and organisational values, interests and ideas to influence what research gets translated and by whom (see more below).

As part of the *Healthcare 2030* strategic plan, the Western Cape PDoH established a set of core values, including competence, caring, accountability, integrity, respect and responsiveness (WCDoH 2013). These values are in line with global thinking on research use in policymaking and have guided the PDoH's interests and ideas in recent years towards 'people-centred healthcare' (WCDoH 2016b; WHO

2017). However, provincial policymakers interviewed reported some political dissonance between national and provincial government, leading to difficulties in aligning interests and ideas.

> *We have an earlier adopter status of taking the global picture and moving towards people-centred systems, healthcare systems. Where we go internationally, our thinking in terms of what we do in this province is on par of what the thinking is globally. That's not the case with the rest of the country. We have a clash in paradigms.* (Senior policymaker P2, PDoH)

The ability to separate and balance technical, bureaucratic and political action has been an ongoing challenge for the Western Cape PDoH as they seek to balance multiple overlapping governance perspectives and priorities within the system (Gilson *et al.* 2017). There was also a strong recognition across expert interviews that neither research nor policy is value neutral. As a senior researcher noted, the same piece of research or evidence could be used for different priorities.

> *…policy is not value-neutral. It's value-driven and value-laden … you take the same policy and you give it to somebody else and they've got a different set of values, a different political and social dynamic. And you use the same things, but you come out with different conclusions.* (Research manager R4, Academic research institution)

Expert interviews reported individual capacity, experience and seniority as factors that determined influence in policymaking (R1), access to resources for KT (P2) and opportunities for developing relationships with stakeholders (R3). Individual capacity to use and understand research was viewed as particularly crucial to balancing knowledge and power between researchers and policymakers.

> *...when I'm talking to researchers I can understand. I can understand and we're almost talking as equals and as colleagues. So, there isn't that power imbalance.* (Senior policymaker P3, PDoH)

A unique view that corresponds with contextual issues reported previously was that the power to translate research findings remains rooted in individual researchers' positions within academic hierarchies and that these positions are still largely shaped by South Africa's socio-political history:

> *...in order to influence you need power. And power in South Africa is still shaped by our colonised past and present.* (Specialist researcher R3, Government research institution)

Discussion

"Knowledge produced by health research is a global public good" (Senkubuge and Mayosi 2012, p. 142). However, this 'good' can only be achieved through the functioning of effective KT systems and strategies that promote the use of quality evidence in policy and practice. The Western Cape provincial health system in South Africa benefits from the presence of a relatively robust KT system supported, in part, by an extensive, but coherent national and provincial policy frameworks that emphasise the importance of evidence-based health policymaking. Furthermore, capable leadership and consistent governance functioning at multiple levels of the provincial health system has strengthened the capacity of the PDoH to conduct, interpret and apply research to decision-making. Moreover, organisational processes that promote the formation of boundary-spanning relationships and embedding of researchers within the PDoH have resulted in a dense network of researchers and policymakers that share multiple forms of engagement (Sheikh *et al.* 2016). Examples include formal arrangements such as the establishment of the PHRC and HIA as well as less formal spaces such as annual research days and the bi-monthly HPSR journal club. The direct consequences of these long-term engagements have

been an increase in the bidirectional flow of knowledge, improved joint priority setting and greater influence of research, albeit varyingly, on policy documents, including the provincial *Healthcare 2030* strategic plan. Finally, the existence of a well-established local research system, including the presence of multiple universities, government, private and not-for-profit research institutions, has resulted in the generation of considerable high-quality health research available for use.

However, barriers to KT in this context highlight persisting gaps and tensions between researchers and policymakers which exacerbates the gap between research and policy in the province. Conflicting interests, ideas, values and imbalances of power (many of which appear rooted in South Africa's socio-political history) were considered important political factors that influence KT - in particular who gets to translate to whom. The political nature of KT is a widely acknowledged phenomenon and demonstrates the contested nature of knowledge production and use (Greenhalgh and Russell 2006; Datta 2012; Langlois *et al.* 2016). Furthermore, while political processes are noted as a barrier in this context, their role and value in shaping which research is relevant to particular needs and goals should not be underestimated (Parkhurst 2016).

Furthermore, limited resources in the Western Cape health system, especially in terms of funding, time and staffing have necessitated "ethical compromise" (P1) in the application of research to local contexts, while policymakers lamented the lack of contextually-relevant research in the province. Additionally, system conflicts, including diverging incentives, priorities and mismatched timing between research and policymaking processes, have largely impeded the timely production of locally-relevant research. The complex role of donors in supplying much needed resources, but also influencing research agendas cannot be ignored. Like many LMICs, donor aid in South Africa frequently meets the funding gap that contributes to research institutions' survival (Hasnida *et al.* 2017). However, it has been criticised for perpetuating knowledge hierarchies and unequal

relationships between recipients and donor organisations and undermining local institutional capacity (Koch and Weingart 2016; Crane *et al.* 2017). The challenge for local health researchers and research institutions going forward will be to secure their financial viability, while maintaining intellectual independence and meeting the demands of local health system decision-makers.

This research highlights a number of health systems issues relevant to KT, including 1) the need for a systematic contextual approach, 2) the value of systems thinking in KT, 3) the potential of an embedded health systems approach and, 4) the view of KT as an ethical imperative (unpacked below).

The need for a systematic contextual approach to KT

Like research impact, context is a nebulous term, widely recognised as important, but rarely clearly defined, especially in KT (see Part B). Echt (2017) described context as "the complex environment that influences how policy decisions take place as the result of simultaneous interactions between various stakeholders" (p. 1). This definition highlights the dynamic and frequently relational aspects of context that should not be ignored when considering how KT functions in a given setting. While the specificity and importance of context in influencing KT has been the subject of much debate, most of this literature provides little insight into what aspects of context should be considered (Court and Young 2003; Bennett and Jessani 2011; Ssengooba *et al.* 2011; Moat *et al.* 2013; Kothari and Wathen 2017). This highlights the need for a systematised approach to understanding 'context' when attempting to explore and map KT systems. This study has attempted to provide one such systematic description of context by focusing on socio-political factors, national and provincial health system organisation and local health and research system challenges found in the Western Cape provincial health system. A description of specific barriers and facilitators to KT in this setting further highlight unique aspects of this context. By systematically describing context in this way, this study has

highlighted some of the reasons underlying research use (or lack thereof) in provincial health policymaking while also revealing the nature and functioning of the local KT 'system.'

Findings in this study appear to support Weyrauch *et al.'*s (2016) conceptual framework of KT. This framework outlines six dimensions to understand how context, at the level of government institutions, influences knowledge use in policy. These dimensions include 1) macro context, 2) intra- and inter-institutional linkages, 3) culture, 4) organizational capacity, 5) organizational management and processes and, 6) core resources. The framework offers an interesting opportunity for a more systematic approach to understanding and mapping context and its role in KT.

A systematised understanding of context has the potential to nurture KT systems that are dynamic and responsive to change (Moat *et al.* 2013). Not only does it facilitate the identification of contextually-relevant KT mechanisms for target audiences, but also adds clarity to motivations underlying research use (Bennett and Jessani 2011; Shearer *et al.* 2014). In the Western Cape health system, routine mapping of contextual factors, including research output and focus and policy environment at provincial, district and sub-district levels should be encouraged by all involved in knowledge production and use. Local KT policies and strategies should highlight specific details, including who, where and how relevant research can be translated and what effect or impact this research can be expected to make. Furthermore, these policies should encourage researchers to be more accountable in disseminating their research at multiple levels of the health system. Increasing researcher accountability for the dissemination of their research was recommended by provincial policymakers interviewed and is a key recommendation emerging from this study (see Box 1 and discussion below).

The value of systems thinking in KT

Like the complex adaptive health systems they are trying to influence, local KT systems and strategies require dynamic responses to deal with shifting contexts, relationships and the research itself. The Western Cape provincial health system contains multiple, overlapping relationships between researchers and policymakers that are evolving over time to influence KT. The prevalence of health system's software permeates these relationships, including the need for trust, credibility, communication, mutual respect and leadership to enhance KT. The role of such health system software in fostering KT is supported by findings from Ghana, Uganda and Zambia (Mirzoev *et al.* 2012) and adds weight to conceptual demands for *integrated* KT (Gagliardi *et al.* 2016; Kothari and Wathen 2017). The findings in this study highlight the value of a systems thinking approach to KT that allows for consideration of complex health system software and the dynamic nature of local decision-making contexts.

Box 1 Recommendations for improving knowledge translation in the Western Cape provincial health system*

- Create spaces for increased *face-to-face interaction and collaboration* across research and policy processes and beyond. These may be informal 'thinking spaces' that facilitate knowledge exchange, conversation and the formation of boundary spanning networks that bridge institutional divides.
- Streamline provincial and academic research days to *target specific topics and/or geographical areas* (for example, all maternal and child health research conducted in a specific substructure or district).
- Adapt research findings into a *digestible format* for specific knowledge users, including plain language summaries and clear recommendations.
- Six-monthly summary reports of research in specific substructures *distributed to substructure managers*, not just at provincial level.
- Improve *researchers' accountability* to feedback research as intended/proposed through, for example, greater follow up of NHRD feedback forms.
- Create a formalised *clearinghouse* for research in the province.
- Disseminate research *across different levels* of the health system.
- Target working models for *integrating learning and research systems* to increase alignment of research priorities and output.

*Recommendations are directly drawn from elite interviews. Further recommendations from the analysis are included in the text.

The mismatch between provincial health and research systems in the Western Cape, particularly in terms of timing, incentives and priorities (identified above), also supports the need for better 'integration' or alignment of systems. However, even in high-income countries such as the United Kingdom, the relationship between health and research systems is weaker than desired (Caffrey *et al.* 2016). This has led to calls for enhancing the development of a *learning health system* approach that aims to "to integrate delivery of health services with the generation of new knowledge about the effectiveness of these services" (English *et al.* 2016, p. 1). These authors recognise how learning health systems are responsive to change, have greater absorption capacity and are more resilient to sudden health system shocks. Such systems require long term collaborations that encourage research and its use as a natural outcome of innovative, quality patient-centred healthcare (Olsen *et al.* 2007). This study indicates that, while many strong examples of engagement, collaboration and leadership for KT exist, much still needs to be done to develop an integrated and aligned 'learning health system' in the Western Cape. Fragmentation between provincial and district services and competition between research institutions for scarce resources continue to inhibit current KT efforts. Streamlining research and policy processes, greater collaboration across and beyond project cycles, and research feedback days disaggregated by district are a few recommendations that may overcome such difficulties (see Box 1). Additionally, individual responses to KT should recognize the complex adaptive nature of health systems to inform decision-making (De Savigny and Adam 2009; Gilson 2012). As one leading policymaker noted: "You can never say that you know it all, or that you have the answers. You have to listen and learn and be a student of the system" (Senior manager P4, PDoH).

The potential of an embedded health systems approach

Embedding of health systems research requires "linking researchers and decision-makers in a system where the latter understand the value of evidence in informing their decisions and the former are positioned to be able to provide timely and relevant evidence to inform each stage of the policy

process" (WHO 2017, p. 36). Embeddedness is an emerging HPSR concept with varying definitions that holds much potential for KT (Olivier *et al.* 2016). In the Western Cape, *organisational embeddedness* of researchers within the PDoH has been strategically targeted by the HIA and supported by the PHRC. This has led to experienced academic health researchers holding joint appointments between local universities and the PDoH as well as the placement of Public Health Medicine 'registrars' within the department. Organisational embeddedness has been shown to foster collaboration and facilitate the co-creation of health research that is more likely to be taken up into policy (Koon *et al.* 2012; Oliver *et al.* 2014). Additionally, it has placed local health system researchers in better situations to conduct much needed pragmatic trials (Fairall *et al.* 2017). An embedded approach enhances ownership of research by policymakers and develops institutional research capacity that can support the integration of research findings into policy (Ghaffar *et al.* 2017; Vindrola-Padros *et al.* 2017). Moreover, embeddedness is regarded as a useful strategy for addressing the power dynamics prevalent in LMIC health systems (MacGregor and Bloom 2016) and an important aspect of health system strengthening (WHO 2012). In short, increasing embeddedness may hold the answer to bridging the chronic 'know-do gap' and achieving the much-anticipated potential of KT systems in LMICs. Findings in this study suggest that there is much potential for the development of researcher and policy-maker *capacities* for embedded research in the Western Cape, particularly beyond the sub-disciplinary speciality of HPSR where it is currently more commonly practiced. Facilitating greater opportunities for formal and informal interactions between researchers and policymakers will be a key strategy in fostering this embeddedness for enhanced KT in the province.

KT as an ethical imperative

Ethical considerations for KT affect both health researchers and provincial policymakers (MacGregor and Bloom 2016). Policymakers have an ethical responsibility to ensure that their decision-making is informed by the best available evidence in order to achieve intended health outcomes, while

researchers are ethically responsible for ensuring that their research findings reach the intended audiences so that correct action can be taken. Interestingly, a large number of the NHRD studies included KT strategies under the *ethics* section of their protocols indicating some, perhaps indirect, awareness by researchers of the ethical nature of KT.

