FISTULA CARE

Strengthening Health Systems Through the Levels of Fistula Care Framework

A Literature Review

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Contents

Executive Summary	1
Introduction	
Background	
Methodology	
Peer-Reviewed Literature	
Grey Literature	
Results	6
Health Systems Strengthening Theory	6
Health service delivery	6
Health workforce	7
Health information system	7
Medical products, vaccines and technologies	7
Health system financing	7
Leadership and governance (stewardship)	7
Health Systems Strengthening Guiding Principles	
Holism	
Context	
Social mobilization	9
Collaboration	9
Capacity enhancement	9
Efficiency	9
Evidence-informed action	9
Equity	
Financial protection	
Satisfaction	
Health System Structure	
Decentralization	
Referral systems	
Health Systems Financing	
Global health partnerships	
Universal coverage	
Surgery	
Surgical capacity	
Infection Prevention	
Anesthesia	
Workforce	
Limitations	19
Conclusions	
References	23

Tables

Table 1. Literature search results by bibliographic database	4
Table 2. Literature search results by HSS domains	6

Figures

Figure 1. The WHO Health System Framework8
Figure 2. The Levels of Fistula Care Framework11
Figure 3. Nine priority areas for optimizing the capacity of maternity referral systems in developing countries:
Figure 4. Ten best practice examples to increase aid commitments:14

Executive Summary

Each year half a million women die due to complications with pregnancy or labor and delivery. The majority of these deaths take place in developing countries and are attributed to lack of access to obstetric care and skilled health professionals. Obstetric fistula, arguably one of the most devastating pregnancy-related injuries, results from prolonged and obstructed labor and a lack of access to emergency obstetric care. The woman is left with urinary or fecal incontinence, or both. Obstetric fistula afflicts almost uniquely women in developing countries with an estimated two million women in Asia and sub-Saharan Africa living with this untreated condition. According to the World Health Organization, obstructed labor occurs in 5% of live births and accounts for 8% of all maternal deaths.

Strengthening health systems in developing countries is essential to improving global health outcomes and central to meeting Millennium Development Goal targets in maternal health. There has been renewed focus and increasing interest in health systems strengthening in recent years. It is particularly important to establish a common set of guidelines and work towards improving health systems in regions such as sub-Saharan Africa, where maternal mortality ratios are the highest. Strengthening health systems is critical to fistula treatment and prevention efforts.

This paper presents findings from a literature review of the peer-reviewed and grey literature, exploring the application of EngenderHealth's Levels of Fistula Care Framework (repair, prevention and reintegration) as a health systems strengthening group of interventions. The methodology offers a comprehensive approach for reviewing the literature that will inform institutionalization of rationalized health systems strengthening through Fistula Care. This framework is a critical piece to strengthening health systems and to establishing an environment of fistula prevention as well as care and surgical interventions.

The key health systems strengthening domains that emerged from the analysis of the literature are: health system structure (including decentralization and referral systems), financing, surgery, and workforce. Analysis of the literature shows that in order to address fistula care and health systems strengthening, careful consideration of these domains is essential. There is no blanket solution but rather an integrated and comprehensive approach, which incorporates these different components of health systems building.

Findings from the literature reviewed suggest that the first level of the Levels of Fistula Care Framework provides a package of prevention interventions that strengthens maternal health systems. The evidence is less clear as to whether the repair services outlined in levels two and three of the framework should be delivered within existing health systems or individual standalone fistula repair centers. Research is needed to explore this question further.

Introduction

Background

Each year half a million women die due to complications of pregnancy or labor and delivery (UNICEF, 2009). The majority of these deaths take place in developing countries and are attributed to a lack of access to skilled health professionals and emergency obstetric care (EmOC) (UNICEF, 2009). The United Nations (UN) created the Millennium Development Goals (MDG) with a mission to reduce extreme poverty by 2015. There are eight goals in total, centering on ending hunger; achieving universal education, gender equality, child health, and maternal health; combating HIV/AIDS; ensuring environmental sustainability, and establishing global partnerships (UN, 2010b). The MDGs are a global initiative, endorsed by 189 nations and supported by leading development institutions (UN, 2010b). To address the critical issue of maternal health, the fifth MDG is broken down into two components; reducing maternal mortality by 75% and assuring universal access to reproductive health services (UN, 2010c).

While global strides have been made to reduce maternal mortality, progress has been slow, with some countries failing to make any progress (Bhutta et al., 2010; Pitt et al., 2010). These mixed results suggest that improving global health outcomes and reaching MDG targets in maternal health will not happen without health systems strengthening (HSS)(Accorsi et al., 2010). There has been renewed focus and increased interest in HSS in recent years. The World Health Organization (WHO) is one of the primary drivers of this movement and defines HSS as: "(i) the process of identifying and implementing the changes in policy and practice in a country's health system, so that the country can respond better to its health and health system challenges; (ii) any array of initiatives and strategies that improves one or more of the functions of the health system and that leads to better health through improvements in access, coverage, quality, or efficiency" (WHO, 2011b). While the need for HSS is widely accepted, there is much less clarity and consensus in the field regarding guiding principles and best practices (Swanson et al., 2010). It is particularly important to establish a common set of guidelines and work towards improving health systems in regions such as sub-Saharan Africa, where maternal mortality ratios are the highest. A woman's risk of dying from complications related to pregnancy and childbirth in sub-Saharan Africa is one in 22, compared with one in 7,300 in developed countries (Accorsi et al., 2010).

Amongst maternal health outcomes, one of the most devastating pregnancy-related injuries is obstetric fistula, which results from prolonged and/or obstructed labor. During obstructed labor, the soft tissues of the pelvis are compressed between the baby's head and the mother's pelvic bone (Donnay & Weil, 2004). This results in a lack of blood flow to these tissues, leading to necrosis and the formation of a hole between the vagina and bladder (vesicovaginal) or vagina and rectum (rectovaginal), and in some cases, both (Donnay & Weil, 2004). The mother is left with urinary or fecal incontinence, or both. Almost all cases of prolonged and obstructed labor result in stillbirth (Creanga et al., 2007). If the woman survives, constant leaking of urine, feces, or both, often results in rejection by her husband and exile from the community. The main treatment option for fistula is surgery to repair the hole in the bladder or rectal wall. In most cases, the surgery is routine with a 90% or higher closed and dry outcome (Creanga et al., 2007; Nardos, Browning, & Member, 2008).

