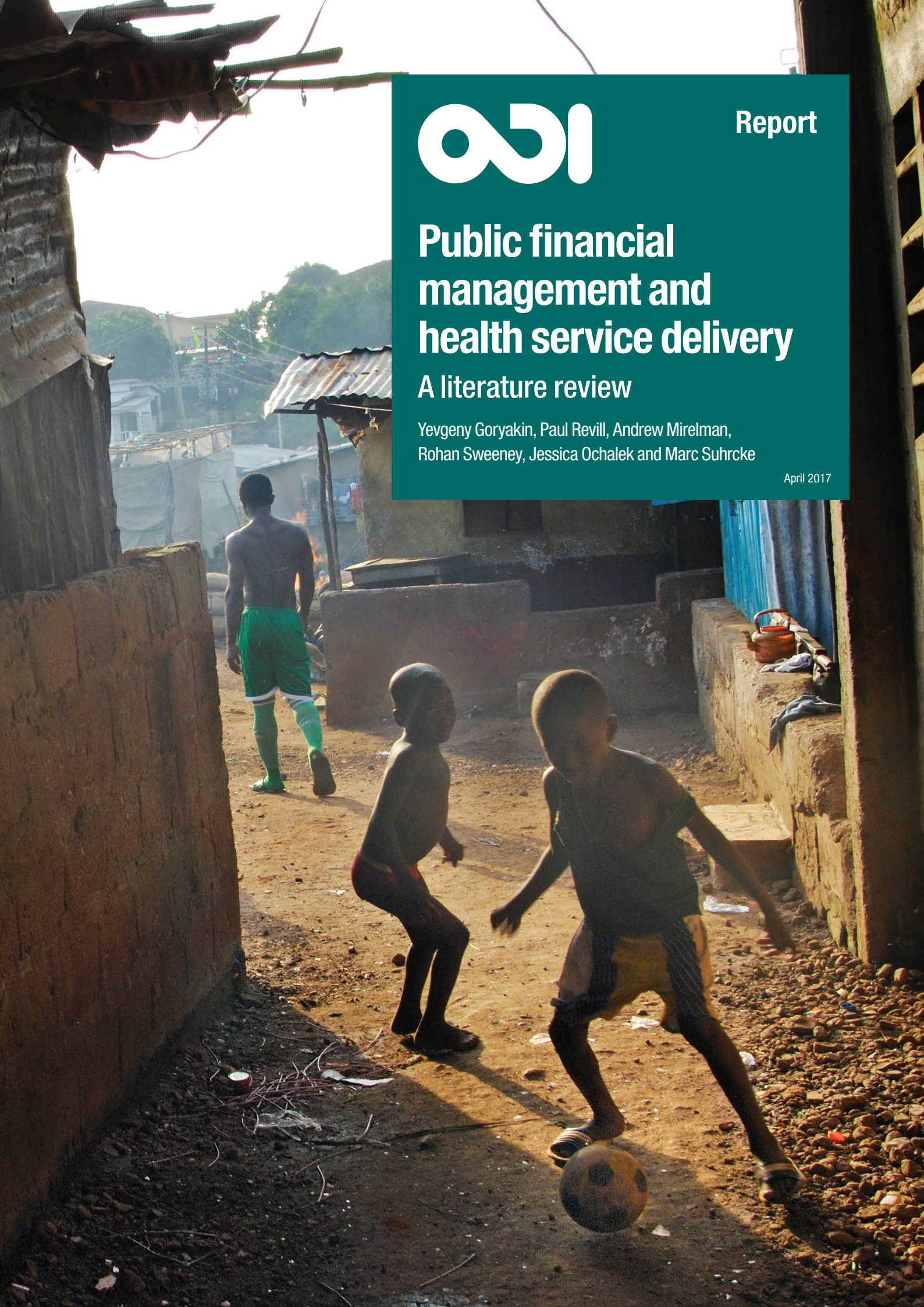

Report

Public financial management and health service delivery

A literature review

Yevgeny Goryakin, Paul Revill, Andrew Mirelman, Rohan Sweeney, Jessica Ochalek and Marc Suhrcke

April 2017

Overseas Development Institute
203 Blackfriars Road
London SE1 8NJ

Tel. +44 (0) 20 7922 0300
Fax. +44 (0) 20 7922 0399
E-mail: info@odi.org.uk

www.odi.org
www.odi.org/facebook
www.odi.org/twitter

Cover photo: Aubrey Wade/Panos. Boys playing football outside the Kroo Bay Community Health Centre. The clinic lacks even the basics. It has no electricity, and clean drinking water must be fetched from the nearby well everyday. The Kroo Bay slum in Freetown has the world's worst infant and maternal mortalitly rates. One in four children die before they reach the age of five, and one in six mothers die during childbirth.

Acknowledgements

This review was undertaken by the University of York Centre for Health Economics in April-June 2016. It was overseen by ODI staff members Tom Hart and Bryn Welham. This research was funded through a grant from the Bill and Melinda Gates Foundation. The study has contributed to a wider research project on the nature of the relationship between public financial management and healthcare delivery that considers the issue through a number of methodological lenses. The final report of the wider research project is published separately.

Contents

Acknowledgements 3

Executive summary 6

1. Introduction 8
   1.1. Public financial management and development results in health 8
   1.2. Defining 'public financial management' 8
   1.3. Defining effective health service delivery 8

2. Methodology 10
   2.1. Measuring PFM quality 10
   2.2. Measuring the quality of health services 10
   2.3. Inclusion criteria 11
   2.4. Exclusion criteria 11

3. Findings from the reviewed theoretical and empirical evidence 12
   3.1. Scope and literature search 12
   3.2. The impact of PFM system quality 12
   3.3. Quality of governance 13
   3.4. Impact of PFM reforms 16
   3.5. Participatory budgeting and community scorecards – theoretical links 18
   3.6. Participatory budgeting and community scorecards – empirical evidence 19
   3.7. Fiscal decentralisation – theoretical links 20
   3.8. Impact of donor-related reforms 22

4. Data and methodological challenges in the empirical evidence 24
   4.1. Data limitations 24
   4.2. The challenge of establishing causality 25

5. Summary and recommendations 26
   5.1. Reviewing the identified hypotheses 26

References 29

Annex: Search terms and article matrix 32

List of tables

Table 1. Summary of hypotheses and evidence reviewed **26**

Table 2. Summary of articles selected for review **36**

Executive summary

The nature of this research

This report reviews, synthesises and critically discusses the findings of the existing academic literature on the potential and actual contributions of public financial management (PFM) systems and PFM reforms to improving the effectiveness of health service delivery. We describe the current state of the evidence on the link between PFM quality and health service delivery and add a judgment on the strength of this evidence. We review both the theoretical literature, which provides hypotheses on the impact of various aspects of PFM quality on health service delivery, and the empirical literature, which we use to scrutinise the validity of the hypothesised links. We have restricted our review search to English-language publications (including peer-reviewed as well as unpublished texts) from the period 1996-2016, searching biomedical and economics databases as well as Google Scholar.

We focused our review on the impact of several dimensions of PFM quality on health service delivery, including the transparency, reliability, predictability and efficiency of the budget process and of intragovernmental fiscal relationships, as well as the effectiveness of institutional accountability. In order to capture health service delivery performance, we take into account population health indicators (given that the ultimate goal of health services is to improve health) as well as more proximate 'process indicators' that may be more closely related to health system performance.

Despite the broad scope we set for the review, our final selection resulted in the inclusion of what may appear as a small set of 52 articles in the review, divided across three sub-themes. The first group comprises 'system quality' studies, including articles on the impact of PFM quality itself as well as on the impact of 'good governance' more generally. The second group comprises studies from the 'health system strengthening' literature, including articles on Medium-Term Expenditure Frameworks (MTEFs), reforms related to budget transparency and participatory budgeting, decentralisation reforms and several other types of reform, as well as studies covering good governance practices (including transparency, accountability and lack of corruption). The third group comprises studies on the impact on health service delivery of donor-related reforms, such as the introduction of sector-wide approaches (SWAps).

Key findings

The theoretical literature predicts that high-quality PFM systems will have a positive impact on various performance dimensions of health service delivery. However, the evidence from the empirical studies reviewed here is mixed and limited in quantity, though for the most part it indicates some positive impact. The evidence is similarly conflicting as to the impact on health service delivery of introducing specific PFM-related reforms, such as MTEFs, although the majority of the (limited) evidence does indicate a positive impact.

A key finding of this review is that good governance does have an important role in health service delivery. A range of good governance indicators were found to be positively related to health service delivery outcomes, while corruption was consistently negatively related to many of these outcomes. One of the strongest and most consistent findings was the evidence that increased public funding of health programmes is likely to be more effective in countries with better governance. There is also strong evidence of a positive relationship between health service delivery-related outcomes and various indicators of transparency.

Greater accountability and responsiveness was found to play an important role in health outcomes. There is some evidence for the positive impact of participatory initiatives such as participatory budgeting and community scorecards. Fiscal decentralisation in general was found to be positively related to good health and service delivery outcomes, especially in communities with sufficient local institutional capacity and accountability. However, the evidence suggests that decentralisation may also entail some undesirable consequences, such as a decline in the share of the budget going to primary healthcare.

We also note that attempts to measure the quality of PFM directly are still rare. The few attempts that have been made use mostly aggregate scores that may overlook the influence of some important sub-dimensions. To avoid having too few studies in this review, therefore, it was necessary to broaden our definition of PFM to include studies that considered some dimensions at least potentially related to the quality of PFM. Our review further found that the performance of health services has often been measured by population-level health outcomes, such as infant mortality or maternal mortality. While such data is easy to obtain, population-level health outcomes may not be sufficiently sensitive to changes in health

service inputs. Nevertheless, it is promising to observe that the relationship between broader quality of governance measures that often include aspects of PFM and/or its various sub-dimensions and these population-level health outcomes was in fact found to be statistically significant in several studies, even though the degree of causal inference could not always be established.

A related limitation in the reviewed evidence is that most studies estimated only simple associations, thus limiting their external validity. Nevertheless, a number of exceptions were found that used more advanced econometric designs, such as instrumental variable analysis and panel regression. One study in particular implemented the random assignment of participants to a monitoring intervention.

1. Introduction

1.1. Public financial management and development results in health

While improving public financial management (PFM) systems is not an end in itself, PFM reforms are widely seen as having an important part to play in the efforts of low- and middle-income countries (LMICs) to improve the welfare of their populations. Many countries have expressed a commitment to strengthening their PFM systems in several high-level international initiatives and declarations,[1] and development partners are paying increasing attention to countries' PFM performance when making decisions about committing development assistance (de Renzio, 2006; de Renzio et al., 2010; de Renzio et al., 2011).

The objective of this paper is to review, synthesise and critically discuss the findings of the existing literature on the potential and actual contributions of PFM systems and PFM reforms to improving the effectiveness of health service delivery. The two specific research questions we seek to answer are as follows:

1. What is the relationship between the quality of PFM systems and the quality of health service delivery?
2. What is the relationship between PFM reforms and the subsequent quality of health service delivery?

1.2. Defining 'public financial management'

The term 'PFM' is a broad concept generally used to describe the ways that governments manage public resources, including systems for budget preparation, approval, execution and evaluation (Andrews et al., 2014). As defined by Cabezon and Prakash (2008:6), PFM consists of: 'the procedures, established by law or regulation, for management of public monies through the budget process, which includes formulation, execution, reporting, and analysis. PFM systems should include management of revenues as well as expenditures.' For the purpose of this review we focus primarily on the following quality dimensions of PFM:

- The credibility, reliability and efficiency of the budget process. (As measured, for example, by the extent to which actual health spending deviates from planned health expenditures and the degree of volatility in fiscal allocations to health services.)
- The transparency of the budget process. (As measured, for example, by whether there is transparency and reliability in intragovernmental fiscal relations and whether there is appropriate legislative and public oversight.)
- The extent of appropriate institutionalised accountability. (As measured, for example, by whether there are appropriate payroll controls and whether audits of financial reports are undertaken by independent accounting firms.)
- The appropriate use of earmarked and extra-budgetary funds.

1.3. Defining effective health service delivery

There is a vast literature conceptualising and measuring various aspects of effective health service delivery, which is our dependent variable of interest for this review (Smith et al., 2009; Smith and Papanicolas, 2012). Ideally, the chosen outcome variable should be sensitive to the impact of PFM as well as correspond to the boundaries of the health system under consideration (Smith and Papanicolas, 2012). Since the overarching goal of health services is to improve health, using population health indicators such as life expectancy at birth and mortality and morbidity rates as the relevant outcome variables would seem to be a natural starting point. In practice, however, it is difficult to establish a credible direct link between PFM and population health outcomes because such outcomes are at least co-determined by a range of factors beyond the control of health systems. It may be more practical, therefore, to consider more proximate 'process indicators' of the performance of health services delivery. Process indicators include, for example, the extent of the utilisation of different health services, patient satisfaction levels and waiting times. However, it is important to bear in mind that even these intermediate indicators may be influenced by factors beyond the control of health services.