However, as was also noted in the NHRD review, these KT activities are mostly planned for *after* the main timeframe and budgets of individual projects have been exhausted. This directly impedes the ability of researchers to conduct KT and has been recognised as a persistent challenge (Bennett and Jessani 2011). The 'ethical' issue here highlights the need for good research practice to extend to and include KT activities as an integral part of the research process. If KT activities continue to be tagged on to the end of individual research projects, it is highly likely that the 'know-do' gap in the province will persist.

A second ethical consideration concerns the diverse assortment of KT mechanisms at work in the province. Heterogeneity in the use of KT mechanisms is not uncommon, particularly within the African context (see part B) and reflects opportunities to create targeted KT approaches that meet the diverse needs of local health system and research settings (Lavis *et al.* 2009). However, the outcomes of these mechanisms are unclear, and frequently target multiple audiences. This disperses responsibility around the follow-up of KT and generally leaves it to the researcher's internal 'ethical mindfulness' as to whether follow-up actually occurs (see Molyneux *et al.* 2016).

A final ethical consideration involves the equitable distribution of knowledge production in the Western Cape provincial health system. The process of research distribution was viewed as mostly fair by researchers and policymakers. However, the high density of research in urban versus rural districts shows an extremely inequitable distribution of research generation and focus in the province (see figure

1). Not only does this place an unnecessary research burden on already over-stretched and research-saturated urban health facilities, but it also provides a skewed picture of health system functioning. There is a danger that decisions based on urban-centric health research do not consider the unique challenges of rural settings, nor functioning of the health system as a whole. Given the strategic systems-oriented focus of current provincial policymakers and the strong equity-oriented nature of research and health policy both locally and internationally, a more equitable distribution of research across the province should be an important goal going forward. Challenges to this may be the geographic distribution of research institutions which also tend to be urban-centric (as frequently are their funding requirements). This is likely contributing to inequitable research distributions as researchers seek to conduct their research in the most geographically convenient health facilities. However, if researchers aim to ensure that their research is of greatest social value (Lutge *et al.* 2017) and policymakers continue to seek the good governance of research evidence (Parkhurst 2016), then the equitable distribution of research in the province needs to be addressed. Advocating for the redistribution of research grants that target rural areas should help stimulate the move from urban-centric to more rural research endeavours, while regular mapping of current research projects through the NHRD should foster greater awareness of how research is distributed and if there is progress towards redistribution.

Conclusion

This study focused on the translation of public health research-based knowledge at the provincial level of health policymaking. It forms one part of the picture of KT system functioning in the Western Cape PDoH and aims to contribute towards understandings of local KT mechanisms as they function in this LMIC setting. Recognising that policymaking and KT are dynamic processes that extend beyond the development of policy to implementation and practice, there remains a need for greater understandings of KT as it is experienced by researchers and health system staff at ‘lower-levels’ of the health system.

An ongoing parallel study to this project will investigate these experiences (see Ndlovu 2018) and together these studies will provide a more comprehensive perspective of KT functioning across health system levels.

The study has further attempted to meet the need for increased contextualised research conducted in local health systems. It has demonstrated that context-specificity is critical to understanding KT and the bridging of local 'know-do' gaps. It has also highlighted how different public health disciplines, through KT, vary in their influence on policymakers and therefore on policymaking in the province. However, this study proposes lessons for the Western Cape health system that are also likely to resonate with other LMIC settings, including the need to view KT as an ethical and systems issue as well as the important role of politics and relationships for KT. Recognising that academic impact is not equivalent to achieving social impact (Harris 2015) and that the adoption of new knowledge is not a spontaneous achievement in health policy (Sudsawad 2007), the study calls for greater embeddedness of health and research processes that foster the development of contextually sensitive learning health systems. Empirical studies have consistently shown that health research is best utilised when it is aligned with local needs, embedded in local infrastructure and led by local researchers who are able to help translate results into action (Hasnida *et al.* 2017). This study has demonstrated that when this occurs, the gap between research-based knowledge and policy need not be an intractable problem. As the need for more rapid and effective progress towards health targets continues to challenge health systems worldwide, those who work in and with health systems should endeavour to understand the value and practical implications of an embedded learning systems approach to KT, while also exploring the ethical translation and uptake of knowledge into all levels of LMIC health systems.

References

Badat S. 2010. The challenges of transformation in higher education and training institutions in South Africa. *Development Bank of South Africa*: 1–37.

Barratt H, Shaw J, Simpson L, Bhatia RS, Fulop N. 2017. Health services research: building capacity to meet the needs of the health care system. *Journal of Health Services Research & Policy* **22**: 243–9.

Benatar S, Vaughan C. 2008. Global and local forces shaping the research agenda and the governance of research ethics. *South African Journal of Science* **104**: 439–42.

Bennett G, Jessani N (eds). 2011. *The Knowledge Translation Toolkit: bridging the know-do gap: a resource for researchers*. New Delhi: Sage Publications.

Berman J, Mitambo C, Matanje-Mwagomba B, *et al.* 2015. Building a knowledge translation platform in Malawi to support evidence-informed health policy. *Health Research Policy and Systems* **13**: 73.

Biesma R, Makoa E, Mpemi R, Tsekoa L, Odonkor P, Brugha R. 2012. The implementation of a global fund grant in Lesotho: applying a framework on knowledge absorptive capacity. *Social Science & Medicine* **74**: 381–9.

Bogner A, Littig B, Menz W (eds). 2009. *Interviewing Experts*. London: Palgrave Macmillan UK.

Bosch-Capblanch X, Lavis J, Lewin S, *et al.* 2012. Guidance for evidence-informed policies about health systems: rationale for and challenges of guidance development. *PLoS Medicine* **9**: e1001185.

Brown K, Elliott S, Leatherdale S, Robertson-Wilson J. 2015. Searching for rigour in the reporting of mixed methods population health research : a methodological review. *Health Education Research* **30**: 811–39.

Brownson R, Royer C, Ewing R, McBride T. 2006. Researchers and policymakers: Travelers in parallel universes. *American Journal of Preventive Medicine* **30**: 164–72.

Buse K, Mays N, Walt G. 2012. *Making Health Policy*. Maidenhead: Open University Press.

Caffrey L, Wolfe C, McKevitt C. 2016. Embedding research in health systems: lessons from complexity theory. *Health Research Policy and Systems* **14**: 54.

CIHR (Canadian Institutes of Health Research). 2016. Knowledge translation - definition. Accessed 12 December 2016. Online at http://www.cihr-irsc.gc.ca/e/29418.html#2.

Contandriopoulos D, Lemire M, Denis J-L, Tremblay É. 2010. Knowledge exchange processes in organizations and policy arenas: a narrative systematic review of the literature. *Milbank Quarterly* **88**: 444–83.

Coovadia H, Jewkes R, Barron P, Sanders D, McIntyre D. 2009. The health and health system of South Africa: historical roots of current public health challenges. *The Lancet* **374**: 817–34.

Court J, Young J. 2003. Bridging research and policy: insights from 50 case studies. *ODI Working Paper 213*. London: Overseas Development Institute.

Crane J, Andia Biraro I, Fouad T, Boum Y, Bangsberg D. 2017. The 'indirect costs' of underfunding foreign partners in global health research: a case study. *Global Public Health* **1692**: 1–8.

Datta A. 2012. Deliberation, dialogue and debate: why researchers need to engage with others to address complex issues. *IDS Bulletin* **43**: 9–16.

Davids N, Waghid Y. 2016. #Feesmustfall: history of South African student protests reflects inequality's grip. *Mail and Guardian*. Accessed 5 January 2018. Online at https://mg.co.za/article/2016-10-10-feesmustfall-history-of-south-african-student-protests-reflects-inequalitys-grip.

Delany-Moretlwe S, Stadler J, Mayaud P, Rees H. 2011. Investing in the future: lessons learnt from communicating the results of HSV/ HIV intervention trials in South Africa. *Health Research Policy and Systems* **9**: S8.

Dobbins M, Robeson P, Ciliska D, *et al.* 2009. A description of a knowledge broker role implemented as part of a randomized controlled trial evaluating three knowledge translation strategies. *Implementation Science* **4**: 23.

Echt L. 2017. 'Context matters': a framework to help connect knowledge with policy in government institutions. *London School of Economics Impact Blog*. Accessed 19 December 2017. Online at http://blogs.lse.ac.uk/impactofsocialsciences/2017/12/19/context-matters-a-framework-to-help-connect-knowledge-with-policy-in-government-institutions/.

El-Jardali F, Lavis J, Moat K, Pantoja T, Ataya N. 2014. Capturing lessons learned from evidence-to-policy initiatives

through structured reflection. *Health Research Policy and Systems* **12**: 2.

Engebretsen E, Sandset T, Ødemark J. 2017. Expanding the knowledge translation metaphor. *Health Research Policy and Systems* **15**: 19.

English M, Irimu G, Agweyu A, *et al.* 2016. Building learning health systems to accelerate research and improve outcomes of clinical care in low- and middle-income countries. *PLOS Medicine* **13**: e1001991.

Fairall L, Mahomed O, Bateman E. 2017. Evidence-based decision-making for primary care: the interpretation and role of pragmatic trials. *South African Medical Journal* **107**: 278.

Frizelle K. 2009. A case for intercultural inquiry and cognitive justice in the internationalisation of HIV/AIDS: a South African example. *Journal of Health Management* **11**: 79–91.

Gagliardi A, Berta W, Kothari A, Boyko J, Urquhart R. 2016. Integrated knowledge translation (IKT) in health care: a scoping review. *Implementation Science* **11**: 38.

Gervais M, Marion C, Dagenais C, Chiocchio F, Houlfort N. 2016. Dealing with the complexity of evaluating knowledge transfer strategies: guiding principles for developing valid instruments. *Research Evaluation* **25**: 62–9.

Ghaffar A, Langlois E, Rasanathan K, Peterson S, Adedokun L, Tran N. 2017. Strengthening health systems through embedded research. *Bulletin of the World Health Organization* **95**: 87–87.

Gilson L. 2012. Health Policy and Systems Research - A Methodology Reader. *Alliance for Health Policy and Systems Research*: 18–40.

Gilson L. 2016. Everyday Politics and the Leadership of Health Policy Implementation. *Health Systems & Reform* **2**: 187–93.

Gilson L, Pienaar D, Brady L, *et al.* 2017. Development of the health system in the Western Cape: experiences since 1994. In: Padarath A, Barron P (eds). *South African Health Review 2017*. 20th edn. Durban: Health Systems Trust, 59–70.

Green A, Bennett S. 2007. *Sound Choices: Enhancing Capacity for Evidence-Informed Health Policy*. Geneva: Alliance for Health Policy and Systems Research.

Green J, Thorogood N. 2009. *Qualitative Methods for Health Research*. London: Sage Publications.

Greenhalgh T, Russell J. 2006. Reframing evidence synthesis as rhetorical action in the policy making drama. *Healthcare policy* **1**: 34–42.

Greenhalgh T, Wieringa S. 2011. Is it time to drop the 'knowledge translation' metaphor? A critical literature review. *Journal of the Royal Society of Medicine* **104**: 501–9.

Grimshaw J, Eccles M, Lavis J, Hill S, Squires J. 2012. Knowledge translation of research findings. *Implementation Science* **7**: 50.

Grootes S. 2016. Analysis: DA vs ANC – shattering myths, creating new perceptions. *Daily Maverick*. Accessed 19 November 2017. Online at https://www.dailymaverick.co.za/article/2016-08-15-analysis-da-vs-anc-shattering-myths-creating-new-perceptions/#.Wn2l9qiWbIV

Gugsa F, Karmarkar E, Cheyne A, Yamey G. 2016. Good Reporting of A Mixed Methods Study (GRAMMS): Newspaper coverage of maternal health in Bangladesh, Rwanda and South Africa: a quantitative and qualitative content analysis. *BMJ Open* **6** (Suppl. 1).

Guieu A, Zhang W, Lafort Y, *et al.* 2016. Practical lessons for bringing policy-makers on board in sexual and reproductive health research. *BMC Health Services Research* **16**: 649.

Haby M, Chapman E, Clark R, Barreto J, Reveiz L, Lavis J. 2016. Designing a rapid response program to support evidence-informed decision-making in the Americas region: using the best available evidence and case studies. *Implementation Science* **11**: 117.

Hamel N, Schrecker T. 2011. Unpacking capacity to utilize research: a tale of the Burkina Faso public health association. *Social Science & Medicine* **72**: 31–8.

Harris R. 2015. The impact of research on development policy and practice: this much we know. In: Chib A, *et al.* (eds). *Impact of Information Society Research in the Global South*. Singapore: Springer Singapore, 21–43.

Harvey W. 2011. Strategies for conducting elite interviews. *Qualitative Research* **11**: 431–41.

Hasnida A, Borst R, Johnson A, Rahmani N, van Elsland S, Kok M. 2017. Making health systems research work: time to

shift funding to locally-led research in the South. *The Lancet Global Health* **5**: e22–4.

Haynes A, Derrick G, Redman S, *et al.* 2012. Identifying trustworthy experts: how do policymakers find and assess public health researchers worth consulting or collaborating with? *PLoS ONE* **7**: e32665.

Hegger I, Marks L, Janssen S, Schuit A, Keijsers J, van Oers H. 2015. Research for Policy (R4P): development of a reflection tool for researchers to improve knowledge utilization. *Implementation Science* **11**: 133.

Hochschild J. 2009. Conducting intensive interviews and elite interviews. *Workshop on Interdisciplinary Standards for Systematic Qualitative Research*. Washington: National Science Foundation.

