



Evidence review of what works for health systems strengthening, where and when?

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Executive summary

Review objectives and approach

This review was commissioned to support strategic planning work within DFID by identifying evidence on effective health systems strengthening approaches in different contexts. It provides a rapid evidence synthesis response to the following:

1. What do we know about how health systems strengthening (HSS) interventions work to improve health and health system outcomes, where, for whom, when and at what cost?
2. What is the evidence that HSS interventions lead to (or contribute to) improvements in health and other outcomes? How robust is this evidence? How can we compare scale and cost across different populations?
3. What is the evidence on the relationship between inputs into individual building blocks of the system and the functioning of the system as a whole?
4. What is the evidence on specific health systems strengthening approaches needed in particular contexts, e.g. conflict-affected countries or those transitioning from aid?
5. What are the key gaps in evidence on HSS programming across contexts?

Methods included a systematic literature review of English language studies published from 2000 to 2018, augmented by expert identification of relevant studies (published and grey). The key intermediate outcomes of interest were: service access, service coverage and quality, and safety. Longer range outcomes of interest were: improved health (morbidity and mortality); equity of outcomes/distributional effects; cost-effectiveness; responsiveness (such as patient-centredness); and social and financial risk protection.

Evidence examined

In total 96 studies were retrieved from the electronic search. As the initial electronic search did not reflect the full literature available, a second (top-down) search was done based on the knowledge of the expert group. A further 97 studies were subsequently added by the research team. Most studies were reviews, including both systematic and non-systematic/literature reviews (n=64), quantitative (n=47), and mixed methods studies (n=21). A majority of studies were from low income contexts. The largest number of studies addressed service delivery (82), followed by health workforce (76) and then health financing (74). Just over half of included studies addressed long-range health outcomes.

Leadership and governance

- Cross-cutting interventions in this segment incorporated: (1) governance and leadership-centred with an (intended and unintended) strengthening spill-over effect on the overall health system and population health outcomes, (2) “governance plus” (interventions paired with ones addressing another HS function – usually HRH or regulation/management of supply chains); and (3) governance policies and reforms embedded within broad programmes aiming at whole-system reform.
- There is increasing evidence that governance-specific interventions, including **civil participation** and **engaging community members with health service structures and processes**, can lead to tangible improvements in health (focusing usually on maternal and child health outcomes) as well as better service uptake and quality of care.

- Capacity development and mentoring are central for effective governance. There is increasing evidence that **complex leadership programmes** blending skills development, mentoring and promotion of teamwork bring about improvements in service quality, management competence and motivation.
- Seven studies (e.g. the Good Health at Low Cost study) addressing **comprehensive HSS** approaches identify good governance as the most important factor in these programmes for improved health and access to services – but here governance reform was embedded within complex, system-wide reform programmes so precise interpretation is difficult. One of the key mechanisms for improving outcomes was seen to be collaborative working models involving different stakeholders working in synergy to achieve long-term strategic reform goals across micro/meso/macro levels of the health system and within the public sphere.
- Evidence on the effect of **decentralisation** as a stand-alone intervention in health system governance on health outcomes highlights mixed effects.

Workforce

- Literature in this area mainly focuses on interventions to address (1) workforce supply, (2) health worker distribution and (3) performance.
- Most evidence on “workforce plus” interventions (addressing workforce and at least one other building block) is focused on **bundled retention packages for health staff** in underserved areas – where outcomes assessed are usually staff attrition rates. These interventions usually combine educational, regulatory and financial incentive design changes. Evidence of effects on retention is mixed – short-range evaluation of the **Zambian Health Worker Retention Scheme** showed positive effects, but a longer-range piece across workforce cadres did not support these findings.
- Skills mix (**task shifting**) approaches have been successfully used to address shortages of more highly skilled but scarcer professional groups. Non-formal cadres of health workers, such as community health volunteers, can help address staff shortages as long as the tasks are not too complex.
- Workforce performance can be improved by **well-designed performance management systems** that at a minimum may reduce absenteeism but have also been shown to improved service delivery. Individual performance contracts can also reduce absenteeism. Supervision can lead to improvements in quality and productivity. Workforce performance is more likely to improve when a coherent combination of strategies is used. There are examples of effectively developing an organisational culture of performance, which impacts on individual performance of health workers.

Financing

- Interventions in this category span (1) revenue raising/pooling, (2) purchasing, (3) benefit package design and service provision, and (4) cross-cutting issues such as governance and public financial management. Interventions rarely fit cleanly into one functional area (performance-based financing (PBF), for example, often combines with aspects of resource mobilisation, pooling, purchasing and influencing benefits package entitlements for specific populations).
- There is good evidence to steer **approaches to financing for health in aggregate**. Public spending on health is associated with improvements in life expectancy and child and infant mortality across a number of studies, as well as more equitable distributions of health outcomes at population level when compared with private spending. These effects are more pronounced in LICs.

- **Provision of external aid** is associated with improved outcomes (especially infant mortality rates) and health equity, but this effect depends on the aid delivery approach (harmonisation with domestic systems and priorities is key). However, evidence on positive health outcome and equity effects from aid coordination mechanisms (such as Sector-Wide Approaches -SWAs, joint assessments and budget support – as “financing plus” interventions that combine financing and governance changes) is limited.
- Health outcome and equity effects arising from a range of other “**financing plus**” interventions (PBF, purchasing reforms, contracting in/out, reforms to the mix of public and private providers operating in the health sector, and others – most of which combine financing and governance reform) are mixed.
- **Community-based health insurance** is unlikely to deliver improvements in service coverage and equity.

Health information

- There is limited evidence on the impact of investment in HIS on long-range health outcomes or intermediate health indicators. Although some of what we know is indicative of the importance of this area, HIS reforms were most likely to be bundled within broader system strengthening packages, so effects were difficult to tease out.

Supply chain strengthening

- Evidence formally linking investment in supply chain to improved access to healthcare or better outcomes is scarce – mostly grey literature-based. This is in general an underexplored area of research – perhaps because it is perceived as more “operational” in focus than some of the other intervention areas.

Service delivery

- This is the most broad-based category, incorporating the design and implementation of packages of services, service redesign, organisational strengthening and other reforms which combine activities across workforce, financing, governance and other building blocks – at macro and meso levels. Inclusion of a demand generation component tends to increase the effectiveness of the intervention.
- **Basic or essential packages of health services** have been examined primarily in FCAS settings as a means for focusing limited resources on core services and aligning donors, often in combination with contracting out services to NGOs (e.g. in post-conflict settings). Empirical evidence on impact is limited and it is not possible at this stage to provide an informed judgement of impact on health outcomes or their distribution across populations. The research literature is focused on package design, less so on impact.
- **Strengthening primary care services** (including integrated community case management of childhood illness) and the implementation of effective strategies to reach underserved populations are seen as central to system strengthening and there is good evidence of positive effects on health outcomes. However, primary health care (PHC) systems in LMICs often suffer from fragmented service delivery, and HSS support to these systems has historically been piecemeal. Existing evidence is suggestive of positive effects on service access and coverage, and health outcomes (focusing principally on infant and child mortality and morbidity, and maternal health). Successful programmes tend to blend Community Health Worker- (CHW) based models with strong referral systems and provision of first level care to improve access.

- **Service integration** interventions usually span multiple building blocks, but primarily at meso or micro level. Effects vary according to domain. Mother and child health integration interventions are supported by fairly good evidence of positive impacts on health outcomes (perinatal mortality and child mortality principally) and intermediate outcomes; evidence for HIV is mixed depending on the service area with which HIV services are integrated.
- Effects on neonatal and child mortality, as well as a cluster of other health outcomes (including nutritional markers) arising from IMCI (integrated management of childhood illness), are conflicting, depending on study location and the fidelity of implementation, which has differed in marked ways between contexts. There is a clearer consensus that service quality improves where IMCI has been implemented.

Major knowledge and research gaps

- **Field definition:** there is still no consensus on definitions of HSS interventions and evaluation that are operational, including how to capture the cross-cutting elements of interventions (using an HSS lens in evaluation). Furthermore, while we focus on specific interventions in this review, there is also HSS which is carried out organically within health systems, as part of continuing efforts at improvement, and which may be powerful, though less studied.
- **Scale:** much of what is identified in the review is small scale, and district-based or project-based. Large-scale evaluation of national reform implementation and impact may provide more useful insights, covering more complex interventions and/or organic health systems strengthening efforts, as well as longer time periods.
- **Context specificity:** the review does not provide a clear picture of which interventions and policies are best suited to which contexts, especially in conflict and post-conflict countries, and those transitioning from aid or under different political arrangements. It may be more important to recognise that every intervention needs to be adapted to context (whatever the context) and to focus on sequencing of components. All HSS interventions will have complex pathways of effect given that they must work through a complex system.
- **Sustainability:** another gap in knowledge is what happens after the specific or cross-block intervention ends - what is the longer-term impact on sustainability, equity and empowerment of local actors? Fit to local context and manner of implementation are likely to be key determinants of sustainability.

Overarching issues and caveats

- There are **conceptual issues** in understanding the level at which cross-cutting HSS interventions act. Evidence spans macro, meso and micro-level (e.g. facility level) interventions. Service delivery interventions tend primarily to operate at meso or micro levels but will often incorporate work across multiple building blocks.
- **Attribution of effect** is an enormous challenge. HSS interventions are often introduced as complex, dynamic packages, featuring more than one change at a given time.
- The literature is **skewed** – partly reflecting donor and other political priorities. There is a fairly large body of evidence on service delivery and financing, but very little on health information and supply chain management.
- Few studies make the link between **HSS interventions and health outcomes**. This is mainly because, by definition, HSS interventions are working on component parts of the system, and so the obvious outcomes to look at are systemic and not health-related. Where health outcomes are considered, there is enormous heterogeneity in the outcomes examined, so comparison across studies and domains is difficult.

- In general, the review does **not suggest that interventions always have to tackle more than one building block** to have an impact on health service access or outcomes. The dynamics of the system mean that effects from “single block” interventions are often cross-cutting, given the interconnectedness of the “building blocks”. However, multi-component interventions are generally most effective.
- Finally, **lack of robust evidence is no indication of lack of effect**. Some interventions are heavily studied and others not (this does not necessarily correlate to effectiveness) and it is inherently challenging to evaluate complex, system-level interventions. It is also important to bear in mind the substantial costs of NOT doing HSS, as illustrated by the literature on vertical programmes.

Introduction

This review was commissioned with three main objectives:

1. To support strategic planning work within DFID by identifying evidence on effective health systems strengthening approaches in different contexts;
2. To support advocacy activities by helping DFID Advisers make the case for investment in HSS as a route to achieving improvements in health; and
3. To help DFID Health Advisers make sense of the large volume of evidence on HSS and sign-post health advisers to key pieces of evidence on health systems strengthening.

It provides a rapid evidence synthesis response to the following:

1. What do we know about how health systems strengthening (HSS) interventions work to improve health and health system outcomes, where, for whom, when and at what cost?
2. What is the evidence that HSS interventions lead to (or contribute to) improvements in health and other outcomes? How robust is this evidence? How can we compare scale and cost across different populations?
3. What is the evidence on the relationship between inputs into individual building blocks of the system and the functioning of the system as a whole?
4. What is the evidence on specific health systems strengthening approaches needed in particular contexts, e.g. conflict-affected countries or those transitioning from aid?
5. What are the key gaps in evidence on HSS programming across contexts?

After explaining the review's methods, we start by discussing definitions of the core concept of HSS and issues relating to evidence on its effectiveness. We then rapidly review studies on a range of interventions across health system pillars and conclude by returning to the original questions.

Core concepts

What is HSS?

There is increasing recognition that efforts to improve global health cannot be achieved without stronger health systems (Chee et al., 2013). Over recent years there has been considerable focus on this challenge, but efforts are hampered by a lack of cohesion over the definitions of health systems strengthening (HSS) and a lack of evidence on which HSS interventions are effective, or how to define that effectiveness. Evidence on health systems strengthening interventions has not been comprehensively collected and reviewed in one place – although some documents have made considerable progress (Hatt et al., 2015). Some strands of work focus on *considering the impact of health interventions on the broader health system* and seek to further refine *thinking around health systems* (De Savigny and Adam, 2012; Chee et al., 2013) whilst others try to assess the *impact of health systems interventions on health status and access to health services* (Hatt et al., 2015). This review sits broadly within the latter of these two strands of work, though we also reflect on wider bodies of literature.

Despite a wealth of research on health system objectives and their functional and organisational arrangements, there is a lack of common understanding of what constitutes health systems strengthening (Reich et al., 2008). WHO has given a definition of HSS as “any array of initiatives that improves one or more of the functions of the health systems and that leads to better health through

improvements in access, coverage, quality or efficiency” (WHO, 2014). This is a broad definition, which would include potentially:

- All programmatic interventions, given that service delivery is one of the ‘building blocks’, and
- Interventions which produce any HSS effects, whether a direct objective or a spill-over.

At the same time, inter-connectedness is a key feature of systems, and WHO’s (2007) definition of HSS calls for improving interactions between the building blocks and for sustainable improvements “across health services and health outcomes” (WHO, 2007), hinting at a more complex, cross-cutting meaning to HSS.

Chee et al. (2013) seek to draw a distinction between health systems strengthening and health systems support interventions. They define health systems strengthening as “about permanently making the systems function better, not just filling gaps or supporting the systems to produce better short-term outcomes” (Chee et al., 2013: 87). Chee et al (2013) state that “an intervention to strengthen the system goes beyond providing inputs (depth) and applies to more than one building block (breadth)” (Chee et al., 2013: 89). They suggest the following criteria to assess what is and what is not HSS:

1. The interventions have cross cutting benefits beyond a single disease
2. The interventions address identified policy and organisational constraints or strengthen relationships between the building blocks, e.g. not just buying inputs but changing policies and procedures for them to be better managed.
3. The intervention will produce long-term systemic impact beyond the life of the activity.
4. The intervention is tailored to country-specific constraints and opportunities with clearly defined roles for country institutions.

Adam and De Savigny (2012) support this approach and further highlight that the intervention needs to have system-level changes as opposed to changes at the organisational level.

Reflecting awareness of these debates, DFID (personal communication) has put forward a definition of HSS as:

‘Strengthening a health system means initiating integrated activities across at least two of the six, internationally accepted, health system building blocks – namely: human resources for health; health finance; health governance; health information; medical products, vaccines, and technologies; and service delivery. Activities focused on a single building block that nevertheless have significant, positive spill-over effects on other building blocks can also be regarded as system strengthening. A strong health system is one that ensures no-one is left behind, delivering either sustained improvements in, or consistently strong, health outcomes for all. Strong health systems achieve this through continuous improvement across system building blocks, building effective collaborations between public, private and third sector actors to ensure that high quality, safe services are delivered equitably, and paid for in ways that do not expose users to financial hardship’.

It is worth noting that while HSS should rightly be taken to imply functional improvements with a longer time span, there will be contexts in which just ‘supporting’ a health system is the right

response (e.g. when systems are frail and under-resourced). Witter and Pavignani (2016) distinguish between (1) supporting health systems, (2) strengthening them, (3) pursuing resilience and sustainability – which ‘entails an intimate understanding of the whole health system, of the determinants of its functioning and of its evolution over time, all framed in the international context that powerfully conditions its prospects’ – and (4) preventing systems under severe stress from collapsing (often in emergency settings). The right approach depends on the system and the context. Finally, we would like to emphasise the role of the community, which is underrepresented in WHO’s original health system building blocks but which clearly plays a critical role in system effectiveness through its engagement, or lack of it, with the processes of maintaining health. Indeed, one recent literature review on health and fragility (which could be regarded as the converse of strength) identifies poor connections between formal systems and communities as being the crux of a fragile health system (Diaconu et al., 2018). In this sense, HSS must also focus on reinforcing that connection.

How to examine evidence in relation to HSS?

We highlight impact assessments and systematic reviews of these impact assessments where available below. However, it is important to note that the literature is not comprehensive – some interventions are studied heavily and others not, and that this does not necessarily correlate to effectiveness. Lack of robust evidence is no indication of lack of effect, given this and the challenges of evaluating complex interventions in dynamic settings.

Equally, however, evidence of effects in a specific study is not necessarily generalisable to other settings, given contextual differences and widespread heterogeneity of design of interventions, even those falling under one label of ‘type’ of intervention. What is important, therefore, as highlighted by realist methodology, is to understand how certain mechanisms of change (e.g. increasing motivation of staff, increasing responsiveness of managers, enabling more effective working conditions to provide quality care) can be triggered and sustained (and at what cost) in different environments.

Review methods

In line with the discussion above, we determined that HSS interventions, programmes and policies are those that are not specific to one building block and/or cross over to multiple building blocks, are not specific to a single disease, are not implemented in just one facility or group of facilities but have local/national reach and have effects along the patient pathway and not just at one level of care.

They include:

1. interventions to strengthen health management information systems for more than one disease, including issues around national standards in records, survey analysis, and research for policymaking;
2. interventions in HR that are not specific to an individual (e.g. training for an individual) or a disease, including performance, motivation, retention, and reducing migration;
3. interventions that strengthen the public finance system including SWAPs, multi-donor programmes, trust funds, and interventions through government systems such as insurance and PBF;
4. interventions that strengthen the supply chain, excluding those that are related to only one set of products or vertical programmes;

5. interventions that strengthen national or district-level planning, regulation, management or implementation, including monitoring and evaluation, intersectoral collaboration, national plans, accountability, quality improvement, and training for leadership and management;
6. interventions that strengthen community engagement to improve planning and oversight, and other interventions at the community level to strengthen engagement in a health system and system accountability;
7. interventions that involve defining and delivering basic packages of care at the primary level or more widely, including attempts to integrate vertical programmes into a wider health system and improving referral systems;
8. (interventions targeting transport and infrastructure that have a systems-thinking approach, for instance, excluding interventions on one community ambulance or on one hospital. Interventions that cut across #5, 6, 7, and 8 include strengthening links between the community level and a formal health system, including CHWs, community accountability mechanisms, and referral systems.

After agreeing the scope of the review, we undertook a literature review. However, as the results did not appear to comprehensively map the field, this was followed by more directed searches by experts, using a structured approach which reflected the known categories of HSS interventions to assess gaps as well as strengths.

We conducted a systematic search in Medline and Embase. Articles were included if they met the following criteria:

1. Took place in low- and middle-income countries, including fragile and conflict-affected states and countries in transition.
2. Were published between 2000-2018.
3. Described interventions targeting two or more health system blocks, or one block but with significant spill-overs to others.
4. Were in English.
5. Included relevant outcomes, as below.

Intermediate:

1. Service access
2. Service coverage
3. Service quality & safety

Long-range:

1. Improved health – covering morbidity and mortality
2. Equity of outcomes/distributional effects
3. Cost-effectiveness
4. Responsiveness, such as patient-centredness
5. Social and financial risk protection

[See annex 1](#) for more details of the search strategy, analysis grille and bibliographic analysis.

Results

Leadership and Governance

Kinds of interventions included and links to HSS

Governance is considered to be a cross cutting health system function underlying all other functions (represented by 'blocks') and enabling an effective health system operation (WHO, 2000; WHO, 2007). This means that interventions targeted to improving governance usually have spill-over effects and impact on many other blocks. Furthermore, interventions in the area of governance and leadership can have an indirect effect in creating a broad conducive environment for improved system functioning. An effectively-governed and highly functioning system is often perceived as an equivalent of a well-performing health system. However, this creates difficulties in assessing the independent contribution of interventions and policies seeking to improve governance on health and population outcomes.

There are multiple ways to conceptualise governance, and increasingly its roots in the political and power structures, history, traditions and institutions of a state or area are discussed (Abimbola et al., 2017). Governance and leadership have often been understood within *normative models*, involving top-down good governance and accountability programmes and policies framed by global ideologies and perspectives of appropriate values. However, this approach tends to operationalise governance from the vantage point of policy maker and donors seeking to implement effective programmes and may not always take into account the behaviour and motivation of frontline actors, their incentives and relationships (Brinkerhoff and Bossert, 2008). The idea that governance reforms have to recognise and work closely with the prevailing institutions (norms and values) driving implementation actors, as well as seeking to challenge them towards new goals, is gaining traction as the dynamic nature of health systems is better understood. Health system resilience debates, for example, recognise such dynamism and the vital role of nurturing resilience through leadership strategies that support front line actors and relationships among them and enable creative responses to various forms of shock (Adam and de Savigny, 2012; Ciccone et al., 2014). Drawing on these ideas, a different set of governance approaches is informed by the concept of people-centred systems, where governance relates to the views and incentives of actors and their interrelationships and their responses to internal and external stimuli (Adam and de Savigny, 2012).

The commonly used (normative) models may also underestimate the complexity of regulating and steering a system that is under-resourced and disjointed. As a response to this complexity, in many settings *technical models* of governance and leadership – for example, focused on efficiency and effectiveness - are deemed useful (Brinkerhoff and Bossert, 2008). Finally, *'pragmatic' models* often emerge as a flexible way of managing complexity, especially where there is time pressure to respond to crises, which may involve absorbing an influx of funding or devising innovative strategies to cope in the absence of adequate funding.

Elements of [government] leadership (WHO, 2007)

Vision. Policy formulation. Reflecting core public values.

Regulation and management capacity: fair rules of the game.

Intelligence and oversight (research to policy, monitoring & evaluation).

Collaboration and coalition building.

System design – synergies between building blocks, reducing fragmentation.

Accountable. Transparent.

The following type of interventions can be distinguished based on the existing bodies of literature:

- Domain 1. *Governance and leadership-centred*: interventions that focus entirely on improving governance, including leadership and training interventions, management and clinical governance interventions and others. Although primarily focused on governance, these can have an indirect strengthening effect on the overall health system and population health outcomes;
- Domain 2. *'Governance plus'*: Governance interventions paired with interventions in other blocks, for example human resource training and supervision linked to improved leadership and management capacity; improving human resource planning for deployment and retention; reforms to regulation and management of supply chains etc.);
- Domain 3. Governance policies and reform programmes seeking *a whole-system change*, with the intention to improve outcomes across multiple diseases (outcomes/ access). These interventions and reforms often have a coherent set of governance interventions at their core but can also be seen as cross-cutting health systems strengthening interventions. These are often large-scale, comprehensive and implemented over longer time periods. They can be implemented at:
 - Macro/meso level: interventions that involve multiple legislative, bureaucratic and managerial reforms, usually drive by governments, elites and political groups.
 - Meso/micro: district and sub-district reforms that involve a mix of top down and bottom up engagement; developing, adapting and testing good practices and administrative improvements. These initiatives involve a key role for street level bureaucrats, district managers, implementers and local authorities.

Given the cross-cutting nature of the governance function and its presence within most health systems reform interventions, we highlight key studies in each of the three domains described above. We also discuss how to operationalise this concept in relation to health systems strengthening.

Specific interventions that are prevalent in the literature, both on health systems strengthening and leadership and governance, include: decentralisation, strengthening district health management, national-level health system reforms and the adoption of the private sector as a delivery mechanism.

There are clear challenges in trying to focus only on health outcomes or intermediate measures, such as health care access, with an intervention area that has wide influence over health system performance and does not lend itself to exact links to health delivery. This also means that interventions in this field are generally complex and, in addition, governance strengthening interventions usually form part of a complex set of health systems strengthening interventions. Attributing outcomes to them is always difficult.

Table 1: Key governance and leadership interventions

Main types of governance policies and interventions	Theme (and sub-themes that are included)
<p>Domain 1.</p> <p>Governance and leadership-centred</p>	<ul style="list-style-type: none"> • Leadership development, comprising training and workplace-based mentoring and other support • Training, mentoring, peer support, networking • Clinical governance interventions, e.g. appropriate use of guidelines and protocols • Community participation in assuming authority, in decision making and priority setting • Community engagement in improving accessibility and quality of service
<p>Domain 2.</p> <p>Governance interventions paired with interventions in other blocks</p>	<p>Governance / intelligence and oversight / human resources Training for community-based cadre (incl. CHWs and community volunteers) to :</p> <ul style="list-style-type: none"> • support patient treatment and navigation of health system, and • collect, manage and use data. Training to conduct M&E. <p>Governance / service delivery / human resources</p> <ul style="list-style-type: none"> • Design and implementation of community-led or close-to community delivery models <p>Health governance and broader administrative interventions</p> <ul style="list-style-type: none"> • Decentralisation of delivery/ financing – meso/micro level • Devolution of delivery/ financing – meso/micro level • Autonomy, flexibility to adapt to local needs • Regulating the private and voluntary sector • Clear rule and effective monitoring and enforcement of rules
<p>Domain 3.</p> <p>Whole-system/ cross-cutting</p>	<p>Vision</p> <ul style="list-style-type: none"> • Formulation and enactment of national policy <p>Effective policy making</p> <ul style="list-style-type: none"> • Design of policies and interventions reflecting level of resources and core public values • Comprehensive reform programmes – to realise synergies between building blocks, reducing fragmentation • Attention to sequencing of reforms and windows of opportunity • Effective processes to develop relationships and create learning feedback loops <p>Enacting effective legal and administrative framework</p> <ul style="list-style-type: none"> • Regulation and management capacity <p>Equity</p> <ul style="list-style-type: none"> • Pro-poor focus • Societal values supporting expanding coverage • Basic benefits packages (services and medicines) to cover poor and excluded groups <p>Collaboration and coalition building</p> <ul style="list-style-type: none"> • Collaboration across sectors, as appropriate

	<ul style="list-style-type: none"> • Collaboration with voluntary and private providers, as appropriate • <u>Decentralisation</u> • Decentralisation of planning and management – macro level
	Anticorruption and rule of law <ul style="list-style-type: none"> • Fit for purpose framework and fair rules of the game • Clear rule, enforcement, opportunity for redress
	Accountability and transparency <ul style="list-style-type: none"> • Management channels, lines of accountability within bureaucracies • Clear entitlements and exemptions

Effects (or contribution) of government interventions on outcomes are hard to assess independently – as discussed earlier, governance interventions often act directly and indirectly (e.g. triggering improvement in other blocks and in the overall environment). Most governance interventions also involve a gradual adaptation, disruption and transformation, and this impacts on outcomes, e.g. the roles of community organisations are mediated by changing political climates and trust. This was seen with Better Health Outcomes through Mentoring and Assessment (BHOMA) where there was increased acceptance and adaptation to changing conditions, which makes it difficult to interpret findings (Mutale et al., 2017). There are often unintended consequences that trigger new cycles of action and the context also interacts with the intervention, influencing the effects (Mutale et al., 2017). Samuels et al. (2017), note that the drivers of governance at the micro/meso/macro levels are interrelated and also interdependent. Drivers at different levels are often transversal, e.g. “community engagement can make a difference to service delivery, but only in the presence of appropriate and effective meso- and macro- level systems and processes” (Samuels et al., 2017: 1028).

There is an increasing volume of theoretical literature offering frameworks, but these are often not operationalised in studies or used to support interpretation; many of the studies found are not grounded in theory. Interestingly, governance is often measured by its absence – the existing studies and the debate around knowledge gaps highlight governance failure as a cross-cutting issue (Abimbola et al., 2017), linked to work on the other system domains. Documented outcomes are often in the context of better functioning health systems which are able to collect and use data, and which may be more equipped to improve health from the start.

Issues generic to other areas of health systems research involve difficulties in managing time lags of reforms, which complicate establishing a causal relationship.

Evidence on effects

Domain 1. Governance and leadership-centred interventions

A global review by Ciccone et al. explored the evidence on empirically-tested associations between governance policies and characteristics, and health outcomes in LMICs (Ciccone et al., 2014). It identified 30 studies exploring community initiatives. Four studies examined the impact of governance interventions, the rest were cross-sectional or descriptive. Fourteen studies tested the association of governance with under-five mortality rates, while other indicators included life expectancy, maternal mortality, and immunisation coverage.

Fourteen studies indicated significant and positive associations between governance and health outcomes. Governance reforms directly led to improvements in outcomes in only 9 studies, while in 5 there were positive but indirect effects, acting in conjunction with contextual factors. A further four studies demonstrated that governance interventions act on other system functions and structures through spill-overs. This includes the degree to which these interventions are responding to local needs and values, the level of community empowerment and trust, and their fit with existing economic and political structures. Thus, the authors emphasise that many of the studies suggest that health governance cannot be separated from improvements in developmental governance, political regimes and values (e.g. as measured through a country governance score such as Political Rights Index or World Bank Governance Index). The rest of the studies revealed either mixed findings about the association between governance and health (n=6), no association between governance and health (n=4) or had inconclusive results (n=2).

Governance mechanisms engendering positive associations with health outcomes include leveraging civic engagement in health systems (in shaping locally responsive provision but also priority setting and needs assessment) and promoting better accountability mechanisms throughout the system. This corroborates findings from other studies (Samuels et al., 2017; Rohde et al., 2008). Examples of concrete initiatives that were successful include community monitoring processes to improve accountability of providers, community dialogues and interventions to generate service delivery improvements, equity-focused and pro-poor primary healthcare reform, or decentralisation (a shift of authority to local governorate and village councils in Egypt and local authorities in Brazil). A subset of studies statistically explored the association between overall governance across multiple countries, using the World Bank Governance Index (political stability, government effectiveness, rule of law, regulatory quality, control of corruption, and voice and accountability) or Quality of Government (QoG) and health. The authors report that there were mixed results on the relative influence of the form of government (democratic, autocratic) versus the nature of institutions (bureaucratic, informal) on achieving better health outcomes. Also, several studies conclude that strategies other than governance may be an important influence on environmental factors or processes leading to health improvement. In particular, certain contextual factors, concurrent interventions and structural elements may trump the influence of governance on health outcomes, such as the availability of foreign aid and the penetration of interventions into rural areas. Hence, governance by itself is not guaranteed to improve health, and its role in the larger system of human development and health care delivery deserves further research. This reflects the somewhat mixed evidence from the literature on the link between overall governance and health sector governance despite its intuitive validity. Importantly, macro-level associations between these two constructs may reflect the political environment or a country's history and are not necessarily a result of a specific government policy that can be replicated elsewhere.

