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Health systems bottlenecks and evidence-based district health planning

*Experiences from the district health system in
Uganda*

DORCUS KIWANUKA HENRIKSSON



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Abstract

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In low-income countries where maternal and child mortality remains high, there is limited use of context-specific evidence for decision making and prioritization of interventions in the planning process at the sub-national level, such as the district level. Knowledge on the utility of tools and interventions to promote use of district-specific evidence in the planning process is limited, yet it could contribute to the prioritization of high-impact interventions for women and children.

This thesis aims to investigate, in the planning process, the use of district-specific evidence to identify gaps in service delivery in the district health system in Uganda in order to contribute to improving health services for women and children.

Study I evaluated the use of the modified Tanahashi model to identify bottlenecks for service delivery of maternal and newborn interventions. Study II and III used qualitative methods to document the experiences of district managers in adopting tools to facilitate the utilization of district-specific evidence, and the barriers and enablers to the use of these tools in the planning process. Study IV used qualitative methods, and analysis of district annual health work plans and reports.

District managers were able to adopt tools for the utilization of district-specific evidence in the planning process. Governance and leadership were a major influence on the use of district-specific evidence. Limited decision space and fiscal space, and limited financial resources, and inadequate routine health information systems were also barriers to the utilization of district-specific evidence.

Use of district-specific evidence in the planning process is not an end in itself but part of a process to improve the prioritization of interventions for women and children. In order to prioritize high impact interventions at the district level, a multifaceted approach needs to be taken that not only focuses on use of evidence, but also focuses on broader health system aspects like governance and leadership, the decision and fiscal space available to the district managers, limited resources, and inadequate routine health information systems.

Keywords: District, health systems, decentralization, evidence, planning, bottleneck analysis, governance, decision space, health information systems, maternal and newborn care, child survival, Uganda

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To Auntie Vero Mukankusi Nzabandora

If you want to go fast, go alone. If you want to go far, go together.
African proverb

List of Papers

This thesis is based on the following papers, which are referred to in the text by their Roman numerals.

- I Henriksson, KD., Fredriksson, M., Waiswa, P., Selling, K., Peterson, SS., (2017) Bottleneck analysis at district level to illustrate gaps within the district health system in Uganda. *Global Health Action* 2017;10(1):1327256.
- II Katahoire, RA., Henriksson, KD., Ssegujja, E., Waiswa, P., Ayebare, F., Bagenda, D., Mbonye, KA., Peterson, SS. (2015) Improving child survival through a district management strengthening and community empowerment intervention: early implementation experiences from Uganda. *BMC Public Health* 15:797
- III Henriksson, KD., Ayebare, F., Waiswa, P., Peterson, SS., Tumushabe, EK., Fredriksson, M. (2017) Enablers and barriers to evidence based planning in the district health system in Uganda; perceptions of district health managers *BMC Health Services* 17:103
- IV Henriksson, KD., Peterson, SS., Waiswa, P., Fredriksson, M. Decision making in district health planning in Uganda: Does use of district-specific evidence matter? *Manuscript*

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Abbreviations

ANC	Antenatal Care
CODES	Community and District Empowerment for Scale-up project
CRC	Citizen Report Card
CQI	Continuous Quality Improvement
DHIS	District Health Information System
DHMT	District Health Management Team
DHO	District Health Officer
DHS	District Health System
EBM	Evidence-Based Medicine
EBP	Evidence-Based Planning
EQUIP	Expanded Quality Management Using Information Power
GAVI	Global Alliance for Vaccines and Immunizations
HC	Health Centre
HCII, III, IV	Health Centre – Level II, Level III, Level IV
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
HSD	Health Sub-District
HSDP	Health Sector Development Plan
HUMC	Health Unit Management Committee
IDI	In-Depth Interviews
LIC	Low-Income Country
LQAS	Lot Quality Assurance Sampling
MBB	Marginal Budgeting for Bottlenecks
MFPED	Ministry of Finance Planning and Economic Development
MMR	Maternal Mortality Ratio
MoH	Ministry of Health
NHP	National Health Plan
PHC	Primary Health Care
PFP	Private-For-Profit
PNFP	Private-Not-For-Profit
PREFA	Protecting Families Against HIV/AIDS
SMS	Short Message Service
SSA	Sub-Saharan Africa
TDF	Theoretical Domains Framework
UMHCP	Uganda Minimum Health Care Package
U5MR	Under-5 Mortality Rate

UNCST	Uganda National Council of Science and Technology
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USD	United States Dollar
WHO	World Health Organization

Preface

After medical school, I was full of energy ready to go out and save the lives of Ugandans. I ended up in one of the few regional referral hospitals at that time as an intern doctor. Surgery was one of my two majors during the internship. I have vivid memories of that day, I got up very early, just to be sure that I was not late for my first day on the surgery ward as a 'doctor'. We (together with the other new interns) were greeted by the sister in-charge (Nursing officer) and the day began with introductions and a tour of the ward, treatment rooms, consultation rooms, patient beds, etcetera. We then moved on to the operating theatre. I remember stopping in my tracks when the door opened, thinking to myself, 'how can anyone not acquire post-operative infection after a procedure in here?' One could not compare the theatre in this regional referral hospital to the one I had spent several years training in as a medical doctor. The faculty of medicine I attended was relatively new but well established with an operating theatre that fulfilled the highest standards of infection control. On that first day as an intern doctor, my heart sank, and I began my journey providing care to those who desperately needed it, working in a system that was far from ideal. At that time, I had never heard of the 'health system' as a concept. If I knew what I know today, I would have realized that the system bottlenecks were mostly as a result of 'upstream' issues that we (interns and hospital management) neither had the resources nor the 'power' to change.

After my internship, (still very enthusiastic!) I joined the district health system as an in-charge of a health-sub district that was much more rural than the hospital I had worked. On my first day, I was met by the district health officer who was at that time called the district director of health services. He told me about the district, introduced me to my new colleagues and informed me that the health center IV I would be working in had not had a medical doctor for a while and they were all delighted to have me. We then drove together to the health centre IV which was not very far from the district local government headquarters, where we had been. The health center IV had three buildings including the 'doctor's house'. The doctor's house was then home to two families of staff that worked at the health centre. That left two buildings, one that was the out-patient department and the administrative office for the health sub-district. The other building had treatment rooms, a laboratory and the store where medicines and other supplies were kept. There was a fourth building under construction, and it was the theatre; however, construction had been

halted because of the poor quality of the construction work. I never got to put my newly acquired surgical skills to use, not at that health centre. I started a new journey where I was expected to attend to patients at the health centre IV, attend district health management team meetings, fulfill my duties as the district malaria focal person, in-charge of a health sub-district, attend health unit management committee meetings, and the list goes on and on. I had to quickly develop skills I had never been taught, one very important being multitasking to thrive in that environment. On the one hand, the community had very high expectations because I was a doctor and they had not had one in a long time. The community members could see a building that they were told is a theatre but could not understand why they had to be referred several kilometers for relatively simple surgical procedures. On the other hand, I was expected to attend several meetings and do the equally important job of making sure all the other health facilities in the health sub-district were functioning well.

From the health sub-district, I then become a district director of health services, which meant that I had more responsibilities for even more health sub-districts and people, more meetings to attend and more administrative work to do. However, there was a critical new dimension that came with the territory, the politics at the district level. I could go on and write hundreds of pages about my experience in the district health system and my 'upstream' experiences after that. I hope that this gives you a tiny insight into the context within which several hard-working and committed health professionals work and in which I conducted my studies for this Ph.D. thesis.

Introduction

Maternal, newborn and child mortality – Globally and in Uganda

About 16,000 children under the age of five die every day – 11 each minute, approximately 5.9 million every year mainly from preventable causes (1). About 45 percent of these deaths occur during the first 28 days of life, that is during the neonatal period (1). Countries in Sub-Saharan Africa (SSA) disproportionately account for high numbers of child mortality. West and central Africa have the highest under-five mortality rate (U5MR) worldwide, with 98.7 deaths per 1000 live births, or approximately 1.8 million deaths per year (30%). This is almost 15 times higher than the average U5MR in high-income countries at 6.8 deaths per 1000 live births. Another 1.1 million deaths (18%) occur in eastern and southern Africa (2). SSA also accounts for roughly 66% (201 000) of all maternal deaths, with a maternal mortality ratio (MMR) of 546 deaths per 100 000 live births in 2015 compared to 12 for high-income settings (3, 4).

Although significant progress has been made in Uganda and at the global level, maternal, newborn and child mortality remain a global health challenge. Mortality is still unacceptably high, especially in SSA countries, which are mostly low-income countries (LIC). Uganda, which is the empirical focus in this Ph.D. thesis, saw a decline in MMR from 438 deaths per 100,000 live births in 2011 to the current 336 deaths per 100,000 live births (5). According to the Uganda demographic health survey conducted in 2016, the U5MR also decreased from 147 deaths per 1000 live births in 1995, to 64 in 2016 (5). The majority of deaths are preventable or avoidable through the provision of timely interventions proven to be effective and affordable (6, 7). Yet due to constraints and bottlenecks both within and outside the health system (8), effective interventions often do not reach the people who need them the most.

However, there is a limited understanding of health system barriers to delivery and utilization of these affordable and effective interventions in districts and sub-districts in low-income countries (9), where service delivery takes place (8). Most studies focus on the global and national levels (10, 11) where studies have identified barriers within the health system using clinical (12) and patient pathway frameworks (13). Another obstacle is the failure to prioritize and plan for evidence-based essential interventions (14, 15). Prioritization and planning for these interventions requires adequate health systems; therefore,

the challenge is to identify strategies that address the issues of health systems strengthening and delivery of system-oriented interventions that focus on local contextual needs and the important influences on service providers and users (16).

Important concepts in this thesis include district health systems (DHS), decentralization, the planning process, and use of evidence in the planning process. The health system building blocks of particular importance in this thesis are leadership and governance (stewardship), the health information system, and health system financing. However, all health system building blocks and their relationships and interactions are essential and will be further discussed before the aim and purposes are presented. After discussing the results and presenting my conclusions, I will then give recommendations for program implementation, policy and for future research.

Health system building blocks

Health systems consist of all organizations, people, and actions whose primary intent is to promote, restore or maintain health (17). According to the World Health Organization (WHO), the health system's goals are 'improving health and health equity in ways that are responsive, financially fair, and make most efficient use of available resources' (17). The key functions of the health system include: providing services; generating the human and physical resources that make service delivery possible; raising and pooling the resources used to pay for health care; and the function of stewardship (18).

Several health systems frameworks have been documented (19-21) including an analytical framework by the WHO which disaggregates the health system into six core components, leadership and governance (stewardship), service delivery, health workforce, health information system, medical products, vaccines and technologies, and health system financing, also referred to as building blocks (16). Another analytical framework is the health system dynamics framework (22) which incorporates components of the WHO building blocks (16, 17), and considers some components more important than others, with governance and leadership and interaction with the population and actors being central to service delivery. The health system dynamics framework also draws upon the concepts of systems thinking (16, 23) by taking into account the dynamic relationships and interactions between the components of the health system.

