An Evidence Brief for Policy

Task shifting to optimise the roles of health workers to improve the delivery of maternal and child healthcare

Full Report

This policy brief was prepared by the Uganda country node of the Regional East African Community Health (REACH) Policy Initiative.

26 July 2010

Who is this policy brief for?

Policymakers, their support staff, and people with an interest in the problem that this policy brief addresses

Why was this policy brief prepared?

This policy brief was prepared to summarize the best available evidence about the problem which it addresses and solutions to that problem

! This evidence-based policy brief includes:

- A description of a health system problem
- Viable options for addressing this problem
- Strategies for implementing these options

X Not included: recommendations

Executive Summary

A shorter version of this Full Report is available in the Executive Summary.

What is an evidence-based policy brief?

Evidence-based policy briefs bring together global research evidence (from systematic reviews) and local evidence to inform deliberations about health policies and programmes

What is a systematic review?

A summary of studies addressing a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise the relevant research, and to collect and analyse data from this research

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Preface

The purpose of this policy brief

The purpose of this policy brief is to inform deliberations among policymakers and stakeholders on optimising roles of health cadres in the delivery of maternal and child health. It summarises the best available evidence regarding the design and implementation of policies for extending the roles of non-medically trained primary health care workers ("task shifting") to deliver cost-effective maternal and child health interventions.

This brief was prepared for discussion at meetings of those engaged in developing policies for task shifting and other stakeholders with an interest in these policy decisions. In addition, it is intended to inform other stakeholders and to engage them in deliberations about those policies. It is not intended to prescribe or proscribe specific options or implementation strategies. Rather, its purpose is to allow stakeholders to systematically and transparently consider the available evidence about the likely impacts of different options for task shifting.

How this policy brief is structured

The policy brief is presented in two parts. The first is an executive summary that provides key messages and summarises each section of the brief in consideration of the target audience that may not have time to read the full text of the brief.. The second part provides details of problem, approaches in preparation of the brief and available evidence used to address the problem.

How this policy brief was prepared

This policy brief brings together global research evidence (from systematic reviews) and local evidence to inform deliberations about optimising the use of different cadre of health workers to deliver cost-effective MCH services. We searched for relevant evidence describing the problem, the impacts of options for addressing the problem, barriers to implementing those options, and implementation strategies to address those barriers. The search for evidence focused on relevant systematic reviews regarding the effects of policy options and implementation strategies. We supplemented information extracted from the included systematic reviews with information from other relevant studies and documents that are useful for helping to understand a problem, but do not provide reliable evidence of the most probable impacts of policy options. (The methods used to prepare this brief are detailed in Appendix 1.)

Why focus on systematic reviews

Systematic reviews of research evidence constitute a more appropriate source of research evidence for decision-making than the latest or most heavily publicized research study.[1,2] By systematic reviews, we mean reviews of the research literature with an explicit question, an explicit description of the search strategy, an explicit statement about what types of research studies were included and excluded, a critical examination of the quality of the studies included in the review, and a critical and transparent process for interpreting the findings of the studies included in the review.

Systematic reviews have several advantages.[3] Firstly, they reduce the risk of bias in selecting and interpreting the results of studies. Secondly, they reduce the risk of being misled by the play of chance in identifying studies for inclusion or the risk of focusing on a limited subset of relevant evidence. Thirdly, systematic reviews provide a critical appraisal of the available research and place individual studies or subgroups of studies in the context of all of the relevant evidence. Finally, they allow others to appraise critically the judgements made in selecting studies and the collection, analysis and interpretation of the results.

Uncertainty does not imply indecisiveness or inaction

Most of the systematic reviews included in this brief conclude that there is "insufficient evidence". Uncertainty about the potential impacts of policy decisions does not mean that decisions and actions can or should not be taken. However, it does suggest the need for carefully planned monitoring and evaluation when policies are implemented.[4]

"Both politically, in terms of being accountable to those who fund the system, and also ethically, in terms of making sure that you make the best use possible of available resources, evaluation is absolutely critical." (Julio Frenk 2005, former Minister of Health, Mexico)[5]

Limitations of this policy brief

This policy brief is based largely on existing systematic reviews. For options where we did not find an up-to-date systematic review, we have attempted to fill in these gaps using evidence from other documents, through focused searches, personal contact with experts, and external review of the report.

Summarising evidence requires judgements about what evidence to include, the quality of the evidence, how to interpret it and how to report it. While we have attempted to be transparent about these judgements, this brief inevitably includes judgements made by review authors and judgements made by ourselves.

Key messages

The problem:

Shortage of medically trained health professionals to deliver cost-effective maternal and child health (MCH) services

There is a shortage and maldistribution of medically trained health professionals. These are important reasons why cost-effective MCH services are not available to over half the population of Uganda and progress towards the Millennium Development Goals for MCH is slow. Optimising the roles of less specialised health workers ('task shifting') is one strategy to address the shortage and maldistribution of more specialised health professionals. However, the lack of an explicit policy limits the implementation and coordination of task shifting.

Policy options:

Optimising the roles of 1) lay health workers, 2) nursing assistants, 3) nurses, midwives and clinical officers, and 4) drug dispensers

1. Lay health workers (community health workers) may reduce morbidity and mortality in children under five and neonates; and training for traditional birth attendants may improve perinatal outcomes and appropriate referrals.
2. Nursing assistants in facilities might increase the time available from nurses, midwives and doctors to provide care that requires more training, but the impacts of expanded the use of nursing assistants on the quality and costs of care are uncertain.
3. Nurses and midwives to deliver cost effective MCH interventions in areas where there is a shortage of doctors would probably improve MCH outcomes and reduce inequities.
4. Drug dispensers to promote and deliver cost-effective MCH interventions and improving the quality of the services they provide could potentially improve health outcomes and reduce inequities.

- The costs and cost-effectiveness of all four options are uncertain.
- Given the limitations of the currently available evidence, rigorous evaluation and monitoring of resource use and activities (particularly the delivery of cost-effective MCH interventions) is warranted for all four options.

Implementation strategies:

A combination of strategies is likely needed to effectively implement all four options

- A clear policy is needed to ensure optimal roles of health workers based on which cadres can deliver cost-effective MCH interventions efficiently and equitably.
- Community mobilisation and reduction of out-of-pocket costs to improve mothers' knowledge and care-seeking behaviours, continuing education and incentives to ensure health workers are competent and motivated, and community referral and transport schemes for MCH care are needed to ensure effective implementation of such policies.

The problem

Background

The world is experiencing a chronic shortage of human resources for health with at least 57 countries (36 in Sub-Saharan Africa) facing a crisis.[6] The low and middle-income countries, where HIV/AIDS has taken the greatest toll particularly on the health workforce, are affected most acutely.[7] 'Task shifting' - a process of delegation whereby tasks are moved, where appropriate, to less specialized health workers – is one way of addressing this problem.[6] In this way, more efficient use is made of the available health workforce to improve access to health care.

A collaboration of national governments, civil society, professional organisations and international organisations initiated a series of broad consultations addressing the human resource crisis through task shifting starting in February 2007. The Ugandan Ministry of Health, as one of the partners, chaired the committee that produced the initial draft guidelines and recommendations, which were globally reviewed and revised in December 2007.[8] The first global conference on Task Shifting was convened by the World Health Organisation (WHO) in January 2008 in Addis Ababa, Ethiopia, where the WHO Global recommendations and guidelines for task shifting were formally launched.[6]

Following these developments, the Ugandan Ministry of Health initiated a process to formulate a national policy on human resources for health aimed at reorganizing and decentralizing the health workforce using the generic principles adopted at Addis Ababa. In addition, discussions with key policymakers in the Ministry of Health identified the need for a policy brief to inform the development of national policy for task shifting, specifically for improving access to maternal and child health (MCH) care. This was in consideration of a number of factors that contribute to poor access to health care in Uganda. These include inadequate infrastructure, supplies and financing, as well as inadequate human resources for health. The shortage of healthcare workers is exacerbated by inequitable distribution and poor performance.[9]

This policy brief aims to address poor access to healthcare through optimizing roles of health workers by shifting tasks from more to less specialised health cadres that could be trained to meet specific healthcare needs.[10] It also seeks to summarize the best available evidence and provide a variety of task-shifting options with which to inform an explicit policy on task-shifting in Uganda.