Moving on from reviews towards specific government-centred programmes, Better Health Outcomes through Mentoring and Assessment (BHOMA) is a well-documented, complex governance and leadership-focused set of interventions aiming to strengthen the health system in three districts in Zambia (Mutale et al., 2017; Mutale et al., 2018; Mutale et al., 2013; Mutale et al., 2014; Mutale et al., 2017). The intervention aims to achieve an impact on mortality and service utilisation (data on mortality are forthcoming). It operates across three systems levels. At district level, a Quality Improvement team provides support and mentoring on developing clinical skills, applying clinical guidelines, and optimal and responsive patient management. Although it is a multifaceted intervention that seeks to improve health outcomes through adherence to clinical protocols and quality assurance, the major mechanisms for achieving impact is through mentoring, teamwork

involving different types of cadre (community health workers, PHC providers, managers, community representatives) and ongoing support—for this reason it is listed under Domain 1 (Governance and leadership-centred interventions). At the health facility level, practical steps to improve the quality of care include providing resources and leadership training on management, financing, and supply chain. They are supported by community health workers, providing preventive services, helping patients navigate through the system, providing diagnosis, triaging and information collection and management services, and linking to other health system actors such as Neighbourhood Health Committees (NHCs) and Traditional Birth Attendants (TBAs). The intervention was evaluated using mixed methods which involved a cluster randomised trial and qualitative research, for which a balanced scorecard was developed and validated.

Following 12 months of intervention implementation, the study found significant mean differences between intervention and control sites in the training domain, adult clinical observation domain and health information domain, which were significant when adjusted for district and baseline scores (Mutale et al., 2014), but no difference in governance (assessed through an index), service satisfaction and health worker motivation scores. The follow-up qualitative study demonstrated that the BHOMA intervention improved the quality of service regardless of the study district, health facility type and duration of the intervention. There were tangible improvements with more resources and better patient management at facility level, as well as an improved community follow-up of patients who missed appointments with more traditional birth attendants referring patients to the health centres. The community health workers and clinic supporters were key to the operation of the intervention, with active roles in patient tracing, registration, triaging, diagnosis, and appropriate referral, and also in data management (Mutale et al., 2017). They were seen to alleviate the burden on the health workers. Overall this led to reduced perceived barriers to accessing services. However, there were some variations across districts and health facilities. For example, the intervention had a more pronounced impact in the rural Luangwa district compared with Kafue and Chongwe, which had a broader range of larger facilities operating vertical programmes and were less able to respond to the increase in demand due to BHOMA and the adherence to the clinical protocols, leading to bottlenecks and long waiting times. Community participation was also better in the rural district, especially where traditional leaders were fully engaged with the intervention. However, there are issues around sustaining these results after the end of the incentive payments.

Another significant initiative is the Zambia Management and Leadership Academy (ZMLA), an in-service leadership and management course aiming to improve health system governance aspects such as orientation towards strategic goals, accountability and transparency (Mutale et al., 2017). Before and after assessments showed significant increases in knowledge and skill levels after each workshop (measured through a survey), increased perceived capacity to engage in human resource management and leadership activities, and perceived improvements in the workplace environment. No major improvements were found in accountability and ethics. The qualitative methods demonstrated that shared vision, teamwork and coordination have improved more in facilities where the lead manager had been trained. The disruption to routine services was minimal. The impact on patient care is not yet assessed for this intervention, but analytical work is under way. Doherty et al. reports on the evaluation of the Oliver Tambo Fellowship Programme as convened by the University of Cape Town, South Africa (Doherty et al., 2018). This is essentially a health leadership training programme offering an innovative mix of technical training (up to a post-graduate diploma), management training and leadership training. Mentoring, empowering and connecting the participants through networking events and reflective practice formed a key part of the training, with the ultimate aim of enabling the participants to become ‘change agents’ when

returning to practice. Impact on health outcomes is not yet fully assessed, but the authors report improvements in management competence and motivation, and there are reports of improved system performance and tangible management and service delivery changes. Practice-informed health leadership training was seen to make a vital contribution to leadership capacity development, and it was suggested that the government human resources department could be involved in continued mentorship for alumni as a vehicle to improve practice.

Domain 2. 'Governance plus': Interventions paired with interventions in other blocks

Almost all described interventions under other building blocks include governance-centred elements. For example, in an extensive systematic review of health systems facilitators and barriers to the integration of HIV and chronic disease services (n=150 studies), Watt et al. (2017) demonstrated that integrating services requires joint planning, coordination of management systems and leadership training. A major cross-cutting domain 'leadership, stewardship, management and organisational culture' was critical in facilitating or inhibiting integration and improving patient-level health and social outcomes. Three areas were particularly important. First was leadership and political commitment to implementing integration, which often entailed significant upfront and on-going resources. This included setting an explicit goal and having a vision and clearly defined strategy for integrating services. Second, a change of governance arrangements (including structures and processes) and on-going support for implementation by frontline managers and staff was found to be a critical facilitator of integration. Proactive engagement of multiple stakeholders (both in and outside the health system, including users and their families) and a shared vision for the objective were also considered key, particularly during scale up, in relation to viability and sustainability. At a practical level, diverging treatment and care guidelines and protocols, administrative processes (e.g. for prescribing, data recording and sharing) were reported to disrupt successful service integration in many studies.

A final but essential factor was the need for a 'change in organisational culture' – this is often less tangible but emerged in many studies. A conducive culture is often most obvious when it is absent, e.g. where there is a clash of organisational cultures. An example was given of seeking to integrate a service based on a behavioural, patient-centred approach with other more medicalised services, with the two cultures often competing. All these challenges clearly relate to different elements of the governance and leadership building block.

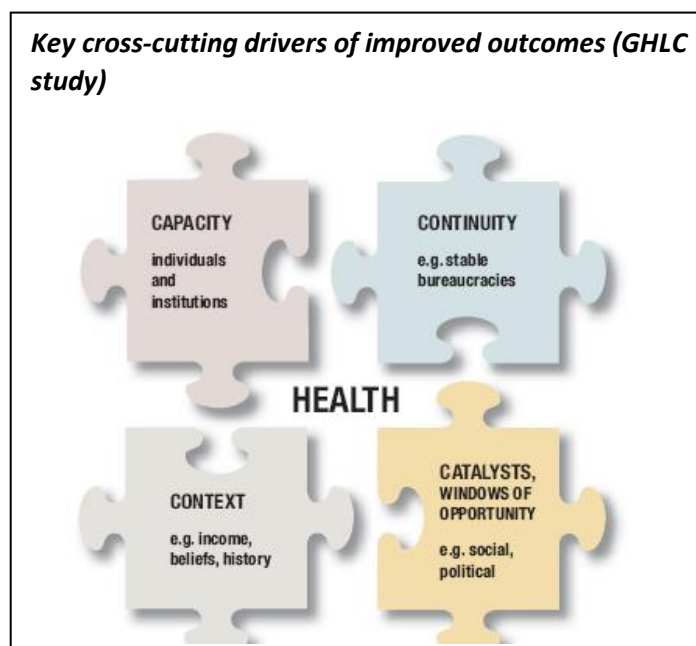
Another governance-related theme that interacted with delivery, human resource, financing and information strategies was the need to develop patient-centred models of care which involved supporting patient and families to overcome stigma, fear of dual diagnoses, side effects of treatment, breaches of confidentiality or any issues related to marginalisation—all presenting major barriers and shown to lead to poor outcomes (poor health outcomes, adherence and co-morbidities). Reorienting the system and using patient peer-to-peer support appeared to promote use of integrated care services. This linked to another important cross-cutting theme, the need for effective and appropriate communication, building relationships and collaboration. It involves a multitude of formal and informal relationships, vertical and horizontal links within teams and between teams, across different levels of care, e.g. coordinated management and clear referrals. The collaborative models of working are more effective in the context of institutional support and trust, with the mutual exchange of information and negotiation around any emerging barriers to integration.

Another example is a review by Bright et al. (2017), who systematically reviewed strategies to increase access to health services among children in LMICs and to identify multiple governance-related interventions. These are often stand-alone interventions (women’s groups, educational interventions with community participation, etc.) or linked to particular building blocks (e.g. home visits by CHWs to weigh children and liaise with GPs to follow up on abnormalities and ensure free consultations if required). All of this requires governance inputs including collaboration across levels, shared plans and referral procedures, and information sharing. Bright et al. also describe ‘combined interventions’ aimed at service delivery improvement but involving an array of activities: health worker training and support, health systems improvements, family and community support and awareness campaigns, deployment of village health workers, and integration of HIV and immunisation services. There were also ‘combined interventions’ primarily targeted at education and awareness raising involving women’s groups, health education for families, health promotion, the identification of sick newborns in the community by CHWs, training of staff, illness management, reporting and community development. The combined elements had an explicit governance and health systems strengthening focus. The authors report mixed impacts of each type of intervention on service coverage, utilisation and outcomes, and remark that ‘the lack of sufficient data on combined interventions may reflect the challenges faced in evaluating them’.

Domain 3. Governance policies and programmes for ‘whole-system’ change

National system-wide programmes

A set of eight papers and one multi-component project demonstrate how comprehensive policies have led to improved health outcomes toward health goals at the macro level. Often the studies seek to capture the functioning of the whole system, with improvements in multiple outcomes over long periods of time, exploring the nature, scope and sequencing of policies. In all these studies, governance was identified as the single most important factor for improved health and access to services – acting independently and also supporting other health system functions.



The Good Health at Low Cost (GHLC)

project examined why some countries achieve better health outcomes than can be expected at their income levels and when compared other countries in their respective regions (Balabanova et al., 2013; Balabanova et al., 2011). The project involved case studies examining the experiences of Bangladesh, Ethiopia, Kyrgyzstan, Tamil Nadu (India) and Thailand, seeking to understand the contribution of factors related to the health system, to social determinants of health, and to the context (political, economic, social, geographical) which may explain the advances in maternal and child health. Effective governance—as a targeted set of interventions or intersecting all other blocks—was a key factor. Specifically, it included political vision and windows of opportunity to initiate reform (often triggered by political crises), early national plans, operationalised goals and deliverables, and enactment of appropriate regulations. Continuity and coherence of reform plans

and strategies appeared key. Another aspect was the presence of stable bureaucracies with capacity to implement comprehensive and coherent reform packages, and with flexibility to adapt policies and learn through feedback loops. Health systems managing engagement and implementing coordinated action with the private and voluntary sectors and working across public sectors were also key. Systems to protect the poor (through benefits packages or stratified insurance packages) led to improved accountability and population support.

Samuels et al. report the results of a study of the drivers of health systems strengthening in Mozambique, Nepal and Rwanda, again countries seen as performers in the area of maternal and child health, and predominantly identified strategies related to leadership and governance, manifested at the macro, meso and micro levels (Samuels et al., 2017). The literature review synthesis identified three types of governance-related drivers of well-functioning health systems and which impact on health advances. The first is *good governance at the macro level*, operationalised as the capacity and ability to design and implement effective policies and programmes. Within this domain, specific steps included effective leadership supported by political will and ownership of policy and implementation process, and evidence-based decisions that reflect best practice and health needs, regulatory and accountability mechanisms and promoting alignment and collaboration among actors. Rohde et al. (2008) and Kuruville et al. (2014) are two other key papers focused on whole system governance and who identify similar aspects (Rohde et al., 2008). Effective and committed leaders accompanied with sustained (donor) funding had positive effects on maternal and child health (Samuels et al., 2017). At the meso level, inter-sectoral partnerships, as well as decentralisation and task-shifting, emerged as critical. Partnerships across public provision of education, water and sanitation and other sectors at this level have been shown to promote improvements in health, equity and efficient use of resources (Samuels et al., 2017; Kuruville et al., 2014). This allows successful leveraging of resources.

At the service interface level, community-centred models and accessible and appropriately trained and incentivised local health providers play a central role in all study countries. Community ownership and participation is identified as a particularly important driver of increased service utilisation, identifying local health priorities and locally-grounded pragmatic solutions to health system deficiencies. Locally-owned institutions promote accountability and local governance and they are often channelled via an enhanced role for the CHWs. The authors suggest that this ‘whole-system’ approach -exploring how the drivers work at the three levels and their interdependencies (vertical and transversal relationships) - is key to strengthening systems and promoting improved health and population outcomes.

The experience of one of the GHLC countries—Bangladesh—was further explored in The Lancet series on Bangladesh: Innovation for Universal Health Coverage (November 22, 2013, <https://www.thelancet.com/series/bangladesh>). Chowdhury et al. examined ‘The Bangladesh paradox: exceptional health achievement despite economic poverty’ (Chowdhury et al., 2013), arguing that the root cause of the large reductions in maternal and child mortality, despite malnutrition and low use of essential services, can be traced to a pluralistic health system. This includes many stakeholders implementing locally-adapted interventions, ‘women-focused, equity-oriented, nationally targeted programmes, such as those in family planning, immunisation, oral rehydration therapy, maternal and child health, tuberculosis, vitamin A supplementation, and others’. Both this and the GHLC study (Balabanova et al., 2013) emphasise the key role of (mostly female) CHWs performing home visits to deliver priority services to each household. A high level of literacy among women, female’s empowerment (Balabanova et al., 2013), a good road infrastructure

and domestic and government-supported manufacturing of essential drugs, have been key despite the low level of national income and high inequality (Balabanova et al., 2013).

Gilson et al. (2017) explored the development of the health system in the Western Cape, charting the nature and sequence of its transformation since 1994. This represents an experience of a 'whole-system' long-term intervention (the provinces in South Africa institute and manage their own systems), with governance being central to this process. The analysis demonstrates that among the key characteristics that facilitated reform was the continuity of policy development toward overarching goals, with each policy or intervention building on the previous one to ensure momentum was sustained. Strong technical leadership, stability of the institutional framework, clear roles and insulation of senior management from turnover in the political sphere are all also important. This process was supported by increased budget allocation for health and increased efficiency, made possible through strategic and innovative use of resources. This was the result of strategic oversight, planning and management.

Importantly, change occurred across all of the building blocks of the health system. For example, strengthening PHC involved health worker training, rehabilitating infrastructure, and improving medicine supply chains, which was made possible by governance restructuring with higher-level hospitals assuming new roles. The system transformation involved a shift from disease-control to comprehensive health care, despite the fact that some programmes, such as the HIV/AIDS programme, retained some elements of a vertical accountability model. It involved both reforms of the 'hardware' (physical resources, delivery models, human resource/drug supply, organisational changes), and the health system's 'software' – both the 'tangible software' of developing routine managerial processes and planning and the 'intangible software' of values and norms. The hardware/software combination of reforms has been credited with sustaining strategic policy directions and ensuring stability and space for maintaining routines as well as experimentation. This process was associated with a significant increase in provincial per capita expenditure and utilisation of district services, with a 60% increase in PHC utilisation over a 12-year period (1999/2000–2010/11) and increased use of district hospitals over a five-year period, above the population growth rate. Coverage and retention within many essential programmes (e.g. ART) also improved.

This conceptualisation of governance transformation illuminates the multi-faceted processes involved in 'whole-system' governance change processes. This experience echoes closely the main findings of the Good Health at Low Cost project (Balabanova et al., 2013). Interestingly, some countries initiated this 'whole-system' transformation with a comprehensive and multi-faceted national plan (in Kyrgyzstan after the collapse of the USSR and subsequent political change, and following the influx of donor funds into Ethiopia) while others, such as the Western Cape, followed a gradual transformation that evolved over time. In that setting 'whole-system change' implied 'a series of interrelated processes of adaptation and development, working across the multiple levels of the system and engaging multiple actors' (Gilson et al., 2017). Both patterns respond to specific political contexts and windows of opportunities that shape the governance initiatives that are possible during any given time period.

Governance need to be understood as a continuous process of designing, adapting and refining policies. In this sense, it is difficult to establish a cause and effect, but instead the attention should be on the pathway and its characteristics. This has underpinned the Overseas Development Institute (ODI) Development Progress project, which undertook case studies, including quantitative data synthesis, to explore drivers of progress across a range of sectors, including the social determinants

of health and wellbeing in Nepal, Rwanda, Mozambique, Cambodia and Sierra Leone (ODI, 2019). The project found a two-thirds reduction in under-fives mortality between 1990 and 2015 as a result of a comprehensive set of interventions (accelerated coverage of reproductive, maternal and child health indicators made possible through external funding). However, declines were also facilitated by often parallel investments and initiatives to improve coverage of essential services such as immunisation, nutrition, food security, access to clean water, and poverty reduction.

Continuing the analysis in Rwanda, Thomson et al. (2018) undertook a multi-method analysis of the impact of a health systems strengthening intervention on maternal and child health outputs and outcomes in rural Rwanda 2005–2010. They demonstrated that integrated interventions that span the building blocks of the health system (investments in infrastructure, supply chain, health management information system, provider training and incentives, free essential services for the poorest), can expand coverage and lead to further significant improvements in infant and under-five mortality in the (rural) intervention areas, compared to the country average in 2005–2010. Composite coverage of child health interventions increased from 58% to 75% in the intervention area and from 59% to 74% in the other rural areas. Under-five mortality declined by an annual rate of 12.8% per 1,000 live births in the intervention area, against a decline of 8.9% in other rural areas. Improvements were most marked among the poorest households. The authors conclude that (locally-adapted) integrated health systems strengthening interventions can offer considerable advantages compared to vertical programmes, leading to a rapid expansion of service coverage and relatively rapid and dramatic improvements in population health outcomes. The analysis also found that such interventions help to narrow the inequalities in coverage and outcomes in the society. However, given the multiple funding sources, the role of the government in coordinating multiple partners and aligning strategies and resources can be critical.

A new study of child survival across four African countries emphasises several core, underlying factors for improvement—all relating to the role of strong health governance and leadership in maternal, neonatal and child health (Haley et al., 2019).

Health governance and broader administrative interventions (decentralisation)

Health system governance initiatives are often part of a package of administrative decentralisation. However, there is scarce evidence on the impact of decentralisation on health outcomes. Panda and Thakur's systematic review from India found mixed evidence for the impact of decentralisation on health systems: 'effective management practices may facilitate a shift to decentralized local health systems rather than vice versa'. They noted that decentralisation may appear to affect performance positively or negatively as a result of other background factors (e.g. decentralisation did not alleviate the problems of retaining the PHC cadre in rural Nigeria as it delayed the timely payment of salaries and de-incentivised staff to work in rural PHC facilities) (Panda and Thakur, 2016). This mixed effect was also seen in a review by Sumah et al. (2016). Panda and Thakur quote a study by Khaleghian, who used cross-country time series data to assess the effect of decentralisation on immunisation coverage and found better coverage in decentralised settings in low-income countries, while the opposite was the case in middle-income countries (Khaleghian, 2004). The Panda and Thakur review found that, on balance, the effect of governance interventions implemented in decentralised schemes largely depends on context and quote a study by Atkinson and Haran that found only a tentative association between decentralisation and improved performance (for five of our 22 performance indicators), suggesting that 'good management practices led to decentralized local health systems rather than vice versa, and that 'any apparent association between decentralization and performance could be an artefact of the informal management'. The authors of that study

conclude that 'the wider political structure strongly influenced the performance of local health systems' (Atkinson and Haran, 2004).

Perks et al. (2006) reported on a comprehensive PHC programme in a remote province of Lao PDR that focused on strengthening district health management, in addition to improving access to health facilities and integration of primary health care activities. Over the course of more than a decade, the programme increased service access and service utilisation and decreased infant, child and neonatal mortality (Perks et al., 2006).

The second observational study compared performance of centralised and decentralised providers in rural areas of Mexico, and found that households served by centralised providers reported less regressive out-of-pocket expenditure and higher utilisation of preventive services (Vargas Bustamante, 2010).

Sumah et al., systematically reviewing the literature on the implications of decentralised governance of health care on equity in health, health care and health financing, found nine studies (Sumah et al., 2016). Similar to the review from India, it found mixed impacts for decentralisation, suggesting that it could either lead to equity gains or exacerbate inequities. The authors suggest that the impact of decentralisation is mitigated by socio-economic disparities and the health system context, and depends on pre-existing inequalities. This was the case in China where decentralisation may have increased the existing inequalities in access to health care, and through this the inequalities in health outcomes, however, this process occurs in the context of large socio-economic factors that influence health which are a 'contributory factor' to the problems emerging in decentralised China. Similarly, where there are large financial barriers to access, decentralisation can lead to inequities in health financing between sub-national jurisdictions, requiring substantial central government transfers and cross-subsidisation. The impact of decentralisation is also dependent on other reform packages that are implemented in parallel.

Conclusion

The literature exploring health systems governance demonstrates that interventions and policy change in this area can improve health, access to services and responsiveness (Table 2). Initiatives to improve how health systems are governed and perform often address what is understood to be the essence of health systems strengthening.

There is an increasing body of evidence that suggests that governance-specific interventions, including civil participation and engaging community members with health service structures and processes, can lead to tangible health improvements, as well as improved service uptake and quality of care. Leveraging collaborative models involving different stakeholders and health units and other sectors to work towards a clear objective – managing a particular service or unit - is found to achieve results. Capacity development and mentoring is particularly important to enable this process. Leadership and management training remains a key ingredient in improving governance and health systems strengthening in LMICs. Context here is critical, e.g. government acceptance of shifting authority to community organisations or shared societal values in line with pro-equity and gender equality policies.

Given this context-dependence, the fluidity of the governance intervention and the time lags involved, the opportunity to apply randomised designs is limited and methods are mostly qualitative.

Few studies (such as BHOMA) are able to take mixed methods approaches. The studies from South Africa and Kenya demonstrate the value of longitudinal qualitative work in 'learning sites' to obtain a better picture of the impact of governance on intermediary and health outcomes.

Furthermore, most interventions in other blocks have a governance component – as each of these functions needs to be regulated, managed, resourced, and monitored. Each function is strengthened by a good governance framework, such as a delivery model that involves supported community members, or a human resource intervention that relies on policy on promotion and deployment and responsive management. Investments cannot seek to separate these, and on the contrary, should attempt to mainstream governance in all funding and programmatic streams.

The set of studies demonstrating whole-system change (which is growing) is somewhat difficult to interpret. These are overarching health systems strengthening policies often involving comprehensive programmes that intersect with almost all building blocks. However, there has been a clear emphasis in the relevant literature that governance is the single most important factor in these programmes and has underpinned all interventions that have ultimately led towards improving health and progress towards universal coverage. Health system governance and broader good governance have been credited with achieving improvements even where resource inputs have been insufficient; the Good Health at Low Cost study and other work have demonstrated that achievements in access and health outcomes were sought and attained even during crises (e.g. the Asian financial crisis, tsunami, flooding, the fall of a communist regime and a political revolution etc.) and despite countries being at a lower level of wealth than their neighbouring countries (Kuruville et al., 2014; ODI, 2019). In fact, such crises may have promoted partnerships and political momentum that has enabled innovative and coordinated solutions. The concept of whole-system governance approach involves: political elites invested in change and taking into account windows of opportunity, a national plan, comprehensive and coherent reform programmes addressing multiple building blocks over significant periods of time and allowing for lesson learning, and policy adaptation to changing the environment.

Evidence on what governance interventions and policies are best suited to which contexts is still limited, especially in conflict, post-conflict countries, and those transitioning from aid or under different political arrangements. Furthermore, a more in-depth understanding of the informal systems that govern the behaviour of all health systems actors (patients, providers and bureaucrats), which shape their actions and determine whether health policies and interventions achieve their intended outcomes, is still underway. Another key gap in knowledge is what happens after the governance-specific or cross-block interventions end - what is the longer-term impact on sustainability, equity and empowerment of local actors? An emerging area of debate on potentially effective interventions is how ICT and mobile technology enable implementation of governance improvements, enforcement of rules (e.g. a large-scale online platform for submitting health-sector related complaints is being implemented in Indonesia) and equip progressive actors to implement innovations. No studies in this area were identified.

A more pragmatic strategy to improve governance and leadership is to ensure that actions in all health systems functions/blocks are appraised in terms of their impact on governance. This can lead to designing data collection mechanisms and indicators that allow for comprehensive assessment of governance, the inputs required but also conceptualising the plausible pathways from improved governance to accelerated health improvements and coverage. Efforts in this area have so far lagged behind work on other systems functions.

Leadership & governance	Service access & coverage	Service quality & responsiveness	Improved health	Equity of outcomes	Financial equity and risk protection	Cost-effectiveness	Key references	Overall comments on field, including important spillover effects and contextual factors
Domain 1. <i>Governance and leadership-centred:</i>	Governance - immunisation coverage	Responsiveness to community needs, values	14 studies indicated positive associations between governance and health outcomes (<5 mortality rate, life expectancy, maternal mortality). (9 direct link, in 5 indirect, acting with contextual factors).	?	?	None?	Reviews/multi-country: Ciccone et al., 2014 Samuels et al., 2017 Rohde et al., 2008	Mixed evidence on link between governance and outcomes, it appears that it is mediated by community/end user buy-in where there is a fit with local needs, values and participation (e.g. community monitoring, accountability). Impact of governance initiatives is often indirect – via spill over to other building blocks, Even where there is a link between governance and outcomes, it is rooted in effective local governance, social development and community empowerment. The impact of governance is constrained by availability of aid and coverage of interventions. Mixed results on association between national governance and improving outcomes, and hard to replicate.
	Perceived reduced barriers to accessing services (better patient management, follow-up, team work across types of health workers)	Improved quality of care	Results are not yet available (aims to measure impact on mortality) – forthcoming papers				Better Health Outcomes through Mentoring and Assessment (BHOMA) (Mutale et al., 2017; Mutale et al., 2018; Mutale et al., 2013; Mutale et al., 2014; Mutale et al., 2017) ZMLA, Mutale et al., 2017 Doherty et al., 2018	Positive or neutral changes in health system performance indicators, and in some outcomes (further analysis is forthcoming). Some negative effects (adherent to protocols led to longer waiting times). Community mobilisation and engagement of traditional leaders are key intermediating factors. Reported improvements of human resource capacity, management competence, motivation, with indicated plausible associations with improved system performance, management and operation; no impact on outcomes measured.
Domain 2. <i>'Governance plus':</i>	Mixed but examples of impact in specific contexts (the contribution of governance is difficult to establish)	Mixed but examples of impact in specific contexts (the contribution of governance is difficult to establish)	Mixed but examples of impact in specific contexts (the contribution of governance is difficult to establish)	Some	-	-	Watt et al. (2017) <i>review</i> Ciccone et al., 2014 <i>review</i> Bright et al., 2017 <i>review</i>	Interventions across blocks/ combined but with a governance focus/spill over of governance/ leadership interventions common – seen as critical in facilitating or inhibiting integration. Indications that it has improved health and social outcomes.

Leadership & governance	Service access & coverage	Service quality & responsiveness	Improved health	Equity of outcomes	Financial equity and risk protection	Cost-effectiveness	Key references	Overall comments on field, including important spillover effects and contextual factors
Domain 3. <i>National system-wide programmes</i>	Yes – on maternal and child health, neglected tropical diseases (but the contribution of governance is difficult to establish)	Limited	Yes – on maternal and child health, neglected tropical diseases (but the contribution of governance is difficult to establish)	Yes	Yes	-	GHLC, Balabanova et al., 2013; Balabanova et al., 2011 Samuels et al., 2017 Rohde et al., 2008 Kuruville et al., 2014 Chowdhury et al., 2013 Gilson et al., 2017 ODI, 2019 Thomson et al., 2018 Haley et al., 2019	Most whole-system studies emphasise the core role of governance in achieving intermediary and health outcomes. Governance is seen not only to support each building block but also to be the underlying framework for effective implementation. Link is made with political governance, through the link to political commitment for effective programmes. Multiple effects on health systems strengthening established.
<i>Health governance and broader administrative interventions (decentralisation)</i>	Mixed - governance acts within decentralisation		Mixed (governance acts within decentralisation)		Limited – (governance acts within decentralisation)		Panda and Thakur, 2016 <i>review</i> Khaleghian, 2004 Atkinson and Haran, 2004 Perks et al., 2006 Vargas Bustamante, 2010 Sumah et al., 2016, <i>review</i>	Health system governance initiatives are often within the context of health system decentralisation. Evidence of improved coverage, outcomes and financial protection in specific contexts.

Table 2: Summary table on effects of governance interventions

Workforce

Kinds of interventions included and interlinkages between them

Shortages of health workers are reported in most countries, especially LMICs – sometimes as a consequence of migration to HICs to address their shortages. Workforce supply is largely a function of training output, attraction to jobs – with pay being a major factor which is largely dependent on financing - and the mechanism of recruiting and selecting, without excluding sections of society, appropriately skilled health workers into the labour market and more specifically into health institutions. A final factor affecting workforce supply is the ability to retain skilled health workers at particular institutions or in the health labour market more generally.

A second major challenge with the workforce is the distribution of health workers to ensure equitable access to services, with the major areas affected by maldistribution in LMICs being remote rural locations. The distribution of health workers is managed through effective deployment systems and, in some cases, additional incentives.

The third area of challenge is the performance of health workers. While the focus is often primarily on the individual, the organisation of work, the management, supervision and appraisal of health workers and ensuring that competencies are updated are all needed to improve health workforce performance. Because of the shortage of skilled health workers, employers have taken to reorganising the skills mix of the workforce or reallocation of work often to lower cadres in a process known as task-shifting or task-sharing, linking efficiency gains to improving workforce supply. The effectiveness of the health workforce is dependent on other health systems components such as information, finance and leadership and governance, and collaboration in the health sectors.