1 Examples include the 2005 Paris Declaration, the 2008 Accra Agenda for Action and the 2011 Busan Partnership for Effective Development Cooperation.

1.4. Links between PFM and health service delivery

Defining and using suitable indicators for PFM quality and effective health service delivery is a necessary first step. However, it is a greater challenge to attribute any given level or change in health service delivery variables to a specific level or change in indicators of PFM quality.

In the present report we describe the current state of evidence on the link between PFM quality and effective health service delivery, adding a judgment on the strength of the evidence. We review both the theoretical literature, which provides hypotheses as to the impacts of various aspects of PFM quality on health service delivery, and the empirical literature, which we use to scrutinise the validity of the hypothesised links.

The paper starts by describing the methodology applied in our review (Section 2). Section 3 provides a narrative of the findings by key themes, using supportive evidence from the literature review. Section 4 discusses the quality of the empirical evidence, and Section 5 concludes by drawing out the main lessons learned from the review and sketching out the implications for future research. The Annex to this report contains a full list of the studies included in the review, with a brief summary of each study's findings and an assessment of the quality of the evidence.

2. Methodology

This literature review took into account studies that present theoretical and/or empirical evidence for the presence or absence of associations – ideally causal associations – between higher or lower quality PFM systems and the presence of PFM reforms and indicators suggesting 'better' or 'worse' health service delivery.

We did not restrict ourselves only to studying the impact of PFM reforms specifically designed to improve health service delivery. Instead, we considered all instances encountered in the literature that included any hypothesised or assessed link to health service delivery.

2.1. Measuring PFM quality

Capturing the 'quality' of PFM, i.e. our key independent variable of interest, is inherently difficult, and a 'perfect' measure may well not exist. For this reason, we take into account a broad range of *potentially* relevant quality measures.

PFM quality can be measured, for example, by certain aggregate scores, such as the 'Public Expenditure and Financial Accountability' (PEFA) score (as used in Fritz et al., 2014), and we thus tried to capture such scores in our selection of search terms. Looking more broadly, we used indicators from a dataset maintained by the World Bank, the 'Country Policy and Institutional Assessment' (CPIA), as proxies for PFM quality. Because PFM quality and quality of governance are likely to be interlinked, we also explored the Quality of Governance database maintained by the World Bank, which contains a set of country-level indicators. Another potentially useful indicator mentioned in the literature is the 'Open Budget Index' developed by the International Budget Partnership.[2] All of these measures of PFM quality were employed as search terms in our literature search strategy.

We also searched for articles on the impact of specific PFM-related reforms, including the introduction of Medium-Term Expenditure Frameworks (MTEFs), Financial Management Information Systems (FMIS), and Public Expenditure Tracking Surveys (PETS) (Fritz et al., 2012). Such reforms may be directed, for example, at strengthening processes of budget preparation, improving resource management (such as formalised disbursement rules) and/or improving internal and external auditing and monitoring, accounting and reporting. However, we do not suggest that having an MTEF in place necessarily triggers improvements in PFM quality. Rather, the impact of MTEFs on health service delivery is of interest in itself.

Finally, some initiatives have been designed to improve the accountability, transparency and responsiveness of those tasked with managing health systems. These initiatives include, for example, the introduction of community scorecards, Sector-Wide Approaches (SWAps) and participatory budgeting. While the first two initiatives might not be introduced with the specific aim of improving the quality of PFM systems, they may nevertheless affect them by exposing PFM entities to greater scrutiny by end-users of the health system, and by using information produced by PFM systems to support wider accountability initiatives. Accordingly, this review also includes studies that refer to instances where such reforms have been introduced.

2.2. Measuring the quality of health services

As mentioned in section 1.3, health system performance can be assessed with the help of standard population health indicators, such as life expectancy at birth and child mortality rates. This is problematic, however, because the quality of a country's health system is not the only driver of population health outcomes. An alternative method of assessment is to use indicators more closely related to the performance of health services. Any changes in these indicators could then be attributed more confidently to the impact of PFM quality (wherever any correlation is found). For example, the OECD's Health Care Quality Indicators project considers effectiveness indicators in primary care (e.g. hospital admission rates for diabetes), in hospital care (e.g. 30-day case fatality rates for acute myocardial infarction and stroke) and in mental healthcare (e.g. unplanned hospital re-admission rates for psychiatric disorders). The OECD justifies the inclusion of these indicators on the basis that the quality of health services can be measured by their ability to prevent unnecessary complications leading to avoidable hospitalisation or premature mortality (Smith and Papanicolas, 2012). This review therefore included studies that measured these potentially more sensitive indicators. However, we also took into serious consideration any articles that proposed

2 For further details, see: www.internationalbudget.org/opening-budgets/open-budget-initiative/open-budget-survey/ (Last accessed: 03/01/2017).

links between population health outcomes and PFM quality. The latter were included primarily because any significant correlation identified in such studies (especially in higher quality empirical studies) were likely to provide more convincing evidence of the importance of PFM quality than studies using more sensitive process indicators.

The OECD suggests a range of indicators for evaluating health system performance, which are presented in with the objective of gaining 'a broader view of public health' (OECD, 2015). Bearing in mind the limitations discussed above, we have considered a long list of possible outcome indicators, including both population health outcomes and process indicators. For the purpose of this review, the following indicators are considered most relevant:

Input/process indicators:

- the availability of medicines in the public sector
- the number of avoidable hospital admissions
- waiting times in the public sector
- immunisation coverage
- health service utilisation.

Health outcome indicators:

- infant mortality rate/maternal mortality rate
- life expectancy at birth
- avoidable hospitalisations/mortality
- surgical complication rates
- mortality from cardiovascular diseases
- general satisfaction with health.

Efficiency:

- measured by technical/allocative efficiency scores derived from stochastic frontier analysis models of public health service delivery or from Data Envelopment Analysis.

We also reviewed studies that treated the allocation of funding towards health in the total budget as an outcome variable. Despite not being a perfect measure of health service delivery, we consider the impact of decentralisation and participatory budgeting on budgetary allocations to health, for example, to be of interest in this review because health expenditures are an important determinant of the quality of health service delivery. In addition, we included studies which considered the combined impact of spending on health and the quality of governance as an additional measure of PFM quality (as discussed below).

2.3. Inclusion criteria

The articles selected for inclusion in this review were restricted to English-language studies only. As well as academic peer-reviewed articles, articles from the 'grey literature' were also included. The review focused primarily on evidence from low-income and middle-income countries (LMICs), though we also sought to take into account selected evidence from high-income countries where this complemented available evidence from LMICs.

We considered the impact of PFM quality, as defined above, rather than the impact of specific governmental expenditure policies. The only exception to this rule was when we considered the impact of reforms designed to improve the quality of PFM systems.

We did not restrict the search to studies on the impact of PFM in health-related ministries only, but extended it to studies related to other governmental departments wherever these studies reported a connection with health services.

2.4. Exclusion criteria

In relation to PFM systems, we concentrated on approaches to expenditure management rather than resource mobilisation. We did not consider the impact of PFM reforms on PFM quality in this review. Rather, in relation to research question 2, papers investigating the impact of PFM reform were only included if they measured impact in terms of health service delivery outcomes.

We conducted the search for peer-reviewed articles in the PubMed search engine, which focuses on biomedical and public health literature, and in EconLit, which focuses on economic literature. In addition, we searched relevant 'grey literature' through Google Scholar. Since the preliminary PubMed search produced 1,433 results, a great majority of which turned out to be false positives, we limited the search period to the 21-year period 1996-2016. This allowed for more careful checking of abstracts for relevance. Where appropriate, we also looked for additional studies by checking the references in the studies found during the preliminary search. (Full details on the search strategy are provided in the Annex.)

3. Findings from the reviewed theoretical and empirical evidence

3.1. Scope and literature search

The initial EconLit search resulted in 477 references, while the initial PubMed search yielded 335 references. (See Annex for keywords and restrictions.) In addition, we searched Google Scholar using a range of keywords, sorting results by relevance, and looked into the first 200 results for each keyword combination. Articles were selected based on our reading of all the abstracts. Wherever abstract findings looked promising we sought further information from the main text of the articles. Several articles were added on the basis of reading the text and checking for additional references. No articles that showed promise were excluded from the review. In total, 40 empirical studies were chosen for the final review and were included in the analysis stage.

After the original submission of the draft report, we conducted further searches using additional keywords (see Annex for further details). This resulted in 45 new abstracts using PubMed and 31 using EconLit. In addition, we searched Google Scholar using keywords (provided in the Annex), sorting results by relevance and looking into the first 200 results for each keyword combination. This resulted in 12 additional empirical references.

In total, our combined searches resulted in 52 reviewed empirical articles (which also included three literature reviews of empirical evidence). Of these, 34 were quantitative studies while the rest comprised literature reviews, qualitative studies and case studies, with some studies employing more than one such approach.

In the following section we first lay out the theoretical predictions outlined in the literature about the relationship between PFM quality and PFM-related reforms and various dimensions of effective health service delivery. We then scrutinise each of these theoretical predictions in the light of the existing empirical evidence. We group the evidence into the following three broad categories:

- The first group is made up of 'system quality' studies, including studies on the impact of PFM quality itself as well as the impact of good governance.
- The second group comprises studies on the impact of 'PFM-related reforms', which include MTEFs, reforms related to budget transparency and participatory budgeting, decentralisation reforms and several other types of reforms, as well as good governance practices such as transparency, accountability and lack of corruption. The studies in this group can also be considered part of the so-called 'health system strengthening' literature. These studies, while not explicitly measuring PFM systems, are concerned with dimensions of health systems that are potentially important for well-functioning PFM systems.
- The third group contains studies on the impact on health service delivery of donor-related reforms such as the introduction of SWAps.

In the discussion that follows we present only the key findings that reflect the main themes of the literature, without explicitly referring to every single study. (See the Annex for the full list of articles and their summary descriptions.)

3.2. The impact of PFM system quality

3.2.1. PFM system quality

In this sub section we discuss the theoretical and empirical literature that explicitly considers the impact of PFM quality on health service delivery outcomes. In the subsections that follow, we consider the impact of practices and reforms that may be of importance to high-quality PFM systems (e.g. the transparency, accountability and responsiveness of a system) but which may not necessarily be directly identified as pertaining to the PFM domain.

3.2.2. Theoretical links

The PFM literature postulates that higher quality PFM systems produce a number of benefits that could result in more reliable and better quality service delivery, including

health service delivery (Fritz et al., 2012). For instance, better PFM may be linked to more transparent and accountable governance, which may in turn lead to greater efficiency in public spending (Fonchamnyo and Sama, 2016). The development of more robust budgeting systems, in which stakeholders adhere to formal rules and enforcement mechanisms, may lead to fiscal system being more stable and reliable. Ultimately, better PFM systems should:

- improve overall fiscal discipline, with realistic budgets being executed in a timely fashion
- improve allocative efficiency, with fund allocations aligned with public priorities
- maximise social welfare
- improve operational efficiency, with reduced waste, corruption and other leakages (Fritz et al., 2014).

Hypothesis 1: Better quality PFM is positively related to health service delivery.

3.2.3. Empirical evidence

Within the literature reviewed, two studies (Fonchamnyo and Sama, 2016; Fritz et al., 2014) attempted to directly evaluate the impact of PFM system quality on health service delivery. Both articles were relatively high-quality econometric studies that relied on cross-country evidence.

Fonchamnyo and Sama (2016) used the World Bank-provided CPIA rating for measuring the quality of budgetary and financial management rating. The CPIA rating 'assesses the extent to which there is a comprehensive and credible budget linked to policy priorities, effective financial management systems, and timely and accurate accounting and fiscal reporting, including timely and audited public accounts.'[3] Fonchamnyo and Sama (2016) used the non-parametric Data Envelopment Analysis (DEA) approach to estimate public sector efficiency scores as an outcome variable. Their findings indicate that in the countries they considered (Cameroon, Chad and the Central African Republic) the quality of budgetary and financial management has a positive and significant association with public sector efficiency in the health sector in relation to life expectancy at birth and rates of infant mortality and immunisation against measles. However, Fritz et al. (2014) find no evidence of a relationship between PFM quality – as measured both by a country's Public Expenditure and Financial Accountability (PEFA) score[4] as well as by its CPIA score (as a robustness check) – and efficiency in service delivery, as measured by life expectancy at birth relative to government health spending per capita (at purchasing power parity), even after controlling for GDP per capita.