Framing of the problem

The focus for this policy brief is 'task shifting', as determined by the current policymaking process in the Ministry of Health. However, we have chosen to use the term 'optimising health worker roles' to clarify that the focus is primarily on expanding the roles of less specialised health workers to deliver MCH interventions that are currently not accessible for the majority of the population.

Task shifting (optimising health worker roles) is being proposed as a solution to a problem. It is important to clarify what the problem is that this solution is intended to address in order to ensure that appropriate options and implementation strategies are considered. The primary problem which optimising health worker roles is intended to address is Uganda's health workers shortage at the frontline. Other problems that could be affected include the distribution of health workers, health worker performance (quality of care), and healthcare costs.[Error! Bookmark not defined.] Optimising health worker roles is one of many strategies that could be used to address all of these problems. Thus, it is important to consider how options for expanding the roles of health workers will address the underlying problems and how they might complement or conflict with other strategies for addressing Uganda's health workforce shortage, improving the distribution of health workers, their performance and efficiency.

Task shifting is based on one or more of the following assumptions:

- that there is under-utilised capacity among less specialised health workers,
- that it is desirable and possible to change priorities or roles of less specialised health workers to include tasks from more specialised health workers, or
- that the number of less specialised health workers can be increased to accommodate increased responsibilities more cost-effectively.

The decision to focus on maternal and child healthcare was influenced by discussions with key policymakers in the Ministry of Health with respect to poor MCH health indicators. The Uganda National Health Research Organisation conducted a survey of policymakers on priority health policy issues in the short and medium-term. Maternal and child health was cited as an area of current policy interest, and task shifting is an ongoing theme under discussion by policymakers in the Ministry of Health.[10]

MCH is a broad area covering a large proportion of the population that is particularly vulnerable and could serve as a model for other areas such as HIV/AIDS. However, the current policy discussions in the Ministry of Health regarding task shifting are more broadly focused on the health workforce as a whole, not limited to a specific area of care. While this policy brief focuses on task shifting in maternal and child health, we will take into consideration relevant evidence for other areas of care, as well as identifying limitations in the application of the policy options that are considered for other areas.

Size of the problem

Uganda is making slow progress towards meeting the Millennium Development Goals (MDGs) for maternal and child health. MDG 4 refers to reduction of under-five mortality by two-thirds between 1990 and 2015. MDG 5 refers to reduction by two-thirds of the maternal mortality ratio during the same period.[11] The Ugandan maternal mortality ratio is still high at 440 per 100,000 live births. The under-five and infant mortality rates are 140 and 82 per 1000 live births, respectively.[12]

Lack of access to effective healthcare is a major cause of unnecessarily high maternal and child mortality.[13] The Uganda Demographic and Health Survey (2006) reported percentage of pregnant mothers receiving antenatal care from a skilled provider at least once at 93.5%. However, only 42.1% of mothers delivered with a skilled provider, traditional birth

attendants assisted 23% of deliveries and 24.9% of deliveries were assisted by relatives or other unskilled helpers.[14] The percentage of under-five children with fever who received anti-malarials on the same or next day was 28.9%. Only 35.7% of children received basic vaccinations by one year of age.[14] The Uganda Population Census (2002) showed that 88% of the population lived in rural areas that are under served by higher cadres in the health workforce.[15]

The annual health sector performance report for 2006/7 showed improvement in some indicators over the previous year, but these were still under desirable targets - for immunisation, facility-based maternal deliveries, intermittent preventive treatment for malaria in pregnancy and under-fives with fever receiving malaria treatment within 24 hours among others. Stagnated indicators included the tuberculosis notification rate and outpatient attendance at health facilities.Error! Bookmark not defined.

In 2002, Uganda had a total of 2,919 medical doctors with 71% working in the central urban region which is inhabited by only 27% of the total population. 64% of the nation's total of 20,186 nurses and midwives are also working in the central urban region (Table 1). There are 3,785 clinical allied health professionals, 15,228 nursing aides/assistants, and 4,530 traditional practitioners/faith healers countrywide.[16]

Table 1: Healthcare personnel per population*

Health cadres	Total number of health cadres in Uganda (2002)	Health cadre per 100,000 population (Uganda)*
Medical doctors	2,919	12
Allied health professionals	3,785	16
Nurses and midwives	20,186	83
Nursing assistants	15,228	63

*The Health Cadre per population ratio was derived by dividing the total number of health cadres in Uganda per category by the total population as of 2002 = 24.4 million people (Uganda Bureau of Statistics 2002)

Source: Uganda Human Resources for Health Strategic Plan (2005-2020)[15]

Table 2 shows selected cross-country comparative health workforce ratios with Uganda among the lowest health worker ratios per population.

Table 2: Healthcare personnel per population – cross-country comparison*

Health cadres	Health cadre per 100,000 population								
	Uganda	South Africa	Botswana	Ghana	Zambia	Tanzania	Malawi	USA	UK
Medical doctors	12	69.2	28.7	9.0	6.9	2.3	1.1	230	256
Nurses	83	388.0	241.0	64.0	113	36.6	25.5	1212	937

*Source: World Health Report 2006.[17]

The shortage of human resources for health is highlighted by the fact that forty-seven percent of the approved positions in the public sector are vacant.[18] The statistics available regarding

distribution between public and private not-for-profit health services indicate that 53% of the total health staff are in government facilities at district level, 30% at private not-for-profit health facilities at district level and 17% are in regional and national hospitals and the Ministry headquarters. No data are available regarding health workers in private for-profit facilities.[10]

In the fight against the AIDS pandemic, Uganda is one of the countries implementing task shifting as a pragmatic response to the health workforce shortage at an informal level As a result, nurses are now undertaking tasks that were formerly the responsibility of doctors, including: managing milder opportunistic infections in HIV, determining eligibility for antiretroviral therapy (ART), and treating side-effects of ART. Correspondingly, some nursing work such as counselling and testing for HIV, undertaking clinical triage, and monitoring adherence to ART has been taken on by community health workers who have training but no professional qualifications. . Newer types of health cadres, such as expert patients with HIV and ART aides are trained to support clinical triage, HIV education and counselling, and provide ART adherence support. This has occurred with integrated management for childhood illnesses and training of traditional birth attendants in maternal healthcare, as well as for HIV/AIDS care.[19,20,21]

On the other hand, the National Health Policy (1999) and Health Sector Strategic Plan II (2005/06 – 2009/10) support the establishment of village health teams (VHTs) to facilitate the process of community mobilization for health action.[22,23] The VHTs are trained and equipped with key messages and health commodities (including medicines) for delivery of an integrated package of care at the household level.

Factors underlying the problem

A number of factors underlie the problems of a health workforce shortage, inequitable distribution of health workers, poor health worker performance, and inefficient use of health workers. Deciding on and implementing appropriate options for optimising the roles of health workers to address those problems requires consideration of governance arrangements, financial arrangements, consumer attitudes, health workers' attitudes and motivation, and organizational constraints among others.

The health sector strategic plan emphasizes minimum staffing norms for each level of service delivery in the national health system.[27] These staffing norms prescribe specific roles for each health cadre limiting development of new healthcare delivery arrangements. This limitation overemphasizes delivery of care by professional health cadres perpetuating the problem of poor access to health services particularly in rural areas. This is reflected by restrictions in regulations and statutes of the health professionals councils, which do not permit flexiblity and responsiveness to the rapidly changing health environment.[24]

The way human resources are planned, trained, placed and managed within the service impact on quality, character and current costs of healthcare provision. However, current information systems are paper-based and inadequate. Reporting of health information data in Uganda is done through district health offices that collect and summarise data from sub-districts and over 2,000 health facilities; including government and private not-for profit

units. Reporting from private practitioners has been very difficult as there has been no sustainable motivation for them to report and therefore information on the patients they administer is in most cases not included in the health management information system. Computerisation of the HMIS in Uganda has been a slow process due to financial and technical limitations.[25] This makes health workforce deployment and service delivery arrangements very difficult.

Health workers lack incentives to expand their roles. CHWs are not paid and reimbursement systems of other health workers do not provide incentives for appropriate delivery of cost-effective interventions. Non-financial incentives are also inadequate. Ugandan health workers are dissatisfied with their jobs, especially their compensation.[26] On average midwives earn between USD 75 (Ushs 150,000) and USD 125 (Ushs 250,000) per month. A registered nurse is paid about USD 200 (Ush 400,000), which is far below what they are paid in other countries. An enrolled nurse earns USD 135 (Ushs 270,000) and lower cadres about USD 115 (Ushs 230,000). Salaries have increased a little with health workers in government facilities earning less than those working with the private sector. This draws health workers away from government facilities that are already understaffed.[27] Health workers also often have poor living conditions with inadequate housing and lack of social amenities, particularly in rural areas.[18] Non-material incentives are also often lacking.