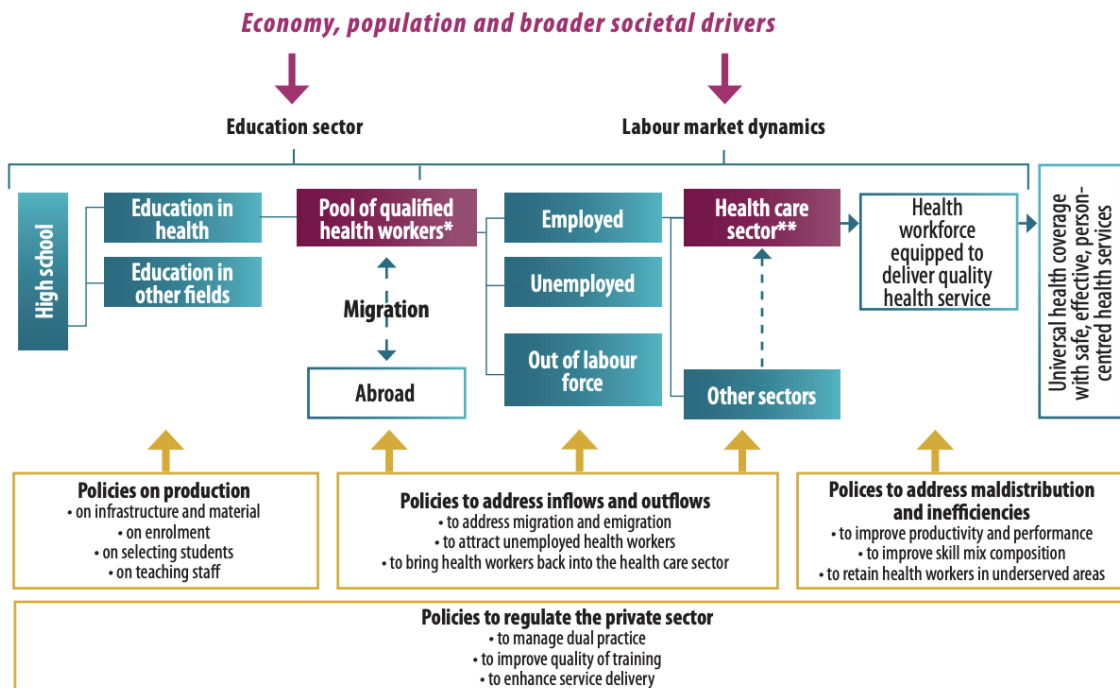
A key characteristic of effective human resource management is the use of linked and coordinated human resource management (HRM) interventions (Buchan, 2004). Coordination is also needed between HRM and other health systems components such as information, finance and governance. These elements were used to guide the development of a review on HRM – in this case in post-conflict contexts – by Roome et al. (2014) as shown below, which highlights some of the key intervention areas within HRH.

Table 3: Framework for analysing HRM publications

	Workforce supply	Workforce distribution	Workforce performance
Topic areas	<ul style="list-style-type: none"> ● Recruitment and selection ● Pay ● Pre-service education and training 	<ul style="list-style-type: none"> ● Deployment (including incentives) 	<ul style="list-style-type: none"> ● Work organisation and job design ● Management and supervision ● Performance appraisal ● Performance-related incentives ● In-service training
Cross-cutting topics	<ul style="list-style-type: none"> ● Retention ● Task shifting ● HR data ● Leadership and governance ● Finance ● NGOs and aid agencies ● Gender 		

Source: Roome et al. 2014

Many HRH interventions also follow the labour market structure (see figure below).



*Supply of health workers= pool of qualified health workers willing to work in the health-care sector.

**Demand of health workers= public and private institutions that constitute the health-care sector.

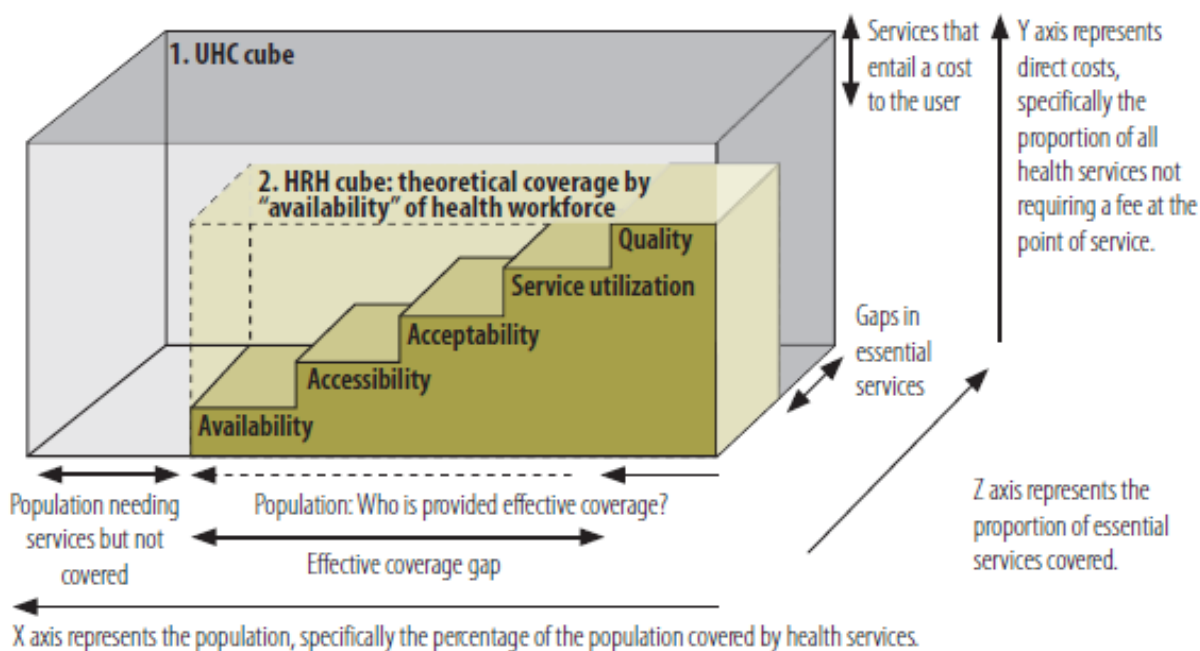
Source: Sousa A, Scheffler M R, Nyoni J, Boerma T "A comprehensive health labour market framework for universal health coverage" Bull World Health Organ 2013;91:892– 894

Figure 1: Policy levers to shape health labour markets

Source: https://www.who.int/hrh/resources/global_strategy2030en-printversion.pdf

Discussion of links to HSS

As indicated in the figure below, human resources are a core component in enabling the realisation of UHC and health system goals, with different HR dimensions enabling or blocking the reality of service delivery. In addition, HR policy directly affects leadership capacities and performance, linking to governance.



Adapted from *The world health report* (2010),⁴ UN Economic and Social Council (2000)²² and Tanahashi (1978).¹⁹

Figure 2: Dimension of universal health coverage pertaining to human resources for health: effective coverage

Source: Campbell et al., 2013: 854

State of the literature

The human resources field has a well-developed menu of prioritised actions, as reflected in policy documents such as the Workforce 2030 (WHO, 2016), which emphasise the importance of HR goals not only for health systems and health but also the wider economy. Much evidence synthesis has already fed into global agenda setting, including studies linking health workforce density with health outcomes (Castillo-Laborde, 2011). However, studies of specific HSS interventions for HR tend to be short term, missing on longer term effects. More macro interventions – for example, the effectiveness of creation of HRH observatories, of HRH strategies, or approaches to strengthening HR information systems – are under-evaluated.

Evidence on effects

Recruitment and selection

Recruitment to public service is often seen as an opportunity for nepotism and patronage (Lewis, 2006). There are also problems of ineffectiveness and delays as well as poorly controlled selection processes as found in the health service in India (Purohit and Martineau, 2016). Whereas political bias was found in recruitment in post-conflict Rwanda, it was reported that there was some improvement in this situation when the Public Services Commission was established in 2002 (UN, 2010). However, since mid-2000 donors have become more open to funding health worker salaries under certain conditions and these programmes have been able to bypass normal government recruitment systems to fast-track and regulate the recruitment process e.g. (Adano, 2008). The Kenyan Emergency Hiring Plan, funded by PEPFAR, managed to rapidly recruit 830 new staff in 2007,

and evaluation showed this led to increased access to services (Fogarty et al., 2009). A much bigger scheme was introduced in Malawi, with funding from DFID and Global Fund. Recruiting across 11 priority cadres, the health workforce was increased by 53% between 2004 and 2009. Using the Lives Saved Tool (LiST) the evaluators calculated that 13,187 lives had been saved due to increased coverage (O’Neil et al., 2010). However, a review of other similar funding arrangements to increase staffing found that there was a lack of information on the determination of payment rates, negatives consequences and, most importantly how payments – and therefore staffing – would be sustained at the end of the grant period (Vujicic et al., 2012).

Interest has grown in understanding labour market dynamics, which influences recruitment into, movements within and exits from organisations at one level and the labour market as a whole at a higher level (e.g. McPake et al., 2013; Scheffler et al., 2016). A number of labour market studies were carried out at country level by WHO around 2013, but this activity appears to have stopped and has recently restarted (see <https://www.who.int/hrh/labour-market>). There has been significant research into roles in leadership and the delivery of health services by women which has identified occupational segregation and disadvantage regarding pay rates, career pathways and decision-making power (Magar et al., 2017). This has an important impact on the availability and efficiency of the use of human resources.

Since the 1990s there have been attempts to improve workforce planning by getting a clear estimate of need using Workload Indicators of Staffing Need (WISN). The process was computerised and guidelines developed by WHO in 2010 (WHO, 2010). Since then, there have been numerous reports of the use of the methodology and a review of experiences in four African countries. The main findings were that the approach was helpful in giving more accurate information on staffing needs which can be used for determining staffing norms and standards. The approach is, of course, reliant on accurate staffing data which some countries may not have and there is limited expertise available for using the WISN methodology (World Health Organization, 2016). Nevertheless, the approach continues to be used (Asamani et al., 2018). While these studies and methodologies do not improve workforce effectiveness on their own, they can inform strategies to improve planning, recruitment, deployment and retention and are therefore a sound investment.

Deployment

The systems of deployment – the initial posting and subsequent transfer to other posts – is subject to the same risks of “capture” as recruitment and selection (Schaaf and Freedman, 2015; Purohit et al., 2016), given the value of jobs and their location. It is particularly problematic for filling posts in remote rural areas. This prompted WHO to commission evidence-based recommendations to address this challenge (WHO, 2010). The recommendations covered four key areas (see below) and example strategies are provided for each area. The evidence for each recommendation was reviewed using the GRADE system and designated as “low” quality as most was derived from observational studies.

Category of intervention	Examples
A. Education	A1 Students from rural backgrounds
	A2 Health professional schools outside of major cities
	A3 Clinical rotations in rural areas during studies
	A4 Curricula that reflect rural health issues
	A5 Continuous professional development for rural health workers
B. Regulatory	B1 Enhanced scope of practice
	B2 Different types of health workers
	B3 Compulsory service
	B4 Subsidized education for return of service
C. Financial incentives	C1 Appropriate financial incentives
D. Professional and personal support	D1 Better living conditions
	D2 Safe and supportive working environment
	D3 Outreach support
	D4 Career development programmes
	D5 Professional networks
	D6 Public recognition measures

Table 4: Categories of interventions used to improve attraction, recruitment and retention of health workers in remote and rural areas.

Source: WHO, 2010

The recommendation is that several strategies should be bundled together to produce a more coherent approach to addressing the problem. Early testing of these guidelines in Europe and Asia included improved staff distribution as an outcome (Buchan et al., 2013). The evidence still remains weak for this complex area of intervention (Behera et al., 2017), though it is understood that WHO is now planning a review of the 2010 guidelines. There are few examples of attraction and retention strategies that are tracked over time. The Zambian Health Worker Retention Scheme (ZHWRs) for rural areas, which started in 2003, was initially financed by the Dutch government and initially only targeted doctors. This was deemed to be successful in attracting 68 Zambian nationals into remote posts (Koot and Martineau, 2005). However, a later evaluation of the programme when it had expanded to cover a larger number of cadres concluded that it had failed to decrease attrition rates and increase recruitment of critical health care service providers (Gow et al., 2013). Another way of filling posts in underserved areas is through the use of a bonding mechanism, usually tied to repayment of training costs (Frehywot et al., 2010). Studies in a number of countries, e.g. Turkey and Thailand, demonstrated improved staffing in rural areas. One study in South Africa reported that better staffing levels led to shorter waiting times and better support to outlying clinics (Reid, 2003).

Workforce performance

Much effort has been invested in ensuring health workers have the competencies they need, but the challenge is then to support and encourage the use of them to provide effective service delivery. While a lot of research covers what motivates staff (Borghi et al., 2017), there is less evidence on what managers can do to improve workforce performance. On the 'support' side there is evidence that audit and feedback, as well as managerial supervision, lead to improvements in service quality but to little difference in patient outcomes or utilisation of services (Ivers et al., 2012; Bosch-Capblanch et al., 2011). Supervision can lead to improved productivity (Frimpong et al., 2011). The effects of educational outreach visits and continuing education meetings on professional performance have been found to be small (O'Brien et al., 2007; Forsetlund et al., 2009). There has been increasing interest in linking financial reward to performance. This may reward the organisational or the individual – or both. A Cochrane review carried out in 2012 found that the evidence was too weak to draw conclusions about the effectiveness in improving performance (Witter et al., 2012). A study in Pakistan found that the scheme was seen as more of a salary top-up with little relation to individual performance. In fact, there were negative side-effects related to team work and sustainability (Witter et al., 2011). While pay for performance demonstrates a good integration between the health system's components of finance and human resources, it is often difficult to determine the effect on individual health workers. However, Baral et al carried out a study using performance-based management with a financial component but carefully observed the effect on individuals. They found that there was a significant increase in job satisfaction (which would lead to improved performance), but importantly there was a significant decrease in absenteeism – a major impediment to workforce performance. Improved health worker performance was linked to increased immunisation coverage and increases in ante-natal check-ups (Baral et al., 2018). Individual performance contracts have been introduced in a number of countries across public service for senior cadres, for example in Kenya and Cambodia, where in the latter case this helped reduce absenteeism and informal payments (Vujicic et al., 2009), though implementation of such schemes has been problematic, for example in Malawi (Tambulasi, 2010) and Sierra Leone (Martineau and Tapera, 2012). While some form of performance-based incentive may be appropriate in stable contexts, this becomes more problematic in conflict or crisis-affected environments where regulatory systems may be weak (Witter et al., 2012).

Other approaches to improving performance include working at the organisational level and developing a culture of performance. A study of a well-performing hospital in Ghana identified teamwork, recognition and trust as key elements of the organisational climate which led to organisational commitment (Marchal et al., 2010). This kind of 'organisational development' approach is broad and takes time and has not been tested on a wider scale.

Vasan et al. reviewed interventions to support and improve performance of primary health care workers. They differentiated five approaches: 1. supervision, 2. mentoring, 3. tools and aids, 4. quality improvement methods and 5. coaching. They found evidence of improvements in service quality and increased service coverage but due to the variation in approaches, comparability of interventions and transferability of results was limited (Vasan et al., 2017). The most extensive review of strategies of improving workforce performance has been carried out by the Health Care Provider Performance Review project (www.hcppperformancereview.org) (Rowe et al., 2018). This examines strategies that go beyond the normal human resource management scope including community support, strengthening infrastructure, group problem-solving etc. The quality of evidence is mostly moderate to weak. A key finding is the importance of combinations of strategies,

such as of training and supervision. These combinations had larger effects than single strategies. There is some evidence about impact on service quality. A searchable database of interventions is available on the website.

The effects of educational outreach visits and continuing education meetings on professional performance have been found to be small (O'Brien et al., 2007; Forsetlund et al., 2009), although studies reported positive impact of improvement teams on service uptake and quality in maternal health services (Mwaniki et al., 2014) and of a leadership development course for physiotherapists on service coverage (Pascal et al., 2017).

Perrier et al. assessed the effectiveness of multi-faceted interventions encouraging the use of systematic reviews in clinical decision making. Of two trials from middle-income countries one found no impact on professional practice change, the other reported improvement in service quality (Perrier et al., 2011). In a review on tailored interventions to address determinants of practice, the effect was shown to be variable and small (Baker et al., 2015).

There is limited evidence on interventions for hiring, retaining and training district health system managers. In a review published in 2013, Rockers et al. included only two studies and found that private contracts with international NGOs lead to improved service uptake but no effect on health outcomes, while intermittent training courses led to improvements in performance. Similarly, a trial investigating the impact of a management strengthening intervention, including workshops and follow-up meetings, reported positive impacts on workforce strengthening and service delivery (Martineau et al., 2018).

Skills mix/task-shifting

Task-shifting became popular with HIV/AIDS programmes because of the high level of available funding and the low availability of more highly-skilled health personnel. A guide book has been developed by WHO for task-shifting for HIV/AIDS programmes (WHO, 2007) and an electronic guide on Maternal and Newborn Health (WHO, 2012). In a review of task-shifting and sharing in the area of Maternal and Reproductive Health, Dawson et al claim that “shifting obstetric surgery, anaesthesia and abortion tasks may not compromise performance or patient outcomes”, but that more support and incentives may be needed for people taking on new roles (Dawson et al., 2014: 396). It is possible to deliver programmes safely and effectively and expand coverage using task-shifting (Polus et al., 2015) but the operationalisation of such programmes can be challenging (Okyere et al., 2017).

A systematic review in 2018 identified 122 reviews (Scott et al., 2018), indicating the importance of this approach to reorganising the way work is done. The review focused on the design and operations of the CHW programmes, but not the impact. General HR practices such as training, supervision and logistical support were identified as being important to the success of the programmes. CHW programmes have been found to promote more equitable access (McCollum et al., 2016). Their programmes being properly integrated with the wider health system and the programme being properly embedded in the community are important factors (Woldie et al., 2018). A review of 39 systematic reviews of community health volunteers in 2018 (Woldie et al.) reported that ‘most concluded the services provided by CHVs were not inferior to those provided by other health workers, and sometimes were better. However, CHVs performed less well in more complex tasks such as diagnosis and counselling. Their performance could be strengthened by regular supportive supervision, in-service training and adequate logistical support, as well as a high level of

community ownership. The use of CHVs in the delivery of selected health services for population groups with limited access, particularly in LMICs, appears promising. However, success requires careful implementation, strong policy backing and continual support by their managers’.

The key findings are reflected in the table below, structured using the same headings as above.

Conclusion

There is increasing understanding of the political economy of HRM in the public sector, but other than contracting out functions like recruitment, there are no clear ways of avoiding nepotism and patronage in the recruitment and selection processes. The increased use of labour market analysis is assisting the development of relevant recruitment (and retention) strategies. Evaluations are only available for donor-funded initiatives for increasing recruitment and, though effective in the short term, there are challenges of sustainability. Strong evidence on strategies for attracting and retaining staff, particularly in underserved areas, is still lacking. The HRM literature points to the need for integrated strategies for improving workforce performance and evidence of this has been found by researchers, but this then poses difficulties for researchers to identify what combination of strategies works in what contexts. Research on organisational development is perhaps more promising for delivering change, but whereas it may work in smaller semi-autonomous institutions, it is likely to be more challenging across a whole ministry as the introduction of performance contracts has shown. Research on work organisation and job design – in particular in relation to task-shifting – is helpful for specific cadres and areas of service delivery.

Table 5: Summary table on effects of HRH Intervention

Health workforce topic	Service access & coverage	Service quality & responsiveness	Improved health	Equity of outcomes	Financial equity and risk protection	Cost-effectiveness	Key references	Overall comments on field, including important spillover effects and contextual factors
Recruitment and selection	+	+	Estimated by one study using the Lives Saved Tool	none	none	none	Adano, 2008 Fogarty et al., 2009 Vujicic et al., 2012	Much work is being done on understanding how to expand the workforce, but evaluations are only available for donor-funded initiatives
Deployment	+	none	none	none	none	none	WHO, 2010 Buchan et al., 2013 Behera et al., 2017	Most of the evidence is relatively weak and only supports increased service access and coverage
Workforce performance	none	+	none	none	none	none	Witter et al., 2012 Rowe et al., 2018 Bosch-Capblanch et al., 2011 Marchal et al., 2010	Evidence of the effects of interventions is generally weak. A combination of strategies to improve workforce performance is recommended
Skills mix/task shifting	+	Many not lead to a reduction of quality	none	none	none	none	WHO, 2012 Scott et al., 2018 McCollum et al., 2016	In LMIC this is largely used for increasing the availability of service in response to shortages of professional health workers. There may not necessarily be a loss in quality

Financing

Kinds of interventions included and interlinkages

Within the health financing literature, interventions are often grouped according to the health financing ‘functions’. For example, in a recent review of health financing in fragile and conflict-affected states (Witter and Bertone, 2018), thematic analysis followed the table below.

Table 6: Thematic framework for health financing interventions

Main element of health financing	Theme (and sub-themes that are included)
Revenue raising / pooling	Public spending <ul style="list-style-type: none"> tax mobilisation level, progressiveness, government allocation to health sector
	Private spending <ul style="list-style-type: none"> (OOPS, catastrophic expenditures, informal payments, etc.)
	External aid <ul style="list-style-type: none"> trends in aid levels, aid dependency, coping with too little or too much funding, aid coordination and effectiveness, influence of external actors
	Insurance / <i>mutuelles</i>
	User fees, exemptions and targeted exemptions
	Health Equity Funds
	Aid coordination mechanisms <ul style="list-style-type: none"> Health Pooled Funds / Multi-donor Trust Funds / technical assistance / etc. + transitional funds
Purchasing	Active or passive purchasing <ul style="list-style-type: none"> fragmented purchasing, or no purchasing at all
	Contracting <ul style="list-style-type: none"> contracting in, contracting out
	Performance-based financing
	Resource allocation
	Provider payments
	Demand-side financing (vouchers, cash transfers etc.)
Benefit packages & service provision	Regulation, especially of non-state providers
	Basic packages of health services
	Role of the private sector / non-state actors, NGOs <ul style="list-style-type: none"> role in service provision, coordination (or not) at local level, etc.
Cross-cutting issues	Governance <ul style="list-style-type: none"> transparency and accountability, capacity of local institutions, legitimacy of the state, policy processes and windows of opportunity, path dependency
	Public financial management <ul style="list-style-type: none"> fragmented PFM / cash flows and procurement done in parallel, input-based budgeting, lack of links between plans and expenditure, etc.

Adapted from: Bertone et al. 2019

It is important to note, first, that interventions rarely fit cleanly into only one functional area, e.g. PBF often combines features of resource mobilisation, pooling, purchasing and influencing benefits package entitlements for specific populations. Secondly, the interlinkages with other health system ‘pillars’ is clear – for example, provider payments are a core interest for health financing, but also an important topic for health staff. Finally, reforms are commonly introduced as complex packages (with more than one change, even within the health financing arena), which are also dynamic, with reforms being introduced in waves and modified over time, all of which challenges any attribution of effect.

Discussion of links to HSS

The discussion of inputs and HSS is highly relevant to the health financing area. Does the addition of resources – for example, via increased donor funding or through a specific mechanism such as conditional cash transfers – constitute a strengthening of the system? Clearly, this is not necessarily the case, however, the way in which such funding is provided *may*, in some cases, provide benefits such as better targeted public expenditure or increased responsiveness. The important question is, therefore, less about the type of intervention (its formal label), and more about how it is designed, implemented and iteratively managed over time, contributing to the development of positive functional features and core health financing capacities. WHO has recently been trying to define these positive functional features. The table below gives a summary.

Table 7: Guiding principles for health financing reforms in support of UHC (in summary form)

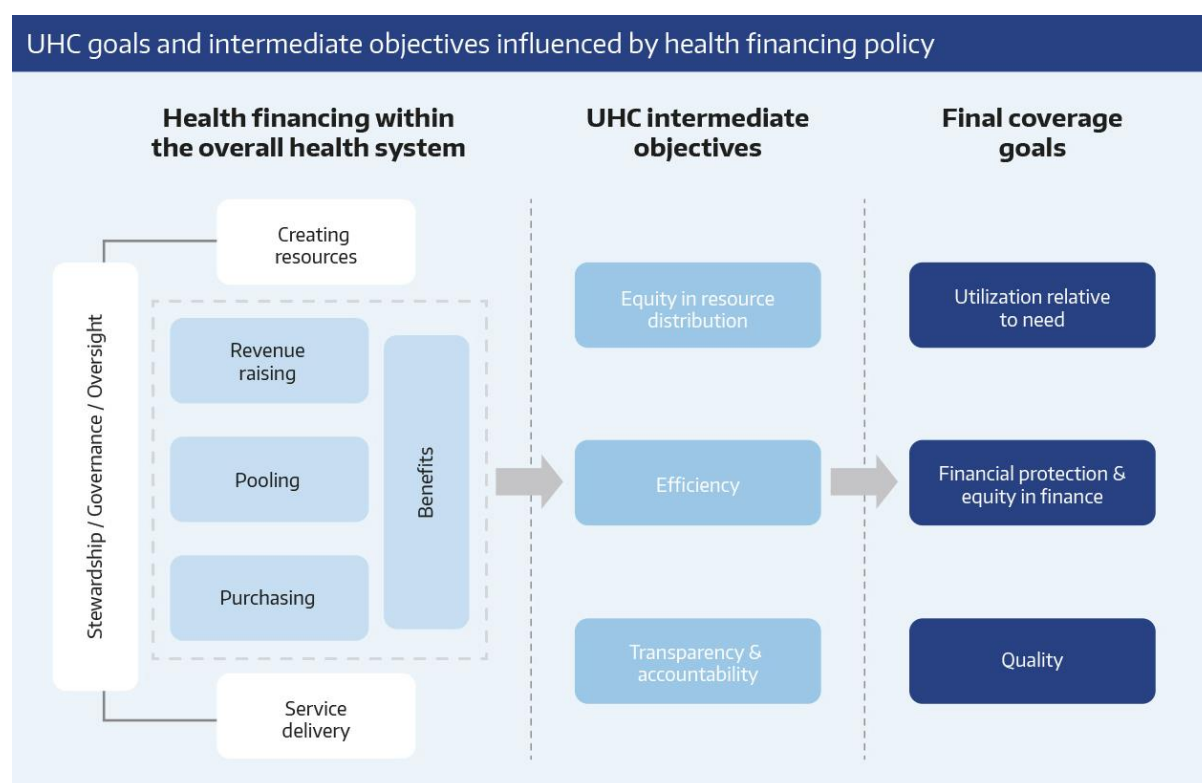
1. Revenue raising (RR)	
Move towards a predominant reliance on public/compulsory funding sources (i.e. some form of taxation)	(RR1)
Increase predictability in the level of public (and external) funding over a period of years	(RR2)
Improve stability (i.e. regular budget execution) in the flow of public (and external) funds	(RR3)
2. Pooling revenues (PR)	
Enhance the redistributive capacity of available prepaid funds	(PR1)
Enable explicit complementarity of different funding sources	(PR2)
Reduce fragmentation, duplication and overlap	(PR3)
Simplify financial flows	(PR4)
3. Purchasing services (PS)	
Increase the extent to which the allocation of resources to providers is linked to population health needs, information on provider performance, or a combination	(PS1)
Move away from the extremes of either rigid, input-based line item budgets or completely unmanaged fee-for-service reimbursement	(PS2)
Manage expenditure growth, for example by avoiding open-ended commitments in provider payment arrangements	(PS3)
Move towards a unified data platform on patient activity, even if there are multiple health financing / health coverage schemes	(PS4)

4. Benefit design and rationing (BR)

- Clarify the population’s legal entitlements and obligations (who is entitled to what services, and what, if anything, they are they meant to pay at the point of use) (BR1)
- Improve the population’s awareness of both their legal entitlements and their obligations as beneficiaries (BR2)
- Align promised benefits, or entitlements, with provider payment mechanisms (BR3)

These form a first level set of indicators for judging health financing interventions in relation to their likely contribution to UHC. UHC’s intermediate and final goals (see below) indicate whether a health system is strong, in the sense of being able to deliver full, fair, quality health care coverage with financial protection.

Figure 3: UHC goals and intermediate objectives influenced by health financing policy



Source: (Kutzin et al., 2017)

It is, however, important to recognise the very different contexts which are faced across LMICs. In some of these settings (e.g. acute crises or gradual collapse of functions), appropriate goals for health financing may be not so much advancing UHC but preventing loss of gains – for example, preventing a reversal of financial protection as budgets collapse and out of pocket payments replace them (Witter and Bertone, 2018). Whether this is regarded as HSS is debatable, however, it may be the right strategy in specific contexts, as we highlight above.

State of the literature

The literature on health financing comes with similar health warnings to other areas of health systems research:

- **Variable focus:** some interventions are studied more than others, reflecting a range of factors, including donor interest, feasibility etc. Having more studies on a topic does not necessarily indicate its higher priority – for example, Witter and Bertone (2018) note that ‘the literature on health financing in fragile states focuses quite heavily on some countries – Afghanistan being by far the most highly documented – while others receive very little attention. Equally, some topics have received much more research attention than others, with aid coordination dominating, and some topics such as purchasing, quality of care, provider regulation, resource allocation, efficiency, and data and financial management systems are either totally or relatively neglected, perhaps because these are seen as less urgent issues in FCAS settings. They are, however, arguably equally or more critical to health financing and systems performance here’. Similarly, there is a bias towards what are seen as new interventions (like PBF or demand-side financing), which often receive considerable funding and study attention, while ‘older’ approaches have often not been fully evaluated.
- **Quality issues:** It is also important to note the variable quality of studies reviewed, especially in FCAS contexts (Witter, 2012). Many are hampered by poor data quality, given the challenging settings (Woodward et al., 2016), and a significant proportion are conducted by designers and implementers of health financing reforms and are therefore not independent. Many are commissioned by external agencies and there is therefore likely a neglect of smaller, local and more home-grown reforms (Witter and Bertone, 2018). Silos are also observed: the literature on fragile and post-conflict settings also tends to be distinct from that oriented towards humanitarian settings, mirroring organisational and funding differences. Many studies are also carried out shortly after implementation, when unrealistic early ‘pilot’ effects are observed, or when interventions are not yet fully bedded in. Longer term studies, though much fewer, should be given more weight in evidence reviews.
- **Interpretation:** Lack of robust evidence is no indication of lack of effect, given the points above and some of the challenges of evaluating complex interventions in dynamic settings. Equally, however, evidence of effects is not necessarily generalisable to other settings, given contextual differences and widespread heterogeneity of design of interventions, even those falling under one label of ‘type’ of intervention. What is important, therefore, as highlighted by realist methodology, is to understand how certain mechanisms of change (e.g. increasing motivation of staff, increasing responsiveness of managers, enabling more effective working conditions to provide quality care) can be triggered and sustained (and at what cost) in different environments.