Health system relationships and interactions

According to De Savigny and Adam (2009), the interactions between the various health system components and how they affect each other is what converts them into a health system (16). Therefore, the components of the health

system do not function on their own but do so by interacting with each other within a dynamic system (24). Relationships between the individuals in the health system and the broader social values and context also affect the functioning of the health system. Gilson, in 2003, documented that health systems are inherently relational and therefore some of the critical challenges are related to relationships, trust, and the behavior of the individuals within the health system (25). As a result of the realization of these relationships, systems thinking draws attention to the nature of relationships and the synergies that arise from them to promote the understanding that it is the sum of these (relationships and synergies) and the components (building blocks) that result in a well-functioning health system (16, 23). The health system operates across three different levels; the macro, meso and micro levels. The macro level usually refers to the national level while the meso level relates to the regional or district level and the micro level to the individuals within the health system (26, 27). These different levels have different roles and responsibilities within the health system. The meso level (district) in a decentralized health system constitutes the focus of this thesis.

Decentralization and the health system in Uganda

Health systems in many African countries have undergone significant reforms, with decentralization of health services being central to these changes (28, 29). Decentralization is the transfer of authority and responsibilities for governance and public service delivery from the central government to sub-national levels of governments (regional, district or local) (30). The intention is to promote accountability, local preference (31), and to make health systems more equitable, inclusive and fair (32). Decentralization was promoted by several organizations, including the United States Agency for International Development (USAID), United Nations Children's Fund (UNICEF), WHO (28) and in the World Development Report 1993: Investing in Health (33).

There are three modes of decentralization: devolution, delegation and deconcentration. Devolution is the deepest mode of decentralization and refers to the shift of authority, responsibility and accountability from the central government to lower autonomous levels: provincial, district or municipal governments (28, 30, 34). Delegation is an intermediate level of decentralization, where some authority and responsibilities are transferred to a lower level of government, but where there is a principal-agent relationship between the central and sub-national government, with the agent remaining accountable to the principal. The least ambitious level of decentralization is deconcentration, where responsibilities are transferred to an administrative unit of the central government that is spatially closer to the population where service is to be provided (28, 30, 34).

Decentralization is a complicated process and its application varies according to the setting. Although the modes of decentralization indicate the location of the power, they do not provide an answer to the level of authority for decision making that is transferred to the lower levels (28). Different dimensions of decentralization attempt to address this. Administrative decentralization refers to the transfer of authority for policies and decision making, while political decentralization refers to how voices of local citizens integrate into politics. The fiscal dimension is about assignment of expenditure and revenue raising authority (30).

In 1997, Uganda took on political, administrative and fiscal decentralization, thereby transferring authority from the central government to the local government authorities, mainly in the form of devolution (35, 36). Unlike many other countries, Uganda has no functional ‘intermediate level’ such as provinces or regions (8), although this level has been planned for and included in the health sector development plan 2015/16-2019/20 (10). Empirical evidence suggests that compared to central government, decentralization has helped local governments in LICs to better respond to local needs. In Colombia, Faguet and Sanchez in 2014, showed that decentralization improved enrollment rates in public schools and access for the poor to public health services. In both sectors, improved access was driven by the financial contributions of local governments (37). There is a general support for decentralization in society as well as within the health sector. However, skeptics have argued that it is hard to generalize the relationship between decentralization and effective government performance (38).

Some case studies in the health sector in LICs have demonstrated negative effects of decentralization for example, in Zambia and the Philippines, where inadequate funding for health programs and political interference with local appointments led to poor staff morale and deterioration of service delivery (39). In the Philippines, the integrity of the referral system for obstetric care was disrupted (40). A study in Tanzania showed that over dependency on the central government, especially for financial resources, undermined decentralization (41). Some of the other documented shortcomings of decentralization are the lack of decision space (42), inadequate funding, incompetent staff (43), corruption, and creation of new districts (44). In line with this, in recent years the number of districts in Uganda has increased exponentially. The number has almost tripled in a period of about two decades, from 38 in 1991, to 112 in 2014 (45, 46), and to 116 districts in 2017 (47). This rapid increase has led to different levels of infrastructure, human capacity and organizational capacity to carry out various tasks among districts. While the health sector has performed relatively well against some objectives (such as, the increase in the number of new outpatient contacts and increase immunization rates), health system performance has tended to vary across and within districts (48).

The health system in Uganda

In Uganda, the health sector agenda is guided by the second national health policy (NHP II), which has strengthening health systems through decentralization and evidence-based policy as some of the guiding principles (49, 50). In the medium and long term, the health sector agenda is defined by the health sector development plan (HSDP) 2016/16 - 2019/20, with the goal ‘to accelerate movement towards universal health coverage with essential health and related services needed for promotion of a healthy and productive life’ (50). The core strategy of the HSDP for achieving outcomes is the implementation of the Uganda national minimum health care package (UMHCP) (49, 50).

Health services are delivered through the public sector as well as the private sector. The private sector includes private-for-profit (PFP), private-not-for-profit (PNFP) and complementary health service providers, such as traditional medicine providers (51). Public health facilities account for 55% of care facilities, while PFP and PNFP account for 29% and 16% respectively (52). In the public sector, health services are provided by the national referral hospitals, the regional referral hospitals, and the district health services as shown in Figure 1 (50, 52). The health services are structured by national referral hospitals, regional referral hospitals, general hospitals, health centre (HC) IVs, HC IIIs, HC IIs and village health teams (50, 51), as shown in Table 1.

Table 1. *Health facilities in Uganda and their administrative levels*

Health service level	Number of facilities (50)	Population ratio standard	Current situation (46)	Administrative/political level
National referral hospital	2	1: 10 000 000	1: 30 000 000	National (MoH)
Regional referral hospital	14	1: 3 000 000	1: 2 307 692	National (MoH)
General hospital	114	1: 500 000	1: 263 157	District
HC IV	197	1: 100 000	1: 187 500	County
HC III	1289	1: 20 000	1: 84 000	Subcounty
HC II	2947	1: 5 000	1: 14 940	Parish
HCI/VHT	-	1: 1 000 or 1 per 25 households	-	Village

The provision of health care is the responsibility of two levels of government – the central (macro level) and the local (meso and micro level).

The local government, at the district level, is responsible for the delivery of health services, planning, management, and implementation of policies (50). Other responsibilities include recruitment, development of human resources, development and passing of health related by-laws, and monitoring of overall

health sector performance, as shown in Figures 1 and 3. The local governments also supervise and monitor all health activities (51). The central government, through the Ministry of Health (MoH), as shown in Figure 1, is responsible for core functions such as policy formulation and setting standards, planning, quality assurance, resource mobilization and the management of national and regional hospitals. These responsibilities are carried out in collaboration with other central institutions, like the health service commission and national medical stores. The central and local level have shared responsibility for leadership and governance (stewardship), the health information system and medical products, and vaccines and technologies. In addition to these, the central level is responsible for health financing, while the local level is responsible for service delivery and the health workforce.

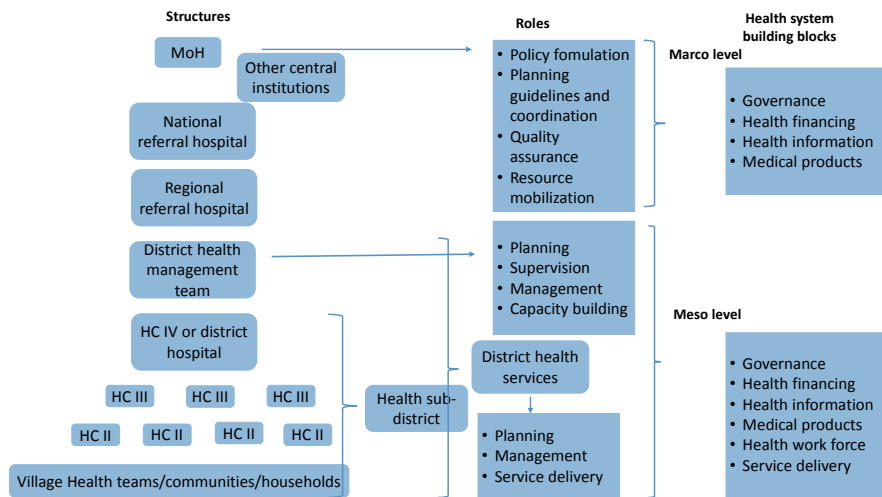


Figure 1. Managerial organization of the health sector in Uganda

The district health system

The district health system received political endorsement as the key strategy to achieve 'Health for all' during an inter-regional meeting in Harare, Zimbabwe in 1987, organized by WHO (53). With the decentralized system of governance in Uganda, the DHS is part of the district local government (36) and is a self-contained segment of the national health system. The DHS is headed by a district health officer (DHO), in collaboration with appointed officials from the district health management team (DHMT) (50). See Figures 2 and 3. The DHS is governed by a district council of elected officials (36, 54, 55), as shown in Figure 3. Some of the core members of the DHMT are the DHO, maternal and child health officer, environmental health officer, health inspector, health educator, biostatistician, program focal officers, and health sub-

district in-charges although the composition and number of members may vary from district to district (47, 56).

District health management team (DHMT)

The district health system in Uganda is headed by appointed officials composed of the district health management team (DHMT). The team is headed by the district health officer (DHO).

Composition of the DHMT

The composition and the number of members of the DHMT varies from district to district however the core members include:

- District health officer, who is the head of the DHMT
- Assistant district health officer
- Maternal and child health officer
- Environmental health officer
- Senior health inspector
- Senior health educator
- Biostatistician
- Program focal officers
- Health sub-district in charges
- Assistant chief administrative officer
- Assistant district planner

Roles and responsibilities of the DHMT

- Prepare a district health sector strategic plan
- Coordinate planning for health services
- Prepare annual plans
- Co-ordinate all stakeholders, including development partners at all levels in the district
- Oversee operational research and any sector specific studies in the district
- Monitor planned implementation
- Mobilize resources for the district health programs
- Promote staff welfare
- Monitor and evaluate staff performance

Figure 2. The DHMT in the district health system in Uganda (47)

After the Harare declaration, the DHMT was entrusted with a pivotal role in the development of the district health system. Many expectations were put upon these teams, probably too many: policy implementation and planning; human resources development management; quality assurance and supervision; coordination and integration of health services; disease and epidemic control and disaster preparedness; monitoring and evaluation of health services; advocacy for health services; budgeting, and allocation of resources; and leadership (34, 35). The discrepancy between the vision and the reality has sometimes been significant, especially in places where the district strategy has been implemented in too bureaucratic a fashion, ignoring the complex nature of health systems (36).

