

Reflections on Experiences in Doctoral Training and its Contribution to Knowledge Translation in an African Environment

This report is submitted as the final report covering the extension period for:

IDRC project number: **104519-008**

IDRC project title: **Turning health research into policy**

Project Leader: Nelson K. Sewankambo, MBChB, MMed, MSc, FRCP (IDRC Research Chair / IRC)
IDRC International Research Chair in Evidence-Informed Health Policies and Systems

Makerere University
College of Health Sciences, New Mulago Hospital Complex,
P.O. Box 7072, Mulago Hill Rd., Kampala, Uganda

Country/region: Burkina Faso, Cameroon, Centrafrique, Ethiopia, Mozambique, Uganda, Zambia

Mijia Murong and Allen Nsangi. *Reflections on Experiences in Doctoral Training and its Contribution to Knowledge Translation in an African Environment*. 9 May 2019. Makerere University, Uganda.

This work is licensed under the Creative Commons Attribution 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/> or send a letter to Creative Commons, PO Box 1866, Mountain View, CA 94042, USA.

Contents

Introduction	4
Background	4
Objectives	5
Context of doctoral training programs in KT	6
Methodologies	7
Key informant interviews:	7
Focus group interviews:	7
Activities and outputs inventory analysis	8
Findings	8
Respondents' background	8
Objective 1: To describe the perceived benefits, shortcomings, and suggestions for improvement of the program from the perspective of the PhD candidates, administrators, and supervisors	10
Effective aspects of the program	10
Ineffective aspects of the program	12
Challenges experienced by candidates	12
Suggestions for improvement	13
Objective 2: To document the major outputs of the program	15
Other outputs	29
Objective 3: To describe the perceived outcomes of the program	30
Student- centered outcomes	30
Field-Centered Outcomes	31
Program Impacts	32
Discussion	35
Statement of principal findings	35
Strength and weakness of the study	36
Conclusion	42
Appendix 1: Tables characterizing other doctoral training programs in KT	43
Appendix 2: Activities and outputs inventory form	45
Appendix 3: PhD students semi-structured interview guide	47
Appendix 4: End-users semi-structured interview guide	49
Appendix 5: Initiation focus group discussion guide	50
Appendix 6: Exiting focus group discussion guide	52

Introduction

Background

Knowledge Translation (KT) is the process of ensuring that research evidence is scientifically and systematically incorporated into policy and practice. It is often described as the effort to close the “know-do gap” between knowledge creation and policy formulation. The idea of KT emerged in the 1990s, as an outgrowth of evidence-based medical practices. In 2005, WHO reported that for the last 20 years, there has been an unprecedented effort to use evidence in policy and decision making for health systems. As a part of this effort, many strategies and KT platforms have emerged, particularly from high-income countries.

Despite of this growing body of evidence-based decision-making initiatives, there is still inadequate KT work and capacity in low- and middle-income countries (LMICs). In sub-Saharan Africa, policies are often made in the absence of research evidence, and when such evidence accumulates it is rarely used by policy-makers. For instance, of the research carried out by post-graduates in the health fields at Makerere University in a ten-year period from 2001 to 2011, only 4% of the research outputs were cited in policy-related documents. Recognizing that the burden of disease and health inequities in (LMICs) can be addressed by existing research knowledge, it is especially important to introduce KT mechanisms in these settings.

Efforts to introduce KT mechanisms in Africa have been contributed to through initiatives such as EVIPNet Africa (in Burkina Faso, Cameroon, Central African Republic, Ethiopia, Mozambique, Zambia) and the REACH Policy Initiative (in Uganda), both of which are WHO and International Research Development Center (IDRC) supported KT platforms respectively. They are designed to improve the use of research evidence in policy decisions about health systems through partnerships with policymakers, researchers, and civil society. In addition in 2009, the European Commission’s 7th Framework Programme funded a 5-year project, the *Supporting the Use of Research Evidence (SURE) for Policy in African Health Systems*, which brought together seven African countries, two European , and one Canadian institutions to strengthen, support, and evaluate the SURE work in those African countries. Among many outputs, the SURE

collaboration has produced Evidence briefs, policy dialogues, rapid response services, and national clearinghouses.

To address the need for capacity building in knowledge translation, the IDRC provided funding for an International Research Chairs in Evidence-Informed Health Policies and Systems program co-chaired by Dr. Nelson K. Sewankambo and Dr. John N. Lavis. The program began on 28 June 2009, with the objectives to pursue both research and capacity-building.

The latter objective states the following:

To provide four graduate students from the participating African countries and three graduate students from Canada (who are committed to long-term collaborative research with African partners) with a unique training experience in the area of knowledge translation for policy that includes: exposure to our multi-method approach, joint supervision by us (and others as appropriate), reciprocal training opportunities, a dyad- or triad-arrangement with other graduate students, and the opportunity to pursue their doctoral thesis an in-depth examination of a KT platform in a single country or a single area of inquiry (such as the formative evaluation of policy dialogues) across countries.

The capacity building efforts targeting the students from African countries is the focus of this report. Five doctoral students were registered in in Uganda at the Makerere University PhD program between the years 2010-2012. As one of the first PhD training program of its kind in Africa, it was imperative that as part of the educational program a critical reflection or self-evaluation of the experiences and lessons learned from its implementation is carried out and the findings shared widely.

Objectives

The objectives of this self-evaluation are:

1. To describe the perceived benefits (including contribution to the field of KT), shortcomings, challenges in program implementation and suggestions for improvement, of the program, from the perspective of the PhD candidates, administrators, and supervisors

2. To document the major outputs of the program
3. To describe the perceived outcomes of the program

Context of doctoral training programs in KT

A review of existing peer-reviewed literature discussing doctoral training programs in KT found that several doctoral programs addressing capacity building in KT exists globally and, to a limited extent, in Sub-Saharan Africa. (Table 1) in Appendix 1 shows that the majority of the programs identified exist in high income countries, with 8 operating in Canada, 2 in each the US and the UK. In the LMICs we found programs in Brazil, South Africa, and Nigeria that included KT related skills training as part of different doctoral training initiatives; most of these are hosted in conjunction with a Canadian institution. Unlike the IDRC Research Chairs (IDRC RC) program, most of the other capacity building programs in KT discussed in peer-reviewed literature did not focus solely on KT as the individual field of study. Instead, they provided KT training in conjunction with another field of study. (Table 2) in appendix 1 shows that only 2 of the 13 programs that we found centered KT-science as their main area of focus. Most doctoral programs we identified provided KT training adjacent to training at different academic levels. (Table 1) in Appendix 1 shows that the PhD accreditation stream is often hosted in conjunction with undergraduate, masters, or post-doctoral program offerings.

In order to contextualize our doctoral training program, we cross-referenced its components with that of other programs in (Table 3) of appendix 1. In general, there are few KT programs in the African context that simultaneously offer co-supervision by a joint effort between supervisors/mentors from high income and LMIC institutions. Co-supervision provides the opportunities for trainees to study from two different academic institutions, to learn and work within a cohort of students with similar interests, and to work within different functioning KT initiatives. Meanwhile, these features function as the main pillars of our program offering. This is one of the unique approaches to our doctoral training in KT.

Methodologies

We used a multi-method evaluation approach involving mainly Key Informant Interviews, and complimented by Focus Group Interviews, and an activities and outputs inventory analysis. Each evaluation method used is discussed in detail below.

Key informant interviews:

A set of semi-structured interviews were conducted to address select components of all four objectives previously discussed. One interview guide was used for interviews of all the 5 PhD fellows from the African countries while another guide was used to interview all 5 end-users who were identified by the fellows as having engaged with the trainees' KT fieldwork. These end-users include policy analysts, policy makers and district health officers in various Uganda government health departments. The interview guides can be found in Appendix 3 and Appendix 4. The PhD fellows' interviews, which lasted approximately 1 hour each, were held at Makerere University, College of Health Sciences, Kampala, Uganda whenever possible, and otherwise conducted over Skype while the end-user interviews were kept at 15-20 minutes. The end-user interviews were all conducted in a place convenient to them at the Golf-View Hotel, Entebbe, Uganda. All interviews were recorded, transcribed verbatim, and basic, descriptive, and analytic coding were performed on the transcripts to generate key findings. Field notes were also referenced and used to inform the generation of findings.

Focus group interviews:

In this evaluation, the focus group interviews were used to explore the relationship between the perspectives of the fellows, coordinator, and supervisors of the program. We conducted two focus groups: one before, and one after all other data collection activities had been completed. As such, these interviews were intended to not only contribute findings relevant to the evaluation objectives, but also to operate in coordination with the other data collection strategies. The initial focus group discussion was attended by the two supervisors and the program coordinator, and this helped to inform the design of the interview guides of the subsequent key informants interviews; the exiting focus group was attended by one supervisor,

two PhD students, and the program coordinator, and addressed some of the unanswered questions, major themes, and areas of contention, that came out of the findings from the other data collection methodologies. Each focus group interview lasted one hour and was conducted at Makerere University, Kampala. Both focus group interviews were conducted using interview guides (appendix 5 and 6), which were circulated to the participants two days before the interview. The interviews were recorded. The audio-files were reviewed and the key messages were summarized. These key messages were then used as supporting evidence to enrich the findings generated from the key-informants' interviews.

