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IMPACT OF HEALTH SYSTEMS STRENGTHENING ON HEALTH



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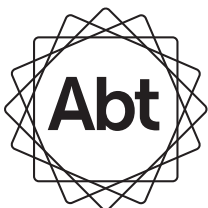
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Impact of Health Systems Strengthening on Health

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June 2015

This publication was produced for review by the United States Agency for International Development (USAID). It was prepared by Laurel Hatt, Ben Johns, Catherine Connor, Megan Meline, Matt Kukla, and Kaelan Moat for the Health Finance and Governance Project. The author's views expressed in this publication do not necessarily reflect the views of USAID or the United States Government.

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ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
AMSTAR	A Measurement Tool to Assess Systematic Reviews
ANC	Antenatal Care
ART	Antiretroviral Therapy
CBO	Community-Based Organization
CCT	Conditional Cash Transfer
CD4	Cluster of Differentiation 4
CHW	Community Health Worker
CBHW	Community-Based Health Worker
CI	Confidence Interval
DALYs	Disability-Adjusted Life Years
DARE	Database of Abstracts of Reviews of Effects
HFG	Health Finance and Governance
HIV	Human Immunodeficiency Virus
HSE	Health Systems Evidence
HSS	Health Systems Strengthening
ICT	Information and Communications Technology
ITN	Insecticide Treated Net
IUD	Intra-Uterine Device
LMIC	Low- and Middle-Income Countries
MNCH	Maternal, Newborn, Child Health
NGO	Nongovernmental Organization
NHA	National Health Accounts
NMR	Neonatal Mortality Rate
OHS	Office of Health Systems
PBF	Performance-Based Financing
PBIs	Performance-Based Incentives
PMTCT	Preventing Mother-to-Child Transmission
RBF	Results-Based Financing
RD	Risk Difference
RR	Relative Risk

SROE	Systematic Review of Effects
STI	Sexually Transmitted Infection
UNICEF-PHFI	United Nations International Children's Emergency Fund and the Public Health Foundation of India
USAID	United States Agency for International Development
WHO	World Health Organization

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EXECUTIVE SUMMARY

To end preventable child and maternal deaths, create an AIDS-Free Generation, and protect communities against infectious diseases such as Ebola, countries require effective, functional health systems that can deliver essential health services to those in need. For decades, the United States Agency for International Development (USAID) has invested in building stronger health systems to help improve and sustain health outcomes in partner countries.

In an environment of competing investment options, decision-makers demand robust evidence for investing health funds in health systems strengthening interventions. The effects of health systems strengthening on health status and related outcomes, however, have not been comprehensively reviewed or captured in a single document. To address this knowledge gap, the Health Finance and Governance (HFG) Project conducted a review of published systematic literature reviews that assessed the effects of health systems strengthening interventions on health status and health system outcomes (service utilization, quality service provision, uptake of healthy behaviors, and financial protection) in low- and middle-income countries (LMICs).

An inclusive definition of health systems strengthening interventions was used for this review, reflecting the World Health Organization's definition: "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".^[97] USAID defines health systems strengthening as strategies, responses, and activities designed to sustainably improve country health system performance. The researchers identified 66 systematic reviews that met the inclusion criteria for analysis from the McMaster University Health Systems Evidence Database and the online database PubMed. Together, these reviews cover more than 1,500 individual peer-reviewed studies on the effects of health systems strengthening interventions on health status and health system outcomes. Table ES-1 summarizes the results of this review.

The main conclusion from this literature review is that health systems strengthening interventions produce substantial positive effects on health status and health system outcomes. Specifically:

- **Mortality:** Interventions as diverse as accountability and engagement initiatives, conditional cash transfers, health insurance, training health workers to improve service quality, service integration, and strengthening health services in communities have been shown to reduce mortality.
 - Neonatal and perinatal mortality were lowered by training health workers to improve service quality and strengthening health services in communities.
 - Integrated primary health care and health insurance were associated with lower infant mortality.
 - Maternal mortality was lowered by promoting community and provider engagement, conditional cash transfers, and training health workers to improve service quality.

TABLE ES-1:

SUMMARY RESULTS OF THE REVIEW: DOCUMENTED EFFECTS OF 13 TYPES OF HEALTH SYSTEMS STRENGTHENING INTERVENTIONS

Types of interventions	Health Impacts and Health System Outcome Measures				
	Improved service provision/ quality	Increased financial protection	Increased service utilization	Uptake of healthy behaviors	Reduced morbidity, mortality
Accountability and engagement interventions	X		X	X	X
Conditional cash transfers			X	X	X
Contracting out service provision		X	X		X
Health insurance		X	X		X
Health worker training to improve service delivery	X			X	X
Information technology supports (m-health/ e-health)			X	X	
Pharmaceutical systems strengthening initiatives	X				
Service integration			X	X	X
Strengthening health services at the community level			X	X	X
Supply-side performance-based financing programs			X		X
Task-sharing/task-shifting			X		X
User fee exemptions			X		
Voucher programs		X	X	X	X

Note: This table reflects the interventions for which evidence was available. It does not present information regarding the quality or quantity of evidence. The absence of a given health systems strengthening intervention may only reflect an absence of published systematic reviews on the topic. Readers should not conclude that these 13 interventions necessarily represent “best buys” because the reviews were not comparative evaluations of interventions.

- Under-five mortality was lowered by promoting community and provider engagement and strengthening health services in communities.
- Task-sharing was shown to provide care similar to, if not better than, traditional care for HIV patients.
- **Morbidity:** Multiple interventions had an effect on morbidity, including:
 - Contracting out service provision was associated with lower incidence of diarrhea.
 - Vouchers were effective at reducing the incidence of sexually transmitted diseases.
 - Task-sharing was found to reduce the incidence of “common mental disorders among women during the perinatal period.”^[15]
 - Contracting out service provision, conditional cash transfers, and performance-based financing were found to reduce under-nutrition or wasting. Service integration may increase the number of children recovering from malnutrition.
 - Conditional cash transfers were shown to improve birth weight.
 - Self-reported or parent-reported health status was improved by conditional cash transfers, contracting out service provision, and supply-side performance-based programs.

- Health insurance was associated with reductions in many different morbidity conditions, including better diabetes management, fewer birth complications, and reduced pain, anxiety, and depression.
- **Service utilization:** Accountability and engagement initiatives, conditional cash transfers, contracting out service provision, health insurance, pharmaceutical systems strengthening initiatives, service integration, strengthening health services at the community level, performance-based financing, user fee reductions, and vouchers were all found to increase service utilization or coverage of specific interventions. Information technology supports were shown to increase patient retention and long-term adherence to treatment. Training health workers to improve service quality was associated with increased energy intake among children.
- **Financial protection:** A large body of evidence connects health insurance to lower need for out-of-pocket payments and lower rates of catastrophic payments. Contracting out service provision and vouchers were shown to lower out-of-pocket payments.
- **Quality service provision:** Training health workers to improve service quality and performance-based financing were associated with improvements in quality of care. Accountability and engagement initiatives, and pharmaceutical systems strengthening were associated with fewer drug stock-outs.

There is an absence of published systematic reviews on many well-known health systems strengthening interventions. The absence of a given intervention in this report reflects an absence of published reviews on the topic, and as a result does not allow us to draw conclusions about its effectiveness. We cannot conclude that the interventions listed above represent “best buys” in health systems strengthening because none of the systematic reviews included a comparative evaluation of the relative effectiveness of alternative health systems strengthening interventions.

The interventions included in this analysis reflect innovations and reforms in how and where health services are delivered, how they are organized and financed, and who delivers them. **This report demonstrates clearly that improvements to these health system components can improve the health of populations in LMICs.** Decisions made about who delivers health services, and where and how health services are organized, matter for improving health status. The findings of this review are an important validation of the investment value of health systems strengthening.

I. INTRODUCTION

To end preventable child and maternal deaths, create an AIDS-Free Generation, and protect communities against infectious diseases such as Ebola, countries need effective, functional health systems that can deliver essential health services. The United States Agency for International Development (USAID) has invested in building stronger health systems for decades to help improve and sustain health outcomes in partner countries. This report seeks to provide a review of the existing evidence related to health systems strengthening interventions.

The field of health systems strengthening research is relatively young. Health Systems Global (<http://www.healthsystemsglobal.org/>), which was launched in 2010, is the first and only international membership organization fully dedicated to promoting health systems research and knowledge translation. Previous reviews related to health systems strengthening have focused on listing and defining indicators to measure health systems strengthening^[2] and the need for — and difficulties with — assessing the effects of health systems strengthening.^[9,34] The production of concrete evidence linking health systems strengthening interventions to health outcomes is hampered both by the youth of the field itself and the difficulties of assessing some health systems strengthening interventions. The distal nature of some systems-level interventions implies a longer time horizon for effects to be experienced, observed, and measured. For instance, planning, designing, and implementing at scale a major policy change (such as development of a national health insurance scheme or the training and deployment of a new cadre of community health workers) might take five or

more years — far longer than the time horizon of routine monitoring within most technical assistance projects. Further, many health systems strengthening interventions are implemented in complex and changing environments, and finding suitable comparison areas is difficult or impossible. This also means that generalizing results from one setting to another is difficult.^[34]

In an environment of competing investment options, decision-makers demand robust, evidence-based reasons for investing health funds in health systems strengthening interventions. Evidence on whether and how much such interventions affect health are thus necessary for justifying continued investment, whatever the difficulties in research and the newness of the health systems research field in general. However, there has been little work on compiling the effects of health systems strengthening across interventions and until now, the evidence of their impact on health status has not been captured in a single document.

To better inform current and future health systems strengthening investments, a team of experts from the Health Finance and Governance (HFG) Project conducted a review of systematic literature reviews that assessed the documented effects of health systems strengthening interventions on health status and health system outcomes (e.g., service utilization, quality service provision, uptake of healthy behaviors, and financial protection) in low- and middle-income countries (LMICs). This review identifies areas where effects on health outcomes are well-documented. It should be noted that the full universe of health systems strengthening interventions supported by USAID is not reflected here due to a lack of published reviews on many of these interventions.

This review includes only published systematic reviews of effects (i.e., it is a ‘review of reviews’) because published systematic reviews are likely to contain a broad range of studies, but remain tractable relative to a wider systematic search of individual studies. Section 2 presents the classification of indicators used to guide the literature review as well as the definitions used for health systems strengthening. Section 3 describes the methods used for the literature search and data analysis, and presents limitations of this review. The main body of the report, Section 4, summarizes the findings of the review and provides detailed examples of selected interventions to illustrate how they affect health status and outcome measures. Section 5 concludes with a summary of the findings and a discussion of the challenges in measuring the impacts of health systems strengthening, and flags important gaps in the literature for both what is known about the effectiveness of particular interventions and areas in need of future research to better inform health systems investments.