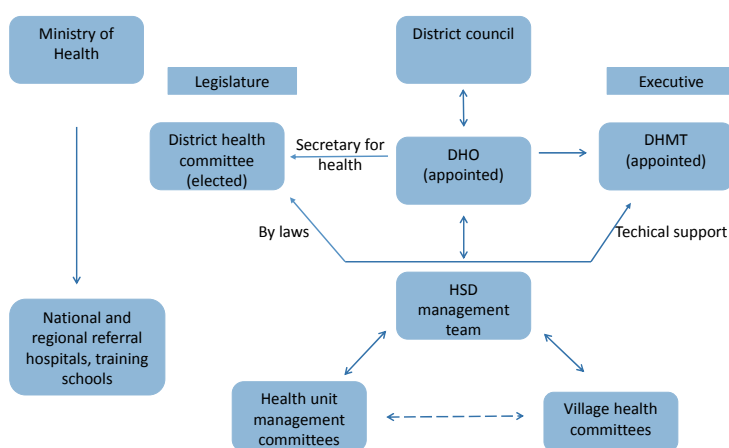


Figure 3. Governance structure of the district health system in Uganda

Governance for health

Health governance is about the role of the government and decision makers in health and their relation to other actors whose activities impact on health. Governance involves setting the rules, steering, overseeing and guiding the whole health system, to protect the public interest. Governance is a political process that involves balancing competing influences and demands (57).

Governance for health in Uganda is provided through three governance, management, and partnership oversight structures at all levels: 1) The management structure: guides internal ministry of health coordination and implementation of defined interventions and activities at the different levels; 2) The governance structure: defines the strategic direction of interventions and follows up on the operation. This role is largely defined through formal legislation, with members and functions formally set by the government; 3) The part-

nership structure: guides external coordination of service delivery by all stakeholders at the respective levels of care. All partners at any given level of care should engage with each other through this structure. All these structures are intended to establish a sector-wide governance mechanism (50, 55).

At the district level, the DHMT is responsible for the planning, organizing, monitoring and evaluation of services in the whole district, and effective coordination among all health-related stakeholders in the district (50). (See Figure 2). The health sub-district management team's responsibilities are the same as the DHMT, except conducted at the HSD. The second national health policy provides for the establishment of a health unit management committee (HUMC) and a hospital board to provide stewardship in operations of health centers II – IV and hospitals, respectively. HUMCs and hospital boards are critical in overseeing the development, approval, implementation, and monitoring and evaluation of health facility plans (50). The governance structure for the DHS is shown in Figure 3.

Resource allocation in the health sector

The MoH is responsible for the allocation of central government grants between local governments. The grants include primary health care (PHC) recurrent non-wage, PHC wage, and PHC conditional grants. These grants are linked directly to the district annual work plans and budgets, as approved by the district council, if not objected to by MoH. Allocation of grants to organizational units within the district, namely DHO, HSD, HC IV, HC III, and HC II, is also guided by the MoH (50).

The PHC wage is allocated according to the number of staff in post and the planned recruitment. PHC recurrent non-wage allocation should be equal to or higher than the previous financial years. Its allocation is based on the following criteria; 1) a fixed amount to each district to cater for the cost implications of a higher local government; 2) a fixed amount for hard-to-reach local governments and those implementing special government programs, and 3) a variable amount depending on the estimated number of infant deaths in each local government (50). PHC conditional grants are released upon timely submission of performance reports by the district local government to the Ministry of Finance Planning and Economic Development (MFPED) and MoH. Utilization of this grant should be per the PHC conditional grants guidelines, issued by MoH each financial year. However, a review of the allocation formula is underway to consolidate the grants and introduce performance- and results-based financing (50).

The health information management system

According to the 2016 MoH guidelines for the local government planning process, all districts in Uganda have transitioned to the District Health Information System-2 (DHIS-2) platform (47). DHIS-2 is an electronic web based health management data platform for aggregate statistical data collection, validation, analysis, management, and presentation (58). With the use of mTrac, which is a short message service (SMS)-based health system strengthening tool, health management information system (HMIS) data is collected at the health facilities and directly analyzed by the DHIS-2 platform at the national level (59).

Planning in the Ugandan health system

Planning is a process that aims to ensure that the resources available now and in the future are used most efficiently to obtain specific objectives (60). The 1997 local government act and the constitution mandate the district local government to plan, budget and implement health policies and health sector plans. However, the central government has the role of setting standards and providing guidelines to the local governments. While the Ugandan health system is decentralized, most of the priority setting is carried out at the national level and communicated annually to the district local governments during regional planning meetings (47). Districts then follow these national guidelines during their planning process (26, 50). The MoH is also responsible for coordinating planning activities which typically follow an annual planning cycle, and compiling annual work plans for the health sector (47). However, the increase in the number of districts and the absence of a regional level has weakened the capacity of the MoH to effectively coordinate, support and supervise the growing number of districts (51). This led to a deterioration in the planning process within districts (61). The deterioration resulted in a critical review of the DHS and revision of the guidelines to the local government planning process which emphasizes the use of district-specific evidence in the planning process (47, 61).

District health systems and the planning process

Planning is one of the key functions of the DHMT. The planning process at the district level takes both a bottom-up and a top-down approach. Work plans from HC II, HC III, and HC IVs (see Figure 1) are consolidated into health sub-district work plans which are then merged into a district work plan. This process is designed to involve input from community members through health facility management committees (47). The MoH sets the national priorities which are communicated to the district local governments, who then make

their work plans according to these priorities, thus making the planning process both bottom-up and top-down (47). During the planning process, the DHOs together with the DHMT are increasingly making decisions regarding the performance of health services and health system, thus playing a pivotal role in the planning and implementation of health interventions, the management of health services, and the delivery of health outcomes (37, 45, 50).

The district planning process in Uganda, like in many other LICs, has been affected by factors such as political and technical resistance to effective decentralization, the limited operational responsibility of the DHMT (61, 62), the rapid increase in the number of districts (44), and limited financial resources and decision space (63, 64). Donor and other institutional priorities and concerns for example, about measurable results and promotion of vertical and disease specific programs have also affected the district planning process (61, 62). Furthermore, the DHS has evolved as a result of increasing populations, changing disease patterns, urbanization, and the enhanced role of the private sector. The important focus previously given to the district planning process in the 1990s mainly concerned the capacity of the DHMT to better use available public resources (61, 65, 66). However, there is limited knowledge and experience of the changes needed in this changing context, such as the use of district-specific evidence to prioritize high-impact interventions for maternal newborn and child survival.

Use of evidence in the planning process

Evidence-based planning (EBP) is the process of basing decisions about ways to address a problem on information to achieve the best results (67). The use of evidence in the field of medicine is usually understood as evidence-based medicine (EBM), which is defined as ‘the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients’ (68, 69). Over the years, evidence-based health policy making has become increasingly common (70, 71), thus shifting the focus away from the individual level to the population level (72).

What constitutes ‘evidence’ in the area of evidence-based and evidence-informed policy making has been a subject of discussion. Rychetnik et al. define evidence as facts or testimony in support of a conclusion, statement or belief (73). Oxman et al. have a similar definition, saying that evidence is concerned with actual or asserted facts intended for use to support a conclusion (74). However, both of these definitions are broad and do not speak of the context within which evidence is used, what is considered evidence, and who uses the evidence (73).

Policies are not made solely based on evidence, but other factors are considered as well, such as the priorities at the time the policy is decided, the context and financial resources, and the actors involved (75). Therefore, the

use of evidence in policy-making involves a complex process of interactions between policy actors and different powers, interactions and agendas (75), and can be affected by institutional characteristics and the political process. Therefore some literature refers to evidence-informed policy making (76-78) and not evidence-based policy making. However, both refer to a transparent, systematic appraisal of the available evidence for its use in the policy making (74).

Evidence-based planning, as defined by Steen, is a process of basing decisions about ways to address a problem on information to achieve the best results (79). Although evidence-based planning is not as commonly referred to in the literature, it follows similar principles as evidence-based or evidence-informed policy making, with the primary purpose being the use of evidence to inform decision making.

However, there is limited knowledge on how evidence informs decision making in the planning process at the district level, which is the level of implementation of policy and service delivery. Although planning should be increasingly evidence-based in order to prioritize activities (80, 81), priority setting in LICs like Uganda has been described as ad hoc and seldom evidence-based (26, 82, 83). The poor use of evidence has been attributed to the lack of tools to aid priority setting and decision making, amongst other things (14, 15). Even when tools are available, they are not always used by decision makers in LICs (84) as they lack credibility for priority setting in this setting (84, 85). One of the tools that can be used to inform the planning process based on district-specific data is the bottleneck analysis tool (86, 87).

The bottleneck analysis tool to identify gaps in service delivery

The Tanahashi model for bottleneck analysis was first described in 1978. It displays bottlenecks in the health system with a focus on quality and effectiveness of interventions (87). The model emphasizes the importance of effective coverage, which is coverage of sufficient quality to reach a defined health impact (88, 89) and not merely geographic access (90). The Tanahashi model used in this thesis was modified for its use in the Marginal Budgeting for Bottlenecks (MBB) tool. The MBB was developed to enable LICs at the national level to plan for, cost, and budget marginal allocations to health services, and assess their potential effect on health coverage (91). So far the modified Tanahashi model has mainly been used at the national level, and its utility at the district level remains to be determined.

The modified Tanahashi model still focuses on determinants of effective coverage. However, as opposed to the original model which has five determinants (accessibility, availability, initial utilization, adequate coverage and effective coverage), the modified Tanahashi model divided the determinant 'availability' into the availability of human resources and the availability of commodities. This division was thought to reflect the types of data that are

available and still allow for a stepwise approach to identify bottlenecks to achieving effective coverage (92). The modified Tanahashi model, therefore, has six determinants for effective coverage. The first three determinants –accessibility, availability of human resources, and availability of essential health commodities – are supply-side determinants in the health system while initial utilization and continuous utilization focus on the demand-side, and effective coverage on the quality of service provided.

Supply-side determinants are defined as those factors that influence the production and function of health care. Demand-side determinants are those that operate at the community, household, and individual levels, and are influenced by demand of health services (93). Similar to the original model, the six determinants reflect six distinct aspects of service provision that can be used to assess service delivery. Examining the largest differences between each determinant indicates larger losses of health system effectiveness, thus pointing to those areas of service provision that need to be prioritized. This loss of effectiveness is referred to as a ‘bottleneck’ within the health system (92). Effective measures are then determined during the planning process to overcome these bottlenecks in order to improve service performance and quality.

Rationale

In Uganda and many other LICs, maternal, newborn and child mortality remains unacceptably high. In many of these countries, the health system is decentralized where district health systems implement interventions and are the first point of contact with users of the health system. Resources within the health sector and the district health system in low-income settings are limited and yet countries are expected at the same time to achieve ambitious targets like universal health coverage and sustainable development goals. Meanwhile, local contexts at the district level are different, and local priorities and ‘bottle-necks’ in implementation may differ between districts. Thus, there is a need for planning that is driven by the use of district-specific evidence and identification of bottlenecks to service delivery within the district health system. However, there has been limited focus on the use of district-specific evidence in the planning process at the district level, even in decentralized systems. This has led to the planning processes in a low-income country like Uganda being described as ad hoc and seldom evidence-based (26, 82). The poor use of evidence has been attributed to the lack of tools to aid priority setting and decision making (14, 15), amongst other things. Even when tools are available, they are not always used by decision makers in LICs (84) as they lack credibility in this setting (84, 85). Furthermore, the understanding of health system bottlenecks at the district level is limited, with most studies focusing on the global and national levels (10, 11).