Activities and outputs inventory analysis

To comprehensively document the outputs of the PhD program, an outputs inventory was circulated to all of the PhD candidates and collected upon their completion. This inventory required each student to reflect upon the impact of their dissertation as well as other KT-related outputs and engagements that they took part in during their training. The complete output inventory form can be viewed in appendix 2. After all inventory forms were completed and collected, the types of outputs produced by the PhD candidates, and their impact, were qualitatively and quantitatively analyzed. The data obtained from the inventory responses were also used to give context to the information obtained from the key informants' interviews.

Findings

Respondents' background

The key informant interviews, focus group interviews, and activities and outputs inventory analysis mainly focused on the five African PhD candidates trained by the IDRC RC program. In (Table 2), their names, identifier code, dissertation description, nationality, year of entry, and motivation for, enrolling in the PhD program are summarized.

Table 1: Background information on PhD respondents

Name	Id	Nationality	Year of involvement	Motivation for involvement	Dissertation description
Pierre Ongolo-Zogo	C1	Cameroon	2010	Scholarly understanding of health systems and policy making	The impact of EVIPNET in Cameroon and REACH in Uganda
Rhona Mijumbi	C2	Uganda	2011	Interest in achieving higher academic qualification	Rapid Response Synthesis as a strategy to support policy making in Uganda
Andre Zida	C3	Burkina Faso	2011	Opportunity to engage further with RRS	Institutionalization of the Rapid Response Synthesis mechanism in the policy making process of Burkina Faso
Boniface Mutatina	C4	Uganda	2012	Interest in evidence informed decision making	Evaluating the Uganda Clearing House for policies and systems
Ekwaro Obuku	C5	Uganda	2012	Interest in achieving higher academic qualification	Usage of masters and post graduate research in decision making and policy making

We also interviewed program supervisors and several end-users who frequently interacted with the PhD candidates. (Table 2 and 3) summarizes their names, identification code, the details of their roles, and their motivations for becoming involved in the program or professionally engaging with the PhD students.

Table 2: Background information on Program Administrators Respondents

Name	Id	Role in the program	Institutional base	Motivation for involvement in program
Nelson K Sewankambo	S1	Academic Supervisor	Makerere University	<ul style="list-style-type: none"> ● Availability of funding ● Desire to build KT capacity in the African Region
John Lavis	S2	Academic Supervisor	McMaster University	<ul style="list-style-type: none"> ● Availability of IDRC funding ● Opportunity to leverage existing KT partnership
Allen Nsangi	S3	Administrative Supervisor	Makerere University	<ul style="list-style-type: none"> ● Program needed a training coordinator ● Interest in building skills in health policy and

				management upon completing masters
--	--	--	--	------------------------------------

Table 3: Background information on End-User Respondents

Name	Id	Institution of employment	Profession	Reason for engagement with PhDs
Christina Rebecca Mubiru	E1	Uganda Ministry of Health *Retired	Policy analyst in the department of planning	Introduced to the SURE project by a PhD fellow
Isaac Dumba	E2	Mukono District Health Office	District Health Officer	Trained on evidence informed decision making by a PhD fellow
Jacinto Amandua	E3	Uganda Ministry of Health *Retired (2017)	Commissioner for clinical services	Was an active user of the SURE project before the PhD program was established
James Mugisha	E4	Uganda Ministry of Health	Senior planner in the department of policy and planning	Trained on evidence informed decision making by a PhD fellow

In the subsequent sections, we will address the findings in relation to the evaluation objectives discussed at the beginning of this report.

Objective 1: To describe the perceived benefits, shortcomings, and suggestions for improvement of the program from the perspective of the PhD candidates, administrators, and supervisors

Effective aspects of the program

1. Theoretical Grounding

One of the aspects of the program which many of the student respondents identified as being beneficial to their training was getting the opportunity to learn the theories behind KT work. All five of the students reported that courses and seminars in health systems, policy making, and research methodology were significant to their training. Since all of the students have had some interactions with KT platforms and activities before starting their PhDs, they saw the PhD as an opportunity to contextualize their previous engagements in more foundational understanding of the KT field.

2. Co-Supervision

Another aspect of the doctoral training that the respondents unanimously identified as being well-executed was the co-supervision from the research chairs. Many of the respondents identified the complementary skills-set and leadership style of the supervisors as being a unique and helpful approach to doctoral training.

In addition, the students found the guidance they received with their co-supervisors to be enriching and clarifying, listing numerous examples of instances in which the supervisor supported them in making difficult decisions or overcoming challenges during their work and learning. These instances include reviewing their written work, sharing relevant courses and project opportunities, and advising on career options.

It may also be significant to note that the two international students from both identified having three supervisors instead of two (each based in their individual home country; Burkina Faso and Cameroon). Besides the two research-chairs performing supervisory duties from their respective institutions (McMaster and Makerere), the international students both discussed a third mentor based in their country of origin. Both students found the additional local support, in fieldwork and data collection, to be effective.

3. Enriching learning environment

Finally, many of the respondents identified their learning environment, and the resources made available to them in these environments, as being crucial to their education. For instance, all student respondents discussed being immersed in new learning environments as a result of their enrollment in the program to be highly beneficial. The students and supervisors also recognized that receiving training in prestigious academic institutions such as McMaster and Makerere granted access to resources and opportunities the students would not otherwise have access to. One supervisor used the analogy of a “sandbox of leading-edge KT activities” to characterize the resource-rich setting in which the students’ could explore freely.

Ineffective aspects of the program

1. Meeting publication requirements

According to the respondents, a program attribute that contributed to the students' delay in completing the program is meeting the publication requirements of the Makerere University PhD degree. It is mandatory for all doctoral students registered in Makerere to write a dissertation based on (a) 2 of their original research papers published (or accepted for publication) in peer-reviewed scientific journals and (b) a third completed publishable manuscript. This non-negotiable requirement is sometimes challenging given the novelty of the KT field and the scarcity of peer-reviewers in the field.

2. McMaster course credits

Another aspect of the program which was not effectively delivered was the issue of accreditation for the comprehensive courses that the students took during their time spent at McMaster University. Both student and supervisor respondents recognized that although the students benefited immensely from their experiences at McMaster, their newly-acquired skills and knowledge was not fairly reflected in their transcripts.

Challenges experienced by candidates

1. Over commitment and distractions

One of the biggest challenges described by the student respondents was being overwhelmed with commitments that are not directly related to their PhD work. Some students expressed feeling the need to prioritize other commitments before their doctoral studies because of financial pressures and family needs, while others identified the necessity to prioritize their jobs over their PhD training. Some students also felt the responsibility to advocate for KT and share their KT-related expertise outside of their PhD training requirements, despite the fact that these commitments compromised the time they had to spend on their PhDs. However, most students agreed that these engagements are tightly linked to their acquisition of knowledge, skills and expertise in the KT field and thus beneficial to the overall goal of building capacity in KT.

The program supervisors were equally aware of the students' challenges with prioritization and overcommit. Both supervisors identified work unrelated to the students' PhDs as a major reason for their delay in completing the program. They have taken between 5 to 7 years to complete their training.

2. Low field capacity and credibility

Another challenge that both affected the students' experience with the program, and the delivery of the program from the administrative side, was the lack of credibility that the KT field had in the academic community in the early years of the program. This resulted in failed attempts to secure additional sources of funding and challenges when trying to disseminate the students' research. One of the supervisors also recalled that the lack of field credibility negatively impacted the recruitment process during their search for PhD candidates, while another supervisor discussed the lack of immersive KT conference opportunities. However, several respondents noted that the field capacity in KT has been rapidly expanding in recent years, which has resulted in increased acceptance and uptake of the candidates' work.

3. Communication challenges from international students

(Table 1) shows that two of the five students enrolled in the program were not based in Uganda and thus received their PhD training mainly remotely. One unique challenge that the international students faced was communication. These two candidates both discussed communication challenges when trying to contact their supervisors and fellow cohort members. One of these candidates also faced an additional language-barrier because he was not fluent in English, which further infringed upon effective communication.

Suggestions for improvement

1. Extra funded time

Recognizing the challenges with completing a PhD program in a relatively novel field and in a low resource setting, both the supervisors and students suggested that it was

helpful to receive additional funding to support the student's PhD work beyond the intended 4-year timeframe. PhD funding agencies should have flexible funding policies that allow for enrolled students to graduate.

2. Avail protected time

While a supervisor merely suggested the importance of figuring out “what are all of the ways we can help students focus on their thesis and not be distracted by other priorities”, most of the students were clear that the best way to support them is through providing them with “protected time.” Many of the students believed that they would be more productive if the program mandated them to focus on paper and dissertation writing, without external distractions, for an extended period of time.

3. Strengthen student support system and administrative oversight

To better provide student support, the students themselves discussed strategies to scale up the support they received from the other PhD fellows in their cohort. In particular, two of the five students suggested increasing the frequency of the cohort meetings (where all of the PhD students and their mentors meet to discuss their progress and exchange feedback) such that it is a quarterly occurrence, instead of an annual event. The students also indicated the importance of maintaining their collaborative relationship with their cohort beyond the completion of their training.