Evidence on effects

With all of the above health warnings in mind, some key findings (non-comprehensive, given the broad sweep of topics) are reflected in the table below, structured according to key health financing topics and our outcomes of interest.

Table 8: Summary table on effects of health financing interventions

Health financing topic	Service access & coverage	Service quality & responsiveness	Improved health	Equity of outcomes	Financial equity and risk protection	Cost-effectiveness	Key references	Overall comments on field, including important spillover effects and contextual factors
Public spending	+	+	+ A number of studies using cross-country analysis found negative relationships between public health expenditure and life expenditure, and child and infant mortality in particular. Less relationship found for maternal mortality	+	+	Limited evidence for LMICs	Makuta and O'Hare, 2015 Farag et al., 2013 Rana et al., 2018	Quality of governance is a mediating factor, with the power to double elasticities in one study. As would be expected, relationships are more powerful for lower income countries.
Private spending	Negative impact, if out-of-pocket, as is the bulk of private expenditure in LMICs	Mixed	Mixed - positive impact on health outcomes of higher total private spend in some contexts,	-	-	Limited evidence for LMICs	Novignon et al., 2012 Rad et al., 2013 Raeesi et al., 2018	High private spend has implications for whole of health market structure, so substantial spill overs for HRH etc. Equally, the market structures will strongly influence outcomes of spending and its efficiency.

Health financing topic	Service access & coverage	Service quality & responsiveness	Improved health	Equity of outcomes	Financial equity and risk protection	Cost-effectiveness	Key references	Overall comments on field, including important spillover effects and contextual factors
			though to a lesser extent than public. Negative or neutral in others (e.g. one study in EMRO).					
External aid	+	+	+ Positive but small effects found for indicators like under-IMR.	+	+	Limited evidence for LMICs	Negeri and Halemariam, 2016 Gyimah-Brempong, 2015 Marty et al., 2017	Debate about substitution with domestic financing. Clearly, the aid delivery approach is key – harmonisation with public priorities and systems are key, especially for more aid-dependent states (e.g. FCAS). Internal distribution (geographically) is a key factor.
Health insurance	+	Mixed, depending on design	No strong evidence of impact on health outcomes (also under-studied)	Largely depends on subsidies being available to support enrolment of low-income groups	Mixed, coverage can be shallow, leaving household still exposed	Limited evidence for LMICs	Spaan et al., 2012 Escobar et al., 2010 Sood et al., 2014 Ekman, 2004 Acharya et al., 2012 Comfort et al., 2013	Social health insurance can have significant system effects, linked to separation of functions and more explicit packages. Coverage of the informal sector a major challenge however. Costs and institutional development requirements a challenge, especially in low-income settings. Consensus that community health insurance does not provide large-scale protection and coverage, however, some countries have adapted the model at scale (e.g. Rwanda). Private health insurance inequitable.
User fee exemptions and waivers	+	Mixed, much depends on whether services are fully and timely reimbursed	+ Evidence for modest improvement (depending on outcomes, study)	Mixed, potentially pro-poor	+ Dependent on population and service group targeted for exemptions; systems for	Limited evidence for LMICs	Qin et al., 2019 Lagarde and Palmer, 2008 Hatt et al., 2013 Witter, 2009 Witter et al., 2016 Leone et al., 2016	System effects depend on implementation; potential for damaging effects on facility functionality and staff motivation/quality of care if introduced without effective support and funding, as has often occurred. Complementary reforms are needed to ensure access is equitable and quality of care high. In humanitarian contexts, consensus that fees should be removed for essential care packages; however, transition

Health financing topic	Service access & coverage	Service quality & responsiveness	Improved health	Equity of outcomes	Financial equity and risk protection	Cost-effectiveness	Key references	Overall comments on field, including important spillover effects and contextual factors
			population etc.)		allocating waivers generally suffer from conflicts of interest			post-conflict can be challenging.
Health Equity Funds	+	Limited evidence	Limited evidence	+	+	Limited evidence; model also not tested in many settings	Flores et al., 2013 Jacobs et al., 2018	Introduced to circumvent conflict of interest challenge for exemptions (health staff not wanting to give waivers as reduces facility income, or selecting inappropriately). Only tested in a few countries, most especially Cambodia, in part due to active role of donors and NGOs post-conflict. Potential for HEFs to become purchasing agencies more broadly. As for most HF interventions, relies on complementary measures on demand and supply side for full effectiveness
Aid coordination mechanisms	+	Limited evidence	Limited evidence – some encouraging case studies for SWAps, but limited counter-factuals	Limited evidence, depends on how funding is used	Limited evidence	Limited evidence	Commins et al., 2013	Various mechanisms, including sector-wide approaches, joint assessments and sector budget support (more common in stable settings) and multi-donor trust funds or virtual pooling in FCAS settings. Gains from harmonisation are important in principal, especially in weaker systems, but overall evidence is mixed due to variety of forms and contexts. May by-pass, more than build, systems in FCAS settings. Important links to public financial management (feasibility of these mechanisms link to strength of PFM) and to wider governance issues (confidence in public systems, relationships between key actors etc.), as well as strength of health information systems for reporting/accountability.
Purchasing reforms	Limited evidence	Limited evidence	Limited evidence	Limited evidence	Limited evidence	Limited evidence	Busse et al., 2007 Tangcharoensathien et al., 2015	Relatively little empirical study of impact of support to reforms of purchasing (e.g. purchaser-provider split, or support to development of purchasing capacity), though some encouraging case studies (e.g. from Thailand), where a package of reforms including SP produced gains. Impact will depend on design and market conditions,

Health financing topic	Service access & coverage	Service quality & responsiveness	Improved health	Equity of outcomes	Financial equity and risk protection	Cost-effectiveness	Key references	Overall comments on field, including important spillover effects and contextual factors
								especially degree of competition. Shift in focus more recently towards more cooperative models, given complexities and uncertainties of health markets. Strong links to PBF and contracting – see below.
Contracting out/in	Potentially positive, but limited evidence	Unclear – depends on available suppliers and competition	Limited evidence	Limited evidence	Limited evidence, though some positive impacts highlighted in recent systematic review	Limited evidence	Odendaal et al., 2018	The recent systematic review concluded that: ‘contracting out healthcare services may make little or no difference in people’s use of healthcare services or to children’s health, although it probably decreases the amount of money people spend on health care. We need more studies to measure the effects of contracting out on people’s health, on people’s use of healthcare services, and on how well health systems perform. We also need to know more about the potential (negative) effects of contracting out, such as fraud and corruption, and to determine whether it provides advantages or disadvantages for specific groups in the population’. Only two studies were eligible for inclusion. Many studies are commissioned by donors and lack independence. Most studies focus on coverage to neglect of other dimensions. Links to other contractual approaches, like PBF, also commonly seen as vehicles for expanding the role of the private/PNFP sector. FCAS settings face clear institutional difficulties with contracting; however, due to gaps in coverage and donor engagement, contracting is a common modality in FCAS settings, especially post-conflict.
Performance-based financing	+ Some indicators respond better in general – where within provider scope and less effort.	Mixed, current debate about how to enhance focus on QoC within PBF design (emphasis hitherto having been quite structural, not outcomes-	Mixed. Some modest improvement but many indicators not impacted.	Mixed	Mixed. Often combined with fee removal.	Limited evidence and mixed.	Witter et al., 2012 Blacklock et al., 2016 Zeng et al., 2018 Borghi et al., 2015 Eichler et al., 2013	First systematic review of PBF in LMICs highlighted weak evidence – since then, there has been a large growth in the literature and the review is being updated (due for publication 2019). Preliminary findings highlight highly heterogeneous evidence (settings and levels of the schemes but also study designs and therefore quality of evidence), however, emergent evidence on systemic effects (especially in relation to increased autonomy for providers and some greater emphasis on data systems). Effects on health outcomes are mixed. The few recent cost-effectiveness

Health financing topic	Service access & coverage	Service quality & responsiveness	Improved health	Equity of outcomes	Financial equity and risk protection	Cost-effectiveness	Key references	Overall comments on field, including important spillover effects and contextual factors
	Some services, like FP, have not responded well to date.	focused)						analyses have been sceptical or mixed, e.g. input-based support was more cost-effective in a recent study in Zambia, compared to PBF.
Resource allocation	Potentially all but robust empirical impact assessments are limited						Diderichsen, 2004 Pearson, 2002 Ensor and Weinzierl, 2007	Relatively thin literature on this, mostly focused on introduction of resource allocation formulae and prioritisation of spend (generally normative, not empirical studies of impact of reforms). Reforms have tended to be linked to governance changes, e.g. decentralisation (as in Tanzania's TEHIP programme), i.e. linked to change in decision-making and budgeting.
Provider payments	Limited empirical evidence from LMICs, though clearly potential for impact. Existing studies tend to focus on outcomes such as efficiency and costs.						Moreno-Serra et al., 2009 Barnum et al., 2007 World Bank, 2010	Generally blended payment methods are needed to balance goals of efficiency, quality, managing risk and promoting quality. Again, the literature is more normative and OECD-focused, though some country case studies exist, especially China, mainly focused on cost containment. Also, studies assessing reforms in transitional economies post-FSU. Such studies highlight the importance of an efficient delivery system, if provider payments are to work well (e.g. primary care orientation, focus on cost effective packages, provider organisation), as well as the interaction with wider incentives (e.g. multiple payers of providers) and factors such as professional ethics.
Demand-side financing (e.g. vouchers, conditional cash transfers, unconditional cash)	+ Most studies report increased utilisation, although the degree of response is	Hampered by poor quality of care; some accompanied by measures to address this.	Limited evidence. Some schemes, like Mexico's, find health gains from a combined package of measures.	Often targeted at poor but equity impact not always measured. Under-coverage and leakage	Rarely studied.	Costs vary and overhead costs often high. Limited cost-effectiveness, though positive results for one STI programme in Nicaragua, and for mixed package	Borghi et al., 2005 Alfonso et al., 2015 Bellows et al., 2011 Glassman et al., 2013	A review of literature on DSF for SRH in LMICs highlights important preconditions for effectiveness, including many systemic factors: correct identification of demand-side barriers to use; adequate supply-side capacity and quality; the right economic conditions; appropriate design of package; the right size of transfers; motivated and incentivised suppliers; institutional capacity; strong political leadership; simple payment systems; and good collection and use of evidence.

Health financing topic	Service access & coverage	Service quality & responsiveness	Improved health	Equity of outcomes	Financial equity and risk protection	Cost-effectiveness	Key references	Overall comments on field, including important spillover effects and contextual factors
transfers, in-kind)	sometimes lower than expected, suggesting either low price elasticity of demand, poor implementation of policies and/or the presence of other (non-financial) barriers to service use			reported. Universal schemes often captured by better off.		in Uganda (DSF plus quality improvement)		
Regulation	Potentially all but robust empirical impact assessments are limited						Kumaranayake et al., 2000 Azimova et al., 2016 Patouillard et al., 2007	Often discussed in relation to the private sector, see below. Typically focused on individual providers, rather than the market as a whole. Few studies of impact of regulatory reforms in LMICs on health systems and health (a few focused specifically on pharmacy regulation). Implementation and funding of regulatory activities are also challenging in most LMICs. Strong linkages with governance, as well as HR and professional regulatory bodies.
Basic or essential packages of health services	Potentially all but robust empirical impact assessments are limited						Glassman et al., 2016 Petit et al., 2013 WHO, 2008 Watkins et al., 2017	Recent literature focused in FCAS settings. Used to focus limited resources on core services and align donors. Commonly combined with contracted out services to NGOs in post-conflict settings. Providers need to be adequately trained, resourced and incentivised to implement the chosen services, otherwise the package may have little resemblance to services actually provided. Literature is focused on package design, less on impact of their introduction.
Reforms to public/	No specific reforms are relevant here – this domain relates more to market structure and is influenced by a wide variety of system and wider features.						Wiysonge et al., 2017 Morgan et al., 2017	Private formal, informal and PNFP sectors play an important role in many areas of service delivery, though typically more

Health financing topic	Service access & coverage	Service quality & responsiveness	Improved health	Equity of outcomes	Financial equity and risk protection	Cost-effectiveness	Key references	Overall comments on field, including important spillover effects and contextual factors
private roles and mix							<p>Limwattananon, 2008 Mackintosh et al., 2016 Soderlund, et al., 2003 Basu et al., 2012</p>	<p>pro-rich in their users. Many interventions above, such as regulation and contracting, are tools to influence the role of the private sector. Across the health system, training, supplies, governance, all need to address the role of different sectors. Comparative analysis of performance by different sectors ‘do not support the claim that the private sector is usually more efficient, accountable, or medically effective than the public sector; however, the public sector appears frequently to lack timeliness and hospitality towards patients’.</p>
Public financial management	Potentially all but robust empirical impact assessments are limited						<p>Goryakin et al., 2017 Cashin et al., 2017 Piatti-Funfkirchen and Schneider, 2018</p>	<p>This topic links to extra-sectoral issues, especially coordination with MoF on reform of PFM systems more generally. Recognised recently as an important facilitator/barrier to potential reforms, and as an important driver of efficiency in the health system. Can include technical interventions such as MTEFs, or reforming budget structures, or more participatory approaches, linking strongly to governance reforms to increase accountability, reduce corruption, or decentralise. Not many robust impact assessments but see wider governance section.</p>

Conclusion

Financial resources and the systems and modalities through which they flow are a key factor in how effective (and strong, using the various criteria) health systems are. As a lubricant of all other functions, the interlinkage between reforms to financing and other system areas is also clear. The many types of interventions with potential HSS effects are clear from the (very synthetic) table above. However, it is important to note that many apparently different mechanisms can achieve similar changes, hence the emphasis on underlying functions and the recent definitions of desirable practices in relation to these. HSS monitoring should focus more on trends towards these desirable features than formal labels, which often hide heterogeneity of design. Within most health financing interventions is a bundle of activities, which trigger different mechanisms in different contexts. Evaluation is rarely able to separate their individual contributions. Moreover, the commitment to a process, quality of implementation and iterative learning are key to effectiveness, thus asking whether 'x intervention' works may not be meaningful.

All of the topics outlined above have significant potential to strengthen health systems – and, put another way, if neglected, have significant potential to undermine health systems, as illustrated by the many health system assessments which highlight the challenges raised by health financing blockages¹. Evidence strength is variable, but often linked to difficulty of gathering evidence. The main intervention which by design is seen as unlikely to further the various objectives of coverage, equity etc. is community-based health insurance. However, schemes with this label have still met with some success through successful pooling approaches, in some contexts (Kutzin, 2012). Hence the importance of considering function and wider context, not just form.

Health information

Kinds of interventions included and interlinkages

Health Information systems (HIS) include health data sources required to plan and implement national health strategies. These include electronic health records for patient care, health facility data, surveillance data, census data, population surveys, vital event records, human resource records, financial data, infrastructure data, and logistics and supply data. Health information can inform the planning and targeting of national and subnational health programs to support the achievement of health equity and universal health coverage.

HIS strengthening is the implementation of one or more interventions targeting one or more components of the HIS to improve the quality and use of data for decision making at all levels of the health system. It consists of a range of technical, behavioural, and organisational interventions. The output of a strengthened HIS is the improved availability of high-quality data used on a continuous basis for decision-making at all levels of the health system. Developing, adapting, and deploying new information technologies may help service providers 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 (Hatt et al., 2015).

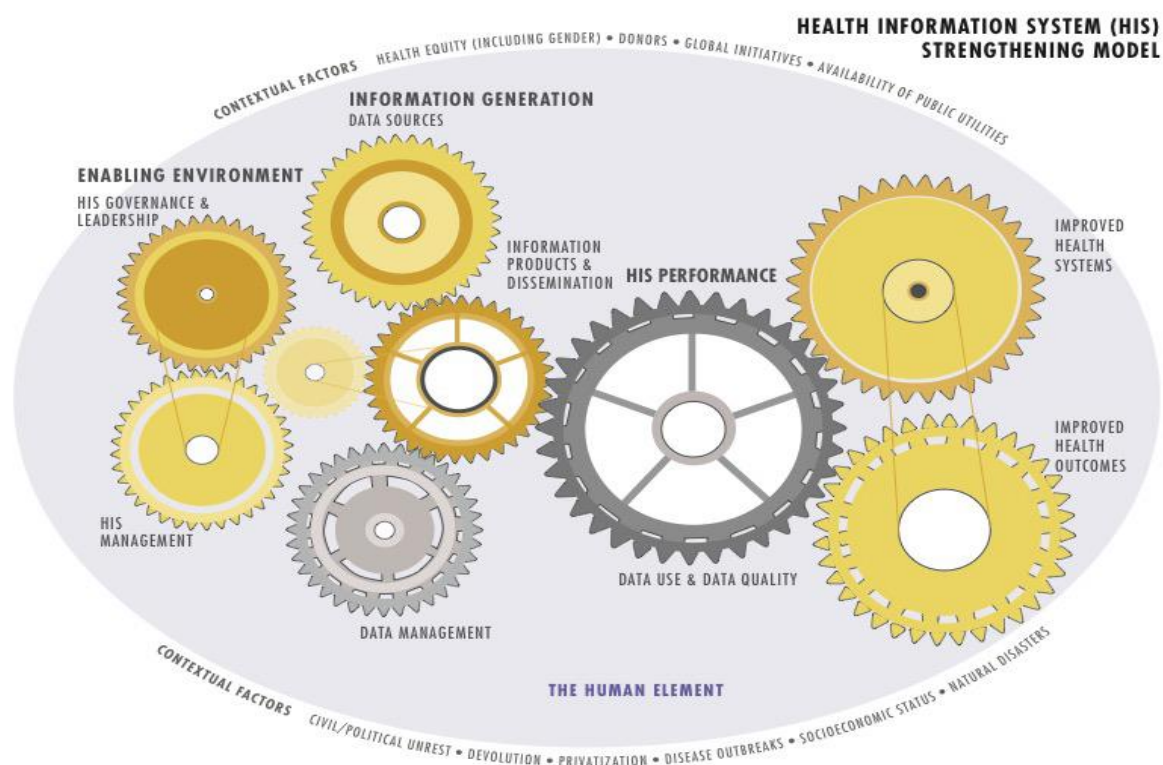
¹ Also by the increasing number of national health financing strategies, which aim to produce more focused and effective reforms in this area (Kutzin et al., 2017) <http://apps.who.int/iris/bitstream/10665/254757/1/9789241512107-eng.pdf>. Whether these are successful in HSS is yet to be established.

The HIS is often included as a component in health systems interventions that cut across several building blocks, such as district level strengthening initiatives (Mutale et al., 2018) but these interventions can be localised. Some effects are reported in other sections. Health information is also increasingly seen as an important element to facilitate Learning Health Systems (English et al., 2016).

State of the literature and evidence on effects

We identified a few papers that draw linkages between investments in key support functions, such as information systems, and health outcomes or access. However, there is a logical progression from support functions that are shown to be effective on intermediate indicators and improving access to effective health services. Current evidence discusses the role of HIS in strengthening health systems, including monitoring, data management and application, and the development of e-health agendas. Reviews identify the need for developing trained health workers in informatics, involvement of stakeholders, adaptation to local needs, strong leadership and policy direction for improving health information, and the use of routine health information systems (RHIS) to increase capacity over time (Akhlaq et al., 2016; Wagenaar et al., 2016; Luna et al., 2014).

A large programme of work by Measure Evaluation (2017) makes the case for the importance of health information system strengthening (HISS). Aqil, Lippeveld and Hozumi (2009) observe that measuring the impact of improved RHIS on health system performance is an 'unexplored, but crucial frontier in terms of attracting more investment and countering criticism of RHIS's ability to improve health system performance' (Aqil et al., 2009: 222). They propose the PRISM framework for measuring the impact of Routine Health Information System performance on the health system, and these tools have been piloted in a range of countries. PRISM places HIS strengthening efforts in the context of the familiar logic of monitoring and evaluation (M&E), where the output of HIS strengthening efforts is an improved HIS and the outcome is improved health system performance. The ultimate impact of these efforts is the improved health status of the population. The PRISM framework also describes three separate factors that are part of the inputs: technical, behavioural, and organisational.



Source: MEASURE Evaluation. 2017. Chapel Hill, NC: MEASURE Evaluation, Carolina Population Center, University of North Carolina.

Figure 4: Health information system strengthening model

Source: MEASURE Evolution, 2017

This framework proposed by Measure Evaluation (2017) builds on the work of the PRISM model and contains similar features but at a scale focused on all elements of the HIS. The health information system strengthening model (HISSM) consists of four areas: the human element, the enabling environment, information generation, and HIS performance. Interlinkages with other key areas of the health system, in particular human resources and their ability and motivation to maintain high quality HIS, are stressed.

The authors note the need to test and implement this model in a range of countries to build an evidence base on HIS strengthening, to align with contextual factors and to understand the dynamics within different health systems. They conclude “Existing HIS interventions and gaps in HIS strengthening can also be identified and documented using the HISSM. If undertaken for multiple countries, this can provide us with information to illuminate the dynamic nature of HIS strengthening” (Measure Evaluation, 2017: 34).

A review conducted by Hatt et al. (2015) identified two broad categories of 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). M-health has been excluded from this report as it

is less clearly a health systems strengthening intervention per se, but the findings on e-health are summarised here. Two systematic reviews of e-health interventions were identified. One review 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 (Blaya et al., 2010). The authors found few rigorous evaluations and little direct evidence related to service utilisation 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 behaviours or patient outcomes but found few relevant studies and did not detect significant associations (McGowan et al., 2009).

At a more detailed intervention level, studies assessed the development of health information systems and their impact on health and service quality. Some studies examined HIS and data collection and dissemination through the establishment of monitoring and data collection tools. A study from Papua New Guinea (Rosewell et al., 2017) concludes that using mobile technologies (“mhealth”) and GIS in the capture and reporting of National Health Interview Survey (NHIS) data in Papua New Guinea provided timely data required for malaria elimination. With the eNHIS, malaria case reporting shifted from aggregated sub-national reporting to individual geo-located cases reporting and is reported as timely and complete. All malaria control stakeholders can access the data and there are simple to use programme management tools. All data can be mapped to health facility or village level so that transmission foci can be visualised and responses targeted. Data aggregation, analysis, outbreak detection, and regular reporting are automated. The authors conclude that increased long-lasting insecticidal nets use and treatment of pregnant women is likely to decrease rates of maternal anaemia and low birth weight babies, although their study does not quantify this impact. Whilst this is a study that only focuses on one disease outcome, it demonstrates the value of timely and reliable health information for health outcomes, which investments in strengthening health information systems would bring.

Another study examined data collection and improvements in service provision through the development of a HIS in Nepal, consisting of a home-to-facility electronic health record platform for rural municipalities. The study reports that the intervention resulted in increased coverage amongst targeted populations (Citrin et al., 2018). Key aspects of the approach include community healthcare workers continuously engaging with populations through household visits every three months and community healthcare workers using digital tools during the routine course of clinical care. CHWs continually engaged with the population through household visits, and data was utilised for programme improvement as well as population health monitoring. The study considered the creation of a community advisory board and a monthly data system for direct use by CHWs to be effective. The community advisory board consisted of local community members and public officials and met bi-annually to provide advice and feedback. The monthly data system for direct use by CHWs provided regular data quality review sessions. The aim of data quality assessment was to track programmatic progress and challenges, identify patterns and deviations of care delivery, and monitor health outcomes among the catchment area population. Clean summary data was then visualised on topographical maps and provided to CHWs (Citrin et al., 2018).

A study in Belize (Graven et al., 2013) identified the impact of a patient-centred health information system on mortality. Using eight disease management algorithms, Belize implemented a country-

wide system which was found to be low cost (\$3 CAN per Belizean citizen per year), and mortality in these eight diseases was reduced whilst health care expenditure was stabilised (Graven et al., 2013).

Studies assessing the implementation of HIS in combination with the strengthening of primary health care in Laos (Perks et al., 2006) and with IMCI in Egypt (Rakha et al., 2013) considered appropriate technical assistance, political commitment, strong partnerships with international partners and donors, and involvement of academia as key components of success. These studies report that improved access and health outcomes were achieved as a result of the dual implementation HIS and service delivery strengthening.

Conclusion

There is a limited evidence base on the impact of investments in HIS on long-range health outcomes or intermediary health indicators (Table 9). However, there is increasing interest in this area. There is also a plausible argument that stronger health information can improve the functioning of a health system. Evaluations that connect the functioning of HIS with specific interventions without combining HIS with other forms of service delivery would allow researchers and practitioners to better understand how data and monitoring improves quality and other health outcomes. Further research should also focus on resourcing and technical evaluations of health system and outcome measures, building theory, and providing reliable paths for investment in countries where new interventions are prioritised (Measure Evaluation, 2017).

Table 9: Summary table on effects of health information and supply chain interventions

Health Information Systems	Service access & coverage	Service quality & responsiveness	Improved health	Equity of outcomes	Financial equity and risk protection	Cost-effectiveness	Key references	Overall comments on field, including important spillover effects and contextual factors
Interventions to strengthen or standardise HIS	N/A	+	+	More effective programmes in disadvantaged areas	none	none	Rosewell et al., 2017 Hatt et al., 2015 Measure Evaluation, 2017 Aqil et al., 2009 Citrin et al., 2018	<ul style="list-style-type: none"> • HIS is fundamental part of health system infrastructure. • HIS interventions are poorly researched and written up. • They are highly vulnerable to “verticalization” and other health interventions often come in conjunction with changes to HIS which may not be system wide or dealing with a broad package of services.
Interventions to strengthen the supply chain	+	+	+	+	none	none	Barton et al., 2016 MSH, 2014 Nunan and Duke, 2011	<ul style="list-style-type: none"> • Supply chain strengthening has been a key intervention of many health programmes but has been poorly researched and written up. • Large sums of money have been put into this field by GHIs such as GAVI and GFATM but there has been little evaluation.

Supply Chain

Kinds of interventions included and interlinkages

“A key view from the Global Fund’s experience... has been that... simply supplying life saving commodities without concomitant investment to strengthen health systems... will not create robust supply chains capable of meeting future demands and challenges. Without strong health systems, countries will not have the weapons they need to combat their burden of disease. This has been evident in the historic fight against HIV, for example, and more recently with the Ebola outbreak in West Africa, where inadequate health facilities, staffing and supply systems facilitated the spread of the deadly virus.” (Barton et al., 2016)

It is recognised that a key limitation in health systems is effective supply chains (Barton et al., 2016). Functioning health supply chains are essential to achieving health programme goals such as increasing availability of medicines, improving quality of health services, and delivering commodities cost-effectively. Inefficiencies in supply chain management (SCM) are linked to increased costs of medicines for patients, proliferation of falsified or substandard medicines, stock-outs, and wastage. 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 SCM to reduce stock-outs and loss due to expiration, bulk or pooled procurement of medicines to obtain lower prices and increase affordability, training of pharmacists and providers to improve stock management and prescribing practices, and others (Hatt et al, 2015).

The Global Fund has been a key actor in supply chain strengthening in the recent two decades, alongside other Global Health Initiatives such as GAVI and PEPFAR (High-Level Independent Review Panel on Fiduciary Controls and Oversight Mechanisms of the Global Fund to Fight AIDS, Tuberculosis and Malaria, 2011). Barton, Duncan and Clark (2016) estimate that between \$1.3 billion and \$1.5 billion have been invested in supply chain strengthening over the last 10 to 15 years. However, we have not been able to identify many studies that assess the impact of investments in supply chain strengthening on health outcomes or access to health care. Barton, Duncan and Clark have concluded that the lack of evidence for impact can also be due to the manner in which the money has been invested – “investments have been overwhelmingly fragmented, disjointed and piecemeal, without strategic purpose”.

State of the literature and evidence of effects

Hatt et al. (2015) were only able to identify one systematic review which focused specifically on pharmacy system interventions and their effects on health indicators. Due to the low yield of articles from the HSE database, they 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. We have supplemented the information from these reviews with a search of the grey literature, which yields some country-specific and donor-specific insights to this area of HSS.

Studies that are able to make a link to health outcomes/ intermediary measures include Nunan and Duke (2011), which reviewed the effectiveness of pharmacy interventions to improve the availability

of essential medicines at the primary health care level. They identified one randomised multi-centre trial conducted in Cameroon, Nigeria, and Uganda on “community-directed interventions” (defined as programmes where communities establish their own, locally-appropriate measures to ensure the supply of medicines, and local leaders take responsibility for the on-going 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 programmes 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 randomised controlled trial, although this latter finding was not statistically significant (Nunan and Duke, 2011). There is some evidence from observational studies in Nepal and India that training pharmaceutical staff results in fewer drug stock-outs (Nunan and Duke, 2011).

Hatt et al. (2015) found three reviews assessing the problems faced in the health commodity supply chain (Arney and Yadav, 2014; Faden et al., 2011) but little focus on interventions to address these problems. Faden et al. (2011) find several studies linking active pharmaceutical management by health insurance agencies to increased use of medicines as well as adherence to longer term treatment protocols. Huff-Rousselle (2012) in a narrative synthesis of available documents, and to some extent Arney and Yadav (2014) 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.