Medical advances of the 20th century, primarily cesarean sections, have led to the eradication of obstetric fistula in developed countries. Currently, fistula afflicts primarily women in developing countries and it is estimated that two million women in Asia and sub-Saharan Africa are living with untreated fistula (de Bernis, 2007). According to WHO, obstructed labor occurs in 5% of live births and accounts for 8% of all maternal deaths (WHO, 2010). Obstructed labor is one of the four leading causes of maternal mortality and morbidity, with 50,000 to 100,000 women worldwide developing obstetric fistula each year (WHO, 2010). MDG 5 includes making a concerted effort to end fistula (UN, 2010a). The unmet need for surgical treatment of fistula is estimated to be as high as 99% (Ahmed et al., 2007). The main risk factors of fistula include poverty, child marriage, malnutrition, and general poor health (Donnay & Weil, 2004). However, it is important to note that very few statistics and data are available to adequately indicate the burden of fistula. The reason is twofold; first, there is a general neglect of the issue and second, fistula most often occurs in rural areas (Stanton, Holtz, & Ahmed, 2007). As a result, its precise incidence in developing countries is unknown (Kelly & Winter, 2007; Stanton, Holtz, & Ahmed, 2007). It is almost certain that the toll of fistula is largely underestimated. HSS is critical to fistula treatment and prevention efforts.

To address the complexity of fistula repair services, Fistula Care developed a strategic approach which links a network of sites to facilitate prevention, diagnosis, limited treatment and referral, treatment of simple cases, treatment of complex cases, and the establishment of one or more sites capable of providing training. This document describes in detail three levels of facility-based care that Fistula Care envisages. This project to describe a network of facilities that implement rationally distributed prevention, simple repair and complex repair services (Fistula Care, 2009).

Objectives

The aim of the current study is to examine the available peer-reviewed and grey literature on HSS as relevant to the Levels of Fistula Care framework. The methodology offers a comprehensive approach for reviewing the literature with an aim of informing institutionalization of rationalized HSS through Fistula Care. There were two questions which framed the literature review:

- 1. Does the literature provide evidence that the Levels of Fistula Care framework strengthens health systems?
- 2. If so, should fistula treatment services be integrated into existing health systems or provided at stand-alone facilities?

Methodology

Peer-Reviewed Literature

Literature searches were conducted between June 7th and June 15th 2011 in the following bibliographic databases: MEDLINE (1966 to June 2011); Embase (1980 to June 2011); The Cochrane Library (Issue 6, 2011); and Global Health (1973 to June 2011).

Embase, MEDLINE and Global Health were searched through the OVID interface. The Cochrane Library was searched using the Wiley interface.

The search strategy was first developed in the MEDLINE database, results were reviewed and the strategy was revised. The finalized MEDLINE strategy was then adopted for other databases. The MEDLINE strategy combined concepts of HSS and developing countries. MeSH (Medical Subject Heading) and text words (searching titles and abstracts) were used. The MeSH terms used for health systems included "health systems strengthening" and "referral system". The text words used included "service delivery", "health system boundaries", "health system performance", "integrated health system", "health system capacity", "horizontal integration", "network of services", "surgical capacity", "surgical services", and "decentralization". Depending on the volume of results, some of these terms were combined using the Boolean operator "and".

No limits were included for age, publication type, publication year, gender or study design. Language limitations were imposed, however, with English-, French- and Spanish- language publications included. Studies were also only considered if full-text versions of the article were available through the McMaster University Library system. A total of 2,678 citations were identified with 1,154 remaining after duplicate citations were removed (see Table 1 for overview of search results). EndNote software was used as the citation management database. Citations were exported through EndNote into an Excel spreadsheet for analysis.

All of the study abstracts were reviewed for relevance screening and 77 articles were identified as potentially relevant. Publication year ranged from 1978 to 2011, with the majority (95%) of the articles being published in the past decade. Full-text copies of the articles were obtained for analysis. Each article was reviewed and the following data was gathered and entered into the Excel database: 1) unique identifier, 2) authors, 3) publication year, 4) title, 5) study design, 4) relevance score (1-5), 6) objective, 5) main conclusions, and 6) other notes.

Bibliographic Database	Results	Duplicates
MEDLINE	1,735	891
Embase	819	529
Global Health	130	104
Cochrane Library	I	0
Total	2,685	1,524

Table 1. Literature search results by bibliographic database

Health systems strengthening for fistula services-A literature review

Grey Literature

A grey literature search was also conducted, as many relevant HSS reports published by leading organizations are not peer-reviewed and available through bibliographic databases. Searches of the grey literature were conducted in June 2011 using the Google search engine. The same keyword search process for the peer-reviewed literature was employed in the grey literature search. Relevant Listservs (e.g., GHDonline) and blogs (e.g., Maternal Health Task Force) were also searched for relevant posts.

A snowball technique was applied to the grey literature where reference lists were scanned to identify additional potentially relevant publications.

A further 28 publications were identified through the grey literature search as relevant and included in the review.

Results

The searches did not yield any publications specific to HSS in fistula care. However, many relevant publications were found on the broader and more global issues relating to HSS, with many articles that focused on HSS in maternal health and specifically MDG 5. These results and concepts are discussed and applied to the fistula context. The key HSS domains that emerged from the analysis of the literature and are applicable to the area of maternal health and fistula care are: health system structure, financing, surgery, and workforce (see Table 2 below).

Domain	Results
Health System Structure Health systems theory, principles, decentralization, and referral systems	37
Financing	15
Global health partnerships and universal coverage	15
Surgical capacity, infection prevention and anesthesia	35
Workforce	18

Table 2. Literature search results by HSS domains

The results section begins with an exploration of HSS theory and guiding principles, followed by an examination of the Levels of Fistula Care Framework. The findings from the central domains of health systems structure, financing, surgery, and workforce as they relate to maternal health are then discussed.