- Two studies attempted to directly evaluate the impact of PFM system quality on health service delivery.
- Both studies were relatively high-quality econometric studies that relied on cross-country evidence.

3.3. Quality of governance

The quality of PFM systems and the quality of governance are likely to be strongly interlinked.[5] In this subsection we discuss the link between good and poor governance and health service-related outcomes, as well as the impact on such outcomes of reforms potentially linked to changes in the quality of governance.

3.3.1. Theoretical links

It is widely recognised that state-building and PFM progress are mutually interdependent (Fritz et al., 2012). In addition, there is a large body of empirical evidence (to be discussed in this review) on the relationship between the effectiveness of public health spending and the quality of governance. The impact of public spending on health is therefore likely to depend on the institutional capacity of the system to convert this investment into improved public services (Filmer and Pritchett, 1999; Fukuda-Parr et al., 2011). This institutional capacity may include well-designed PFM systems. The reasons why high-quality governance is important for better service delivery are numerous and may include the following factors (all of which will be reviewed in this article):

- greater technical capacity of the relevant staff and institutions responsible for managing the delivery and auditing of public funds
- reduced information asymmetries associated with corruption and resource leakages, for example through a more transparent budget process and greater accountability in the use of funds (Holmberg and Rothstein, 2011; Hu and Mendoza, 2013; Rajkumar and Swaroop, 2008)

3 http://data.worldbank.org/indicator/IQ.CPA.FINQ.XQ

4 The PEFA score is designed to measure the following six dimensions: (1) the credibility of the budget; (2) comprehensiveness and transparency; (3) policy-based budgeting; (4) predictability and control in budget execution; (5) accounting, recording and reporting; and (6) external scrutiny and auditing. (See: http://www.pefa.org/.)

5 By 'quality of governance' we mean the quality of formal institutions (such as formal laws and regulations designed to guarantee transparency and accountability and to prevent corruption), as well as the technical capacity and competence of the bureaucracy.

- a more transparent procurement process, leading to lower purchase costs, and adjustments in incentive systems to prevent fraud and promote cost-effectiveness (Rajkumar and Swaroop, 2008)
- greater responsiveness to population preferences when setting budgeting priorities.

Corruption, while not a direct measure of PFM quality, may nevertheless reduce the ability of public financial allocations to affect health outcomes, as well as being a general proxy for the quality of various public institutions, including PFM systems. Corruption and a lack of transparent budgeting are known to lead to mismanagement of public funds and thus to misallocation of resources. (It should be noted, however, that an alternative view on corruption regards corruption as a possible antidote to red tape in certain circumstances (Banerjee et al., 2012).) The potential for misallocation arises mainly from problems in the relationships between principals and agents, whereby the incentives of the principals (i.e. the voters) and the agents (i.e. elected and appointed public officials) are misaligned and information asymmetries exist that agents can exploit to their advantage (Sarr, 2015; Carlitz, 2013). Corruption can also lead to higher prices for health sector consumables and thus result in lower utilisation of health services, since such prices will usually include various bribes and other unofficial payments in the supply chain (Gupta et al., 2000). This may negatively impact on service delivery (as measured by accessibility), and this effect is likely to be exacerbated by the unwillingness of donors to provide resources in highly corrupt environments (Fonchamnyo and Sama, 2016). Corruption may also lead to a reduction in governmental expenditures on health (Mauro, 1998), which may ultimately result in poorer quality health service delivery.

One important function of well-designed PFM systems is that of reducing or preventing corruption and the misuse of public funds by reducing informational asymmetries or by adjusting incentives for agents. These effects should be achieved because well-designed PFM systems establish and implement rules about who has access to public resources and about the processes for accessing these resources, for example through effective procurement mechanisms (Cabezon and Prakash, 2008). This is challenging, however, since politicians may not necessarily find it in their self-interest to increase transparency and accountability (Sarr, 2015). Higher levels of corruption can also lead to less efficiency in PFM, since even well-designed PFM systems may not function well if bribery, stealing and fraud are widespread (Akin et al., 2005). For example, a PFM system that is malfunctioning due to a lack of transparency and accountability in the use of public funds (Cabezon and Prakash, 2008) may promote corruption if rules are not observed, leading to misallocation and leakages of resources (Ablo and Reinikka, 1998; Azfar and Gurgur, 2008), as well as inflated prices, ultimately resulting in poor-quality health service delivery. Governmental transfers designed to encourage greater utilisation of health services through reductions in user fees may be ineffective, moreover, if there are significant resource leakages in the process (Gauthier and Wane, 2009) or if inadequate procurement rules result in the payment of exceedingly high prices.

Hypothesis 2: The quality of general governance is positively related to health service delivery, including health outcomes.

Hypothesis 3: The extent of corruption is negatively related to health service delivery, including health outcomes.

Hypothesis 4: Good governance helps translate public health spending into more effective health service delivery.

3.3.2. Empirical evidence

Eleven empirical studies were reviewed for this section, of which all but one were quantitative. The research design of these studies was generally of good standard, with multivariate regression employed. Several studies applied more advanced methods (e.g. fixed effects and instrumental variable (IV) regressions). Cross-country data was used in almost all of the studies. While such study designs and data can still produce relevant insights, not least due to their wide-ranging, potentially global scope, the extent to which they allow for causal inference tends to be more limited than studies making use of randomisation and/or more fine-grained within-country data.

Using cross-country data on child mortality from UNICEF and data from the World Bank on public health expenditures, Filmer and Pritchett (1999) found that public spending accounted for less than 1% of the variation in child mortality rates, while 95% of the variation could be explained by national income per capita, inequality in income distribution, female education and religious and ethno-linguistic diversity. The implied spending per child death averted in a developing country is thus found to be as high as $50,000-100,000 (in 1985

international US dollars). This is less favourable when compared to the conventional cost-effectiveness estimated for medical interventions to avoid child mortality, at only $10-4,000. The authors attribute this gap to a potential lack of efficacy in public sector spending, which in turn may be related to the quality of public sector institutions, including the quality of PFM systems.

Holmberg and Rothstein (2011) assessed the impact of quality of governance on population health, finding that variables for the quality of government (i.e. the World Bank's rule of law indicator, the World Bank's government effectiveness measure, and Transparency International's Corruption Perceptions Index) were positively associated with life expectancy and subjective health, and negatively associated with rates of infant and maternal mortality. (These findings also applied after controlling for additional control variables in multivariate analyses.)

Assessing the interaction between quality of governance and public spending on health may provide a more informative measure of PFM quality than assessing quality of governance alone. Holmberg and Rothstein (2011), for example, found that improving the quality of governance can partly compensate for a lack of financial resources. On the other hand, Hu and Mendoza (2013) found that while the quality of governance (as measured by quality of bureaucracy and control of corruption scores) and per capita spending on health were negatively associated with child mortality rates in their analysis of 136 countries spanning the period 1960-2005, the interaction between these was not statistically significant. In addition, they found that neither an Open Budget Index score nor its interaction with health spending were significantly associated with under-five mortality rates. (These results did not change when adjusting for country fixed effects or when using instrumental variable estimation.)

Rajkumar and Swaroop (2008) estimated that public health spending had a stronger impact on child mortality in countries with good governance (measured by the level of corruption and the quality of bureaucracy) than in countries with poor governance. This finding was maintained even after the authors used an instrumental variable (IV) approach to control for potential endogeneity in the relationship. The authors therefore concluded that simply increasing public funding of health programmes is ineffective in poorly governed countries. Similar results were obtained in studies by Lewis (2006) and by Wagstaff and Claeson (2004). Lewis concluded that returns to health investments (measured by rates of under-five mortality and measles immunisation coverage) were lower in poorly governed countries. By contrast, governmental spending was more strongly related to health outcomes, including underweight, infant and maternal mortality rates and tuberculosis mortality, in better governed countries (as measured by the World Bank's CPIA scores[6]).

Good governance was also found to be positively correlated with public sector efficiency. In a panel data study of 111 countries over the period 1990-1998, Feeny and Rogers (2008) found the governance index (constructed from the following dimensions: voice and accountability, political stability, government effectiveness, regulatory quality, government effectiveness, and control of corruption) to be significantly positively correlated with public sector efficiency in achieving higher life expectancy levels (estimated using the stochastic production function approach).

Azfar and Gurgur's (2008) study of the Philippines found that the index of corruption (derived from responses to a range of questions designed to measure perceived levels of corruption) was negatively related to a range of health outcomes measured at both municipal and household level. These outcomes included immunisation rates, vaccination rates for newborns and the satisfaction of end-users with healthcare. Their study also found that corruption led to longer waiting times at health clinics, as well as a reduction in the use of health services.

Gupta et al. (2000) employed a range of estimation approaches, including panel data analysis, to estimate the association between the 'corruption perception index' and health service outcomes in 128 advanced and developing countries. Their study found that corruption adversely affected child and infant mortality rates, as well as the percentage of low-birthweight babies among the total number of births. This finding was confirmed when using the 'ordinary least squares' method and when applying fixed effects regressions. Specifically, child mortality rates were found to be a third higher in highly corrupt countries than in countries with low corruption levels, while infant mortality rates in highly corrupt countries were almost twice as high as in countries with low levels of corruption. They concluded that it is important to have transparent procurement procedures as well as better financial accountability for public spending in order to achieve better health outcomes.

Burnside and Dollar (1998) concluded that the effect of foreign aid on infant mortality was strong in developing countries, with aid to the value of 1% of GDP being related to a drop of about 0.9% in infant mortality rates. However, they further found that this association was not significant in countries with poor property rights and high levels of corruption.

Gauthier and Wane (2009) used data from a Health Facilities Survey covering 281 health centres collected by the World Bank in Chad. Their study found that, even after taking into account any potential endogeneity of

6 The CPIA index contains 20 items grouped into the following four categories: (1) economic management; (2) structural policies; (3) policies for social inclusion and equity; and (4) public sector management and institutions. The index ranges from a minimum of 1 (unsatisfactory for an extended period) to a maximum of 6 (good for an extended period).

competition between health centres, the extent of leakage of government resources was significantly related to the price mark-up charged by health centres for drugs. Health centres receiving less public support as a result of leakage were found to be charging significantly higher mark-ups. The authors estimated that out of $1.17 allocated, only $0.02 of publicly provided resources reached an average patient. Their study recommends the introduction of more transparent allocation rules, together with information and verification systems to monitor whether resources reach their intended destination.

- Eleven empirical studies were reviewed in this section.
- All except one were quantitative studies (one was qualitative).
- Research design was generally quite good, with at least multivariate regression employed. In several studies, more advanced methods (e.g. fixed effects and IV regressions) were used.
- Cross-country data was used in almost all of the studies.

3.4. Impact of PFM reforms

PFM reforms are generally conducted with the goal of improving service delivery, which should ultimately lead to better health outcomes. Thus, according to the framework developed in Fritz et al. (2012), PFM reforms can have an impact on service delivery through a number of sequential inputs and outcomes, both intermediate and final. In theory, PFM reforms should lead to changes in intermediate outcomes, including the extent of transparency, oversight and accountability in PFM systems. This is expected to lead to improvements in fiscal discipline, with more efficient allocation of resources and greater efficiency in public spending. For these reasons, PFM reforms are expected to lead to improvements in capacity and accountability, and ultimately to better service delivery and population health. At the same time, however, the effectiveness of PFM reforms, as well as the speed and effectiveness of the transmission of benefits between different links in the chain of assumed relationship, is also expected to depend on contextual factors such as existing income levels and governmental and institutional capacity.

3.4.1. Medium-Term Expenditure Frameworks – theoretical links

As mentioned in the Introduction to this review, the defining features of well-functioning PFMs include the timeliness, effectiveness and predictability of the budgeting process. One important reform to improve the long-term budgetary planning ability of governments is the introduction of fiscal commitment devices, known under the umbrella term of Medium-Term Expenditure Frameworks (MTEFs). When implemented properly, MTEFs can be viewed as a key component of high-quality PFM systems. The intended purposes of these frameworks include reducing volatility in revenue collection and the disbursements of funds, the institution of multi-year expenditure controls, as well as improving overall budgetary discipline and increasing the ability to take future fiscal challenges into account in preparing annual budgets (Vlaicu et al., 2014; Bevan and Palomba, 2000). More than two thirds of all countries had introduced multi-year MTEFs (typically two to five years) by 2010 in an effort to improve their budgeting processes (Brumby et al., 2013). MTEFs also serve as a straightforward accountability device, enabling government performance to be checked against previously declared targets. A potential complication, however, is that spending patterns may remain unaffected over the medium term in spite of changing needs (and hence the need to change targets) (Brumby et al., 2013). This lack of change means that the extent to which improved PFM quality translates into improved health service delivery is not certain, since allocative efficiency may remain unaffected by MTEF reforms.