Kasonde J, Campbell S. 2012. Creating a knowledge translation platform: nine lessons from the Zambia forum for health research. *Health Research Policy and Systems* **10**: 31.

Kebede D, Zielinski C, Mbondji P, Piexoto M, Kouvividila W, Lusamba-Dikassa P. 2014. The way forward – narrowing the knowledge gap in sub-Saharan Africa to strengthen health systems. *Journal of the Royal Society of Medicine* **107**: 10–2.

Keita N, Lokossou V, Berthe A, Sombie I, Johnson E, Busia K. 2017. The West African experience in establishing steering committees for better collaboration between researchers and decision-makers to increase the use of health research findings. *Health Research Policy and Systems* **15**: 50.

King L, Hawe P, Wise M. 1998. Making dissemination a two-way process. *Health Promotion International* **13**: 237–44.

Kirigia J, Ota M, Senkubuge F, Wiysonge C, Mayosi B. 2016a. Developing the African national health research systems barometer. *Health Research Policy and Systems* **14**: 53.

Kirigia J, Pannenborg C, Amore L, Ghannem H, IJsselmuiden C, Nabyonga-Orem J. 2016b. Global forum 2015 dialogue on 'From evidence to policy – thinking outside the box': perspectives to improve evidence uptake and good practices in the African Region. *BMC Health Services Research* **16**: 215.

Koch S, Weingart P. 2016. *The Delusion of Knowledge Transfer: The Impact of Foreign Aid Experts on Policy-making in South Africa and Tanzania*. Cape Town: African Minds.

Koon A, Nambiar D, Rao K. 2012. *Embedding of Research into Decision-making Processes*. Geneva: Alliance for Health Policy and Systems Research.

Kothari A, Wathen C. 2013. A critical second look at integrated knowledge translation. *Health Policy* **109**: 187–91.

Kothari A, Wathen C. 2017. Integrated knowledge translation: digging deeper, moving forward. *Journal of Epidemiology and Community Health* **71**: 619–23.

Kothari A, Bickford J, Edwards N, Dobbins M, Meyer M. 2011. Uncovering tacit knowledge: a pilot study to broaden the concept of knowledge in knowledge translation. *BMC Health Services Research* **11**: 198.

Langer L, Tripney J, Gough D. 2016. *The Science of Using Science: Researching the Use of Research Evidence in Decision-Making*. London: EPPI-Centre, University College London.

Langlois E, Becerril Montekio V, Young T, Song K, Alcalde-Rabanal J, Tran N. 2016. Enhancing evidence informed policymaking in complex health systems: lessons from multi-site collaborative approaches. *Health Research Policy and Systems* **14**: 20.

Lavis J, Lomas J, Hamid M, Sewankambo N. 2006. Assessing country-level efforts to link research to action. *Bulletin of the World Health Organization* **84**: 620–8.

Lavis J, Oxman A, Lewin S, Fretheim A. 2009. SUPPORT Tools for evidence-informed health policymaking (STP)1 : What is evidence-informed policymaking? *Health Research Policy and Systems* **7**: 1–7.

Lewin S, Bosch-Capblanch X, Oliver S, *et al.* 2012. Guidance for evidence-informed policies about health systems: Assessing how much confidence to place in the research evidence. *PLoS Med* **9**: 789–94.

Lutge E, Mbatha T. 2007. Strengthening Research Capacity in South Africa: An Audit of Provincial Health Research Committees. Durban: Health Systems Trust.

Lutge E, Slack C, Wassenaar D. 2017. Defining and negotiating the social value of research in public health facilities: perceptions of stakeholders in a research-active province of South Africa. *Bioethics* **31**: 128–35.

MacDonald N, Bortolussi R, Kabakyenga J, *et al.* 2014. MicroResearch: Finding sustainable local health solutions in East Africa through small local research studies. *Journal of Epidemiology and Global Health* **4**: 185–93.

MacGregor H, Bloom G. 2016. Health systems research in a complex and rapidly changing context: ethical implications

of major health systems change at scale. *Developing World Bioethics* **16**: 158–67.

Mayosi B, Dhai A, Folb P, *et al.* 2009. *Consensus Report on Revitalising Clinical Research in South Africa: A Study on Clinical Research and Related Training in South Africa.* Pretoria: Academy of Science of South Africa.

Mayosi B, Lawn J, Van Niekerk A, Bradshaw D, Abdool Karim S, Coovadia H. 2012. Health in South Africa: changes and challenges since 2009. *The Lancet* **380**: 2029–43.

Mijumbi R, Oxman A, Panisset U, Sewankambo N. 2014. Feasibility of a rapid response mechanism to meet policymakers' urgent needs for research evidence about health systems in a low income country: a case study. *Implementation Science* **9**: 114.

Mirzoev T, Omar M, Green A, *et al.* 2012. Research-policy partnerships - experiences of the Mental Health and Poverty Project in Ghana, South Africa, Uganda and Zambia. *Health Research Policy and Systems* **10**: 30.

Moat K, Lavis J. 2013. 10 Best resources for ... evidence-informed health policy making. *Health Policy and Planning* **28**: 215–8.

Moat K, Lavis J, Abelson J. 2013. How contexts and issues influence the use of policy-relevant research syntheses: a critical interpretive synthesis. *Milbank Quarterly* **91**: 604–48.

Molyneux S, Tsofa B, Barasa E, *et al.* 2016. Research involving health providers and managers: ethical issues faced by researchers conducting diverse health policy and systems research in Kenya. *Developing World Bioethics*, **16**(3):168–77.

Morris Z, Wooding S, Grant J. 2011. The answer is 17 years, what is the question: understanding time lags in translational research. *Journal of the Royal Society of Medicine* **104**: 510–20.

Murphy K, Fafard P. 2012. Taking power, politics, and policy problems seriously: the limits of knowledge translation for urban health research. *Journal of Urban Health* **89**: 723–32.

Nabyonga-Orem J, Mijumbi R. 2015. Evidence for informing health policy development in low-income countries (LICs): perspectives of policy actors in Uganda. *International Journal of Health Policy and Management* **4**: 285–93.

Naledi T, London L, Dudley L, Vallabhjee K. 2010. Collaboration to provide Public Health expertise to a provincial health department : the Western Cape story. *Healthcare 2010 Strategy*: 1–5.

Ndlovu L. 2018 (forthcoming). Health care providers' experiences of research activities in public sector health facilities in the Western Cape Province of South Africa. MPH Thesis. Cape Town: University of Cape Town.

NDoH (National Department of Health). 2001. *Health Research Policy in South Africa*. Pretoria: National Department of Health.

NDoH (National Department of Health). 2003. *National Health Act: Act no. 61 of 2003*. Pretoria: National Department of Health.

NDoH (National Department of Health). 2015. *White Paper on National Health Insurance for South Africa: Towards Universal Health Coverage*. Pretoria: National Department of Health.

NDoH (National Department of Health). 2017. *National Public Health Institute of South Africa Bill*. Pretoria: National Department of Health.

O'Cathain A, Murphy E, Nicholl J. 2008. The quality of mixed methods studies in health services research. *Journal of Health Services Research & Policy* **13**: 92–8.

Oliver K, Innvar S, Lorenc T, Woodman J, Thomas J. 2014. A systematic review of barriers to and facilitators of the use of evidence by policymakers. *BMC Health Services Research* **14**: 2.

Olivier J, Scott V, Molosiwa D, Gilson L. 2016. Embedded systems approaches to health policy and systems research. In: de Savigny D, Blanchet K, Taghreed A (eds). *Applied Systems Thinking for Health Systems Research: A Methodological Handbook.* Maidenhead Berkshire: Open University Press.

van Olmen J, Criel B, Van Damme W, *et al.* 2012. Analysing health system dynamics: a framework. *Studies in Health Services Organization & Policy* **28**: 1–117.

Olsen L, Aisner D, McGinnis J. 2007. *The Learning Healthcare System: Workshop Summary (IOM Roundtable on Evidence-Based Medicine).* Washington: National Academies Press.

Ongolo-Zogo P, Lavis J, Tomson G, Sewankambo N. 2014. Initiatives supporting evidence informed health system policymaking in Cameroon and Uganda: a comparative historical case study. *BMC Health Services Research* **14**:

612.

Parkhurst J. 2016. *The politics of evidence: from evidence-based policy to the good governance of evidence*. Abingdon: Routledge.

Pluye P, Hong Q. 2014. Combining the power of stories and the power of numbers: mixed methods research and mixed studies reviews. *Annual Review of Public Health* **35**: 29–45.

Rehfuess E, Durão S, Kyamanywa P, Meerpohl J, Young T, Rohwer A. 2016. An approach for setting evidence-based and stakeholder-informed research priorities in low- and middle-income countries. *Bulletin of the World Health Organization* **94**: 297–305.

Rodríguez D, Hoe C, Dale E, *et al.* 2017. Assessing the capacity of ministries of health to use research in decision-making: conceptual framework and tool. *Health Research Policy and Systems* **15**: 65.

Roman T, Cleary S, Mcintyre D. 2017. Exploring the functioning of decision space : a review of the available health systems literature. *International Journal of Health Policy and Management* **6**: 365-76

de Savigny D, Adam T. (eds). 2009. *Systems Thinking for Health Systems Strengthening*. Alliance for Health Policy and Systems Research. Geneva: WHO.

Senkubuge F, Mayosi B. 2012. The state of the national health research system in South Africa. *South African Health Review*: 141–9.

Shearer J, Dion M, Lavis J. 2014. Exchanging and using research evidence in health policy networks: a statistical network analysis. *Implementation Science* **9**: 126

Sheikh K, Schneider H, Agyepong IA, Lehmann U, Gilson L. 2016. Boundary-spanning: reflections on the practices and principles of Global Health. *BMJ Global Health* **1**: e000058.

Shroff Z, Aulakh B, Gilson L, Agyepong I, El-Jardali F, Ghaffar A. 2015. Incorporating research evidence into decision-making processes: researcher and decision-maker perceptions from five low- and middle-income countries. *Health Research Policy and Systems* **13**: 70.

South African Government. 1996. *Constitution of the Republic of South Africa*. *No. 17678*. Pretoria: National Government of South Africa.

South African Government. 1991. *South African Medical Research Council Act 1991*. *No. 13256.* Pretoria: National Government of South Africa.

Ssengooba F, Atuyambe L, Kiwanuka S, Puvanachandra P, Glass N, Hyder A. 2011. Research translation to inform national health policies: learning from multiple perspectives in Uganda. *BMC International Health and Human Rights* **11**: S13.

Sudsawad P. 2007. *Knowledge Translation: Introduction to Models, Strategies, and Measures*. Austin: Southwest Educational Development Laboratory, National Center for the Dissemination of Disability Research.

Sumner A, Crichton J, Theobald S, Zulu E, Parkhurst J. 2011. What shapes research impact on policy? Understanding research uptake in sexual and reproductive health policy processes in resource poor contexts. *Health Research Policy and Systems* **9**: S3.

Surender R, Van Niekerk R, Hannah B, Allan L, Shung-King M. 2015. The drive for universal healthcare in South Africa: views from private general practitioners. *Health Policy and Planning* **30**: 759–67.

Sutcliffe S, Court J. 2006. *A Toolkit for Progressive Policymakers in Developing Countries*. London: Overseas Development Institute.

Tetroe J, Graham I, Foy R, *et al.* 2008. Health research funding agencies support and promotion of knowledge translation : an international study. *The Milbank Quarterly* **86**: 125–55.

The Lancet. 2008. The Bamako call to action: research for health. *The Lancet* **372**: 1855.

Tricco A, Zarin W, Rios P, Straus S, Langlois E. 2016. Barriers, facilitators, strategies and outcomes to engaging policymakers, healthcare managers and policy analysts in knowledge synthesis: a scoping review protocol. *BMJ Open* **6**: e013929.

Tulloch O, Mayaud P, Adu-Sarkodie Y, *et al.* 2011. Using research to influence sexual and reproductive health practice and implementation in sub-Saharan Africa: a case-study analysis. *Health Research Policy and Systems* **9**: S10.

Uneke C, Ezeoha A, Ndukwe C, *et al.* 2011. Individual and organizational capacity for evidence use in policymaking in Nigeria: an exploratory study of the perceptions of Nigeria health policy makers. *Evidence & Policy* **7**: 251–76.

Uthman O, Wiysonge C, Ota M, *et al.* 2015. Increasing the value of health research in the WHO African region beyond 2015- reflecting on the past, celebrating the present and building the future: a bibliometric analysis. *BMJ Open* **5**: e006340–e006340.

Uzochukwu B, Onwujekwe O, Mbachu C, *et al.* 2016. The challenge of bridging the gap between researchers and policy makers: experiences of a health policy research group in engaging policy makers to support evidence informed policy making in Nigeria. *Globalization and Health* **12**: 67

Vindrola-Padros C, Pape T, Utley M, Fulop N. 2017. The role of embedded research in quality improvement: a narrative review. *BMJ Quality and Safety* **26**: 70–80.

WCDoH (Western Cape Department of Health). 2013. *Healthcare 2030: The Road to Wellness*. Cape Town: Western Cape Department of Health.

WCDoH (Western Cape Department of Health). 2015. *Policy for Approval of Health Research in the Western Cape 2015/16*. Cape Town: Western Cape Department of Health.