2. OBJECTIVES, CONCEPTUAL APPROACH AND DEFINITIONS

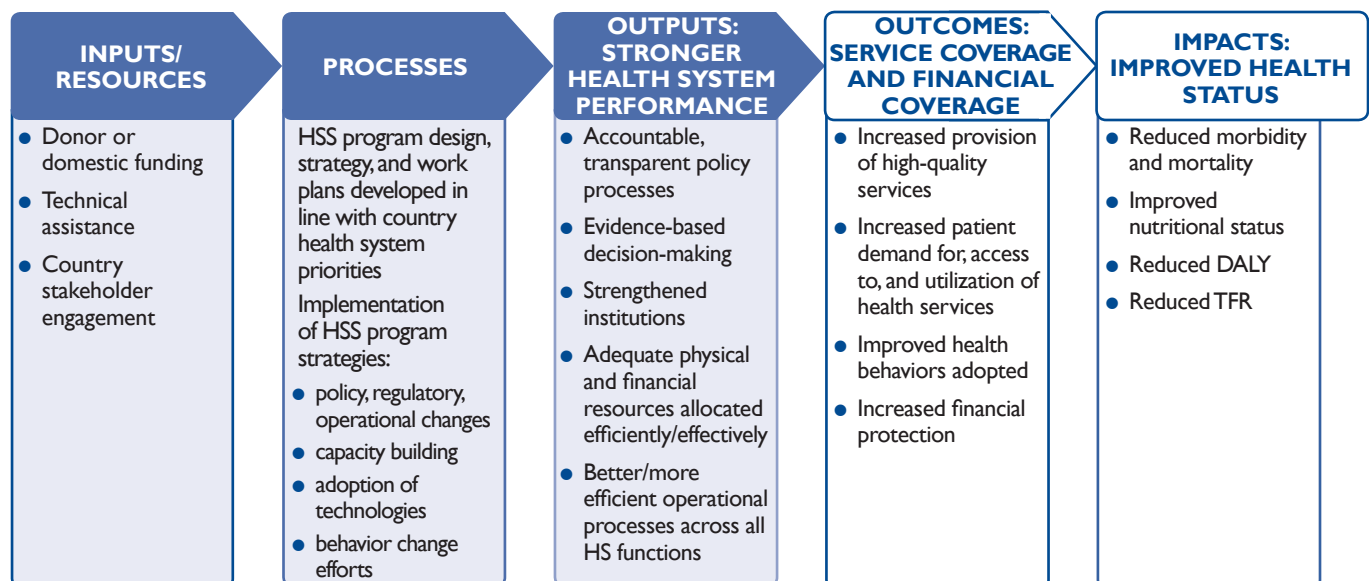
This paper aims to answer the following question: What are the documented effects of health systems strengthening interventions on health status and on health system outcome measures (including health service utilization, quality service provision, uptake of healthy behaviors, and financial protection) according to published systematic reviews of effects?

Figure 1 shows the classification used to determine which indicators were included – and which were not – in the literature review. Developed by the authors to guide the review, this classification draws upon the United States Government’s “Results Framework for the Global Health Initiative Health Systems Strengthening Principle;”^[87] the World Health Organization (WHO)’s framework for the monitoring and evaluation of health systems strengthening;^[96] and the WHO’s framework for monitoring progress towards universal health

coverage.^[98] Given the goal of identifying effects on health, this classification was a way to quickly identify studies that included relevant indicators. Studies that reported results for indicators listed in the Outcomes and Impacts boxes below were included in this review. Results related to indicators listed in the first three boxes (Inputs/ Resources, Processes, and Outputs) were not included.

The primary impact measures in this review are changes in **health status**. We defined health status to include mortality, life expectancy, morbidity (including prevalence and incidence of diseases and risk factors for disease), nutritional status (including anthropometric measures and clinical indications such as anemia), fertility measures, and constructed measures such as disability-adjusted life years (DALYs).

FIGURE 1: CLASSIFICATION OF HEALTH SYSTEMS STRENGTHENING INTERVENTION INDICATORS USED TO GUIDE THE LITERATURE REVIEW



We also included reviews that reported results for health system outcomes, some of which serve as proxy indicators for a likely impact on health status. The preponderance of evaluative health systems strengthening research assesses such outcome measures, and their causal connections with changes in health status have previously been demonstrated. These outcome measures included changes in the **provision of health services** (including their availability and quality); changes in the demand for, access to, and **utilization of health services**; the uptake of **healthy behaviors** (such as hand washing and breastfeeding); and improvements in **financial protection** (reduced likelihood of impoverishment due to health expenditures).

The classification places measures of health system performance at the “outputs” level. These measures include indicators of effective health system stewardship, adequacy of financial resources, and efficient and effective functioning of each of the various functions of the health system. While often the direct focus of health systems strengthening efforts, effects on these outputs are not the focus of this paper’s review.

Finally, we utilized an inclusive, non-prescriptive approach to define **health systems strengthening** interventions. We drew upon the WHO’s definition: “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.”^[97] These efforts may be supported by donors, through technical assistance, or implemented by country stakeholders. They encompass a wide range of strategies, policies, regulations, and programs. Our approach captured those interventions that were documented in the comprehensive Health Systems Evidence database (see methods below); we did not start with an a priori list of health systems strengthening interventions. Thus the absence of a given intervention from this paper may reflect an absence of published reviews on the topic.

While recognizing that many other sectors outside the health system influence health status (such as education, water and sanitation, agriculture, economic growth, and democracy and governance), this review did not address non-health sector interventions.

3. METHODS

The authors conducted a review of systematic reviews* to summarize the published evidence on the effectiveness of health systems strengthening interventions to improve health status, service utilization, quality service provision, uptake of healthy behaviors, and financial protection, as well as to identify gaps in what is known about the effectiveness of particular interventions.

3.1 ELECTRONIC DATABASE SEARCHES

To accomplish the literature search feasibly within the available time frame (July-September 2014) and to approach it methodically, the team utilized the McMaster University Health Systems Evidence (HSE) online database (www.healthsystemsevidence.org) as the primary source of review articles. The HSE database is a comprehensive and continuously updated source of systematic reviews focusing on a range of health systems topics. Systematic reviews included in HSE must meet the following inclusion criteria: 1) The interventions reviewed must address at least one of the health systems governance, financing, or delivery arrangements used to categorize records in HSE (i.e. they must be health systems relevant); 2) at least two electronic databases must have been searched; and 3) the authors must have explicitly stated their inclusion/exclusion criteria.

HSE's reviews are identified from Medline, the Cochrane Database of Systematic Reviews, the Database of Abstracts of Reviews of Effects

(DARE), the Rx for Change database, the Cochrane Qualitative and Implementation Methods Group's reference database for qualitative reviews, and other listservs and websites that are known to contain relevant systematic reviews. HSE's sources are periodically checked to ensure any new reviews published about health systems strengthening interventions are identified and included.^[49,92] A fuller description of the methods used to create HSE is contained in a recently published manuscript.^[49]

Figure 2 displays a schema summarizing the review process. There were 9,930 systematic reviews in the HSE at the time of the literature review (July 2014). Of these, 3,184 were systematic reviews of "effects" (studies that evaluated the effect of an intervention(s) on an outcome(s)). Six hundred sixty-seven (667) of these reviews contained at least one study that met the following criteria: included results from at least one LMIC, was in English, and had been conducted since 1990. Two health systems researchers independently reviewed the abstracts of these 667 review articles and excluded those that were not relevant to the focus of the study. Specifically, they excluded reviews that addressed primarily medical or pharmacological interventions or did not explicitly review a health system strengthening intervention. They also excluded articles that did not measure effects on a health status measure (mortality, morbidity, disability, fertility, life expectancy, disability-adjusted life years, or anthropometric or nutritional status measures) or on a health system outcome measure (defined as use of health services,

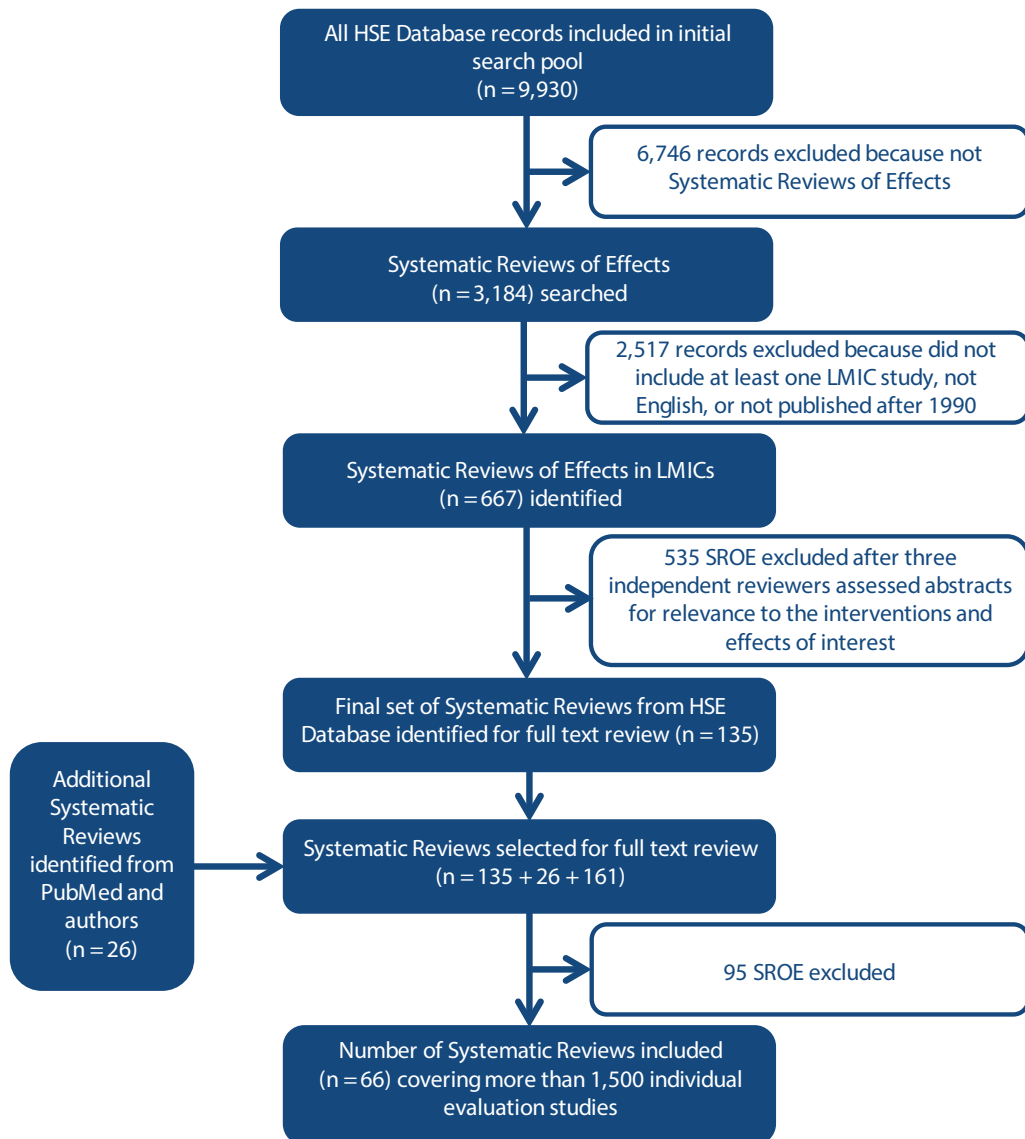
* Systematic reviews are literature reviews that attempt to identify, assess for quality, and synthesize all research evidence relevant to a specific pre-defined research question.

provision of quality health services, health behaviors changed, and financial protection). A third reviewer was consulted as a tie breaker for the 143 abstracts for which the two reviewers did not concur. A total of 532 reviews were excluded in this stage, leaving 135 reviews.

At this point, the team undertook targeted searches of the online database PubMed (www.ncbi.nlm.nih.gov/pubmed) to complement the searches in HSE, and contacted experts in the field of health systems strengthening research to identify relevant reviews that were missing.

This led to the inclusion of an additional 26 review articles, including one published during July 2014, for a total of 161. The lead authors read all the reviews, and discussed any remaining disagreements about whether to include or exclude any reviews with the wider research team. After full text review of the 161 systematic reviews, the authors excluded 95 additional reviews that did not meet inclusion criteria. The final set of 66 reviews referenced in this narrative synthesis represent more than 1,500 individual evaluation studies.

FIGURE 2: SEARCH PROCESS FLOW DIAGRAM



3.2 DATA ANALYSIS AND SYNTHESIS

To facilitate analysis of the systematic review articles, they were initially divided among the six health system functions^[94] (governance; financing; service delivery; human resources for health; health information systems; and medical products, vaccines and technologies) using the HSE database's taxonomy of health systems codes. Annex 1 lists the HSE taxonomy and how these were mapped to the functions. Health system functions are not mutually exclusive, and as such some reviews were included in more than one category.

Researchers with expertise in each topic area analyzed and extracted key information from the studies assigned to that function using an Excel-based data extraction template (see Annex 2). During this process, the researchers redistributed articles to other researchers if they were found to be more relevant to another health system function. Key variables extracted included study location, health system strengthening interventions, outcome and health status indicators measured, AMSTAR quality rating,^{[81]†} and key findings.