Health Systems Strengthening Theory

The history of the HSS movement is easy to track through WHO documentation, with WHO having lead the push to recognize that it is impossible to attain national and international targets, such as the MDGs, without increased and effective investments in health systems (WHO, 2007). WHO's Framework for Action outlines and clarifies its approach to strengthening health systems (WHO, 2007). Underpinning the Framework for Action is the Alma Ata Declaration For Health For All and the Principles of Primary Healthcare (WHO, 1978). The Framework consists of six "building blocks" that comprise the health system as defined in the World Health Report (WHO, 2000). The building blocks are: service delivery; health workforce; information; medical products, vaccines and technologies; financing; and leadership and governance (stewardship) (see Figure 1 for WHO's Health System Framework). The building blocks serve to define desirable attributes of a health system (WHO, 2007).

Health service delivery

Health services include promotion, prevention, treatment, and rehabilitation. Effectively delivering these health services relies on sufficient staffing, equipment, information, finance, and medications (WHO, 2011c). A health system is successful when services are provided in a safe and high-quality manner with minimal waste (WHO, 2011c).

Health workforce

Fifty-seven (57) countries are currently experiencing a health workforce shortage with each of these countries reportingless than 23 health workers per 10,000 people (WHO, 2011e). A country's health workforce is central in the provision of health services ranging from service providers to support workers. This includes private and public health workers, paid and unpaid, as well as lay and professional workers (WHO, 2007). A good and well-functioning health workforce is one that is available, competent, responsive and productive (WHO, 2007).

Health information system

Key components of the information system building block are health information and surveillance systems, development of standardized tools, and the collection and dissemination of health statistics (WHO, 2007). Efficient and reliable data collection of health-related statistics is especially important in preparing for epidemics and responding to public health emergencies. Health information is comprised of collecting high-quality data in three key areas: health determinants, health systems performance, and health status (WHO, 2007).

Medical products, vaccines and technologies

A strong health system provides equitable access to medicines, vaccines and technologies that are safe, cost-effective and scientifically sound (WHO, 2007). In order to achieve these goals, national policies and standards must be in place with international trade agreements (WHO, 2007). Reliable manufacturing as well as procurement, supply, storage, and distribution systems ensure patient safety and minimize waste (WHO, 2007).

Health system financing

Arguably one of the most crucial of the building blocks is financing. Solid health financing ensures sufficient funds so that people who need the services can use them and are sheltered from financial catastrophe of being unable to pay for them (WHO, 2007). Universal coverage is the gold standard and aim of health financing systems. There is no set formula for health systems financing; rather it must be customized to the local history, institutions and traditions (WHO, 2007).

Leadership and governance (stewardship)

This is the most complex of the building blocks as it involves the role of government in health. It is the responsibility of the entire health system (private and public) in order to protect public interests, requiring both political and technical action (WHO, 2007). While no government is the same, there are some overarching principles common to all health systems. These include: policy guidance, intelligence and oversight, collaboration and coalition building, regulation, system design, and accountability (WHO, 2007).

Figure I. The WHO Health System Framework (WHO, 2007)



SYSTEM BUILDING BLOCKS

OVERALL GOALS/OUTCOMES

Health Systems Strengthening Guiding Principles

Swanson and colleagues (2010) conducted a systematic review and key informant interviews to inform and develop a set of guiding principles for HSS in low and middle-income countries. The review highlighted a lack of consensus and inconsistencies in the definition and application of HSS. As the authors illustrate, a lack of agreement on these principles diminishes its effectiveness and emphasizes a great need for clarity within the field. Study results were used to inform and create best practice guidelines as a way to establish a core set of principles within the field. Ten guiding principles were developed: holism, context, social mobilization, collaboration, capacity enhancement, efficiency, evidence-informed action, equity, financial protection, and satisfaction (Swanson et al., 2010). These guiding principles have been applied to policy and practice in a variety of global health initiatives and institutions (Swanson et al., 2010; Waage et al., 2010).

Holism

This principle focuses on strengthening health systems as a whole because strengthening one component of a system does not necessarily lead to the strengthening of the entire system (Swanson et al., 2010). Global health planners are advised to consider the impact of their activities on the entire health system and to plan their work based on all of the ten guiding principles to promote holism (Swanson et al., 2010).

Context

Work in HSS must consider local contexts as well as the overarching architecture of the system

(Swanson et al., 2010). Global health activities often span multiple communities, such as local government, international donors and health professionals. As a result, it is very important that there is an understanding of the context on multiple levels. Global health solutions should consider global, national, regional, and local culture and politics in HSS (Swanson et al., 2010).

Social mobilization

Social mobilization and political engagement are key to HSS efforts (Swanson et al., 2010). Health policy reform is needed in order to strengthen health systems. The training of health professionals should include information on the social determinants of health and political advocacy in order to create change within the determinants (Swanson et al., 2010).

Collaboration

HSS is a complex process that requires the participation of many actors across multiple levels. This collaborative relationship requires partnerships at the national level and across ministries, as well as the district and community level which also includes providers, program planners, and program users (Swanson et al., 2010). Effective collaborations are based on respect and open dialogue that results in a positive health system that is owned by all stakeholders for lasting and permanent change (Swanson et al., 2010).

An example of successful collaboration in global health is the Global Alliance for Vaccines and Immunization (GAVI) and their mission to fund vaccines for children in 70 of the world's poorest countries (Dodd & Lane, 2010). Through a collaborative process GAVI has brought together major players (WHO, UNICEF, the World Bank, the Bill & Melinda Gates Foundation, donor governments, developing countries, international development and finance organizations, and pharmaceutical industry) in the field to create a single decision-making body in the provision of immunizations for children (GAVI, 2011).

Capacity enhancement

Capacity enhancement increases capacity at all levels from households to health centers and government health agencies (Swanson et al., 2010). This capacity enhancement is necessary to bring about effective community and national ownership (Swanson et al., 2010). It also allows for local capacity, and the ability to perceive as well as anticipate challenges and problem-solve to create a strong health system (Swanson et al., 2010).