WCDoH (Western Cape Department of Health). 2016a. *Annual Report 2015/16*. Cape Town: Western Cape Department of Health.

WCDoH (Western Cape Department of Health). 2016b. *Executive summary of the 2016 Western Cape Provincial Health Research Committee Strategic Planning (Strat Plan) Workshop*. Cape Town: Western Cape Department of Health.

Weiss C. 1979. The many meanings of research. *Public Administration Review* **39**: 426–31.

Weyrauch V, Echt L, Suliman S. 2016. *Starting from context : how to make strategic decisions to promote a better interaction between knowledge and policy*.

WHO (World Health Organisation). 2002. *National Health Research Systems: Report of an International Workshop*. Geneva: World Health Organisation.

WHO (World Health Organisation). 2004a. *World Report on Knowledge for Better Health: Strengthening Health Systems*. Geneva: World Health Organisation.

WHO (World Health Organisation). 2004b. *The Mexico Statement on Health Research*. Geneva: World Health Organisation.

WHO (World Health Organisation). 2007. *Everybody's business: strengthening health systems to improve health outcomes: WHO's framework for action*. Geneva: World Health Organisation.

WHO (World Health Organisation). 2012. *Changing Mindsets: Strategy on Health Policy and Systems Research*. Geneva: World Health Organisation.

WHO (World Health Organisation). 2017. *World report on health policy and systems research*. Geneva: World Health Organisation.

Young J. 2005. Research, policy and practice: why developing countries are different. *Journal of International Development* **17**: 727–34.

Zielinski C, Kebede D, Mbondji P, Sanou I, Kouvividila W, Lusamba-Dikassa P. 2014. Knowledge systems in health in sub-Saharan Africa: results of a questionnaire-based survey. *Journal of the Royal Society of Medicine* **107**: 22–7.

APPENDICES

Appendix 1 Study information sheet

KEY INFORMANT INTERVIEWS: STUDY INFORMATION SHEET

Study title: "*Exploring Knowledge Translation Mechanisms in the Western Cape Provincial Health System*"

Researcher: Amanda Edwards

Principal Investigator: Dr Jill Olivier

Co-supervisor: Dr Virginia Zweigenthal

Introduction

You are formally invited to participate in the above study. This study forms part of a broader research project initiated by the Western Cape's Health Impact Assessment and is aimed at improving research dissemination products and systems so that health research is taken up for implementation in the province.

Purpose of the Study

The purpose of the study is to explore and explain what mechanisms are used by researchers and provincial policymakers for knowledge translation (KT) in the province. Currently, there is a dearth of empirical evidence on the tools and processes used to move research-based knowledge into policy in the Western Cape Provincial Health Department. This lack of information not only contributes to a persisting 'know-do' gap, but also undermines informed action with significant consequences for health outcomes.

Explanation of Procedures

If you agree to participate in this study, I would like to interview you (preferably face-to-face in a location of your choice), with the interview lasting approximately 30-60 minutes. During this interview you will be asked to share your views about how research-based knowledge moves through the provincial health system, what tools are used and if any barriers or facilitators affect the process. I will also ask you to share your opinion on who is important to this process and how it can be improved. Interviews will be audio recorded with your permission for accuracy. Following the interview, I will confirm your responses personally via telephone or email, according to your preference.

Potential Risks and Benefits

This study does not involve any physical or psychological risks and will not cause any personal discomfort or distress. You are also under no obligation to answer questions that make you feel uncomfortable in any way. While there are no immediate tangible benefits to be gained from the study, the results may be of instrumental use to stakeholders on how to improve the translation of research findings into policy in the future.

Confidentiality

Every answer in the interview will be kept strictly anonymous. All statements will be attributed to participants' designation (e.g. researcher/policymaker) and department or institution (e.g. department of health/research institution) to protect anonymity. Data will be stored electronically and password protected. Access to this data will be limited to the primary researcher (myself), principal investigator, co-supervisor and one research colleague working within the same broader study. Due to the small community of researchers and policymakers that are likely to be included in this study, we would ask that you refrain from discussing your participation with colleagues as this may risk your confidentially.

Withdrawing Participation

Your participation is entirely voluntary. You may decline to answer questions and can withdraw from the study at any time without fear or risk of penalty. Should you choose to withdraw, any information you have provided until that point will be removed from the study's records, returned to you or destroyed according to your preference.

Who to Contact for Queries or Concerns

Should you have any concerns or queries about the study, the researcher or your rights as a participant please feel free to contact the relevant party below:

1. **Questions/Concerns about the study**

   Amanda Edwards - Researcher
   Email: edwards.amanda84@gmail.com
   Tel: 076 242 0821

2. **Questions/Concerns about the researcher**

   Dr Jill Olivier - Principal Investigator & Supervisor
   Email: jill.olivier@uct.ac.za
   Tel: 021 406 6489

   Dr Virginia Zweigenthal - Co-Supervisor
   Email: virginia.zweigenthal@uct.ac.za
   Tel: 021 483 9366

3. **Questions/Concerns about your rights as a participant and the ethical approval for the study**

   Prof Marc Blockman
   Human Research Ethics Committee

Faculty of Health Sciences
University of Cape Town
Tel: 021 406 6492

Permission for the Study

Ethical clearance has been obtained from the University of Cape Town's Human Research Ethics Committee (**HREC REF: 476/2017**). The study is also registered on the National Health Research Database and received clearance from the Western Cape Provincial Department of Health (**REF: WC_201708_010**).

Appendix 2 Informed consent form

KEY INFORMANT INTERVIEWS: INFORMED CONSENT FORM

Declaration of Participant

I, _____ (participant's name), hereby declare that I have read and understood the information about the study entitled "***Exploring Knowledge Translation Mechanisms in the Western Cape Provincial Health System***." I have had the opportunity to ask questions about this study and these questions have been answered to my satisfaction. I understand that there will be no immediate risks or benefits to my person during this study and that my participation is entirely voluntary. I understand that I have the freedom to withdraw from the study at any time and will not be disadvantaged for doing so. I voluntarily give consent for the following:

	(Please initial)
1. Consent to participate in the study interview process	__Yes __No
2. Consent for interviews to be audio recorded	__Yes __No
3. Consent to be contacted with the results for clarification	__Yes __No

_____ _____ _____

Name of Participant Signature Date

Declaration of Researcher

I, Amanda Edwards (researcher's name), hereby declare that I have provided the participant with an opportunity to ask questions and answered these questions honestly and to the best of my ability. I confirm that the participant has provided consent freely and of their own volition without coercion from the researcher. I confirm that a signed copy of this consent form has been provided to the participant.

Name of Researcher	Signature	Date

Appendix 3 Key informant interviews topic guide

Interview Number: _____ **Date:_____**

Introduction*

Hello, my name is Amanda Edwards from the Health Policy and Systems Division at the University of Cape Town's School of Public Health. Thank you for taking the time to meet with me (and my colleague).

On behalf of the Western Cape Provincial Health Department: Health Impact Assessment, I am conducting a study on the knowledge translation mechanisms at work in the province. This study seeks to understand what mechanisms (i.e. tools, processes and strategies) are employed by researchers and policymakers when translating research-based knowledge into policy. We also want to explore how and why research-based evidence is used or not used and what factors may foster increased use in the future.

The following interview should last between 30 minutes to one hour. However, should you need to terminate the interview sooner, you are free to do so. Please feel free to talk openly and honestly and let me know if there are any issues that you do not want to discuss. I will be attributing your statements to your designation and type of institution (e.g. policymaker, provincial DoH or senior researcher, research institution name) and your confidentiality will remain a priority at all times. You can also let me know if there is another way you would prefer me to cite your statements in the writing up of the results.

Please let me know if you have any questions. Once those are addressed we can get started.

*Introduction adapted from the interview guide employed by Koon et al. (2012).

A. Socio-demographic Information

Could you tell me the following information?

1. Designation:_____

   (researcher/policymaker/other)

2. Department/Institution:_____
3. No. of years in current position:_____
4. No. of years in health sector:_____

B. Role of Evidence in Health Policymaking

1. In your opinion, does evidence/research-based knowledge play a role in policy decision-making in the provincial health department?

   Prompts:

   - Why is this the case?
   - Has it always been like this?
   - Any recent changes?

2. Give an example of a MAJOR health policy implemented in the last 5 years.

   Prompts:

   - Who was involved/consulted?
   - What were the processes of deliberation?
   - What was the decision (services offered, new initiatives, legislation)?
   - Were there any linkages to ongoing or prior research, including local research? If yes, describe. If not, why do you think not?

3. In your opinion, what has increased the chances of research and evidence being used in the policymaking process? Please think of the aforementioned example.

   Prompts:

   - Type of research or evidence available?
   - Relationships between researchers and policymakers?
   - Specific areas of capacity/expertise/kinds of evidence?
   - Reputation of organisations or individuals?
   - Role of legislation/politics?
   - External influences (international, cultural, economic factors)?
   - Other?

4. Which of the following categories of research do you provide or receive most information about: clinical, epidemiological, health systems and policy, health services?

   Prompts:

   - Why do you think this is the case?
   - In what format or mode do you provide or receive this information?
   - To whom do you provide or receive this information?
   - What format or mode do prefer this information to take?

5. In your opinion, what are the constraints for policy makers to translate research into policy?

   Prompts:

   - Buy-in of clinicians/Lack of trained staff/Out of synch with national guidelines/Intervention prohibitively expensive/Restructuring very difficult/Not on list of priority conditions

6. What would enable this to be more easily translated into policy and practice?

C. Links between Actors

1. What are the relationships between the institutions that produce evidence and the provincial health department? Between researchers and decision-makers? Other actors involved?

2. In your experience, when evidence is required by the provincial health department, how is it sourced?

   Prompts:

   - Role of interpersonal networks?
   - Role of institutional networks?
   - Role of informational networks? (portals/public information)
   - Other sources? (E.g. Provincial Clinical Governance Committees)

D. Additional Qualitative Information about Knowledge Translation Processes

1. What do you perceive as potential barriers to the translation of research-based knowledge into policy?

   Prompts:

   - In general
   - In the Western Cape health system
   - Can you give an example of a situation when these obstacles influenced you directly?

2. What do you perceive as potential enabling factors to the translation of research-based knowledge into policy?

   Prompts:

   - In general
   - In the Western Cape health system
   - Can you give an example of a situation when these factors influenced you directly?

3. In your experience, can you identify any knowledge champions or knowledge brokers in the province who you think have supported the translation of research into policy in the last five years?

   a. If yes, who and why?

4. Do you have any recommendations for improving research uptake by policymakers in the province?

E. Conclusion of the Interview

1. Is there anything else you would like to add that I have not asked about regarding the topic we have been discussing?

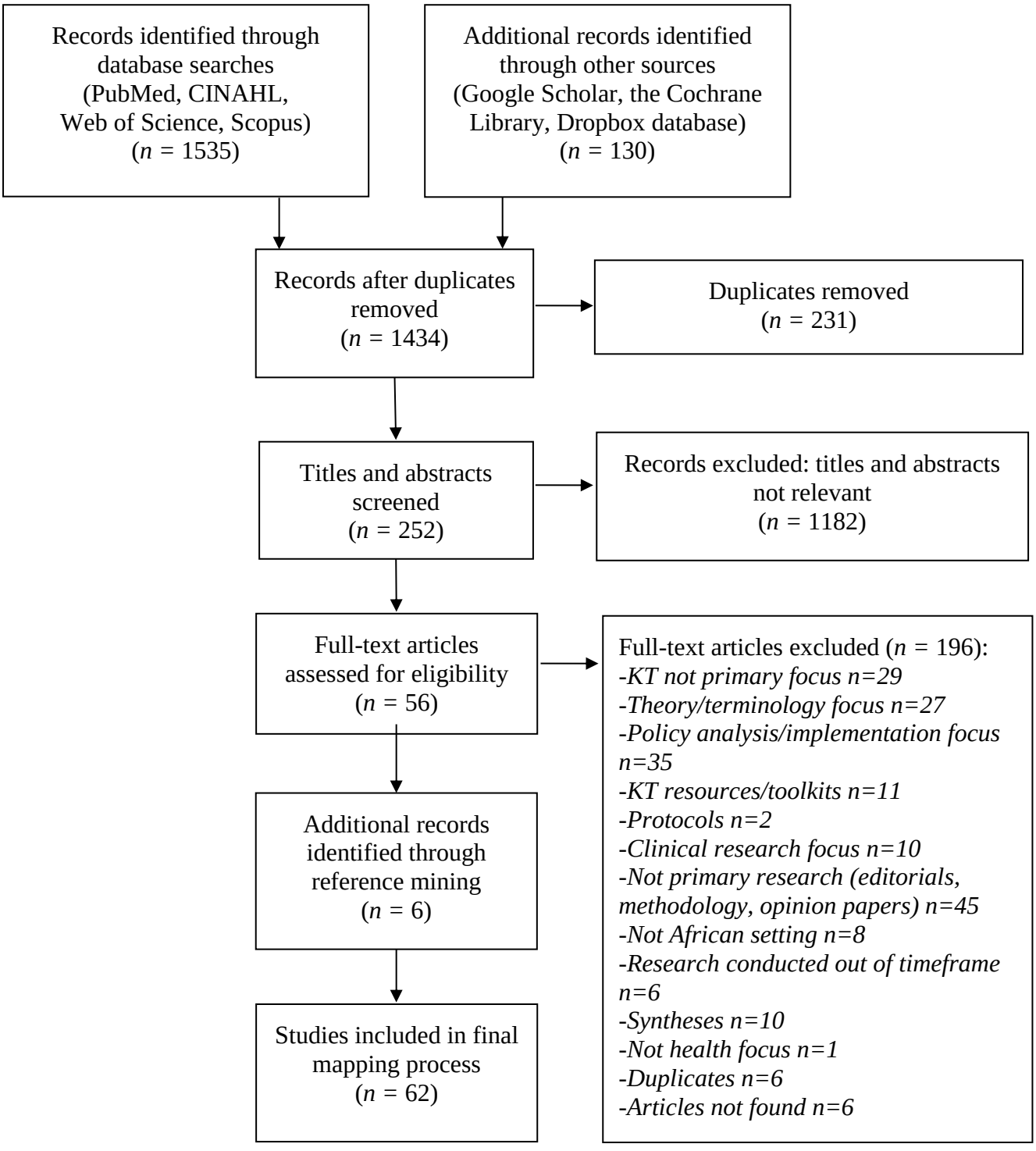
Those are all my questions for now. Thank you so much for taking the time to share your experiences. In case we have any clarifications regarding what you have shared with us, would it be alright to contact you again telephonically or in person depending on your convenience?