Hypothesis 5: The introduction of MTEF systems is likely to lead to improvements in health service delivery.

3.4.2. Medium-Term Expenditure Frameworks – empirical evidence

Three quantitative studies were included in this group of articles. All three were of relatively high quality, relying on a range of estimation techniques, including panel data, and IV to deal with endogeneity, though still mostly relying only on cross-country data (hence allowing for only a limited degree of causal inference.

Bevan and Palomba (2000) observed that the introduction of an MTEF reform in Uganda did not prevented a decline in the proportion of budgets being allocated to healthcare. The authors suggest that this may have been due to a perception on the part of central financial agencies that funding education was a greater priority than funding healthcare. An additional factor, they suggest, may have been that the Ugandan government considered it acceptable to leave the health sector more reliant on donor financing than on governmental spending.

Brumby et al. (2013) concluded that introducing the most advanced form[7] of MTEF,[8] i.e. Medium-Term Performance Frameworks (MTPFs), was indeed positively related to the cost-effectiveness of public health expenditures in their sample of mostly low-income and middle-income countries. In addition, they found that health expenditures appeared to be less volatile after the implementation of an MTPF. In light of the small sample size used in their analysis, however, the authors cautioned against over-interpreting their findings.

Vlaicu et al. (2014) assessed the impact of multi-year budgeting initiatives on the technical efficiency of the health sector by employing a range of estimation techniques, including fixed effects and IV estimation. Analysing a newly-collected dataset of worldwide Medium-Term Framework adoptions in 181 countries in the period 1990-2008, Vlaicu et al. found that more advanced MTEF reforms were likely to improve budget reliability (as measured by lower fiscal volatility) and fiscal discipline, while the introduction of MTPFs was found to have a significant positive impact on the technical efficiency of the health sector.

- Three quantitative studies were included in this group of articles.
- All three studies were relatively high quality, relying on a range of estimation techniques, including panel data and IV to deal with endogeneity. All three studies relied primarily on cross-country data.

3.4.3. Fiscal and budget transparency – theoretical links

Transparency is particularly important both as a component and a goal of PFM systems. This is because transparency may help to ensure that the benefits of public spending are not distributed only to elites (Bellver and Kaufmann, 2005) and because greater transparency may increase public trust in government and thus encourage greater public participation in policy decision-making processes (de Renzio et al., 2005). Greater transparency may also increase allocative efficiency as a result of public officials being subject to increased accountability and gaining greater legitimacy (de Renzio et al., 2005).

One way of enhancing transparency in fiscal policy-making is to undertake open budgeting initiatives aimed at reducing information asymmetries. The logical argument for introducing such initiatives is that the disclosure of budgeting information is fundamentally important for enhancing the transparency and accountability of public officials (Fukuda-Parr et al., 2011), which may lead to greater allocative efficiency in the setting of health priorities (from the voters' perspective). If high-quality health service delivery is a desired public good, then budgeting priorities are likely to be aligned with this goal in societies where open budgeting is practised (Simson, 2014).

However, a number of potential contextual factors may limit the gains in service delivery that open budgeting initiatives to improve transparency are intended to facilitate. For example, some have called into question the applicability of such initiatives in environments where people have limited ability – and may lack incentives – to process and act upon complicated financial information. Applying these initiatives in countries where the average level of education is low, as is the case in many LMICs, has been highlighted as particularly problematic (Carlitz, 2013). It is further argued that adequate institutional mechanisms to monitor and punish corrupt public officials are needed in order for initiatives to be effective. In addition, some have argued that fiscal transparency can create additional incentives for public officials to falsify budget information (Carlitz, 2013).

Hypothesis 6: Fiscal and budgetary transparency are positively correlated with health service delivery, particularly in well-governed countries with sufficient institutional capacity.

3.4.4. Fiscal and budgetary transparency – empirical evidence

Our research of the literature identified eleven empirical studies to be reviewed in this group. However, eight of these studies had questionable research design. Weaknesses in the quantitative studies included a lack of controls and/or a reliance on simple correlations. The qualitative studies, meanwhile, included small case studies with findings that are difficult to extrapolate to other settings

De Renzio et al. (2005) found a positive correlation in resource-dependent countries between budget transparency, as measured by the Open Budget Index (OBI), and the Human Development Index (HDI). Although population health is only one component of the HDI, the strong positive relationship identified between OBI and HDI

7 The three types of MTEF are as follows (from the least to the most advanced types): Medium-Term Fiscal Frameworks (MTFFs), which focus primarily on resource allocation; Medium-Term Budgetary Frameworks (MTBFs), which are also primarily input-based; and Medium-Term Performance Frameworks (MTPFs) (Brumby et al., 2013).

8 MTPFs are considered to be the most advanced form of MTEF because they focus on the measurement and evaluation of performance (Brumby et. al., 2013).

is interesting in itself. However, further analysis by the authors in the cases of Peru, Angola and Vietnam suggested a more nuanced picture of the association between resource dependency the character of a political regime, the maturity of civil society and the effects of these factors on development than the bivariate association between OBI and HDI may suggest. Nevertheless, Cimpoeru's (2015) study of a much larger sample of countries found a positive and significant correlation between a country's control of corruption and level of fiscal transparency (as measured by OBI scores) and its HDI (again, emphasising that health is a major component of the HDI).

Using ordered logit analysis applied to 73 developed and developing countries, and controlling for endogeneity with an IV approach, Sarr (2015) found that greater fiscal transparency (as measured by OBI scores) was positively related to budget credibility (as measured by deviations from budgeted health expenditures) and thus to more reliable funding of health service delivery. Simson (2014), using a sample of 70 countries (about half of which were LMICs) from several new datasets, found that the decrease in child mortality rates was substantially higher in countries with fast-improving OBI scores, i.e. with OBI scores that improved by at least 15 points between surveys. Simson also found that these countries had increased spending related to Millennium Development Goals (MDGs) by a significantly greater extent than the other countries. Robinson (2006) conducted several case studies on the impact of civil society initiatives and similarly found a link between budget transparency and increased allocations for social welfare expenditure priorities, especially for reproductive health in Mexico.

Fukuda-Parr et al. (2011) assessed the association between budget openness (using OBI) and rates of mortality among under-fives. Controlling for GDP per capita, geography and a range of other potential confounders, they found that a one-unit increase in a country's OBI score predicts a reduction of about 0.44 child deaths per 1,000. Bellver and Kaufmann (2005) assessed the association between life expectancy and child immunisation rates and transparency using a transparency index they constructed for 194 countries from 20 independent sources and based on two dimensions: economic/institutional transparency and political transparency. Their study found that transparency was positively and significantly related to both life expectancy and child immunisation rates, even after controlling for income per capita.

Public Expenditure Tracking Surveys (PETS) are another mechanism to increase accountability and fiscal transparency. Although we did not find any studies that directly assessed the impact of PETS initiatives on health service delivery, PETS were found to help in revealing leakages and gaps between declared and actual levels of health service financing at facility level (Gauthier, 2006; Ablo and Reinikka, 1998). In Uganda, for example, the results of a field survey suggested that the actual quality of health service delivery was poor relative to the amount of resources allocated towards healthcare (Ablo and Reinikka, 1998). The authors hypothesised that this was due either to a mismatch in priorities between different levels of government or to the misuse of funds. Their study concluded that the lack of public sector efficacy in health service delivery in Uganda was due to lack of accountability.

Finally, a case study of mental healthcare services in a small programme in the USA provides a cautionary tale. Robins (2001) considered the impact of financial management initiatives in mental healthcare on intrinsic motivation, concluding that greater public financial accountability can backfire in some cases. This is because some service providers, when under pressure, may focus less on the quality of the services they deliver and instead prefer to focus on quantitative outcomes. The finding that greater financial scrutiny may potentially distort incentives on the part of providers to deliver high-quality services is a matter of concern. However, it should be noted that this study was conducted in the USA, a high-income country with a health system setup very different from those in LMICs. A study by Barata and Cain (2001), meanwhile, concluded that the automation of financial functions in sub-Saharan Africa, introduced with the aim of increasing transparency in financial reporting, did not lead to improvements in financial accountability, as evidenced by continuing corruption and theft of state assets.

- Eleven empirical studies were reviewed in this group.
- The majority (eight) of these studies had questionable research design, including quantitative studies that lacked controls and/or relied on simple correlations, as well as small qualitative case studies with findings that are difficult to generalise to other settings.

3.5. Participatory budgeting and community scorecards – theoretical links

Effective PFM systems are supposed to make public spending not only more resistant to the influence of corruption, but also more closely aligned with the preferences of the general public. PFM reforms may thus include such initiatives as participatory budgeting and community scorecards, as well as more general monitoring.

Participatory budgeting initiatives were originally inspired by the Porto Alegre experiment to study the potential of citizen participation to influence budgeting and spending priorities in Brazilian municipalities (Robinson, 2006). Such initiatives can be viewed as a potential alternative to fiscal decentralisation, with a similar goal of increasing the responsiveness of policy-making to people's preferences and thus ultimately leading to improved allocative efficiency in the delivery of public services

(Robinson, 2006). Participatory budgeting is expected to improve health service delivery by enhancing information flows between policy-makers and users of health services. They are expected to achieve this aim by strengthening accountability as a commitment device for policy-makers and by enabling easier and more frequent checks on policy-makers' actions (Gonçalves, 2014). The mechanism of action is thus somewhat similar to open budgeting initiatives aimed at reducing information asymmetries between principals and agents. However, the focus of participatory budgeting is not only on increasing accountability, but also on enabling greater information exchange with the aim of increasing responsiveness to voters' preferences.

The use of community scorecards, while not generally viewed as a mechanism aimed at affecting the quality of PFM, is intended to improve transparency and accountability in health service delivery by increasing public participation in policy-making and by holding public officials and service providers to account (Ho et al., 2015). Combining the techniques of social audits and citizen report cards, community scorecards are a monitoring tool that is expected to lead to greater public accountability and responsiveness from service providers (Mistra and Ramasankar, 2007). While community scorecards may not be viewed as an essential component of well-functioning PFM systems, they can affect their quality in a similar way to the accountability and transparency initiatives discussed above. Another monitoring device is the 'balanced scorecard performance system', which is basically a collection of a range of performance indicators in key domains, described in Edward et al. (2011) as 'an integrated management and measurement tool that enables organisations to clarify their vision and strategy and translate them into action'. The rationale for using balanced scorecard systems is similar to the rationale for using community scorecards.

Hypothesis 7: transparency and accountability initiatives such as participatory budgeting and community scorecards will be positively correlated with health service delivery.

3.6. Participatory budgeting and community scorecards – empirical evidence

Twelve empirical studies were reviewed in this group. One was a synthesis report summarising empirical evidence from other studies; three were individual case studies; four were studies with relatively poor design (e.g. lack of controls in regression, or lack of clarity about their empirical approach); and four were relatively high-quality econometric studies. The majority of the studies relied primarily on cross-country data only.

Commenting on the impact of transparency and accountability initiatives in a synthesis report, McGee and Gaventa (2010) noted that the preliminary evidence indicates that these initiatives do help reduce corruption and improve service quality. However, the author also acknowledged that the evidence for this finding is context specific. Among the initiatives reviewed in McGee and Gaventa's study were PETS (Gauthier and Wane, 2009; Fritz et al., 2012; Gauthier, 2006), community score cards (Mistra and Ramasankar, 2007), community monitoring (Bjorkman and Svensson, 2007) and participatory budgeting.

Using municipal-level data from Brazil spanning the period 1990-2004, Gonçalves (2014) found that municipalities which implemented participatory budgeting reforms were likely to allocate more funding to health and sanitation services. This finding was confirmed even after controlling for municipal fixed effects and a range of other control variables. The parallel reduction in the share of funding going to administration, housing, education and legislation expenditures suggested that public preferences in Brazil were inclined to greater spending on health, even at the expense of other public services. The study further found that infant and child mortality rates were significantly more likely to decrease in municipalities that adopted participatory budgeting. The author cautioned, however, that the implementation of participatory budgeting requires political commitment to be successful. Another study on participatory budgeting initiatives in Brazil found that such initiatives led to improvements in services for the poor, including an increase in the percentage of municipal expenditures on health (Baiocchi et al., 2006). Finally, using a database of the largest Brazilian cities over the preceding 20 year-period, Touchton and Wampler (2014) found that cities where participatory budgeting initiatives were implemented had greater health spending per capita and lower infant mortality rates. The authors further found that this effect became stronger the longer the programme was implemented.