Another recommendation involving student support is to enhance administrative oversight. This may involve workshops on important formal procedures and skills needed to complete their PhDs, or digitizing student management and communication processes.

4. Stronger KT center at Makerere University

Both supervisors agreed on the importance of leveraging the individual KT capacity achieved by the program to build institutional capacity in KT in Africa. They pointed out that the KT related outputs from the fellows and other KT researchers at Makerere University should be centralized under one KT center, similar to the way in which the

McMaster Health Forum centralized much of the on-going KT activities in McMaster University

5. Introducing KT to fields beyond the health system

Most of the end-user respondents noted the importance of extending KT capacity building initiatives beyond the health sector, making the argument that all fields need evidence-based decision making. The students' echoed this sentiment, noting that health does not operate in isolation, and that evidence-based decision making in other sectors are equally important to address as in the health sector and may impact health outcomes.

Objective 2: To document the major outputs of the program

(Tables 4, 5, and 6) summarize the major outputs produced by the students over the course of their PhD training.

Table 4: Peer-Reviewed publications authored by the PhD students by 2018 and their citations

Publication Title	Year of Publication	Purpose of the paper	Causal/ attributable outcomes	Citation count
Policymaker experiences with rapid response briefs to address health-system and technology question in Uganda	2014	Little is known about users' experience with the newer formats for presenting Evidence. This paper sought to explore Ugandan policymakers' experience with rapid response briefs in order to develop an acceptable format for policymakers.	This paper has been welcomed alongside earlier literature on how to package and report technical research findings to non-science or non-technical audiences.	14
A process evaluation to assess contextual factors associated with the uptake of a rapid response service to support health systems' decision-making in Uganda	2014	Although proven feasible, rapid response services (RRSs) to support urgent decision and policymaking are still a fairly new and innovative strategy in several health systems, more especially in low-income countries. We still don't know (or at the time of this work) the factors that make them work in different contexts and in addition that affect their uptake by potential end users. This study sought to determine what contextual factors affect the utilization of a RRS, so that managers or EIPM practitioners know what is crucial for the growth and functionality of their services.	The paper is being used and referred to severally to guide set up and implementation especially in interacting with the demand side which has increasingly been proven critical for the RRS and other KT strategies' survival.	6

<p>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</p>	<p>2014</p>	<p>This study aimed to establish the feasibility of a rapid response mechanism, a knowledge translation strategy designed to meet policymakers' urgent needs for evidence about health systems in a low income country, Uganda. This followed evidence that alluded to the fact that these were not feasible, leave alone necessary.</p>	<p>What we see are the citations in peer-reviewed literature but this has been a cornerstone paper for many of the rapid response services especially in low and middle income countries, and a few high income countries. For example, in the issue brief that guided the discussions for the McMaster Health Forum rapid response, this was a pivotal paper. The same goes for the Ethiopian PACT at the Ministry of Health, in Malawi, Zimbabwe, Georgia and India, to mention but a few.</p>	<p>23</p>
<p>Initiatives supporting evidence informed health system policymaking in Cameroon and Uganda: a comparative historical case study</p>	<p>2015</p>	<p>Describe the genealogy and the breadth of activities of two knowledge translation platforms</p>	<p>This paper has provided insights on the efforts needed to establish a knowledge translation platform, the types of activities and the resources needed.</p>	<p>19</p>

Climate for evidence informed health system policymaking in Cameroon and Uganda before and after the introduction of knowledge translation platforms: a structured review of governmental policy documents	2017	This paper describes the changes in the climate for evidence informed policy making in Cameroon and Uganda through a review of governmental policy documents	This paper has been used to unpack barriers and facilitators of evidence informed policy in similar health systems	13
Assessing the influence of knowledge translation platforms on health system policy processes to achieve the health millennium development goals in Cameroon and Uganda: a comparative case study	2018	Describe pathways of and actual influence of KTPs on policymaking progress and climate for evidence informed health system policymaking	This paper provides empirical evidence on the influence of KTPs on policy processes to achieve health related MDGs	3
National Framework for the Sustainability of Health Knowledge Translation Initiatives in Uganda	2018	The purpose of this study was to provide evidence about the design and implementation of policies for advancing the sustainability of knowledge translation (KT) initiatives and policies in Uganda's health system		4

<p>Working with non-state providers in post-conflict and fragile states in primary healthcare service delivery: a systematic review protocol</p>	<p>2017</p>	<p>This was a protocol in preparation for the systematic review</p>	<p>This paper is used as a reference for other scholars doing similar work.</p>	<p>4</p>
<p>Evaluating User Experiences of the Uganda Clearinghouse for Health Policy and System</p>	<p>2017</p>	<p>The study aimed to explore the user experiences of Uganda Clearinghouse for Health Policy and System. It identified issues for improving this site but also those that might help other researchers or institutions interested in developing and evaluating a similar knowledge translation strategy</p>	<p>The focus of the paper on user experiences of one-stop shop for evidence in a limited resource setting introduces a new dimension to the body of knowledge from previous work that has majorly focused on one-stop shops for global research evidence and local policy-relevant documents in high-income countries</p>	<p>1</p>

<p>Identifying and characterizing health policy and system-relevant documents in Uganda: A scoping review to develop a framework for the development of a one-stop shop</p>	<p>2017</p>	<p>The paper demonstrates the feasibility of identifying the content of a one-stop shop for health policy and system information in a low- and middle-income country. It also provides an explicit mechanism for categorising the content, and shows that it is possible to adapt the index of health policy documents</p>	<p>This paper informed the indexing of policy documents in the Uganda Clearinghouse for health policy and systems and revision of its initial architectural design. The clearinghouse facilitates timely access to decision-relevant information required by policymakers, stakeholders and researchers about the Ugandan health system and interventions.</p> <p>The paper has also provided background information to some research studies such as the evaluation of The of The Demand-Driven Evaluations for Decisions (3DE) programme that was piloted in Zambia and Uganda in 2012–2015</p>	<p>4</p>
---	-------------	--	---	----------

<p>Analysis of the policymaking process in Burkina Faso's health sector: Case studies of the creation of two health system support units</p>	<p>2017</p>	<p>This study aimed to: i) analyze the policy-making process in Burkina Faso's health sector related to the establishment of two units; ii) document the factors leading to these units appearing on the decision agenda and supporting the decision to implement; and ii) identify factors and issues that supported the implementation process.</p> <p>We wanted to understand how the Ministry of Health made the decision to create new organizational units within the health system, and then went about the process of creating them.</p>	<p>This paper demonstrates the use of Kingdon agenda-setting framework to understand the policymaking process in Burkina Faso. Three streams—problem, policy, and politics— influenced the move of the two units onto Burkina Faso's decision agenda, resulting in decisions to create the units. The problem stream was marked by a critical mass of people interested in changing Burkina Faso's health information and performance systems, for a variety of reasons. These included both external (often development partners) organizations, and also policymakers from within the Ministry concerned about how to address major policy problems.</p>	<p>4</p>
--	-------------	--	--	----------

<p>Evaluating the process and extent of institutionalization: A case study of a rapid response unit for health policy in Burkina Faso</p>	<p>2017</p>	<p>The purpose of this study was therefore to describe the process and extent of institutionalization of the health policy rapid response service, and provide advice about how the process could be supported and improved in future, to inform the future development of both this and other units.</p>	<p>The study has evaluated the process and extent of the institutionalization of the health policy rapid response unit in Burkina Faso. It has focused in particular on the earlier stages of the unit's implementation, when the unit was mainly funded by the European Union.</p>	<p>1</p>
<p>The factors affecting the institutionalisation of two policy units in Burkina Faso's health system: A case study</p>	<p>2017</p>	<p>This study aimed to develop a deeper understanding of the specific factors that have facilitated or hindered successful institutionalization in the health system in Burkina Faso. It focuses on two policy units, the first set up to administer the National Health Accounts Unit (NHAU) and the second established to run a non-communicable diseases program within the Ministry of Health.</p>	<p>This research has explored the factors that affect the institutionalization of policy units in Burkina Faso's health system. It is based on two case studies, one an institutionalized policy unit and a second that has not been institutionalized. The study examined the relationship between successful institutionalization and the existence of an institutional framework,</p>	<p>3</p>

			<p>consistent production of data and preparation of reports, adequate financial and human resources, and infrastructure capacity to routinely produce and make use of data in policymaking. It therefore contributes to our understanding of the dynamics linking institutionalization to these specific indicators.</p>	
<p>Academic research productivity of post-graduate students at Makerere University College of Health Sciences, Uganda, from 1996 to 2010: A retrospective review</p>	<p>2018</p>	<p>This baseline paper defined the problem of non-publication at a leading university in sub Saharan Africa. The paper provides a baseline for quantifying and characterizing the problem of “scientific waste”, common in efforts to produce theses that gather dust in shelves.</p>	<p>This article has been accessed 2,104 times suggesting it has been widely read since its publication 24 months ago in April 2017.</p> <p>Altmetric Attention Score: 1</p> <p>Unfortunately there has been no policy related engagement, which would improve its relevance and applicability in Uganda.</p>	<p>1 (self)</p>