Zavila (2018) conducted a scoping review and found several studies in the grey literature which demonstrate effective methods to improve ‘last mile’ supply chain problems. In particular, she highlights the potential for private sector solutions to be useful in the context of supply chain management, alongside the lack of formal implementation research, in an area that is much discussed and in which there is heavy investment. Some of the studies identified provide a link to health access/outcomes.

In Malawi, Shieshia et al. (2014) found that a combination of mobile health technology to support supply chain strengthening – “c stock” – reduced stock-out rates and lead times for health surveillance assistants’ resupply in the implementation of Integrated Community Case Management. This is a good example of an intervention that crosses more than one “building block” by introducing integrated community case management via health surveillance assistants and supporting them using c stock to strengthen their drug supply chain.

Moves to involve the private sector in the storage and delivery of pharmaceuticals in countries such as Malawi, Nigeria and Kenya have delivered greater consistency in delivery and stocking rates and this intervention can be seen to have a beneficial impact on health access/ outcomes (Barton et al., 2016). In Malawi, nearly 100% of commodities were delivered to over 640 facilities within a 10-15-day distribution window, whilst in Nigeria a third-party logistics provider delivers HIV programme commodities to over 5,000 facilities. These data are not linked to improvements in health access or health outcomes, but quality of care is improved by reliable supply chains, and a link to improved health services can be expected without other health systems failures (Barton et al., 2016).

The Supply Chain Management System (SCMS) of Management Sciences for Health (MSH), funded by the US President's Emergency Plan for AIDS Relief (PEPFAR), has used a pooled procurement system for HIV and AIDS commodities across 22 countries. The high volume and frequency of procurement, averaging \$25 million with 260 deliveries, has allowed SCMS to develop close working relationships with suppliers and freight forwarders. These collaborative relationships are argued to have increased the efficiency of procurement by SCMS (Management Sciences for Health, 2014). In Ethiopia, in 2010 the Pharmaceutical Fund and Supply Agency (PFSA) implemented the Integrated Pharmaceuticals Logistics System (IPLS) to improve the management of pharmaceutical supplies through more refined record keeping, storage, and availability. IPLS provided training to improve communication between supervisors and suppliers in order to better monitor supplies stocks. By 2014, availability of essential medicines increased from 65% to 89% (Annis and Ratcliffe, 2019). Linked to supply chain strengthening is the issue of quality of laboratory services and here Alemnji et al. (2014) describe a collaboration to build sustainable laboratory capacity within Africa but are not able to provide any evidence of impact.

Conclusion

Supply chain strengthening is an area that has benefitted from large investments in recent years, particular due to the interest of global health initiatives in strengthening supply chains for their commodities. There is anecdotal and grey literature evidence of success, in particular with reforms which have moved supply chain management to a greater distance from centralised control. There is also evidence of considerable scope for private sector involvement. However, evidence that formally links investments in supply chain to greater access to health care or better outcomes is scarce. It is not clear whether the lack of evidence is due to a perception that it is not needed or a difficulty in implementing research on this topic at scale.

Service delivery

Kinds of interventions included and interlinkages

Strategies to strengthen health services are aimed at improving the provision, quality, utilisation, coverage, efficiency, and equity of health services, with the view to improving effectiveness and achieving the intended health outcomes. There is a wide range of systems strengthening interventions that focus on service delivery, both on the supply side and to a lesser extent on the demand side. The spectrum of interventions is large, from disease-focused interventions, the design and provision of packages of services (e.g. IMCI) to service redesign (e.g. strengthening community level delivery of health services), organisational strengthening (e.g., improvement of referral systems and quality improvement initiatives), the implementation of complex and multi-component interventions, and the provision of patient-focused integrated care models. On the demand side, strengthening strategies generally involve demand generation programmes at community level, and in some cases co-production of services. Supply and demand strategies can also be combined as exemplified in the Community-based Health Planning and Services (CHPS) in Ghana (see Box 1).

Box 1: Community-based Health Planning and Services (CHPS)

Community-based Health Planning and Services (CHPS) is a national health policy initiative adopted in 1999 by the Ghana Health Service (GHS). The initiative set out to improve access to primary health care (PHC) in geographically hard-to-reach and underserved areas in rural districts. The aim of CHPS was to reform the PHC system with a shift from facility-based and outreach services to community-based care provided by resident nurses, and trained volunteers from local communities. A community health nurse (CHN) or a community health officer (CHO) is stationed at the compound and is tasked with providing preventative, health promotion-oriented services as well as curative care for community members. Community health volunteers (CHVs) support CHOs and CHNs through assistance with community mobilisation and health education among other activities (Nyonator et al., 2005).

Table 10: Overview of main service delivery interventions

Main service delivery interventions	Theme (and sub-themes that are included)
Community-based delivery	Community health workers
	Interventions delivered close to home by health professionals
	Immunisation camps
	Mobile clinics
	Community-directed treatment
	Primary Health Care reforms
Integration of care	Integration of HIV services <ul style="list-style-type: none"> • into maternal and child health services • into family planning services • into primary health care services
	Integration of mother and child health care
	Integration of other health services
Strengthening referral chain	
Specific packages	Integrated Management of Childhood Illness
	Integrated Community Case Management of childhood illness
Quality improvement	Public oversight strategies
	Provider strategies: Human resources
	Provider strategies: Performance improvement or input management
	Provider strategies: Public provider reorganisation
	Household and community empowerment

Discussion of links to HSS

The majority of health systems strengthening interventions aim directly or indirectly at improving the provision of effective health care services. There are many challenges faced by HSS programmes, including the poor assessment of needs; lack of coordination between different levels of services (community, primary care, and secondary care); deficient care continuum; inefficient utilisation of resources; inadequate quality and performance monitoring; and the coordination with siloed disease specific programmes that may or may not use or interact with existing routine services.

Strengthening primary care services, and the implementation of effective strategies to outreach underserved populations, is viewed as central to strengthening systems (see WHO framework below). However, PHC systems in LMICs remain heavily marked by fragmentation of service delivery, and generally HSS support has been piecemeal and focused on particular disease programmes.

Recently WHO has emphasised that “UHC and people centred integrated health services should be regarded as interdependent and mutually reinforcing if the goals of UHC are to be realized”. Achieving people-centred and integrated health services is regarded as central to sustainable health systems in LMICs. This hypothesises that effective health service delivery needs to deliver a “continuum of health promotion, disease prevention, diagnosis, treatment, disease management, rehabilitation and palliative care services, through the different levels and sites of care within the health system (including informal, public and private service provision), and according to their needs”², working with communities.

Integration increasingly features in approaches to HSS. However, a recent review by Le et al. (2016) on health service integration on the path to universal health coverage showed that in LMICs most interventions that demonstrated some evidence of impact were a package of one or more medical conditions and the shift of service provision from specialist to primary care level, often in relation to scaling up specific programmes. These were more tightly focused on diseases than health systems (e.g. HIV, integrated management of childhood diseases), although they could potentially contribute to improved service delivery.

² <https://www.who.int/healthsystems/topics/delivery/en/>

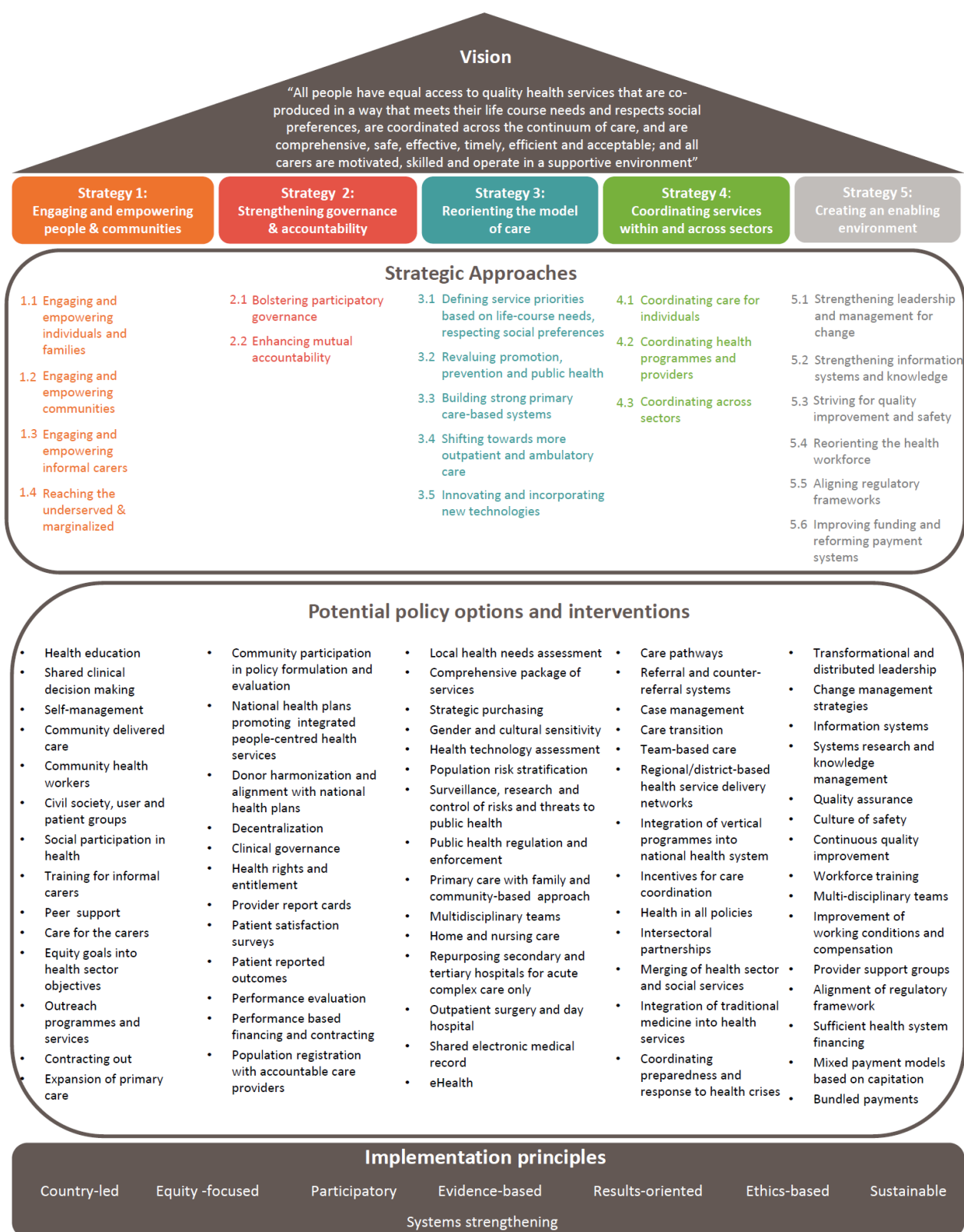


Figure 5: Framework on integrated people-centred health services: an overview

Source: https://www.who.int/servicedeliverysafety/areas/people-centred-care/Overview_IPCHS_final.pdf?ua=1

Evidence on effects

Service delivery topic	Service access & coverage	Service quality & responsiveness	Improved health	Equity of outcomes	Financial equity & risk protection	Cost-effectiveness	Key references	Overall comments on field, including important spillover effects and contextual factors
Strengthening services at the community level	+	+	+			+	Hatt et al., 2015 Schiffman et al., 2010 Mbuagbaw et al., 2015	Wide range of interventional packages.
iCCM	+	+	0			+	Guenther, 2017 Kalyango, 2013 Daviaud, 2017	Intervention includes strengthening supervision of frontline workers and ensuring reliable supply of medicines. Success dependent on support, workload, feedback and drug supply.
PHC	+		+				Geissler et al, 2015 McPake et al, 2015	Successful programmes use CHWs with regular contact with all households, collaborations with communities, strong referral capabilities and provision of first-level hospital care.
IMCI	Mixed evidence	+	+			+	Gera et al, 2016	Results depend on the quality of training and provision of systematic supervision or feedback.
Integration of HIV services	+	+	+			+	Lindgren et al Sweeney, 2012	No effects if affected by staff absences and irregular supply of essential commodities. Links to wider health system interventions such as training workers, strengthening laboratories, harmonising patient flows and improving infrastructure.
Mother and child health integration	+		+				Rahman, 2012 de Jongh et al., 2016 Macinko et al., 2006	Most effective interventions included training, and demand generation components.
Other integration studies	+	+	+	+		+	Le et al., 2016	Integration enhances well established systems rather than fundamentally changing care outcomes.
Quality improvement	+ low certainty	+ low certainty	+ low certainty				Peters et al., 2009	Transferability of strategies limited.
Strengthening referral chain							No studies conducted in LMIC identified	

Table 11: Summary table on effects of service delivery interventions

Strengthening community-level delivery of health services

We identified 11 individual studies and seven reviews that covered aspects of community-level delivery of health services, including community health workers, strengthening primary health care, mobile clinics and integrated community case management of childhood illness (iCCM).

Hatt et al included eight reviews on strengthening health services at the community level in their evidence review for USAID. They found good evidence that interventions to strengthen health services available closer to communities reduced perinatal, newborn and under-five mortality, and maternal morbidity but less evidence of effects on maternal mortality. Additionally, they reported that CHW programmes had been shown to increase uptake of care for malaria, pneumonia and diarrhoea, health behaviours such as breastfeeding, and long-acting contraceptive methods (Hatt et al., 2015). In the following paragraphs we consider additional studies and reviews that were identified in our search.

Two economic evaluations and six reviews focused on community-based intervention packages for maternal, neonatal and child health. Mbuagbaw et al. conducted a review including 34 trials and Schiffman et al. reviews including nine large-scale controlled studies, covering a wide range of interventional packages. These reviews provided evidence that community-based interventions reduced mortality for women (Schiffman et al., 2010), mortality (Mbuagbaw et al., 2015; Schiffman et al., 2010) and morbidity for babies (Mbuagbaw et al., 2015) and improved care-related outcomes (Mbuagbaw et al., 2015). A review focusing on the effect of interventions on access to health services among children in LMICs reported that delivery of services close to home improved uptake of services (Bright et al., 2017). Sibley et al. found only four studies providing insufficient evidence to establish the effectiveness of training traditional birth attendants for improving pregnancy outcomes, although they found potential to reduce peri-neonatal mortality when combined with improved health services (Sibley et al., 2007). A review on interventions delivered by lay health workers intended to improve maternal or child health or the management of infectious diseases - including 82 studies (only 27 of which were conducted in LMIC) - concluded that lay health workers provided promising benefits in promoting immunisation uptake and breastfeeding, improving tuberculosis treatment outcomes and reducing child morbidity and mortality when compared to usual care (Lewin et al., 2010).

Community-based health programmes are particularly effective in increasing treatment coverage. A systematic review identified specific strategies with the largest positive influence on treatment coverage. These were strategies that increased community participation in and ownership of distribution activities, such as community-directed distribution, incentives to increase distributor motivation and distribution along kinship networks (increases of 26.2%, 25.3% and 24.4% respectively). Door-to-door distribution and community-based delivery were found to demonstrate the highest absolute post-intervention coverage (100% and 94.5% respectively). (Deardorff et al., 2018)

Two economic evaluations analysed the costs for community-based maternal and newborn care (CBMNC). In Malawi, the cost per mother visited for a standardised 100,000 population at 95% coverage was estimated to be US\$6.1 (Greco et al., 2017). In a multi-country analysis, the annualised set-up and running financial costs of a CBMNC programme was estimated to be less than US\$1 per capita in six out of seven countries even in rural, hard to reach populations. In five out of six evaluated countries, the programme would be highly cost-effective even if it only achieved a reduction of one neonatal death per 1000 live births (Daviaud et al., 2017).

Five studies evaluated integrated community case management of childhood illness (iCCM). iCCM is a strategy of training community health workers based in villages to treat malaria, suspected pneumonia and diarrhoea. Additionally, the strategy focuses on strengthening supervision of frontline workers and ensuring a reliable supply of medicines (Unicef & WHO, 2012). In Mozambique, the introduction of iCCM improved timeliness of treatment (63.9% received treatment within 24 hours of symptom onset compared to 37.5%) and service quality (61.3% of children received the correct drug within 24 hours compared to 26.0%) (Guenther et al., 2017). In Uganda, children in intervention areas were more likely to receive prompt and appropriate antibiotics for pneumonia symptoms and were less likely to have increased temperature on day four compared to children in control areas (Kalyango et al., 2013). In Sierra Leone, only the coverage of appropriate treatment of fever increased, whereas changes for diarrhoea and pneumonia were not significant and neither was the change in under-five mortality. The researchers reported though that a reduction of morbidity was likely given that the trend in timely and equitable access, appropriate treatment, quality of care, community recognition of CHWs and utilisation over time showed the expected progress (Ratnayake et al., 2017).

Evaluating the quality of iCCM implementation, Hailu et al found that 60% of health posts were well implemented but only 26.8% were staffed with the recommended number of health workers (Hailu et al., 2018), while Bagonza et al. found that only one in five (21.7%) of CHWs performed optimally. Their performance was both associated with the support health workers received from the community, local leadership and family members as well as wider health system issues such as workload, receiving feedback and experiencing drug stock outs (Bagonza et al., 2014). A community health worker-based programme for elderly people with hypertension was found to improve service quality and access to affordable health care in Indonesia (Rahmawati and Bajorek, 2015). Kojima et al reported that a mobile medical clinic for prenatal care and sexually transmitted infection prevention increased access to educational sessions, integrated antenatal care (ANC) and HIV/STI testing for pregnant women (Kojima et al., 2017).

The strengthening of primary health care systems, including the scale up of the health extension workers, has also been a notable strategy in increasing primary care services coverage and improving health outcomes in Ethiopia. Although there is some evidence of increased coverage for a number of health services (e.g. immunisation and reproductive health) (Annis, 2019) and some evidence of narrowing of inequities (Memirie et al., 2016), there remains limited rigorous evaluation to date demonstrating evidence of health outcomes. McPake et al evaluated community-based practitioner programmes in Ethiopia, Indonesia and Kenya as being cost-effective with an incremental cost per life year gained of I\$999, I\$3396 and I\$82 respectively (McPake et al., 2015).

A programme providing primary health care through integrated microfinance and health services in five countries in Latin America was found to improve four dimensions of healthcare access (geographic accessibility, availability, affordability and acceptability) (Geissler & Leatherman, 2015). Perry et al reviewed four community-based primary health care programmes that had demonstrated reductions in infant and under-five mortality. They found several shared characteristics of these successful programmes, such as utilisation of CHWs who maintain regular contact with all households, strong collaborations with the communities, strong referral capabilities and the provision of first-level hospital care (Perry et al., 2006).

Integrated management of childhood illness (IMCI)

IMCI is a strategy developed by WHO, the United Nations Children's Emergency Fund (UNICEF) and other agencies to reduce child mortality and morbidity. It includes three main components: 1. improvement in the case management skills of health care staff through provision of locally-adapted guidelines on IMCI and activities to promote their use; 2. improvement in the overall health care system required for effective management of childhood illnesses, and 3. improvement in family and community health care practices (Gera et al., 2016).

Our search identified one review and 12 additional individual studies looking at the effects of IMCI on intermediate and long-range outcomes. Not all of the included studies implemented all three IMCI components and implementation varied which limited direct comparability.

A review including four studies concluded that there was low-certainty evidence that IMCI reduced child mortality and neonatal mortality if interventions for the neonatal period are included. They found no effect on nutritional status and little or no effect on vaccine coverage (Gera et al., 2016). Two randomised-controlled trials conducted in Bangladesh and India reported increased service uptake from appropriate providers for severe neonatal and childhood illnesses (Arifeen et al., 2004; Mazumder et al., 2014), reductions in prevalence of diarrhoea and pneumonia (Mazumder et al., 2014) and an increase in service quality measured as the mean index of correct treatment for sick children (Arifeen et al., 2004).

Increased service quality was also reported in observational studies evaluating IMCI (Bryce et al., 2005; Kader, 2013; Rakha et al., 2013; Schellenberg et al., 2004). Additionally, IMCI was found to reduce the proportion of underweight children in Nigeria (Ebuehi, 2009), double the annual rate of under-five mortality reduction in Egypt (3.3% vs 6.3%) (Rakha et al., 2013), decrease mortality rates in Tanzania by 12% (Armstrong Schellenberg et al., 2004) and lead to reductions of 49% and 42% in infant and under-five mortality respectively in Mozambique (Edward et al., 2007).

Contrary to these results, Huicho et al did not find a correlation between IMCI implementation and outpatient utilisation, vaccine coverage, mortality or nutrition indicators (Huicho et al., 2005). As possible explanations the researchers proposed the low quality of training, insufficient supervision and insufficient budgeting at national or departmental levels (Huicho et al., 2005). Setting minimum standards of quality for training and implementing systematic feedback was reported as a factor for success by several studies (Arifeen et al., 2004; Bryce et al., 2005; Rakha et al., 2013; Schellenberg et al., 2004), and struggles in scaling-up and larger human resources issues as problems faced when implementing IMCI programmes (Bryce et al., 2005).

Two studies evaluated the cost-effectiveness of IMCI. Prinja et al. found the implementation of IMCI to be very cost-effective with an incremental cost of USD 34.5 per Disability-Adjusted Life Year averted from a health system perspective and USD 24.1 per DALY averted from a societal perspective (Prinja et al., 2016). Manzi et al. evaluated the economic cost of a mentorship and enhanced supervision programme to improve quality of IMCI at USD 2.95 per additional child correctly diagnosed and USD 5.30 per additional child correctly treated (Manzi et al., 2018).

Integration

The concept of "Integration" is complex and not easily defined. It generally involves multi-component interventions aiming at responding to patients' needs through the delivery of multiple

health services and/or integrated pathways, either in one visit, one location or by the same team, in a coordinated manner. It can also refer to adding a new component to an existing service. Integration-focused interventions involve a varying number and range of health systems building blocks. The review included 22 papers, out of which there were 18 individual papers and five reviews. A Cochrane review (Dudley, 2011) identified five randomised trials and four controlled before-and-after studies, focused primarily on HIV, reproductive health and maternal and child health. It concluded that adding on services probably increases service utilisation but found no evidence that it improved health status outcomes, such as incident pregnancies.

HIV services integration

Fourteen studies, including seven reviews, evaluated the impact of integration of HIV services into either maternal and child health services, including family planning, or primary health care services. The majority of the studies (six reviews, two individual studies) focused on integration of HIV services into maternal and child health services, particularly ANC and family planning services and generally reported positive results. A review by Lindegren et al included 20 studies and found positive effects on antiretroviral therapy (ART) initiation, contraceptive use, HIV testing and quality of services (Lindegren et al., 2012). An increase in ART enrolment was also found by two other reviews (Suthar et al., 2013; Tudor Car et al., 2011). Looking at attrition rates between women testing HIV positive in pregnancy-related services and accessing long-term HIV care, a review by Ferguson et al included 20 studies and reported that full integration of HIV care and treatment services into pregnancy-related services increased women's uptake (Ferguson et al., 2012). Increased coverage of HIV testing, particularly among difficult-to-reach populations through integration of HIV testing and counselling into routine maternal and child health services, was also found in a qualitative study in Tanzania (An et al., 2015).

Car et al reported limited evidence of the effectiveness of integrated programmes (Car et al., 2012). Spaulding et al reported generally positive or mixed results of the effect of linking family planning with HIV/AIDS services in their review which included 16 studies (Spaulding et al., 2009). A study in Mozambique found no difference in follow-up of HIV-exposed infants after integration. A review by Haberlen et al. (2017) included 14 reviews and showed that although integration was associated with more effective contraceptive method prevalence and better knowledge, there was insufficient evidence to evaluate its effects on unintended pregnancy or achieving a safe and healthy pregnancy. According to Geelhoed et al, potential effects might have been overshadowed by structural healthcare system limitations, such as staff absences and irregular supply of essential commodities (Geelhoed et al., 2013).

Integration of HIV care and treatment into general health services, community-based care or primary health care was evaluated by one review and five individual studies. A review on the cost-effectiveness of integration, including 46 studies, found HIV integration into sexual and reproductive health services, integrated tuberculosis and HIV services, as well as HIV integration into primary healthcare to be cost-effective (Sweeney et al., 2012).

Further reported outcomes are an increase in access to HIV services and uptake of ART (Harris et al., 2008; Pfeiffer et al., 2010; Price et al., 2009), declines in hospitalisation rates at health facilities that offered HIV care (Price et al., 2009), and decreases in other sexually transmitted infections (Jiang et al., 2011).

In terms of impact on other services, there is mixed evidence with studies reporting no effect on other services (Price et al., 2009) and others an increase in waiting times (Deo et al., 2012). Integration into primary care was often linked to wider health system interventions such as training workers, strengthening laboratories, harmonising patient flows and improving facility infrastructures - often made possible by the use of HIV-focused funding (Deo et al., 2012; Harris et al., 2008; Jiang et al., 2011; Pfeiffer et al., 2010; Price et al., 2009).

Mother and Child Health services integration (MCH)

We identified two reviews and four individual studies that covered interventions primarily targeting the integration of Mother and Child Health Care (MCH). Individual papers included in the review aimed at using integration to improve the coverage, quality and health outcomes of MCH-related health services. Interventions described were multi-faceted and involved a combination of new and improved health services, including strengthened continuum of care referral pathways between different levels of the health systems - from pregnancy to post-delivery (Rahman, Moran et al. 2011), from pregnancy to neonatal and child health (Emond, Pollock et al. 2002, Findley, Uwemedimo et al. 2013) - and a wide health system multi-component intervention over many years (Doherty, Zembe et al. 2015). All interventions described had a strong component of demand generation, involving the development with and delivery of health services at households and community level. Interventions also involved strengthening the majority of health systems building blocks, including human resources, infrastructure and pharmaceuticals.

We found medium to good evidence that the majority of these integrated interventions had a positive impact on health outcomes and utilisation of services. Improved health outcomes included significant reduction in perinatal mortality by 36% in Bangladesh (Rahman, Moran et al. 2011), decline in infant mortality from 90 to 50 per 1000 and 160 to 84 for child mortality in Northern Nigeria, (Findley, Uwemedimo et al. 2013), and a reduction in infant mortality from 60 to 34 per 1000 in Brazil over the period (Emond, Pollock et al. 2002). The impact of the larger (Catalytic Initiative) intervention implemented over many years in ten districts in Malawi was modelled using the LiST Methodology and showed a reduction in the infant mortality rate from 219 (range of 189-249) to 119 (range of 105-132) over 10-15 years. As none of these studies used a randomised controlled trial, all studies noted limitations in proving causation and recognised other contextual factors might have biased the results. Changes in service utilisation (ANC, immunisation facility-based delivery, etc) were reported by all studies, and were large and significant in several studies (Rahman, Moran et al. 2011, Findley, Uwemedimo et al. 2013).

The two reviews predominantly evaluated the impact of adding specific intervention(s) to an existing care platform. The De Jongh study (de Jongh, Gurol-Urganci et al. 2016) showed that nine of the twelve reviews included studies related to the integration of HIV and ANC platforms, and found limited evidence that integrated delivery of services resulted in improved uptake and utilisation of services (mostly a positive effect on uptake of STI and HIV services), leading in some cases to lower rates of infection. Similarly, the review (Wallace, Dietz et al. 2009), which investigated integrated delivery of immunisation services with other services (ITNs, VitA, family planning), either routinely or as part as campaigns, demonstrated some beneficial increase in uptake in services but no health outcome data was available.

Broader health systems integration interventions

Two papers reported on systems wide integration interventions. The Belize Integrated Patient-Centred Country Wide Health Information System (BHIS) was a large scale implementation of an information management system embedded quality improvement featuring eight protocol disease domains (Graven et al., 2013). The Hopital Albert Schweitzer's integrated system in Haiti provided a set of multi-faceted interventions that involved community-based primary health care services (e.g. HCW peer-to-peer health education, community involvement, home visits, staff training immunisation, nutrition, HIV and TB prevention and treatment programmes, as well as micro-credit support) (Perry et al., 2006).

Mortality data for the eight BHIS disease management algorithm domains declined significantly and expenditure on public healthcare stabilised. The integrated hospital care intervention study provided good evidence that a well-developed system of primary health care, with outreach services to the household level, integrated with hospital referral care and community development programmes, can reduce child mortality (respectively 58% less and 76% in the intervention areas in under-five children and children aged 12-19). Similarly, population coverage of targeted child survival services was generally 1.5-2 times higher in the intervention area compared to rural Haiti.

Other integration studies

A 67-article review of service integration found that integration improved care processes and timeliness of care usually led to a reduction in costs and positive effects on user satisfaction. However, these improvements were incremental, suggesting that integration was more likely to enhance already well-established systems than fundamentally change outcomes (Le et al., 2016). A study that investigated the effects of integrating primary chronic care with primary healthcare activities in the Philippines showed some evidence of positive change on glycaemic control, including significant reductions in HbA1c, waist-hip ratio and waist circumference as well as improvement in staff knowledge and skills (Ku and Kegels, 2014). Another study exploring the integration of male reproductive health services into Health and Family Welfare Centers in Bangladesh showed limited evidence of an increase in service uptake (Al-Sabir et al., 2004).

Quality improvement

Quality improvement strategies can involve a range of components. Peters et al. conducted a review of strategies to strengthen the performance of health organisations in LMIC involved 98 studies, and categorised them according to the following organisational strategies: public oversight (e.g. contracting out, accreditation), provider-human resources (e.g. training, peer support, personal development), provider-performance improvement or input management (e.g. guidelines, supervision, audit, financial or pharmaceutical management, monitoring), provider-public provider reorganisation (e.g. decentralisation, integration) and household and community empowerment (community education, community empowerment). Peters et al. concluded that strategies are not likely to be reproducible in detail across countries. Provider-based performance improvement strategies were found to have a large effect, although because of the limited comparability between studies it was not possible to define more successful or sustainable approaches (Peters et al., 2009). An overview of systematic reviews found few studies that had been conducted in LMICs and many of the included studies had variable effects (Althabe et al 2008).