There is a support supervision system and a quality assurance unit in the Ministry of Health that is responsible for supervision. However, the system is not functioning adequately. Because resources are limited, only more accessible health facilities tend to receive supervision visits, and only a few times a year. Furthermore, a top-down, control-oriented approach mostly focuses on collecting data without addressing local staff's performance needs.[28] In addition, many health workers fear supervision, mainly due to perceived or real misuse of authority by supervisors. In Uganda, one out of four interviewed health workers reported physical, verbal or emotional abuse from their supervisors[29] Local leaders are responsible for supervising and monitoring the activities of civil servants. However, these accountability mechanisms have been found to be lacking.[30]

The task shifting that has occurred has been without a clear policy, planning, or monitoring and evaluation. Moreover, some of this task shifting may be in conflict with current health professional regulations and licensure with some health workers feeling that any problem can arise affecting the concerned health worker who does not have legal protection for the additional tasks. For example, nurses are concerned that if something goes wrong when they admit patients, the Nursing and Midwifery Council cannot protect them. This impedes nurses from taking on more responsibilities.[31] Professional protectionism is also an issue. Many professionals are reluctant to cede tasks to others for fear of being undermined. For example, some doctors are reluctant to have clinical officers perform any type of surgery.[31] Nurses' organisations have protested against moves toward the development of a cadre of comprehensive nurses that would supervise deliveries as well as deliver primary care to a rural population.[32]

In addition, there is both support and resistance to task shifting. There are varied views on task shifting. Those in favour of task shifting see it as a potential solution to Uganda's dual problem of lack of skilled personnel and high demand for services. Those opposed to task

shifting see it as a quick fix and an approach that could dilute the quality of care and compromise the health system in the long term. Donor and international agencies widely support task shifting,[33,34] although WHO is now opposed to training TBAs.[35]

Policy options

The four options are complementary, with the primary aim of ensuring the optimal use of different cadres of health workers to ensure universal delivery of cost-effective MCH services (such as those in Appendix 2). In addition, Appendix 2 highlights the current scope of practice of health cadres in Uganda. An underlying principle is that care should be provided at the lowest effective level; i.e. by the least specialised health worker that can provide appropriate (cost-effective) care. We have therefore focused on expanding the use of primary health care providers other than medical doctors. Barriers to expanding the use of these four cadres of health workers and strategies for addressing them are described below under 'Implementation considerations'.

Policy option 1: Optimise the use of lay health workers

A lay health worker is not a health care professional but is a member of the community who has received some training to promote health or to carry out some healthcare services.[36] Lay health workers may receive varying degrees of training and support. Lay health workers include community health workers (CHWs) and traditional birth attendants (TBAs). Lay health workers can potentially be used to deliver a broad range of promotional, preventive and treatment interventions, including most MCH interventions for which there is evidence of cost-effectiveness in primary care (such as those in Appendix 2). Expanding the use of community drug distributors who are also lay health workers is being considered together with expanding the use of professional drug dispensers presented in Policy option 4.

Current use in Uganda

CHWs have been recognized as partners in health care delivery in Uganda. Research by Family Health International carried out in two central districts of Uganda showed that, with training, these community-based health workers can give accurate information on how to use pills and can identify conditions that rule out using pills in some clients. In addition it is advantageous that CHWs live in the same areas as their clients, because then they can monitor their clients' adherence.

A study evaluating the ability of CHWs to assess rapid breathing in under-5 year olds and exploring caretaker interpretation of pneumonia symptoms in western Uganda concluded that CHWs could recognize pneumonia in children and that there was consistency in the interpretation of severity, cause and treatment of the condition.[37] Seventy-one percent of the CHW assessments were within ±5 breaths/minute of the gold standard. The sensitivity of CHW classification was 75% and the specificity was 83%. In another non-randomized community trial of administration of contraceptive injections by CHWs in Uganda in 2007, 95% of their clients were "satisfied" or "highly satisfied" with services, and 85% reported receiving vital information, for example on side-effects. In addition there were no serious injection site problems in either group and there was no significant difference between continuation to second injection (88% among clients of community-based workers, 85% among clinic-going clients), nor were there significant differences in other measures of safety, acceptability and quality.[38]

TBAs have also been found to represent an important component of the healthcare system in resource-limited settings and are presently responsible for 50% of deliveries in developing countries. In Uganda TBAs represent one of the practices of traditional healing systems and constitute 12.3% of traditional healers.[39,40]

Anecdotal evidence suggests that TBAs are seizing an opportunity left by gaps in the health care delivery. They have organized themselves into a registered association with about 60,000 members, which is attracting expectant mothers to their side.[41] While the majority of mothers (over 70%) visit antenatal clinics during the first months of pregnancy, they opt to stay away at the moment of giving birth with only 42% of mothers delivering with a skilled provider.[14]

Impacts of optimising the use of lay health workers

A recently updated (2010) systematic review found 82 randomised trials of interventions delivered by lay health workers (paid or voluntary) in primary or community health care and intended to improve maternal or child health or the management of infectious diseases.[36]

They found that (Table 5) using lay health workers as an add-on to usual care:

- ➔ *Probably increases immunisation coverage and breast feeding*
- ➔ *May increase care seeking behaviour for children under five and reduce morbidity and mortality in children under five and neonates*

Table 5: Using lay (community) health workers as an add on to usual care

Patients or population: Mothers or children under five
Settings: Mixed (high-income countries for immunisations, mixed for breast feeding, low-income countries for morbidity and mortality in children
Intervention: Lay health workers (LHWs) (members of the community who are not health professionals and have received some training to promote health or to provide some health care services)
Comparison: Usual care (varied across studies)

Outcomes	Impact			Number of studies	Quality of the evidence (GRADE)*
	Without Lay health workers	With Lay health workers	Relative change		
Mortality in children under five	5 per 100 children	4 per 100 children	25% relative reduction	3	⊕⊕○○ Low
Neonatal mortality	4 per 100 infants	3 per 100 infants	24% relative reduction	4	⊕⊕○○ Low
Morbidity in children under five (e.g. fever, diarrhoea)	50 per 100 children	43 per 100 children	14% relative reduction	7	⊕⊕○○ Low
Care seeking for children under five	20 per 100 children	27 per 100 children	33% relative increase	3	⊕⊕○○ Low
Completed infant immunisations	50 per 100 infants	61 per 100 infants	22% relative increase	4	⊕⊕⊕○ Moderate
Initiation of breastfeeding	50 per 100 mothers	68 per 100 mothers	36% relative increase	12	⊕⊕⊕○ Moderate
Exclusive breastfeeding	20 per 100 mothers	36 per 100 mothers	178% relative increase	10	⊕⊕⊕○ Moderate

*GRADE Working Group grades of evidence
⊕⊕⊕⊕ **High:** We are confident that the true effect lies close to what was found in the research.
⊕⊕⊕○ **Moderate:** The true effect is likely to be close to what was found, but there is a possibility that it is substantially different.
⊕⊕○○ **Low:** The true effect may be substantially different from what was found.
⊕○○○ **Very low:** We are very uncertain about the effect.

Overall Assessment: This is a good quality systematic review with only minor limitations.