<p>Use of post-graduate students' research in evidence informed health policies: A case study of Makerere University College of Health Sciences, Uganda</p>	<p>2018</p>	<p>This is a multiple case study of how research from post – graduate students theses was used in policy related documents</p>	<p>This article has been accessed 617 times suggesting it has been widely read since its publication 6 months ago in August 2018.</p> <p>Altmetric Attention Score: 5</p> <p>However, there has been no policy related engagement, which would improve its relevance and applicability in Uganda.</p>	<p>0</p>
<p>Where is students' research in evidence-informed decision-making in health? Assessing productivity and use of postgraduate students' research in low and middle-income countries: A systematic review protocol</p>	<p>2018</p>	<p>This is a protocol for the systematic review on academic research productivity. The purpose of publishing it was to share ideas on new methods and attract appraisal for improvement</p>	<p>This article has been accessed 1,078 times suggesting it has been widely read since its publication 25 months ago in March 2017.</p> <p>Altmetric Attention Score: 12</p>	<p>2</p>
<p>A systematic review on academic research productivity of postgraduate students' in low and middle-income countries</p>	<p>2018</p>	<p>This is the systematic review report following the protocol published in March 2017</p>	<p>This article has been accessed 908 times suggesting it has been widely read since its</p>	<p>2</p>

			publication 6 months ago in August 2018. Altmetric Attention Score: 11	
Working with non-state providers in post-conflict and fragile states in primary healthcare service delivery. A Systematic Review	2017	This was a mega review examining 10 interventions for primary health care in fragile states	Although this review has not been cited, it provided the basis for advocacy on: <ul style="list-style-type: none"> 1. Uganda National Health Insurance Scheme bill, which has been emended 2. Pay for performance as an additional intervention in health facilities 	0

Table 5: Grey-Literature authored by the PhD students during their training

Publication Title	Year of Publication	Statement of impact
<i>Stratégies d'amélioration des allocations budgétaires pour la santé au Burkina Faso</i>	2010	This policy brief was written and presented in a deliberative policy dialogue in Burkina Faso that led to support the state budget allocation countrywide.

<i>Stratégies de viabilisation de l'assurance maladie universelle au Burkina Faso</i>	2011	This policy brief was written and presented in a deliberative policy dialogue in Burkina Faso that led to support the universal health coverage mechanism.
stratégies d'accélération de la réduction du tabagisme au Burkina Faso	2013	This paper was written to support policy dialogue in Burkina Faso in preparation of a debate at the national assembly for the free zone smoking in Burkina Faso.
A Cost Analysis of Cambodia's Strategic Plan for HIV/AIDS and STI Prevention and Control in the Health Sector 2015-2020.	2015	The report was written to support policy discussions for raising funds in-country and to support Global Fund proposal.
Fee Guidelines for Medical and Dental Practitioners in Uganda	2016	This contributed to a remuneration policy on public service restructuring.
Task Shifting of Caesarean Section to Clinical Officers: what are the policy considerations for Uganda	2016	This paper was shared on the Uganda Medical Association online chat forum and generated heated debate.
<i>Health workers internship training: what are the policy options for Uganda?</i>	2016	This advocacy paper guided medical interns on advocacy platforms and informed a number of their constructive engagements and informed the drafting of a pending policy document.
Uganda National Health Insurance Scheme Bill 2012; policy concerns & Options	2016	This paper led to the formation of a task force under the Uganda Health Care Federation.
Rapport d'analyse du costing du plan stratégique national VIH/SIDA 2016-2020	2016	The report was written to support policy on raising funds in the country and to support the Global Fund proposal.
<i>Senior House Officers: what are the policy options for Uganda?</i>	2017	This paper lobbied fee guidelines for resident doctors which has recently been adapted under the public service salary scale policy for the different healthcare cadres.
Benin's Immunization Financing Landscape What do the 2014 and 2015 Health Accounts in Benin tell us?	2017	This brief presents Benin's immunization finance landscape using the results generated from the 2014 and 2015 System of Health Accounts (SHA 2011) exercise
Dépenses de planification familiale au Burkina Faso : Leçons aux responsables politiques	2018	This brief presents select health expenditure data derived from using the family planning guide as part of Burkina Faso's Health Accounts exercise, along

		with how the data can help answer key policy and planning questions related to family planning, with some recommendations.
--	--	--

Table 6: Public presentations delivered by the PhD students during their training

Presentation Title	Year	Conference theme	Conference location
Evaluating the Uganda Clearinghouse for health policy and systems	2012	International Forum on developing resources and capacity building to support evidence-informed health policymaking (EIHP) in low and middle-income countries	Addis Ababa, Ethiopia
CCGHR – McMaster Symposium-Workshop	2012	What Do We Know About Knowledge Translation: An Interdisciplinary Perspective”	McMaster Health Forum, Canada
Rapid Response Services to meet Policymakers’ urgent needs for Research Evidence.	2012	Health Systems Research Symposium,	Beijing, China
The African Centre for Systematic Reviews and Knowledge Translation	2013	Cochrane Collaboration & University of Laval: 21st Cochrane Colloquium	Quebec, Canada
Rapid Response Services as KT strategies for improving access to evidence in policymaking for LMIC health system managers.	2013	Improving access to evidence in policy making.	WHO Headquarters, Geneva
Building capacity for systematic reviews in low-income countries: the Africa centre for systematic reviews and knowledge translation	2014	Cochrane Collaboration & University of Laval: 22nd Cochrane Colloquium	Hyderabad, India
Building capacity for evidence synthesis in Africa	2015	1st Africa Evidence Network Colloquium	Johannesburg, South Africa
Building capacity for systematic reviews in low-income countries beyond the classroom: the Africa	2016	Cochrane Collaboration & University of Laval: 23rd Cochrane Colloquium	Vienna, Austria

centre for systematic reviews and knowledge translation			
Does Evidence-informed decision making have a place in the life cycle of health technology? 7 - 9 June 2017	2017	Southern African Health Technology Assessment Society. Gallagher Convention Centre, Midland.	Johannesburg, South Africa.
Annual meeting of the Health Technology Assessment international, 2017. Rome Italy	2017	The experience of the Africa Center for Systematic Reviews and Knowledge Translation (Uganda). Rapid response Units: the experience of LMICs	Rome, Italy
Building capacity for evidence synthesis in Africa	2017	2nd Africa Evidence Network Colloquium	Pretoria, South Africa
Evaluating User Experiences of the Uganda Clearinghouse for Health Policy and System	2018	3rd International Conference on Public Health	Kuala Lumpur, Malaysia
Evidence Synthesis in Africa	2018	Public Lecture at the Africa Centre for Evidence	Johannesburg, South Africa
Evidence informed Policymaking international community of practice, Bellagio, Italy 2018	2018	International Conference on Evidence Informed Policy	Bellagio, Italy
African Evidence informed Policy forum Nairobi March 2018	2018	Championing Evidence Informed Policy in Africa	Nairobi, Kenya
Africa Evidence Network Conference	2018	Evidence 2018	Johannesburg, South Africa

Furthermore, through the interviews, it was clear that the students' outputs extended beyond traditional publications and presentations. According to the students, three of the major output categories outside of publications and presentations are:

Other outputs

1. Contributions to the formation and maintenance of KT units

All of the students discussed either their contributions to KT initiatives, such as SURE and the EVIPNET Secretariat in Cameroon, or their establishment of new KT platforms and units, such as the Ugandan Clearinghouse for health policy and systems research and the establishment of a KT unit in the ministry of health in Burkina Faso. One supervisor stressed the importance of this work, commenting that it was a “major achievement” that the students engaged in work in “strengthening the units at their home bases”. PhD fellows have created KT platforms (The Rapid Response Services in Uganda and Burkina Faso and the Ugandan Clearinghouse for health policy and systems research) that have greatly contributed to health policy discussions in their respective ministries of health.

2. Capacity building initiatives

All of the students also named anecdotes which confirmed that a part of their outputs lie in capacity building. They discussed engaging with policymakers, decision makers, NGOs, knowledge brokers, researchers, and health-related ministries in order to advocate for the uptake of KT methodologies in decision making.

3. Consultations to improve health related services and legislations

Through their existing collaborations with government and civil society organisations, all the students discussed engaging in policy and the legislative process in order to make lasting changes in the health system. Examples of these efforts include: consultation on the implementation of professional fee guidelines for health workers in public service in Uganda, in addition consulting on issues related to drug shortage and supply at the

National Medical Stores, and improving human resources remuneration by the public service commission. These changes if brought into existence in the coming financial year 2019/2020 will have lasting impression on the health care system.

Objective 3: To describe the perceived outcomes of the program

Student- centered outcomes

1. The students were exposed to new research and KT methodologies

All of the student respondents discussed gaining skills related to research (i.e. qualitative and quantitative methodologies) and/or KT (i.e. writing policy briefs, plain language summaries, blogs and facilitating stakeholder dialogues) as a major achievement of their training.

2. The students were exposed to a broader network of opportunities

Most of the student respondents discussed having more opportunities made available to them as a result of the program. This outcome of the program is often discussed in relation to the one year exchange opportunity at McMaster University and to the networks developed during the entire program years. Many of the students felt that spending time at McMaster allowed them to broaden their perspectives, network, and as a result the opportunities available to them. A very remarkable future of the training is that the students have become extensively networked not only at a country level but also in the sub-Saharan Africa and globally. This has resulted from their active participation at seminars, workshops, conferences and collaboration in research and health policy discussions.