Efficiency

Efficiency is the ability to achieve as much as possible with a set amount of resources (Swanson et al., 2010). Technical efficiency is where services or goods are created at a minimum cost (Swanson et al., 2010). Health system providers and practitioners should be trained to operate in a way that maximizes performance in the most financially efficient way possible. This also includes being conscious of reducing waste in a health system.

Evidence-informed action

A strong evidence base and best-practice knowledge is necessary for health systems. This is needed across community to national levels. There are three primary characteristics for quality programs: 1) routine evaluations to measure impact and making changes based on the feedback; 2) flexibility to local situations; 3) accountability to the people the program serves (Swanson et al., 2010).

Equity

Creating an equitable environment and health system minimizes disparities. Gender equity is particularly important to fostering a strong health system. Three ways to establish an equitable health system are: 1) identify disenfranchised populations and set targets among these groups; 2) create service delivery approaches to reach groups that are often left out in health systems; 3) empower clients who live in poverty to take an active role within the health system (Swanson et al., 2010).

Financial protection

The financing of health systems must include safeguards to protect people from the catastrophic financial impact that can result from illness. Health financing through taxation or foreign aid must be continuous, especially during crises (Swanson et al., 2010).

Satisfaction

Satisfaction is needed across all levels for a strong health system. Clients (e.g., patients) and health care employees must be satisfied, as satisfaction is associated with high quality care and health care utilization rates (Swanson et al., 2010). HSS is responsive and accountable to the needs of the client and provider.

Levels of Fistula Care Framework

Creating health services for fistula care is complex, as fistula repair surgery is extremely technical, requiring a high level of surgical skill, even for simple cases. While the training of surgical teams is an essential component, it is only one component necessary to establish access to fistula services. Fistula Care developed the Levels of Fistula Care Framework to describe the network of sites to promote the prevention, diagnosis, limited treatment and referral, treatment of simple cases, treatment of complex cases and the creation of a site (or sites) with the ability to provide training (Fistula Care, 2009).

The framework outlines three levels of facility-based interventions (see Figure 2 for framework applied to Fistula Care's Guinea program, modeled on EngenderHealth's SEED[™] Model). It should be noted that the three levels described in the framework are not intended to, nor, correlate with primary, secondary and tertiary levels of facilities. The model is founded on the principle of "whole site readiness" (with regards to equipment, supplies, infrastructure, skilled workforce, management and support systems, and financial resources) and informed by a range of fistula care research findings (from sources including studies, reports, and programmatic evidence). It takes into account the difficulties posed by complex fistula repairs and the fact that these surgeries represent a large proportion of the disease burden. As a result, the framework promotes "fistula champions" who are surgeons highly qualified in repair who act as ultimate referral destinations, trainers and mentors for other surgeons in the process of building their skills in repair capacity..

The framework is based on a systems approach that proposes rationalized investments into a network of facilities, with the underlying assumption that the components of fistula care that respond to the non-emergency repair piece occur within the same supply and demand forces that must be reckoned with when aiming to reduce maternal mortality and other morbidities through more generalized HSS. The system sub-components need to work together to deliver targeted and high quality services to those in need.

Figure 2. The Levels of Fistula Care Framework (Guinea application)



Health System Structure

Different approaches to health system structure are studied in the HSS literature. These are sometimes referred to as vertical or horizontal approaches. Vertical approaches utilize planning, human resources, management, and financing systems that are separate from other services, while horizontal approaches function through existing structures within the health system (Travis, 2004). Vertical programs are most commonly used in priority interventions, such as infectious diseases and family planning, and often receive separate funding from national governments.

Decentralization

A central aspect of health system structure is the organizational culture. Until recently, many health systems in low-income countries have been based on central planning and financing structures (Ensor & Ronoh, 2005). Decentralization is one of the main organizational changes that has been introduced to health structures and has significantly changed the way in which health systems function and provide maternal, as well as other health services. This approach has long been advocated as a desirable process for improving health systems, whereby control is given to local communities (Ensor & Ronoh, 2005). Research suggests that decentralization may improve service provision. Technical efficiency can be increased by delivering existing services at a lower cost or higher quality, by giving organizations management over resources and services, and by reducing local supply bottlenecks (e.g., locally purchasing drugs or food and increasing staff wages to minimize attrition) (Ensor & Ronoh, 2005). Most importantly, decentralization may improve

¹ Adapted from EngenderHealth's SEED^{RM} Model. http://www.engenderhealth.org/our-work/seed/

efficiency in allocation of services so that they are specifically designed to fit the needs of the local population (Ensor & Ronoh, 2005).

While the literature suggests that decentralization strengthens health systems, there have been very few empirical studies to examine its impact (Bossert, 1998). There is a lack of rigorous quantitative data within the field. This is because changes to organizational structures are most often implemented at the same time as other reforms, making it difficult to differentiate the impact of decentralization. However, a recent study of Brazil's ongoing decentralization has shown improved outcomes in primary healthcare services. Researchers found that administrative decentralization and increased population coverage of primary healthcare services was associated with significantly lower post-neonatal mortality rates (25% reduction), compared with municipalities that did not incorporate either approach (Guanais & Macinko, 2009).

In contrast, a study conducted by Bossert and Beauvais (2002) on the decentralization of health systems in Ghana, Zambia, Uganda, and the Philippines showed mixed results. Researchers examined the effects of decentralization on health system financing and human resources. Results of the study highlight that although these four countries have undergone significant periods of decentralization, very limited conclusions can be drawn about the effectiveness of decentralization due to a lack of sufficient evidence (Bossert & Beauvais, 2002). Partial evidence suggests that local decision-making ability regarding financing in Uganda and the Philippines resulted in funding to curative care rather than the national priorities of primary care (Bossert & Beauvais, 2002). In the area of decentralization of human resources in health systems, findings were also mixed. In Uganda, differences between district and central government led to significant disparities between the two. Health workers employed by the district or local level were often not paid for months or years after decentralization while hospital workers that were not decentralized received regular payments from the Ministry of Finance (Bossert & Beauvais, 2002).