The researchers met to analyze preliminary findings from each function review, and to highlight emerging themes and potential gaps in the literature. While the health system functions were used as an initial organizing framework from which to identify relationships to health status and outcome measures, the reviewers determined that this categorization was less useful for presenting results. Many health systems strengthening interventions straddle several functions, and the interactions among these categories might also be important to effectiveness.

Instead, the authors decided to organize the synthesis report around the interventions themselves. An outline for the synthesis was prepared, highlighting 13 types of interventions that had evidence of effects on health status or health outcomes. The lead authors then drafted text for the results section of the synthesis report drawing upon the Excel extraction templates and referring to the original systematic review articles and the underlying individual studies as necessary. Quality reviewers within the HFG project and at USAID provided critical feedback and comments.

When available, the paper reports the numeric results presented in the included reviews for health impact measures. For health system outcome measures, we attempt to include numeric results from reviews where (i) the reviews performed a meta-analysis or similar analysis to pool results from individual studies, (ii) reviews present ranges of results across individual studies for a specific indicator, or (iii) only a few numeric results were reported in the review.

Thus, we do not report numeric results for studies that have a large number of reported results for numerous indicators or that did not report numeric results from the individual studies they assessed. In addition, we include a narrative synthesis of the findings. For example, if a review reported results on utilization from multiple studies for multiple different kinds of services, we do not report results for all types of visits, but describe the trend in the results. In each narrative synthesis, we interpret the results in keeping with the conclusions of the authors of the review. Thus, if the authors of a review conclude that there is strong, sufficient, limited, insufficient, etc. evidence, we report this conclusion.

† AMSTAR is a numerical rating system that assesses the methodological quality of systematic reviews, including comprehensiveness of the review process, inclusion of gray literature, assessment of study quality, and likelihood of publication bias, among other factors (see <http://www.amstar.ca/>).

3.3 LIMITATIONS OF THE LITERATURE REVIEW PROCESS

Several limitations are important to highlight, given the ambitious scope of this paper. To accomplish this review feasibly within the time frame, the researchers limited their analysis to existing systematic reviews. Systematic reviews are conducted infrequently, typically after a substantial number of individual studies have been completed and published. There may be a non-trivial time lag between the identification of a promising intervention with an adequate number of published studies, and the implementation of a systematic review on that topic. Therefore, this review likely missed relevant individual manuscripts that have not yet been included in a systematic review.

The researchers chose the McMaster HSE database as the primary source for articles. This database is considered a highly comprehensive, well-reputed source of systematic reviews on health systems topics (c.f., Mills 2014^[59] and Rockers et al. 2013^[75]). This source was supplemented with a search of PubMed and consultation of experts. It is possible, however, that the analysis missed relevant articles that were not included the HSE database.

For reasons of time and to ensure the highest possible quality of evidence, we did not review the “gray” literature (project reports, reports from international organizations, unpublished dissertations, etc.). Thus, this technical report should be considered the groundwork for a more extensive evidence review process, ideally conducted over a longer time period and involving validation from a large pool of health systems experts.

We sought to be as comprehensive as

possible in including what could reasonably be considered health systems strengthening interventions. Defining the boundaries of what might plausibly be considered “health systems strengthening” is not straightforward. The World Health Organization’s definition of health systems strengthening noted above^[97] as well as USAID’s definition (“strategies, responses, and activities designed to sustainably improve country health system performance.”)[‡] are both arguably very inclusive. We took our cue from these definitions and adopted an inclusive approach, excluding obviously non-relevant clinical interventions rather than starting from a detailed list of known health systems strengthening interventions. However, this approach meant that our reviewers utilized judgment in defining inclusion and exclusion boundaries. To promote objectivity, we engaged two independent experts for the initial culling process, with a third expert as a tiebreaker.

We limited our review to articles that reflected at least one LMIC study given the focus of the review on LMIC contexts. There is, however, a wealth of evidence from high-income contexts that might also be relevant. Future reviews could aim to incorporate this evidence.

Classifying health systems strengthening interventions into subgroups is also challenging. The health system functions are commonly-used categories, but many (if not most) interventions reviewed here overlap more than one category. As the researchers analyzed the literature, they were encouraged to re-organize interventions and themes organically as they emerged across studies. A related weakness of the health systems literature is the dearth of analyses of interaction effects. Many studies treat health system interventions as discrete and

[‡] The source of this definition is USAID’s draft HSS Vision for Action.

independent, failing to document the possible interactive effects that one intervention may have on the effectiveness of another. This review inherits that weakness.

This analysis should not be interpreted as having generated a list of “best buys” in health systems strengthening. This is true for two reasons. First, none of the more than 1,500 individual studies included in the systematic reviews was a comparative evaluation of different health systems strengthening interventions. Only a comparative evaluation would allow conclusions about the relative effectiveness of alternative interventions. Designing such a study would be challenging due to the complexity and interconnectedness of health systems strengthening interventions (see section 5.1). Second, as noted in the objectives section, the absence of an intervention from the list may only reflect an absence of published systematic reviews on the topic. The absence of a given intervention should not lead us to conclude, necessarily, that the intervention is not effective; rather, it reflects an absence of published systematic reviews on the intervention.

4. FINDINGS

DOCUMENTED EFFECTS OF HEALTH SYSTEMS STRENGTHENING INTERVENTIONS ON OUTCOMES (SERVICE UTILIZATION, QUALITY SERVICE PROVISION, HEALTHY BEHAVIORS, FINANCIAL PROTECTION) AND HEALTH STATUS

Drawing on the evidence culled from the 66 systematic reviews included in this technical report, we identified 13 types of health systems strengthening interventions with measured effects on health status, service utilization, quality service provision, uptake of healthy behaviors, and/or financial protection in LMICs. We present the results for these 13 types of interventions in alphabetical order. As noted above, many of the interventions straddle several health system functions. Higher-level categorization or organization of the types of interventions would result in multiple classifications or subjective decisions regarding the focus of the interventions. The interventions described below often overlap or are implemented in combination, though we have done our best to present ‘types’ of interventions based on how they have been reported in the literature.

In the 13 sections below, we describe or define each type of intervention and summarize the evidence of its effects, first highlighting effects on health status measures, and then reviewing effects on health system outcome measures. Table I provides a summary of the health impact and health system outcome effects found for each intervention. For a few of the interventions, we present a detailed example to illustrate how it affects health status and/or health system outcome measures (see Boxes 2-4).

TABLE 1:
SUMMARY OF DOCUMENTED RESULTS FOR EFFECTS OF HEALTH SYSTEMS STRENGTHENING ON HEALTH STATUS AND HEALTH SYSTEM OUTCOMES

Intervention type	Specific activity	Health status results found	Health system outcome results found
1. Accountability and engagement interventions	<ul style="list-style-type: none"> Community-provider engagement initiatives Engaging women's groups 	<ul style="list-style-type: none"> Reduced under-five mortality Increased infant weight May reduce neonatal and maternal mortality 	<ul style="list-style-type: none"> Increased utilization of health service Decreased drug stock-outs
2. Conditional cash transfers	<ul style="list-style-type: none"> Conditional cash transfers to families 	<ul style="list-style-type: none"> Reduced maternal mortality Reduced child malnutrition Positively associated with mother-reported health outcomes for children Decreased incidence of low birth weight 	<ul style="list-style-type: none"> Increased utilization of health services
3. Contracting out service provision	<ul style="list-style-type: none"> Contracting non-government health providers in under-served areas 	<ul style="list-style-type: none"> Reduced malnutrition Reduced probability of self-reported illness Reduced incidence of diarrhea 	<ul style="list-style-type: none"> Increased service utilization May lower out-of-pocket payments
4. Health Insurance	<ul style="list-style-type: none"> Health insurance coverage 	<ul style="list-style-type: none"> Reduced infant mortality Reduced morbidity (e.g., better diabetes management, fewer birth complications, and reduced pain, anxiety, depression, etc.) Reduced cancer and cardiac mortality 	<ul style="list-style-type: none"> Improved health service utilization Reduced out-of-pocket expenditure and catastrophic health payments
5. Health worker training to improve service quality	<ul style="list-style-type: none"> Train traditional birth attendants at the community level Health worker training Education to reduce inappropriate prescriptions of antibiotics 	<ul style="list-style-type: none"> Reduced newborn and maternal mortality 	<ul style="list-style-type: none"> Increased vaccination coverage in setting with low coverage Improved energy intake/feeding frequency among children Reduction of the proportion of patients receiving inappropriate prescriptions
6. Information technology supports to improve service provision and patient behaviors (including e-Health and m-Health)	<ul style="list-style-type: none"> Mobile phone text message reminder systems Mobile messaging to promote uptake of preventive services 		<ul style="list-style-type: none"> Increased timely attendance at clinics, treatment completion rates, treatment adherence rates May influence patient adherence

Intervention type	Specific activity	Health status results found	Health system outcome results found
7. Pharmaceutical systems strengthening initiatives	<ul style="list-style-type: none"> • Community-directed interventions to improve the availability of essential medicines • Supervisory programs for pharmacies 		<ul style="list-style-type: none"> • Increased coverage of vitamin A, anti-parasite drugs, and appropriate malaria treatment • Potentially improved drug availability
8. Service integration	<ul style="list-style-type: none"> • Adding a new component to an existing service • Integrated primary health care services • Integrating HIV/AIDS services with MNCH, nutrition, and family planning services • Integration of family planning services with other services 	<ul style="list-style-type: none"> • Reduced infant mortality 	<ul style="list-style-type: none"> • Increased service utilization • Positive service utilization effects • Increased new and continuing family planning users and self-reported contraceptive use prevalence
9. Strengthening health services at the community level	<ul style="list-style-type: none"> • Community-based maternal and/or newborn care • CHWs delivering care for malaria, pneumonia and diarrhea • Community- and home-based delivery of anti-malarial medications • CHWs providing long-acting family planning methods • Providing HIV care at lower-level health facilities • Community-organized emergency referral services 	<ul style="list-style-type: none"> • Lowered perinatal and neonatal mortality rates • Reduced under-five mortality • Reduced all-cause mortality • Can reduce neonatal mortality 	<ul style="list-style-type: none"> • Increased use of contraceptives • May reduce attrition; not inferior to hospital care
10. Supply-side performance-based financing programs	<ul style="list-style-type: none"> • Performance based financing/ performance based incentives 	<ul style="list-style-type: none"> • Reduced rates of wasting • Improved parent-reported health status among children under-five 	<ul style="list-style-type: none"> • Can improve service utilization • Can improve quality of services
11. Task-sharing	<ul style="list-style-type: none"> • Nurse-led provision of antiretroviral therapy • Non-mental health specialists providing non-pharmaceutical psychological interventions for women suffering from mental disorders during the perinatal period.^[15] 	<ul style="list-style-type: none"> • No greater mortality than physician-led care • Reduced incidence of perinatal common mental disorders 	<ul style="list-style-type: none"> • Better patient retention than physician-led care
12. User fee exemptions	<ul style="list-style-type: none"> • User fee exemptions 		<ul style="list-style-type: none"> • Increased rates of facility-based deliveries and caesarean sections (in some contexts)
13. Voucher programs	<ul style="list-style-type: none"> • Reproductive health voucher programs • Maternal health voucher programs • Engaging women's groups 	<ul style="list-style-type: none"> • Reduced prevalence of sexually transmitted infections • May reduce neonatal and maternal mortality 	<ul style="list-style-type: none"> • Increased service utilization • Lowered out-of-pocket payments

4.1 ACCOUNTABILITY AND ENGAGEMENT INTERVENTIONS AMONG COMMUNITIES AND PROVIDERS

Health governance interventions with the intention of creating or promoting accountability of health service providers to the communities they serve can improve health status and outcomes by improving the technical and patient-perceived quality of service provision, thereby increasing utilization; by ensuring health service providers engage in activities relevant to the local community and thus increasing the effectiveness of care; by raising awareness of healthy behaviors; and by holding health service providers accountable for their actions and budgets.