Y / N

Appendix 4 List of databases, final search strategies and key terms

PUBMED	**CINAHL (via EBSCOhost)** **Web of Science** **Scopus** **Cochrane Library**
knowledge translation OR knowledge transfer OR knowledge exchange OR research utilization OR research utilisation OR implementation OR dissemination OR diffusion OR evidence-based decision making OR Translational Medical Research AND Policy Making OR Health Policy OR policy makers OR policy making OR health policy OR health researchers AND Africa OR African OR Algeria OR Angola OR Benin OR Botswana OR Burkina Faso OR Burundi OR Cameroon OR Canary Islands OR Cape Verde OR Central African Republic OR Chad OR Comoros OR Congo OR Democratic Republic of Congo OR Djibouti OR Egypt OR Eritrea OR Ethiopia OR Gabon OR Gambia OR Ghana OR Guinea OR Ivory Coast OR Cote d'Ivoire OR Jamahiriya OR Kenya OR Lesotho OR Liberia OR Libya OR Madagascar OR Malawi OR Mali OR Mauritania OR Mauritius OR Mayotte OR Morocco OR Mozambique OR Namibia OR Niger OR Nigeria OR Principe OR Reunion OR Rwanda OR Sao Tome OR Senegal OR Seychelles OR Sierra Leone OR Somalia OR St Helena OR Sudan OR Swaziland OR Tanzania OR Togo OR Tunisia OR Uganda OR Western Sahara OR Zaire OR Zambia OR Zimbabwe	“knowledge translation” OR “knowledge transfer” OR “knowledge exchange” OR “research utilization” OR “research utilisation” OR implementation OR dissemination OR diffusion OR “evidence-based decision making” OR “Translational Medical Research” AND “Policy Making” OR “Health Policy” OR “policy makers” OR “policy making” OR “health policy” OR “health researchers” AND Africa OR African OR Algeria OR Angola OR Benin OR Botswana OR Burkina Faso OR Burundi OR Cameroon OR “Canary Islands” OR “Cape Verde” OR “Central African Republic” OR Chad OR Comoros OR Congo OR “Democratic Republic of Congo” OR Djibouti OR Egypt OR Eritrea OR Ethiopia OR Gabon OR Gambia OR Ghana OR Guinea OR “Ivory Coast” OR “Cote d'Ivoire” OR Jamahiriya OR Kenya OR Lesotho OR Liberia OR Libya OR Madagascar OR Malawi OR Mali OR Mauritania OR Mauritius OR Mayotte OR Morocco OR Mozambique OR Namibia OR Niger OR Nigeria OR Principe OR Reunion OR Rwanda OR “Sao Tome” OR Senegal OR Seychelles OR “Sierra Leone” OR Somalia OR “St Helena” OR Sudan OR Swaziland OR Tanzania OR Togo OR Tunisia OR Uganda OR “Western Sahara” OR Zaire OR Zambia OR Zimbabwe

Appendix 5 Study flow diagram (Source: adapted from Moher (2009))



Appendix 6 Characteristics of KT interventions (all studies)

Study	Country	Underlying Theory	KT Type	KT Mechanisms	Participants	Personnel	Reported Contextual Factors
Aaserud *et al.* 2005	Multinational - Rwanda, South Africa	NR	Integrated Efforts	Small group discussions Plenary discussions Journal article publication Mass media campaigns	Health authorities (local, national, global), professional organisations, civil society, drug licencing agency, pharmaceutical industry, mass media, influential professionals	NR	NR
Albert *et al.* 2007	Mali	Giorgi's phenomenological approach	Push Efforts	Reports	National policymakers	NR	As a "verbal society" many policy-makers prefer verbal reports to documentation.
Ashford *et al.* 2006	Kenya	Interactive model	Integrated Efforts	District seminars Region-specific presentations District fact sheets Press alerts/Media release Collaborative regional planning seminars to develop district-level work plans Multidisciplinary working groups	District medical health officers, nurses, health educators, NGO representatives, private physicians, hospital representatives, and personnel from the two government ministries (health and planning)	Officials from Ministry of Health & Ministry of Planning	Kenyan government's new decentralized programme-reform initiative.
Avan *et al.* 2016	Multinational - Ethiopia, Nigeria	TELOS framework	Push Efforts	District data-sharing platform Coordinating & synthesizing local programme health data	State and district level administrators, NGO representatives, primary and secondary care clinical staff	NR	Culture of democratic governance, decentralization, public–private partnerships.
Ayah *et al.* 2014	Multinational - Uganda, DRC, Tanzania, Kenya, Rwanda, Ethiopia	NR	Push Efforts	Dissemination at scientific conferences and workshops	Academic researchers	NR	Limited press freedom in some countries.
Beesley *et al.* 2011	South Sudan	Walt and Gilson policy analysis triangle	Push Efforts	Consultative workshop	NGO and Ministry of Health workers	National Ministry of Health staff	Post-conflict environment (poor quality of care, inefficiency, heterogeneous standards, low and uneven coverage stood out as the defining features of a fragmented health space). Detailed description according to framework.
Behague *et al.* 2009	Multinational - Burkina Faso, Ghana, Malawi	Network theory	Exchange Efforts	Multi-institutional consortium	Opinion leaders, policymakers, researchers, health administrators, clinicians	NR	Political contexts promote uniformity of methodology and policy approaches. Donor Priorities and distribution of limited resources shape interpretation of research findings.
Bennett *et al.* 2012	Multinational - Ghana, South Africa, Uganda	NR	Integrated Efforts	Research reports and publications (indirect) Verbal briefings Policy briefs Conducting policy-relevant research and analysis Providing policy advice and technical assistance in policy formulation and evaluation Conducting policy dialogues at national level	Policymakers, donors, NGO	Members of research institutes	NR

Study	Country	Underlying Theory	KT Type	KT Mechanisms	Participants	Personnel	Reported Contextual Factors
Beran *et al.* 2015	Multinational - Mali, Mozambique, Zambia	NR	Push Efforts	Rapid assessment tool Reports Publications	National policymakers, researchers	NR	NR
Berman *et al.* 2015	Malawi	NR	Integrated Efforts	Stakeholder mapping exercise Initial capacity building workshops Evidence briefs Structured deliberative dialogues Formation of multidisciplinary steering committee Structured prioritization process Meetings with Communities of Practice	National-level policymakers, researchers and implementers	Researchers and policymakers	NR
Blau *et al.* 2012	Cote d'Ivoire	NR	Pull Efforts	Technical advisory group Meetings with national health authorities and partners Development of concept paper National workshop Appointed committee Annual consultations	National experts, Ministry of Health representatives, partner representatives	NR	Detailed demographics and disease profile, national vaccine schedules, coverage rates over time, current health system issues, national training capacity (universities), socio-political context.
Cole *et al.* 2016	Malawi	NR	Push Efforts	National and institutional meetings Sponsoring attendance at conferences Close relationships with individuals in the print media Sponsorship of an issue of the Malawi Medical Journal Meetings of special interest groups Interactive website National and international conference presentations Publication in international journals	International funders, national research users, researchers, consultants	NR	Research system development over time, key actors, health system history and development, socio-political history.
Dagenais *et al.* 2013	Burkina Faso	NR	Push Efforts	Policy briefs District/regional workshops Scientific communication/publications Theatre forums Cultural workshops Advocacy publications Press conference	NGO, policymakers, technical partners, civil society, lay health workers	NR	NR
Dagenais *et al.* 2015	Burkina Faso	Grounded theory, Logic model developed for KB process	Integrated Efforts	Participatory planning workshops Collaborative training workshops Intensive KB recruitment and training	Canadian and African researchers, a knowledge broker, health practitioners, and policymakers	NR	French speaking nation, primary disease burden, centralised decision-making, high level of donor aid.
Daniels and Lewin 2008	South Africa	Kingdon's policy agenda setting; Influencers of the policy process (political science framework)	Exchange Efforts	Policy networks	Policymakers, academic clinicians	NR	Democratic change, health system reform, policy context equals a window of opportunity, burden of problem/disease.

Study	Country	Underlying Theory	KT Type	KT Mechanisms	Participants	Personnel	Reported Contextual Factors
Daniels and Lewin 2011	South Africa	NR	Exchange Efforts	Professional networks and links Meetings Personal contact Advocacy Local conferences	Local researchers and policymakers	NR	Detailed local and international context description of medical advancements in the field, political changes over time in South Africa.
de Carvalho *et al.* 2015	Ghana	WHO KT framework on ageing and health	Integrated Efforts	Joint priority setting Local evidence collection Policy Dialogue Policy briefs Presentations	Representatives from Ghana health service, teaching hospitals, professional bodies, WHO, HelpAge Ghana	Ghana Health Service, WHO	Well-structured health system, adaptable to meet needs of ageing population; policy in place and favourable political environment; good local data; epidemiological transition.
Delany-Moretlwe *et al.* 2011	South Africa	NR	Exchange Efforts	Building credibility through linkages - Community advisory boards, community consultation workshop, monthly meetings Multiple means of communication - drama, music, radio and community events SMS Face-to-face meetings, telephonically, email (especially with policymakers) Interdisciplinary workshops	Researchers	NR	Misunderstandings, mistrust between researchers, policymakers and society; disease profile, health system and political context of SA.
El-Jardali *et al.* 2014	Multinational - Nigeria, Burkina Faso, Cameroon, Central African Republic, Ethiopia, Uganda, Sudan, Zambia	Linking research to action framework	Integrated Efforts	Knowledge translation platforms (KTPs) - Deliberative dialogues informed by evidence briefs - Capacity building workshops - Rapid response services - Online clearinghouses - Assess and enhance the capacity of research users	Policymakers, stakeholders and KTP leaders	NR	NR
Fiankor and Akussah 2012	Ghana	NR	Pull Efforts	Media (newspapers, radio, TV) Meetings Conferences Seminars Workshops Government publications Reports Published and unpublished materials Other (personal contacts, conversation, gossip and advice)	Assembly policymakers	NR	Local government system.
Guieu *et al.* 2016	Multinational - Kenya, Mozambique, South Africa, Burkina Faso, Malawi	NR	Exchange Efforts	A "work package" of translation activities, including strong involvement of stakeholders through: - Inviting policymakers to open meetings - Key-informant interviews with policymakers - Workshops with policymakers - Fora for policymaker feedback on research projects - Policy advisory boards at each site - Stakeholder workshops	Researchers	NR	Importance of context noted, but not described; LMIC setting - resource constrained.

Study	Country	Underlying Theory	KT Type	KT Mechanisms	Participants	Personnel	Reported Contextual Factors
				- Policy recommendations in format adapted to policymaker needs			
Hawkes *et al.* 2016	Multinational - Gambia, Nigeria	Department of International Development capacity framework- individual, organizational, institutional levels	Integrated Efforts	Pre-intervention situation analysis Access to research through infrastructure and online platforms Regular meetings Training workshops with policymakers and managers Training health journalists Biannual policy retreats Established a Health Policy-Research Committee	Researchers, policymakers, managers	NR	Cross country variations noted, but not explicit; importance of political context noted.
Hennink and Stephenson 2005	Multinational - Malawi, Tanzania	Models of research utilization - rational, incremental and political models	Push Efforts	Workshops Research report distributed Academic channels (journals, conference presentations)	Health researchers, policymakers, and practitioners	NR	NR
Hunsmann 2012	Tanzania	Grounded theory approach; Political economy perspective	None	NR	Health officials, donor representatives, academic researchers, NGO consultants	NR	Strongly heteronomous and most implementing organisations heavily depend on international funding.
Hutchinson *et al.* 2011	Multinational - Malawi, Uganda, Zambia	ODI framework - context, evidence, links	None	Dissemination Advocacy	NR	NR	Political and economic context influenced interpretation of results.
Hyder *et al.* 2011	Multinational - Malawi, Egypt	NR	None	NR	National-level policymakers	NR	Political context factors: legislative processes, parliamentary machinery and budgetary policies, electoral impact.
Keita *et al.* 2017	Multinational - Burkina Faso, Nigeria, Senegal and Sierra Leone	'Doing by learning' approach	Exchange Efforts	Steering committees Formal meetings Regular telephone and email exchanges	Researchers, stakeholders, decision-makers	NR	Country specific factors alluded to, but not explicit.
Kok *et al.* 2016	Ghana	Actor-scenario perspective	Exchange Efforts	Discussions Knowledge brokers ("user-investigator") Research reports Memo Discussion forum Working groups	Researchers, policymakers	NR	NR
Koon *et al.* 2012	Multinational - Nigeria, Cameroon	WHO building blocks; Conceptual framework of institutional embeddedness	Integrated Efforts	Institutional embeddedness	High-ranking researchers, national policymakers	NR	Country specific noted, but not explicit.