In order for decentralization to be successful, responsibilities at each level must be clearly defined with finances appropriately allocated in accordance with the new responsibilities (Ensor & Ronoh, 2005). With regards to maternal health, studies indicate that clear national policies on reproductive health are essential (Ensor & Ronoh, 2005; Guanais & Macinko, 2009). Clear maternal health policies place the obligations on the local powers to deliver these goals. In situations where straightforward guidelines are not in place, decentralization has the potential to lead to deprioritization of maternal health issues due to the lack of local incentive to promote a comprehensive strategy (Ensor & Ronoh, 2005).

Referral systems

Effective referral systems are a key element to strengthening health systems, especially in the area of improving access to maternity care. A well-functioning referral system consists of timely identification of complex cases, planned transportation services, and communication between the health care facilities to ensure prompt and appropriate intervention at the receiving facility (Nakahara et al., 2010). In the event of an obstetric emergency, appropriate referral systems are crucial as, without appropriate interventions such as cesarean delivery, labor and delivery complications can progress rapidly and lead to catastrophic results. Obstructed labor is one of the primary complications arising from insufficient or non-existent EmOC referral systems. Thaddeus and Maine's (1994) Three Delays Model identifies the main factors that can delay access to maternal health interventions and prevent mortality. The levels of delay in the model consist of: 1) delays

within the home to recognize the problem and seek care; 2) delays in reaching the appropriate health care facility; and 3) delays in care once the woman is at the health care facility (Thaddeus & Maine, 1994). While these delays affect both rural and urban areas, the issue is more pronounced in rural regions, as there may be limitations in the availability of qualified health professionals, communication systems, transport, and road infrastructure barriers (Hussein et al., 2011). However, similar disparities have been found in intra-urban populations, for example, in Kenya. This is largely attributed to barriers in transportation to healthcare facilities due to insecurities in delivering the baby at night and having to use public transport (Humboldt, 2011). Furthermore, they found that antenatal care is used in 54% of rural areas as well as in urban-slum areas, suggesting that there are not only urban and rural differences but that these barriers are also present within urban-slum areas (Humboldt, 2011).

Studies on referral systems in developing countries have found that obstetric services received the highest proportion of referrals (Ohara et al., 1998; Simba et al., 2008). The primary reason cited for referral from other health facilities was lack of expertise and adequate equipment (Simba et al., 2008).

Murray and Pearson's (2006) literature review on maternity referral systems recommends that common emergency care be provided by decentralized 24 hour EmOC at the district hospital. While this approach is recommended as best practice, current studies suggest that referral systems fall behind and that the number of complicated deliveries handled at referral facilities is far below the estimated need of 15% of all pregnancies (Jahn et al., 2000). The scoping study also found that in African studies, the majority (61-82%) of hospital deliveries were not referred by a healthcare provider but rather were "selfreferrals" (Murray & Pearson, 2006). This also suggests a problem within the referral process, as it can result in the underutilization of lower-level facilities and strain hospitals with volume of patients. These findings suggest that there is an overall lack of trust in the quality of care, as well as lack of confidence in the referral system process

Figure 3. Nine priority areas for optimizing the capacity of maternity referral systems in developing countries:

- I. A referral strategy informed by the assessment of population needs and of health system capabilities
- 2. Active collaboration between referral levels and across sectors
- 3. Formalized communication and transport arrangements
- 4. Agreed setting-specific protocols for referrer and receiver
- 5. Accountability for providers' performance and supportive supervision
- 6. Pro-poor protection against the costs of emergency referral
- 7. Capacity to monitor effectiveness
- 8. Policy support
- 9. The knowledge gaps

(Murray and Pearson, 2006)

(Murray & Pearson, 2006; Simba et al., 2008). The authors suggest creating "functional splits," an approach widely used in the United Kingdom within the referral hospitals, but less often implemented in developing countries. It has been put into practice at the Patan Hospital Birthing Centre in Lalitpur, Nepal, where some wards service non-complicated births (midwifery-led) with minimal technology and separate wards (obstetrician-led) specialize in complex cases (Murray & Pearson, 2006; Rana et al., 2003). Findings showed that the care provided by midwife-led wards in low-risk obstetric services was as safe as the care provided in the physician-led teams of the

functional split (Rana et al., 2003).

An important component of effective referral systems is planning and management. An understanding and knowledge of the population and those at risk is needed so that appropriate health system resources can be put in place to meet the demands of the population. Estimates are necessary on the proportion of pregnant women in a given population as well as the proportion of those that will experience complications. This type of forecasting is essential to successful referral systems and must be specific to the local context, conditions and needs of the population (Murray & Pearson, 2006). For example, communities with a high prevalence of HIV need adequate referral systems in place to provide the required pregnancy and post-partum care at the hospital.

Health Systems Financing

The financing of health systems is a key determinant of health in a population (Sarowar et al., 2010). Sustainable and long-term financial support is critical to HSS efforts. A systematic review of barriers

to surgical care in middle and low-income countries found that financial concern was the most significant barrier preventing access to care (Grimes et al., 2011). In particular, the economic burden associated with EmOC can be severe. A study conducted in Nepal found that over half of the families of women who delivered in hospital borrowed money to pay the high cost of transportation and facility-based EmOC (Borghi et al., 2006). These immense costs associated with EmOC deter the poor from accessing life-saving surgery, like cesarean sections (Ronsmans, Holtz, & Stanton, 2006).