HEALTH STATUS RESULTS

One review, by Ciccone et al., showed that **community-provider engagement initiatives** and initiatives to **engage women's groups** may improve health status measures.^[14] The review identified two pre-post intervention studies and one cluster randomized trial evaluating participatory governance approaches that promoted dialogue and accountability mechanisms between patients and providers. The cluster randomized evaluation in Uganda^[11] of a rural community monitoring initiative led to a significant increase in the weight of infants and a 33% reduction in under-five mortality. A community-based, participatory health intervention to promote healthy behaviors among women of reproductive age in one district in Nepal led to 30% lower neonatal mortality and 80% lower maternal mortality in intervention versus control sites, according

to a cluster-randomized evaluation.^[14] However, a large cluster-randomized trial in Mumbai to engage women's groups for better perinatal health did not find improvements in neonatal mortality, antenatal care, facility-based delivery, or initiation of breastfeeding.^[14]

HEALTH SYSTEM OUTCOMES RESULTS

The review also found a 20% greater utilization of outpatient services associated with participatory governance approaches.^[14] One pre-post evaluation from Kenya of an intervention to enhance community engagement with providers found improved measles vaccination coverage and use of insecticide-treated bed nets.^[14] In Uganda, community-provider engagement was shown to decrease the frequency of drug stock-outs.^[11]

Decentralization may indirectly improve health care utilization and behaviors by strengthening accountability, allowing institutions to respond better to local needs, and enhancing community engagement. Ciccone et al.^[14] identified one study from the state of Ceará, Brazil in which decentralization (transfer of authority from central government to local units) was positively associated with improved patient satisfaction, immunization coverage, antenatal care attendance, clinical productivity, and service utilization. The authors also reference a study from Egypt in the 1980s which found that the transfer of authority to local units at the governorate and village council level had a significant positive impact on contraceptive knowledge, use and practice.

BOX 1: CITIZEN REPORT CARDS CONTRIBUTE TO REDUCED UNDER-FIVE MORTALITY IN UGANDA

Every year in sub-Saharan Africa, millions of children die from preventable diseases, such as malaria and pneumonia, because they cannot access basic health services. To determine why such services were not available in Uganda, a team of researchers from Stockholm University, the World Bank, and local nongovernmental organizations (NGOs) designed a randomized field experiment to address a likely cause – ineffective monitoring of health care providers and weak accountability to clients.

In their study, Martina Bjorkman and Jakob Svensson describe piloting community-based monitoring and citizen report cards to influence provider behavior and improve delivery of health services.^[11] Report cards are a citizen-driven exercise to collect data on the performance of a health facility and its personnel. They offer a way to monitor health staff behavior by pooling and sharing the knowledge of individual families, based on their experiences with a provider or facility, for the benefit of the entire community.

Launched in late 2004, the pilot took place in 50 rural public dispensaries in nine districts across the country. There were approximately 55,000 households in the health facility catchment areas and of these 5,000 were surveyed. Fifty providers also participated. Half of the facilities were assigned to the treatment or intervention group and the rest were assigned to the control group.

After collecting the baseline data, a series of meetings was held to develop an individual report card for each facility. Staff from local community-based organizations (CBOs) facilitated all of these meetings. The meetings included gathering community views on the quality and efficacy of providers' service. Each facility and its community then created a unique report card, which was translated into the main language spoken in the community. They then shared it with the providers, and together created an action plan to address issues identified by the community. Six months later, the CBOs facilitated another community meeting and a meeting between the community and provider to track progress on the action plan.

One year later, the authors found that this pilot significantly improved both the quality and quantity of primary health care services provided in the treatment group. Among the key findings:

- a 33% reduction in under-five mortality;
- a significant increase in the weight of infants—0.14 z-score increase; and
- a 20% increase in use of general outpatient services.

The evidence suggested that the treatment group began to more closely monitor their health units and the providers worked harder to provide better health services. The authors cautioned that despite the promise of community monitoring, further research is needed to assess long-term effects and unintended effects beyond the health sector.

4.2 CONDITIONAL CASH TRANSFERS

Conditional cash transfers (CCTs) are cash payments made to individuals or households, contingent upon their use of particular services (such as childhood immunizations) or other demonstrated behaviors (such as girls' school attendance). Payment is made after the desired behavior is carried out and verified. CCTs aim to both alleviate poverty by improving overall household income and incentivize desirable behaviors through the application of conditions. Because of the poverty alleviation focus, cash transfer programs are often implemented outside the health sector, and are likely to affect non-health issues as well as health issues.

HEALTH STATUS RESULTS

Three rigorous reviews of CCT programs and their effects on health status and health care utilization were identified; several of the included examples were common across the reviews. Murray et al.^[60] highlight perhaps the most famous example, the *Oportunidades* CCT program from Mexico, which provides cash payments to families for regular school attendance, health clinic visits for preventive care, and nutritional support. The program led to an 11% reduction in maternal mortality during the period from 1995 to 2002.^[60] Glassman et al.^[28] reviewed the impact of CCTs on maternal and newborn health, and found that CCTs have decreased the incidence of low infant birth weight (two out of two programs reported statistically significant decreases ranging from 2-5%).

Evidence summarized by Lagarde et al.^[45] from Mexico and other Latin American countries (Brazil, Columbia, Honduras, and Nicaragua) as well as Malawi indicate that conditional cash transfers were positively associated with increases in mother-reported health outcomes for children (22-25%) and reduced child malnutrition (e.g. stunting, underweight). Associations between CCTs and other health outcomes, such as anemia, diarrhea, and child height, were either mixed or not statistically significant.^[45]

HEALTH SYSTEM OUTCOMES RESULTS

Glassman et al.'s review^[28] also concluded that there is a strong association between CCTs and **utilization of health services**. The authors found that CCTs have been effective at increasing antenatal visits (6 out of 8 countries reported statistically significant increases ranging from 8-19%); increasing rates of skilled birth attendance (5 out of 6 programs reported statistically significant increases ranging from 4-36%); and increasing rates of delivery at a health facility (3 out of 3 programs reported statistically significant increases ranging from 4-44%). The authors did not find any significant effects of conditional cash transfers on fertility rates, use of Cesarean section, or maternal tetanus toxoid vaccination. Lagarde et al.^[45] found effects on other types of health care utilization, including a 27% increase in seeking HIV test results in Malawi; 11-20% more children taken to health facility in last month in Honduras; and 23-33% more children with preventive care visits in Mexico. Findings on immunizations were mixed.

4.3 CONTRACTING OUT SERVICE PROVISION

In the health sector, contracting out refers to governments establishing contracts with non-government health care providers (either for-profit or not-for-profit) to offer publicly-funded health care services. This type of partnership between the public and private sectors can potentially improve access to health care in contexts where the government's direct service provision capacity is limited, or where non-government service providers can offer services at lower cost or higher quality. The contract is intended to provide a binding, enforceable mechanism for ensuring provision of quality care.

HEALTH STATUS RESULTS

In the two systematic reviews we found covering contracting out,^[46,52] both identified positive effects on health status measures. Liu et al. reviewed 13 studies and found that contracting out nutritional services in Senegal and Madagascar was associated with gains in nutritional outcomes after 17 months; severe malnutrition disappeared among children aged 6–11 months, going from 6% to 0%, while moderate malnutrition declined among those aged 6–35 months from 28 to 24%.^[46,52] Lagarde and Palmer, reviewing three experimental and quasi-experimental studies, found that contracting out reduced the probability of self-reported illness (by 15%) and the incidence of diarrhea (by 25%) among young children in Cambodia.^[46,52]

HEALTH SYSTEM OUTCOMES RESULTS

Positive effects on service utilization were also reported in both reviews. Liu et al.^[46,52] found that in situations where health services are in general under-provided, contracting out can lead to increased utilization. Contracting-out programs (for a variety of primary health care services) consistently increased access to the specified services, as measured by coverage rates, the availability of services, and the quantity of services provided and utilized. These findings are mirrored in the studies reviewed by Lagarde and Palmer,^[46,52] which found that contracting out in Cambodia led to a 29 percentage point increase in use of public (contracted) facilities and a 42 percentage point increase in vitamin A consumption. Contracting out of public facilities in Bolivia increased deliveries attended by health personnel by 21% compared to the comparison group, and contracting out of services in Pakistan led to short-term increases in patient volumes. Finally, a review by Ryman et al.^[78] on strategies to improve immunization coverage found that contracting out immunization services to NGOs in Cambodia was associated with increased coverage and improved equity. Contracting out in that context also lowered household out-of-pocket payments, due primarily to a reduced use of private for-profit providers.^[46,52]

4.4 HEALTH INSURANCE

Health insurance is a financing mechanism that collects regular and predictable contributions from large numbers of people (who have varying risks of illness, and include both the healthy and the sick), “pools” these resources, and disburses payment for health care when it is needed. Health insurance affects health status, health care utilization, service quality, and financial protection through several pathways:

- **Increasing financial access:** By separating the ability to pay for care from ability to obtain care when needed, insurance coverage may mitigate financial access barriers, encouraging individuals to utilize preventive care and to seek and receive care in a more timely fashion when they are sick.
- **Influencing provider behaviors:** The mechanisms by which an insurance program pays health care providers can affect the volume, type, and quality of services they offer. Insurance can promote strategic purchasing – paying for a cost-effective package of health services and paying lower prices for services and inputs – as the insurer is paying on behalf of a large group of enrollees.
- **Poverty alleviation:** In addition to reducing financial access barriers, insurance coverage can protect individuals and families from catastrophic health care payments or impoverishment due to health care costs. This could contribute to poverty alleviation which in turn improves health status.
- **Improving availability of system inputs:** Collecting insurance prepayments through premiums, taxes, or other funding sources helps ensure a dedicated flow of resources for health, and may increase health spending overall compared to contexts where most health spending is “out-of-pocket”. By facilitating predictable flows of financing, insurance can improve the availability of essential inputs such as medicines and promote development of improved information systems.

We found four systematic reviews looking at the effect of health insurance on health status measures and health system outcomes.

HEALTH STATUS RESULTS

In Acharya et al.'s^[1] review of 34 studies on the impact of health insurance for the poor, one study (using propensity scores to match insured and uninsured pregnant women in Ghana) found that enrollment in Ghana's National Health Insurance Scheme was associated with lower infant mortality. [58] Evidence from other included studies also showed positive correlations between health insurance coverage and health status measures, such as better diabetes management, fewer birth complications, and reduced pain, anxiety, depression and other self-reported outcomes.^[1]

Comfort et al.,^[16] in their review of 29 studies on the effect of insurance on maternal and newborn health, identified a study from Brazil showing that insurance was correlated with reduced neonatal mortality. A recently-published large study from Karnataka state in India,^[82] using a geographic regression discontinuity design, found significantly lower cancer and cardiac mortality, comparing insurance-eligible households with those in matched non-eligible villages.

HEALTH SYSTEM OUTCOMES RESULTS

The effect of health insurance coverage on the use of health services (curative and preventive, inpatient and outpatient, public and private) is well established. Spaan et al.'s systematic review of 159 studies of health insurance in Africa and Asia^[83], Ekman's review of 17 studies of community-based health insurance in low-income countries,^[22] Acharya et al.^[1] and Comfort et al.^[16] consistently document positive associations between health insurance coverage and increased utilization of health services.^[1,22] Examples extend across numerous population groups (including the poor) and include various types of insurance (community-based, social, national, and private insurance).

There is also strong and consistent evidence that health insurance improves financial protection by reducing out-of-pocket payments for health care,^[1,16,22,83] which was observed in studies from Nicaragua, Mexico, Senegal, Colombia, India, Georgia, Vietnam, Egypt, Ghana. In most of these studies, there was also a decline in catastrophic (poverty-inducing) payments, with the greatest reductions in catastrophic payments among the poorest population segments.

The four reviews^[1,16,22,83] also consistently noted that many included studies were observational in nature, and thus subject to selection bias. This bias is likely stronger for insurance schemes with voluntary enrollment rather than mandatory or population-wide enrollment, because the sick are more likely to enroll voluntarily in insurance. Nonetheless, findings with respect to out-of-pocket payments and utilization have been reflected in randomized studies in high-income contexts (such as the RAND health insurance experiment [<http://www.rand.org/health/projects/hie/hiepubs.html>] and a randomized experiment in Ghana^[73]).

4.5 HEALTH WORKER TRAINING TO IMPROVE SERVICE QUALITY

In-service training for health care providers (whether at the community level, in primary care clinics or in hospitals) can improve provider adherence to clinical guidelines, resulting in reduced mortality and better patient behaviors.