The use of community scorecards, as another instrument designed to increase the responsiveness of health systems to the input of end-users, was studied by Ho et al. (2015). They conducted a qualitative evaluation of the impact of introducing community scorecards in the Democratic Republic of Congo on the general public's perception of changes in the quality of health system delivery. On the basis of 45 stories collected from community members and health service providers, the authors reached the overall conclusion that there was a public perception of greater transparency and community participation in heath facility management, as well as improved quality of care. These perceived improvements included 'better access to services, improved patient-provider relationships, improved performance of service providers, and improved maintenance of physical infrastructure' (Ho et al., 2015).

In an India-based case study by Mistra and Ramasankar (2007), the introduction of community scorecards was found to be related to greater patient satisfaction with healthcare, possibly because of the reduced gap between users and service providers. Bjorkman and Svensson (2007) conducted a randomised field evaluation of the community-based monitoring of primary healthcare providers in Uganda. After one year, the authors found significant improvements in health services utilisation as well as health outcomes, including reduced child mortality rates and increased birth weight, in the experiment communities as compared to the control communities.

Finally, a study conducted by Edward et al. (2011) considered the impact on health system performance of introducing balanced scorecards and concluded that scorecards led to improvements in health system capacity and delivery. However, it appears that conclusion was reached simply on the basis of observing changes in trends for various indicators over the five-year period, without any comparison with control communities or controlling for potential confounders.

- Twelve empirical studies were reviewed in this group.
- One of the studies was a synthesis report summarising empirical evidence; three were case studies; four were studies with relatively poor design (e.g. a lack of controls in regression, lack of clarity about their empirical approach); and four were relatively high-quality econometric studies, though relying primarily on cross-country data.

3.7. Fiscal decentralisation – theoretical links

Fiscal decentralisation has been promoted as a mechanism for increasing the responsiveness of public policy to voters' preferences and for increasing democratic participation in governance. The theoretical argument for greater decentralisation is the presumed inability of centralised systems to coordinate large-scale activities due to lack of knowledge about local culture and circumstances (Akin et al., 2005; Robalino et al., 2001). In this view, decentralisation may bring about Pareto improvements in aggregate welfare, i.e. improvements that help some people without harming others (Akin et al., 2005). Decentralisation is also sometimes theorised to encourage yardstick competition among local governments and thus potentially lead to better quality public services (Adam et al., 2008), especially if accompanied with appropriate performance management. In relation to health service delivery, fiscal decentralisation is expected to bring about improvements in allocative and technical efficiency through the abovementioned mechanisms (Robalino et al., 2001), as well as by involving local communities in decision-making and implementation processes (Uchimura and Jütting, 2009). However, fiscal decentralisation reform will not necessarily lead to greater community participation unless accompanied by additional steps, such as the introduction of participatory budgeting and community scorecards, as well, perhaps, as the adoption of SWAps (discussed below).

As in the case of transparency, however, the view on the usefulness of fiscal decentralisation initiatives is not uniformly positive. A major concern is that decentralisation may lead to the capture of decision-making processes by local elites rather than by the communities they represent (Akin et al., 2005), thereby promoting rather than preventing corruption (Vian and Collins, 2006). Another concern is that poorer regions may suffer if the redistributive powers of central government are reduced (Robalino et al., 2001). The positive impact of decentralisation reforms is also viewed sceptically in the context of institutionally weak systems (Lewis, 2006).

Hypothesis 8: Fiscal decentralisation is likely to lead to better health service delivery outcomes, although this effect will depend on local institutional capacity.

3.7.1. Fiscal decentralisation – empirical evidence

Seven empirical studies were reviewed in this group, of which one was a quality-adjusted literature review of other empirical evidence. The remaining six articles all used relatively high-quality econometric approaches based on cross-country data analysis (for which, as mentioned earlier, it is harder to draw causal inferences, even with sophisticated econometric methods).

Robalino et al. (2001) assessed the impact on infant mortality rates of fiscal decentralisation (as measured by the share of public expenditure managed by local government), using a panel data sample from both high- and low-income countries for the period 1970-1995. They found that fiscal decentralisation was associated with a significant reduction in infant mortality rates, particularly in countries that promoted political rights. Based on the obtained results, the authors cautioned that greater fiscal decentralisation will only be successful in lowering mortality rates if there is sufficient local institutional capacity.

Soto et al. (2012) considered the impact on infant mortality rates in Colombia of fiscal decentralisation (as measured by locally controlled health expenditure as a proportion of total health expenditure). On the basis of data from 1,080 municipalities for the period 1998-2007,

the authors found that decentralisation correlated with lower infant mortality rates, with the effect being stronger in richer municipalities. These findings also applied to province-level data from China analysed by Uchimura and Jütting (2009) to assess the effect of fiscal decentralisation and local fiscal autonomy on infant mortality rates. From their panel data they found that that these reforms correlated to reduced infant mortality rates. However, this was again found to be true only under certain conditions, including adequate fiscal capacity at local level.

In their quality-adjusted review of the empirical evidence, Channa and Faguet (2016) concluded that the higher quality studies found fiscal decentralisation led to better health service delivery outcomes. The authors put the abovementioned study by Uchimura and Jütting (2009) in the 'strongly credible' category, while the studies of Robalino et al. (2001), Asfaw et al. (2007) and Habibi et al. (2003) were placed in the 'somewhat credible' category. Asfaw et al. (2007) found that fiscal decentralisation (as measured by an index constructed by them) was significantly associated with a reduction in infant mortality rates in India. While their study did include several control variables, other potentially important variables, such as fertility rates, were excluded. In the paper by Habibi et al. (2003), the authors used a range of econometric techniques to assess the impact of the devolution of political powers on infant mortality rates in Argentina. They concluded that devolution had a positive effect on human development (including health) and further found that this effect was stronger in provinces with greater tax accountability. A paper by Khaleghian (2004) found that political decentralisation (as measured by an indicator from the Database of Political Institutions) was associated with significantly higher rates of immunisation coverage for diphtheria and measles. However, they also found that this association applied only in low-income countries, while in middle-income countries there was a reversal in the sign of the relationship.

While the impact of fiscal decentralisation from higher to lower levels of government is of significant interest, PFM-related decentralisation may also encompass the devolution of fiscal authority to health facilities and hospitals, i.e. greater hospital autonomy (Mitchell and Bossert, 2010). One study, for example, considered the impact of providing tuberculosis health services in primary care facilities instead of hospitals (El-Sony et al., 2003). However, such devolution typically encompasses not only fiscal decentralisation but also other dimensions, such as administrative and political decentralisation (Robinson, 2007). Decentralising to hospital level, for example, may involve devolving not only greater fiscal authority but also greater authority to manage health-sector functions (Mitchell and Bossert, 2010). It is very difficult, therefore, to differentiate between the impacts of these interrelated dimensions.

- Seven empirical studies were reviewed in this group, of which one was a quality-adjusted literature review of the empirical evidence.
- The remaining six articles were all relatively high-quality econometric articles based on cross-country data analysis.

3.7.2. Other PFM reforms – theoretical links

'Activity-based budgeting' is an MTEF-related reform designed to improve the budgeting process by increasing the capacity to set appropriate priorities and cost activities, which should lead to a greater sense of ownership of the budgeting process. Under activity-based budgeting, changes in funding allocations should be related to changes in activities (Anipa et al., 1999) rather than being based simply on spending in previous years (Bentes et al., 2004).

'Performance-based budgeting', meanwhile, aims to improve health service delivery through a number of assessment mechanisms designed 'to strengthen links between the funds provided [...] and their outcomes/outputs' (Brumby and Robinson, 2005:5). These assessment mechanisms act as incentives related to achieving certain service quality targets. Although there is an extensive literature on the use of such mechanisms in the financing of healthcare, almost all of this literature is limited to high-income countries (Glied and Smith, 2011; Brumby and Robinson, 2005). Performance-based budgeting is not considered in this review because such budgeting can affect health service delivery not only through changes in PFM quality, but also through the provision of strong incentives on organisational behaviour focused on the impact of cost-containment incentives.

A number of studies consider the impact of reforms in health financing on service delivery outcomes. Kutzin et al., (2009), for example, considered the impact of introducing social health insurance on informal payments, equity in regional governmental health spending and financial protection. Again, we do not take into account evidence from such studies because they do not shed light on changes in the quality of PFM systems.

Another potentially important factor for improving health service delivery is greater reliability of funding flows. This could be achieved, for example, by a more efficient setup of payroll mechanisms. However, the available literature appears to focus on comparing the impact on health-related outcomes of different modes of raising revenue, such as payroll vs general taxation (Baeza and Packard, 2006), rather than on payroll controls, such as monitoring the presence of ghost workers. Nevertheless, the quality of payroll controls is a component of PEFA scores designed to measure the overall quality of country-level PFM systems. As such, the ability of payroll controls to influence health service delivery (in combination with other dimensions as measured by PFM scores) was considered in relevant studies, such as Fritz et al. (2014).

Stronger and more competitive open market procurement systems may theoretically result in lower costs, more reliable resource flows and better health service outcomes. As yet, however, there is little to no reliable evidence on this (Andrews et al., 2014). While 'competition, value for money and controls in procurement' is one of the dimensions measured by the PEFA score (Fritz et al., 2014), we did not find any studies that explicitly considered the impact of the quality of procurement systems on health service delivery. Some limited information was found, however, on the impact of competitive procurement on prices and procurement lead times (Arney et al., 2014). According to case study evidence, procurement lead times in Ghana were actually longest in the case of competitive bidding types of procurement, and this method was also found to result in longer medicine stock-outs (Arney et al., 2014). The authors further observed that while international competitive bidding is often considered a preferable method, primarily because it is transparent and presumably results in lower purchase costs, the potential advantages of this method should be weighed against its drawbacks. These drawbacks include longer lead times, greater requirements for technical expertise and less flexibility in forecasting than simpler and more informal procurement methods (Arney et al., 2014).

Finally, the introduction of Health Management Information Systems (HMIS), of which Financial Management Information Systems (FMIS) are a subcomponent, is another reform with the potential to improve health service delivery. Such systems are intended to enable the integration of reliable data which can then be used to measure and ultimately improve the quality of health services (Chaulagai et al., 2005).

Hypothesis 9: Activity-based budgeting is likely to be positively related to health service delivery outcomes.

Hypothesis 10: The introduction of Health Management Information Systems is likely to lead to better health service delivery outcomes.

3.7.3. Other PFM reforms – empirical evidence

Four empirical studies were reviewed in this group, none of which were large-N econometric or statistical studies. All four studies relied on case study design, thus limiting their ability to generalise findings to other contexts.

A synthesis report by Fritz et al. (2012) found little evidence that PFM reforms affected service delivery in post-conflict countries. Instead, they noted, service delivery was found to improve in all the studies of post-conflict countries that they reviewed, regardless of how much progress was made in PFM reforms. The authors acknowledge that these findings are difficult to generalise to other settings, however, since early improvements in service delivery in post-conflict countries are likely to have been driven by improvements in the security situation and in the reintegration of refugees, as well as by increases in flows of aid.

Activity-based budgeting has been implemented in a number of countries for some time now, including in Ghana since the early 1990s. However, no study to our knowledge has evaluated the impact of activity-based budgeting on health service delivery in isolation from other reforms. One study did find that activity-based budgeting in Portugal had had a limited impact on cost-effectiveness and cost containment, because budget overruns were typically covered by supplementary allocations (Bentes et al., 2004). This study provided no further details, however.

Some other relevant PFM reforms may also be related to the quality of health service delivery. A case study of South African health management teams, for example, revealed that efforts to integrate financial data and statistics on service utilisation, for example through expenditure-tracking initiatives involving not only financial but also medical personnel, resulted in better management control and greater transparency, as well as enabling attention to be focused on areas more likely to be abused (Vian and Collins, 2006).

We did not manage to find any studies on the impact of FMIS, although some studies did consider the impact of HMIS, of which FMIS are a subcomponent. A mid-term review by Chaulagai et al. (2005), for example, rated favourably a programme in Malawi to strengthen the quality of HMIS. This programme started with an analysis of the system's strengths and weaknesses and subsequently provided training for staff on information management. Nevertheless, little evidence was found that the HMIS programme was used for 'rationalising decisions regarding planning and management of health services'.

- Four empirical studies were reviewed in this group.
- None of the studies were econometric/statistical studies. All relied on case study design.

3.8. Impact of donor-related reforms

Given the importance of donor involvement in the healthcare and PFM reform agendas of developing countries, the literature review looked specifically at the theoretical and empirical evidence for links between typical donor-related PFM reforms and their impact on healthcare delivery.