Impacts of expanding the use of traditional birth attendants

A traditional birth attendant (TBA) is a person who assists the mother during childbirth and who initially acquired her skills by delivering babies herself or through an apprenticeship to other TBAs (WHO 1992).[42] A systematic review found four studies of the effects of additional training for TBAs. They found that (Table 6):[43]

Providing as little as two to three days additional training for TBAs:

- ➔ *May reduce maternal, perinatal and neonatal mortality and stillbirths*
- ➔ *May have mixed effects on maternal morbidity*

Table 6: Training traditional birth attendants (TBAs)

Patients or population: Pregnant women and newborns
Settings: Rural communities in Pakistan, Malawi, Bangladesh and Guatemala
Intervention: Training of TBAs, delivery kits, training of lay health workers to support TBAs
Comparison: TBAs who had not received additional training

Outcomes	Impact			Number of studies	Quality of the evidence (GRADE)*
	TBAs without additional training	TBAs with additional training	Relative change		
Maternal mortality	Uncertain	Uncertain	26% relative reduction (Confidence interval: from a 22% increase to a 55% reduction)	1	⊕⊕OO Low
Perinatal mortality	12 per 100 mothers	9 per 100 mothers	27% relative reduction	1	⊕⊕OO Low
Neonatal mortality	4 per 100 babies	3 per 100 babies	29% relative reduction	1	⊕⊕OO Low
Stillbirths	7 per 100 babies	5 per 100 babies	29% relative reduction	1	⊕⊕OO Low
Puerperal sepsis	4 per 100 mothers	1 per 100 mothers	82% relative reduction	1	⊕⊕OO Low
Haemorrhage	25 per 100 mothers	16 per 100 mothers	38% relative reduction	1	⊕⊕OO Low
Obstructed labour	5 per 100 mothers	6 per 100 mothers	24% relative increase	1	⊕⊕OO Low

*GRADE Working Group grades of evidence
⊕⊕⊕⊕ **High:** We are confident that the true effect lies close to what was found in the research.
⊕⊕⊕O **Moderate:** The true effect is likely to be close to what was found, but there is a possibility that it is substantially different.
⊕⊕OO **Low:** The true effect may be substantially different from what was found.
⊕OOO **Very low:** We are very uncertain about the effect.

Overall Assessment: This is a good quality systematic review with only minor limitations.

A recent review (2009) found low to moderate quality evidence that traditional birth attendant training may improve linkages with facilities (referral rates) and improve perinatal outcomes including a 30% reduction in perinatal mortality rate and an 11% reduction in birth-related neonatal mortality rate.[44] There was also moderate quality evidence that community health workers reduced perinatal mortality by 28% and early neonatal mortality (during the first week of life) by 36%.

Equity, costs, monitoring and evaluation

In Uganda, there is an existing network of community health workers and TBAs providing care to underserved populations that could be targeted for further training. Provision of training and expanding the roles of TBA could potentially reduce inequities in service delivery. Improvements in appropriate referrals, however, would require access to trained and equipped healthcare professionals. Adequate support supervision provided by skilled health cadres to the TBAs would also improve health outcomes.

Darmstadt and colleagues estimated costs of TBA training per TBA ranging from US$44 in Uganda to US$45-$95 in Ghana, Mexico and Bangladesh.[44] Cost-effectiveness by the same review found a TBA assisting 30 births a year would save 1 baby every 1000 births at a cost savings of USD 3630 per life saved. Costs for community health worker training in India came to USD 7 for a cost savings of USD 150 per death averted.

Lay health workers could potentially reduce the costs of health care if substituted for professionals, by providing care at a level closer to local service users. However, there is a lack of data on the costs and cost effectiveness of using LHWs.[36] A recent systematic review (2009) of the cost-effectiveness of LHW interventions for vaccination promotion and delivery identified few relevant studies.[45]

Expanding the use of community health workers and providing training for TBAs may be a cost-effective approach to improving MCH outcomes and reducing inequities. However, given the limitations of the available evidence, consideration should be given to rigorously evaluating their cost-effectiveness prior to or in conjunction with scaling up. Careful planning is needed to ensure that LHWs are used and trained to deliver an appropriate package of cost effective interventions (such as those listed in Appendix 2) and that effective training and support) are provided (see 'Implementation considerations'), as well as ensuring the availability of necessary supplies and access to healthcare professionals and facilities for referrals.

Policy Option 2: Optimise the use of nursing assistants

Various terms may be used to describe nursing assistants, including nursing auxiliaries, nurse extenders and health care assistants. Nursing assistants may have various degrees of training, but they have less training than registered or qualified nurses.

Current use in Uganda

In Uganda nursing assistants are the majority of staff particularly at lower levels of service delivery in rural areas.[23] In addition to vaccinations, both nurses and nursing assistants have been found to be in charge of assessing and diagnosing patients and prescribing treatment. Without adequate numbers of physicians working in rural areas, nurses may have to step into the role of a primary care provider. For example, a volunteer at a private rural health centre in Eastern Uganda observed that nurses and nursing assistants would evaluate their patients and request further laboratory investigations. In between patients, they would do inventory, stock the facility, and make sure that the health centre was compliant with government and district standards. Optimally, they would also discuss with patients' lifestyle issues, such as balanced nutrition, personal hygiene, and family planning.[46] However, nursing assistants are not regulated by any formal professional council including the Uganda Nurses and Midwives Council. In comparison to LHWs, nursing assistants are facility-based and easier to supervise but lack of data on, numbers and distribution of nursing assistants render it impossible.

Impacts of optimising the use of nursing assistants

There is a paucity of information on the impacts of expanding the use of nursing assistants. Two reviews of the evidence regarding nursing skill mix found significant limitations to the current evidence.[47,48] Studies of the impacts on quality and costs of different uses of nurses and nursing assistants/auxiliaries are almost entirely descriptive and from high-income countries. Buchan and Dal Poz concluded that there is "limited support for the suggestion that redistribution of certain tasks in nursing could be possible and could contribute to strategies for meeting the demands of changes within health care delivery." However, "any reallocation of task, and substitution of qualified by unqualified staff, should be based on sound evidence and not merely on staff availability, service demand or apparent costs."[47] There is descriptive evidence that suggests that qualified nurses spend a considerable amount of time on non-nursing duties and that hiring lower grades of staff can increase the availability of trained nurse time. However, there are concerns that handing over some nursing to less skilled workers might reduce the role of the nurse and skills that are an integral part of nursing.[47]

A more recent review (2009) found that nurse-aides (assistants) could provide intrapartum supervision to enable midwives or doctors to handle obstetric emergencies.[49] In a study in rural Zimbabwe, nurse-aides were trained to conduct low-risk deliveries to enable doctors and nurses to manage primigravidas and high-risk deliveries. Nurse-aides conducted 57% of all deliveries with a perinatal mortality rate of 5 per 1000, suggesting that nurse-aides could competently attend appropriately identified low-risk births in this setting.[49]

Equity, costs, monitoring and evaluation

Nursing assistants are cheaper to train and pay than qualified nurses, midwives or doctors. Expanding the use of nursing assistants in facilities might increase the time available from nurses, midwives and doctors to provide care that requires more training, but the impacts of expanded use of nursing assistants are uncertain. It is also uncertain what, impact its likely to have on equity. There are logical reasons to consider increasing the use of nursing assistants

in facilities where there is a shortage of skilled nurses, midwives and doctors. Given the paucity of evidence, rigorous evaluation is warranted before doing this on a large scale, as well as monitoring of the use of resources, the delivery of cost-effective MCH interventions and patient outcomes.

Policy Option 3: Optimise the use of nurses, midwives and clinical officers

A range of primary care services normally provided by doctors have been transferred to nurses, midwives and clinical officers in many countries. The expectation is that they can provide as high quality care as doctors at lower cost or improve access to care where there is a shortage of doctors.

In sub-Saharan Africa, clinical officers are healthcare providers with a diploma in clinical medicine, surgery and community health following three years of training. Clinical officers work either independently or with a medical officer to provide healthcare services to largely rural populations. The basic training is roughly similar. However the scope of practice is as varied. In Uganda training takes place in clinical officer training schools. Internship is not required to be registered as a clinical officer. In other countries healthcare providers with comparable training and responsibilities may be called physician assistants, assistant medical officers, or nurse practitioners.

Nurses and midwives undergo clinical training at certificate, diploma and more recently bachelors' degree level. Nurses are more focused on general primary health care while midwives are specific to maternal and child health care.