HEALTH STATUS RESULTS

Several reviews found that efforts to **train traditional birth attendants at the community level** led to reduced newborn or maternal mortality. In their review of delivery care in community settings, Darmstadt et al.^[18] found evidence from one randomized controlled trial that training traditional birth attendants to provide better delivery care led to a 30% reduction in perinatal mortality. The review also identified a meta-analysis that had calculated an 11% reduction in intrapartum-related neonatal mortality associated with training traditional birth attendants.

A systematic review by Kidney et al.^[40] similarly reported that trainings of traditional birth attendants and primary-level clinicians aimed at improving perinatal care led to a statistically significant reduction in maternal mortality, according to combined results from two randomized trials (OR 0.62, 95% CI 0.39 to 0.98). Wilson et al.^[91] conducted a meta-analysis on six randomized controlled studies, and found that training and support for traditional birth attendants in both developing and developed countries led to significant reductions in perinatal deaths (RR 0.76, 95% CI 0.64 to 0.88) and neonatal deaths (RR 0.79, 95% CI 0.69 to 0.88). Non-randomized control trial studies in the Wilson et al. review showed similar results.

HEALTH SYSTEM OUTCOMES RESULTS

Other reviews looked at the effect of **health worker training** on outcomes such as healthy behaviors and service quality.^[6,68,74] Health worker training was associated with increases in coverage in countries with low vaccination coverage.^[6,68] Sunguya et al.^[85] reviewed studies looking at the effectiveness of training for health workers that aimed to improve health workers' nutritional counseling to children's caregivers, measuring effects on uptake of healthy feeding behaviors, a proxy for improved nutritional status. In their review, five randomized controlled studies found that health worker training led to improved daily energy intake among children. Three randomized controlled studies found that training improved feeding frequency among children.

Ranji and co-authors^[74] published a systematic review of efforts to **reduce inappropriate prescriptions of antibiotics** for common infections in ambulatory settings, reviewing studies from both developed and developing countries. The cluster of interventions studied included provider education, patient education, delayed prescriptions, audit and feedback, provider reminders, and incentives. Overall, these interventions were found to reduce the proportion of patients receiving inappropriate prescriptions by 9.7%. Active clinician education training appeared more effective than passive training.

4.6 INFORMATION TECHNOLOGY SUPPORTS TO IMPROVE SERVICE PROVISION AND PATIENT BEHAVIORS (INCLUDING E-HEALTH AND M-HEALTH)

Developing, adapting, or deploying new information technologies may help service providers to perform their jobs more efficiently and with higher quality. Information technology supports may also help providers contact patients or convey health promotion messages, ultimately improving adherence to treatment and better treatment outcomes. We identified at least two broad categories of these information technology supports: **e-health** (use of information technology for health care) and **m-health** (delivering health services with the aid of mobile electronic devices).

HEALTH SYSTEM OUTCOMES RESULTS

We found five systematic reviews that assessed the effects of **m-health** interventions on service utilization outcomes and healthy behaviors.^[5,36,51,61,90] Two reviews (Nglazi et al.^[61] and Liu et al.^[51]) found some evidence that mobile phone text message reminder systems increased timely attendance at clinics among TB patients and the likelihood

of treatment completion. Bärnighausen et al.^[5] and Horvath et al.^[36] found evidence that reminders, including text messages, increased HIV patients' clinic attendance and HIV treatment adherence at six months^[5] and at one year^[36] after starting antiretroviral treatment. Vodopivec-Jamsek et al.'s review on mobile messaging to promote uptake of preventive services and healthy behaviors found "very limited" evidence that this strategy may be able to influence patient adherence or other behaviors, although many of the studies reviewed came from developed countries.^[90]

Two systematic reviews of **e-health** interventions were identified. One review^[12] assessed studies on a wide variety of e-health interventions, including the use of electronic health records, laboratory and pharmacy management information systems, patient scheduling and tracking systems, clinical decision support tools, and research data collection systems. The authors found few rigorous evaluations and little direct evidence related to service utilization or health status, but concluded that studies suggest promise for e-health as a means of improving provider efficiency, timeliness and accuracy of patient care data, and increased patient and provider satisfaction. A second review explored whether improved provider access to electronic information sources (such as online databases) improved provider behaviors or patient outcomes, but found few relevant studies and did not detect significant associations.^[57]

4.7 PHARMACEUTICAL SYSTEMS STRENGTHENING INITIATIVES

Ensuring that essential pharmaceuticals and other medical inputs are available and affordable to patients when needed is critical to high-quality service provision and improvements in health status. Interventions may include improvements to supply chain management to reduce stock-outs and loss due to expiration, bulk or pooled procurement of medicines to obtain lower prices and increase affordability, trainings to pharmacists and providers to improve stock management and prescribing practices, and others.

Only one systematic review in the HSE database focused specifically on pharmacy system interventions and their effects on health indicators.^[64] Due to the low yield of articles from the HSE database, we performed a dedicated search in PubMed and identified other systematic reviews. However, none of the reviews included any studies linking pharmaceutical systems strengthening, supply chain management or commodity security initiatives to mortality or other health outcomes.

HEALTH SYSTEM OUTCOMES RESULTS

Nunan and Duke^[64] reviewed the effectiveness of pharmacy interventions to **improve the availability of essential medicines** at the primary health care level. They identified one randomized multi-center trial conducted in Cameroon, Nigeria, and Uganda on “community-directed interventions” (defined as programs where communities establish their own, locally appropriate measures to ensure the supply of medicines, and local leaders take responsibility for the ongoing facilitation of the system).

These interventions resulted in significantly increased coverage of vitamin A, anti-parasite drugs (Ivermectin), and appropriate malaria treatment. Another observational study from Tanzania assessing community-directed interventions also found increased availability of anti-parasite drugs, but not vitamin A.

Supervisory programs aimed at improving stock management practices at health facilities in Zimbabwe were found to result in better stock management indicators and improved drug availability in a randomized controlled trial, although this latter finding was not statistically significant.^[64] There is some evidence from observational studies in Nepal and India that training pharmaceutical staff results in fewer drug stock-outs.^[64]

Through the PubMed search, we found three reviews assessing the problems faced in the health commodity supply chain^[3,25] but little focus on interventions to address these problems. Faden et al.^[25] find several studies linking active pharmaceutical management by health insurance agencies and increased use of medicines as well as adherence to longer term treatment protocols. Huff-Rousselle^[37] in a narrative synthesis of available documents, and, to some extent Arney and Yadav^[3] using a case study approach, suggest that **pooled procurement** (at a national or international level) may serve to reduce the procurement price of drugs, help ensure quality, limit procurement-related corruption, and possibly increase access to drugs, among other benefits.

4.8 SERVICE INTEGRATION

Service integration refers to a broad array of service delivery activities meant to enable patients to receive multiple needed health services in a coordinated and convenient fashion, minimizing administrative hurdles and waiting times. This can include systems designed to provide multiple services during one visit or within one facility, facilitate patient access to care from different providers within a single facility, and coordinate and streamline patient referrals to different facilities.

Service integration could improve health status through several pathways: by improving the quality of services provided (for instance, through better coordination of patient information among a team of providers); by expanding patient access to needed services (through “one-stop-shopping” and facilitated referrals); and by increasing patient demand for and uptake of services (by reducing waiting times, administrative hurdles, and information barriers). In addition, by increasing health system efficiency (for instance, by reducing missed opportunities to provide essential services and minimizing duplication of services) health care providers could be freed up to provide more and better quality care.

HEALTH STATUS RESULTS

The literature on the health impacts of service integration is mixed, but there is some evidence that providing **integrated primary health care services** improves health outcomes. In their extensive review of the effect of integrated primary health care services on population health, Macinko et al.^[53] found that an integrated approach to primary health care was associated with an average 40% reduction in infant mortality, with individual study estimates ranging from 0% to as high as a 71%. They comment that although the peer-reviewed literature is lacking in rigorous experimental studies, “a small number of

relatively well-designed observational studies and the consistency of findings” lend strength to this conclusion. Haws et al.^[32] reviewed 41 studies that implemented **integrated packages of interventions** to improve neonatal health, including 19 randomized controlled trials. While many studies reported declines in perinatal and neonatal mortality, the authors could not ascertain associations between particular interventions and mortality, and they found little evidence that an integrated package of neonatal care had a different effect than individually implemented interventions.

HEALTH SYSTEM OUTCOMES RESULTS

Dudley and Garner^[20] found five studies measuring the effects of **adding a new component to an existing service**; these studies suggested that integration was associated with increased service utilization, although no health status effects were detected. They also found four studies comparing integrated services to stand-alone services; here, they found that integration may decrease utilization, client knowledge and satisfaction, and they found little difference in health outcomes.^[20]

Lindgren et al.^[50] examined 20 peer-reviewed articles assessing the impact of **integrating HIV/AIDS services with MNCH, nutrition, and family planning services** on service utilization indicators and healthy behaviors. They identified various positive service utilization effects. For instance, integrating antenatal care (ANC) and antiretroviral therapy (ART) services doubled the proportion of individuals initiating ART during pregnancy and reduced delays between HIV diagnosis and treatment initiation; integrating child malnutrition services with HIV testing led to a 30% higher uptake of HIV testing among children and caregivers, as well as a significant increase in the number

of children recovering from malnutrition; and integrating HIV testing and family planning services resulted in increased contraceptive uptake, increased condom use, fewer pregnancies, and an increase in the percent of clients tested. The authors concluded that stakeholder, staff, and community support, investments in training and supervision, as well as improvements in engagement between providers and patients were critical for the success of integration programs.

Similarly, Ferguson et al.^[26] reviewed efforts to **link pregnancy-related and HIV services**, and found positive service utilization effects. These included increased enrollment in HIV services (from 30% to 75%) after integration with antenatal care at a site in Mozambique,^[72] and in Zambia, women at integrated sites had higher odds of enrolling in HIV care at integrated sites than their counterparts at non-integrated sites (adjusted OR 2.01, 95% CI: 1.37 to 2.95).^[41] These findings were mirrored in the review by Suthar et al.,^[86]

which found four studies that showed the increased enrollment of pregnant women in ART where ANC clinics were integrated with ART relative to those that were not (RR: 2.09; 95% CI: 1.78 to 2.46). Spaulding et al.^[84] found that **integration of family planning services into various HIV services**, or vice-versa, led to improved service utilization outcomes; increases in patients receiving HIV testing ranged from 5-10% of clients, while increases in family planning uptake were observed among 10% to 25% of clients.

More broadly, Kuhlmann et al.^[43] reviewed efforts to **integrate family planning services with a range of other services**, including postnatal care, immunizations, curative care for children, post-abortion care and STI care. They found that integrating family planning services with other care improved family-planning related outcomes, such as new and continuing family planning users and self-reported contraceptive use prevalence, in seven of the nine studies included in their review.

BOX 2: INTEGRATING ART AND ANC TO REACH MORE WOMEN IN LUSAKA, ZAMBIA

Many countries in sub-Saharan Africa have made significant progress in testing pregnant women for HIV and providing antiretroviral therapy (ART) to reduce transmission of the virus. But a major challenge of preventing mother-to-child transmission (PMTCT) is reaching eligible women with treatment. In Zambia, researchers observed that “the mere presence of ART services in the public sector has not been sufficient to ensure that all eligible pregnant women avail themselves of it.”^[41]

To address this gap, Killam et al. (2010) designed a study to determine if providing ART in antenatal care (ANC) clinics led to more women starting ART during pregnancy than the existing approach – referring them to a separate ART clinic.^[41] In the study, Antiretroviral therapy in antenatal care to increase treatment initiation in HIV-infected pregnant women: a stepped-wedge evaluation, the researchers included all HIV-infected, ART-eligible pregnant women in the eight public sector clinics in Lusaka district, Zambia. The control cohort consisted of 13,917 women who started ANC more than 60 days before the intervention rollout, while the intervention cohort included 17,619 women who started antenatal care after ART was integrated into ANC services.