Therefore, there remains a knowledge gap on using local data presented in bottleneck analyses at the district level to identify bottlenecks within and outside the health system, and on the use of district-specific evidence in the planning process at the district level in low-resource settings and decentralized systems like Uganda. Furthermore, while district health managers are entrusted with the role of planning and ensuring implementation of effective services (50, 51), there is limited knowledge on their ability to carry out evidence-based planning. For instance, are the district health managers empowered and able to spearhead planning of effective, efficient and quality service delivery? What happens in the intersection between the technical and the political decision makers, and how does the interaction between the technical and the political decision makers influence the use of evidence in the planning process? Do the district managers have the means or resources, tools, and the skills to use evidence in the planning process? What are the enablers and barriers to using evidence in the planning process?

This thesis focuses on contributing knowledge on the utility of the bottleneck analysis at the district level (Study I); how tools that utilize district-specific evidence for decision making and priority setting can be adopted into the district planning process (Study II); understanding the barriers and enablers to use of district-specific evidence in the district planning process (Study III); and how the use of district-specific evidence affects the planning process (Study IV). Figure 4 presents a conceptual framework for the thesis, and summarizes the studies and how they relate to the planning process and service delivery within the DHS.

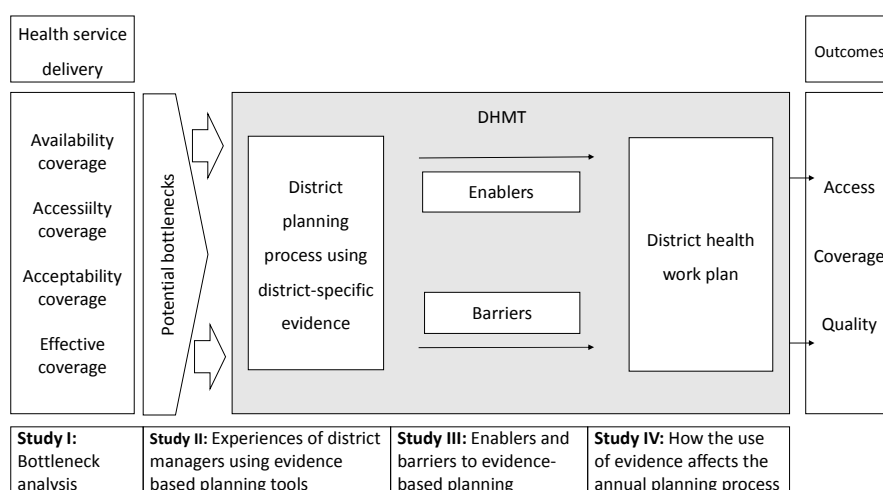


Figure 4. Conceptual framework for the thesis, Adapted from Tanahashi T: Health service coverage and its evaluation (87), and De Savigny and Adam: Systems thinking for health systems strengthening (16)

This conceptual framework takes into account the fact that the DHMT has the responsibility for the planning process, which should be based on district-specific evidence. The planning process should also be guided by the knowledge on the potential bottlenecks for provision of health services. The assumption is that using district-specific evidence that also takes into consideration the potential bottlenecks to service delivery will result in work plans that incorporate these priorities, and whose implementation will lead to better access, coverage, and quality of maternal, newborn and child survival interventions. The implementation and outcomes of implementing these activities in the district work plans are not part of this thesis.

Aim and objectives

To investigate, in the planning process, the use of district-specific evidence to identify gaps in service delivery in the district health system in Uganda in order to contribute to improving health services for women and children.

Specific objectives

- I To illustrate how a modified Tanahashi model can be used to identify bottlenecks in service delivery at the district level. (Study I)
- II To determine district health management teams' experiences in the adoption of tools used for evidence-based planning. (Study II)
- III To determine barriers and enablers to the evidence-based planning process at the district level. (Study III)
- IV To investigate how the use of district-specific evidence affects the district annual planning process. (Study IV)

Methodology

Overview of the study design

In order to address the specific objectives, this thesis consists of four studies, which were conducted in seven districts in Uganda and correspond to four Studies as shown in Table 2.

Table 2. *Overview of study design*

Study	I	II	III	IV
Research question	Can the modified Tanahashi model identify bottlenecks in service delivery at the district level?	What are the district managers' experiences of adopting tools for evidence-based planning?	What are the enablers and barriers to evidence-based planning at the district level?	How does the use of district-specific evidence affect the planning process?
Study setting	Two districts	Five districts	Two districts	Two districts
Design	Descriptive cross-sectional study	Qualitative study	Qualitative study	Qualitative study; Descriptive study
Study population	6513 women who had a live birth 2010-2014; 50 public health facilities	District managers and implementing partners	District managers	District managers; district annual health work plans; bottleneck analysis reports
Data collection	Structured questionnaires; health facility censuses	In-depth interviews	Semi-structured interviews	Semi-structured interviews
Analysis	Bottleneck analysis	Thematic analysis (94)	Thematic analysis	Thematic analysis; descriptive work plan analysis

Study I evaluated the use of a modified Tanahashi model to identify bottlenecks in service delivery at the district level. Study II documented the experiences of district health managers in adopting tools for the use of district-specific evidence during the planning process. Study III determined the barriers and enablers to the use of district-specific evidence in the planning process. Study IV investigated how the use of district-specific evidence affected the planning process.

Study setting

Studies were conducted in seven districts in the eastern and central region of Uganda (see Figure 5). Uganda is a LIC located in East Africa with an estimated population of about 34.6 million, with an average annual growth rate of 3.0%. About 48% of the total population is below the age of 14 years. Life expectancy at birth is estimated to be 63 years. About three-quarters of the population live in rural settings, and about 80% of the population are involved in agriculture. Uganda has a gross national income per capita of 690 US dollars (5).

The health system in Uganda is made up of the public and the private sectors. The public sector consists of government health facilities under the MoH, health services of the ministries of defense (army), education, internal affairs (police and prisons) and ministry of local government. The private health delivery system consists of PNFP, PFP, and complementary health service providers.

During the thesis work, two large projects aiming to improve health outcomes in the districts were ongoing in the study setting: Expanded Quality Management Using Information Power (EQUIP) and Community and District Empowerment for Scaling-up (CODES).

health facility and district levels with the aim to increase both the quality and coverage of health interventions for mothers and newborns.

The EQUIP project included a descriptive cross-sectional study using household and facility census surveys. The sample size for the EQUIP study was calculated to be able to estimate coverage of key maternal and newborn interventions with 80% power at the district level. The household surveys used continuous cluster sampling of ten household clusters, with the probability of selection proportional to the population size. Each cluster had 30 randomly selected households (96). The health facility census was repeated every 4 months in all government-owned health facilities in the districts.

In this thesis, Study I uses data from two rural districts in the eastern region of Uganda – Mayuge and Namayingo districts – to evaluate the use of the modified Tanahashi model for bottleneck analysis. The population of Mayuge and Namayingo districts is approximately 474,000 and 216,000, respectively (97). In these districts, maternal and newborn care, is predominantly provided at no cost by public health facilities at different levels. Data from the EQUIP project was used for Study I because it included variables for coverage and quality of care for pregnant women and newborns that could be used to assess both the supply and demand-side of the health system using the modified Tanahashi model bottleneck analysis tool.

The Community and District Empowerment for Scaling-up project (CODES)

The CODES research project was a five-year Gates foundation-funded project implemented in 21 districts in Uganda from 2011 to 2016. The project hypothesized that implementing a package of interventions that have been prioritized based on district epidemiologic profiles and bottleneck analysis, combined with quality improvement interventions to improve management and appropriate community mobilization, would lead to accelerated scale-up of key interventions against pneumonia, malaria and diarrhea mortality (98).

The CODES project focused on health systems management and community empowerment and sought to improve effective coverage and quality of child survival interventions. CODES combined tools designed to systematize priority setting, allocation of resources and problem solving (98). The first two years of the project were a proof-of-concept phase, during which time the tools were adapted to the local situation and piloted in five districts. Two implementing partner organizations, (Child Fund International together with Liverpool School of Tropical Medicine and Advocates Coalition for Development and Environment) supported the districts' local governments during the implementation of the project (98, 99).

The tools used by the CODES project included; Lot Quality Assurance Sampling (LQAS), bottleneck analysis, causal analysis, continuous quality improvement (CQI), and community dialogues based on citizen report cards (CRC) (98, 99) as shown in Figure 6. LQAS surveys and qualitative studies were used to generate district-specific data on service provision and health

care use at community and health facility levels (100). Based on the data generated, the bottleneck analysis tool was then used to assess health system constraints. The causal analysis and management analysis tool enabled DHMT members to determine effective measures for improving service performance and quality (99). CQI was used to aid the implementation of the identified priorities. In order to engage and empower communities in monitoring health service provision and to demand for quality services, citizen report cards (CRCs) were developed with factual information generated from the LQAS and qualitative surveys to facilitate community dialogues.

Study II was conducted in all five of the districts that were involved in the proof-of-concept phase of the CODES project, while Studies III and IV were carried out in two of the districts involved in the proof-of-concept phase. A schematic representation of the CODES intervention components and tools is shown in Figure 6.

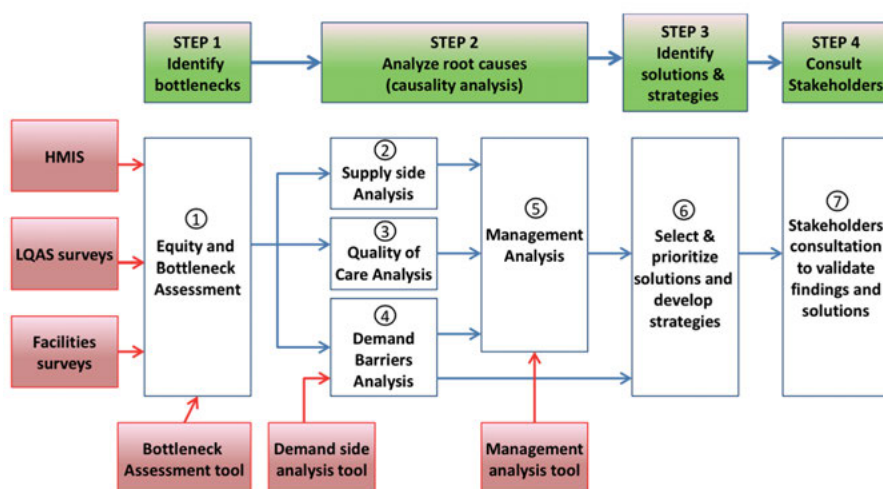


Figure 6. Schematic representation of CODES intervention components and tools

Studies II, III and IV used districts implementing the CODES project because DHMT members were already familiar with tools that enabled them utilize district-specific data, focused on child survival interventions, in the district planning process. The modified Tanahashi model of bottleneck analysis was one of the tools.

Participants, data collection, and analysis

Study I

Participants and data collection

Participants in the study were 6513 women from Mayuge and Namayingo districts who were pregnant 12 months before data collection began. The data collection period was from November 2011 to April 2014. Household surveys using structured questionnaires were used to collect data from the 6513 women on pregnancy and delivery. Data from 50 health facilities (30 in Mayuge and 20 in Namayingo) were also used in this study. The facilities included 40 HC IIs, 7 HC IIIs and 3 HC IVs (see Table 3). Health facility surveys were conducted using a checklist to determine the availability of essential commodities and services provided for maternal and newborn care.