If quality improvement strategies are adapted to the local context and address underlying problems, they can have positive effects on coverage (Doherty et al, 2009; Bardfield et al, 2015, Youngleson et al, 2010), service quality (Bardfield et al., 2015, Youngleson et al, 2010) and health outcomes (Youngleson et al., 2010). These successful interventions included performance measurement, establishment of areas for improvement and development of ideas for change, as well as on-going coaching and mentoring.

Conclusion

Overall, we face challenges in generalising findings given the heterogeneity of interventions targeting service delivery. In addition, many studies do not provide sufficient details on the intervention itself and its components and how it was implemented. Despite these limitations, there is reasonable evidence that multi-component interventions, and notably those whose constituent components reinforce each other, are associated with higher effectiveness. This is particularly evidenced in the case of comprehensive service integration where, when the aim is to improve the whole continuum of care delivery - including services redesign, demand generation and quality improvement through supervision, data management and pre-service training - integration is more likely to lead to positive health outcomes, service utilisation and sustainability.

Conversely, when the intervention is designed predominately as a means to increase uptake of a specific and often siloed service (e.g. HIV uptake), without investment in broader health systems components (e.g. governance and training), impact is more limited or unknown. Similarly, so called “package” interventions (e.g. IMCI) often have an effect on increasing uptake but evidence on health outcomes was mixed. The role of community engagement in the design and implementation of the interventions also came out from the review as an ingredient of higher effectiveness of interventions reviewed. Briggs et al, 2006 note in their review, the vast majority of integration efforts focus on the supply side, with little consideration for the demand (Briggs and Garner, 2006).

Finally, it must be noted that the context in which interventions are set matters to their effectiveness and sustainability and are not easily replicable or scalable. This means that beyond the effectiveness of an HSS intervention on service delivery, one needs to gain an understanding of processes and expected mechanisms of change.

Conclusion

This review has examined evidence for what works in HSS. Initially, a more systematic approach was planned but as the review was conducted under time pressure and initial searches did not turn up the full range of expected results, a more directed approach was added, working from frameworks for the different health system blocks and searching for relevant evidence, bearing in mind the outcomes of interest and drawing on existing expertise within the group. This approach has the advantage of highlighting evidence gaps more clearly.

The lack of clarity around the central concept of HSS complicates the task of reviewing the literature, which is also potentially vast, so this review is indicative, rather than complete. Potential elements within definitions include elements relating to scope (cutting across pillars; tackling more than one disease), scale (having national reach; cutting across levels of the system), sustainability (effects being sustained; addressing blockages) and effects (impacting on outcomes, equity, and risk protection). All of these are relevant. We focused on measures with cross-cutting implications and which at least aim to create or support longer-term health systems improvements. However, we note that in some circumstances, supporting or preventing collapse in health systems may be an appropriate response (e.g. in emergency settings). It also became clear in the course of the review that substantial reforms or interventions in any health system block tend to have spill-over effects on the whole system (intended and unintended), which enlarged the literature to be examined.

There are many health system frameworks, all with their own limitations. Although our interventions all have implications beyond their 'block', the review is structured along the lines of WHO's building blocks, with studies of some of the more complex interventions included under governance, given the broad implications of governance as a sphere.

Overall, there is reasonably strong evidence of HSS interventions producing beneficial effects on system outcomes in the right circumstances, including:

- civil participation (engaging community members with health service structures and processes),
- leveraging collaborative models involving different stakeholders and health units and other sectors to work towards a clear objective,
- bundled retention packages for health staff in underserved areas,
- most interventions within health financing, though the importance is less the formal labelling of arrangements than shifting towards accepted good practices in revenue raising, pooling, purchasing and provision,
- many of the service delivery reforms, including strengthening community-level services, introducing integrated care packages such as IMCI and ICCM, PHC strengthening, service integration (especially comprehensive approaches) and some quality improvement initiatives, and
- complex interventions targeting multiple areas within a larger scale reform initiative.

Other areas look highly promising but are less well studied – these include many of the initiatives within supply chain strengthening, for example, and information systems.

It is also important to consider the costs or benefits foregone of not investing in HSS – this is well understood by most development actors but rarely systematically documented. For example, there are indications that corruption is a pervasive problem that not only undermines the effectiveness and equity of health systems but also has a major impact on outcomes; a 2011 study estimated that 140,000 child deaths per year may be linked to corruption (Hanf et al., 2011). It is expected that addressing it requires actions and policies in all system blocks and levels, as well as changing social norms and culture and social determinants of health (Mackey et al., 2018; World Bank, 2015). However, investment in anti-corruption (including that of major donors) has mainly had a narrow focus on accountability and transparency, and a systematic review found weak evidence of effectiveness for the most common anti-corruption interventions (Gaitonde et al., 2016). Similarly, it is essential to recognise and address the negative effects of disease-specific HSS programmes on routine services in order to achieve more effective mobilisation of longer-term investment towards health systems. For example, repeated “campaign” strategies targeting specific health problems displace funding that could be used to strengthen systems; avoiding this can interrupt an inefficient *modus operandi*.

In considering the case for HSS, it is important to note that the overall literature is highly skewed towards better funded areas, with more external support and interest, which means that local level innovations and smaller projects are neglected. We also highlight the tendency to evaluate what are seen as ‘new’ initiatives, while many important areas of potential reform are overlooked if seen as ‘more of the same’³, even though not well studied or understood. It also appears that more ‘operational’ topics, such as SCM and HIS, do not receive the same research and evaluative attention. Finally, more complex packages of measures, even if potentially more powerful, are harder to evaluate and also to publish on, leading to a bias towards studies of discrete investments. Many studies focus on one element within health systems and fail to describe the wider effects of an intervention, thus inadvertently ‘verticalising’ what is in fact an HSS intervention (this links back perhaps to the greater ease of publishing on more specific topics).

More significantly, within most interventions is a bundle of activities, which trigger different mechanisms in different contexts. Evaluation is rarely able to separate their individual contributions, which is a challenge to generalising from existing studies. This highlights the need to use a wider range of research methods, including realist evaluation and theory-based evaluation⁴, which is able to draw conclusions on contributions, if not attribution, as well as longitudinal studies and mixed methods.

Few studies make the link between HSS interventions and health outcomes. This is mainly because, by definition, HSS interventions are working on component parts of the system, and so the obvious outcomes to look at are systemic and not health-related. All interventions have complex theories of change relating to ultimate health system goals, but these can be summarised in a set of overarching health system process goals (see figure below). If projects, programmes or reforms contribute to these it is reasonable to assume, other things being equal, that they will improve the overall health system and its outcomes.

³ A point well made here: <https://www.tandfonline.com/doi/full/10.1080/23288604.2018.1513265>

⁴ For example: Witter, S. et al. (2018) [The Free Health Care Initiative in Sierra Leone](#) - evaluating a health system reform, 2010-2015. *International Journal of Health Planning and Management*, p. 1-15

Health Systems Strengthening Framework.

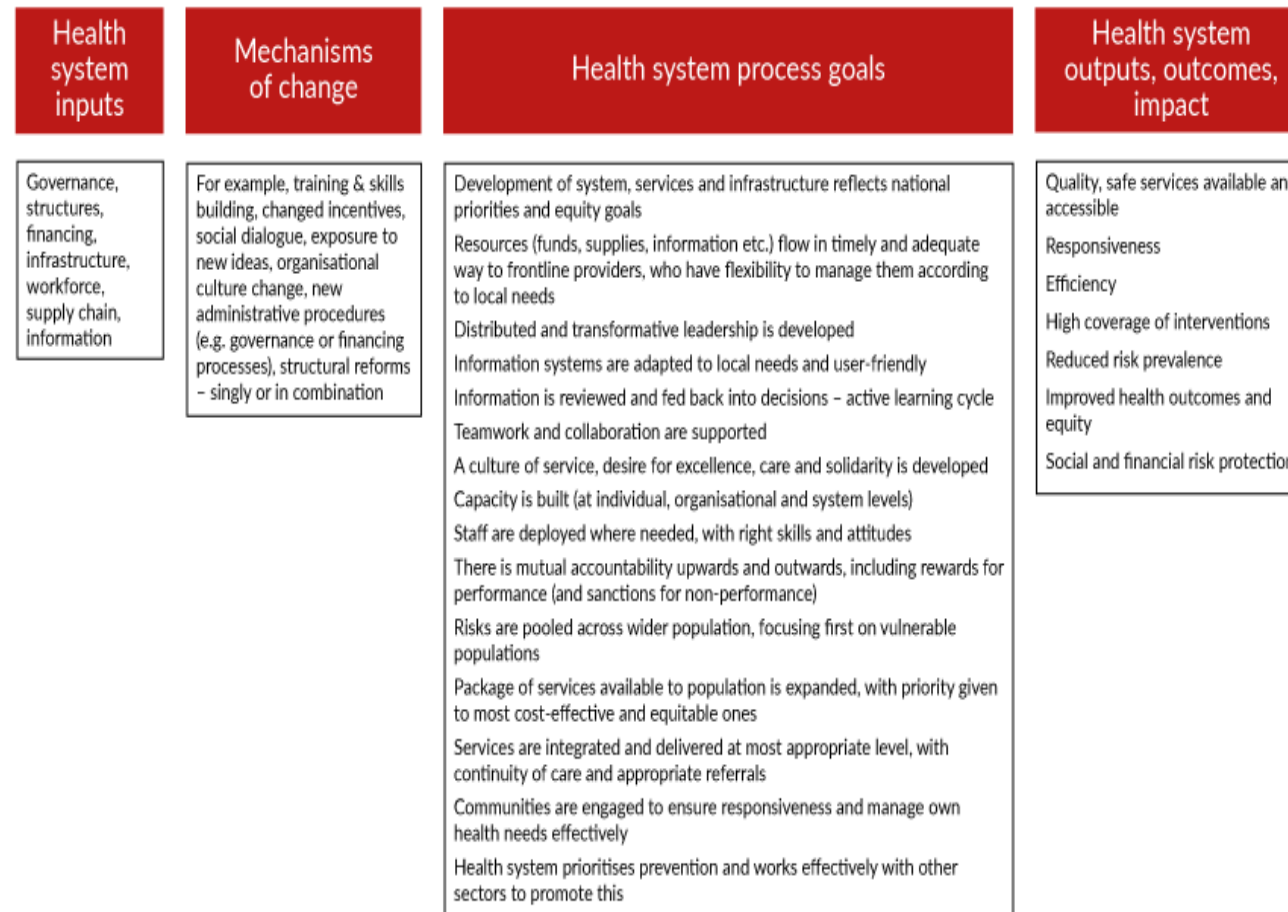


Figure 6: HSS framework and process goals

Source: The authors

Given the cost of randomised designs, the fluidity of interventions and contexts, the methodological challenges, including time-lags, and the issues raised above about generalisability, it may make sense to work from plausible interventions which have demonstrated good progress in relation to HSS process goals in prioritising support. System strengthening will also always entail concern for how any specific intervention is adapted to and works with the existing system, not only to ensure its long-term sustainability but also to support, rather than undermine, system resilience. Paying attention to system software - such as trust in relationships or leadership processes and values - is critical in this regard (Cleary et al., 2018; Gilson et al., 2017).

In relation to the research question on the sum and the parts of HSS, our review does not suggest that interventions always have to tackle more than one building block to have an impact on health service access or outcomes. Lasting impact on any part of the system is important and the cross-cutting nature of its impact can be derived from the dynamics of the system itself. Investment in a stronger health information system will, if it works, deliver a stronger health system because of the inherent and multiple connections to other blocks. Furthermore, these reforms do usually have minor parts that address the other system components, even though this is not always well reflected in the evaluations.

In terms of how reforms play out in different settings, this is hard to state in categorical terms. A recent review of health financing in FCAS settings, for example, found that the general principles of good health financing practice still applied in these settings – in fact, were even more key, given the urgent resource constraints - which are highly heterogeneous between one another in any case (Witter & Bertone, 2018). The sequencing of interventions might be somewhat different and the focus of investments was also different (reflecting donor confidence and the local health markets etc.). Equally, countries in transition often still face institutional weaknesses which might be associated with lower income countries. Each context, therefore, has to be approached with sensitivity to its unique history and features.

Factors highlighted across the studies which are likely to increase HSS success include political commitment to a process, shared societal values, taking advantage of windows of opportunity, sustained commitment, coherent reform programmes, quality of implementation and iterative learning and adaptation. The role of community engagement in the design and implementation of the interventions also came out as an ingredient of higher effectiveness in interventions reviewed, as did capacity development and mentoring.

This review focused on HSS interventions (not on qualities of a strong health system *per se*) but the wider literature on resilience and learning health systems is part of a broader body of knowledge identifying some desirable general features for strong and resilient health systems, such as adaptability, good collaborative mechanisms and intelligence gathering (Barasa et al., 2018), which can be fostered by features such as staff commitment, community cohesion and organisational flexibility (Alameddine et al., 2019).

In terms of areas for further research and evaluation, we note that:

- Supply chains and information systems appear more reliant on grey literature and donor reports and would merit more thorough assessment.
- Large-scale evaluation of national reform implementation and impact is important. Much of what we have identified is small scale, and district-based or project-based.

- We continue to need to reach consensus on definitions of HSS interventions and evaluation that are operational, including how to capture the cross-cutting elements of interventions (using and HSS lens in evaluation).
- Evidence of what interventions and policies are best suited to which contexts is still limited, especially in conflict, post-conflict countries, and those transitioning from aid or under different political arrangements.
- Furthermore, a more in-depth understanding of the informal systems that govern the behaviour of all health systems actors (patients, providers and bureaucrats), which shape their actions and determine whether health policies and interventions achieve their intended outcomes, is valuable.
- Another gap in knowledge is what happens after the specific or cross-block interventions end - what is the longer-term impact on sustainability, equity and empowerment of local actors?

References

- Abimbola, S., Negin, J., Martiniuk, A.L., and Jan, S. (2017). Institutional analysis of health system governance. *Health Policy and Planning* 32(9): 1337-1344.
- Acharya, A., Vellakkal, S., Taylor, F., Masset, E., Satija, A., Burke, M., and Ebrahim, S. (2012). *Impact of national health insurance for the poor and the informal sector in low- and middle-income countries*. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.
- Adam, T., and De Savigny, D. (2012). Systems thinking for strengthening health systems in LMICs: Need for a paradigm shift. *Health Policy and Planning* 27(4): iv1-iv3.
- Adano, U. (2008). The health worker recruitment and deployment process in Kenya: an emergency hiring program. *Human Resources for Health* 6:19.
- Akhlaq, A., McKinstry, B., Muhammad, K.B., and Sheikh, A. (2016). Barriers and facilitators to health information exchange in low- and middle-income country settings: A systematic review. *Health Policy and Planning* 31(9): 1310-1325.
- Aqil, A., Lippeveld, D., and Hozumi, D. (2009). PRISM framework: A paradigm shift for designing, strengthening and evaluating routine health information systems. *Health Policy and Planning* 24(3): 217-228.
- Akter, T., Dawson, A., and Sibbritt, D. (2016). What impact do essential newborn care practices have on neonatal mortality in low and lower-middle income countries? Evidence from Bangladesh. *Journal of Perinatology* 36(3): 225-30.
- Alameddine, M., Fouad, F.M., Diaconu, K., Jamal, Z., Lough, G., Witter, S., and Ager, A. (2019). Resilience capacities of health systems: Accommodating the needs of Palestinian refugees from Syria. *Social Science & Medicine* 220: 22-30.
- Al-Sabir, A., Alam, M.A., Hossain, S.M., Rob, U., and Khan, M.E. (2004). *Integration of Reproductive Health Services for Men in Health and Family Welfare Centers In Bangladesh*. Retrieved online. <https://www.k4health.org/sites/default/files/Integration%20of%20Reproductive%20Health%20Services%20for%20Men%20in%20Family%20Welfare%20Centers_0.pdf>
- Alfonso, Y.N., Bishai, D., Bua, J., Mutebi, A., Mayora, C., and Ekirapa-Kiracho, E. (2015). Cost-effectiveness analysis of a voucher scheme combined with obstetrical quality improvements: Quasi experimental results from Uganda. *Health Policy and Planning* 30(1): 88-99.
- Alemnji, G., Zeh, C., Yao, K., and Fonjongo, P. (2014) Strengthening national health laboratories in sub-Saharan Africa: A decade of remarkable progress. *TMIH* 19(4): 450-458.
- Alfonso, Y.N., Bishai, D., Bua, J., Mutebi, A., Mayora, C., and Ekirapa-Kiracho, E. (2015). Cost-effectiveness analysis of a voucher scheme combined with obstetrical quality improvements: Quasi experimental results from Uganda. *Health Policy and Planning* 30(1): 88-99.

An, S. J., George, A. S., LeFevre, A., Mpembeni, R., Mosha, I., Mohan, D., Yang, A., Chebet, J., Lipingu, C., Killewo, J., Winch, P., Baqui, A.H., and Kilewo, C. (2015). Program synergies and social relations: Implications of integrating HIV testing and counselling into maternal health care on care seeking. *BMC Public Health* 15(1): 1–12.

Annis, E., and Ratcliffe, H. (2019). *Strengthening primary health care systems to increase effective coverage and improve health outcomes in Ethiopia*. PHCPI. Retrieved online. <<https://improvingphc.org/strengthening-primary-health-care-systems-increase-effective-coverage-and-improve-health-outcomes-ethiopia>>

Aqil, A., Lippeveld, T., and Hozumi, D. (2009). PRISM framework: A paradigm shift for designing, strengthening and evaluating routine health information systems. *Health Policy and Planning* 24(3): 217-228.

Arifeen, S. El, Blum, L. S., Hoque, D. M. E., Chowdhury, E. K., Khan, R., Black, R. E., Victora, C.G., and Bryce, J. (2004). Integrated Management of Childhood Illness (IMCI) in Bangladesh: early findings from a cluster-randomised study. *The Lancet* 364(9445): 1595–1602.

Armstrong Schellenberg, J.R., Adam, T., Mshinda, H., Masanja, H., Kabadi, G., Mukasa, O., John, T., Charles, S., Nathan, R., Wilczynska, K., Mgalula, L., Mbuya, C., Mswia, R., Manzi, F., de Savigny, D., Schellenberg, D., and Victora, P. C. (2004). Effectiveness and cost of facility-based Integrated Management of Childhood Illness (IMCI) in Tanzania. *The Lancet* 364(9445): 1583–1594.

Arney, L., and Yadav, P. (2014). *Improving procurement practices in developing country health programs: Final report*. Ann Arbor: William Davidson Institute Healthcare Research Initiative, University of Michigan.

Asamani, J.A., Chebere, M.M., Barton, P.M., D’Almeida, S.A., Odame, E.A., and Opong, R. (2018). Forecast of healthcare facilities and health workforce requirements for the public sector in Ghana, 2016-2026. *International Journal of Health Policy and Management* 7(11): 1040-1052.

Atkinson, S., and Haran, D. (2004). Back to basics: does decentralization improve health system performance? Evidence from Ceara in north-east Brazil. *Bulletin of the World Health Organization* 82(11): 822-7.

Azimova, A., Abdraimova, A., Orozalieva, G., Muratlieva, E., Heller, O., Loutan, L., and Beran, D. (2016). Professional medical associations in low-income and middle-income countries. *The Lancet* 4: e606-e607.

Bagonza, J., Kibira, S. P., and Rutebemberwa, E. (2014). Performance of community health workers managing malaria, pneumonia and diarrhoea under the community case management programme in central Uganda: a cross sectional study. *Malaria Journal* 13(1): 367.

Baker, R., Camosso-Stefinovic, J., Gillies, C., Shaw, E.J., Cheater, F., Flottorp, S., Robertson, N., Wensing, M., Fiander, M., Eccles, M.P., Godycki-Cwirko, M., van Lieshout, J., and Jager, C. (2015). Tailored interventions to address determinants of practice. *Cochrane Database of Systematic Reviews* 29(4): CD005470.

Balabanova, D., McKee, M., and Mills, A. (2011). *'Good health at low cost' 25 years on: What makes a successful health system?* London: London School of Hygiene & Tropical Medicine.

Balabanova, D., Mills, A., Conteh, L., Akkaziya, B., Banteyerga, H., Dash, U., Gilson, L., Harmer, A., Ibraimova, A., Islam, Z., Kidanu, A., Koehlmoos, T.P., Limwattananon, S., Muraleedharan, V.R., Murzalieva, G., Palafox, B., Panichkriangkrai, W., Patcharanarumol, W., Penn-Kekana, L., Powell-Jackson, T., Tangcharoensathien, V., and McKee, M. (2013). Good Health at Low Cost 25 years on: lessons for the future of health systems strengthening. *The Lancet* 381(9883): 2118-33.

Baral, S., Subedi, H., Paudel, P., Chand, P., Shrestha, M., McCullough, A., Raven, J., Theobald, S., Martineau, T., and Elsey, H. (2018). Implementation research to assess a health workers performance-based management system in Nepal. *Acta Paediatrica* 107(S471): 24-34.

Barasa, E., Mbau, R., and Gilson, L. (2018). What is resilience and how can it be nurtured? A systematic review of empirical literature on organizational resilience. *International Journal of Health Policy Management* 7(6): 491-503.

Bardfield, J., Agins, B., Akiyama, M., Basenero, A., Lumphala, P., Kaindjee-Tjituka, F., Natanael, S., and Hamunime, N. (2015). A quality improvement approach to capacity building in low- and middle-income countries. *AIDS* 29(2): S179-86.

Barnum, H., Kutzin, J., and Saxenian, H. (2007). Incentives and provider payment methods. *International Journal of Health Planning and Management* 10(1): 23-45.

Barton, I., Duncan, R., and Clark, M. (2016). *FGATM Contribution to Strengthening In Country Supply Chains: A thematic review*. Imperial Health Sciences.

Basu, S., Andrews, J., Kishore, S., Panjabi, R., and Stuckler, D. (2012). Comparative performance of private and public healthcare systems in low- and middle-income countries: A systematic review. *PLoS Med* 9(6): e1001244.

Behera, M. R., Prutipinyo, C., Sirichotiratana, N., and Viwatwongkasem, C. (2017). Interventions for improved retention of skilled health workers in rural and remote areas. *Annals of Tropical Medicine and Public Health* 10(1): 16.

Bellows, N.M., Bellows, B.W., and Warren, C. (2011). The use of vouchers for reproductive health services in developing countries: Systematic Review. *Tropical Medicine & International Health* 16: 84-96.

Bertone, M., Jowett, M., Dale, E., Witter, S. (2019) Health financing in fragile and conflict-affected settings: what do we know, seven years on? *Social Science and Medicine*, 232, p. 209-219.

Black, N., Rafferty, A.M., West, E., and Gough, P. (2004). Health care workforce research: Identifying the agenda. *Journal of Health Services Research & Policy* 9(1): 62-4.

Blacklock, C., MacPepple, E., Kunutsor, S., and Witter, S. (2016). Paying for performance to improve the delivery and uptake of family planning in low- and middle-income countries: A systematic review. *Studies in Family Planning* 47(4): 309-324.

Blaya, J.A., Fraser, H.S., and Holt, B. (2010). E-health technologies show promise in developing countries. *Health Affairs* 29(2): 244-251.

Borghgi, J., Gorter, A., Sandiford, P. and Segura, Z. (2005). The cost-effectiveness of a competitive voucher scheme to reduce sexually transmitted infections in high-risk groups in Nicaragua. *Health Policy & Planning* 20(4): 222-231.

Borghgi, J., Little, R., Binyaruka, P., Patouillard, E., and Kuwawenaruwa, A. (2015). In Tanzania, the many costs of pay-for-performance leave open to debate whether the strategy is cost-effective. *Health Affairs* 34(3): 406-414.

Borghgi, J., Lohmann, J., Dale, E., Meheus, F., Goudge, J., Oboirien, K., and Kuwawenaruwa, A. (2017). How to do (or not to do)... Measuring health worker motivation in surveys in low-and middle-income countries. *Health Policy and Planning* 33(2): 192-203.

Bosch-Capblanch, X., Kelly, M., and Garner, P. (2011). Do existing research summaries on health systems match immunisation managers' needs in middle- and low-income countries? Analysis of GAVI health systems strengthening support. *BMC Public Health* 11: 449.

Briggs, C.J., and Garner, P. (2006). Strategies for integrating primary health services in middle- and low-income countries at the point of delivery. *Cochrane Database of Systematic Reviews* 19(2): CD003318.

Bright, T., Felix, L., Kuper, H., and Polack, S. (2017). A systematic review of strategies to increase access to health services among children in low and middle income countries. *BMC Health Services Research* 17(1): 252.

Brinkerhoff, D., and Bossert, T. (2008). *Health governance: Concepts, experience, and programming options*. USAID Health Systems 20/20 Project. Retrieved online. <<https://www.hfgproject.org/wp-content/uploads/2015/02/Health-Governance-Concepts-Experience-and-Programming-Options.pdf>>

Bryce, J., Victora, C. G., Habicht, J. P., Black, R. E., and Scherpbier, R. W. (2005). Programmatic pathways to child survival: Results of a multi-country evaluation of Integrated Management of Childhood Illness. *Health Policy and Planning* 20(1): i5-i17.

Buchan, J. (2004). What difference does ("god") HRM make? *Human Resources for Health* 2(1): 6.

Buchan, J., Couper, I.D., Tangcharoensathien, V., Thepannya, K., Jaskiewicz, W., Perfilieva, G. and Dolea, C. (2013). Early implementation of WHO recommendations for the retention of health workers in remote and rural areas. *Bulletin of the World Health Organization* 91(11): 834-40.

Busse, R., Figueras, J., Robinson, R., and Jakubowski, E. (2007). *Strategic purchasing to improve health system performance: Key issues and international trends*. Healthcare Papers 8. Retrieved online. <https://www.mig.tu-berlin.de/fileadmin/a38331600/2007.publications/HP_vol8_Splssue_busse_purchasing.pdf>

Campbell, J., Buchan, J., Cometto, G., David, B., Dussault, G., Fogstad, H., Fronteira, I., Lozano, R., Nyonator, F., Pablos-Mendez, A., Quain, E.E., Starrs, A., and Tangcharoensathien, V. (2013). Human resources for health and universal health coverage: Fostering equity and effective coverage. *Bulletin of the World Health Organization* 91(11): 853-63.

Cashin, C., Bloom, D., Sparkes, S., Barroy, H., Kutzin, J., and O'Dougherty, S. (2017). *Aligning public financial management and health financing: Sustaining progress toward universal health coverage*. Geneva: World Health Organization.

Car, L. T., van Velthoven, M. H. M. M. T., Brusamento, S., Elmoniry, H., Car, J., Majeed, A., Tugwell, P., Welch, V., Marusic, A., and Atun, R. (2012). Integrating prevention of mother-to-child HIV transmission programs to improve uptake: A systematic review. *PLoS ONE* 7(4).

Castillo-Laborde, C. (2011). Human resources for health and burden of disease: An econometric approach. *Human Resources for Health* 9: 4.

Chee, G., Pielemeier, N., Lion, A., and Connor, C. (2013). Why differentiating between health system support and health systems strengthening is needed. *International Journal of Health Planning and Management* 28(1): 85-94.

Chowdhury, A.M., Bhuiya, A., Chowdhury, M.E., Rasheed, S., Hussain, Z., and Chen, L.C. (2013). The Bangladesh paradox: Exceptional health achievement despite economic poverty. *The Lancet* 382(9906): 1734-1745.

Ciccone, D.K., Vian, T., Maurer, L., and Bradley, E.H. (2014). Linking governance mechanisms to health outcomes: A review of the literature in low- and middle-income countries. *Social Science & Medicine* 117: 86-95.

Citrin, D., Thapa, P., Nirola, I., Pandey, S., Kunwar, L.B., Tenpa, J., Acharya, B., Rayamazi, H., Thapa, A., Maru, S., Saut, A., Poudel, S., Timilsina, D., Dhungana, S.K., Adhikari, M., Khanal, M.N., Pratap, N., Acharya, B., Karki, K.B., Singh, D.R., Bangura, A.H., Wacksman, J., Storisteanu, D., Halliday, S., Schwarz, R., Shwarz, D., Choudhury, N., Kumar, A., Wu, W.J., Kalaunee, S.P., Chaudhari, P., and Maru, D. (2018). Developing and deploying a community healthcare worker-driven, digitally-enabled integrated care system for municipalities in rural Nepal. *Healthcare* 6(3): 197-204.

Clarke, M., Dick, J., Zwarenstein, M., Lombard, C., and Diwan, V. (2005). Lay health worker intervention with choice of DOT superior to standard TB care for farm dwellers in South Africa: A cluster randomised control trial. *The International Journal of Tuberculosis and Lung Disease* 9(6): 673-9.

Cleary, S., Erasmus, E., Gilson, L., Michel, C., Gremu, A., Sherr, K., and Oliver, J. (2018). The everyday practice of supporting health system development: Learning from how an externally-led intervention was implemented in Mozambique. *Health Policy and Planning* 33(7): 801-810.

Comfort, A.B., Peterson, L.A., and Hatt, L.E. (2013). Effect of health insurance on the use and provision of maternal health services and maternal and neonatal health outcomes: A systematic review. *Journal of Health, Population and Nutrition* 31(4): S81-S105.