At the integrated clinics, eligible women were enrolled into ART care at the ANC clinic when they returned to receive their CD4 results. At this time, they also received treatment for opportunistic infections, health education, antenatal services, and counseling on antiretroviral drugs. Patients also were started on cotrimoxazole prophylaxis, multivitamins, and iron and were asked to return in 2 weeks to start ART, unless they were close to delivery.

The authors found that of the 1,566 patients eligible for ART, more enrolled while pregnant and within the 60 days of HIV diagnosis in the intervention cohort (376/846, 44.4%) than in the control cohort (181/716, 25.3%). Also, more than twice the number of women in the intervention cohort started ART while pregnant (278/846, 32.9%) than in the control cohort (103/716, 14.4%). The authors concluded that the integration of ART into ANC increases uptake of ART in such resource-limited settings.

4.9 STRENGTHENING HEALTH SERVICES AT THE COMMUNITY LEVEL

Interventions to strengthen health services available at levels closer to communities – including making use of community-based health workers and shifting care from hospitals to more peripheral facilities – have been shown to reduce perinatal, newborn, and under-five mortality and maternal morbidity, although there is less evidence of effects on maternal mortality. Community health worker (CHW) programs have also increased uptake of care for malaria, pneumonia, diarrhea; healthy behaviors such as breastfeeding; and uptake of

long-acting contraceptive methods. These types of programs enable easier geographical access by patients to services and may also facilitate more timely care provision. Their effects on health status are modulated by the readiness and ability of workers in peripheral locations and at the community level to undertake additional activities.

HEALTH STATUS RESULTS

Five systematic reviews^[18,29,30,48,99] of programs providing community-based maternal and/or newborn care found these programs resulted in significantly lower perinatal and neonatal mortality rates, with relative risks ranging from 0.62 to 0.84 (see Table 2)*.

Intervention (Review)	Effects on Health Status (Number of Individual Studies and Sample Sizes)				Locations (number of individual studies)
	Maternal Mortality	Neonatal Mortality	Still births	Perinatal mortality	
Community based package of maternal and newborn health services (Lassi et al. 2010 ^[48])	Not statistically significant (4 studies, n = 138,290)	RR=0.76 (95% CI: 0.68 to 0.84) (12 studies, n = 136,425)	RR=0.84 (95% CI: 0.74 to 0.97) (11 studies, n = 113,821)	RR=0.80 (95% CI: 0.71 to 0.91) (10 studies, n = 110,291)	Asia (15) Sub-Saharan Africa (2) Other (1)
Home visits by CHWs to prevent newborn deaths (Gogia and Sachdev 2010 ^[30])	(not applicable)	RR= 0.62 (95% CI: 0.44 to 0.87) (5 studies, n = 1,525)	RR=0.76 (95% CI: 0.65 to 0.89) (3 studies, n = 31,926)	(not applicable)	Asia (5)
Community-based skilled birth attendance (Yakoob et al. 2011 ^[99])	(not applicable)	(not applicable)	(not applicable)	RR=0.77 (95% CI: 0.69 to 0.85) (2 studies, n not reported)	Asia (6) Sub-Saharan Africa (5) Other (3) Developed (3)
Community based neonatal care by CHWs (Gogia et al. 2011 ^[29])	(not applicable)	RR=0.73 (95% CI: 0.65 to 0.83) (15 studies, n = 192,000)	(not applicable)	(not applicable)	Not reported in detail; mainly Asia
Community-based skilled birth attendance (Darmstadt et al. 2009 ^[18])	(not applicable)	(not applicable)	(not applicable)	RD: -12% (95% CI not reported due to low quality of evidence)	Asia (26) Sub-Saharan Africa (6) Other (9) Developed (2)

RR = Relative risk; RD = Risk Difference; CI = Confidence Interval

*This is the only intervention for which multiple reviews that included meta-analyses on mortality outcomes were found for this analysis. Reviews assessing strengthening services at the community level for older child health did not include meta-analyses, and are not included in Table 2.

These programs included community-based provision of a package of maternal and newborn services,^[48] home visits and provision of newborn care by CHWs^[29,30], and community-based provision of skilled attendance at delivery.^[18,99] Gogia et al.^[29] note that these programs appear to be more effective in settings with a baseline neonatal mortality rate higher than 50 per 1,000 live births.

Christopher et al.^[13] systematically reviewed the impact of **CHWs delivering care for malaria, pneumonia and diarrhea** on child mortality and morbidity in The Gambia, Ghana, and Benin. They found that six of the seven studies they reviewed, which varied considerably in methodological rigor, showed reductions in under-five mortality overall. The highest-quality study showed a 63% decrease in under-five mortality from CHWs providing basic treatments, insecticide treated bed nets (ITNs), and education, and a 36% decrease in under-five mortality from the CHWs delivering anti-malarial chemoprophylaxis.

Similarly, the review by Okwundu et al.^[65] found that **community- and home-based delivery of anti-malarial medications** increased uptake of treatment; one study they reviewed from Ethiopia found that community worker-based management of malaria in a rural setting reduced all-cause mortality by over 40% (RR 0.58, 95% CI 0.44 to 0.77).^[39] Druetz et al.^[19] reviewed 15 studies on community health worker treatment of childhood pneumonia in sub-Saharan Africa. While community case management of pneumonia has been shown to be effective in South Asia, this review found a lack of evidence of effectiveness in sub-Saharan Africa, concluding that implementation conditions and co-morbidities may complicate its application in sub-Saharan Africa as compared with South Asia.

In a review of 19 randomized control trials and quasi-experimental studies, Hussein et al.^[38] find strong evidence from South Asia that

community-organized emergency referral services can reduce neonatal mortality (one study calculated an odds ratio of 0.48 [95% CI: 0.34 to 0.68]).^[44] However, because many studies applied complex interventions with multiple components, it was impossible to attribute the impact each component had on neonatal mortality.

There is currently less evidence on whether community based services can reduce maternal mortality, a health status indicator which is difficult to measure. Lassi et al.'s review^[48] of studies in Asia and Africa looking at community-based intervention packages to improve maternal care during pregnancy, delivery and in the postpartum period did not detect a significant reduction in the risk of maternal mortality.

HEALTH SYSTEM OUTCOMES RESULTS

Three high-quality systematic reviews of studies from Asia, Africa, and Latin America assessed the effectiveness of **CHWs in providing long-acting family planning methods**. The reviews found consistent evidence that CHWs can safely and effectively increase uptake of IUDs (Peto OR 5.73; 95% CI 3.59 to 9.15)^[4] and injectable contraceptives (11 to 26 percentage point increase in injectable contraceptive use in Afghanistan and Bangladesh).^[54,55]

One review by Kredon et al.^[42] assessed the service delivery strategy of **providing HIV care at lower-level health facilities**, looking at effects on patient retention (a measure of service utilization and quality). The review found that starting anti-retroviral therapy at hospitals and then providing routine antiviral maintenance care at more peripheral health facilities may reduce attrition (RR 0.46, 95% CI 0.29 to 0.71) based on observational evidence.^[42] The evidence suggests that neither peripheral health facility delivery nor community-based delivery by trained volunteers is inferior to hospital delivery in terms of patient retention, while it may expand the ability of the health system to deliver HIV and AIDS care.^[42]

4.10 SUPPLY-SIDE PERFORMANCE-BASED FINANCING PROGRAMS

Supply-side performance-based financing programs (sometimes referred to as performance-based incentives or pay for performance programs) aim to improve health provider performance by providing rewards that are directly linked to better health outcomes, increased service use, and/or improved service quality.^[21] A payment agency (most commonly the government) establishes contractual arrangements with health districts, health facilities, or staff working in facilities, and agrees to provide financial incentives contingent upon the achievement of specific, quantifiable goals – whether increased volumes of targeted (high priority/cost-effective) services, improved quality scores, or improved health measures in targeted population groups. The approach aims to incentivize service providers to deliver more and/or better-quality health services, while enhancing their autonomy and increasing the transparency of the health system as a whole. Performance-based payments may supplement or substitute for existing funds.^[93]

HEALTH STATUS RESULTS

We identified two relevant reviews, one assessing **performance-based financing (PBF)** authored by Witter et al. (covering nine studies)^[93] and one by Eichler et al. reviewing the effects of **performance-based incentives (PBI)** on maternal and newborn health (covering nine studies);^[21] both reviews indicated that the quality of the evidence was generally weak. The Witter et al. review identified only one study that measured effects on health status. In that study from the Philippines, PBF was found to reduce rates of wasting and improve parent-reported health status among children under-five discharged after treatment for diarrhea or pneumonia, but no significant effect was found on two other clinical measures (anemia or presence of C-reactive protein in the blood). Eichler et al.^[21] found no direct evidence of the impact of PBI on the mortality of mothers and newborns.

BOX 3: HEALTH SYSTEM INTERVENTIONS HELP TO REDUCE INDIA'S NEONATAL MORTALITY RATE

Each year, one out of every five babies born worldwide is born in India, according to World Health Organization estimates. Newborns continue to die at a high rate there, especially in rural and poor areas. Of the annual 1.8 million under-five deaths in India in 2008, nearly 55% occurred during the neonatal period (before the age of 28 days). According to World Health Organization estimates, India has about 27 million live births each year. There are also two million under-five deaths each year, accounting for roughly a quarter of all global child mortality.

In “Community Based Newborn Care: A Systematic Review and Meta-analysis of Evidence: UNICEF-PHFI Series on Newborn and Child Health, India,” Gogia et al.^[29] sought to “assess the effect of community based neonatal care by CHWs on the neonatal mortality rate (NMR) in resource-limited settings.” The team identified 273 potentially eligible study reports. After review, they eliminated 252, leaving 21 reports that are covered in this review. This systematic review includes 13 controlled trials involving approximately 192,000 births. The interventions in these trials included community health workers making home visits with and without community mobilization and participatory learning by women’s groups. In most trials, the workers came from the local area.

The review found that community-based neonatal interventions by CHWs in combination with community mobilization can help to reduce NMR in low-resource settings in India. According to the authors, “A significant decrease in NMR is possible by providing community based neonatal care in areas with high NMR by community health workers with a modest training duration and ensuring high program coverage with home visitation on the first two days of life.” The impact seems greatest in areas with the highest baseline NMR and with the most program coverage.

HEALTH SYSTEM OUTCOMES RESULTS

Both reviews included studies measuring effects on service provision quality and service utilization.^[21,93] In general, performance-based incentive programs had either positive or mixed effects on service utilization. For example, of the two studies Witter et al.^[93] consider to have the strongest study designs, some indicators of utilization (institutional delivery care, bed net coverage, vaccination of pregnant women) increased in association with performance-based financing, while other indicators of utilization did not change. Studies from Rwanda and Burundi measured a statistically significant increase in rates of institutional deliveries, while the reverse was found in the Democratic Republic of Congo. The review by Eichler et al. concludes that incentives that reward providers for increased institutional deliveries result in an increase in the number of institutional deliveries.^[21]

Both reviews found some evidence that quality of care showed improvements when payments were tied to quality (usually measured by a composite index); Witter et al. highlighted a 10% improvement in quality scores (based on vignettes given to health care providers) compared to baseline in the Philippines study, and improved quality in prenatal care in Rwanda (as measured by observed activities compared with the guidelines).^[93]

4.1 | TASK-SHARING

Task-sharing (sometimes referred to as task-shifting^{[95]†}) consists of modifying the scopes of practice for health care workers to allow different cadres of workers to routinely deliver health services, thus expanding the potential pool of health workers available to provide services and expanding patient access to care.^[95] Task-sharing may occur in concert with efforts to strengthen health services at the community level, as described in section 4.9. Task-sharing can also occur without the relocation of service delivery – that is, it can occur within a facility, with nurses, pharmacists, etc. taking on more tasks from more highly-trained cadres of workers. In settings where access to more highly trained cadres of health workers is severely limited, effective (even if inferior) care under task-sharing may still be acceptable.^[27] Numerous reviews have been conducted to evaluate whether task-sharing results in comparable health outcomes.