Global health partnerships

In order to meet the MDGs, increased financial support of health systems is essential. Financial provisions by donor support plays an increasingly large role in HSS, as many countries do not have sufficient domestic funds. WHO recognizes the importance of global health partnerships in the provision of healthcare and reviewed the practices of seven major health partners. The following agencies were chosen for review because of their long-term (more than five years) funding of Figure 4. Ten best practice examples to increase aid commitments:

- 1. Set a strategic objective to increase longterm financing for health
- Track progress towards the strategic objective by systematically reporting on the duration of new projects and programs
- 3. Make indicative country support strategies publicly available
- 4. Define a strategy for funding long-term innovative financing instruments
- 5. More widespread use of promissory notes in replenishments
- 6. Adjust financing policies to permit commitments against pledges for future years at a discount that reflects the funding risk
- Specifically for the US, set uniform terms for the commitment of funds across all channels of aid delivery
- 8. Provide staff with incentives to make more use of existing, long-term instruments
- Align behind country multi-year plans and provide incentives for countries to develop such plans
- Make systematic use of financial sustainability plans, cost-sharing rules and exit strategies

(Dodd and Lane, 2010)

health initiatives: the GAVI Alliance; the Global Fund; Norway; Sweden; United Kingdom; United States [including PEPFAR, the Millennium Challenge Corporation and USAID]; and the World Bank (Dodd & Lane, 2010). These agencies combined account for two-thirds of country health aid disbursements and commitments provided by official donors reporting to the Organization of

Economic Cooperation and Development (Dodd & Lane, 2010). Based on the review of these agencies, the authors developed ten examples of practices that can help increase and extend the duration of aid commitments (see Figure 4) (Dodd & Lane, 2010). Each of the recommendations is practiced by at least one of the agencies and should be viewed as best practice within the field.

Universal coverage

As a component of the building blocks and a means of strengthening health systems, WHO recommends that financial systems include universal coverage (WHO, 2011d). Removing the economic barriers that prevent women in poor communities from accessing services and making maternity services free can greatly increase usage rates (Kasenga et al., 2009). While it is critical for women to be able to receive appropriate maternal health care, the health system must be able to handle the volume.

In 2003 the Government of Ghana introduced the policy of exempting all users from delivery fees in health facilities with the purpose of reducing the financial barriers to using maternity services (Penfold et al., 2007). The number of in-hospital deliveries was 60% higher after the introduction of the policy, suggesting that fee exemptions may have resulted in reduced maternal mortality and morbidity (Penfold et al., 2007). Another study found that when free obstetric care was offered in northern Ghana, women who knew delivery care was free of charge were 4.6 times more likely to seek professional health care (Mills et al., 2008). Similar results were also found in Malawi, with hospital deliveries increasing from 42.9 to 57.1% after introducing free maternity services (Kasenga et al., 2009).

A Nigerian study on the impact of free maternal care on the utilization of the available delivery services found an 88% rise in the number of deliveries (Ezugwu et al., 2011). The free maternal health services were introduced in September of 2008 and abruptly ended four months later by the government due to the accumulating bill (Ezugwu et al., 2011). Findings suggest that the elimination of the cost barrier increased access to available healthcare and upon program termination, the number of women delivering at the hospital significantly dropped, further buttressing the cost barrier (Ezugwu et al., 2011).

Removing cost barriers to EmOC and allowing universal access is instrumental in saving women's lives. With increasing public awareness of maternal health issues it has become a priority on many political agendas. Caution is needed, however, as popular campaign promises of offering free maternal health services risk becoming inadequately planned for unfunded mandates. If quality of care is not upheld, a free service policy can have the opposite of its desired effect. Appropriate planning and staffing to increase capacity and handle increased patient volume is key in providing free coverage.

Surgery

Historically, surgical care has been neglected by global health strategies (Bickler and Spiegel, 2010). This can be attributed to the fact that surgery is most often a highly complex intervention and the provision of surgical services requires a significant investment in infrastructure and training, as well as supplies (Farmer & Kim, 2008). However, increasing evidence has shown that surgery is an important global health issue that can be delivered in a cost-effective manner (Farmer & Kim, 2008). In response to this increasing body of research, WHO launched the Global Initiative for Emergency and Essential Surgical Care to reduce death and disability, listing pregnancy and related

complications as a priority (WHO, 2011a). WHO now includes surgical care as a component of the new primary health care initiative, which has the potential to strengthen health systems with the provision and maintenance of a quality surgical services (Bickler & Spiegel, 2010).

Surgical conditions have been found to account as much as 11% of total disability adjusted life-years (DALYs) worldwide (Debas et al., 2006). Furthermore, Funk and colleagues (Funk et al., 2010) found that the global distribution of operating theatres is lowest in west and sub-Saharan Africa at one per 100,000 population (compared with highest concentration of 25.1 per 100,000 population in Eastern Europe). Of the 234 million surgical and obstetric procedures occurring annually, there are significant global disparities with four billion people accounting for 96.5% off all surgeries (Abdullah, Troedsson, & Cherian, 2011). This is compared with the 2 billion people who comprise the lowest socio-economic status and receive 3.5% of all surgical procedures (Myles & Haller, 2010).

Surgery is at the heart of fistula treatment from both the repair and the prevention perspectives. It is an important component of the Levels of Fistula Care Framework through the surgical provision of emergency cesarean sections and fistula repairs. The surgical aspect of fistula repair positions it amongst a group of injuries and acute surgical diseases attracting increased attention due to the high maternal mortality statistics which are largely attributable to an absence of these surgical services (Farmer & Kim, 2008).

Surgical capacity

Building surgical capacity is essential to EmOC. In a retrospective study on essential surgery at district hospitals in Uganda, Tanzania and Mozambique, Galukande and colleagues (2010) found that the same basic surgical skills and equipment needed in emergency obstetric surgeries are required to treat other surgical conditions. Therefore, building surgical capacity in EmOC has the potential to improve a variety of other health outcomes. In seven of the eight hospitals included in the study sample, 50% of the surgeries performed were obstetric and of those the majority were cesarean sections (Galukande et al., 2010).

WHO's Emergency and Essential Surgical Care program is being implemented in 35 countries and focuses on increasing education, safety, and capacity in the provision of surgical, anesthetic, and obstetric care at first-level health facilities (Abdullah, Troedsson, & Cherian, 2011). Training on pregnancy-related care (e.g., obstructed labor, hemorrhage and unsafe abortion) is one of the top priorities and included in the training manuals (WHO, 2009, 2003). In order for this program to succeed there needs to be direct participation from surgeons, obstetricians and anesthesiologists, as policy makers alone do not have the technical knowledge to prioritize surgical care to bring about the necessary health systems infrastructure improvements (Abdullah, Troedsson, & Cherian, 2011).