Current use in Uganda

In Uganda clinical officers, along with other allied healthcare professionals, play a pivotal role in the delivery of primary healthcare. Their role is now extending to incorporate surgical obstetric skills and other tasks normally undertaken by medical professionals working in secondary healthcare facilities. A study of the role that the clinical officers currently play in Ugandan found that they are highly involved in the delivery of emergency, surgical and obstetric services to their respective communities.[50]

There has been reluctance to legalise task-shifting to clinical officers and nurses due to concerns about the quality of care provided. Nonetheless, Uganda and other countries in sub-Saharan Africa have expanded the use of clinical officers to treat HIV patients.[51]

Impacts of optimising the use of nurses, midwives and clinical officers

Nurses

A systematic review evaluated the impact of doctor-nurse substitution in primary care.[52] The review has some important limitations (Table 7). They found that:

- ➔ *Nurses and physicians may lead to similar health outcomes for patients.*
- ➔ *It is uncertain whether there is any difference in the cost of care provided by nurses compared to the cost of care provided by physicians.*

Table 7: Substitution of doctors with nurses in primary care

Patients or population: All presenting patients in primary care
Settings: Primarily Canada, the USA and the UK
Intervention: Substitution of doctors with nurses (nurse led primary care)
Comparison: Routine care provided by doctors (doctor led primary care)

Outcomes	Impact	Number of studies	Quality of the evidence (GRADE)*
Patient outcomes	Nurses and doctors may lead to similar health outcomes for patients.	4	⊕⊕OO Low
Quality of care	Not reported.		
Patient satisfaction	On average patients are probably more satisfied with care provided by nurses, but some prefer care provided by nurses and some prefer care provided by doctors.	3	⊕⊕⊕O Moderate
Direct costs	The lower salary costs of nurses may be offset by their increased use of resources or lower productivity so that there may be little if any difference in the cost of care provided by nurses compared to the cost of care provided by doctors. Because the difference in salary between nurses and doctors may vary from place to place and over time, the net saving, if any, is likely to depend on the context.	2	⊕OOO Very low
Indirect use of resources	Patients cared for by nurses are probably hospitalised more, but probably are not referred more to hospitals and probably do not have more emergency visits.	3	⊕⊕⊕O Moderate

*GRADE Working Group grades of evidence
⊕⊕⊕⊕ **High:** We are confident that the true effect lies close to what was found in the research.
⊕⊕⊕O **Moderate:** The true effect is likely to be close to what was found, but there is a possibility that it is substantially different.
⊕⊕OO **Low:** The true effect may be substantially different from what was found.
⊕OOO **Very low:** We are very uncertain about the effect.

Overall Assessment: The review on which this summary of findings is based had some important limitations. These include: the search only goes up to 2002 and only articles written in English or Dutch were included. Some analyses were potentially misleading.

Midwives

Another systematic review compared midwife-led care versus other models of care (obstetrician-led, family doctor-led and shared models of care) for childbearing women.[53] All of the included evaluations were conducted in high-income settings (Table 8). They found that midwife-led care:

- ➔ *Reduces the use of instruments for vaginal births*
- ➔ *Probably reduces overall foetal loss and neonatal death, antenatal hospitalisations, and use of intrapartum analgesia.*
- ➔ *Probably leads to little or no difference in the incidence of low-birth weight or preterm birth*

Table 8: Midwife-led care for childbearing women

Patients or population: Childbearing women
Settings: High-income countries
Intervention: Midwife-led models of care
Comparison: Other models of care

Outcomes	Impact			Number of studies	Quality of the evidence (GRADE)*
	Without Midwife-led care	With Midwife-led care	Relative change		
Overall foetal loss and neonatal death	5 per 100 babies	4 per 100 babies	17% relative reduction	10	⊕⊕⊕O Moderate
Antenatal hospitalisation	20 per 100 mothers	18 per 100 mothers	10% relative reduction	5	⊕⊕⊕O Moderate
Intrapartum analgesia	20 per 100 mothers	17 per 100 mothers	14% relative reduction	9	⊕⊕⊕O Moderate
Instrumental vaginal birth (forceps/vacuum)	20 per 100 mothers	17 per 100 mothers	14% relative reduction	10	⊕⊕⊕⊕ High

*GRADE Working Group grades of evidence

⊕⊕⊕⊕ **High:** We are confident that the true effect lies close to what was found in the research.

⊕⊕⊕O **Moderate:** The true effect is likely to be close to what was found, but there is a possibility that it is substantially different.

⊕⊕OO **Low:** The true effect may be substantially different from what was found.

⊕OOO **Very low:** We are very uncertain about the effect.

Overall Assessment: A good quality systematic review with only minor limitations.Uganda is a low income country whereas all the studies in this review were conducted in high-income countries.

Nurse practitioners

Nurse practitioners are nurses who have undergone further training to work autonomously; making independent diagnoses and treatment decisions. Nurse practitioners are not available in Uganda but this cadre is comparable to dinical officers in their training. A systematic review assessed evidence regarding substitution of doctors with nurse practitioners in providing safe, effective, and economical primary care management of patients.[54] The review showed (see Table 9):

- ➔ *Nurse practitioners compared to doctors probably have longer consultations and order more laboratory investigations*
- ➔ *Patients are probably more satisfied with nurse practitioners*
- ➔ *There is probably little or no difference in the number of prescriptions, return consultations or referrals*
- ➔ *There may be little or no difference in the quality of care or patient outcomes*

It is uncertain whether similar outcomes could be expected when substituting clinical officers for doctors in Uganda. Although there are some descriptive studies of expanding the use of clinical officers, there appear to be few, if any, evaluations of the impacts of doing this.[55]

Table 9: Substitution of doctors with nurse practitioners in primary healthcare

Patients or population: All presenting patients in primary care
Settings: Primary care in Canada, the UK and USA
Intervention: Nurse practitioners
Comparison: Doctors

Outcomes	Impact	Number of studies	Quality of the evidence (GRADE)*
Health status	There was no difference in health outcomes between doctors and nurse practitioners	7	⊕⊕○○ Low
Patient satisfaction	Patients were more satisfied with care provided by a nurse practitioner than by a doctor.	5	⊕⊕⊕○ Moderate
Quality of care	Better for nurse practitioners than doctors	6	⊕⊕○○ Low
Consultation length	Significantly longer consultations for nurse practitioners compared to doctors	5	⊕⊕⊕○ Moderate
Investigations	Nurse practitioners ordered for significantly more laboratory investigations than doctors	5	⊕⊕⊕○ Moderate
Prescriptions	There were no significant differences between nurse practitioners and doctors	4	⊕⊕⊕○ Moderate
Return consultations	There were no significant differences between nurse practitioners and doctors	6	⊕⊕⊕○ Moderate
Referrals	There were no significant differences between nurse practitioners and doctors	2	⊕⊕⊕○ Moderate

*GRADE Working Group grades of evidence

⊕⊕⊕⊕ **High:** We are confident that the true effect lies close to what was found in the research.

⊕⊕⊕O **Moderate:** The true effect is likely to be close to what was found, but there is a possibility that it is substantially different.

⊕⊕OO **Low:** The true effect may be substantially different from what was found.

⊕OOO **Very low:** We are very uncertain about the effect.

Overall Assessment: The review on which this summary of findings is based had some important limitations. These include: the search only goes up to 2002. Some missing information regarding selection of studies and description on heterogeneity of studies.

Equity, costs, monitoring and evaluation

Given the scarcity of obstetricians and medical officers serving disadvantaged populations in Uganda, particularly in rural areas, using midwives has the potential to reduce inequities in access to antenatal and postpartum care, provided midwives can be recruited and retained in underserved communities. Similarly, nurses or clinical officers could potentially provide a majority of cost-effective MCH interventions in primary care, such as the ones listed in Appendix 2, and may be easier to recruit and retain in underserved areas than doctors. Evidence from some studies in the review on midwife-led care suggest that midwife-led care is cost effective and produces comparable outcomes to other models of care. However, it is uncertain how transferable those results from high-income countries are to Uganda. It is also uncertain whether substitution of nurses for doctors is cost-effective. On the other hand, there is no sufficient data to determine expanding the use of clinical officers. Expanding the use of clinical officers would entail the cost of expanding training programmes, since there is an insufficient supply to fill currently available positions in the country.

Expanding the use of nurses and midwives where there is a shortage of doctors would probably improve MCH outcomes and reduce inequities; consideration should be given to incentives and regulations to support it. Given the uncertainty about costs and cost-effectiveness, it would be important to monitor resource use, the delivery of cost-effective MCH interventions and patient outcomes; and to evaluate the cost-effectiveness of expanding the use of nurses and midwives in Uganda.

Policy Option 4: Optimise the use of drug dispensers

The term 'drug dispensers' is used here purely descriptively to collectively refer to trained pharmacists, formally trained dispensers, clinicians dispensing drugs and untrained retailers in drug shops and other outlets.

However, many people buy medicines from retail drug shops usually manned by untrained dispensers, because they are convenient and often have drugs available when public health facilities are out of stock. Drug dispensers in these shops often lack basic qualifications and training. Inappropriate dispensing of medicines resulting in inappropriate patient use is one of the key factors driving drug resistance around the world. Drug dispensers are also consulted for health advice on problems of all kinds.