Reviews on task-sharing in general did not include randomized controlled trials; 6 of the reviews we identified reported that there was insufficient evidence from which to draw conclusions^[10,17,56,62,76,88] while one concluded that contextual factors play an important part in determining the success of task-sharing, making generalizations difficult.^[69]

† According to the WHO, **task shifting** is defined as “the rational redistribution of tasks ... from highly qualified health workers to health workers with shorter training and fewer qualifications in order to make more efficient use of the available human resources for health.” **Task-sharing** is the more current terminology and implies a greater emphasis on a team approach, though the terms should be interpreted interchangeably for this report.

HEALTH STATUS RESULTS

Four systematic reviews, although reviewing non-randomized studies, concluded that task-shifted delivery of interventions is potentially an improvement over not receiving the interventions at all. The strongest evidence with respect to task-sharing comes from three systematic reviews assessing **nurse-led provision of antiretroviral therapy** for HIV and AIDS treatment.^[23,24,63] The three reviews found that nurse-led routine HIV/AIDS care is comparable to, and possibly better than, physician-led care. Two of these reviews measured patient mortality;^[23,63] one review reported that 7 of 8 included studies found no difference in mortality,^[63] and the other review calculated a non-statistically-significant hazard ratio of 1.05 (95% CI: 0.88 to 1.26) showing no difference in mortality measures comparing non-physicians to physicians.^[23]

The fourth systematic review found that health providers who were not mental health specialists could effectively **provide non-pharmaceutical psychological interventions** and health promotion interventions to women suffering from perinatal mental health disorders, such as depression and anxiety. Combining results from 10 studies in low-resource settings, the authors found that this type of task-shifting significantly reduced the incidence of “common mental disorders among women during the perinatal period” (OR 0.59; 95% CI: 0.26 to 0.92).^[15]

HEALTH SYSTEM OUTCOMES RESULTS

One review^[23] reported that patient retention rates were significantly better under non-physician-led care than under physician-led care, with a hazard ratio for loss to follow-up of 0.72 (95% CI: 0.56 to 0.94); a second review^[63] came to similar conclusions.

4.12 USER FEES AND USER FEE EXEMPTIONS

User fees are charges at government health facilities that patients must pay to receive care. They are often levied by facilities to supplement insufficient budget transfers, and may cover local operating costs, including the purchase of drugs, supplies, and salary supplements. User fees can represent a substantial proportion of health facility budgets in some contexts, and may be especially important for covering recurrent costs. However, user fees can be a significant barrier to access, especially for the poor.^[31] User fee exemption policies aim to reduce the financial burden on patients and increase access to health care services by reducing or eliminating fees for certain services (such as delivery care) or certain groups (such as pregnant women or under-five children).

HEALTH STATUS RESULTS

We found two reviews assessing effects of user fees and user fee exemptions.^[31,47] Hatt et al.^[31] found three studies on user fee exemptions that reported reduced institutional maternal deaths and post-Caesarean neonatal deaths, but the quality of evidence was very weak.

HEALTH SYSTEM OUTCOMES RESULTS

In general, Lagarde and Palmer^[31,47] found that introducing or raising user fees was associated with decreased service utilization of between 5% and 55%, although one study from Niger found outpatient visits increased by 73% when concerted efforts to improve quality accompanied the introduction of user fees (compared to 4% in areas with continued no user fees). Concomitantly, they found that lowering or removing user fees is associated with increased utilization. The effect appears to take the form of a one-time increase in utilization, after which utilization tends to change over time as it did before the user fees were removed.

They found most of the studies in the review to be of low quality.^[31,47] Hatt et al. found that introduction of user fee exemptions appears to have resulted in increased rates of facility-based deliveries and caesarean sections in some contexts, but the evidence was also found to be weak.^[31] Some studies cited negative effects on service quality if user fee revenue was not replaced with another source of funding after the fee exemption policy was instituted.

4.13 VOUCHER PROGRAMS

Voucher programs provide coupons or other types of discounts to individuals (who are usually eligible based on their residence, health condition or income status) to receive free or reduced-price access to health goods (such as drugs, contraceptives) or services (such as antenatal care or transportation). As with conditional cash transfers, vouchers are a form of demand-side financing because they transfer purchasing power directly to health care consumers. Voucher programs may include a diverse range of interventions in addition to subsidized services, such as contracting with private providers, provider accreditation, community outreach and awareness-raising, and claims-based reimbursements. They are posited to increase access to priority health services by reducing financial and transportation barriers; they may also encourage healthy behaviors through their awareness-raising components; and they may influence the quality of service provision via the accreditation process and competition among providers for voucher recipients.

HEALTH STATUS RESULTS

In Murray et al.'s review^[60] of more than 70 demand-side financing schemes, including voucher programs, one study assessed the association between the Bangladesh Maternal Health Voucher Scheme and maternal mortality, but could not detect an impact, possibly because of small sample size.^[60] Nicole Bellows et al.^[8] in their review of reproductive health voucher programs found two rigorous studies in Uganda and Nicaragua in which voucher programs reduced the prevalence of sexually transmitted infections.

HEALTH SYSTEM OUTCOMES RESULTS

In the Nicole Bellows et al. review^[8] as well as a review of maternal health voucher programs by Ben Bellows et al.^[7] the authors identified consistent evidence that vouchers increased service utilization. Nicole Bellows et al.^[8] found that vouchers were associated with increased utilization of antenatal care, post-natal care, contraceptives, condoms, and sexually transmitted infections services across seven quantitative studies. Ben Bellows et al.^[7] confirmed these findings in a later review of 11 maternal health voucher programs in 15 voucher studies, also identifying increases in facility-based deliveries. Additionally, Murray et al. found that vouchers increased insecticide-treated bed net ownership and use during pregnancy.^[60] One study found that women receiving vouchers had lower out-of-pocket payments for health care than women in a comparison group.^[8]

5. DISCUSSION

The purpose of this review was to summarize the documented effects of health systems strengthening interventions on health status and health system outcome measures (including health service utilization, quality service provision, uptake of healthy behaviors, and financial protection), to better inform investments in global health. The main conclusion from this literature review is that health systems strengthening interventions do produce substantial positive effects on health status and health system outcomes (Table 3). Specifically:

- **Mortality:** Interventions as diverse as accountability and engagement initiatives, conditional cash transfers, health insurance, training health workers to improve service quality, service integration, and strengthening health services in communities have been shown to reduce mortality.
 - Neonatal and/or perinatal mortality were lowered by training health workers to improve service quality and strengthening health services in communities.
 - Infant mortality was lowered through integrated primary health care and health insurance.
 - Maternal mortality was lowered by promoting community and provider engagement, conditional cash transfers, and training health workers to improve service quality.
 - Under-five mortality was lowered by promoting community and provider engagement and strengthening health services in communities.
- Task-sharing was shown to provide care similar to, if not better than, traditional care for HIV patients.
- **Morbidity:** Multiple interventions had an effect on morbidity, including:
 - Contracting out service provision was associated with lower incidence of diarrhea.
 - Vouchers were effective at reducing the incidence of sexually transmitted diseases.
 - Task-sharing was found to reduce the incidence of women suffering from perinatal mental health disorders.
 - Contracting out service provision, conditional cash transfers, and performance-based financing were found to reduce under-nutrition or wasting
 - Conditional cash transfers were shown to improve birth weight.
 - Self-reported or parent-reported health status was improved by conditional cash transfers, contracting out service provision, and supply-side performance-based programs.
 - Health insurance has been associated with reductions in many different morbidity conditions, including better diabetes management, fewer birth complications, and reduced pain, anxiety, and depression.

TABLE 3:

SUMMARY RESULTS OF THE REVIEW: DOCUMENTED EFFECTS OF 13 TYPES OF HEALTH SYSTEMS STRENGTHENING INTERVENTIONS

Types of interventions	Health Impacts and Health System Outcome Measures				
	Improved service provision/ quality	Increased financial protection	Increased service utilization	Uptake of healthy behaviors	Reduced morbidity, mortality
Accountability and engagement interventions	X		X	X	X
Conditional cash transfers			X	X	X
Contracting out service provision		X	X		X
Health insurance		X	X		X
Health worker training to improve service delivery	X			X	X
Information technology supports (m-health/ e-health)			X	X	
Pharmaceutical systems strengthening initiatives	X				
Service integration			X	X	X
Strengthening health services at the community level			X	X	X
Supply-side performance-based financing programs			X		X
Task sharing/task shifting			X		X
User fee exemptions			X		
Voucher programs		X	X	X	X

Note: This table reflects the interventions for which evidence was available. It does not present information regarding the quality or quantity of evidence. The absence of a given health systems strengthening intervention may only reflect an absence of published systematic reviews on the topic. Readers should not conclude that these 13 interventions necessarily represent “best buys” because the reviews were not comparative evaluations of interventions.

- **Service utilization:** Accountability and engagement initiatives, conditional cash transfers, contracting out service provision, health insurance, pharmaceutical systems strengthening initiatives, service integration, strengthening health services at the community level, performance-based financing, user fee reductions, and vouchers were all found to increase service utilization or coverage of specific interventions. Information technology supports were shown to increase patient retention and long-term adherence to treatment. Training health workers to improve service quality was associated with increased energy intake among children.
- **Financial protection:** A large body of evidence connects health insurance to lower need for out-of-pocket payments and lower rates of catastrophic payments. Contracting out service provision and vouchers were shown to lower out-of-pocket payments in some settings.
- **Quality service provision:** Training health workers to improve service quality and performance-based financing were associated with improvements in the quality of care. Accountability and engagement initiatives and pharmaceutical systems strengthening were associated with fewer drug stock-outs.

The results from this review demonstrate that there is substantial, currently available quantitative evidence linking health systems strengthening interventions with health impacts and health system outcomes.

The interventions included in this analysis are not clinical trials of medical technologies or new pharmaceutical agents. Rather, they reflect innovations and reforms in how and where health services are delivered, how they are organized and financed, and who delivers them. **This systematic review of reviews demonstrates clearly that improvements to these systems components can improve the health of populations in LMICs.**

Decisions made about who delivers health services, and where and how health services are organized, matter for improving health status. Whether services can only be delivered through an existing health system or whether “vertical” or disease-specific programs are administered, interventions aimed at improving the system will not only improve the reach, effectiveness, quality, sustainability, and efficiency of services – but also lead to better health.

These findings are an important validation of the investment value of health systems strengthening. Health systems practitioners have often based the case for investing in health systems strengthening on arguments such as: long-term sustainability in the face of inevitable donor transition; an ability to achieve scale and reach the poor more effectively through systems-level approaches; and the potential for greater efficiencies via leveraging and improving existing systems. These arguments are powerful and at the core of the global shift over the past three decades toward routine inclusion of health systems strengthening approaches in most global and country health sector initiatives.

In a climate of scarce resources for health programs, there will always be a need for metrics of success such as lives saved and deaths averted. With this review, health systems strengthening practitioners can point assuredly to such health impacts resulting from their work, as well as improved health system outcomes.

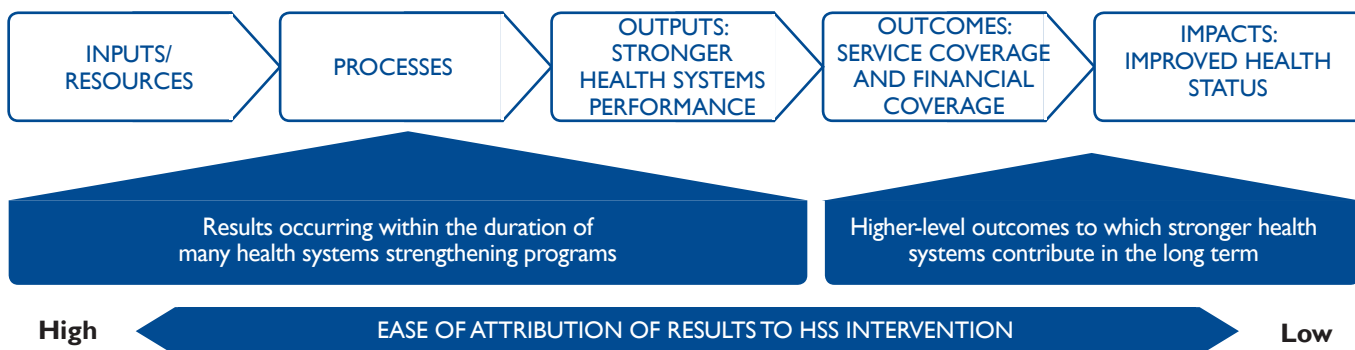
CHALLENGES IN MEASURING THE IMPACTS OF HEALTH SYSTEMS STRENGTHENING

Beyond the limitations noted in the Methods Section, compiling this synthesis has highlighted the particular challenges health systems researchers face in generating the underlying evidence of impact on health status. Our review echoed what others have observed to be challenges in non-biomedical public health research, for example around service delivery.^[34,71]

Distal causal relationships: The distal nature of many health systems strengthening interventions often makes it difficult to draw causal connections. Many, but by no means all, health systems strengthening efforts, by their very systems-level nature, take place far upstream in the causal chain from the person whose health they ultimately aim to improve. Figure 3 reconfigures our indicator classification schema to illustrate this point. While there may indeed be effects on entire populations over time, the magnitudes of individual effects may be too small to detect or isolate using common evaluation research methods. Many powerful factors influence health behaviors and health outcomes in individuals, and these may drown out the effect or “signal” attributable to the health systems intervention.