Infection Prevention

Another component closely tied with building surgical capacity is access to safe surgery, as infections are a serious concern worldwide. Infection accounts for 15% of maternal deaths (Lester, Benfield, & Fathalla, 2010). The provision of safe obstetric surgery and, most notably, cesarean sections is critical as they are the most significant factor related to postpartum infection (Lamont et al., 2011). Compared with a vaginal delivery, the risk of infection with a cesarean delivery is five to 20-fold higher (Lamont et al., 2011). This is even more pronounced in developing countries where health facilities universally lack basic infrastructure (e.g., water, electricity, oxygen, goggles, aprons, and gloves), which hinders access to safe surgery (Kushner et al., 2010).

Galukande and colleagues (2010) found that within the hospitals they studied (district hospitals in Uganda, Tanzania and Mozambique), cesarean deliveries, while insufficient to meet population needs, greatly outnumbered instrumental deliveries (e.g., vacuum extraction or forceps). These findings are concerning, as instrumental deliveries are lower risk to the mother and fetus in comparison to surgical interventions where weak infection control practices increase risk and mortality (Galukande et al., 2010; Hofmeyr, 2004). The importance of surgical safety is recognized by WHO through several initiatives and surgical site infection prevention in specific has been identified as one of four priority areas where dramatic improvements can be made (WHO, 2008).

Prophylactic antibiotics during cesarean deliveries have been shown to substantially reduce the risk of infection (van Dillen et al., 2010). A recent Cochrane Review comparing prophylactic antibiotics with no prophylactic antibiotics on infections in women undergoing cesarean section found that endometritis was reduced by two-thirds to three-quarters and wound infection was also decreased (Smaill & Gyte, 2010). Authors recommend that prophylactic antibiotics should be administered to all women undergoing elective or non-elective cesarean section, as it is demonstrated to reduce the risk of infection, however research did show that there is uncertainty about the consequences of antibiotics for the baby (Smaill & Gyte, 2010). As a result of prophylactic antibiotics best practices, infection rates and associated maternal deaths have fallen significantly in developed countries. However, a lack of access to these antibiotics during cesarean deliveries in developing countries continues to have a major impact on maternal mortality and morbidity, particularly in Africa and Asia (van Dillen et al., 2010). In order to build surgical capacity and access to safe surgery, health system strengthening in maternal health must include these important infection prevention practices.

Anesthesia

Access to and appropriate anesthesia services are an integral component of surgical care. Delivering surgical care, especially in obstetrics, is greatly dependent on anesthesia services. Emerging evidence shows that maternal and infant survival is proportionately correlated to the number of health care workers providing obstetric care, including anesthesia (Cherian et al., 2010). While it is the perception that anesthesia services are only required at secondary and tertiary level health facilities, there is a great need for basic anesthesia skills at the first referral level facility (Taira et al., 2010). These are critical in the management of labor (pain relief) as well as pregnancy-related complications. To overcome this lack of anesthesia workforce, Cherian et al (2010) believe that trained non-physician anesthetists can carry out these basic anesthesia services. To further remove barriers to surgery, small district hospitals need at least two operating theatres (one for EmOC and another for elective cases), a blood bank, and trained anesthesia services (including machines and staff who know how to use and repair them) (Farmer and Kim, 2008).

Workforce

Sub-Saharan Africa carries 24% of the global burden of disease in 11% of the world's population, but has as little as 3% of the world's health care workers (Cherian et al., 2010). Creation and maintenance of a health workforce is a key component of HSS. Researchers believe that African countries need an additional one million workers in order to offer basic services consistent with the MDGs (Willis-Shattuck et al., 2008). The brain drain as well as in-country migration (from rural to urban healthcare settings) is cited as one of the main reasons for the current health worker crisis (Willis-Shattuck et al., 2008). A systematic review on the retention of health workers in developing countries found that financial incentives, career development and management issues are core

Fistula Care

factors affecting health worker motivation (Willis-Shattuck et al., 2008).

One workforce solution in maternal health is increasing the presence of skilled birth attendants (SBA), as 60 million women give birth outside of health facilities and of those 52 million without the presence of a SBA (UNICEF, 2009). As part of an HSS strategy, the utilization and mobilization of community-based SBAs has the potential to increase access to essential pregnancy and childbirth care for the poor, link pregnant women to the formal health system, and, in turn, improve perinatal outcomes (Darmstadt et al., 2009). Impact at the community level can be further improved by increasing SBA training to include selected tools and technologies, including some that are currently in use in referral-level facilities, serving to further reduce pregnancy-related complications (Darmstadt et al., 2009). Increasing SBAs in the community should not undermine, but rather, compliment the need to strengthen referral systems, as they would work together simultaneously.

Limitations

There is no HSS data available specifically in the area of fistula. As such, the literature was analyzed in a broader sense with key concepts and findings applied to the fistula context. The broader literature pertained to maternal health systems as well as surgical interventions.

As HSS research is relatively new and the surge of interest in and funding for systematic analysis of the topic has been recent, there are a limited number of published papers available. As a result, some of the articles included in the searches were editorials. While it is acknowledged that this is less than ideally rigorous, these were included in the literature review as some valuable insights and references were gathered from these publications.

Conclusions

The literature reviewed clearly confirms that all three levels of the Levels of Fistula Care Framework potentially strengthen maternal health systems and that the theoretical basis of all framework components is sound. Analysis of the HSS literature facilitates operationalization of improved maternal health services including fistula care. Specifically, health system structure (including decentralization and referral systems), financing, surgical capacity, and workforce emerge as domains relevant to the framework that merit careful consideration and planning. There is no blanket solution for HSS, but it can be argued that fistula care potentially serves as a compelling entry point to an approach that inclusively addresses these important health systems components and aims to comprehensively improve maternal health status.