3. The students gained the confidence to engage with end users

Several of the students discussed having more confidence to interact and teach others about KT. One student explained that the key skills needed in KT are highly applicable to the key skills needed in teaching. The end-users also noted that the students have become more mature communicators over the course of their training.

4. The students gained a new skillset to introduce into their professional careers

All student respondents discussed effectively integrating their newly obtained KT knowledge with their other professional responsibilities, be it capacity building, leadership, consultancy, or other forms of professional pursuits. For example, one candidate recalled a particular situation in which their exposure to the Ontario Medical Association during their exchange program at McMaster University has greatly influenced their decision making as the current president of the Ugandan Medical Association (tenure 2017-2019). The supervisors also observed that the integration of KT with the student's professional career is a major outcome of the program.

5. Students gained insight into the policy making process

Several students also discussed gaining a new understanding of political science, and the policy making process, as a result of the program. The end-users greatly embraced this outcome, they noted that the students from this program stand-out among other academicians because of their understanding of the policy making process.

Field-Centered Outcomes

1. New experts in the field of KT were cultivated

One of the major field-related outcomes echoed by all the respondents was the emergence of new experts in the field of KT. The student's respondents listed many examples in which their expertise in KT was sought-after by researchers and end users alike. Several of the students mentioned being "known for" the KT mechanism they are studying, such as Rapid Response service that conducts and summarizes relevant research into rapid response evidence briefs availed to policy makers within 28 days, policy briefs and conducts policy dialogues bringing together various stakeholders such as policy makers, researchers and civil society or the Clearinghouse (a one stop centre for evidence frequently updated and maintained by one of the PhD fellows and hosted by the Ugandan Ministry of Health website). The supervisors echoed this observation. One supervisor gave the example of the Health System Global conferences, in which *"the PhD students were often very prominent"*. The end-users also agreed that the students brought a new level of expertise to the acquisition of knowledge and evidence.

2. Evidence based practice became normalized in policy making

The students discussed in detail their efforts to disseminate KT related ideas to various sectors of government and society. One supervisor made the observation that more academicians are talking about KT than ever before. The end-users also discussed their personal experiences of growing accustomed to evidence-based decision making as a result of their interactions with the PhD candidates, with such interactions viewed as both exposure to new and relevant evidence and learning opportunities for them. This further broadened their understanding and appreciation of knowledge translation in a policy making context.

3. The end users became proactive in seeking out research evidence

Another outcome of the program noted by the respondents was that the policymakers had begun to actively incorporate use of and reference to scientific research into their decision-making process. Many of the end-users discussed taking up some of the knowledge-broker's role with the support of the PhD students. One supervisor noted that evidence-informed policy making shifted from being supply-driven to demand-driven, observing that "now it is the ministry of health in Uganda demanding some of the outputs from the fellows instead of the other way around."

Program Impacts

1. Impact on Policy

There has been a significant expansion of KT platforms in Uganda, Cameroon, Burkina Faso and other Sub-Saharan countries benefiting from initiatives established by the PhD students. KT Platforms, usually partnerships between policy makers, civil society, researchers and other key health system stakeholders have been established, to facilitate the KT process. Systematic reviews, rapid reviews and policy briefs are increasingly being recognised as important tools used by various stakeholders to bring different health actors together in a bid to strengthen use of research evidence in their respective fields. As a result of these engagements, one of the PhD students has carried

out a cost benefit analysis, to inform “*Costing of the Uganda National Food Fortification Strategy*” with support from USAID, while another has participated in drafting a policy paper entitled, “*Task Shifting of Caesarean Section to Clinical Officers: what are the policy considerations for Uganda*” <http://ecsahc.org/wp-content/uploads/2017/06/HR-Task-shifting-CO-MO-rapid-review-of-evidence-2016-December-3.pdf>, to inform task shifting efforts recommended by WHO under the WHO MNH guidelines.

The students highlighted that, in order to continuously harness the benefits of KT on policy, there is need for institutionalisation of KT platforms. Although this comes with challenges that include limited availability of resources, (e.g funding and human resource capacity), KT platforms should be adapted to the political, social, research and institutional systems of a country and ensure the ability for policy makers to meaningfully engage in the KT processes and stimulate the use of research evidence.

The PhD students felt that the relevancy of KT platforms has stimulated ongoing discussions on where to best locate these platforms namely whether in a government department like ministry of health, an academic institution like a University or research institute, or a private facility.

2. Impact on Education.

Makerere University College of Health Sciences, through its efforts to improve the quality of training of healthcare professionals, has recognised the urgent need to close the gap between the creation and dissemination of high-quality evidence and its translation into clinical practice and policy. In order to emphasize the importance of KT in current medical practice, the university has introduced a module, “*Introduction of Evidence Synthesis*” for master’s students enrolled on courses within the Clinical Epidemiology Unit at the university. Some of the PhD students are currently involved in tutoring sessions on the KT module and supervision of masters’ students. One of the PhD students has been involved with tutoring a module on “*Evidence-informed policy making (EIPM)*” at Jima University in Ethiopia and the South African Medical Research Council, Cape Town, South Africa.

3. Impact on Collaborations

Participation in the PhD program has fostered collaborations and networks, as fellows recognise the urgency for greater efficiency by reducing the time between “finding the evidence and packaging it for the policy maker”. Research networks rely on (identifying and establishing professional relationships, resources and knowledge) that act as a solution for the PhD fellows’ quest to swiftly translate research findings into practice. PhD fellows, working with some of the researchers who benefitted from capacity building initiatives at the University have collaborated on a systematic review entitled, *“Working with non-state providers in post-conflict and fragile states in primary healthcare service delivery”*, funded by DFID. The PhD fellows have also collaborated with WHO-EvipNet in their capacity building efforts, “Train-the-trainers (TTT) workshops” on using research evidence for policy-making in Europe, the Middle East and sub-Saharan Africa. The fellows have also been called upon to support select WHO country teams to embed rapid evidence units in their Ministries of Health in countries like – Georgia, India, Malaysia and Zimbabwe.

4. Impact on Capacity building

At the start of the program, KT capacity was generally cross cuttingly weak across different stakeholders of knowledge producers, brokers and consumers. Right from the beginning of the program gaps were identified, that extended from knowledge producers (researchers), knowledge brokers (intermediaries that include individuals and organisations) and knowledge consumers/users (policy makers, health practitioners and the public). The PhD scholars have attracted funding to further contribute to building additional skills relevant to KT for example through the “The Africa Centre for Systematic Reviews and Knowledge Translation” where they have recruited and trained over 80 individuals from the sub-Saharan region to conduct systematic reviews.

Our PhD training program has contributed to building KT capacity in other partner organisations and institutions within the sub Saharan region and beyond. The PhD fellows have often been consulted on KT initiatives ranging from policy dialogues, to rapid response services and systematic reviews. One of the PhD students provided

consultation services to the WHO/TDR group, to train selected countries in rapid evidence synthesis and to co-author a rapid review guide for evidence synthesis. Another of the PhD fellows, was consulted by the WHO, to address the “Improvement of demand, production of, and use of research results for decision-making in MNCH programs and policies in Burkina Faso”.

Discussion

Statement of principal findings

According to the students, supervisors, and end-users involved in the program, the impact of the program has been significant and cross-cutting. Unique attributes of the program, such as co-supervision and the provision of a resource-rich learning environment, has been effectively delivered, while other aspects of the program, such as publication mandates and course accreditation procedures, may need readjustment. Changing well established university rules and procedures is a huge task and especially when the same rules and procedures apply across board to other PhD programs. A more viable option is for future trainees to prioritise their training and minimize engagement in other activities not central to doctoral training. This would allow the students to be more focused and spend less time to complete their doctoral training. Improving student experience as suggested by the students is key to success of any training program. Some of the mechanisms for stronger student support as highlighted are quite appropriate.

The trainees have made an appreciable contribution to generating new knowledge particularly in the area of demonstrating that a rapid response service to the policy makers’ urgent evidence needs is a viable option in LMICs. The 15 peer reviewed publications that we identified were collectively cited 45 times. Furthermore, the students also contributed to establishing and maintaining new KT units, building capacity among researchers and end user, and improving health related services and legislations, locally and internationally.

We can deduce from the results of the evaluation that the major outcomes of the training were the exposure to KT methodologies and opportunities, the skills developed and confidence to train others in KT, the connection they made between their careers and academic studies, and their insight into the policy making process. For the field at large, the program managed to train at doctoral level a new cohort of KT experts, who are contributing to advance the use of evidence in health systems policy making who have encouraged end-users to consider a major shift to evidence-informed policy making. The personnel trained in KT at doctoral level will be a great resource in developing the KT field as appropriate to the LMICs and will provide significant contributions to global discussions and debates in KT. However, the numbers are small and there is a definite need to put more resources to training more professionals at this level. They too will hopefully train others and in the long run with a multiplier effect in sight.