Study	Country	Underlying Theory	KT Type	KT Mechanisms	Participants	Personnel	Reported Contextual Factors
Kwamie and Nabyonga-Orem 2016	Multinational - Guinea, Chad	Realist framework: context-mechanism-outcome	Exchange Efforts	Policy dialogue	Policymakers, civil society, development partners	NR	Socio-political factors, maternal and under-five mortality rates, hierarchical health system organisation.
Lairumbi *et al.* 2008	Kenya	NR	Push Efforts	Publication in journals Presentation in workshops/ seminars/conferences Presentation of brief reports Project steering committees involving policymakers Teaching at universities	Policymakers, policy implementers, researchers, health advisors	NR	Health system context, organisational arrangements.
Langlois *et al.* 2016	Multinational - South Africa, Cameroon	NR	Integrated Efforts	Baseline situational analysis Capacity building workshops Subsequent meetings and dialogues Online sharing platform ("Ezcollab") Systematic reviews	Subnational policymakers	Health field experts (KT buddy)	Level of government centralization.
Lavis *et al.* 2010	Multinational - Ghana, Tanzania, Senegal	NR	Integrated Efforts	Systematic reviews Access to a searchable database of research products Long-term partnerships	Researchers	NR	NR
Mbonye and Magnussen 2013	Uganda	NR	Exchange Efforts	Workshops Presentations	Midlevel policymakers, researchers, media	NR	Country's high Burden of Disease (BoD), decentralised health system organisation.
Mc Sween-Cadieux *et al.* 2017	Burkina Faso	NR	Push Efforts	Workshops Policy briefs Local knowledge broker	Researchers, policymakers, programme managers, NGOs, health professionals, civil society organisations	Researchers	Malaria policy history.
Mijumbi *et al.* 2014	Uganda	NR	Pull Efforts	Question clarification Research synthesis Written evidence brief	Policymakers and stakeholders, including technical support staff, health managers, advocacy personnel, development partners	NR	NR
Mirzoev *et al.* 2012	Multinational - Ghana, South Africa, Uganda, Zambia	Conceptual framework - study specific	Exchange Efforts	Research-policy partnerships	Ministries of Health and research organisations	NR	Detailed: healthcare expenditure, form of health system decentralisation, mental health worker distribution, status of current mental health policy.
Moat *et al.* 2014	Multinational - Burkina Faso, Cameroon, Ethiopia, Nigeria, Uganda, Zambia	Theory of planned behaviour	Integrated Efforts	Evidence briefs Deliberative dialogues	Policymakers, stakeholders, researchers	NR	Role of political context noted, but not specific.

Study	Country	Underlying Theory	KT Type	KT Mechanisms	Participants	Personnel	Reported Contextual Factors
Mwendera *et al.* 2016	Malawi	Conceptual framework based on Ottawa Model of Research Use (OMRU)	Exchange Efforts	Knowledge translation platforms Technical working groups Systematic reviews Policy briefs Teaching evidence-based healthcare Annual research dissemination conferences	Researchers, policymakers, programme managers and key stakeholders	NR	National Malaria policy and BoD.
Nabudere *et al.* 2013	Uganda	SUPPORT Tools framework	Exchange Efforts	Policy brief Stakeholder dialogue meetings	Policymakers, researchers	NR	Maternal health statistics, health service delivery.
Nabyonga-Orem *et al.* 2014a	Uganda	Middle range theory (MRT), policy development framework	Integrated Efforts	Media - newspaper reports Partnership forums, including: - Malaria Case Management Technical Working Group (MCMWG) - The Interagency Coordination Committee for Malaria - The national stakeholder forum	Researchers, policymakers, civil society, service providers, media	NR	Malaria treatment history in region, previous policy timeline.
Nabyonga-Orem *et al.* 2014b	Uganda	Middle range theory (MRT)	None	Dissemination tools: Summary reports Policy briefs Once-off KT task force	Donors, policymakers, researchers, civil society, journalist, private service provider	NR	Polarisation of stakeholders on issue, detailed timeline of political events.
Naude *et al.* 2015	Multinational-South Africa, Cameroon	Consolidated Framework for Implementation Research (CFIR)	Exchange Efforts	NA	Subnational policymakers (provincial and regional)	NR	Constitutional democracies, country statistics.
Oliver and Dickson 2016	Multinational – African region	Overlapping social worlds - conceptual framework	Push Efforts	Systematic reviews	Policymakers, systematic reviewers	NR	NR
Ongolo-Zogo *et al.* 2014	Multinational - Cameroon, Uganda	Combined frameworks of knowledge brokerage and the integrated model for knowledge translation	Integrated Efforts	Knowledge translation platforms Evidence briefs Policy dialogues Rapid evidence syntheses Online clearinghouse Capacity building workshops Advocacy meetings Presentations Stakeholder and research mapping Priority setting exercises Grant applications	Policymakers, researchers and other stakeholders	NR	Health system, political, social and economic context in each country, MDG indicators, historical account.
Onwujekwe *et al.* 2015	Nigeria	Conceptual framework for assessing the role of evidence in policy development	Integrated Efforts	Reports Publications Expert consultation meetings International documents	Policymakers, researchers, civil society, professional groups, development partners, health workers	NR	Detailed socio-political, health system context for each policy case.

Study	Country	Underlying Theory	KT Type	KT Mechanisms	Participants	Personnel	Reported Contextual Factors
Pittman 2006	Multinational - South Africa	NR	Push Efforts	Crafting and selecting messengers in accordance with audience's concerns. Delaying publication until interactions with policy makers had occurred. Monitoring public opinion. Ideas relating to the style and content of government- sponsored commission reports.	Researchers and policymakers	NR	Democratic changes, allegations of corruption, AIDS denialism, public outcry, confrontational environment and political controversy.
Rehfuess *et al.* 2016	Multinational- Burundi, Ethiopia, Malawi, Rwanda, South Africa, Uganda	NR	Exchange Efforts	Structured participatory approach: - Online survey of policymakers and partners (gathering relevant information) - Iterative face-to-face consultations through conferences, discussions - Identify gaps in evidence base through evidence maps - Joint protocol development through cross-national research teams	Researchers, high level policymakers	NR	NR
Rispel and Doherty 2011	South Africa	NR	Integrated Efforts	University-based research unit involved in: - Meetings - Workshops - Research reports - Journal articles - Conference participation - Policy briefs - Facilitating stakeholder engagement - Media engagement (least amount)	Researchers, policymakers, Centre for Health Policy stakeholders	NR	Socio-political history of South Africa, health care reform.
Rodríguez *et al.* 2015	Multinational- Niger, Kenya and Mozambique	Carol Weiss' models of research utilization; Walt and Gilson policy triangle	Push Efforts	Regional meetings Scientific journal series in Lancet Evaluation reports Knowledge brokers	National policymakers, donors, researchers, civil society	NR	Country specific - disease burden, health service distribution.
Rosenbaum *et al.* 2011	Multinational- South Africa, Uganda	NR	Push Efforts	Evidence summaries of systematic reviews	Policymakers	NR	NR
Shearer *et al.* 2014	Burkina Faso	Social networking analysis	Exchange Efforts	Interpersonal relationships	Policy actors	NR	Political, health system organisation.
Shroff *et al.* 2015	Multinational- Cameroon, Nigeria, Zambia	Jacobson et al. KT framework	Integrated Efforts	Policy briefs Policy dialogue Formal research to action group (Zambia) & Health Policy Advisory Committee (Nigeria) Researcher directory Training workshops Online clearinghouse of policy briefs & relevant academic literature Radio programmes (Nigeria)	National policymakers, researchers	NR	Commented on influence of context, but not explicit.
Ssengooba *et al.* 2011	Uganda	Multiple KT frameworks	Integrated Efforts	Decision-making fora (e.g. national advisory committees) Policy briefings Mass media	Researchers, policymakers, media practitioners	NR	BoD, health system design, MDG progress, local research environment.

Study	Country	Underlying Theory	KT Type	KT Mechanisms	Participants	Personnel	Reported Contextual Factors
Stewart *et al.* 2005	Multinational- Zambia, Zimbabwe, South Africa, Tanzania, Swaziland, Lesotho and Mozambique	NR	Exchange Efforts	Mixed and participatory residential training workshops in accessing and appraising research Creation of informal networks	Policymakers, practitioners, researchers	Four researchers	Political and economic factors.
Uneke *et al.* 2015a	Nigeria	NR	Integrated Efforts	Training workshops Mentoring Policy briefs	Health policymakers	NR	Burden of disease.
Uneke *et al.* 2012	Nigeria	NR	Exchange Efforts	Training workshop	Researchers, policymakers, health stakeholders	NR	NR
Uneke *et al.* 2015b	Nigeria	Implementation research framework	Integrated Efforts	Knowledge translation platform: - Capacity building training workshops and university short courses - Mentorships - Policy briefs - Multi-stakeholder policy dialogue	Policymakers, researchers	NR	History of platform development.
Uzochukwu *et al.* 2016	Nigeria	NR	Exchange Efforts	Researcher-policymaker engagement via 4 strategies: 1. Policymakers and stakeholders seeking evidence from researchers 2. Involving stakeholders in designing objectives of a research and throughout the research period 3. Facilitating policymaker research	Researchers and policymakers	NR	Influence of political context noted, but not specific.
Vargas *et al.* 2016	Multinational - Ghana, Malawi, Mozambique	Instrumental, conceptual, symbolic use framework	Push Efforts	Executive summaries Policy briefs Bulletins Web pages Scientific papers	Policymakers and program managers	NR	Country specific - organisations for evidence-based health policy described only.
Woelk *et al.* 2009	Multinational - Mozambique, South Africa, Zimbabwe	NR	Integrated Efforts	Lobby groups Champions Research and policy networks	Health officials, policymakers, researchers, donors	NR	Noted importance of specific political and economic contextual factors.
Zachariah *et al.* 2014	Multinational- Kenya	NR	Push Efforts	Training workshops	Public health practitioners	NR	NR

Appendix 7 Documents for Review

Document Type	Document Name	Author	Year
Relevant Policies & Legislation	1. Health Research Policy in South Africa (2001)	NDoH	2001
	2. National Health Act (2003)	NDoH	2003
	3. Policy for Approval of Health Research in the Western Cape (2015/16)	WCDoH	2015
	4. Healthcare 2030: The Road to Wellness	WCDoH	2013
	5. National Health Insurance for South Africa: Towards Universal Health Coverage	NDoH	2015
	6. National Public Health Institute of South Africa Bill	NDoH	2017
Provincial DoH Documents	7. Executive summary of the 2016 Western Cape Provincial Health Research Committee Strategic Planning (Strat Plan) Workshop	PHRC	2016
	8. Annual Report 2015/16	WCDoH	2016
Published literature	9. Strengthening Research Capacity in South Africa: An Audit of Provincial Health Research Committees	Lutge & Mbatha	2007
	10. The State of the National Health Research System in South Africa	Senkubuge & Mayosi	2012
	11. Consensus report on revitalizing clinical research in South Africa: A study on clinical research and related training in South Africa	Mayosi et al.	2009
	12. Collaboration to provide Public Health expertise to a provincial health department: The Western Cape story	Naledi et al.	2010
	13. South African Health Review 2017 (20th Edition)	Padarath & Barron (editors)	2017
Miscellaneous	14. Annual Provincial Health Research Day 2016 & 2017 (Programmes, observational notes & research newsletter)	PHRC	2016, 2017
	15. Western Cape Provincial Health Research Committee Meeting Agenda and Minutes (25 August & 22 September 2017)	PHRC	2017
	16. Northern Tygerberg Substructure Research Day 2017: Improving Clinical Governance (Agenda and observational notes)	NTSS	2017
	17. Primary Care Research: 2016 Brochure	Stellenbosch University	2017

Appendix 8 Ethical clearance letter

UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee

Room E53-46 Old Main Building
Groote Schuur Hospital
Observatory 7925
Telephone [021] 406 6626
Email: shuretta.thomas@uct.ac.za
Website: www.health.uct.ac.za/fhs/research/humanethics/forms

14 August 2017

HREC REF: 476/2017

Dr Jill Olivier
Public Health & Family Medicine
Falmouth Building

Dear Dr Olivier

PROJECT TITLE: EXPLORING KNOWLEDGE TRANSLATION MECHANISMS IN THE WESTERN CAPE PROVINCIAL HEALTH SYSTEM (MASTERS CANDIDATE - MS A EDWARDS)

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

Approval is granted for one year until the 30 August 2018.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.
(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

Please quote the HREC REF in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval before the research may occur.

The HREC acknowledge that the student, Amanda Edwards will also be involved in this study.