Drug dispensing is often overlooked by health planners during the development of health care delivery. This oversight is unfortunate, because poor or uncontrolled dispensing practices can have a detrimental impact on the health care delivery system. All of the

resources required to bring a drug to the patient may be wasted if dispensing does not ensure that the correct drug is given to the right patient in an effective dosage and amount, with clear instruction, and in packaging that maintains the integrity of the drug.

Among the cost-effective interventions listed in Appendix 2, the use of drug dispensers could be expanded for promotional interventions, such as promoting appropriate care seeking behaviour, provision and promotion of preventive interventions, including clean delivery kits, insecticide-treated bednets as well as treatment interventions, like improved management of diarrhoea and malaria.

Current use in Uganda

There is scant information regarding experience with expanding the use of drug dispensers in Uganda. The Government of Uganda with funding from the Gates Foundation recently launched Accredited Drug Dispensing Outlets (ADDO) to be manned by lay health workers in Kibaale district, in western Uganda. The ADDO program was adopted from Tanzania's experience with government accreditation of new shops called *Duka La Dawa Muhimu* (Swahili for "essential drug shop"). The ADDO program is intended to ensure adherence to standards related to better products and service quality with a key objective of improving awareness of the importance of pharmaceutical quality and treatment compliance.[56]

Impacts of optimising the use of drug dispensers

A review looked at the quality of private pharmacy services in low and middle-income countries.[57] Most of the 30 included studies have highlighted shortcomings in advice-giving and the supply of medicines. The included studies were all descriptive and do not provide evidence of the impacts of expanding the use of drug dispensers. However, given the important role that drug dispensers play, it is important to find effective strategies to ensure that they provide good quality services or that the services which they provide are shifted to other cadres of health workers.

An older systematic review (2000) found that expanded use of outpatient pharmacists targeted at patients may decrease the use of specific health services – such as hospital admissions and ambulatory care visits – and may improve patients' compliance with drug therapy.[58] However, differences in health systems, attitudes towards drug dispensers, training of drug dispensers and legal restrictions may limit the applicability of the findings from this review, especially because all but two of the studies were conducted at single sites in the United States. A number of studies of expanding the use of drug dispensers in low and middle-income countries have been conducted since that review was last updated, but this evidence has not yet been systematically reviewed.

➔ *The impacts of expanding the use of drug dispensers to promote and deliver cost-effective MCH interventions are uncertain.*

Equity, costs, monitoring and evaluation

Drug dispensers are an important source of care for disadvantaged populations with limited access to doctors. Improving the services they provide and expanding the use of drug dispensers to promote and deliver cost-effective MCH interventions could potentially reduce

inequities. The cost-effectiveness of doing this is uncertain. A systematic review of studies of expanding the use of drug dispensers in low and middle-income countries as well as a rigorous evaluation of expanding the use of drug dispensers and improving the quality of the services they deliver in Uganda should be considered prior to scaling up their use.

Implementation considerations

Optimizing the role of health workers is just one solution to improving the delivery of maternal and child health care and addressing other health system challenges. Implementing changes in the roles of health workers requires other changes. It is also an opportunity to address other health system problems. Implementation strategies can capitalise on enablers of optimising health workers' roles as well as addressing barriers to doing so. The focus here is primarily on barriers and strategies to address them.

Key enablers of optimising health workers' roles to deliver effective maternal and child health care include:

- There is widespread support for improving maternal and child health care
- Demand for care is unmet and there is a shortage and uneven distribution of health professionals
- Health facilities are widely available and the hierarchical organisation of the health system provides a structure for delegating tasks to less specialised health workers, referring patients who need more specialised care, and providing supportive supervision
- Mothers feel more comfortable with health workers with less training and people in rural areas prefer free public health services that are close to home
- There is international support for task shifting
- Successful task shifting is already occurring in Uganda and internationally

Evidence regarding barriers to expanding the use of health workers and strategies to address them is summarised in Table 10.

Table 10. Key barriers to optimising the roles of health workers and implementation strategies

Barrier	Mothers' knowledge and care seeking behaviour	
	Distance to service points, perceived quality of care and availability of drugs are key determinants of utilisation of health services provided by all cadres of health workers. Other barriers include a perceived lack of skilled staff in public facilities and lack of knowledge.[59,60,61] Mothers tend to trust that health workers are appropriately trained and competent and are more content with nearby providers.[62] In most cases, especially in the rural areas, they may not even be aware of which cadre of health worker is attending to them.[63,64,65] There is a general perception that services are of low quality in the public sector, with chronic gaps such as shortages of essential supplies, particularly in urban areas.[59] In more rural areas people tend to be keen to utilize free public health services.[66]	
	Implementation strategies	***Evidence***
	Outreach by CHWs and drug dispensers CHWs and drug dispensers can be used to teach mothers and promote appropriate use of health services.	The results of three randomised trials suggest that lay health workers may increase the likelihood of seeking care. However, the evidence is of low quality, due to a wide confidence interval that includes no effect and unexplained differences in their effectiveness across the three trials.[36] Cost data are not available, but would include the cost of training, supervision, incentives, and increased use of health services. More appropriate use of services and fewer complications, on the other hand, could result in savings.
	Community mobilisation Community mobilisation may include active community participation, contextualization of information in the local customs and culture, involvement of a broad range of key stakeholders, home visitation and peer counselling.	There is moderate quality evidence that community mobilisation probably increases demand for skilled obstetric care and institutional births. More intensive and participatory mobilisation strategies may be more effect. Limited cost data suggest that the cost of community mobilisation programmes may vary between 1 and 6 USD per person.[67]
	Mass media campaigns Mass media information on health-related issues may induce changes in health services utilisation, both through planned campaigns and unplanned coverage.	There is low quality evidence from interrupted time series analyses that mass media interventions may have an important role in influencing the use of health care interventions.[68]
	Patient education materials A wide range of patient education materials can be used to inform mothers about health care.	.There is some evidence that interventions including a patient education or information component in conjunction with other interventions can improve immunisation rates and adherence.[69]

Reduction or elimination of out-of-pocket costs

User fees may be reduced or removed completely for some or all women and children and for some or all types of MCH care.

Other ways of reducing or eliminating out of pocket costs include voucher schemes, community-based health insurance schemes, community loans for emergency transport and care, and conditional cash transfers (payments conditional on utilisation of services such as immunisations or prenatal care).

The elimination of user fees and other financial schemes to remove financial barriers may increase coverage rates of skilled birth attendance and the use of other services. However, strategies to increase demand for services need to be accompanied by actions to ensure the supply side can cope with the increased demand.[67,70] Utilisation increased when all fees at first level government health facilities in Uganda were removed in 2001. However, the incidence of catastrophic health expenditure among the poor did not fall. The most likely explanation is that frequent unavailability of drugs at government facilities after 2001 forced patients to purchase from private pharmacies. Informal payments to health workers may also have increased to offset the lost revenue from fees.[71]

Conditional cash transfer programmes can increase in the use of health services, including prenatal care and institutional delivery. They have had mixed effects on immunisation coverage. The cost-effectiveness of conditional cash transfer programmes, compared with supply-side strategies and other policy options, has not been evaluated.[67,72]

Community-based health insurance schemes may increase institutional delivery rates when obstetric care is included in the insurance package, as well as the use of other services. However, the financial viability of small-scale programs may be tenuous and uptake may be inequitable. National health financing strategies may be more sustainable.[67,73]

Barrier

Health workers' knowledge and competency

Additional training is required for all cadres of health workers to ensure appropriate delivery of cost-effective interventions, such as those listed in Appendix 2.[59,61,74,75,76,77] Over 60% of institutions for training health workers do not have adequate infrastructure and buildings. There is a critical shortage of tutors in health training institutions due to inadequate tutor training and non-appointment of qualified tutors.[78]

The Ministry of Health has the authority to ensure the quality of continuing education and has addressed this in its strategic plan and in policy guidelines. However, it is not clear whether it has the necessary resources to ensure adequate continuing education for expanding the use of each cadre of health workers or who is accountable for ensuring adequate continuing education.

Implementation strategies	*Evidence*

Educational meetings, outreach visits, audit and feedback

Educational meetings (training workshops), educational outreach (a personal visit by a trained person to health workers in their own settings),audit and feedback (a summary of performance over a specified period of time given in a written or verbal format) can be used alone or in combination with each other and other interventions to improve health worker practice.