3.8.1. Theoretical links

In the context of donor support, Sector-Wide Approaches (SWAps) have been adopted in many countries as a strategy to increase the efficiency of health spending. SWAps are designed to improve efficiency by increasing the responsiveness of health policy to local priorities, fostering greater public participation, and improving interaction between different key stakeholders (particularly donors) in a fragmented system (Bodart et al., 2001; Chansa et al., 2008; Cassels and Janovsky, 1998). SWAps are expected to bring the following benefits: to strengthen coordination between different players; to serve as a mechanism for improved coordination and alignment between donors and partners; to improving domestic ownership and accountability; to reduce transaction costs; to improve planning; to improve resource allocation and policy implementation capacity; and ultimately to lead to better health service delivery (Dickinson, 2011). However, the implementation of SWAps may also lead to a perception on the part of some donors that they are losing control. For this reason there is some concern that the implementation of SWAps may lead donors to reduce aid toward health programmes in low-income countries. This concern is supported by some recent empirical evidence (Sweeney et al., 2014).

Hypothesis 11: The introduction of SWAps is likely to be positively correlated with improved health service delivery. However, there is less certainty about the predicted impact of SWAps on aid flow towards health.

3.8.2. Empirical evidence

Three empirical studies were found in the literature relevant to this topic. None of the studies involved advanced quantitative analysis. One was a literature review, while the other two were case studies.

In Burkina Faso, despite increases in healthcare funding, a range of health service delivery outcomes have been declining, including rates of immunisation, the use of curative services and patient satisfaction with healthcare. Bodart et al. (2001) suggested that one possible solution to this decline could be to increase the participation of stakeholders in the management of resources linked to healthcare. This could be achieved through the introduction of a SWAp, for example. However, the authors doubted the feasibility of applying this reform in Burkina Faso at the time of the study. By increasing the attractiveness for donors of funding the health sector, SWAps may have an impact on health system quality. However, with a fixed amount of funding available, resources may simply be reallocated among sectors rather than increased.

The introduction of a SWAp in Zambia in the early 1990s was found to be related to small improvements in the administrative efficiency of the health sector (Chansa et al., 2008). However, the effect of the SWAp on technical efficiency was actually found to be negative (as measured by rates of hospital bed utilisation and governmental funding for medicine). The effect of the SWAp on allocative efficiency was found to be slightly positive. The predictability of funding deteriorated in 1997-1998, though this may have been due to the inability of health services to absorb large increases in health budgets. A study by Dickinson (2011) concluded from the available literature that programme-based approaches such as SWAps may indeed contribute to better health service delivery by leading, for example, to greater resource allocations to health from both donors and health ministries. Dickinson qualifies this conclusion, however, by emphasising the difficulty of attributing changes in health service delivery outcomes specifically to SWAps. The author also points out that implementing SWAps may be associated with high transaction costs.

Finally, there is some tentative evidence that SWAps may contribute to better service delivery by increasing the reliability of funding flows as a result of pooling funds at district level (Dickinson, 2011). In some countries, including Uganda, Ghana, Zambia, Malawi and Tanzania, the introduction of SWAps has been found to be related to improvements in such outcomes as drug availability, immunisation coverage, outpatient utilisation, under-five mortality rates, skilled birth attendance, and tuberculosis cure rates (Dickinson, 2011).

- Three empirical studies were included in this group.
- None of these studies involved advanced quantitative analysis. One was a literature review and the other two were case studies.

4. Data and methodological challenges in the empirical evidence

4.1. Data limitations

In assessing the state of the evidence on the link between PFM and relevant health system outcomes as reviewed here, it is important to bear in mind the existing, significant challenges in even accurately measuring either side of the relationship.

Few attempts have yet been made to measure PFM quality directly. To avoid having too few studies in this review, therefore, we had to broaden our definition of PFM to include studies that considered any dimensions potentially related to the quality of PFM. Where PFM quality was explicitly measured in a study, this was usually done by using aggregated scores, such as a transparency index (Bellver and Kaufmann, 2005), the CPIA index (Fonchamnyo and Sama, 2016), PEFA scores (Fritz et al., 2014), the Open Budget Index (de Renzio et al., 2005) or other broad indicators of the quality of governance (Hu and Mendoza, 2013; Uchimura and Jütting, 2009). The problem with using such aggregated scores is that they are unable to show the importance of sub-dimensions, lacking sensitivity to the specifics of sub-dimensions, including those that are related to PFM. Despite efforts to standardise data sources, these indicators are known to be subject to error and/or bias (Bellver and Kaufmann, 2005). In the future it may be useful to have more studies focussing on specific sub-dimensions of PFM systems. One way to start doing this would be to break down the analysis of the broad indicators into their component parts.

The performance of health services is often measured in the literature by outcomes such as infant or maternal mortality rates. While this data may be easy to obtain, these outcomes may not be sensitive enough to changes in health service inputs. For example, while maternal mortality rates may be driven primarily by the contribution of health systems, infant mortality rates may be the result of inputs of a range of factors, including health services, household behaviour and sanitation (Wagstaff and Claeson, 2004). There may be considerable error, moreover, in the measurement of child mortality rates in lower income countries (Lewis, 2006). Despite these qualifications, however, to the extent that the relationship between PFM-related measures and health outcomes was found to be causal (and the likelihood of this was greater in studies with more robust econometric designs), the fact that this relationship was found to be significant in a number of studies is particularly noteworthy.

More generally, evaluating the impact of PFM quality on public health service delivery entails appropriate definition and measurement of the outcome variables, which is quite challenging given the lack of any standardised measurement for a functioning health system (Lewis, 2006). Ideally, the chosen outcome variables should be sensitive to the impact both of health systems and of PFM, and health outcome variables could potentially be used for this purpose. In practice, however, it is not easy to assess impact on health outcomes, since this can be driven by a range of factors beyond the control of health systems, including differences in resource availability, socioeconomic status, the epidemiological environment and the disease burden in the population. It may be more practical, therefore, to focus instead on the 'process indicators' of health service delivery performance. Again, however, these process indicators may vary between different environments, depending on factors beyond the control of health services. Moreover, some health services may not necessarily be beneficial to health. In addition, the available indicators often reflect not only the relationship between public service delivery and health output, but also, due to their being more general in nature, the impact of private sector delivery.

Cross-country comparisons can be particularly difficult because the definition of outcome variables may vary substantially between countries, and the impact of other variables on both PFM and health service delivery may be difficult to rule out. Also, country-level studies may suffer from an inability to differentiate among various subpopulations within a given country. In such situations, evidence from country case studies may be useful, although it may be difficult to generalise findings from a small

sample size to a larger population. In addition, some concerns were raised about participant representativeness in the qualitative case studies that relied on interview collection (Ho et al., 2015). Some case studies were also conducted in post-conflict countries, and findings from these countries may be particularly difficult to generalise to other settings (Fritz et al., 2012).

Finally, in some cases reforms were implemented in law but were not functioning in practice, as was mentioned, for example, in a study of the impact of MTEFs (Vlaicu et al., 2014). The inclusion of countries where this is true would introduce a measurement error in MTEF exposure, leading to a potential underestimation of the effects of MTEF. A number of studies also had a rather short time span, which may preclude them from finding effects that require a lag of sufficiently long duration (Vlaicu et al., 2014; Simson, 2014).

4.2. The challenge of establishing causality

The majority of the evidence reviewed did not have strong mechanisms in place to determine causality, as would be expected in a domain that, at least so far, has not seen many truly randomised evaluation designs. Most of the empirical studies we reviewed assessed simple associations between PFM dimensions (or their proxies) and outcomes related to health services. However, the influence of omitted (or unobserved) factors may bias the assessment of such associations. At a minimum, adequately controlling for potential confounders should be included. Likewise, several case studies claimed that the implementation of certain reforms, such as the introduction of community scorecards, resulted in improvements in some health outcomes. In most cases this claim is based on a potentially false *post hoc ergo propter hoc* assumption, whereby any observed changes in health were attributed to certain reforms.

The best studies would provide causal evidence of the impact of PFM and PFM reforms on public health service delivery. The most convincing research design for making causal statements, it is argued, includes evaluations using randomisation. In our search, only one study fulfilled this criterion (Bjorkman and Svensson, 2007). However, other types of empirical research design can go a long way toward suggesting causal associations. Longitudinal studies, for example, can account for time-invariant heterogeneity by controlling for fixed effects, and can explore the intertemporal nature of the relationship between PFM quality and public health service delivery. Another example is studies that attempt to control for omitted time-varying confounders and for reverse causality by applying an instrumental variable strategy. Several of the articles in our review used IV and/or panel data analysis (Vlaicu et al., 2014; Hu and Mendoza, 2013; Gupta et al., 2000; Rajkumar and Swaroop, 2008; Robalino et al., 2001; Uchimura and Jütting, 2009; Fonchamnyo and Sama, 2016; Gonçalves, 2014; Sarr, 2015).

5. Summary

5.1. Reviewing the identified hypotheses

This literature review has reviewed the selected studies in order to draw out more clearly their implicit or explicit hypotheses regarding the relationship between PFM and health service delivery. These hypotheses are summarised here alongside a concluding set of remarks identifying the degree to which the hypotheses have been supported by the reviewed empirical evidence.

Table 1. Summary of hypotheses and evidence reviewed

Hypothesis	Summary of evidence	# of studies
1. Better PFM quality is positively related to health service delivery.	The evidence on the impact of PFM quality (as measured by broad generic indicators) on health service delivery is uncertain. One study found that the CPIA rating of the quality of budgetary and financial management had a positive and significant association with public sector efficiency in the health sector. Another found that a narrower range of PEFA scores and the broader CPIA index were unrelated to efficiency in service delivery.	2 studies reviewed
2. The quality of general governance is positively related to healthcare delivery.	A range of indicators of the quality of governance were found to be generally positively related to health service delivery-related outcomes.	11 studies reviewed
3. The extent of corruption is negatively related to health service delivery, including health outcomes.	Corruption was found to be persistently negatively related to a range of health service delivery-related outcomes.	
4. Good governance helps translate public health spending into more effective health service delivery.	All of the studies reviewed found that public spending on health was more effective in better governed countries.	
5. The introduction of MTEFs is likely to lead to improvements in health service delivery.	The evidence for the positive impact of MTEF reforms on health service delivery is conflicting, although there is more evidence in support of this hypothesis than against it. One study found that MTEF reform had not prevented a decline in the proportion of budgets allocated to healthcare. Another study found that the most advanced form of MTEF, i.e. MTPF, was positively related to the cost-effectiveness of public health expenditures. In a third study, MTPFs were found to have a significant positive impact on technical efficiency in the health sector.	3 studies reviewed
6. Fiscal and budgetary transparency are positively correlated with health service delivery, particularly in well-governed countries with sufficient institutional capacity.	Several studies found strong evidence of a positive relationship between various indicators of fiscal and budgetary transparency and outcomes related to health service delivery.	11 studies reviewed, of which 8 were of questionable design.
7. Initiatives to increase transparency and accountability, such as participatory budgeting and community scorecards, are positively correlated with health service delivery.	There is some evidence for the positive impact on health service delivery of initiatives to increase transparency and accountability, such as participatory budgeting and community scorecards.	12 studies reviewed
8. Fiscal decentralisation is likely to lead to better health service delivery outcomes, although the effect is likely to depend on local institutional capacity.	Fiscal decentralisation in general was found to be positively related to good health service delivery outcomes. However, it seems that decentralisation is more likely to be effective where there is sufficient local institutional capacity and accountability	7 studies reviewed

Hypothesis	Summary of evidence	# of studies
9. Activity-based budgeting is likely to be positively related to health service delivery outcomes.	There is limited evidence on the impact of activity-based budgeting on the quality of health service delivery. One study found that activity-based budgeting had only a limited impact on cost-effectiveness and cost containment.	4 studies reviewed
10. The introduction of HMIS is likely to lead to better health service delivery outcomes.	We found no empirical evidence on the impact of FMIS on health service delivery. One study undertaken specifically of HMIS concluded that very little improvement in decision-making in the health sector resulted from the introduction of HMIS.	
11. The introduction of SWAps is likely to be positively correlated with health service delivery, although its predicted impact on aid flow towards health is less certain.	While the scarce available case study evidence provides some initial support for the hypothesis (and for the notion that SWAps can increase resources allocated to the health sector), the lack of studies involving any advanced quantitative analysis does not allow for major conclusions at this stage.	3 studies reviewed

5.1.1. Further key conclusions and issues

The above discussion has set out the empirical evidence in relation to the theoretical hypotheses identified in the literature. The following points also emerged in the course of this review.