- Commins, S., Davies, F., Gordon, A., Hodson, E., Hughes, J., and Lister, S. (2013). *Pooled funding to support service delivery: Lessons of experience from fragile and conflict-affected states*. London: DFID. Retrieved online.
https://assets.publishing.service.gov.uk/media/57a08a10ed915d622c00053d/61050-PFs-Full_Volume_May2013_.pdf
- Das, A., Gopalan, S.S., and Chandramohan, D. (2016). Effect of pay for performance to improve quality of maternal and child care in low- and middle-income countries: A systematic review. *BMC Public Health* 16(1): 321.
- Daviaud, E., Besada, D., Leon, N., Rohde, S., Sanders, D., Oliphant, N., and Doherty, T. (2017). Costs of implementing integrated community case management (iCCM) in six African countries: implications for sustainability. *Journal of Global Health* 7(1): 010403.
- Dawson, A.J., Buchan, J., Duffield, C., Homer, C.S., & Wijewardena, K. (2014). Task shifting and sharing in maternal and reproductive health in low-income countries: A narrative synthesis of current evidence. *Health Policy and Planning* 29(3): 396-408.
- De Jongh, T.E., Gurol-Urganci, I., Allen, E., Zhu, N.J. and Atun, R. (2016). Integration of antenatal care services with health programmes in low- and middle-income countries: Systematic review. *Journal of Global Health* 6: 010403.
- Deardorff, K.V., Means, A.R., Asbjornsdottir, K.H., and Walson, J. (2018). Strategies to improve treatment coverage in community-based public health programs: A systematic review of the literature. *PLoS Neglected Tropical Diseases* 12(2): e0006211.
- Deo, S., Topp, S., Garcia, A., Soldner, M., Yagci Sokat, K., Chipukuma, J., Wamulume, C.S., Reid, S.E., and Swann, J. (2012). Modeling the impact of integrating HIV and outpatient health services on patient waiting times in an urban health clinic in Zambia. *PLoS ONE* 7(4): e35479.
- DFID. (2017). International Development Committee (IDC) *Inquiry: Allocation of resources. Memorandum by the Department for International Development (DFID)*. Retrieved online.
<http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/international-development-committee/dfids-allocation-of-resources/written/28276.pdf>
- Diaconu, K., Falconer, J., Vidal, N., Azasi, E., Sarb, C., O'May, F., Elimian, K., Bou-Orm, I., Witter, S., and Ager, A. (2018). Understanding fragility: Implications for global health research and practice. Submitted to *Health Policy and Planning*.
- Diderichsen, F. (2004). *Resource allocation for health equity: Issues and methods*. Health, Nutrition and Population (HNP) Discussion Paper. Washington, DC: The World Bank.
- Doherty, T., Chopra, M., Nsiband, D., and Mngoma, D. (2009). Improving the coverage of the PMTCT programme through a participatory quality improvement intervention in South Africa. *BMC Public Health* 5(9): 406.

Doherty, J., Gilson, L., and Shung-King, M. (2018). Achievements and challenges in developing health leadership in South Africa: the experience of the Oliver Tambo Fellowship Programme 2008-2014. *Health Policy and Planning* 33(2): ii50-ii64.

Doherty, T., Zembe, W., Ngandu, N., Kinney, M., Manda, S., Besada, D., Jackson, D., Daniels, K., Rohde, S., Van Damme, W., Kerber, K., Daviaud, E., Rudan, I., Muniz, M., Oliphant, N. P., Zamasiya, T., Rohde, J. and Sanders, D. (2015). Assessment of Malawi's success in child mortality reduction through the lens of the Catalytic Initiative Integrated Health Systems Strengthening programme: Retrospective evaluation. *Journal of Global Health* 5: 020412.

Ebuehi, O.M. (2009). Health care for under-fives in Ile-Ife, South-West Nigeria: Effect of the Integrated Management of Childhood Illnesses (IMCI) strategy on growth and development of under-fives. *African Journal of Primary Health Care and Family Medicine* 1(1): 63–70.

Edward, A., Ernst, P., Taylor, C., Becker, S., Mazive, E., and Perry, H. (2007). Examining the evidence of under-five mortality reduction in a community-based programme in Gaza, Mozambique. *Transactions of the Royal Society of Tropical Medicine and Hygiene* 101(8): 814–822.

Eichler, R., Agarwal, K., Askew, I., Iriarte, E., Morgan, L., and Watson, J. (2013). Performance-based incentives to improve health status of mothers and newborns: What does the evidence show? *Journal of Health, Population and Nutrition* 31(4): S36-S47.

Ekman, B. (2004). Community-based health insurance in low-income countries: A systematic review of the evidence. *Health Policy and Planning* 19(5): 249-270.

Emond, A., Pollock, J., Da Costa, N., Maranhao, T. and Macedo, A. (2002). The effectiveness of community-based interventions to improve maternal and infant health in the Northeast of Brazil. *Revista Panamericana de Salud Publica* 12: 101-110.

English, M., Irimu, G., Agweyu, A., Gathara, D., Oliwa, J., Ayieko, P., Were, F., Paton, C., Tunis, S., and Forrest, C.B. (2016). Building learning health systems to accelerate research and improve outcomes of clinical care in low- and middle-income countries. *PLoS Medicine* 13(4): e1001991.

Ensor, T., and Weinzierl, S. (2007). Regulating health care in low- and middle-income countries: Broadening the policy response in resource constrained environments. *Social Science & Medicine* 65(2): 355-66.

Escobar, M.L., Griffin, C.C., and Shaw, R.P. (2010). *The Impact of Health Insurance in Low- and Middle-Income Countries*. Washington, DC: The Brookings Institution.

Faden, L., Vialle-Valentin, C., Ross-Degnan, D., and Wagner, A. (2011). Active pharmaceutical management strategies of health insurance systems to improve cost-effective use of medicines in low- and middle-income countries: A systematic review of current evidence. *Health Policy* 100(2-3): 134-143.

Frag, M., Nandakumar, A.K., Wallack, S., Hodgkin, D., Gaumer, G., and Erbil, C. (2013). Health expenditures, health outcomes and the role of good governance. *International Journal of Health Care Finance and Economics* 13(1): 33-52.

Ferguson, L., Grant, A. D., Watson-Jones, D., Kahawita, T., Ong'ech, J. O., and Ross, D. A. (2012). Linking women who test HIV-positive in pregnancy-related services to long-term HIV care and treatment services: A systematic review. *Tropical Medicine and International Health* 17(5): 564–580.

Findley, S.E., Uwemedimo, O.T., Doctor, H.V., Green, C., Adamu, F. and Afenyadu, G.Y. (2013). Early results of an integrated maternal, newborn, and child health program, Northern Nigeria, 2009 to 2011. *BMC Public Health* 13: 1034.

Flores, G., Ir, P., Men, C.R., O'Donnell, O., and van Doorslaer, E. (2013). Financial protection of patients through compensation of providers: The impact of health equity funds in Cambodia. *Journal of Health Economics* 32(6): 1180-93.

Fogarty, L., Mungai, K., Adano, U., and Chirchir, B. (2009). *Evaluation of a rapid workforce expansion strategy: The Kenya emergency hiring plan*. Chapel Hill, NC: Capacity Project.

Forsetlund, L., Bjorndal, A. Rashidian, A., Jamtvedt, G., O'Brien, M.A., Wolf, F., Davis, D., Odgaard-Jensen, J., and Oxman, A.D. (2009). Continuing education meetings and workshops: Effects on professional practice and health care outcomes. *Cochrane Database of Systematic Reviews* 2: CD003030.

Frehywot, S., F. Mullan, P. W. Payne and H. Ross (2010). Compulsory service programmes for recruiting health workers in remote and rural areas: do they work? *Bulletin of the World Health Organization* 88(5): 364-370.

Frimpong, J. A., Helleringer, S., Awoonor-Williams, J.K., Yeji, F., and Phillips, J.F. (2011). Does supervision improve health worker productivity? Evidence from the Upper East Region of Ghana. *Tropical Medicine & International Health* 16(10): 1225-1233.

Gaitonde, R., Oxman, A.D., Okebukola, P.O., and Rada, G. (2016). Interventions to reduce corruption in the health sector. *Cochrane Database of Systematic Reviews* 16(8): CD008856.

Geelhoed, D., Lafort, Y., Chissale, É., Candrinho, B., and Degomme, O. (2013). Integrated maternal and child health services in Mozambique: Structural health system limitations overshadow its effect on follow-up of HIV-exposed infants. *BMC Health Services Research* 13(1): 1–8.

Gera, T., Shah, D., Garner, P., Richardson, M., and Sachdev, H. S. (2016). Integrated management of childhood illness (IMCI) strategy for children under five. *Cochrane Database of Systematic Reviews* 6: CD010123.

Gertler, P., and Vermeersch, C. (2012). *Using performance incentives to improve health outcomes*. World Bank. Retrieved online. <https://elibrary.worldbank.org/doi/abs/10.1596/1813-9450-6100#>

Geissler, K. H., and Leatherman, S. (2015). Providing primary health care through integrated microfinance and health services in Latin America. *Social Science and Medicine* 132: 30–37.

Gilson, L., Barasa, E., Nxumalo, N., Cleary, S., Goudge, J., Molyneux, S., Tsofa, B., and Lehmann, U. (2017). Everyday resilience in district health systems: Emerging insights from the front lines in Kenya

and South Africa. *BMJ Global Health* 2(2): e000224.

Gilson, L., Brady, L., Naledi, T., Schneider, H., Pienaar, D., Hawkrigde, A., and Vallabhjee, K. (2017). *Development of the health system in the Western Cape: experiences since 1994*, in *SAHR – 20 Year Anniversary Edition*, SAHR, Editor. Retrieved online.
<http://www.hst.org.za/publications/South%20African%20Health%20Reviews/6_Development%20of%20the%20health%20system%20in%20the%20Western%20Cape_experiences%20since%201994.pdf>

Glassman, A., Duran, D., and Koblinsky, M. (2013). *Impact of conditional cash transfers on maternal and newborn health*. Washington, DC: Center for Global Development.

Glassman, A., Giedion, U., Sakuma, Y., and Smith, P.C. (2016). Defining a health benefits package: What are the necessary processes? *Health Systems & Reform* 2(1): 39-50.

Goryakin, Y., Revill, P., Mirelman, A., Sweeney, R., Ochalek, J., and Suhrcke, M. (2017). *Public financial management and health service delivery, a literature review*. London: Overseas Development Institute.

Gow, J., George, G., Mwamba, S., Ingombe, L., and Mutinta, G. (2013). An evaluation of the effectiveness of the Zambian Health Worker Retention Scheme (ZHWS) for rural areas. *African Health Sciences* 13(3): 800.

Graven, M., Allen, P., Smith, I. and MacDonald, N.E. (2013). Decline in mortality with the Belize Integrated Patient-Centred Country Wide Health Information System (BHIS) with Embedded Program Management. *International Journal of Medical Informatics* 82(10): 954-963.

Greco, G., Daviaud, E., Owen, H., Ligowe, R., Chimbalanga, E., Guenther, T., Gamache, N.,imba, E., and Lawn, J. E. (2017). Malawi three district evaluation: Community-based maternal and newborn care economic analysis. *Health Policy and Planning* 32(1): i64–i74.

Guenther, T., Sadruddin, S., Finnegan, K., Wetzler, E., Ibo, F., Rapaz, P., Koepsell, J., Khan, I.U., and Amouzou, A. (2017). Contribution of community health workers to improving access to timely and appropriate case management of childhood fever in Mozambique. *Journal of Global Health* 7(1): 010402.

Gyimah-Brempong, K. (2015). *Do African countries get health from health aid?* Tampa, FL: University of South Florida, Department of Economics.

Haberlen, S.A., Narasimhan, M., Beres, L.K., and Kennedy, C.E. (2017). Integration of family planning services into HIV care and treatment services: A systematic review. *Studies in Family Planning* 48(2): 153-177.

Haley, C.A., Brault, M.A., Mwinga, K., Desta, T., Ngure, K., Kennedy, S.B., Maimbolwa, M., Moyo, P., Vermund, S.H., Kipp, A.M., and WHO AFRO Child Survival Study Team. (2019). Promoting progress in child survival across four African countries: The role of strong health governance and leadership in maternal, neonatal and child health. *Health Policy and Planning* 0(0): 1-13.

Hailu, W. B., Salgado, W. B., and Walle, A. A. (2018). Factors affecting implementation of integrated community case management of childhood illnesses in South West Shoa Zone, Central Ethiopia. *Journal of Public Health and Epidemiology Full Length Research Paper* 10(5): 132–138.

Hanf, M., Van-Melle, A., Fraise, F., Roger, A., Carme, B., and Nacher, M. (2011). Corruption kills: Estimating the global impact of corruption on children deaths. *PLoS One* 6(11): e26990.

Harris, J.B., Hatwiinda, S.M., Randels, K.M., Chi, B.H., Kancheya, N.G., Jham, M.A., Samungole, K.V., Tambatamba, B.C., Cantrell, R.A., Levy, J.W., Kimerling, M.E., and Reid, S. E. (2008). Early lessons from the integration of tuberculosis and HIV services in primary care centers in Lusaka, Zambia. *International Journal of Tuberculosis and Lung Disease* 12(7): 773–779.

Hatt, L., Johns, B., Connor, C., Meline, M., Kukla, M., and Moat, K. (2015). *Impact of Health Systems Strengthening on Health*. Bethesda, MD: Health Finance & Governance Project, Abt Associates.

Hatt, L.E., Makinen, M., Madhavan, S., and Conlon, C.M. (2013). Effects of user fee exemptions on the provision and use of maternal health services: A review of literature. *Journal of Health, Population and Nutrition* 31(4): S67-S80.

High-Level Independent Review Panel on Fiduciary Controls and Oversight Mechanisms of the Global Fund to Fight AIDS, Tuberculosis and Malaria. (2011). *Turning the page from emergency to sustainability*. Retrieved online. <http://www.ip-watch.org/weblog/wp-content/uploads/2012/10/HighLevelPanel_IndependentReviewPanelOnFiduciaryControlsAndOversightMechanisms_Report_en.pdf>

Huff-Rousselle, M. (2012). The logical underpinnings and benefits of pooled pharmaceutical procurement: A pragmatic role for our public institutions? *Social Science & Medicine* 75(9): 1572-1580.

Huicho, L., Dávila, M., Gonzales, F., Drasbek, C., Bryce, J., and Victora, C.G. (2005). Implementation of the Integrated Management of Childhood Illness strategy in Peru and its association with health indicators: an ecological analysis. *Health Policy and Planning* 20(1): i32–i41.

Ivers, N., Jamtvedt, G., Flottorp, S., Young, J.M., Odgaard-Jensen, J., French, S.D., O'Brien, M.A., Johansen, M., Grimshaw, J., and Oxman, A.D. (2012). Audit and feedback: Effects on professional practice and healthcare outcomes. *Cochrane Database of Systematic Reviews* 6: CD000259.

Jacobs, B., Bajracharya, A., Saha, J., Chhea, C., Bellows, B., Flessa, S., and Antunes, A.F. (2018). Making free public healthcare attractive: Optimizing health equity funds in Cambodia. *International Journal for Equity in Health* 17: 88.

Jiang, Z., Wang, D., Yang, S., Duan, M., Bu, P., Green, A., and Zhang, X. (2011). Integrated response toward HIV: A health promotion case study from China. *Health Promotion International* 26(2): 196–211.

Kader, S. (2013). Assessment of Integrated Management of Childhood Illness (IMCI) approach in Alexandria, Egypt. *Scholars Journal of Applied Medical Sciences* 1(3): 177–190.

Kalyango, J. N., Alfvén, T., Peterson, S., Mugenyi, K., Karamagi, C., and Rutebemberwa, E. (2013). Integrated community case management of malaria and pneumonia increases prompt and appropriate treatment for pneumonia symptoms in children under five years in Eastern Uganda. *Malaria Journal* 12(1): 1.

Khaleghian, P. (2004). Decentralization and public services: the case of immunization. *Social Science and Medicine* 59(1): 163-83.

Kojima, N., Krupp, K., Ravi, K., Gowda, S., Jaykrishna, P., Leonardson-Placek, C., Siddhaiah, A., Bristow, C.C., Arun, A., Klausner, J.D., and Madhivanan, P. (2017). Implementing and sustaining a mobile medical clinic for prenatal care and sexually transmitted infection prevention in rural Mysore, India. *BMC Infectious Diseases* 17(1): 189.

Koot, J. and T. Martineau (2005). *Zambian Health Workers Retention Scheme (ZHWRS) 2003-2004*. Lusaka: Ministry of Health.

Ku, G.M., and Kegels, G. (2014). Integrating chronic care with primary care activities: enriching healthcare staff knowledge and skills and improving glycemic control of a cohort of people with diabetes through the First Line Diabetes Care Project in the Philippines. *Global Health Action* 7: 25286.

Kumaranayake, L., Mujinja, P., Hongoro, C., and Mpembeni, R. (2000). How do countries regulate the health sector? Evidence from Tanzania and Zimbabwe. *Health Policy and Planning* 15(4): 357-67.

Kutzin, J. (2012). Anything goes on the path to universal health coverage? *Bulletin of the World Health Organization* 90: 867-868.

Kutzin, J., Witter, S., Jowett, M., and Bayarsaikhan, D. (2017). *Developing a national health financing strategy: A reference guide*. Health Financing Guidance Series No. 3. Geneva: World Health Organization.

Kuruvilla, S., Schweitzer, J., Bishai, D., Chowdhury, S., Garamani, D., Frost, L., Cortez, R., Daelmans, B., de Francisco, A., Adam, T., Cohen, R., Alfonso, Y.N., Franz-Vasdeki, J., Saadat, S., Pratt, B.A., Eugster, B., Bandali, S., Venkatachalam, P., Hinton, R., Murray, J., Arscott-Mills, S., Axelson, H., Maliqi, B., Sarker, I., Lakshminarayanan, R., Jacobs, T., Jacks, S., Mason, E., Ghaffar, A., Mays, N., Presern, C., and Bustreo, F. (2014). Success Factors for Women's and Children's Health study groups. *Bulletin of the World Health Organization* 92(7): 533-44B.

Lagarde, M. and Palmer, N. (2008). The impact of user fees on health service utilization in low- and middle-income countries: How strong is the evidence? *Bulletin of the World Health Organization* 86(11): 839-848.

Lagarde, M. and Palmer, N. (2009). The impact of contracting out on health outcomes and use of health services in low and middle-income countries. *Cochrane Database of Systematic Reviews* 4: CD008133.

Le, G., Morgan, R., Bestall, J., Featherstone, I., Veale, T., and Ensor, T. (2016). Can service integration work for universal health coverage? Evidence from around the globe. *Health Policy* 120(4): 406-19.

Leone, T., Cetorelli, V., Neal, S., and Matthews, Z. (2016). Financial accessibility and user fee reforms for maternal healthcare in five sub-Saharan countries: A quasi-experimental analysis. *BMJ Open* 6(1): e009692.

Lewin, S., Munabi-Babigumira, S., Glenton, C., Daniels, K., Bosch-Capblanch, X., van Wyk, B.E., Odgaard-Jensen, J., Johansen, M., Aja, G.N., Zwarenstein, M., and Scheel, I.B. (2010). Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases. *Cochrane Database of Systematic Reviews* 17(3): CD004015.

Lewis, M. (2006). *Governance and Corruption in Public Health Care Systems*. Working Paper Number 78. Washington, DC: Center for Global Development.

Limwattananon, S. (2008). *Private-public mix in woman and child health in low-income countries: An analysis of demographic and health services*. The Rockefeller Foundation, Sponsored Initiative on the Role. Retrieved online. <<https://www.r4d.org/resources/private-public-mix-woman-child-health-low-income-countries/>>

Lindegren, M.L., Kennedy, C.E., Bain-Brickley, D., Azman, H., Creanga, A.A., Butler, L.M., Spaulding, A.B., Horvath, T., and Kennedy, G.E. (2012). Integration of HIV/AIDS services with maternal, neonatal and child health, nutrition, and family planning services. *Cochrane Database of Systematic Reviews* 9: CD010119.

Liu, X., Hotchkiss, D.R., and Bose, S. (2008). The effectiveness of contracting-out primary health care services in developing countries: A review of the evidence. *Health Policy and Planning* 23(1): 1–13.

Luna, D., Almerares, A., Mayan, J.C., Quiros, F.G., and Otero, C. (2014). Health informatics in developing countries: Going beyond pilot practices to sustainable implementations, a review of the current challenges. *Healthcare Informatics Research* 20(1): 3-10.

Macinko, J., Guanais, F.C., and De Souza, M.D.F.M. (2006). Evaluation of the impact of the family health program on infant mortality in Brazil, 1990-2002. *Journal of Epidemiology & Community Health* 60(1): 13-19.

Mackey, T.K., Vian, T., and Kohler, J. (2018). The sustainable development goals as a framework to combat health-sector corruption. *Bulletin of the World Health Organization* 96(9): 634-643.

Mackintosh, M., Channon, A., Karan, A., Selvaraj, S., Cavagnero, E., and Zhao, H. (2016). What is the private sector? Understanding private provision in the health systems of low-income and middle-income countries. *The Lancet* 388(10044): 596-605.

Magar, V., Gerecke, E., Dhillon, I.S., and Campbell, J. (2017). Women's contributions to sustainable development through work in health: Using a gender lens to advance a transformative 2030 agenda. In *Health Employment and Economic Growth: An Evidence Base*. Geneva: World Health Organization.

Makuta, I., and O'Hare, B. (2015). Quality of governance, public spending on health and health status in Sub Saharan Africa: A panel data regression analysis. *BMC Public Health* 21(15): 932.

Management Sciences for Health. (2014). *Improving the performance of supply chains*. Retrieved online. <<http://www.msh.org/blog/2014/04/29/improving-the-performance-of-supply-chains>>

Manzi, A., Mugunga, J. C., Iyer, H. S., Magge, H., Nkikabahizi, F., and Hirschhorn, L. R. (2018). Economic evaluation of a mentorship and enhanced supervision program to improve quality of integrated management of childhood illness care in rural Rwanda. *PLoS ONE* 13(3): 1–12.

Marchal, B., Dedzo, M., and Kegels, G. (2010). A realist evaluation of the management of a well-performing regional hospital in Ghana. *BMC Health Services Research* 10(1): 24.

Martineau, T., Raven, J., Aikins, M., Alonso-Garbayo, A., Baine, S., Huss, R., Maluka, S., and Wyss, K. (2018). Strengthening health district management competencies in Ghana, Tanzania and Uganda: Lessons from using action research to improve health workforce performance. *BMJ Global Health* 3: e000619.

Martineau, T., and Tapera, S. (2012). *Support to reproductive and child health Sierra Leone systems: A rapid assessment of staff performance management systems*. London: Options.

Marty, R., Dolan, C.B., Leu, M., and Runfola, D. (2017). Taking the health aid debate to the subnational level: The impact and allocation of foreign health aid in Malawi. *BMJ Global Health* 2(1): e000129.

Mazumder, S., Taneja, S., Bahl, R., Mohan, P., Strand, T. A., Sommerfelt, H., Kirkwood, B.R., Goyal, N., van den Hombergh, H., Martines, J., and Bhandari, N. (2014). Effect of implementation of Integrated Management of Neonatal and Childhood Illness programme on treatment seeking practices for morbidities in infants: Cluster randomised trial. *BMJ* 349: 1–15.

Mbuagbaw, L., Medley, N., Darzi, A., Richardson, M., Habiba Garga, K., and Ongolo-Zogo, P. (2015). Health system and community level interventions for improving antenatal care coverage and health outcomes (Review). *Cochrane Database of Systematic Reviews* 12: CD010994.

McCollum, R., Gomez, W., Theobald, S., and Taegtmeier, M. (2016). How equitable are community health worker programmes and which programme features influence equity of community health worker services? A systematic review. *BMC Public Health* 16(1): 419.

McGowan, J.L., Grad, R., Pluye, P., Hannes, K., Deane, K., Labrecque, M., Welch, V., and Tugwell, P. (2009). Electronic retrieval of health information by healthcare providers to improve practice and patient care. *Cochrane Database of Systematic Reviews* 3: CD004749.

McPake, B., Edoaka, I., Witter, S., Kielmann, K., Taegtmeier, M., Dieleman, M., Vaughan, K., Gama, E., Kok, M., Datiko, D., Otiso, L., Ahmed, R., Squires, N., Suraratdecha, C., and Cometto, G. (2015). Cost-effectiveness of community-based practitioner programmes in Ethiopia, Indonesia and Kenya. *Bulletin of the World Health Organization* 93: 631–639A.

McPake, B., Maeda, A., Araujo, E.C., Lemiere, C., El Maghraby, A., and Cometto, G. (2013). Why do health labour market forces matter? *Bulletin of the World Health Organization* 91(11): 841–846.

Measure Evaluation. (2017). *Strengthening health information systems in low- and middle-income countries, a model to frame what we know and what we need to learn*. Retrieved online. <<https://www.measureevaluation.org/resources/publications/tr-17-156>>

Measure Evaluation. (2017). *Strengthening health information systems in Mali*. Retrieved online. <https://www.measureevaluation.org/resources/publications/fs-17-236_en>

Memirie, S.T., Verguet, S., Norheim, O.F., Levin, C., and Johansson, K.A. (2016). Inequalities in utilization of maternal and child health services in Ethiopia: The role of primary health care. *BMC Health Services Research* 16: 51.

Moreno-Serra, R., Morena-Serra, R., and Wagstaff, A. (2009). System-wide impacts of provider-payment reforms: Evidence from the health sectors of Central and Eastern Europe and Central Asia. *BMC Health Services Research* 9(1): A2.

Morgan, R., Ensor, T., and Waters, H. (2016). Performance of private sector health care: Implications for universal health coverage. *The Lancet* 388(10044): 606-12.

Mutale, W., Cleary, S., Olivier, J., Chilengi, R., and Gilson, L. (2018). Implementing large-scale health systems strengthening interventions: Experience from the better health outcomes through mentoring and assessments (BHOMA) project in Zambia. *BMC Health Services Research* 18: 795.

Mutale, W., Vardoy-Mutale, A.T., Kachemba, A., Mukendi, R., Clarke, K., and Mulenga, D. (2017). Leadership and management training as a catalyst to health systems strengthening in low-income settings: Evidence from implementation of the Zambia Management and Leadership course for district health managers in Zambia. *PLoS One* 12(7): e0174536.

Mutale, W., Stringer, J., Chintu, N., Chilengi, R., Mwanamwenge, M.T., Kasese, N., Balabanova, D., Spicer, N., Lewis, J., and Ayles, H. (2014). Application of balanced scorecard in the evaluation of a complex health system intervention: 12 months post intervention findings from the BHOMA intervention: a cluster randomised trial in Zambia. *PLoS One* 9(4): e93977.

Mutale, W., Mwanamwenge, M.T., Balabanova, D., Spicer, N., and Ayles, H. (2013). Measuring governance at health facility level: developing and validation of simple governance tool in Zambia. *BMC International Health and Human Rights* 13: 34.

Mutale, W., Balabanova, D., Chintu, N., Mwanamwenge, M.T., and Ayles, H. (2014). Application of system thinking concepts in health systems strengthening in low-income settings: A proposed conceptual framework for the evaluation of a complex health system intervention: The case of the BHOMA intervention in Zambia. *Journal of Evaluation in Clinical Practice* 22(1): 112-121.

Mutale, W., Bond, V., Mwanamwenge, M.T., Mlewa, S., Balabanova, D., Spicer, N., and Ayles, H. Systems thinking in practice: the current status of the six WHO building blocks for health systems strengthening in three BHOMA intervention districts of Zambia: a baseline qualitative study. *BMC Health Services Research* 13: 291.

Mwaniki, M.K., Vaid, S., Chome, I.M., Amolo, D., and Tawfik, Y. (2014). Improving service uptake and quality of care of integrated maternal health services: The Kenya kwale district improvement collaborative. *BMC Health Services Research* 14: 416.

Negeri, K.G., and Halemariam, D. (2016). Effect of health development assistance on health status in sub-Saharan Africa. *Risk Management and Healthcare Policy* 9: 33-42.

Novignon, J., Olakojo, S.A., and Nonvignon, J. (2012). The effects of public and private health care expenditure on health status in sub-Saharan Africa: New evidence from panel data analysis. *Health Economics Review* 2: 22.

Nunan, M., and Duke, T. (2011). Effectiveness of pharmacy interventions in improving availability of essential medicines at the primary healthcare level. *Tropical Medicine & International Health* 16(5): 647-658.

Nyonator, F.K., Awoonor-Williams, J.K., Phillips, J.F., Jones, T.C., and Miller, R.A. (2005). The Ghana Community-based Health Planning and Services Initiative for Scaling Up Service Delivery Innovation. *Health Policy and Planning* 21(1): 25-34.

O'Brien, M.A., Rogers, S., Jamtvedt, G., Oxman, A.D., Odgaard-Jensen, J., Kristoffersen, D.T., Forsetlund, L., Bainbridge, D., Freemantle, N., Davis, D.A., Haynes, R.B., and Harvey, E.L. (2007). Educational outreach visits: Effects on professional practice and health care outcomes. *Cochrane Database of Systematic Reviews* 4: CD000409.

Odendaal, W., Ward, K., Uneke, J., Uro-Chukwu, H., Chitama, D., Balakrishna, Y., and Kredo, T. (2018). Contracting out to improve the use of clinical health services and health outcomes in low- and middle-income countries (Review). *Cochrane Database of Systematic Review* 4: CD008133.

ODI. (2019). *Development progress project*. Retrieved online.

<<http://www.developmentprogress.org/>>

Okyere, E., Mwanri, L., and Ward, P. (2017). Is task-shifting a solution to the health workers' shortage in Northern Ghana? *PloS One* 12(3): e0174631.

O'Neil, M., Jarrah, Z., Nkosi, L., Collins, D., Perry, C., Jackson, J., Kuchande, H., and Mlambala, A. (2010). *Evaluation of Malawi's emergency human resources programme*. Cambridge, MA: DFID, MSH, and MSC.

Panda, B., and Thakur, H.P. (2016). Decentralization and health system performance - a focused review of dimensions, difficulties, and derivatives in India. *BMC Health Services Research* 16(6): 561.