Strength and weakness of the study

One strength of the evaluation was the triangulation of data through a multi-method approach. The benefit of this approach is the opportunity to “compare information to determine corroboration” during analysis (Oliver-Hoyo and Allen, 2006). By determining important information through cross-validation, triangulation improved the reliability and validity of our findings. Similarly, interviewing key-informants from multiple sample groups (students, supervisors, end-users) further facilitated the identification of cross-validated evidence.

Another strength of the evaluation was that data collection, coding, and data analysis occurred concurrently. This allowed to incorporate emerging findings and themes into subsequent interviews, in order to generate more rich and insightful results.

One weakness of the evaluation was the small sample-size of respondents although all of the PhD candidates who were enrolled in the training program being evaluated were interviewed. Since the end-user interviews were intended to supplement the information provided by the candidates, they were identified by the students

themselves and interviewed through convenience sampling. The validity of the findings generated from the end-user interviews could have been improved with a more rigorous sampling strategy and a larger sample size.

Furthermore, capacity building in KT is a relatively new field of study without a unifying theoretical framework. According to Malterud et al., (2016) studies “supported by limited theoretical perspectives” often “require a larger sample to offer sufficient information power.” A larger and broader sample would compensate for the lack of theoretical framework for our specific area of research and enhance the validity of the results.

Findings in relation to other studies, discussing particularly any differences in results -

We found several initiatives of capacity building in KT at the doctorate level in peer reviewed literature (Appendix 1). However, unlike the IDRC RC program under evaluation, many of these programs did not focus on KT as its own field of study, but instead were interested in KT as an added skillset that allows candidates to disseminate the research and knowledge emerging from their doctoral work. Nonetheless, the existence of these programs indicates a growing interest in KT within higher education.

This interest in KT is well documented in literature in the western context, for example a report published by the University of Victoria and Community-Based Research Canada states that “federal research funding agencies in Canada have moved aggressively towards increasing support for community-engaged research and knowledge mobilization efforts” (Wenger 2012).

Our report has a unique role in informing the status of KT work in the African context and contributing to informing the decisions on investment in KT training at doctoral level. Programs like the IDRC RC, which arose through an array of related KT platforms and initiatives such as REACH, SURE, and EVIPNET, indicate that one way to strengthen the academic health sector is by embedding the training effort in existing, funded,

research platforms, teams and organizations. In 2003, a workshop held at the Canadian Institute of AADEMIC Medicine concluded that “large research teams may require new ways of training and nurturing young investigators, including improving grant writing and knowledge translation, human resource management skills and the ability to interact with disciplines that have different research methodologies” (Gray 2003).

The need to build capacity for higher education is especially essential in the African context. Onokerhoraye (2012) observes that “there is a need for more explicit recognition of the essential role of higher education and of intellectuals in sustainable development in the south.” In order for low-resource settings to become self-reliant and produce locally relevant research-evidence, it is essential to allocate resources to higher education and strengthen institutions that offer doctoral or post-doctoral training. Being a doctoral training program that not only builds student capacity to be academicians, but also the field capacity to fill the research to evidence gap. The IDRC RC program as designed by Professor(s) John Lavis and Nelson Sewankambo is a great example answering this call.

Another emerging theme in the findings of this report is the way in which the doctoral training program is embedded within a host of other activities that allowed the students to be highly engaged in the support and training of students, fellow researchers, policymakers and decision makers. There is a body of literature that supports the effort to increase interactions between researchers and policymakers. For example, the notion of “co-production,” in which research users are directly involved in the research process, emerged out of Lavis et al.’s work (2005). Since the doctoral students are not traditional researchers with a niche area of expertise but rather an in-depth understanding of a set of tools used to bridge evidence and policy, this report demonstrates the additional benefits of forming collaborative relationships between research-users, researchers and brokers.

Finally, in 2009, Forrest et al, published a list of 14 doctoral core competences in the training of PhD students in health services research. It is clear that some of the core

competences listed in that report are also targeted by the IDRC RC program. For example the need to “effectively communicate the findings and implications of KT through multiple modalities to technical and lay audiences” and “understand the importance of collaborating with stakeholders”. It may be beneficial to identify a list of core competencies relevant for training of PhD students in LMICs in KT to contextualize future efforts to plan and evaluate this type of programs.

Meaning of the study: possible mechanisms and implications for policy and practice -

The findings showed that the program was clearly beneficial, both for the students themselves and the field at large. These findings imply that the IDRC funding which initiated the establishment of the program was a worthwhile investment that should be renewed and continued. This sentiment that funding for doctoral training in KT should be continued has also been echoed by the supervisors, students, and end-users interviewed in this study.

If the funding for the program is continued, the funders should consider broadening its scope. Many of the respondents reflected that knowledge in KT should be disseminated to sectors other than health (refer to section 1.d.v), and this study has shown that training KT experts in a particular field is effective in shifting that field’s perception of KT and evidence. As such, in order to advocate for an evidence-based approach to decision-making outside of health, the funders should expand similar KT capacity building programs to other sectors in which both (1) the need to bridge evidence and practice is present and (2) there has been interest expressed in KT related engagements.

The institutions hosting the doctoral training should be aware that a unique collection of KT-related outputs may come out of the training program, as was the case in this program. As the respondents recommended (refer to section 1.d.iv), it may be worthwhile to centralize these outputs under a singular project name and brand. This would make the institutions, and by extension the PhD candidates themselves, visible and accessible to end-users, thereby introducing more opportunities for exposure and

field-work. Ultimately, this would also help brand the institution as an academic hub for KT related activities, as Makerere and McMaster are now becoming.

The implementers of the program should consider mechanisms of program delivery that would improve the student experience. For instance, the aspects of this program that the respondents reported to have been effective (refer to section 1.a.) should be scaled up, while the aspects of the program that the respondents found ineffective (refer to section 1.b.) should be reviewed. Notably, students may wish to be given a choice between meeting the publication requirements or submitting their dissertation as a singular document depending on their learning goals and urgency to complete their training. Additionally, although the opportunity for the students to study abroad should be continued and even scaled up, a greater emphasis should be placed on streamlining the process such that the students are accredited for their work abroad upon return to their home institution.

Finally, the students should be encouraged to minimize external commitments that distract them from their doctoral work and training. This is both an institutional effort and a personal one. On the institutional level, sufficient funding should be provided to the students to compensate for the lost opportunities as the students disengage from external commitments. As well, an effort should be made during the candidate selection process such that the candidates are capable and willing to prioritize their PhD responsibilities. For the students themselves, they should be encouraged to manage their time and learn to say “no” when necessary in order to focus on the completion of their doctoral work at hand.

Unanswered questions and future research -

A question that this evaluation was unable to answer is: what is the long-term impact of producing PhD-level academicians in KT on the health sector? As the sample interviewed in this evaluation focused on the candidates’ experiences rather than the end users, the documented outcomes mainly revolve around the changes produced on

the students and their careers, and to a much smaller extent, field outcomes that were visible to the students. In a rigorous impact evaluation report, the impact produced by a program should not be observed in the program's client, but the "client's client". Future evaluations should further examine the impact that the PhD candidates had on their clients when providing KT-related services (including teaching KT related content to other students), and the impact of their doctoral thesis on driving new services or research initiatives.

Another question that this evaluation failed to address is the specific benefit of providing KT training at the doctoral level. Comparative studies should be performed to evaluate the difference in outcome following KT training at varying educational levels, as well as KT training outside of academia. Since all such initiatives are oriented towards the overarching goal of "capacity building in KT", the pros and cons of each approach should be documented, such that the right programs are implemented when targeted outcomes need to be achieved.

Additionally, although a rapid review was performed to identify other doctoral training programs in KT in order to provide background to the program under evaluation, a more comprehensive effort should be made to identify such programs in a systematic review. Since KT is a relatively new field of study, there are likely many other doctoral training programs that have not been formally discussed in peer-reviewed literature. Although they were not captured in our initial literature search, it is worthwhile to consider future efforts to synthesize grey-literature on doctoral training programs in KT through relevant searches and directly contacting academic institutions engaged in KT related work.

Finally, it should be noted that another cohort of doctoral candidates in KT were funded by the IDRC RC program. These students were Canadian and trained at McMaster University, thus they were not directly relevant to the aims of the current study whose focus was on the African students. However, there were many significant parallels and difference between the training received by the Canadian and African students. Most

notably, although the two cohorts began their training at the same time, the Canadian students completed their training several years before the African students (four of whom are still in the process of completing their thesis, with one awaiting graduation having successfully defended his thesis). As such, a future research project may compare the experiences and perspectives of the Canadian and African PhD students, as well as reflect upon their collective impact on KT at large.

Conclusion

In this evaluation, we sought to characterize and document the outcomes of a doctoral training program in KT from the perspective of those involved in the program- notably students, supervisors, and end-users who have interacted with the students' work in KT. By interviewing key informants, we were able to identify several areas of strength and weakness, directions for improvement, and notable outcomes of the program. By taking stock of the publications and engagements self-reported by the students, we were also able to quantitatively document the outputs of the program. The program had a significant and positive impact on the students' careers, and evidence suggest that the program also helped to move forward the field of KT.