A review of this type, therefore, runs the risk of overemphasizing the more proximal health systems strengthening interventions whose effects are closer to people and health

FIGURE 3: DISTAL CAUSAL RELATIONSHIPS



outcomes in the cause-and-effect chain, and risks excluding important efforts operating farther from the people themselves.

A few examples of interventions that are distal and not highlighted in this review include efforts to strengthen health information and surveillance systems, health workforce training institutions, and the management and leadership capacity of senior officials responsible for health system stewardship. For instance, National Health Accounts (NHA) is recognized as a critical health systems strengthening input^[67] as it provides foundational information (about the magnitude, sources, and uses of health financing) that is essential for informing rational health sector policies and resource allocation. Yet demonstrating how an individual NHA estimation has resulted in lives saved or longer life expectancy is extremely challenging, if not impossible.

Even more difficult, by extension, is measuring the impact on health outcomes of the interventions that lay the groundwork for an NHA estimation: developing NHA tools and software; training Ministry of Health staff to collect NHA data; conducting policy workshops to promote understanding and use of results; or ensuring that trainings on NHA methods are incorporated sustainably

into health economics curricula in local universities. These activities are arguably essential for producing NHA data routinely, sustainably, and at reasonable cost – but it is unlikely that a controlled study will ever conclusively “prove” that they saved a life.

Long time horizons: Relatedly, the distal nature of some systems-level interventions also implies a longer time horizon for effects to be experienced, observed, and measured. If the causal chain has more intervening links, then the time from initial interventions to eventual health improvements logically takes longer. For instance, planning, designing, and implementing at scale a major policy change (such as development of a national health insurance scheme or the training and deployment of a new cadre of community health workers) might take five or more years – far longer than the time horizon of routine monitoring within most technical assistance projects. These time horizons are also illustrated in Figure 3. This also means that the benefits of health systems strengthening interventions accrue over longer time horizons, thus making it more difficult to capture all of their benefits.

Complexity and interconnectedness of health systems strengthening interventions:

Another challenge in health systems research relates to the complexity and interconnectedness of health systems strengthening interventions. Though classification frameworks have been proposed, there is no globally-recognized list of health systems strengthening interventions.^[79,80]

The taxonomy of interventions continues to evolve and therefore interventions with the same name may be substantially different. Many health systems strengthening “interventions,” such as a results-based financing initiative, are actually combinations of distinct activities such as a policy change, capacity building, and a change in how or how many resources are allocated. The fact that these interventions may operate system-wide, often with multiple related tasks happening simultaneously, makes it difficult to isolate the individual factors that influence a health status change.

Interaction effects: An associated weakness of the health systems literature is its lack of analysis of the interactions among health systems strengthening interventions. Researchers tend to look at discrete, independent functional results of health systems efforts for the simple reason that these are easier to measure. Commonly, one health systems strengthening intervention influences multiple health system functions, and there may be interaction effects or synergies among these causal pathways. A results-based financing program, for instance, might improve patient health by motivating improved health worker attendance at clinics, strengthening information systems to better monitor health outcomes, or enhancing the availability of essential drugs; improved health worker attendance itself might also facilitate better monitoring.

Scale and universality: The “universality” of systems-level interventions sometimes makes it hard to identify a plausible control group (e.g., institutional capacity building for a Ministry of Health), further limiting researchers’ ability to draw inferences about impacts. Often, researchers are limited to using pre-post comparisons or making use of variations in the intensity and timing of implementation to infer effects. Weak health information systems in LMICs, both for routine and population-based survey data, limit availability of data on changes in service delivery and health status over time. The absence of these data adds to the expense of evaluating the effects on these outcomes.

Given the challenges of health systems strengthening research and limitations of measurement methods, policymakers should be cautious not to conclude that a current lack of extensive, robust evidence about a given intervention means that the intervention does not produce positive effects.

In this report, we focused on those health systems strengthening interventions that have been studied with robust methods, generating conclusive positive findings. For those interventions not well represented in this review, we acknowledge our limited ability to distinguish among the following explanations:

- Those that have **not yet been researched** (thus no effectiveness data are available; the intervention may or may not be effective). A large volume of health systems strengthening interventions remain in this category.
- Those that have been studied, but **research methods are inadequate to detect effects**, the **quality of the research is poor**, or **findings are inconclusive** (thus effectiveness has not been demonstrated; the intervention may or may not be effective). Much existing health systems research falls in this category.

- Interventions that have been studied with robust methods, but research has produced **null findings** (thus the interventions shown to be not effective). There are few published studies in this category, and publication bias is more likely here.

Finally, it is worth recalling that health systems strengthening interventions may have important impacts other than improved health status, including poverty reduction, economic growth, consumer satisfaction and health system responsiveness.

5.2 RECOMMENDATIONS FOR FUTURE RESEARCH

This analysis of 66 systematic review articles, representing more than 1,500 individual research articles, allowed us both to identify studied effects and to begin identifying areas for a selected set of interventions. Clearly, however, there remain numerous health systems strengthening interventions not included in this review. The field of health systems strengthening could benefit from a greater investment in research overall so that a greater body of interventions could be studied. Perhaps because the field is still relatively young, more studies have investigated the direct relationships between health systems strengthening interventions and “output” level performance measures as opposed to “outcome” and “impact” level measures.

As an example, health system governance may influence and contribute to better health status through multiple direct and indirect channels. The existing evidence mapping these causal pathways remains limited and could be expanded. While governance has been frequently acknowledged to be critical to improved health outcomes^[33] it is perhaps the least studied function of the health system, and few studies have assessed the effects of specific interventions to improve governance.

Much of the existing literature focuses on consistent associations between aspects of governance (rule of law, corruption, political structure, voice, accountability, political stability, institutional strength, transparency, and decentralization) and better health outcomes (see for instance Holmberg and Rothstein^[35] and Olafsdottir et al.^[66]).

In addition to a need for a greater volume of research, more work is needed on developing the methods for researching health systems strengthening interventions. Health systems strengthening interventions tend to operate in complex environments with multiple stakeholders and possibly, competing interests.^[70] A corollary to this point is that many of the reviews included in this report specify that for the interventions to produce results, they must be properly designed and well executed; consolidation of evidence is difficult when some individual studies include results from interventions that were poorly conceived or not implemented. In these situations implementation research aimed at understanding how an intervention was conducted, what challenges it faced, and how the implementation of the intervention adapted to challenges over time can provide important information on why an intervention ‘worked’, in what situations it is more likely to ‘work’, and important enablers for intervention success. Documenting and learning how to most effectively engage in health systems strengthening, therefore, is also an important area for future research.

Additional methods for estimating effects and impacts in complex systems, where there are likely multiple enablers and interactive effects, distal relationships, long timeframes, etc. are also needed. These types of analyses must be grounded in strong conceptual models and detailed theories of change, with multiple points of measurement both inside and outside the immediate domain of the intervention itself.

For some interventions, strengthening of routine monitoring systems to collect essential nationally representative data over time may be necessary and welcome^[89] although these data will likely need to be supplemented by intervention-specific data collection.

Finally, this review demonstrated the need for better methods to combine health systems data in systematic reviews and meta-analysis. Even within one intervention area, individual studies tended to use multiple different outcome or output measures. For example, changes in utilization may be collected for different services in different studies; changes in quality may be measured differently in different studies, etc. As a result, for many reviews included in this report the authors were able to combine results only in a narrative manner, and there was no opportunity to increase statistical power by pooling results. Some promising work on the methods for combining disparate results has been started (c.f., Rowe et al.^[77]); more work in this area would help to consolidate knowledge about health systems strengthening interventions and help maximize the utility of individual studies.

This review found evidence that numerous health systems strengthening interventions improve health status or health system outcomes. The authors suspect that many of the interventions also create enabling environments for other types of interventions to have a greater impact, although this was not included in our review. Given the documented results, this review should provide evidence for decision- and policymakers to continue to fund, implement, and evaluate health systems strengthening interventions.

ANNEX I: LIMITS USED TO ORGANIZE INCLUDED REVIEWS INTO HEALTH SYSTEM FUNCTIONS

Health system functions used to organize included reviews	HSE limits used to search for and organize content within each health system function (indexed by the order in which it appears in the taxonomy on the advanced search page of HSE)	Other HSE domains form advanced search page used
Governance	<ol style="list-style-type: none"> 1. Governance arrangements <ol style="list-style-type: none"> a. Policy authority b. Organizational authority c. Commercial authority d. Professional authority e. Consumer and stakeholder involvement 	None identified
Financing	<ol style="list-style-type: none"> 1. Governance arrangements <ol style="list-style-type: none"> a. Policy authority <ul style="list-style-type: none"> • Accountability of the state sector's role in financing and delivery • Stewardship of the non-state sector's role in financing and delivery 2. Financial arrangements <ol style="list-style-type: none"> a. Financing systems b. Funding organizations c. Remunerating providers d. Purchasing products & services e. Incentivizing consumers 	None identified
Service delivery	<ol style="list-style-type: none"> 3. Delivery arrangements <ol style="list-style-type: none"> a. How care is designed to meet consumers' needs b. Where care is provided 	None identified
Health human resources	<ol style="list-style-type: none"> 1. Governance arrangements <ol style="list-style-type: none"> a. Professional authority 2. Financial arrangements <ol style="list-style-type: none"> a. Remunerating providers 3. Delivery arrangements <ol style="list-style-type: none"> a. By whom care is provided 4. Implementation strategies <ol style="list-style-type: none"> a. Provider targeted strategies 	Domain: Providers (all)
Health information systems	<ol style="list-style-type: none"> 3. Delivery arrangements <ol style="list-style-type: none"> a. With what supports is care provided <ul style="list-style-type: none"> • Health record systems • Electronic health record • Other ICT that support individuals who provide care • ICT that support individuals who receive care • Quality monitoring and improvement systems • Safety monitoring and improvement systems 	Domain: Technologies (upper-level category only)
Medicines/products	<ol style="list-style-type: none"> 1. Governance arrangements <ol style="list-style-type: none"> a. Commercial authority 2. Financial arrangements <ol style="list-style-type: none"> a. Purchasing products & services 	Domain: Technologies (all)

ANNEX 2: SAMPLE REVIEWERS' EXTRACTION TABLE

Citation	Country	HSS Intervention	HSS Outputs	HS Outcomes	Health Impact	Quality rating (AMSTAR)	Key Findings	Comments
	Note: LMICs only, with focus on USAID countries	This should be a broad category (i.e. financial incentives)	What was the improvement? (i.e., HRH retention in rural areas)	Health outcome measures. Includes service use, financial protection, behavior change. (i.e., increased rates of ART in rural areas.)	<i>What was the change in health status? (i.e., reduced mortality of people of ART in rural areas)</i>		Summarize main findings in bullets. Include positive or negative change in outcomes/impacts associated with the intervention. Include details about magnitude of change, etc. (i.e., This study found that the incentive intervention increased ART coverage by 15% in rural areas.)	

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Please note: all systematic reviews are in **bold**.

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