Definitions of PFM and healthcare delivery

The studies we reviewed use different definitions of PFM and health service performance, making it problematic to draw comparisons between them. In addition, while it is preferable to use a direct measure of PFM quality (e.g. a measure that can take into account the ability of PFM systems to ensure the transparency and reliability of the budget process), aggregate scores may suffer from a number of disadvantages. For example, aggregate scores may be unable to take into account separate sub-dimensions of PFM, or to distinguish between a PFM system that scores highly with the correct 'form', but that nevertheless fails to deliver actual functionality. An alternative approach is to consider the impact of proxies for these separate dimensions, such as the extent of transparency, the quality of governance and the responsiveness of PFM and related institutions.

Within this review, empirical evidence on the nature of PFM systems was taken from studies in which the impact of PFM systems was more or less clearly defined and measured (e.g. as CPIA index or PEFA scores) as well as from studies in the health system-strengthening literature that concerned dimensions of health systems that are in some way related to well-functioning PFM systems, though these latter studies did not explicitly measure PFM quality.

The relationship between increased financing of health systems and health outcomes

One of the strongest and most consistent findings was the evidence that simply increasing public funding of health programmes is unlikely to be as effective in poorly governed countries as in better governed countries (with 'governance' likely to include the quality of PFM). Good governance is also likely to be positively correlated with public sector efficiency in achieving good population health outcomes.

There is some evidence, however, that greater participation of stakeholders in the design, implementation and evaluation of health services may be an effective way to improve their quality so as to maximise the benefit of additional financing. This could be achieved through mechanisms such as participatory budgeting initiatives (Gonçalves, 2014; Baiocchi et al., 2006), community scorecards (Ho et al., 2015; Mistra and Ramasankar, 2007), community-based monitoring of primary care provision (Bjorkman and Svensson, 2007) and SWAps (Bodart et al., 2001; Chansa et al., 2008; Dickinson, 2011).

The complexities of linking specific PFM reforms to changes in health service effectiveness

Fiscal decentralisation was found to be generally positively related to population health (Robalino et al., 2001; Uchimura and Jütting, 2009), although this appeared to be dependent on the availability of good local institutional capacity. However, decentralisation may also lead to some undesirable results, such as declining proportions of budgets going to primary healthcare or other public goods (Akin et al., 2005; Brixi et al., 2013). Despite fiscal decentralisation being a widely adopted policy in LMICs, the evidence thus does not indicate that decentralisation is unambiguously positive for health service delivery. In some cases, therefore, continued central control over the allocation and use of funds may be beneficial, especially in healthcare.

The studies review found that MTEF reforms usually improve budget reliability and fiscal discipline and sometimes lead to improvements in the technical efficiency of the health sector (especially in the case of MTPF reforms). However, such reforms may actually lead to lower allocation of funding towards health, especially if there is significant fungibility in health aid financing (Lu et al., 2010; Bevan and Palomba, 2000). The reduced funding of healthcare observed in some countries may reflect a genuine preference for alternative spending targets, for example on education

(as discussed in Bevan and Palomba (2000)), even in countries with apparently well-governed PFM systems.

In some cases, greater public financial accountability can have unintended consequences. For example, some service providers, when placed under pressure, may focus less on the qualities of the services they deliver and opt instead to focus on quantitative outcomes. Nevertheless, as the evidence for this unintended consequence comes only from the USA, which has a highly idiosyncratic health system setup, this finding may not apply in LMICs.

There is evidence of greater allocations of funding towards health (as well as greater reliability of health funding) in countries with greater budget transparency and less corruption (Sarr, 2015; Simson, 2014; Robinson, 2006; Mauro, 1998). In some cases, this was even found to be translated into better health outcomes, including lower rates of infant mortality and higher rates of healthcare utilisation (Fukuda-Parr et al., 2011; Sarr, 2015; Bellver and Kaufmann, 2005; Gupta et al., 2000). However, the *reduced* funding of healthcare observed in some countries may reflect a genuine preference for alternative spending targets, e.g. on education (as discussed in Bevan and Palomba (2000)), even in apparently well-governed PFM systems.

The nature of the overall evidence

The overall evidence in this field appears to be patchy, which may be of significance for all the conclusions outlined above. The evidence in some subfields is much more developed than in others. For example, there were 11 empirical articles on the impact of good governance, most of which were of high-quality design, while only two empirical studies were found on the impact of PFM system quality (measured directly) on health services delivery. A significant proportion of the reviewed articles were single-country case studies, or qualitative articles where it was not completely clear how the conclusion was reached. Many of the quantitative studies we reviewed were also not ideal, with some relying on simple correlations, some using regression analysis without appropriate controls, and some employing inappropriate methodological approaches. On the other hand, quite a few of the econometric studies we reviewed relied on more advanced approaches, such as panel data analysis and IV regression. Even these better-designed studies, however, often relied on cross-country data only, hence allowing for limited degrees of causal inference. Only one study made use of a truly randomised design, allowing for greater causal inference.

Nevertheless, given that this field appears to be in its early stages of development, and given the difficulty of finding relevant articles among hundreds of results generated by the search terms, we believe that the 52 empirical articles that we found (not counting the articles that informed the theoretical part of our review) provided a good basis for this initial review.

References

Ablo, E. and Reinikka, R. (1998) 'Do budgets really matter? Evidence from public spending on education and health in Uganda'. World Bank Policy Research Working Paper 1926. Washington, DC: World Bank Publications.

Adam, A., Delis, M. D. and Kammas, P. (2008) 'Fiscal decentralization and public sector efficiency: Evidence from OECD countries'. CESifo Working Paper No.2364.

Akin, J., Hutchinson, P. and Strumpf, K. (2005) 'Decentralisation and government provision of public goods: The public health sector in Uganda'. *Journal of Development Studies,* 41(8)**:** 1417-1443.

Andrews, M., Cangiano, M., Cole, N., de Renzio, P., Krause, P. and Seligmann, R. (2014) 'This is PFM'. CID Working Paper No. 285. Cambridge, MA: Centre for International Development, Harvard University.

Anipa, S., Kaluma, F. and Muggeridge, E. (1999) 'DFID Seminar on Best Practice in Public Expenditure Management: Case Study on MTEF in Malawi and Ghana'. Consulting Africa Limited. In Background Papers for OPM Conference on Good Practice in Public Expenditure Management, Eyesham Hall, Oxford.

Arney, L., Yadav, P., Miller, R. and Wilkerson, T. (2014) 'Improving Procurement Practices in Developing Country Health Programs'. Ann Arbor, MI: William Davidson Institute, University of Michigan.

Asfaw, A., Frohberg, K., James, K. and Jütting, J. (2007) 'Fiscal Decentralization and Infant Mortality: Empirical Evidence from Rural India'. *Journal of Developing Areas*, 41(1): 17-35.

Azfar, O. and Gurgur, T. (2008) 'Does Corruption Affect Health Outcomes in the Philippines?'. *Economics of Governance*, 9(3): 197-244.

Baeza, C. and Packard, T. G. (2006) *Beyond Survival: Protecting Households from Health Shocks in Latin America*. Washington, DC: World Bank and Stanford University Press.

Baiocchi, G., Heller, P., Chaudhuri, S. and Silva, M. K. (2006) 'Evaluating Empowerment: Participatory Budgeting in Brazilian Municipalities' in R. Alsop, M. Bertelsen and J. Holland (eds.) *Empowerment in Practice: From Analysis to Implementation*. Washington, DC: World Bank: 95-128.

Banerjee, A. V., Mullainathan, S. and Hanna, R. (2012) 'Corruption'. NBER Working Paper 17968. Cambridge, MA: National Bureau of Economic Research.

Barata, K. and Cain, P. (2001) 'Information, not technology, is essential to accountability: Electronic records and public-sector financial management'. *The Information Society,* 17(4): 247-258.

Bentes, M., Dias, C. M., Sakellarides, C. and Bankauskaite, V. (2004) *Health care systems in transition: Portugal*. European Observatory on Health Systems and Policies.

Bevan, D. and Palomba, G. (2000) 'Uganda: The Budget and Medium-Term Expenditure Framework Set in a Wider Context'. Background paper for Poverty Reduction Support Credit with DFID Finance, London.

Bjorkman, M. and Svensson, J. (2007) 'Power to the People: Evidence from a Randomized Field Experiment of a Community-Based Monitoring Project in Uganda'. World Bank Policy Research Working Paper 4268. Washington, DC: World Bank.

Bodart, C., Servais, G., Mohamed, Y. L. and Schmidt-Ehry, B. (2001) 'The Influence of Health Sector Reform and External Assistance in Burkina Faso'. *Health Policy and Planning,* 16(1): 74-86.

Brixi, H., Mu, Y., Targa, B. and Hipgrave, D. (2013) 'Engaging sub-national governments in addressing health equities: Challenges and opportunities in China's health system reform. *Health Policy and Planning,* 28(8): 809-824.

Brumby, J., Biletska, N., Grigoli, F., Hemming, R., Kang, Y., Lee, J. W., Mills, Z., Min, S. Y., Moreno-Dodson, B. and Vlaicu, R. (2013) *Beyond the annual budget: global experience with medium-term expenditure frameworks*. Washington, DC: World Bank.

Brumby, J. and Robinson, M. (2005) *Does Performance Budgeting Work? An Analytical Review of the Empirical Literature*. IMF Working Paper WP/05/210. Washington, DC: International Monetary Fund.

Burnside, C. and Dollar, D. (1998) *Aid, the incentive regime, and poverty reduction*. (No. 1937) World Bank, Development Research Group, Macroeconomics and Growth. Washington, DC: World Bank.

Cabezon, E. and Prakash, T. (2008) *Public financial management and fiscal outcomes in sub-Saharan African heavily-indebted poor countries*. IMF Working Paper (WP/08/217). Washington, DC: International Monetary Fund.

Carlitz, R. (2013) 'Improving transparency and accountability in the budget process: An assessment of recent initiatives'. *Development Policy Review*, 31(S1): s49-s67.

Cassels, A. and Janovsky, K. (1998) 'Better health in developing countries: Are sector-wide approaches the way of the future?'. *The Lancet,* 352(9142): 1777-1779.

Channa, A. and Faguet, J. P. (2016) 'Decentralization of health and education in developing countries: A quality-adjusted review of the empirical literature'. *The World Bank Research Observer*, 31(2): 199-241.

Chansa, C., Sundewall, J., Mcintyre, D., Tomson, G. and Forsberg, B. C. (2008) 'Exploring SWAp's contribution to the efficient allocation and use of resources in the health sector in Zambia'. *Health Policy and Planning,* 23(4): 244-251.

Chaulagai, C. N., Moyo, C. M., Koot, J., Moyo, H. B., Sambakunsi, T. C., Khunga, F. M. and Naphini, P. D. (2005) 'Design and implementation of a health management information system in Malawi: Issues, innovations and results'. *Health Policy and Planning,* 20(6): 375-384.

Cimpoeru, M. V. (2015) 'Increasing Budget Transparency and Control of Corruption–Strategy to Increase Human Development'. *International Journal of Business, Humanities and Technology,* 5(4): 44-54.

de Renzio, P. (2006) 'Aid, budgets and accountability: A survey article'. *Development Policy Review,* 24(6): 627-645.

de Renzio, P., Andrews, M. and Mills, Z. (2010) 'Evaluation of Donor Support to Public Financial Management (PFM) Reform in Developing Countries. Analytical study of quantitative cross-country evidence. Final Report'. *Sida Evaluation* (2010:5). Stockholm: SIDA.

de Renzio, P., Andrews, M. and Mills, Z. (2011) 'Does donor support to public financial management reforms in developing countries work? An Analytical Study of Quantitative Cross-Country Evidence'. Working Paper 329. London: Overseas Development Institute.

de Renzio, P., Gomez, P. and Sheppard, J. (2005) 'Budget transparency and development in resource-dependent countries'. *International Social Science Journal,* 57(s1): 57-69.

Dickinson, C. (2011) 'Is aid effectiveness giving us better health results?' London: HLSP Institute.

Edward, A., Kumar, B., Kakar, F., Salehi, A. S., Burnham, G. and Peters, D. H. (2011) 'Configuring balanced scorecards for measuring health system performance: Evidence from 5 years' evaluation in Afghanistan'. *PLoS Med* 8(7): e1001066.

El-Sony, A., Mustafa, S., Khamis, A., Enarson, D., Baraka, O. and Bjune, G. (2003) 'The effect of decentralisation on tuberculosis services in three states of Sudan'. *International Journal of Tuberculosis and Lung Disease,* 7(5): 445-450.

Feeny, S. and Rogers, M. (2008) 'Public sector efficiency, foreign aid and small island developing states'. *Journal of International Development*, 20(4): 526-546.

Filmer, D. and Pritchett, L. (1999) 'The impact of public spending on health: Does money matter?'. *Social Science and Medicine*, 49(10): 1309-1323.