The effect is most likely to be similar to other types of continuing medical education, such as audit and feedback, and educational outreach visits. Strategies to increase attendance at educational meetings and using mixed interactive and didactic formats may increase the effectiveness of educational meetings. Multifaceted interventions may not be any more effective than educational meetings, outreach visits or audit and feedback alone.[79,80,81,82,83,84]

Barrier

Incentives for health workers

Ugandan health workers are dissatisfied with their jobs, especially their compensation.[85] On average midwives earn between USD 75 (Ush 150,000) and USD 125 (Ush 250,000) per month. Salaries have increased little despite increasing costs of living. A registered nurse is paid about USD 200 (Ush 400,000), which is far below what they are paid in other countries. An enrolled nurse earns USD 135 (Ush 270,000) and lower cadres about USD 115 (Ush 230,000). Health workers in government facilities earn less than those working with projects. This draws health workers away from government facilities that are already understaffed.[86] Health workers also often have poor living conditions with inadequate housing and lack of social amenities, particularly in rural areas.[18] Non-material incentives are also often lacking.

Implementation strategies	*Evidence*
Adequate remuneration Health workers can be paid in any of the following ways or combinations of these: salary (a lump sum for a set number of working hours or sessions per week), capitation (a payment per patient), fee-for-service (payment for each item of service or unit of care). Payment in kind (material incentives) includes, for example, housing, transport, childcare facilities, free food and employee support.	Adequate remuneration is essential to motivate health professionals and may be necessary for lay health workers if they are expected to use a substantial amount of time. There is some evidence that primary care physicians in high-income countries provide a greater quantity of primary care services under fee for service payment compared with capitation and salary, although long-term effects are unclear. There is no evidence, however, concerning other important outcomes or comparing the relative impact of salary versus capitation payment.[87] There is low quality evidence that financial incentives may increase retention of CHWs, but can cause problems if the money is not enough, not paid regularly, or stops altogether. Monetary incentives may also cause problems among health workers who are paid and not paid. Payment in kind (material incentives) may increase retention with fewer problems.[88] Although non-financial material incentive schemes are widely used, the design, implementation and evaluation of these schemes has not been systematically documented.[89]

Pay for performance Pay-for-performance refers to the transfer of money or material goods conditional on taking a measurable action or achieving a predetermined performance target.	There is limited evidence of the effectiveness of pay for performance and almost no evidence of the cost-effectiveness of pay for performance. Based on the available evidence and likely mechanisms through which financial incentives work, they are more likely to influence discrete individual behaviours in the short run and less likely to create sustained changes. If not carefully designed, pay for performance can have undesirable effects, including motivating unintended behaviours, distortions (ignoring important tasks that are not rewarded with incentives), gaming (improving or cheating on reporting rather than improving performance), and dependency on financial incentives.[90]
Non-material incentives Non-material incentives include, for example, community recognition, peers support, and acquisition of valuable skills (and the prospect of future employment).	There is low quality evidence that non-material factors may help to motivate CHWs.[88] Health professionals can also be motivated by non-material incentives.[90] Career development and management issues are core factors for motivating and retaining health workers. Recognition is highly influential in health worker motivation and adequate resources and appropriate infrastructure can improve morale significantly.[91]

Barrier

Referral processes and transportation

Health workers in private practice have disincentives for referring, leading to under-referral and late referrals. TBAs also often fail to refer or refer late. On the other hand, health workers in public units have incentives to over-refer. Patients often do not complete referrals due to lack of money, transportation problems, and responsibilities at home.[59,92] Ambulance service is limited, misused and unfairly distributed.

Because resources are limited, only more accessible health facilities tend to receive supervision visits, and only a few times per year. Furthermore, a top-down, control-oriented approach mostly focuses on collecting data without addressing local staff's performance needs.[93] In addition, many health workers fear supervision, mainly due to perceived or real misuse of authority by supervisors. In Uganda, one out of four interviewed health workers reported physical, verbal or emotional abuse from their supervisors.[94] Local leaders are responsible for supervising and monitoring the activities of civil servants. However, such accountability mechanisms have been found to be lacking.[95]

Reporting of health information data in Uganda is done through district health offices that collect and summarise data from sub-districts and over 2,000 health facilities; including government and private not-for profit units. Reporting from private practitioners has been very difficult as there has been no sustainable motivation for them to report. The information on most patients they administer is not included in the health management information system. Computerisation of the HMIS in Uganda has been a slow process due to financial and technical limitations.[96]

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Implementation strategies	*Evidence*
Strategies to implement referral guidelines Strategies to implement referral guidelines include passive dissemination, educational activities, structured referral sheets and the use of financial incentives.	Low to moderate quality evidence suggests that passive dissemination of referral guidelines alone is unlikely to lead to improvements in referral practice. Guidelines for appropriate referral are more likely to be effective if local consultants (more specialised health workers to which patients are referred) are involved in educational activities and structured referral sheets are used. Financial interventions can change referral rates but their effect on the appropriateness of referral is uncertain.[97]
Educational meetings, outreach visits, audit and feedback Educational meetings, educational outreach and audit and feedback (as described above) can be used alone or in combination with each other and other interventions to improve referrals.	See evidence above.
Pay for performance Pay-for-performance (as described above) can be used to motivate appropriate referrals.	See evidence above.

Reduction or elimination of out-of-pocket costs User fees may be reduced or removed completely for some or all women and children and for some or all types of referrals. Other ways of reducing or eliminating out of pocket costs for referrals include voucher schemes, community health insurance schemes, community loans for emergency transport and care, and conditional cash transfers (e.g. for delivery at a facility with skilled birth attendance).	The elimination of user fees and other financial schemes to remove financial barriers may increase completion of referrals (see above).[67]
Community referral and transport schemes Schemes that are used vary widely and may include paying for travel costs, establishing a transportation plan, and providing various means of transportation, including canoes, loan of a truck, and ambulance transport using bicycles, motorcycles or 4-wheel drive vehicles. Establishing effective communication between primary and referral level facilities is a key component of transport systems.	Community referral and transport schemes may increase rates of facility delivery, reduce referral time, and improve access to emergency obstetric care for women with obstetric complications. Challenges include the high cost of vehicles and maintenance, establishing effective communication systems in remote settings, maintaining driver coverage, and sustainability within a resource-constrained health system.[67]

A clear policy is needed to ensure optimal use of health workers. This should be based on which cadres can deliver cost-effective MCH interventions efficiently and equitably. Costing studies are needed to inform the policy and decisions about how to implement it.

Expanding the roles of less specialised health workers (task shifting) is unlikely to improve delivery of health care in the absence of a comprehensive policy. Consideration need to be given to appropriate governance, financial arrangements, and effective implementation strategies to address the health workforce shortage, inequitable distribution of health workers, poor performance or inefficient use of health workers among others.

Monitoring and rigorous evaluation of the impacts of task shifting policies are warranted in light of important uncertainties regarding all of the policy options and implementation strategies discussed in this policy brief.

Appendices

Appendix 1. How this policy brief was prepared

The methods used to prepare this policy brief are described in detail elsewhere.[98,99,100]

The problem that the policy brief addresses was clarified iteratively through discussion among the authors, review of relevant documents and research, discussion with the REACH, Uganda Task Shifting Working Group and external review of a preliminary description of the problem. Research describing the size and causes of the problem was identified by reviewing government documents, routinely collected data, searching PubMed and Google Scholar, through contact with key informants, and by reviewing the reference lists of relevant documents that were retrieved.

Strategies used to identify potential options to address the problem included considering interventions described in systematic reviews and other relevant documents, considering ways in which other jurisdictions have addressed the problem, consulting key informants and brainstorming.

We searched electronic databases of systematic reviews, including: the Program in Policy Decision-Making / Canadian Cochrane Network and Centre (PPD/CCNC) database of systematic reviews of the effects of delivery, financial and governance arrangements (http://www.researchtopolicy.ca/search/reviews.aspx) and the Canadian Agency for drugs and Technologies in Health (CADTH) Rx for Change database (http://www.cadth.ca/index.php/en/compus/optimal-ther-resources/interventions). These databases include records of policy-relevant systematic reviews that were identified through electronic searches of MEDLINE, the Cochrane Database of Systematic Reviews (CDSR), the Database of Abstracts of Reviews of Effectiveness (DARE) and EMBASE.

We supplemented these searches by checking the reference lists of relevant policy documents and with focused searches using PubMed, The Cochrane Library, Google Scholar, ISI Web of Science, and personal contacts to identify systematic reviews for specific topics. The final selection of reviews for inclusion was based on consensus by the authors.