Table 3. *Data sources used in the study*

District	Number of women interviewed	Public health facilities			Total
		HC II	HC III	HC IV	
Mayuge	3372	24	4	2	30
Namayingo	3141	16	3	1	20
Total	6513	40	7	3	50

Data analysis and measurements

Data were analyzed using STATA 13 and construction of the bottleneck analysis graphs were done in Excel 2010. Coverage for each determinant was calculated as the proportion of the target population or supply that each determinant was met. The six coverage determinants are explained in Table 4.

Study II

Participants and data collection

Thirty-eight participants were purposively selected for the study based on their knowledge and participation in the district planning process and the CODES project. They included members of the DHMT in the five districts and officials from the two implementing partners. The sample size was determined by saturation, a point at which further interviews generated no new information about the subject of investigation (101). An invitation to participate in the study was sent out through the DHO's office. Appointments were then arranged by the research team and face-to-face interviews were conducted.

In-depth interviews (IDIs) were used to collect data from January 2012 to December 2013. IDIs were used because they allowed the participants to reflect on their individual experiences related to the adoption of the tools for the use of district-specific evidence in the planning process (102). All interviews

were conducted in English and audio recorded. Each interview lasted approximately 60 minutes.

Data analysis

Data from the audio recordings were transcribed verbatim. The transcripts were read several times to gain a general understanding of the material, which was then coded into themes. Thematic analysis (94) was used to distill the experiences during adoption and implementation, and the lessons learned during the process. This data was supplemented by observations during implementation and information extracted from implementation reports.

Table 4. *Definition of coverage determinants used in the modified Tanahashi model*

Coverage determinants (86)	Definition
Availability of essential health commodities	Refers to the availability of health system inputs, for example, medicines and related commodities for maternal and newborn care.
Availability of human resources	Represents availability of staff at health facilities that provide maternal and newborn care services.
Accessibility	Physical accessibility of service delivery points.
Initial utilization	Refers to first contact or use of health services or interventions, for example, first antenatal visit.
Continuous utilization	Refers to the extent to which the full course of contact with the health system required to be effective was achieved, for example, the proportion of women receiving four antenatal contacts.
Effective coverage	Represents the quality of the intervention which is defined as the minimum inputs and processes sufficient to achieve defined health effects.

Study III

Participants and data collection

Sixteen members of the DHMT from two districts were purposively included as key informants in this study because of their knowledge, involvement and different functional roles in the planning process. It was assumed that because of their participation in the planning process, they would likely contribute relevant and well-founded information on barriers and enablers for district managers to carry out evidence-based planning. Participants were invited to take part in the study through the DHO's office, and telephone calls were made by the research assistant who took part in the interview process, to set up appointments for the face-to face interviews.

Data were collected through semi-structured interviews in March 2015. The interviews were conducted in English, apart from one that was carried out in a local language (Luganda). All interviews were audio recorded. Each interview lasted approximately 60 minutes. Interviews were then transcribed verbatim, with the one conducted in Luganda first translated into English. The interview guide used in the study was developed from the theoretical domains framework (TDF) (103). After pre-testing the interview guide, nine out of the original twelve domains were used. These were: i) knowledge, ii) skills, iii) social and professional roles, iv) beliefs about capability, v) beliefs about consequences, vi) motivation, and goals, vii) memory, attention and decision process, viii) environmental context and resources, and ix) social influences.

Data analysis

A deductive process of thematic analysis (94, 104) was used to classify responses within themes, and the theoretical domains were used as a coding framework. Manifest and latent content was analyzed to elicit both the explicit and implicit meanings from the data. A deductive process of analysis was used because the data collection was guided by the theoretical domains framework that already had established themes to guide data collection and analysis (94). All collected data were represented within the domains of the framework, and in some instances, some of the data were allocated to more than one theme.

Study IV

Participants and data collection

The study was conducted in two districts. District annual health work plans for the financial years 2012/13; 2013/14; 2014/15 and 2015/16 were reviewed. Bottleneck analysis reports, which were outputs of the bottleneck analysis process were also examined. These included reports for 2012, 2013, 2014 and 2015. To further understand how the use of local evidence affected the planning process and the perceived benefits, semi-structured interviews were conducted with eight key informants (102, 105), four from each district. The key informants were purposefully selected (106) due to their involvement and knowledge in the district planning process.

The interview guide used for the semi-structured interviews was developed based on the WHO decentralization analysis framework (107). The framework was used because it considers the background of decentralization, and organizational processes and systems in the health sector under decentralization. At the same time, the framework takes into account the difficulty of establishing direct casual links to changes within the health system. The framework also emphasizes the need to keep looking for alternative explanations for changes that take place in the health system (107).

Data analysis

A descriptive analysis of the district annual work plans was conducted to establish which child survival activities were included in the annual work plans in relation to the identified bottlenecks, and to find out how these activities were financed. Thematic analysis (94) was used to classify data from semi-structured interviews into themes related to the use of evidence in the planning process, and the allocation of financial resources.

The absence of a standard format for the district annual work plan meant that the work plans varied between the districts and even between the different planning cycles. This made the analysis difficult to generalize across the study districts. Furthermore, the analysis of the annual work plans was done on the proposed expenditure for child survival activities, which could be different from the actual amount spent. However, the findings do build on the existing knowledge about the use of district-specific evidence in the planning process in a LIC setting. The analysis only included the planned activities and did not establish if these were implemented or not.

Research ethics and ethical considerations

Ethical clearance to conduct Study I was obtained from the Makerere University School of Public Health and Uganda National Council of Science and Technology, and the London School of Hygiene and Tropical Medicine, ethical clearance No. 5888. This included authorization to distribute all unrestricted survey data files for legitimate research purposes upon receipt of a research project description. Written consent was obtained from household survey participants and health facility census participants.

Ethical clearance to conduct Studies II, III and IV was obtained from Uganda National Council for Science and Technology (UNCST-SS 2548). Permission to conduct the studies was also sought from the district health offices in all the five participating districts. Individual verbal consent was obtained from all the participants, and additional information about the studies was given prior to being interviewed. Participants were informed that participation was anonymous and voluntary, and that participants would not be paid for the interviews. All data were anonymized and kept confidential.

Results

Study I: Bottleneck analysis to illustrate gaps within the district health system

By applying the modified Tanahashi model across four tracer interventions for maternal and newborn care at the district level in Uganda, bottlenecks in service delivery were identified. The tracer interventions were use of iron and folic acid supplementation to prevent anemia during pregnancy, intermittent presumptive treatment for malaria, HIV counseling and testing, and syphilis testing during antenatal care (ANC). Effective coverage and human resource gaps were the biggest bottlenecks in the two selected districts.

Findings related to the tracer interventions

Out of the eight largest potential bottlenecks (four from each district), five were related to effective coverage. For instance, as shown in Figures 7 and 8, effective coverage was the main bottleneck concerning the use of iron and folic acid during pregnancy. Bottlenecks were also identified on the supply side, such as inadequate supplies of commodities and medicines like iron and folic acid, and syphilis and HIV testing kits.

Human resource shortage was a major finding. The share of staff posts filled was 58% and 46% in Mayuge and Namayingo districts, respectively. Geographical access to a health facility in both districts was 100%, as all the interviewed women lived at most 5 km from a health facility, which is the nationally recommended distance. The mean distance to a health facility was on average 2.2 km – 80% of which were HC IIs in both districts. Additionally results also suggest that even when all commodities are in place, health workers may fail to apply them appropriately. For example not offering pregnant women treatment to prevent malaria during pregnancy, conducting HIV testing without counselling and not offering syphilis test results to the pregnant women although blood was taken for the syphilis test.

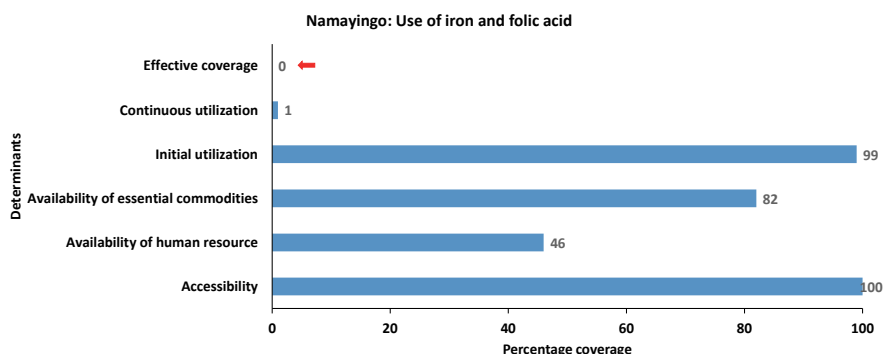


Figure 7. Use of iron and folic acid during pregnancy in Namayingo district

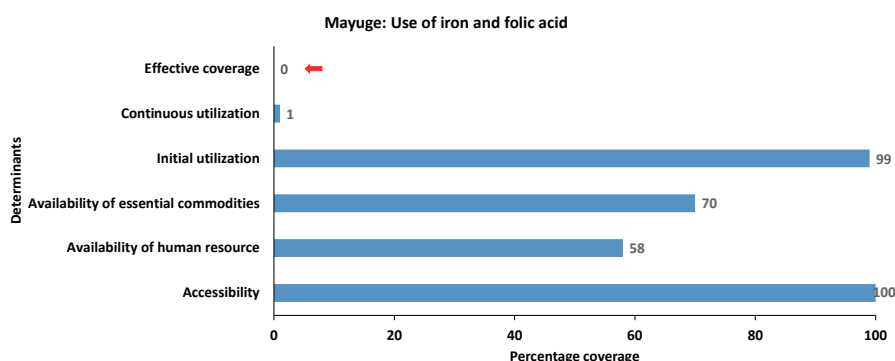


Figure 8. Use of iron and folic acid during pregnancy in Mayuge district

Study II: Management capacity building for the use of district-specific evidence for planning

Adopting bottleneck, causal, and management analyses tools

Each of the five districts went through the processes of bottleneck, causal, and management analyses twice and developed annual district health operational work plans based on evidence from these tools. District health management team members expressed appreciation not only for the knowledge and skills acquired during training on the use of district-specific evidence for planning, but also stressed the importance of carrying out evidence-based planning. They explained that this was not their usual practice and described it as:

A move from an ad hoc to a more systematized prioritization process through bottleneck analysis, causal analysis and the development of action plans to address bottlenecks (District health officer).

However, they acknowledged that it was difficult to interlink the supply and demand-side tools to inform the planning process due to the difference in the amount of time needed to adopt the supply and demand-side tools. It was also difficult to synchronize the use of the tools to the planning cycle. The supply-side tools were easier to adopt and took a shorter time than the demand-side tools.

Citizen report cards and community dialogues

Citizen report cards were developed as a basis for community dialogues. They portrayed district-specific data generated through the LQAS surveys as well as qualitative surveys. Reports on the use of CRCs revealed that community members appreciated the use of smiley and sad faces as a way of portraying information. Criticism from some of the DHMT members was that some of the information presented as cross-cutting was not true in all communities.