When the program was first established in 2009, KT was not a widely known area of study as it is today. Luckily, the funders of this program were quick to recognize the potential of KT and the importance of this line of work. Furthermore, they did not stop at funding KT activities and building KT platforms; they helped to foster a culture of experimentation and growth in the field by funding capacity-building initiatives like this doctoral training program. The PhD program is a unique KT initiative because it treats KT as an active area of academic research rather than a series of tools and mechanisms, and this has fostered rapid growth in the field, and helped to strengthen health systems at large.

Appendix 1: Tables characterizing other doctoral training programs in KT

Table 1: Characteristics of doctoral training programs in KT

Name of program	Institutions involved	Education Type	Length	Number of graduates	Year of inception	Countries of operation
IDDD	N/A	PhD CPD*	N/A	N/A	N/A	UK
KRESCENT	N/A	Post-Doc	3 years	72	2005	Canada
PreHOT	N/A	Undergraduate PhD Post-Doc	5 years	30	2008	Canada
FERASI	Universite de Montreal Universite Laval McGill University Universite de Sherbrooke	Masters PhD	4 years	4	2001	Canada
ARTC	Dalhousie University Memorial University University of New Brunswick University of Prince Edward Island	Masters PhD	2 years	7	2002	Canada
OTC	Lakehead University Laurentian University McMaster University University of Ottawa University of Toronto York University	Masters PhD	Primary graduate degree dependent	1	2002	Canada
WRTC	University of Alberta University of British Columbia University of Manitoba	Masters PhD	2 years	31	2001	Canada
SDP	Federal University of Rio Grande do Sul (Brazil) University of British Columbia, Okanagan Campus (Canada)	PhD	6-12 month	N/A	2011	Brazil Canada
CHESAI	University of Cape Town University of Western Cape	Post-Doc	2 years	4	2014	South Africa
HP4RY	University of Windsor University of Benin	PhD	N/A	2	2008	Canada Nigeria
EBPSLP	University of Central Florida	Masters PhD	15 weeks	N/A	2005	USA
ESRC	University of Aberdeen University of Liverpool	PhD	3 years	4	2006	UK
T32	The University of North Carolina at Chapel Hill School of Nursing	Pre-Doctoral Post-Doctoral	2 years	N/A	2016	USA

*Continued Professional Development

Table 2: Mandate and focus of doctoral training programs in KT

Name of program	Program Mandate	Focus of the program
IDDD	Leadership of undergraduate and post graduate education in basic and clinical pharmacology and related sciences for medical and science students, including continuing professional development (CPD) and transferable skills	Focus on Pharmacology
KRESCENT	To enhance kidney research capacity in Canada and foster knowledge translation across the 4 themes of health research (Biomedical, clinical, health systems and services, social cultural and environmental factors)	Focus on Kidneys Research
PreHOT	To enhance health researchers' capacity to understand KT principles and the practicalities of implementing effective KT practices within an interdisciplinary research team.	Focus on investigation into preterm birth
FERASI	<ul style="list-style-type: none"> To train students at the doctoral and masters' level in nursing services administration To develop research in nursing services administration To promote knowledge translation and exchange among students, researchers, DMs and policy makers 	Focus on Nursing Services
ARTC	<ul style="list-style-type: none"> To increase health services research capacity throughout Atlantic Canada 	Focus on applied health services
OTC	<ul style="list-style-type: none"> To increase health services research capacity in Ontario through a specific graduate training program-built n existing university and Decision Maker environmental strengths 	Focus on Policy
WRTC	<ul style="list-style-type: none"> To support training of applied health services researchers (master's and doctoral students) across disciplines and institutions, equipping them to address the research needs of a wide range of healthcare administrators and policy makers 	Focus on applied health services
SDP	<ul style="list-style-type: none"> to promote the progress of science and solving specific problems in Brazil and others issues common to humanity to provide a distinct opportunity to develop research skills, to increase their visibility within academia, and to expand work opportunities in an international context 	Focus on Brazilian nursing research
CHESAI	To build African capacity in the field of health policy and systems research	Focus on KT
HP4RY	<p>To generate knowledge in the context of HIV prevention for rural youth</p> <p>To develop HIV/AIDS programme in select Junior secondary schools and mobilize community around HIV/AIDS prevention for youth</p> <p>To build Capacity in both Canada and Nigeria to support similar work in the future</p>	Focus on HIV prevention for youth
EBPSLP	<ul style="list-style-type: none"> To develop an in depth understanding of intervention research design and clinical implications of EBP To develop analytical skills to assess the quality of research evidence To foster project management skills needed to manage the systematic review process To provide experience in leadership for the SLP doctoral student To generate and submit a Campbell Collaboration title registration and protocol 	Focus on Speech-Language Pathology
ESRC	<ul style="list-style-type: none"> To support PhD research to inform the development or implementation of the Scottish Government policy To encourage the use of applied research to inform public sector service delivery To build knowledge transfer and knowledge brokerage capacity in a PhD cohort group To create a collaborative network of informed and engaged PhD supervisors supporting policy relevant research in Scotland To encourage the potential for Scottish, and wider UK, universities to retain and grow emerging academic talent with the skill set to provide utilitarian research output for a policy audience. To train doctoral students to be employable in both academe and government 	Focus on KT (But both students in sample specialized in geography)
T32	<ul style="list-style-type: none"> To addressed the need for complex theory-based interventions by training nurse scientists to develop and test complex theory-based interventions To speed the translation theory-based nursing interventions to maximize health outcomes for patients, families, communities, and populations affected by chronic illnesses 	Focus on nursing

Table 3: Comparing the key features of the doctoral training program under evaluation and programs identified in the review

Key Features	None	Few	Some	Most
1. Co-supervision		1/13		
2. Institutional base in home region (i.e. Makerere)				9/13
3. Opportunity to spend time in the partner institution (i.e. McMaster)		4/13		
4. Students offer mutual support as a cohort			6/13	
5. Students have access to real, funded, KT activities in order to study them				10/13

Appendix 2: Activities and outputs inventory form

Note: Please add additional rows to each table when needed

SECTION 1: PERSONAL INFORMATION

University history (Please list all your university degree programs)			
Degree	Institution	Date	
		From	To

Employment history (Please list for the last 10 years)			
Organization	Position	Date	
		From	To

What is your date of birth? (This question is optional)	
What is your citizenship (if more than one, list by priority)?	

SECTION 2: PROGRAM EXPERIENCE

Dissertation Description	
Title of your doctoral dissertation	
A brief description (1-2 sentences) of your doctoral dissertation	

Program Timespan

When did you begin your doctoral studies (month/year)	
When do you anticipate that you will likely be awarded your doctorate degree (month/year)	

Are you aware of any scientific or professional use made of your doctoral dissertation research, or any works based on it, by organisations or persons engaged in health research, education, or policy making? If so, please provide details:	
Organization/stakeholder	How they have engaged in your research

SECTION 3: ACTIVITIES AND OUTPUTS RELATED TO KT

PLEASE FILL IN THE FOLLOWING SECTIONS FOR OUTPUTS AND ACTIVITIES RELATED TO YOUR PHD AND KT AT LARGE

Please identify the books/articles published in peer-reviewed scholarly journals, or manuscripts submitted for review, where you are listed as an author, in the last 10 years

Title	Date of publication (if published)

Please identify any other documents/ grey-literature (posters, rapid reviews, policy briefs, reports) where you are listed as an author, in the last 10 years

Title	Date of publication	Please qualify outcomes/impact, if applicable

Please list any kind of teaching you have carried out during your doctoral studies

Name of teaching engagement	Level of education (e.g. undergraduate, graduate, post-graduate, professional training, continuing education)	Institution	Date	
			From	To

Please list all courses, workshops, or training programs that you have completed during your doctoral studies

Name of learning engagement	Type of training (e.g. workshop, program, seminar series)	Institution	Date	
			From	To

Please list all presentations and conference that you have attended during your doctoral studies

Name of conference	Your role (e.g. attendee, presenter, chair)	Presentation/ conference description

Please list any KT-related consultancies that you have undertaken during your doctoral thesis

Consultancy activity/ problem addressed	Client (e.g. policy-maker name, organization, or department)	Date	Outcomes/Impact

Please list any academic awards or distinctions that you may have received during your current doctoral studies

Title	Date	Significance

Please list any sources of funding (other than the IDRC Research Chair funding) you may have received during your current doctoral studies

Funder	Name of funding initiative	Purpose for funding

Appendix 3: PhD students semi-structured interview guide

Preface

Thank you for agreeing to participate in this interview. My name is Mijia Murong, I am working with Professor Nelson Sewankambo in conducting this interview as a part of the culminative evaluation to the **IDRC Research Chair in Evidence-Informed Health Policies and Systems** project. Specifically, this evaluation will focus on the 5 African PhD students (from Cameroon, Uganda, Ethiopia, and Burkina Faso) who benefited from the IDRC funding.

The evaluation has the following objectives:

1. Understand the overall experiences of the PhD students subjected to the doctoral training program in KT
2. Document the productivity of the PhD students over the 3-year course of their training and research
3. Understand the effects (short term and long term) of the training program on the PhD students themselves, their institutions, and KT at large

This is a semi-structured interview. A copy of the interview guide should have been circulated to you for you to review. The goal of the interview is to reflect on some of your experiences as doctoral trainees from the program, and ultimately arrive at some recommendations for future efforts to build capacity in KT. We will begin with a discussion on your personal experience and output, followed by a discussion on the successes and challenges of the program, and finally wrap up with a discussion on your recommendations for future efforts to build capacity in KT.