One of the authors summarised each included review using an approach developed by the Supporting the Use of Research Evidence (SURE) in African Health Systems project (www.evipnet.org/sure).[99] We extracted the key findings of each review, assessed the quality of the evidence, and summarised important information regarding the interventions, participants, settings and outcomes; and considerations of applicability, equity, economic consequences, and the need for monitoring and evaluation. The quality of the evidence was assessed based on the GRADE approach and the key findings were expressed consistently so as to reflect the quality of evidence, using the approach developed for Cochrane plain language summaries.[99]

Potential barriers to implementing the policy options were identified through brainstorming using a detailed checklist of potential barriers to implementing health policies.[100] We searched for evidence of potential barriers that were identified using PubMed, Google

Scholar, key informants and reviewing the reference lists of relevant documents that were retrieved. Implementation strategies that address potential barriers were identified through brainstorming and reviewing relevant documents. Systematic reviews of relevant implementation strategies were identified using the databases listed above for finding reviews of the policy options. This evidence was summarised using the same approach as described above, but without undertaking detailed assessments of the quality of the evidence or data extraction.

Drafts of each section of the report were discussed with the REACH, Uganda Task Shifting Working Group. The external review process of a draft version was managed by the authors. Comments provided by the external reviewers and the authors' responses are available from the authors. A list of the people who provided comments or contributed to this policy brief in many ways is provided in the acknowledgements section.

Appendix 2. Potential for different cadre of primary care health workers to deliver cost-effective maternal and child health services

(Adapted from Bhutta 2008)[13]

	Reasons for inclusion			Potential for delivery by					
	Responsible Health Cadre in Uganda	**Effectiveness (Strength of evidence)**	**Cost-effectiveness (International US$ per DALY averted)**	**Strength of evidence of benefit in primary care**	**LHWs with limited training†**	**Trained LHWs†**	**Midwives†**	**Nurses or clinical officers†**	**Drug dispensers†**
Promotional interventions									
Promotion of reproductive health and family planning	All cadres	Strong	48–1000	Strong	+	++	++	++	
Promotion of appropriate care seeking and antenatal care during pregnancy	All cadres	Moderate	15–47	Strong	++	++	++	++	+
Promotion of skilled care for childbirth	All cadres	Strong	48–1000	Strong	++	++	++	++	+
Exclusive breastfeeding advice and support	All cadres	Strong	15–47	Strong	++	++	++	++	+
Preventive interventions				Strong					
Provision/availability of contraceptives for birth spacing and safe sex	Nurses, midwives, Clinical Officers, Medical Officers, Community based distributors for some methods	Strong	15–47	Strong	+	++	+	++	..
Cord care and clean delivery kits	Midwives. Nurses, Clinical Officers, Medical Officers, Nursing aides	Strong	15–47	Strong	++	++	++	++	+
Iron folate supplementation during pregnancy	Midwives. Nurses, Clinical Officers, Medical Officers, Nursing aides	Moderate	15–47	Plausible*	+	+	+	++	+
Balanced protein-energy supplements during pregnancy in food-insecure populations	All cadres	Strong	>1000	Plausible*	+	+	..	+	..

	Reasons for inclusion			Potential for delivery by					
	Responsible Health Cadre in Uganda	Effectiveness (Strength of evidence)	Cost-effectiveness (International US$ per DALY averted)	Strength of evidence of benefit in primary care	LHWs with limited training†	Trained LHWs†	Midwives†	Nurses or clinical officers†	Drug dispensers†
Calcium supplementation for PIH	Midwives. Nurses, Clinical Officers, Medical Officers, Nursing aides	Moderate	15–47	Plausible*	+	++	++	++	..
Low-dose aspirin in pregnancy for at-risk women	Medical Officers (with supervision of Obstetrician); Obstetricians	Strong	15–47	Plausible*	+	++	++	++	..
Antiretrovirals in HIV-infected individuals and PMTCT	Midwives. Nurses, Clinical Officers, Medical Officers,	Strong	48–1000	Strong	..	+	+	++	+
Antibiotics for preterm rupture of membranes	Midwives. Nurses, Clinical Officers, Medical Officers,	Strong	>1000	Plausible*	..	++	++	++	..
Antenatal steroids in preterm labour	Obstetricians	Strong	>1000	Plausible*	..	+	++	++	..
EPI (including additional new vaccines Hib, pneumococcal and rotavirus vaccines)	Midwives. Nurses, Clinical Officers, Medical Officers, Nursing aides	Strong	48–1000	Strong	..	..	..	++	++
Vitamin A supplementation in children	Midwives. Nurses, Clinical Officers, Medical Officers, Nursing aides	Strong	15–47	Strong	+	++	+	++	+
Preventive zinc supplementation/fortification for children	(Being introduced) Midwives. Nurses, Clinical Officers, Medical Officers, Nursing aides.	Strong	48–1000	Strong	+	++	+	++	+
Insecticide-treated bednets for the family	All cadres	Strong	15–47	Strong	+	++	+	+	+
IPT for prevention of malaria in pregnancy and children with IPT	Midwives. Nurses, Clinical Officers, Medical Officers, Nursing aides	Strong	15–47	Strong	+	++	++	++	+

	Responsible Health Cadre in Uganda	Reasons for inclusion			Potential for delivery by				
		Effectiveness (Strength of evidence)	Cost-effectiveness (International US$ per DALY averted)	Strength of evidence of benefit in primary care	LHWs with limited training†	Trained LHWs†	Midwives†	Nurses or clinical officers†	Drug dispensers†
Treatment interventions									
Promotion and use of skilled birth attendants in first-level and second-level facilities	All cadres for promotion.	Moderate	15–47	Plausible*	+	++	++	++	+
Interventions for prevention of post-partum haemorrhage and use of oxytocic agents	Midwives. Nurses, Clinical Officers, Medical Officers,	Strong	48–1000	Plausible*	+	+	++	++	..
Basic newborn resuscitation with self inflatable bag and mask	Midwives. Nurses, Clinical Officers, Medical Officers	Moderate	15–47	Plausible*	..	+	++	++	..
Improved diarrhoea management (zinc and ORT etc)	Midwives. Nurses, Clinical Officers, Medical Officers, Nursing aides	Strong	48–1000	Strong	++	++	+	++	++
Community detection and management of pneumonia with short course amoxicillin	All cadres. Village Health Team recently included in community case management including treatment with antibiotics. §	Strong	48–1000	Strong	..		+	++	++
Improved case management of malaria including ACTs	All cadres. Village Health Team recently included in community case management strategy.§	Strong	48–1000	Strong	+		+	++	++
Recognition, triage and treatment of severe acute malnutrition in affected children in community settings	Midwives. Nurses, Clinical Officers, Medical Officers, Nursing aides	Strong	>1000	Strong	+		+	++	++

*** Promising evidence of benefit in primary care; further evaluation needed**

† ++=principal responsibility for the intervention; +=additional task (opportunity)

PIH=pregnancy-induced hypertension. PMTCT=prevention of mother to child transmission. EPI=expanded programme for immunisation. IPT=intermittent preventive treatment for malaria. ORT=oral rehydration therapy. ACT=artemesin combination therapy

§: Under policy discussion.

Glossary, acronyms and abbreviations

ACTs - artemisinin-based combination therapies

ADDO - Accredited Drug Dispensing Outlet

AIDS – acquired immunodeficiency syndrome

ART - antiretroviral therapy

CHW - community health workers

EVIPNet - Evidence-Informed Policy Network (www.evipnet.org)

GRADE (Grading of Recommendations Assessment, Development and Evaluation) – a system for rating the quality of evidence and the strength of recommendations (www.gradeworkinggroup.org).

HIV – human immunodeficiency virus

LHW – lay health worker

MCH - maternal and child health

MDGs - Millennium Development Goals

Task shifting - A process of delegation whereby tasks are moved, where appropriate, to less specialized health workers.

The term 'Less Specialised' is relative in terms of the level of health cadre being compared.

REACH - Regional East African Community Health (REACH) Policy Initiative (www.eac.int/health)

SURE – Supporting the Use of Research Evidence (SURE) in African Health Systems (www.evipnet.org/sure)

TBA – traditional birth attendant

UK – United Kingdom

UNICEF – United Nations Children's Fund

USA – United States of America

USD – United States dollars

Ush – Uganda shillings

VHT - village health team

WHO - World Health Organization

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