Study III: Barriers and enablers to using district-specific evidence for planning

Enablers and barriers were analyzed using nine domains adopted from the theoretical domains framework (103). These included knowledge; skills; social and professional roles (self-standards); beliefs about consequences (anticipated outcomes/attitudes); motivation and goals (intentions); memory, attention and decision process; environmental context and resources (environmental constraints); and social influence (norms). Findings from the study showed that barriers and enablers to EBP as perceived by the DHMT members varied between the two study districts.

Barriers to use of district-specific evidence

The main barriers reported were within the domains of 1) knowledge, 2) skills, 3) environmental context and resources, and 4) social influences. Within the environmental context, limited decision space was perceived as a barrier to the use of district-specific evidence. Decision space refers to the range of choice, or authority and responsibility, which decentralized organizations have been granted by central authorities to make decisions about or influence functions and resources (108) and thus reflects on the district's autonomy. One of the DHMT members had this to say:

At times when we don't have decision space, you identify the gaps, and you come up with solutions then you fail to get support for the intervention you have come up with, that is demoralizing, and it is very discouraging. If I cannot

address my gaps, my bottlenecks, then why should I continue (laughs) why bother? (District health educator)

Results showed that politicians sometimes had different priorities from those backed by evidence and this sometimes led to tensions with DHMT members and hindered the use of evidence. These perceived tensions were sometimes a source of conflict and resulted in a delay in decision making in the planning process. This was compounded by the fact that the politicians were not always perceived to have the necessary knowledge and skills for the use of evidence in the planning process, as expressed in this quote:

Because the councilors are the ruling body, they tend to dictate on how resources are allocated and how we should be spending what we have. Although we might advise them that this is the most pressing issue, they could have a political idea they want, so we are usually forced into a direction of what we do not want because they are our bosses we have to implement what they want. (Assistant district health officer)

Inadequate funding was mentioned as one of the significant barriers to use of district-specific evidence. DHMT members not only referred to inadequate amounts but also to the timeliness in receiving funds, and funds earmarked for activities that were not always district priorities. The inadequate and untimely funding made some DHMT members question how useful district-specific evidence is:

Why go through this process (EBP) when you know that the resources needed for the planned activity are not available? (Biostatistician)

Lack of district-generated data and information was considered a major barrier. This was mainly reported to be due to unavailability of data collection and reporting tools, for example, registers, lack of fuel to travel to and collect data from the various health facilities, and inaccurate data reports from the facilities. Inaccuracy was mainly attributed to completing registers retrospectively due to the high workload and a lack of interest in health information systems. One of the respondents expressed it like this:

One of the problems is this; you have two nurses at the facility, they are going to treat patients, they are going to record whatever they do, so it is too much work to do, that they will not concentrate on the data. In Uganda, the practice is that data is always considered and done last if there is time, so there is no interest. (Health sub-district in-charge)

Enablers to the use of district-specific evidence

The main enablers were reported within the domains of belief about consequences and motivation and goals. DHMT members believed that using locally generated data in the planning process was a better way to plan and that it was worthwhile. This was because it was thought to result in better work plans that reflected the needs of the district and not what was considered most convenient and easy to achieve, or what was implemented the previous year, as was the common practice before. The DHMT members also believed that the use of district-specific evidence led to better performance as reflected in the national district league table for district health systems performance. This good performance led to recognition from peers from within and outside the district. District managers in both districts expressed high levels of commitment to evidence-based planning and their intention to continue using evidence during planning, as shown in these quotes:

Now what can I say, evidence-based planning is the way to go because the resources are too minimal, if you do not have the figures you may not allocate the resource appropriately. (Senior nursing officer)

We were planning blindly, but I can't go back to that, I feel we should maintain this. (District planner)

In both districts, the health departments were motivated to use evidence in the planning process because they stated that they were able to secure additional funding from other partners such as donors and the local government for initially unfunded priorities as a result of using district-specific data in the planning process. One of the managers said:

I went to the executive, to the council using that data I told them we have to train the staff, at least we have TOT (Training of Trainers) and I did that using the data. Using the data I was able to get the money, and I saw that I am doing my job. (Assistant chief administrative officer)

Study IV: Translation of district-specific evidence into district work plans

Outcomes of using district-specific evidence in the planning process

District managers reported that they were able to produce more robust district annual work plans when they used district-specific evidence. For instance one of them said:

I must say the work plans we have now look more real and genuine and factual. I see that using data has enabled us to have realistic work plans. (Assistant district health officer)

In addition to systematizing the planning process, district managers reported that being able to identify their priorities using district-specific evidence enabled them to organize partner meetings and secure support and resources for some of their unfunded priorities. The managers also reported a reduction in disagreements between the elected and appointed officers as a result of using evidence to back decisions in the planning process and this made the planning process easier. One manager said that with the help of evidence:

We could update them [the council/politicians] about what we have, what is at stake and what we need from them. So it helped us in the planning process because those are the bosses, the council. (Senior nursing officer)

During the planning process, about half of the activities that were identified by the district managers to bridge gaps in child survival services using district-specific evidence were included in the district annual work plans.

Funding for child survival activities

District managers appreciated the use of local evidence, but, due to financial constraints that included limited fiscal space, not all priorities identified were allocated resources. One of the managers explained that:

We receive two kinds of grants from central government, conditional and unconditional. The funding received under the unconditional grants are insufficient indeed. There are so many competing priorities that every year we have unfunded priorities that we carry forward to the next year hoping to get additional resources, but we don't. (District health officer)

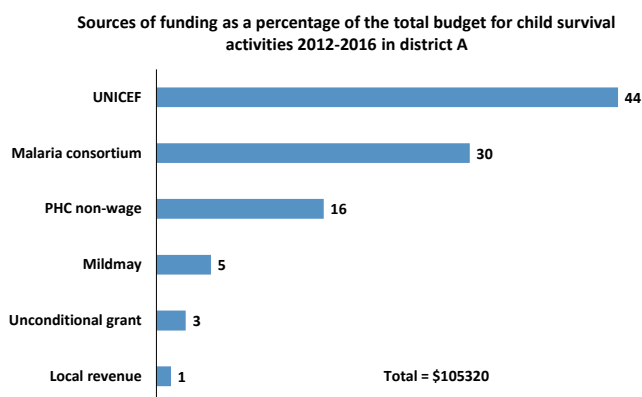


Figure 9. Sources of funding for child survival activities in district A

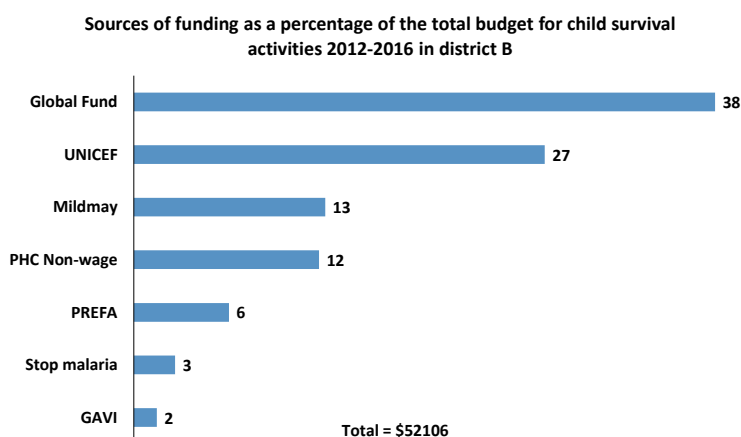


Figure 10. Sources of funding for child survival activities in district B

There was an increase in the planned budget for child survival activities between 2012/13 and 2015/16 in the district annual work plans. In one of the districts the planned expenditure increased from 4550 USD to 45185 USD, while in another it increased from 6626 to 28327 USD. Child survival activities accounted for between 4% and 5.5% of the total planned expenditure on health services with per capita funding of 0.3 USD in one district and 0.1 USD in the other. Child survival activities included outreaches for immunization, logistics and procurement, training and mentorship, data collection and analysis, mobilization and advocacy, planning and meetings, and support supervision. The low levels of funding for child survival activities were emphasized by the district managers. One of them said:

The funding is very, very little when you look at what we have planned and what has come as a contribution from the PHC, it (funding) is very small. (District health officer)

Over the four years, donors' contributions at the district level accounted for between 47% and 94% of the funding for child survival activities, as shown in Figures 9 and 10. One of the managers had this to say:

So we still feel that the money is little and if we had no partners, I think we would not be doing anything. (Senior nursing officer)

Discussion

The findings show that district health management teams were able to adopt and implement tools, including the bottleneck analysis tool, to facilitate the use of district-specific evidence to prioritize and plan for interventions (I, II). However, the limited decision and fiscal space, limited financial resources and inadequate district-specific information were considered barriers to the use of district-specific evidence in the planning process (II, III, and IV). Due to the decision-making dynamics related to the planning process in the decentralized system, governance and leadership within the district health system was considered a significant influence on the use of district-specific evidence in the planning process. This influence was due to the fact that the elected officials of the district council were perceived to have power over resources and therefore more influence in the planning process. In addition elected officials sometimes had different priorities from those backed by evidence, and the relationships between the elected and appointed officials also influenced the use of district-specific evidence (III, IV).

In this section, the main findings from the four studies will be summarized and further discussed in relation to use of the Tanahashi model for bottleneck analysis at the district level, decision space in the district planning process, governance and leadership for the use of district-specific evidence, resources for the use of district-specific evidence in the planning process, and finally the implications for maternal, newborn and child survival and for the health system in Uganda.

Identification of bottlenecks to service delivery in the district health system

Findings from Study I showed that bottleneck analysis using the modified Tanahashi model on combined household data and health facility data on maternal and newborn care can be used to identify bottlenecks in both the supply- and demand-side of the district health system. This finding is similar to other studies that have successfully used bottleneck analysis. These include a study by Grundy et al. in Bangladesh that explored policy opportunities and limitations of evidence-based planning at the district level (109). Another study by Byrne et al. conducted in Nepal and Indonesia utilized bottleneck analysis for

evidence-based planning for the scale-up of family planning services (110). Similar to findings in Study I, both of these studies (109, 110) reported that data for the demand-side determinants was not adequate for the interventions that were analyzed. Furthermore, the data used in Study I, like in other studies that have utilized the modified Tanahashi model (89, 110-112), was not always routinely collected and therefore involved costly data collection, mainly through population-based surveys as opposed to routine health information system data. The population-based surveys might not be feasible or sustainable in routine service provision at the district level in LICs. There is therefore a need to strengthen the routine district health information system to be able to generate accurate and timely information that can be used to inform the planning process.

The results show that bottleneck analysis is a tool that can be used to identify constraints in service delivery; this can support the use of district-specific evidence in the planning process at the district level. Identification of constraints that can be potential bottlenecks to service delivery can then inform the planning process as illustrated in the conceptual framework in Figure 4. However, the use of the modified Tanahashi model is highly dependent on the availability of accurate information for each of the determinants. This information may not be routinely collected, especially for the demand-side of the health system.