The decentralization of health systems has been shown to strengthen maternal health systems and reduce neonatal mortality (Guanais & Macinko, 2009). Devolving planning and budgetary processes and decision making power from central government to local governing bodies and allocating management control to local workers and communities allows healthcare services to be tailored to a specific population's needs. Aggressive prevention is a key component of the Levels of Fistula Care Framework and strong health systems. Literature review findings suggest that health system structures that include decentralization and give more autonomy to local communities will allow them to establish basic surgical services utilizing simple facilities, providing them with basic equipment, and employing selected local personnel trained on the job by teams composed of a consultant surgeon, anesthetist, and scrub nurses (Meo et al., 2006). This will allow for access to some EmOC services (primarily cesarean sections) and play a large role in the provision of surgical services and, in turn, the prevention of fistula.

While all communities potentially benefit from fistula prevention services (e.g., awareness-raising, family planning, high-quality obstetric care in labor and delivery, and fistula diagnosis and referral services), not all communities require facilities which offer fistula repair services. Referral systems need to be in place so that women can access fistula treatment services in a timely and appropriate manner, but it is not feasible nor is there demand (or at least it should only exist as long as it takes to clear the fistula backlog of cases and ensure that skilled attendance and EmOC coverage are adequate) to have them available in all communities. Placement of these facilities and provision of these services needs to be strategic and needs-based.

Such placement should be based on forecasting grounded in the best available information on, not necessarily known fistula clusters, but rather the incidence of obstructed and prolonged labor, availability of quality labor and delivery and EmOC services and other contextual data that indicate sustainable referral and support system success (e.g., presence/functionality of transport schemes, waiting homes, community structures that facilitate reintegration, positive local government political will).

Without strong formal referral systems, complications due to obstructed and prolonged labor will continue, as it is not feasible in most settings to provide EmOC at the primary health care level. Effective referral systems are key to overcoming the barriers identified in the Three Delays Model and in saving lives (Thaddeus & Maine, 1994). Level I of the Levels of Fistula Care Framework is particularly relevant to the Three Delays model, in that its aim is the provision of timely emergency

obstetrical care in addition to fistula diagnosis, family planning during routine ANC and fistula awareness-raising. The additional components of Levels II and III of the Levels of Fistula Care Framework, simple and complex fistula repair, are not emergency-related but rather aim to provide acute care services which, depending on the existing fistula burden or backlog, can be addressed through a combination of campaigns and routine services, both of which should be carried out with an eye to increased in-country surgical capacity. In theory, if prevention and repair services are both truly available, intensive fistula repair efforts will be needed for a finite period of time to clear the backlog of cases that exists and then available as a more specialized referral service moving forward. Both situations depend on both strong intra-facility linkages as well as strong links between facilities and communities. The Levels of Fistula Care Framework seeks to reinforce these links around the aims of fistula prevention, repair and reintegration.

Health system financing is perhaps the most fundamental key component of any health system, including ones that adequately includes fistula care. Provision of universal coverage is a goal in maternal health (WHO, 2011d). However, there are important lessons that can be learned from countries that have made labor and delivery as well as EmOC a free service (Ezugwu et al., 2011; Kasenga et al., 2009; Mills et al., 2008). Service delivery and capacity must be sufficient, as the volume and demands placed on the health systems will drastically increase. These services must be provided in such a way that the quality of care is not compromised; an overburdened system may lead to increases in maternal morbidity and mortality (Ezugwu et al., 2011). Appropriate planning and staffing is required to handle increased patient volume. Increased financial support from government or aid organizations must be secured beforehand to ensure lasting and consistent provision of services, as many programs have been unable to sustain free coverage of maternity services due to increased patient volume and lack of available funds (Borghi et al., 2006; Ezugwu et al., 2011).

While the full decentralization of fistula repair services to all sites capable of surgical services is not practical in terms of sustainable provision of services or demand. HSS theory and guidelines recommend the creation of continued partnerships across levels of local government, administrators and communities. The HSS evidence suggests that although decentralization and facilitating autonomy of communities is key, large-scale health initiatives in low-resource setting still most often require support from donor agencies. Thus close partnerships between aid organizations, local government and hospital administrators are necessary and require a careful balance of independence at the local level while maintaining accountability to government and funding agencies.

The HSS literature was analyzed to explore whether or not there is evidence to support the assertion that the Levels of Fistula Care Framework strengthens health systems and, secondly, what evidence exists to inform whether fistula care should be integrated into existing health systems or provided at stand-alone sites. The literature reviewed clearly reflects that the framework's component interventions potentially strengthen health systems and contribute to improved maternal health status. Investment into surgical capacity building (which spans the framework) is certainly justified and the extent to which the framework aims to strengthen linkages between facilities and between facilities and communities, fills an important, well-documented health system need.

The evidence (and our experience to date) is, however, less clear on the question of integration. Analysis of Level I intervention apart from the rest of the framework, makes it fairly easy to find evidence for and justify an integrated approach. Fistula diagnosis and prevention fit easily into

Fistula Care

comprehensive maternity care and do not significantly add to already over-burdened systems. Whether the repair services outlined in Levels II and III of the framework should be integrated into existing health systems or if they need to be delivered through dedicated facilities is another question. Significant resources are needed to carry out fistula repair and reintegration, and it can be argued that these investments both distract from and help bring attention to maternal health issues more generally. The resultant specialist referral and training resources created at Levels II and III can be used to uphold fundamental principles including informed choice and infection prevention, among others. Specialist units/wards devoted to fistula repair and reintegration (possibly with other morbidities requiring surgical attention) integrated into, but strategically placed throughout a system founded on a comprehensive safe motherhood approach, may prove most effective.

More research is needed, however, to explore the health systems aspects of fistula care further. What strategies work best to retain capacities built at different levels of the framework? How do different implementation models of the framework compare in terms of outcomes and sustainability? Does the problem of fistula serve as an effective point of departure for comprehensively strengthening maternal health services and community engagement? Comparing country strategies that have integrated fistula repair into existing health systems to those that have operated through separate fistula repair facilities could yield important insights into not only fistula care integration, but integration of specialty surgery interventions more generally.

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