Yours sincerely

PROFESSOR M BLOCKMAN
CHAIRPERSON, FHS HUMAN RESEARCH ETHICS COMMITTEE
Federal Wide Assurance Number: FWA00001637.
Institutional Review Board (IRB) number: IRB00001938
This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical

Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Convention on Harmonisation Good Clinical Practice (ICH GCP), South African Good Clinical Practice Guidelines (DoH 2006), based on the Association of the British Pharmaceutical Industry Guidelines (ABPI),and Declaration of Helsinki (2013) guidelines.
The Human Research Ethics Committee granting this approval is in compliance with the ICH Harmonised Tripartite Guidelines E6: Note for Guidance on Good Clinical Practice (CPMP/ICH/135/95) and FDA Code Federal Regulation Part 50, 56 and 312.

Appendix 9 Provincial Department of Health clearance letter

Western Cape Government
Health

STRATEGY & HEALTH SUPPORT
Health.Research@westerncape.gov.za
tel: +27 21 483 6857: fax: +27 21 483 9895
5th Floor, Norton Rose House,, 8 Riebeek Street, Cape Town, 8001
www.capegateway.gov.za)

REFERENCE: WC_201708_010
ENQUIRIES: Ms Charlene Roderick

University of Cape Town

Anzio Road

Observatory

Cape Town

7925

For attention: Mrs Amanda Edwards, Dr Virginia Zweigenthal

Re: **Exploring Knowledge Translation Mechanisms In The Western Cape Provincial Health System.**

Thank you for submitting your proposal to undertake the above-mentioned study. We are pleased to inform you that the department has granted you approval for your research.

Please contact following people to assist you with any further enquiries in accessing the following sites:

National Health Research Database	**Ms Charlene Roderick**	**021 483 6857**

Kindly ensure that the following are adhered to:

1. Arrangements can be made with managers, providing that normal activities at requested facilities are not interrupted.
2. Researchers, in accessing provincial health facilities, are expressing consent to provide the department with an electronic copy of the final feedback (**annexure 9**) within six months of completion of research. This can be submitted to the provincial Research Co-ordinator (Health.Research@westerncape.gov.za).
3. In the event where the research project goes beyond the *estimated completion* date which was submitted, researchers are expected to complete and submit a progress report

(**Annexure 8**) to the provincial Research Co-ordinator

(Health.Research@westerncape.gov.za).

4. The reference number above should be quoted in all future correspondence.

Yours sincerely

AT HAWKRIDGE.

DR A HAWKRIDGE

DIRECTOR: HEALTH IMPACT ASSESSMENT

DATE: 23/8/2017.

Appendix 10 Instructions for authors: Health Policy and Planning

Instructions for Authors

Health Policy and Planning improves the design, implementation and evaluation of health policies in low- and middle-income countries through providing a forum for publishing high quality research and original ideas, for an audience of policy and public health researchers and practitioners. *HPP* is published 10 times a year.

HPP has a double-blinded peer-review policy. All types of papers are peer reviewed and all article abstracts from each issue are translated into French, Spanish and Chinese.

Before you submit please make sure you have followed all the relevant instructions. A checklist for authors is available here.

- Guidance
    i. Improving chances of publication
    ii. Manuscript format and style for all articles
- Types of papers
- Submission process

Guidance

Improving chances of publication

As well as the high overall quality required for publication in an international journal, authors should take into consideration:

- Addressing *HPP*'s readership: national and international policy makers, practitioners, academics and general readers with a particular interest in health policy issues and debates.
- Manuscripts that fail to set out the international debates to which the paper contributes, and to draw out policy lessons and conclusions, are more likely to be rejected, returned to the authors for redrafting prior to being reviewed, or undergo a slower acceptance process.
- Economists should note that papers accepted for publication in HPP will consider the broad policy implications of an economic analysis rather than focusing primarily on the methodological or theoretical aspects of the study.
- Public health specialists writing about a specific health problem or service should discuss the relevance of the analysis for the broader health system. Those submitting health policy analyses should draw on relevant bodies of theory in their analysis, or justify why they have not, rather than only presenting a narrative based on empirical data.
- Primarily focus on one or more low- or middle-income countries.

The editors cannot enter into correspondence about papers considered unsuitable for publication and their decision is final. Neither the editors nor the publishers accept responsibility for the views of authors expressed in their contributions. The editors reserve the right to make amendments to the papers submitted although, whenever possible, they will seek the authors' consent to any significant changes made. The manuscript will not be returned to authors following submission unless specifically requested.

Should you require any assistance in submitting your article or have any queries, please do not hesitate to contact the editorial office at hpp.editorialoffice@oup.com.

Manuscript format and style for all articles

Only articles in English are considered for publication.

Prepare your manuscript, including tables, using a word processing program and save it as a **.doc**, **.rtf** or **.ps** file. Use a minimum font size of 11, double-spaced and paginated throughout including references and tables, with margins of at least 2.5 cm. The text should be left justified and not hyphenated.

The **title page** should contain:

- Title - please keep as concise as possible and ensure it reflects the subject matter
- Corresponding author's name, address, telephone/fax numbers and e-mail address
- Each author's affiliation and qualifications

- Keywords and an abbreviated running title
- 2-4 Key Messages, detailing concisely the main points made in the paper
- Acknowledgements
- A word count of the full article

In the **acknowledgements**, all sources of funding for research must be explicitly stated, including grant numbers if appropriate. Other financial and material support, specifying the nature of the support, should be acknowledged as well.

Figures should be designed using a well-known software package for standard personal computers. If a figure has been published earlier, acknowledge the original source and submit written permission from the copyright holder to reproduce the material. Colour figures are permitted but authors will be required to pay the cost of reproduction.

Please be aware that the requirements for online submission and for reproduction in the journal are different: (i) for online submission and peer review, please upload your figures separately as low-resolution images (.jpg, .tif, .gif or. eps); (ii) for reproduction in the journal, you will be required after acceptance to supply high-resolution .tif files. Minimum resolutions are 300 d.p.i. for colour or tone images, and 600 d.p.i. for line drawings. We advise that you create your high-resolution images first as these can be easily converted into low-resolution images for online submission.

Figures will not be relettered by the publisher. The journal reserves the right to reduce the size of illustrative material. Any photomicrographs, electron micrographs or radiographs must be of high quality. Wherever possible, photographs should fit within the print area or within a column width. Photomicrographs should provide details of staining technique and a scale bar. Patients shown in photographs should have their identity concealed or should have given their written consent to publication. When creating figures, please make sure any embedded text is large enough to read. Many figures contain miniscule characters such as numbers on a chart or graph. If these characters are not easily readable, they will most likely be illegible in the final version.

Certain image formats such as .jpg and .gif do not have high resolutions, so you may elect to save your figures and insert them as .tif instead.

For useful information on preparing your figures for publication, go to http://cpc.cadmus.com/da.

All **measures** should be reported in SI units, followed (where necessary) by the traditional units in parentheses. There are two exceptions: blood pressure should be expressed in mmHg and haemoglobin in g/dl. For general guidance on the International System of Units, and some useful conversion factors, see 'The SI for the Health Professions' (WHO 1977).

Manuscript file must include text body. Title Page, Figures and Tables should be uploaded separately.

Manuscript Preparation

Page 1: **Title Page** – as above.

Page 2: **Abstract**. The abstract should be prepared in one paragraph, no headings are required. It should describe the purpose, materials and methods, results, and conclusion in a single paragraph no longer than 300 words without line feeds.

Page 3: **Introduction**. The Introduction should state the purpose of the investigation and give a short review of the pertinent literature, and be followed by:

Materials and methods. The Materials and methods section should follow the Introduction and should provide enough information to permit repetition of the experimental work. For particular chemicals or equipment, the name and location of the supplier should be given in parentheses.

Results. The Results section should describe the outcome of the study. Data should be presented as concisely as possible, if appropriate in the form of tables or figures, although very large tables should be avoided.

Discussion. The Discussion should be an interpretation of the results and their significance with reference to work by other authors.

Abbreviations. Non-standard abbreviations should be defined at the first occurrence and introduced only where multiple use is made. Authors should not use abbreviations in headings.

All **measures** should be reported in SI units, followed (where necessary) by the traditional units in parentheses. There are two exceptions: blood pressure should be expressed in mmHg and haemoglobin in g/dl. For general guidance on the International System of Units, and some useful conversion factors, see 'The SI for the Health Professions' (WHO 1977).

References. References must follow the Harvard system and must be cited as follows:

Baker and Watts (1993) found...

In an earlier study (Baker and Watts 1993), it...

Where works by more than two authors are cited, only the first author is named followed by 'et al.' and the year. The reference list must be typed double-spaced in alphabetical order and include the full title of both paper (or chapter) and

journal (or book), thus:

Baker S, Watts P. 1993. Paper/chapter title in normal script. Journal/book title in italics **Volume number in bold** : page numbers.

Baker S, Watts P. 1993. Chapter title in normal script. In: Smith B (ed). *Book title in italics*. 2nd edn. Place of publication: Publisher's name, page numbers.

Tables All tables should be on separate pages and accompanied by a title - and footnotes where necessary. The tables should be numbered consecutively using Arabic numerals. Units in which results are expressed should be given in parentheses at the top of each column and not repeated in each line of the table. Ditto signs are not used. Avoid overcrowding the tables and the excessive use of words. The format of tables should be in keeping with that normally used by the journal; in particular, vertical lines, coloured text and shading should not be used. Please be certain that the data given in tables are correct. Tables should be provided as Word or Excel files.

Types of papers

Health Policy and Planning welcomes submissions of the following article types:

- Original research
- Review articles
- Methodological musings
- Innovation and practice reports
- Commentaries
- 'How to do (or not to do)...' [for example, see Hutton & Baltussen, HPP, 20(4): 252-9] and
- '10 best resources' [for example, see David & Haberlen, HPP, 20(4): 260-3].

ORIGINAL RESEARCH

Manuscripts should preferably be a **maximum** of **6,000** words, excluding tables and figures/diagrams.

The manuscript will generally follow through sections: Title page (as above), Abstract (no more than 300 words), Introduction, Methods, Results, Discussion, Conclusion, Acknowledgements, References. However, it may be appropriate to combine the results and discussion sections in some papers. Tables and Figures should not be placed within the text, rather provided in separate file/s.

For the reporting of statistical analyses please consider the following additional points:

- Focus the statistical analysis at the research question.
- Provide information about participation and missing data.
- As much as possible, describe results using meaningful phrases (e.g., do not say "beta" or "regression coefficient", but "mean change in Y per unit of X"). Provide 95% confidence intervals for estimates.
- Report the proportions as *N* (%), not just %.
- Report *P* values with 2 digits after the decimal, 3 if <0.01 or near 0.05 (e.g., 0.54, 0.03, 0.007, <0.001, 0.048). Do not report *P* values greater than 0.05 as "NS".
- Always include a leading zero before the decimal point (e.g., 0.32 not .32).
- Do not report tests statistics (such as chi-2, T, F, etc.)."

For acknowledgements, figures and measures see above.

REVIEW ARTICLES

Manuscripts should preferably be a **maximum** of **10,000 words**, excluding tables, figures/diagrams and references.

Reviews may be invited. They generally address recent advances in health policy, health systems and implementation. **Systematic reviews are particularly welcomed**, but may not be appropriate for every topic. If authors are submitting a review article that is not a systematic review then the paper should explain why a systematic review was not feasible/desirable, and the review methods should be described in a way that is as clear and as replicable as possible.

The manuscript will generally follow through sections: Abstract (no more than 300 words), Introduction, Methods, Results, Discussion, Conclusion, References. However, it may be appropriate to combine the results and discussion sections in some papers. Tables and Figures should not be placed within the text, rather provided in separate file/s.

Checklists have been developed for a number of study designs, including randomized controlled trials (CONSORT), systematic reviews (PRISMA), observational studies (STROBE), diagnostic accuracy studies (STARD) and qualitative studies (COREQ, RATS). We recommend authors refer to the EQUATOR Network website (http://www.equator-network.org) for further information on the available reporting guidelines for health research, and the MIBBI Portal for prescriptive checklists for reporting biological and biomedical research where applicable. Authors are requested to make use of these when drafting their manuscript and peer reviewers will also be asked to refer to these checklists when evaluating these studies.

COMMENTARIES

Short commentaries on topical issues in health systems are welcomed - please email the editorial office prior to submission. Most such commentaries are commissioned by the editors, but the journal will also consider unsolicited submissions. Commentaries should of broad interest to readers of *Health Policy and Planning*, and while they are not research papers, they should be well substantiated. Manuscripts should preferably be a **maximum** of **1,200 words**, excluding tables, figures/diagrams and references.

The manuscript will generally contain a short set of key take-home messages. Tables and Figures should not be placed within the text, rather provided in separate file/s.

HOW TO DO...OR NOT TO DO

This series is meant to explain how to use a particular research or analytical method (e.g. social network analysis, discrete choice experiment etc.). The research or analytical methods discussed should be well accepted and clearly defined: this category of paper is not meant to address methodological debates but rather to help disseminate and promote the use of well-accepted methodologies.

Manuscripts should preferably be a **maximum** of **3,000 words** excluding tables, figures/diagrams and references.