In order for the bottleneck analysis tool to be utilized at the district level to inform the planning process, the routine health information system needs to be strengthened to enable collection of timely and accurate data that can be used (111, 112). However validation of the routine health facility data for its use in the bottleneck analysis needs to be done. Furthermore, the use of routine health information systems may not capture information on populations that do not access services for various reasons, like poverty or other forms of exclusion. Additionally, in Uganda and other LICs, routine health information systems capture information from the public health facilities yet a large proportion of services are provided through the private sector (50, 59). Alternatively, the Tanahashi model could be modified to use data that is already being collected by the routine health facility data. Furthermore, additional emphasis needs to be placed on ways to adequately capture the user perspective (demand-side) of the health system. From Study II of this thesis, community dialogues captured the user perspective and could be one of the approaches that can be used at the district level (99).

Adopting tools to facilitate use of district-specific evidence

The findings from Study II showed that DHMTs were able to adopt and implement tools, including the bottleneck analysis tool to facilitate the use of district-specific evidence to prioritize and plan interventions designed to improve child survival. The DHMT members considered the use of these tools to be a systematic approach to the planning process (99). This was similar to findings in a study to support local planning and budgeting for maternal, neonatal and child health in the Philippines (111), where the local officials found that using tools, including the bottleneck analysis, to utilize local information in the planning process was a more structured approach to the planning process.

Although the tools were appreciated for their use in the planning process in Uganda, using them required a more critical analysis of the evidence that was presented. This was time-consuming, and therefore it was sometimes difficult to synchronize with the planning cycle, especially for the demand-side tools. Community dialogues were used to capture demand-side information about the health system. However, due to the lengthy process of the community dialogues, it was not always possible to align findings to the timing of the planning cycle. Furthermore, the community dialogues were not integrated into already existing structures at the district level, which brought into question their sustainability. For community dialogues to capture user perspectives and inform the planning process, they should be integrated into already existing structures at the district level for example the community based services department to ensure sustainability. The community dialogues should also be aligned to the planning cycle to ensure that the information that is captured can be used to inform the planning process (99). Difficulty in synchronizing information from the district-specific evidence with the existing planning cycle were similar to results from a study to develop and cost local strategies to improve maternal and child health in Nepal, India, Indonesia and the Philippines (109). This is contrary to the aim of using district-specific evidence in the planning process, which is to ensure that evidence is used to prioritize interventions in the district annual work plan. However, in Indonesia, a more flexible approach involving the central government, was taken to ensure that evidence was used to guide priority setting with the local government officials (89, 112).

These findings imply that tools that facilitate the use of district-specific evidence can be adopted to inform the planning process in the district health system in Uganda and similar settings. However, their implementation should be cognizant of the already existing planning cycles to ensure adequate utilization and health system effectiveness for women and children. Tools to support the use of district-specific evidence should in as much as possible be integrated into already existing district structures for example, the community

based services department to ensure sustainability. In a decentralized system like Uganda, where priority setting is also done at the central level, an approach to utilize district-specific evidence that actively involves the central level (MoH) could facilitate the use of district-specific evidence in the planning process. One way of doing this could be communicating district-specific priorities to the central level during the planning process to allow for resource reallocation at the district level. Another way could be to increase the proportion of funding to the districts through the unconditional grants.

Decision space in the planning process

Decision space was considered as a barrier to the use of district-specific evidence in the planning process. Decision space is the term used to describe the range of choice, or authority and responsibility, which decentralized organizations have been granted by central authorities to make decisions about or influence a range of functions and resources (108). On paper, Uganda has the deepest mode of decentralization: devolution. In this mode of decentralization, authority, responsibility and accountability are shifted from the central government to the local government (28). In spite of the extensive decentralization process, where the intent was to enhance local decision-making (36), Study III showed that limited decision space was perceived as a barrier to use of district-specific evidence in the planning process. Therefore, even if tools are available to facilitate the use of district-specific evidence in the planning process, the limited decision space can affect their use as is illustrated in Figure 4. The perceived lack of decision space is not unique to districts in Uganda as it has been documented in other LICs like Ghana, Zambia, and the Philippines (28, 113-115), and as a shortcoming of decentralization (42, 116, 117).

The perceived limited decision space was described by the district managers largely as a result of priority setting at the central level (50, 61). This is similar to findings from other studies (25, 116). An example is a study by Maluka et al. on decentralization and health care prioritization in Tanzania, that documented the frustration of district managers with the overwhelming nature of national priority setting and guidelines, which left little authority to plan according to local needs (83). The same authors however, note that the restrictions that come with central priority setting may facilitate equity and fairness at the district level, since some stakeholders had more power than others (83). As central-level priority setting is a way of rationing health services and allocating resources (33, 64, 118), national priorities may not necessarily be those of the district. Although some DHMT members reported that they were able to set district priorities within the broader national priorities. The limited decision space raises the question of the effectiveness of using district-specific evidence within the context of central-level priority setting.

Theoretically, for the use of district-specific evidence to have benefits for interventions for women and children, the decision space at the district level should be expanded. However, there are other factors that affect the use of district-specific evidence in the planning process, such as financial resources. The CODES project provided additional funding of 10000 USD to each of the districts that participated in the study (99) (II, III, IV). District managers reported that they were able to carry out prioritized activities because of the additional funding. Other factors that affect the use of district-specific evidence in the planning process are, governance and leadership, human resources, and availability of timely and accurate information, some of which will be discussed in this thesis. This thesis does not explore how these factors are affected by or affect the decision space, and if the expansion of the decision space will enable the use of district-specific evidence in the planning process.

Governance and leadership in evidence-based planning

Governance and leadership within the district health system were considered to be a significant influence on the use of district-specific evidence in the planning process. This influence was due to the power and decision-making dynamics of the planning process, where the elected officials, the district council were perceived to have power over resources and therefore more influence in the planning process. The relationships between the elected and appointed officials and the fact that elected officials sometimes had different priorities from those backed by evidence also influenced the use of evidence in the planning process (III, IV).

According to the planning guidelines for the local government in Uganda, the district council has the autonomy to approve district work plans, which gives them power over resources (36, 47). This is similar to other decentralized systems, as in Tanzania, where the councils also have the authority to approve work plans (82, 119). In Uganda, the elected politicians were therefore considered to have more power and influence in the planning process, than the appointed officials, but at the same time, were perceived to have limited knowledge and skills about the use evidence, which was considered a barrier to use of district-specific evidence. These findings are different to those in a study on improving district level planning and priority setting in Tanzania. In that study, the authors showed that the appointed officials, mostly medical professionals seemed to have more influence since other stakeholders were considered less knowledgeable (119). However, another study in Tanzania also found that the perceived low levels of education and a lack of training of the local authorities were challenges in health planning in a decentralized system (120).

The second source of influence is the relationships between the elected officials and the appointed officials, (DHMT), here referred to as the “sociopolitical context” (III). In one of the participating districts the sociopolitical context was considered an enabler for using district-specific evidence, and in another, it was seen as a barrier. It can therefore affect the planning process in different ways as shown in the framework in Figure 4. DHMT members reported that where the relationships were perceived as positive and transparent, not only was evidence used in the planning process, but the process was less time consuming than when there were perceived tensions between the DHMT and the elected officials. The importance of these relationships was also emphasized in a study on improving planning activities for maternal and child health in several countries in south east Asia (112). Poor relationships between elected and appointed officials in local governments in Uganda were also documented as a challenge to governance in the decentralized system by Assimwe and Musisi (54). Similar to findings from Allen’s work on local governments in India (121), findings in this thesis indicate that perceived tensions between politicians and appointed officials are sometimes a source of conflict and could lead to a delay in decision making in the planning process or the resources available for activities. The tension stemmed from politicians who were sometimes said to have different priorities from those backed by evidence (III, IV). Similar findings have been documented elsewhere (26, 111, 121). This is related to the political nature of decision-making and priority setting which is not unique to the districts in Uganda. Bryant et al. and Goddard et al. also documented politics as a primary consideration in the decision-making processes (122, 123). However, efforts to facilitate the use of evidence in the planning process at the district level (98, 112, 119) and health systems as a whole (124) have either had no component that addresses the role and involvement of politicians and their influence in the district health system or an insufficient component. These studies have assumed a linear relationship between what is considered evidence and its use in policy making and planning, many times not paying much attention to the political nature of decision-making (98, 112, 119).

Findings point to the need to have a multifaceted approach to the use of district-specific evidence, which not only focuses on the generated evidence and its quality, or the tools that are needed, but also on the decision making process, the actors involved, their relationships and their level of influence in the decision-making and the planning process. One such way is to make a deliberate effort to build and maintain trust between the elected and the appointed officials, thus balancing the views of politicians representing a perspective different from the more technically oriented DHMT members. This can be done by clearly defining the role that each actor plays in the planning process. It is also critical to build the capacity of the district council or politicians who ultimately make decisions in the planning process, and represent

the interests of the wider community, to use district-specific evidence in the planning process.

Financial resources and utility of district-specific evidence

Inadequate funding was mentioned as one of the significant barriers to use of district-specific evidence in the planning process (II, III, and IV). Inadequate funding has also been cited both as a shortcoming of decentralization, and as a barrier to health service delivery, especially in LICs like Uganda (43, 125). The DHMT members referred to the inadequate funding compared to the assigned responsibilities. This was also the case in Tanzania, where Munga et al. documented the mismatch between the financial resources available at the district level and the responsibilities assigned (126). The limited funding that was available in our study districts was often earmarked for certain activities that were not always for district priorities, leaving the DHMT members little authority over budgetary allocation, indicating a lack of fiscal space. This has been documented in other decentralized systems, like Ghana, Indonesia, and Zambia (127-129).

Further, the DHMT members stated that the delayed release of funds from the central level was also a barrier to using district-specific evidence. The delayed release of funding and its negative effects at the district level has been documented in other studies (127, 130, 131). On the one hand, this could be a strong argument for the use of evidence in the planning process, i.e., to ensure that the limited resources are used for district specific priorities. On the other hand, it raises the question of whether the use of district-specific evidence can lead to meaningful results in resource-limited settings that primarily depend on central funding for the district health system. This therefore calls for firstly, timely release of funds from the central government to the districts and secondly availability of non-earmarked funding from both the central government and donors that district managers can allocate according to the district priorities.

Child survival activities accounted for between 4% and 5.5% of the total planned expenditure on health services, with the per capita funding of 0.3 USD per year in one district and 0.1 USD in the other during the financial year 2015/16. Over the four years, donors and other partners contributed most of the funding for child survival activities, between 47% and 94% of the funding. As was demonstrated by another study in Uganda (85), many times the donors have their own priorities that may not always be those of the districts.

This again brings into question the usefulness of using district-specific evidence, this time in regards to the limited fiscal space and the absence of adequate resources to finance and operationalize the work plans. Another concern

is whether district managers prioritize activities that reflect their local needs as opposed to the interests of the donors. These findings again call for a multifaceted approach to using district-specific evidence in the planning process. This approach should address the limited fiscal space and what responsibilities the DHMT can take on vis-a-vis the financial resources available to them. These approaches would entail not only focusing on the district level and the DHMT, but the central level and other stakeholders, such as the donors and the private sector as well.