Pascal, M.R., Mann, M., Dunleavy, K., Chevan, J., Kirenga, L., and Nuhu, A. (2017). Leadership development of rehabilitation professionals in a low-resource country: A transformational leadership, project-based model. *Frontiers in Public Health* 5: 143.

Patouillard, E., Goodman, C. A., Hanson, K. G., and Mills, A. J. (2007). Can working with the private for-profit sector improve utilization of quality health services by the poor? A systematic review of the literature. *International Journal for Equity in Health* 6(1): 17.

Pearson, M. (2002). *Allocating public resources for health: Developing pro-poor approaches*. London: DFID Health Systems Resource Centre.

Perks, C., Toole, M., and Phouthonsy, K. (2006). District health programmes and health-sector reform: Case study in the Lao People's Democratic Republic. *Bulletin of the World Health Organization* 84(2): 132–138.

Perrier, L., Mrklas, K., Lavis, J.N., and Straus, S.E. (2011). Interventions encouraging the use of systematic reviews by health policymakers and managers: A systematic review. *Implementation Science* 6: 43.

Perry, H.B., Cayemittes, M., Philippe, F., Dowell, D., Dortonne, J.R., Menager, H., Bottex, E., Berggren, W., and Berggren, G. (2006). Reducing under-five mortality through Hopital Albert Schweitzer's integrated system in Haiti. *Health Policy and Planning* 21(3): 217-30.

Peters, D.H., El-Saharty, S., Siadat, B., Janovsky, K., and Vujcic, M. (2009). *Improving health service delivery in developing countries: From evidence to action*. Washington, DC: The World Bank.

Petit, D., Sondorp, E., Mayhew, S., Roura, M., and Roberts, B., (2013). Implementing a Basic Package of Health Services in post-conflict Liberia: Perceptions of key stakeholders. *Social Science & Medicine* 78: 42–9.

Pfeiffer, J., Montoya, P., Baptista, A. J., Karagianis, M., Pugas, M. M., Micek, M., Johnson, W., Sherr, K., Gimbel, S., Baird, S., Lambdin, B., and Gloyd, S. (2010). Integration of HIV/AIDS services into African primary health care: lessons learned for health systems strengthening in Mozambique - a case study. *Journal of the International AIDS Society* 13(1): 3.

Piatti-Funfkirchen, M., and Schneider, P. (2018). From stumbling block to enabler: The role of public financial management in health service delivery in Tanzania and Zambia. *Health Systems & Reform* 4(4): 336-345.

Polus, S., Lewin, S., Glenton, C., Lerberg, P.M., Rehfuess, E., and Gülmezoglu, A.M. (2015). Optimizing the delivery of contraceptives in low-and middle-income countries through task shifting: A systematic review of effectiveness and safety. *Reproductive Health* 12(1): 27.

Price, J. E., Leslie, J. A., Welsh, M., and Binagwaho, A. (2009). Integrating HIV clinical services into primary health care in Rwanda: A measure of quantitative effects. *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV* 21(5): 608–614.

Prinja, S., Bahuguna, P., Mohan, P., Mazumder, S., Taneja, S., Bhandari, N., van den Hombergh, H., and Kumar, R. (2016). Cost effectiveness of implementing integrated management of neonatal and childhood illnesses program in district Faridabad, India. *PLoS ONE* 11(1): 1–19.

Purohit, B., and Martineau, T. (2016). Issues and challenges in recruitment for government doctors in Gujarat, India. *Human Resources for Health* 14(1): 1-14.

Purohit, B., Martineau, T., and Sheikh, K. (2016). Opening the black box of transfer systems in public sector health services in a Western state in India. *BMC Health Services Research* 16(1): 419.

Qin, V.M., Hone, T., Millett, C., Moreno-Serrra, R., McPake, B., Atun, R., and Lee, J.T. (2019). The impact of user fee charges on health outcomes in low-income and middle-income countries: A systematic review. *BMJ Global Health* 3: e001087.

Rad, E.H., Vahedi, S., Teimourizad, A., Esmailzadeh, F., Hadian, M., and Pour, A.T. (2013). Comparison of the effects of public and private health expenditures on the health status: A panel data analysis in Eastern Mediterranean countries. *International Journal of Health Policy and Management* 1(2): 163-167.

Raeesi, P., Harati-Khalilabad, T., Rezapour, A., Azari, S., and Javan-Noughabi, J. (2018). Effects of private and public health expenditure on health outcomes among countries with different health care systems: 2000 and 2014. *Medical Journal of the Islamic Republic of Iran* 1(32): 35.

Rahman, A., Moran, A., Pervin, J., Rahman, A., Rahman, M., Yeasmin, S., Begum, H., Rashid, H., Yunus, M., Hruschka, D., Arifeen, S. E., Streatfield, P. K., Sibley, L., Bhuiya, A. and Koblinsky, M. (2011). Effectiveness of an integrated approach to reduce perinatal mortality: Recent experiences from Matlab, Bangladesh. *BMC Public Health* 11: 914.

Rahmawati, R., and Bajorek, B. (2015). A Community Health Worker-Based Program for Elderly People With Hypertension in Indonesia: A Qualitative Study, 2013. *Preventing Chronic Disease* 12: E175.

Rakha, M.A., Abdelmoneim, A.N.M., Farhoud, S., Pièche, S., Cousens, S., Daelmans, B., and Bahl, R. (2013). Does implementation of the IMCI strategy have an impact on child mortality? A retrospective analysis of routine data from Egypt. *BMJ Open* 3(1): 1–9.

Rana, R.H., Alam, K., and Gow, J. (2018). Health expenditure, child and maternal mortality nexus: A comparative global analysis. *BMC International Health and Human Rights* 18(1): 29.

Ratnayake, R., Ratto, J., Hardy, C., Blanton, C., Miller, L., Choi, M., Kpaleyaa, J., Momoh, P., and Barbera, Y. (2017). The effects of an integrated community case management strategy on the appropriate treatment of children and child mortality in Kono District, Sierra Leone: A program evaluation. *American Journal of Tropical Medicine and Hygiene* 97(3): 964–973.

Reich, M., Takemi, K., Roberts, M., and Hsiao, W.C. (2008). Global action on health systems: A proposal for the Tokyo G8 summit. *The Lancet* 371: 865-9.

Reid, S. (2003). Community service for health professionals. *South African Health Review*. Durban, Health Systems Trust.

Rohde, J., Cousens, S., Chopra, M., Tangcharoensathien, V., Black, R., Bhutta, Z.A., and Lawn, J.R. (2008). 30 years after Alma-Ata: has primary health care worked in countries? *The Lancet* 372(9642): 950-61.

Roome, E., Raven, J., and Martineau, T. (2014). Human resource management in post-conflict health systems: Review of research and knowledge gaps. *Conflict and Health* 8(1): 18.

Rosewell, A., Makita, L., Muscatello, D., John, L.N., Bieb, S., Hutton, R., Ramamurthy, S., and Shearman, P. (2017). Health information system strengthening and malaria elimination in Papua New Guinea. *Malaria Journal* 16: 278.

Rowe, A.K., Labadie, G., Jackson, D., Vivas-Torrealba, C., and Simon, J. (2018). Improving health worker performance: An ongoing challenge for meeting the sustainable development goals. *BMJ* 362: k2813.

Samuels, F., Amaya, A.B., and Balabanova, D. (2017). Drivers of health systems strengthening: Learning from implementation of maternal and child health programmes in Mozambique, Nepal and Rwanda. *Health Policy and Planning* 32(7): 1015-1031.

Schaaf, M., and Freedman, L.P. (2015). Unmasking the open secret of posting and transfer practices in the health sector. *Health Policy and Planning* 30(1): 121-130.

Scheffler, R., Herbst, C., Lemiere, C., and Campbell, J. (2016). *Health Labor Market Analyses in Low- and Middle-Income Countries: An Evidence-Based Approach*. Washington, DC: World Bank.

Schiffman, J., Darmstadt, G.L., Agarwal, S., and Baqui, A.H. (2010). Community-based intervention packages for improving perinatal health in developing countries: A review of the evidence. *Seminars in Perinatology* 34(6): 462-76.

Scott, K., Beckham, S.W., Gross, M., Pariyo, G., Rao, K.D., Cometto, G., and Perry, H.B. (2018). What do we know about community-based health worker programs? A systematic review of existing reviews on community health workers. *Human Resources for Health* 16(1): 39.

Shieshia, M., Noel, M., Andersson, S., Felling, B., Alva, S., Agarwal, S., Lefevre, A., Misomali, A., Chiphanga, B., Nsona, H., and Chandani, Y. (2014). Strengthening community health supply chain performance through an integrated approach: Using mHealth technology and multilevel teams in Malawi. *Journal of Global Health* 4(2): 020406.

Soderlund, N., Mendoza-Arana, P., and Goudge, J. (2003). *The new public/private mix in health: Exploring the changing landscape*. Geneva: World Health Organization.

Sood, N., Bendavid, E., Mukherji, A., Wagner, Z., Nagpal, S., and Mullen, P. (2014). Government health insurance for people below poverty line in India: Quasi-experimental evaluation of insurance and health outcomes. *BMJ* 349: g5114.

Spaan, E., Mathijssen, J., Tromp, N., McBain, F., ten Have, A., and Baltussen, R. (2012). The impact of health insurance in Africa and Asia: A systematic review. *Bulletin of the World Health Organization* 90(9): 685-692.

Sumah, A.M., Baatiema, L., and Abimbola, S. (2016). The impacts of decentralisation on health-related equity: A systematic review of the evidence. *Health Policy* 120(10): 1183-1192.

Tambulasi, R.I. (2010). *Reforming the Malawian public sector: Retrospectives and Prospectives*. Dakar: Council for the Development of Social Science Research in Africa

Tangcharoensathien, V., Limwattananon, S., Patcharanarumol, W., Thammatacharee, J., Jongudomsuk, P., and Sirilak, S. (2015). Achieving universal health coverage goals in Thailand: The vital role of strategic purchasing. *Health Policy and Planning* 30(9): 1152-1161.

Thomson, D.R., Amoroso, C., Atwood, S., Bonds, M.H., Rwabukwisi, F.C., Drobac, P., Kinnegan, K.E., Farmer, D.B., Farmer, P.E., Habinshuti, A., Hirchhorn, L.R., Manzi, A., Niyigena, P., Rich, M.L., Stulac, S., Murray, m.B., and Binagwaho, A. (2018). Impact of a health systems strengthening intervention on maternal and child health outputs and outcomes in Rwanda 2005-2010. *BMJ Global Health* 3(2): e000674.

UN. (2010). *Reconstructing Public Administration after Conflict: Challenges, Practices and Lessons Learned*. World Public Sector Report 2010. New York: United Nations.

Vargas Bustamante, A. (2010). The tradeoff between centralized and decentralized health services: Evidence from rural areas in Mexico. *Social Science & Medicine* 71(5): 925-934.

Vasan, A., Mabey, D.C., Chaudhri, S., Epstein, H.A.B., and Lawn, S.D. (2017). Support and performance improvement for primary health care workers in low- and middle-income countries: A scoping review of intervention design and methods. *Health Policy and Planning* 32(3): 437-452.

Vujicic, M., Ohiri, K., and Sparkes, S. (2009). *Working in Health. Financing and Managing the Public Sector Health Workforce*. Washington, DC: World Bank.

Vujicic, M., Weber, S.E., Nikolic, I.A., Atun, R., and Kumar, R. (2012). An analysis of GAVI, the Global Fund and World Bank support for human resources for health in developing countries. *Health Policy and Planning* 27(8): 649-657.

Wagenaar, B.H., Sherr, K., Fernandes, Q., and Wagenaar, A.C. (2016). Using routine health information systems for well-designed health evaluations in low- and middle-income countries. *Health Policy and Planning* 31(1): 129-35.

Wallace, A., Dietz, V. and Cairns, K.L. (2009). Integration of immunization services with other health interventions in the developing world: What works and why? Systematic literature review. *Tropical Medicine & International Health* 14(1): 11-19.

Watkins, D.A., Jamison, D.T., Mills, A., Atun, R., Danforth, K., Glassman, A., Horton, S., Jha, P., Kruk, M.E., Norheim, O.F., Qi, J., Soucat, A., Verguet, S., Wilson, D., and Alwan, A. (2017). Universal health coverage and essential packages of care. In Jamison, D.T., Gelbrand, H., Horton, S., et al. (eds.), *Disease Control Priorities: Improving Health and Reducing Poverty, 3rd Edition*. Washington, DC: World Bank.

Watt, N., Sigfrid, L., Legido-Quigley, H., Hogarth, S., Maimaris, W., Otero-Garcia, L., Perel, P., Buse, K., McKee, M., Piot, P., and Balabanova, D. (2017). Health systems facilitators and barriers to the integration of HIV and chronic disease services: A systematic review. *Health Policy and Planning* 32(4): iv13-iv26.

WHO. (2007). *Task Shifting: Rational Redistribution of Tasks among Health Workforce Teams*. Geneva: WHO.

WHO. (2008). *Essential health packages: What are they for? What do they change?* DRAFT technical brief no. 2, 3 July 2008. WHO service delivery seminar series. Retrieved online. <https://www.who.int/healthsystems/topics/delivery/technical_brief_ehp.pdf>

WHO. (2010). *Increasing access to health workers in remote and rural areas through improved retention: Global policy recommendations*. Geneva: World Health Organization.

WHO. (2010). *Workload Indicators of Staffing Need (WISN) User's manual*. Geneva: World Health Organization.

Wiysonge, C.S., Paulsen, E., Lewin, S., Ciapponi, A., Herrera, C.A., Opiyo, N., Pantoja, T., Rada, G., and Oxman, A.D. (2017). Financial arrangements for health systems in low-income countries: An overview of systematic reviews. *Cochrane Database of Systematic Reviews* 9: CD011084.

Witter, S. (2009). Service- and population-based exemptions: Are these the way forward for equity and efficiency in health financing in low-income countries? In Chernichovsky, D., Hanson, K. (eds.), *Innovations in Health System Finance in Developing and Transitional Economies (Advances in Health Economics and Health Services Research, Volume 21)*. Emerald Group Publishing Limited, pp. 251-288.

Witter, S., and Pavignani, E. (2016). *Review of Global Fund Investments in Resilient and Sustainable Systems for Health in Challenging Operating Environments*. Geneva: Global Fund for AIDS, Tuberculosis and Malaria.

Witter, S., Boukhalfa, C., Cresswell, J.A., Daou, Z., Filippi, V., Ganaba, R., Goufodji, S., Lange, I.L., Marchal, B., and Richard, F. (2016). Cost and impact of policies to remove and reduce fees for obstetric care in Benin, Burkina Faso, Mali and Morocco. *International Journal for Equity in Health* 15: 123.

Witter, S., Fretheim, A., Kessy, F.L., and Lindahl, A.K. (2012). Paying for performance to improve the delivery of health interventions in low- and middle-income countries. *Cochrane Database of Systematic Reviews* 2: CD007899.

Witter, S., Tulloch, O., and Martineau, T. (2012). *Health workers' incentives in post-conflict settings – a review of the literature and framework for research*. ReBUILD Research Report.

Witter, S., Zulfiquar, T., Javeed, S., Khan, A., and Bari, A. (2011). Paying health workers for performance in Battagram district, Pakistan. *Human Resources for Health* 9: 23.

Woldie, M., Feyissa, G.T., Admasu, B., Hassen, K., Mitchell, K., Mayhew, S., McKee, M., and Balabanova, D. (2018). Community health volunteers could help improve access to and use of essential health services by communities in LMICs: An umbrella review. *Health Policy and Planning* 33(2018):1-16.

Woodward, A., Sondorp, E., Witter, S., and Martineau, T. (2016). Health systems research in fragile and conflict-affected states: A research agenda-setting exercise. *Health Research Policy and Systems* 14(1): 51.

World Bank. (2010). *Health provider payment reforms in China: What international experience tells us*. World Bank. Retrieved online.

<http://siteresources.worldbank.org/INTCHINA/Resources/ProviderPayment_es.pdf>

World Bank. (2015). *World development report: Mind, society and behaviour*. Washington, DC: World Bank.

World Health Organization. (2016). *Workload indicators of staffing need (WISN): Selected country implementation experiences*. Retrieved online. <

https://apps.who.int/iris/bitstream/handle/10665/205943/9789241510059_eng.pdf?sequence=1>

Zavila, C. (2018). *Interventions targeting the last mile of pharmaceutical supply chains in low- and middle-income countries: A scoping review*. Unpublished MSc thesis.

Zeng, W., Sun, D., Nair, D., Nam, J.E., and Gheorghe, A. (2018). Strengthening performance-based financing as a health system approach for quality improvement. *Journal of Global Health* 8(2): 020305.

Appendix 1: Review methods

Search Strategy

The following search string, #1 AND #2 AND #3, was used. Seven databases were searched on October 31st 2018. These include Ovid MEDLINE(R), Ovid Embase, Ovid Global Health, Web of Science, McMaster University Health Systems Evidence, Cochrane, and Campbell Collaboration Library.

#1 (health AND system*) AND (strengthen* OR reform OR intervention OR policy OR policies OR evaluation OR review OR program* OR project OR scheme)
#2 ((human AND resources) OR staff* OR doctors OR nurses OR midwives OR community health workers) OR (finance OR financing) OR (governance OR administrat* OR management) OR (governance OR leadership) OR information OR (products OR vaccines OR technologies) OR (service AND (delivery OR infrastructure))
#3 (low-income countr* OR middle-income countr* OR LMIC* OR LIC*) OR (transition* AND countr*) OR (conflict AND countr*) OR (fragile AND countr*)

The search string was originally tested with two additional lines which aimed to increase the number of studies on integrated interventions and studies that listed HSS specific interventions, listed below. After testing these terms, however, the results had low sensitivity.

#2 integrated OR cross-cutting OR multi-component
#4 (service AND delivery) OR workforce OR training OR financing OR safety OR (pay AND performance) OR (partnership OR collaboration) OR access OR (capacity AND building) OR (sector-wide approach OR SWAp) OR (district AND system* AND strengthen*) OR (risk AND protection) OR (supply AND chain*)

Grey literature was explored using a top-down approach, with team members providing reports and other relevant documents. Backwards citation tracking was conducted for key reviews.

Screening

Five reviewers conducted screening and data extraction. Title and abstract screening was conducted on Abstrackr by uploading search results after removing duplicates. If a study was set in a relevant country, described an intervention that can be defined as health systems strengthening or reviewed studies that describe health systems strengthening interventions, and reported at least one of the specified intermediate or long-range outcomes, it was included in full-text screening. Intermediate outcomes included service access, service coverage, and service quality and safety. Long-range outcomes included improved health (covering morbidity and mortality), equity of outcomes/distributional effects, cost-effectiveness, responsiveness (such as patient-centeredness), and social and financial risk protection.

Studies were either included for full-text screening, excluded, or marked as 'maybe'. Studies marked as 'maybe' were reviewed in a second round of screening by one of the reviewers.

Quality Appraisal

Quality appraisal was conducted for all included studies during data extraction. Questions focused on whether the study had a clear and appropriate research question(s); the methodology was appropriate to answer the research question(s); the data were collected in a way that answered the research question; the sample was adequate; the outcome measure(s) were clearly defined and valid; data analysis was sufficiently rigorous; there was a clear statement of findings; and whether limitations were identified and accounted for. For each of these questions, the full list of which is listed in Appendix B, a study was marked as “Yes fully”, “Yes partially”, or “No”.

Studies received a score of 2 for “Yes fully”, 1 for “Yes partially”, and 0 for “No”. Studies that received a score greater than 12 were categorized as high quality, those receiving a score between 6 and 12 were categorized as moderate quality, and those with a score less than 6 as low quality.

Analysis

Analysis was focused on interventions that report health outcomes, longer-term system effects (e.g. more than five years), and cost information. The review also incorporates analysis of the context of HSS interventions, for instance, fragile states and countries in transition. Although the review includes interventions in LMICs, it focuses on LICs and DFID priority countries in particular.

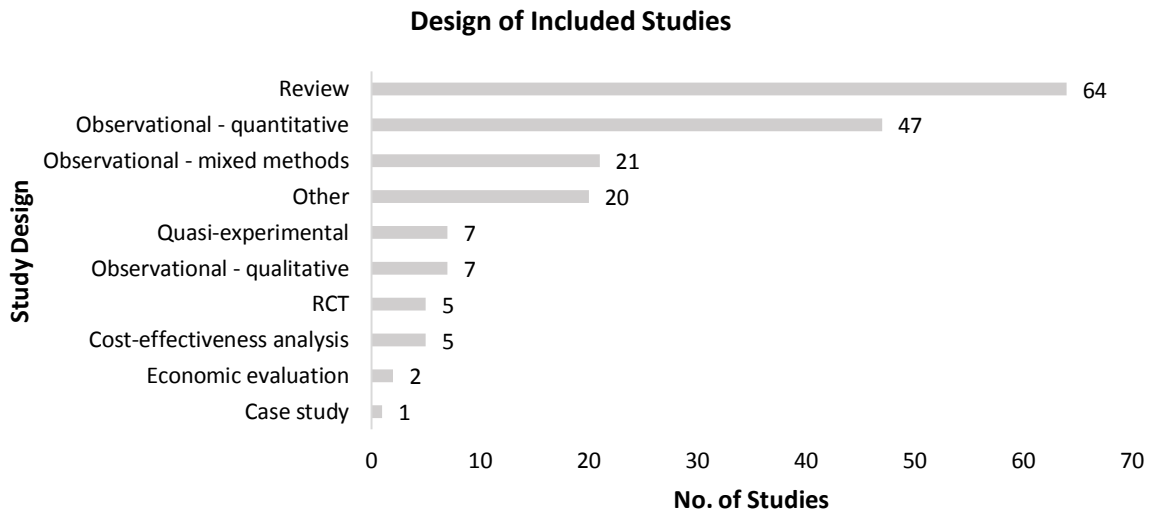
Bibliographic overview

Characteristics of included studies (from initial search; i.e. excluding later more purposive search)

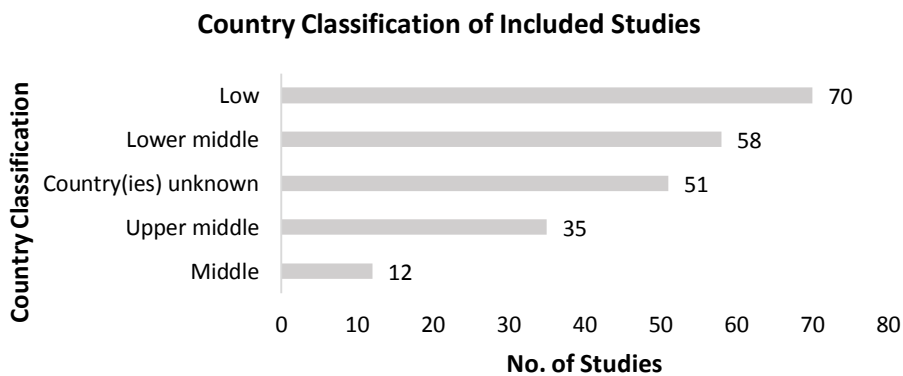
In the initial review 96 studies were included and 88 studies were excluded after data extraction. Subsequently, 97 studies were added by the research team under the categories leadership and governance (n=21), workforce (n=11), financing (n=55), service delivery (n=4), health information systems (n=3), and supply chains (n=3).

Included studies were published from the year 2000 to 2018, with the number of studies gradually increasing from 2008 to 2017. The years that generated the most included studies were 2017 (n=29) and 2013 (n=21). Studies were excluded during data extraction if they did not report the outcomes of an intervention (n=30), did not target one or more building blocks or include spill-over effects in a different building block (n=32), did not describe or evaluate an intervention (n=18), the full text was not available (n=3), was not available in English (n=3), or if they did not evaluate an intervention in a low- or middle-income country (n=2).

Included studies represent a range of study designs. Most studies were reviews, including both systematic and non-systematic/literature reviews (n=64), quantitative studies (n=47), and mixed methods studies (n=21). Fewer qualitative studies (n=7) and case studies (n=1) were included due to their inability to report outcomes. There were very few quasi-experimental (n=7) and randomised controlled trials (RCTs) (n=5) included in this review since they primarily focused on interventions that did not aim or result in the strengthening of health systems. Rather, these studies most often evaluated smaller-scale interventions that did not implicate or influence the larger health systems within which they operated. Two studies conducting economic evaluations that looked at supervision strategies and community-based practitioner programmes were included, as were five studies conducting cost-effectiveness analyses that evaluated IMCI and treatment for tuberculosis. The following chart shows the design of included studies.



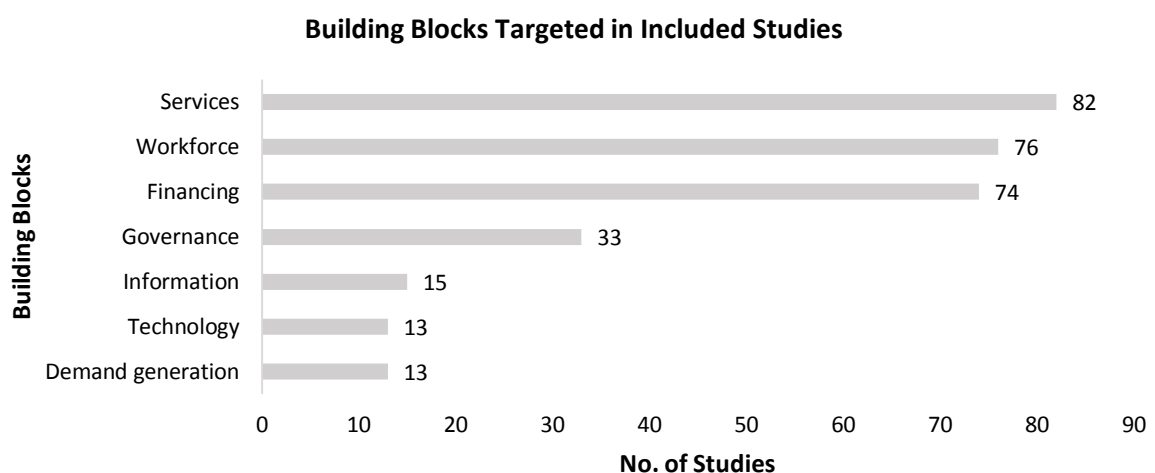
All studies evaluated or described interventions in low- and middle-income countries (LMICs). The World Bank’s classification was used to categorise countries as low-income, lower-middle income, upper-middle income, or middle-income (World Bank, 2018). This classification uses gross national income (GNI) per capita for the previous year and is updated annually on July 1st with an adjustment for inflation. The majority of studies were conducted in low-income countries and are described in 70 included studies, with interventions in lower-middle and upper-middle countries described in 58 and 35 included studies respectively. Studies that did not specify the country(ies) in which an intervention was implemented are listed below as “Country(ies) unknown” (n=51). The following chart shows the country classifications of included studies.



Many studies evaluated or described interventions that were implemented in fragile and conflict-affected countries. DFID’s classification for fragile and conflict-affected countries was used to classify studies during data extraction (DFID, 2017). This classification is based on DFID’s fragile states list, ODA-eligible countries neighbouring ‘high fragility’ states excluding China and India, and DFID’s regional programmes in fragile regions. It provides a useful differentiation between countries with low fragility, moderate fragility and high fragility, and countries that neighbour high-fragility states. The studies included by this review primarily focus on interventions in moderate-fragility countries (n=40) and countries with neighbouring high fragility (n=40), followed by countries with low fragility (n=25), and high-fragility states (n=15).

This review included studies on interventions that either focused on two or more building blocks (WHO, 2007) or reported spill-over effects in multiple building blocks. A large majority of studies

focused on services (n=82) and workforce (n=76). Common cross cutting interventions targeted both services and workforce, many of which focused on IMCI and community-based health workers. Most of these studies examined the dual provision of services with the training and/or supervision of health workers, and commonly evaluated the quality of services provided. Other common combinations include studies focusing on financing (n=74) and governance (n=33), which often examined how health financing schemes interacted with health system administration and governance. These include studies on district-level financing, decentralisation, and cost-effectiveness of the provision of services in primary health care and for IMCI. Studies also focused on both information (n=15) and technology (n=13), most often evaluating technical interventions that either targeted or resulted in increased availability of information and improved responsiveness. The following chart shows the building blocks targeted in included studies.



Intermediate outcomes reported include service quality and safety (n=46), service coverage (n=38), service access (n=27), service uptake (n=9), and service delivery (n=1). Service quality and safety was commonly reported by the included studies as a general increase in quality of the services provided after or during an intervention, although most studies were unable to detail how quality improved. Service coverage, access, and uptake were commonly reported either as a general increase, similar to improvements in quality, or with quantitative data. Service delivery was only reported as an intermediate outcome in one study.

The long-range outcomes reported by included studies primarily consisted of improved health covering morbidity and mortality (n=73). Studies reporting improved health were generally able to provide quantitative and/or detailed descriptions of how the health of targeted populations improved. Other long-range outcomes were not as prominent, and include cost-effectiveness (n=16), social and financial risk protection (n=14), equity of outcomes/distributional effects (n=11), and responsiveness (n=6). There may be a difficulty in measuring such outcomes in low- and middle-income countries without more in-depth research into how health service delivery adapts, for instance in the case of responsiveness, and without access to data which may not be available in lower-resourced health systems, for instance in the case of equity of outcomes.

Only studies retrieved from the electronic literature search were assessed for quality. Most included studies were ranked as high quality (n=74) by the data extraction team, with fewer studies ranked as moderate quality (n=19) and low quality (n=3). Many low and moderate quality studies were excluded because they did not report outcomes. The high quality of included studies suggests that

while the current evidence base on health systems strengthening in LMICs is lacking, especially with regards to conducting evaluations of system-wide interventions and reporting reliable and generalisable outcomes, existing research provides some robust evidence which may be analysed and applied to policy and practice.