- The sections must be arranged as follows: i) Title page (as above), ii) Abstract, iii) Introduction, iv) Body of the paper, and v) References. Main sections should be coordinated by the author, and inserted between Introduction and Reference sessions. Please contact our office before submitting a manuscript in this category.

Tables and Figures should not be placed within the text, rather provided in separate file/s.

10 BEST RESOURCES

This 10 best is a series of articles that identify and outline the 10 most useful resources from a range of sources to help facilitate a better understanding of a particular issue in global health.

We often commission these articles but we also hear unsolicited suggestions.

For acknowledgements, figures and measures see above.

METHODOLOGICAL MUSINGS

This series is meant to address methodological issues in health policy and systems research, where there is currently a lack of clarity about accepted research methods. This series is intended to support the development of the health policy and systems research field, through supporting methodological discussion.

Manuscripts should preferably be a **maximum** of **3,000 words**, excluding tables, figures/diagrams and references.

- The sections must be arranged as follows: i) Title page (as above), ii) Abstract, iii) Introduction, iv) Body of the paper, and v) References. Main sections should be coordinated by the author, and inserted between Introduction and Reference sessions. Please contact our office before submitting a manuscript in this category.
- For acknowledgements, figures and measures see above.

INNOVATION AND PRACTICE REPORTS

These short reports are narratives from the perspective of health managers operating at the national or sub-national level which focus on innovative approaches to strengthen health systems. Papers should highlight the practical experience of health managers or practitioners involved in taking action to strengthen health systems through innovative activities and new practices. The new activities and practices should preferably have been implemented for a sufficiently long time to allow authors to demonstrate the potential for sustained improvement or change in the health system. Examples might include practices to build capacity, develop new partnerships or restructure relationships within health systems. Papers

should identify 2-4 key messages or lessons for consideration in other settings. We will not consider clinical and pharmaceutical innovations and practices. Manuscripts should be a **maximum** of **2,000 words**.

The manuscript will generally follow through sections: Key Messages, Abstract (no more than 300 words), Introduction, Methods, Results, Discussion, Conclusion, References. However, it may be appropriate to combine the results and discussion sections in some papers. Tables and Figures should not be placed within the text, rather provided in separate file/s. In the main body of the paper, sub-headings may be useful to signal key elements of the experience reported. Reports must be led by local practitioners, managers or policy-makers.

Submission process

- Pre-submission language editing
- Authorship
- Originality
- Online submission

PRE-SUBMISSION LANGUAGE EDITING

HPP asks all authors to ensure that their papers are written in as high a standard of English as possible before submission to the journal. If your first language is not English, to ensure that the academic content of your paper is fully understood by journal editors and reviewers, you may want to consider using a language editing service. Language editing does not guarantee that your manuscript will be accepted for publication. For further information on this service, please click here. Several specialist language editing companies offer similar services and you can also use any of these. Authors are liable for all costs associated with such services. If your first language is not English, to ensure that the academic content of your paper is fully understood by journal editors and reviewers is optional. Language editing does not guarantee that your manuscript will be accepted for publication. For further information on this service, please click here. Several specialist language editing companies offer similar services and you can also use any of these. Authors are liable for all costs associated with such services.

AUTHORSHIP

All persons designated as authors should qualify for authorship. The order of authorship should be a joint decision of the co-authors. Each author should have participated sufficiently in the work to take public responsibility for the content. Authorship credit should be based on substantial contribution to conception and design, execution, or analysis and interpretation of data. All authors should be involved in drafting the article or revising it critically for important intellectual content, must have read and approved the final version of the manuscript and approve of its submission to this journal. An email confirming submission of a manuscript is sent to all authors. Any change in authorship following initial submission would have to be agreed by all authors as would any change in the order of authors.

ORIGINALITY

Manuscripts containing original material are accepted for consideration with the understanding that neither the article nor any part of its essential substance, tables, or figures has been or will be published or submitted for publication elsewhere. This restriction does not apply to abstracts or short press reports published in connection with scientific meetings. Copies of any closely related manuscripts should be submitted along with the manuscript that is to be considered by *HPP*. *HPP* discourages the submission of more than one article dealing with related aspects of the same study. . For further information on the prior publication policy see https://academic.oup.com/heapol/pages/Prior_Publication.

During the online submission procedure, authors are asked to provide:

- information on prior or duplicate publication or submission elsewhere of any part of the work;
- a statement of financial or other relationships that might lead to a conflict of interest or a statement that the authors do not have any conflict of interest;
- a statement that the manuscript has been read and approved by all authors (see also section on authorship);
- name, address, telephone and fax number of the corresponding author who is responsible for negotiations concerning the manuscript;
- copies of any permissions to reproduce already published material, or to use illustrations or report sensitive personal information about identifiable persons.

All papers submitted to HPP are checked by the editorial office for conformance to author and other instructions all specified below. Non-conforming manuscripts will be returned to authors.

If authors are unsure about the originality of their manuscript or any part of it, they should contact the editorial office at hpp.editorialoffice@oup.com.

ONLINE SUBMISSION

Prior to submission please carefully read instructions on each type of paper and closely follow instructions on word count, abstract, tables and figures and references. This will ensure that the review and publication of your paper is as efficient and quick as possible. The Editorial Office reserve the right to return manuscripts that are not in accordance with these instructions.

All material to be considered for publication in Health Policy and Planning should be submitted in electronic form via the journal's online submission system. Once you have prepared your manuscript according to the instructions below, instructions on how to submit your manuscript online can be found by clicking here.

Conflict of interest

Authors must declare any conflicts of interest during the online submissions process. The lead author is responsible for confirming with the co-authors whether they also have any conflicts to declare.

Ethical approval

A requirement of publication is that research involving human subjects was conducted with the ethical approval of the appropriate bodies in the country where the research was conducted and of the ethical approval committees of affiliated research institutions elsewhere. A clear statement to this effect must be made in any submitted manuscript presenting such research, specifying that the free and informed consent of the subjects was obtained.

Funding

The following rules should be followed:

- The sentence should begin: 'This work was supported by …'
- The full official funding agency name should be given, i.e. 'the National Cancer Institute at the National Institutes of Health' or simply 'National Institutes of Health' not 'NCI' (one of the 27 subinstitutions) or 'NCI at NIH' - see the full RIN-approved list of UK funding agencies for details
- Grant numbers should be complete and accurate and provided in brackets as follows: '[grant number ABX CDXXXXXX]'
- Multiple grant numbers should be separated by a comma as follows: '[grant numbers ABX CDXXXXXX, EFX GHXXXXXX]'
- Agencies should be separated by a semi-colon (plus 'and' before the last funding agency)
- Where individuals need to be specified for certain sources of funding the following text should be added after the relevant agency or grant number 'to [author initials]'. An example is given here: 'This work was supported by the National Institutes of Health [P50 CA098252 and CA118790 to R.B.S.R.] and the Alcohol & Education Research Council [HFY GR667789].

Oxford Journals will deposit all NIH-funded articles in PubMed Central. See Author self-archiving policy for details. Authors must ensure that manuscripts are clearly indicated as NIH-funded using the guidelines above.

Permissions

Authors are reminded that it is their responsibility to comply with copyright laws. It is essential to ensure that no parts of the submission have or are due to appear in other publications without prior permission from the copyright holder and the original author. Materials, e.g. tables, taken from other sources must be accompanied by a written statement from both author and publisher giving permission to HPP for reproduction.

Copyright

Upon receipt of accepted manuscripts at Oxford Journals authors will be invited to complete an online copyright licence to publish form.

Please note that by submitting an article for publication you confirm that you are the corresponding/submitting author and that Oxford University Press ("OUP") may retain your email address for the purpose of communicating with you about the article. You agree to notify OUP immediately if your details change. If your article is accepted for publication OUP will contact you using the email address you have used in the registration process. Please note that OUP does not

retain copies of rejected articles

It is a condition of publication in Health Policy and Planning that authors assign licence to publish to Oxford University Press. This ensures that requests from third parties to reproduce articles are handled efficiently and consistently and will also allow the article to be as widely disseminated as possible. In assigning licence to publish, authors may use their own material in other publications provided that the Journal is acknowledged as the original place of publication, and Oxford University Press is acknowledged as the original Publisher.

Third-party content in open access papers

If you will be publishing your paper under an Open Access licence but it contains material for which you **do not** have Open Access re-use permissions, please state this clearly by supplying the following credit line alongside the material:

Title of content
Author, Original publication, year of original publication, by permission of [rights holder]

This image/content is not covered by the terms of the Creative Commons licence of this publication. For permission to reuse, please contact the rights holder.

Prior publication policy

Please review our prior publication policy. We expect authors to disclose any prior dissemination including via a website or at national meetings.

Offprints

All authors are supplied with a free URL linking you to a press-ready PDF version of your article. If you wish to order offprints please visit the Oxford Journals Author Services site.

Change of address

Please notify the editors of any change of address. After manuscript acceptance, please also notify the publishers: Journals Production Department, Oxford University Press, Great Clarendon Street, Oxford, OX2 6DP, UK. Telephone +44 (0) 1865 556767 , Fax +44 (0) 1865 267773.

Important notes to authors

The manuscripts will not be returned to authors following submission unless specifically requested.

Proofs

Authors are sent page proofs by email. These should be checked immediately and corrections, as well as answers to any queries, returned to the publishers as an annotated PDF via email or fax within 3 working days (further details are supplied with the proof). It is the author's responsibility to check proofs thoroughly.

Permission to reproduce figures and extracts

Permission to reproduce copyright material, for print and online publication in perpetuity, must be cleared and if necessary paid for by the author; this includes applications and payments to DACS, ARS and similar licensing agencies where appropriate. Evidence in writing that such permissions have been secured from the rights-holder must be made available to the editors.

It is also the author's responsibility to include acknowledgements as stipulated by the particular institutions. Please note that obtaining copyright permission could take some time. Oxford Journals can offer information and documentation to assist authors in securing print and online permissions: please see the Guidelines for Authors section at https://academic.oup.com/journals/pages/access_purchase/rights_and_permissions.

Should you require copies of this then please contact the editorial office of the journal in question or the Oxford Journals Rights department on journals.permissions@oup.com .

For a copyright prose work, it is recommended that permission is obtained for the use of extracts longer than 400 words; a series of extracts totalling more than 800 words, of which any one extract is more than 300 words; or an extract or

series of extracts comprising one-quarter of the work or more. For poetry: an extract of more than 40 lines; series of extracts totalling more than 40 lines; an extract comprising one-quarter or more of a complete poem.

Supplementary data

Supporting material that is not essential for inclusion in the full text of the manuscript, but would nevertheless benefit the reader, can be made available by the publisher as online-only content, linked to the online manuscript. The material should not be essential to understanding the conclusions of the paper, but should contain data that is additional or complementary and directly relevant to the article content. Such information might include more detailed methods, extended data sets/data analysis, or additional figures.

It is standard practice for appendices to be made available online-only as supplementary data. All text and figures must be provided in suitable electronic formats. All material to be considered as supplementary data must be submitted at the same time as the main manuscript for peer review. It cannot be altered or replaced after the paper has been accepted for publication, and will not be edited. Please indicate clearly all material intended as supplementary data upon submission and name the files e.g. 'Supplementary Figure 1', 'Supplementary Data', etc. Also ensure that the supplementary data is referred to in the main manuscript where necessary, for example as '(see Supplementary data)' or '(see Supplementary Figure 1)'.

Return to top of page.

Oxford open access

HPP authors have the option to publish their paper under the *Oxford Open* initiative; whereby, for a charge, their paper will be made freely available online immediately upon publication.

After your manuscript is accepted the corresponding author will be required to accept a mandatory licence to publish agreement. As part of the licensing process you will be asked to indicate whether or not you wish to pay for open access. If you do not select the open access option, your paper will be published with standard subscription-based access and you will not be charged.

Oxford Open articles are published under Creative Commons licences. Authors publishing in *Health Policy and Planning* can use the following Creative Commons licences for their articles:

- Creative Commons Attribution licence (CC BY)
- Creative Commons Non-Commercial licence (CC BY-NC)
- Creative Commons non-Commercial No Derivatives licence (CC BY-NC-ND)

Please click here for more information about the Creative Commons licences.

You can pay Open Access charges using our Author Services site. This will enable you to pay online with a credit/debit card, or request an invoice by email or post. The open access charges applicable are:

- Regular charge - £1680/$2678/€2205
- Health Systems Global member charge - £1260/$2048/€1628
- Reduced Rate Developing country charge* - £840/$1139/€1103
- Free Developing country charge * - £0/$0/€0

*Visit our Developing Countries page for a list of qualifying countries

Please note that these charges are in addition to any colour/page charges that may apply.

Orders from the UK will be subject to the current UK VAT charge. For orders from the rest of the European Union, OUP will assume that the service is provided for business purposes. Please provide a VAT number for yourself or your institution, and ensure you account for your own local VAT correctly.

Ethics

Health Policy and Planning is a member of the Committee on Publication Ethics (COPE), and strives to adhere to its code of conduct and guidelines.

Authors are encouraged to consult http://publicationethics.org/resources/guidelinesfor more information.

In reports of investigations in humans or animals, authors must explicitly indicate (in the appropriate section of the Methods) their adherence to ethical standards and note the approval of an ethics committee when this is relevant.

Crossref funding data registry

In order to meet your funding requirements authors are required to name their funding sources, or state if there are none, during the submission process. For further information on this process or to find out more about the CHORUS initiative please click here.