Health system implications, including implications for maternal, newborn and child survival interventions

Maternal, newborn and child survival interventions were used in this thesis as a departure point to investigate the use of district-specific evidence in the planning process. Thus findings are relevant for prioritizing maternal, newborn and child survival interventions. However, planning for maternal, newborn and child survival interventions does not take place in isolation, but is part of the overall district planning process, which implies that the findings could apply for the district health planning process as a whole.

Results showed that prioritizing interventions for child survival using district-specific evidence was influenced by several factors and did not depend only on the identification of health system bottlenecks or the ability for district managers to use tools that facilitate the use of evidence in the planning process. Therefore, a simplistic approach focusing on the planning process at the district level alone, which focuses only on the health information building block in the absence of interventions at other levels of the health system and other building blocks is insufficient to address the needs to improve care and service delivery for women and children (89, 111).

As mentioned earlier, utilization of district-specific evidence in the planning process was influenced by the relationships, interactions and power dynamics of the actors involved in the governance and leadership of the DHS, i.e., the politicians and the appointed technical officers. In some districts, the relationships and interactions were considered an enabler to the utilization of district-specific evidence while in others they were considered a barrier (III). Other barriers were the inadequate routine health information system and the limited financial resources at the district. Addressing any one of these components of the health system may not necessarily lead to the use of district-specific evidence in the planning process, as each one of them affects the others (III, IV). Furthermore, other upstream or central level barriers such as the limited range of decision and fiscal space also affected the use of district-specific evidence in the planning process. The wide variety of factors that influence

the use of district-specific evidence calls for systems thinking, as was documented by De Savigny and Adam (2009) and Peters (2014) (16, 23), that addresses the interactions and relationships between the components of the health system (24). The broader context within which the health system functions and the relationships and behavior of the various actors also needs to be taken into consideration, as was previously documented by Gilson in 2003 (25). However it is also important to focus on the relationships and interactions of the multiple levels within the health system i.e., the macro, meso and micro level (132).

In summary, this thesis aimed to investigate the use of methods for presenting district-specific evidence to identify gaps in service delivery in the planning process within the district health system. The results show that although the tools can be useful in displaying quantitative evidence, they are not useful for displaying other types of evidence, particularly for the community or user perspective of the health system. Therefore, evidence-based planning should not be interpreted simplistically as only the use of tools to identify service delivery bottlenecks and facilitate the use of district-specific evidence. Although the tools seem to have some merit to the planning process, they should be combined with other aspects of the health system.

Methodological considerations

The case study design was thought to be ideal for the studies because the thesis was examining the use of district-specific evidence in the planning process, which is taking place in the context of the DHS and itself being influenced by the various components of the health system. The case-study approach is described as a research strategy involving empirical investigation of a phenomenon within its real life context and especially valuable when the boundaries between the phenomenon and context are blurred (133). The studies within this Ph.D. thesis also involved multiple interpretations of the same experience (the use of district-specific evidence in the planning process) by different people within their context, which made the case study approach suitable.

Qualitative as well as quantitative research methods were used in this thesis. Each of these methods has strengths and limitations that need to be discussed in relation to the study design.

Study I was a quantitative study that used data from a cross-sectional survey conducted in two rural districts. In this study recall bias could have affected the validity of results, as women were asked about their pregnancy experiences within a twenty-four month period. However, a study conducted in Mozambique established that women were able to report aspects of peripartum care although the recall period was eight to ten months (131). Responses in the survey could have been subject to social desirability bias, as the women were asked about the use of prescribed medicines during pregnancy. The

household data that was used for assessing the demand-side determinants were not directly linked for each of the respondents to the health facility data utilized for determining the supply-side determinants, but the fact that both data sets were collected in the same districts within the same time period strengthens the link. The data collected did not always adequately establish some of the demand-side bottlenecks; however, the data was able to point to possible bottlenecks within service delivery. As the study was conducted in only two districts, the results are not readily generalizable to all the districts in Uganda. However, the findings do build on the existing knowledge about the use of district-specific evidence in the planning process in a LIC setting.

When using qualitative research methods, it is important to determine the rigor with which the research process was performed. This will take into account considerations about the trustworthiness of the findings. These considerations refer to Studies II, III, and IV, but may also apply to Study I. Lincoln and Guba (1995) proposed the concept of trustworthiness to judge the rigor and validity of qualitative research (134): further split into *transferability*; *dependability*; *credibility*; *confirmability* (135, 136).

To help the reader judge *transferability*, (how applicable the results are to another context), a detailed description of the study settings, selection of participants, data collection and analysis processes provides a better understanding of the findings and their application. Transferability was also enhanced by the use of theoretical frameworks to develop the interview guides (133). A detailed description of the data collection procedures with interview guides and transparency about the analytical procedures addresses considerations around *dependability* (Is it possible to repeat the research?). To address *credibility* (Has the research measured what it set out to measure?), participating districts and the respondents within the districts were purposively selected (106) because of their involvement in the planning process and would, therefore, have relevant and well-founded information on the research questions. In addition, the researcher was involved in the data collection and analyzed the study material, and had a prolonged engagement with the study material. *Credibility* was also enhanced by the assurance of confidentiality and performing one-on-one interviews, which allowed the participants to express themselves freely, and by triangulation, which was achieved by comparing responses from participants from within the same districts (within cases) and across different districts (across cases) (133). Dahlgren et al. (2004) and Sandelowski (1986) (136, 137) document that the process of *reflexivity* (awareness of the researcher's role and how it is accounted for in the research process) (138) is one of the ways of assessing *confirmability* (to what extent the findings are affected by biases?). In qualitative research, the researcher brings meaning to the study process through their experience and involvement in the research and the research participants (139). I am a medical doctor and a public health specialist who has worked within the Ugandan health system. Several years before starting the Ph.D. research, I headed a district health system

in one of the rural districts in Uganda, and therefore, in a way, I was studying my 'peers' in this Ph.D. This background inspired my interest in the research area and also influenced the framing of the research questions addressed in this thesis. The fact that I am familiar with the context of the research brought with it a unique understanding of the concepts discussed. This could, however, also contribute to biases as a result of my very close previous experience within the DHS in Uganda. I was aware of this being a potential advantage as well as a disadvantage for me during the research process. During the study period, data collection was done by myself together with research assistants who did not have the same prior experience and contact with the district health system. Data analysis of each of the studies was initially conducted independently with co-authors. Transcripts were read and coded separately and together we discussed and established consensus coding. This created a common meaning and understanding of the data, and aimed to address the subjectivity that I have as a previous head of a district health system myself. However, having this previous experience allowed for a deeper conceptualization of the studies and contributed to a more in-depth understanding and interpretation of findings in this thesis.

In Study II, three interviewers were involved in the data collection, and this has the potential to influence the data collected since individuals have different interview skills. Triangulation of results between the districts improved the credibility of the results from the different interviewers. Furthermore, the point of saturation was used to determine the sample size in each district, however, this point could have varied depending on the interviewer thus affecting the credibility of the results. However, since purposive sampling was done and no data was disregarded during the analysis, probably no more new information would have been established (140). Although in-depth interviews were planned for in Study II, more semi-structured interviews were actually conducted.

The theoretical domains framework used in Study III has the potential to limit the barriers or enablers identified because the themes are already established. However, all the data that were collected was represented within the domains of the framework, and in some instances, some of the data were allocated to more than one theme. The framework has also been used in other studies to identify barriers and enablers for the delivery of the healthy kid checks (141), in implementing antenatal magnesium sulphate for fetal neuro-protection guidelines (142), careful hand hygiene as perceived by nurses and hospital administrators (143), and preconception care guidelines (144). The study did not collect any information from the central level (MoH), which also influences the planning process in the DHS. However, the study provides insight into the enablers and barriers for EBP at the DHS level which can inform the district planning process.

In study IV, the absence of a standard format for the district annual work plan meant that the work plans varied between the districts and even between

the different planning cycles. This made the analysis more difficult to generalize across the study districts. Furthermore, the analysis of the annual work plans was done for the proposed expenditure for child survival activities which could be different from the actual spending. However, findings do build on the existing knowledge about the use of district-specific evidence in the planning process in a LIC setting.

The studies related to this thesis involved the planning process and only included the planned activities and did not establish if these were implemented or the health outcomes of the implementation. However, planning for the activities does not necessarily mean that they will be implemented as was shown by a study on the planning process in Nepal, where several activities that were planned for using context-specific evidence were not implemented (111). However, the thesis builds on existing knowledge on the use of district-specific evidence in the planning process.

Conclusions

The modified Tanahashi model is an analysis tool that can be used to identify bottlenecks to effective coverage within the district health system in LICs like Uganda. However, it requires accurate and timely data, which may not exist in the routine district health information system (I).

District managers were able to adopt and implement tools to facilitate the use of district-specific evidence for improved targeting and planning of interventions designed to improve child survival (II).

The limited decision and fiscal space within the district health system, limited financial resources and inadequate routine district health information systems are important barriers to the use of district-specific evidence in the planning process (II, III, and IV).

Governance and leadership within the district health system were considered a significant influence on the use of district-specific evidence in the planning process. This influence could be a barrier or enabler to the utilization of district-specific evidence (III).

Recommendations

The use of tools to identify system bottlenecks and facilitate the use of district-specific evidence in the planning process is not an end in itself but only a part of the process to improve service delivery for women and children. With that in mind, I propose the following recommendations for program implementation, policy, and future research.

Program implementation

While promoting new approaches or programs in the districts, for example, the use of district-specific evidence in the planning process, multifaceted approaches should be used that take into account the broader aspects of the health system, like the overall capacity at the district level, decision and fiscal space available at the district level, and the governance and leadership within the district health system. The approaches should also take into account the various levels of the health system and their interactions, for example, the central level and how decision making both at the central level and the district level can affect the implementation of new approaches or programs.

Implementation of programs at the district level in a decentralized system should take into account the political nature of decision making and the governance and leadership at the district level. Programs should actively involve the elected officials (politicians) by providing them with information on the program, and build their capacity to use evidence in decision making. This is because politicians within a decentralized system influence the prioritization and resource allocation process.

Innovative ways of including the user perspective into the district planning process should be promoted, such as the use of community dialogues. However, for this innovation to be sustainable, it needs to be embedded in already existing district structures. One way of enabling this process would be to collaborate and work with other departments at the district level, like the community based services department.

The district health information system should be strengthened to provide accurate information within the right time frame that is necessary to inform the planning process. A starting point could be to look at the kind of information

that is currently collected by the routine health information system to determine if it is sufficient for use in the planning process or if other data collection methods could be used to inform the planning process.

Policy implications

The central government should revisit and potentially adjust the decision space and fiscal space available within the decentralized health system, vis-a-vis the responsibilities and outputs expected from the district for both program implementation and service delivery.

Future research

Research on the governance mechanisms within the district health system is needed. This should include identifying mechanisms for efficiently and meaningfully involving elected officials in the use of district-specific evidence in not only the district planning process, but also the health system as a whole, since they are important actors in the decision-making process at the district level.

More research is needed to find innovative and sustainable ways of routinely including the health system user perspective in the planning process at the district level.

Ways to further simplify the bottleneck analysis tool for its use at the district level need to be identified, especially in relation to the routine health facility data that is collected within the district health system. However, there is also a need to validate the use of routine health facility based data for conducting bottleneck analyses.

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