This interview should take up 1.5 hour of your time. I will be taping the session, as well as taking some notes.

Do you have any questions before we begin?

Introductory Questions

1. How and why did you enroll in this program?
2. Please summarize your PhD research interests.
3. What were your goals coming in to the program? Please reflect on whether they were met?

Achievements

4. Reflect upon the most impactful KT related activities, or moments of achievement in your learning, that you have engaged.
5. Where do you feel that your impact is recognized/felt, locally and internationally?

Challenges

6. What were some barriers or challenges, if any, that you encountered
 - a. During your training as a PhD student?
 - b. During your research work?
7. Are there any knowledge gaps or key skills that you feel like you did not learn?

Recommendations

8. What parts of the program did you think worked well? What parts didn't work well?
9. What recommendations do you have for future efforts to implement PhD training programs in KT?

Closing

Is there anything more you would like to add?

I will be analyzing the information that you and your fellow PhD students gave me and using it to generate a second interview that is more in-depth. When will you be available to meet again, before the end of April?

Thank you for your time

Appendix 4: End-users semi-structured interview guide

Thank you for agreeing to speak with me. With your permission, I will also be recording this discussion.

As you may know, Rhona Mijumbi-Deve and Ekwaro Obuku have been working towards their PhDs in conjunction to their engagement with the Rapid Response Services. Their PhD training is supported by the **IDRC Research Chair in Evidence-Informed Health Policies and Systems** funding. I am here because Professor Sewankambo has asked me to produce a report on the productivity and impact of this doctoral training program.

As a policymaker/stakeholder, you may have observed or benefited from Rhona or Ekwaro's expertise in knowledge translation (KT). The goal of this interview is to reflect on some of the ways in which you interacted with them or witnessed their progress throughout their training, and ultimately arrive at some recommendations for future efforts to train KT experts in the African context.

1. Can you give me a brief overview of what you do and how you began your professional relationship with Rhona and Ekwaro?
2. Can you describe the kind of support that Rhona and Ekwaro give you?
3. How have they influenced your policy making process?
 - a. What are major milestones/achievements representative of their impact?
4. How frequently do you interact with academicians like Rhona and Ekwaro in your policy making process?
 - a. What kind of expertise do Rhona and Ekwaro bring, in particular?
5. How has your professional relationship evolved over the course of their PhD training?
 - a. Have you observed any kind of personal/professional growth on their part?

6. Would you describe Rhona and Ekwaro as experts in the field of knowledge translation? Why or why not?
 - a. How do they demonstrate their expertise?
7. How has the evidence-informed decision-making process changed in the past 10 years, and does training field experts like Rhona and Ekwaro contribute to these changes?
 - a. Do you think training more academic KT experts will impact policy making?

Appendix 5: Initiation focus group discussion guide

Preface

Thank you for agreeing to participate in this interview. My name is Mijia Murong, I am working with Professor Nelson Sewankambo in conducting this interview as a part of the culminative evaluation to the **IDRC Research Chair in Evidence-Informed Health Policies and Systems** project. Specifically, this evaluation will focus on the 5 African PhD students (from Cameroon, Uganda, Ethiopia, and Burkina Faso) who benefited from the IDRC funding.

The evaluation has the following objectives:

4. Understand the overall experiences of the PhD students subjected to the doctoral training program in KT
5. Document the productivity of the PhD students over the 3-year course of their training and research
6. Understand the effects (short term and long term) of the training program on the PhD students themselves, their institutions, and KT at large

I chose to put together this focus group consisting of Professor Nelson Sewankambo, Professor John Lavis, and PhD Candidate Allen Nsangi because of your unique and critical roles in the initiation and coordination of this novel PhD training program in KT.

This is a focus group discussion. A copy of the discussion guide should have been circulated to you on February 12th for you to review. The goal of the interview is to reflect on some of the achievements and challenges in the implementation of this doctoral training program, as well as to arrive at some recommendations for future efforts to build capacity in KT. Finally, we will wrap up with a discussion on what we hope to learn through the subsequent interviews that I will be conducting with the 5 African PhD trainees that took part in the program.

This interview should take up one hour of your time. I will be taping the session, as well as taking some notes.

Do you have any questions before we begin?

Participants Introduction

I was hoping that we can begin with a self- introduction of:

1. How and why you became involved in KT research?
2. How and why you became involved in this doctoral training program?

Achievements

1. What were your goals before the initiation of the project? (on June 28, 2009)
 - a. For students
 - b. For yourselves and your collaboration with each other
 - c. For your institutions (Makerere, McMaster)
 - d. For KT at large

Are those goals met 8 years later?

2. In what ways (if any) do you think the output of the program will benefit Knowledge Translation efforts at large?
3. What are some of the significant milestones of the program, particularly for the African KT trainees?

Challenges

4. What were some barriers or challenges, if any, that you encountered as key architects of the program? (e.g. lack of funding)
5. How/did you overcome the barrier (s)?
6. Are you aware of any barriers or challenges that the program participants (PhD trainees) encountered throughout their training?

Recommendations

As you are aware, the primary purpose of this evaluation is to report to the IDRC whether this type of high-level capacity building effort is worthy of further investment. Now let us discuss what the future of this work may look like.

7. What do you see as the future for this doctoral training program?
8. What strategies, interventions, tools, etc., would you recommend be sustained and/or scaled up if this program continues?
9. What strategies, interventions, tools, etc., should be discontinued or changed?
10. What recommendations do you have for future efforts to implement PhD training programs in KT in Low/Middle income settings?

PhD student feedback

Finally, following this interview, I will also be hosting interviews with each of the 5 African PhD student trained through the program.

11. Were there any questions that you feel are important to pose to them, and any aspects of their experience that should be captured in the report?

Closing

Is there anything more you would like to add?

I'll be analyzing the information generated from this discussion, and future interviews with the PhD students. I will be submitting a draft report to Dr. Sewankambo in 3 months. I will be happy to send you a copy to review at that time, if you are interested.

Thank you for your time.

Appendix 6: Exiting focus group discussion guide

ATTENDEES

- Nelson K Sewankambo -IDRC Research Chair
- Allen Nsangi – Program Administrator
- Rhona Mijumbi – PhD Student
- Mijia Murong – QES Scholar/Program Evaluator

SCHEDULE

Time	Agenda Item
9:00-9:10	Evaluator report on evaluation findings
9:10-9:30	Clarification on issues arising from previous interviews/discussions
9:30-10:30	Discussion on possible mechanisms and implications for future program implementation
10:30-11:00	Open-Question, feedback, and expectations for the evaluator

WELCOME

Thank you for agreeing to participate in this interview. My name is Mijia Murong, I am working with Professor Nelson Sewankambo in conducting this interview as a part of the culminative evaluation to the **IDRC Research Chair in Evidence-Informed Health Policies and Systems** project. Specifically, this evaluation will focus on the 5 African PhD students (from Cameroon, Uganda, Ethiopia, and Burkina Faso) who benefited from the IDRC funding.

This discussion should take up two hours of your time. I will be taping the session, as well as taking some notes. Do you have any questions before we begin?

OVERVIEW OF THE EVALUATION FINDINGS

Please refer to report outline that I have circulated to each of you.

CLARIFICATION ON ISSUES ARISING FROM PREVIOUS INTERVIEWS/DISCUSSIONS

- For the fellows in Burkina and Cameroon, exactly what kind of additional support did they receive?
- How much was the stipend support provided for the students? Could the stipend have supported the students to focus on their PhDs full-time?
- What does “protected time” look like for you?
- What were the major difference between the doctoral training received by the McMaster students and Makerere students?
- Do you think it is possible to condense all KT outputs from Makerere University under one KT unit?
- A lot of the students’ coursework at McMaster University were not credited by Makerere University. Were you aware of this problem, or any other challenges that the students faced at McMaster University?

SOME OTHER MAJOR THEMES THAT I WANTED TO CAPTURE YOUR OPINIONS ON

- Thinking in terms of “applied KT” and “theoretical KT”, why is it important (or not important) to examine KT activities through an academic/theoretical lens?
- Why is it important (or not important) to expand KT practices beyond the field of health systems? How can the PhD training program contribute to this expansion? Should it?

DISCUSSION ON POSSIBLE MECHANISMS AND IMPLICATIONS FOR FUTURE PROGRAM IMPLEMENTATION

In this section, I wanted to collectively develop some strategies to address the challenges and suggestions for improvement that arose from the interviews.

1. Difficulties meeting publication requirements
2. Not receiving credits for McMaster courses
3. Over-commitment due to financial strains
4. Over-commitment due to other opportunities and responsibilities
5. Communication challenges for international students
6. Insufficient student support system
7. The cohort felt scattered
8. KT skills can be applied to many other fields and sectors

OPEN-QUESTION TIME, FEEDBACK, AND EXPECTATIONS FOR THE EVALUATOR

- How would you like to see this evaluation being published? (in a peer-review journal, as an evaluation report, or both?)
- Was there anything else that you would like to see in this evaluation
- How much communication do you expect from me regarding my work, from now until the completion of the report?