Fonchamnyo, D. C. and Sama, M. C. (2016) 'Determinants of public spending efficiency in education and health: Evidence from selected CEMAC countries'. *Journal of Economics and Finance,* 40(1): 199-210.

Fritz, V., Fialho Lopez, A. P., Hedger, E., Tavakoli, H. and Krause, P. (2012) 'Public financial management reforms in post-conflict countries'. Synthesis Report. Washington, DC: World Bank.

Fritz, V., Sweet, S. and Verhoeven, M. (2014) 'Strengthening public financial management: Exploring drivers and effects'. World Bank Policy Research Working Paper (WPS7084). Washington, DC: World Bank.

Fukuda-Parr, S., Guyer, P. and Lawson-Remer, T. (2011) 'Does budget transparency lead to stronger human development outcomes and commitments to economic and social rights?'. IBP Working Paper 4. Washington, DC: International Budget Partnership.

Gauthier, B. (2006) 'PETS-QSDS in sub-Saharan Africa: 'stocktaking study'. In *Report for the project 'Measuring progress in public services delivery'* (7 September 2006). Washington, DC: World Bank.

Gauthier, B. and Wane, W. (2009) 'Leakage of Public Resources in the Health Sector: An Empirical Investigation of Chad'. *Journal of African Economies,* 18(1):52-83.

Glied, S. and Smith, P. C. (eds.) (2011) *The Oxford Handbook of Health Economics.* Oxford: Oxford University Press.

Gonçalves, S. (2014) 'The effects of participatory budgeting on municipal expenditures and infant mortality in Brazil'. *World Development*, 53: 94-110.

Gupta, S., Davoodi, H. R. and Tiongson, E. (2000) 'Corruption and the provision of health care and education services'. IMF Working Paper (WP/00/116). Washington, DC: International Monetary Fund.

Habibi, N., Huang, C., Miranda, D., Murillo, V., Ranis, G., Sarkar, M. and Stewart, F. (2003) 'Decentralization and human development in Argentina'. *Journal of Human Development*, 4(1): 73-101.

Ho, L. S., Labrecque, G., Batonon, I., Salsi, V. and Ratnayake, R. (2015) 'Effects of a community scorecard on improving the local health system in Eastern Democratic Republic of Congo: Qualitative evidence using the most significant change technique'. *Conflict and Health,* 9(1):1.

Holmberg, S. and Rothstein, B. (2011) 'Dying of corruption'. *Health Economics, Policy and Law*, 6(04): 529-547.

Hu, B. and Mendoza, R. U. (2013) 'Public health spending, governance and child health outcomes: Revisiting the links'. *Journal of Human Development and Capabilities,* 14(2): 285-311.

Kaufmann, D., & Bellver, A. (2005). Transparenting transparency: Initial empirics and policy applications. World Bank Policy Research Working Paper. Washington, DC: World Bank.

Khaleghian, P. (2004) 'Decentralization and public services: The case of immunization'. *Social Science and Medicine,* 59(1):163-183.

Kutzin, J., Jakab, M. and Shishkin, S. (2009) 'From scheme to system: Social health insurance funds and the transformation of health financing in Kyrgyzstan and Moldova'. *Advances in Health Economics and Health Services Research*, 21(2009): 291-312.
Lewis, M. (2006) 'Governance and corruption in public health care systems'. Center for Global Development, Working Paper 78. Washington, DC: CGD.
Lu, C., Schneider, M. T., Gubbins, P., Leach-Kemon, K., Jamison, D. and Murray, C. J. (2010) 'Public financing of health in developing countries: A cross-national systematic analysis'. *The Lancet,* 375(9723): 1375-1387.
Mauro, P. (1998) 'Corruption and the composition of government expenditure'. *Journal of Public Economics,* 69(2): 263-279.
McGee R. and Gaventa, J. (2010) 'Synthesis report: Review of impact and effectiveness of transparency and accountability initiatives'. Cambridge: Transparency & Accountability Initiative. *Available at SSRN 2188139*.
Mistra, V. and Ramasankar, P. (2007) 'Andhra Pradesh, India: Improving health services through community score cards'. Social Accountability Series Note 1. Washington, DC: World Bank.
Mitchell, A. and Bossert, T. J. (2010) 'Decentralisation, Governance and Health-System Performance: 'Where You Stand Depends on Where You Sit"'. *Development Policy Review,* 28(6): 669-691.
OECD (2015) *Health at a Glance 2015*. Paris: OECD Publishing.
Rajkumar, A. S. and Swaroop, V. (2008) 'Public spending and outcomes: Does governance matter?' *Journal of Development Economics,* 86(1): 96-111.
Robalino, D. A., Picazo, O. F. and Voetberg, A. (2001) *Does Fiscal Decentralization Improve Health Outcomes? Evidence from a Cross-Country Analysis*. World Bank Policy Research Working Paper 2565. Washington, DC: World Bank Publications.
Robins, C. S. (2001) 'Generating revenues: Fiscal changes in public mental health care and the emergence of moral conflicts among care-givers'. *Culture, Medicine and Psychiatry,* 25(4): 457-466.
Robinson, M. (2006) 'Budget analysis and policy advocacy: The role of non-governmental public action'. University of Sussex Institute of Development Studies Working Paper 279. Brighton: IDS.
Robinson, M. (2007) 'Does decentralisation improve equity and efficiency in public service delivery provision?' *IDS Bulletin*, 38(1): 7-17.
Sarr, B. (2015) 'Credibility and Reliability of Government Budgets: Does Fiscal Transparency Matter?'. International Budget Partnership Working Paper 5. Washington, DC: International Budget Partnership.
Simson, R. (2014) 'Transparency for Development: Examining the Relationship Between Budget Transparency, MDG Expenditure, and Results'. IBP Working Paper: Applied Research on Open and Accountable Public Finance Management and Civil Society Budget Advocacy. Washington, DC: International Budget Partnership.
Smith, P. C., Mossialos, E., Leatherman, S. and Papanicolas (eds.) (2009) *Performance Measurement for Health System Improvement: Experiences, Challenges and Prospects.* Cambridge: Cambridge University Press.
Smith, P. C. and Papanicolas, I. (2012) *Health system performance comparison: An agenda for policy, information and research*. Copenhagen: World Health Organization Regional Office for Europe.
Soto, V. E., Farfan, M. I. and Lorant, V. (2012) 'Fiscal decentralisation and infant mortality rate: The Colombian case'. *Social Science and Medicine,* 74(9): 1426-1434.
Sweeney, R., Mortimer, D. and Johnston, D. W. (2014) 'Do Sector Wide Approaches for health aid delivery lead to 'donor-flight'? A comparison of 46 low-income countries'. *Social Science and Medicine*, 105(2014): 38-46.
Touchton, M. and Wampler, B. (2014) 'Improving social well-being through new democratic institutions'. *Comparative Political Studies*, 47(10): 1442-1469.
Uchimura, H. and Jütting, J. P. (2009) 'Fiscal decentralization, Chinese style: Good for health outcomes? *World Development*, 37(12): 1926-1934.
Vian, T. and Collins, D. (2006) 'Using financial performance indicators to promote transparency and accountability in health systems'. *U4 Brief* 1. Bergen: Anti-Corruption Resource Centre, Chr. Michelsen Institute.
Vlaicu, R., Verhoeven, M., Grigoli, F. and Mills, Z. (2014) 'Multiyear budgets and fiscal performance: Panel data evidence'. *Journal of Public Economics,* 111(2014): 79-95.
Wagstaff, A. and Claeson, M. (2004) *The Millennium Development Goals for Health: Rising to the Challenges.* Washington, DC: World Bank Publications.

Annex: Search terms and article matrix

EconLit search strategy and keywords

"health outcomes" OR "cure rate" OR "treatment failure" OR "vaccination" OR "immunization" OR "prevention" OR "cancer" OR "life expectancy" OR "infant mortality" OR "maternal mortality" OR "waiting time" OR "case fatality rate" OR "patient satisfaction" OR "health services" OR "health system" OR "health systems" OR "efficiency" OR "cost effectiveness" OR "stochastic frontier analysis" OR "data envelopment analysis" OR "preventable mortality" OR "preventable hospitalization" OR "hospitalizations" OR "quality of care" OR "health care" OR "utilization" OR "utilisation" (all text)

AND
"budgets" OR "budget" OR "budgeting" OR "public financial management" OR "PFM" OR "PEFA" OR "Public Expenditure and Financial Accountability" OR "budget credibility" OR "budget transparency" OR "Country Policy and Institutional Assessment" OR "open budget index" OR "Government Spending Watch" OR "Medium-Term Framework" OR "fiscal transparency" OR "financial transparency" OR "Financial Accountability" OR "governance" OR "corruption" OR "rule of law" OR "donor relations" OR "extra-budgetary" OR "extra budgetary" OR "earmarked" OR "Financial Management Information" OR " Medium-Term Expenditure Framework" OR "Country Financial Accountability" OR "Financial Management Information" OR "CPIA" OR "Public Expenditure Tracking" OR "medium-term expenditure framework" OR "system of health accounts " OR "financial management assessment" OR "Procurement" OR "audit" OR "Sector Wide Approach" OR "disbursement" (all text)

AND
Public (abstract)

AND
Health (abstract)

The search was limited to articles published in the period 1996-2016. Only English-language articles were reviewed.

PubMed search strategy and keywords

"health outcomes"[All Fields] OR "cure rate"[All Fields] OR "treatment failure"[MeSH Terms] OR "vaccination"[MeSH Terms] OR "prevention and control"[Subheading] OR "early detection of cancer"[MeSH Terms] OR "life expectancy"[MeSH Terms] OR "infant mortality"[MeSH Terms] OR "maternal mortality"[MeSH Terms] OR "waiting time"[All Fields] OR "mortality"[MeSH Terms] OR "case fatality rate"[All Fields] OR "patient satisfaction"[MeSH Terms] OR "health services"[MeSH Terms] OR "health system"[All Fields] OR "efficiency"[MeSH Terms] OR "cost effectiveness"[All Fields] OR "stochastic frontier analysis" OR "data envelopment analysis"[All Fields] OR "preventable mortality"[All Fields] OR "preventable hospitalization" OR "hospitalization"[MeSH Terms] OR "quality of care" [All Fields] OR "health care" [All Fields] OR "utilization"[Subheading]

AND
"public financial management"[Title/Abstract] OR "Public Expenditure and Financial Accountability"[Title/Abstract] OR "budget credibility"[Title/Abstract] OR "budget transparency"[All Fields] OR "Country Policy and Institutional Assessment"[Title/Abstract] OR "open budget index"[Title/Abstract] OR "Government Spending Watch"[Title/Abstract] OR "Medium-Term Framework"[Title/Abstract] OR "fiscal transparency"[Title/Abstract] OR "Financial Accountability"[Title/Abstract] OR "medium-term expenditure framework" [Title/Abstract] OR "system of health accounts " [Title/Abstract] OR "financial management assessment"[Title/Abstract] OR "audit"[Title/Abstract] OR "Sector Wide Approach" [Title/Abstract] OR "disbursement"[Title/Abstract] OR "extra-budgetary"[Title/Abstract] OR "earmarked"[Title/Abstract]

AND
Public[Title/Abstract]

AND
"health care economics and organizations"[MeSH Terms] OR finance[Title/Abstract] OR financial[Title/Abstract] OR financing[Title/Abstract]

The search was limited to articles published in the period 1996-2016. Only English-language articles were reviewed.

Google Scholar search strategy

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "public financial management" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "budget credibility " -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "budget transparency" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "open budget index" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations " fiscal transparency" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "Financial Accountability" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "extra budgetary" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "Medium-Term Expenditure Framework" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "Public Expenditure Tracking" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "financial management assessment" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "Country Policy and Institutional Assessment" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "Government Spending Watch" -book

Restricted to 1996-2016. English. Sorted by relevance. The first 200 results for each combination were reviewed.

Econlit Search strategy and keywords

"health outcomes" OR "cure rate" OR "treatment failure" OR "vaccination" OR "immunization" OR "prevention" OR "cancer" OR "life expectancy" OR "infant mortality" OR "maternal mortality" OR "waiting time" OR "case fatality rate" OR "patient satisfaction" OR "health services" OR "health system" OR "health systems" OR "efficiency" OR "cost effectiveness" OR "stochastic frontier analysis" OR "data envelopment analysis" OR "preventable mortality" OR "preventable hospitalization" OR "hospitalizations" OR "quality of care" OR "health care" OR "utilization" OR "utilisation" (all text)

AND
"budgets" OR "budget" OR "budgeting" OR "public financial management" OR "PFM" OR "PEFA" OR "Public Expenditure and Financial Accountability" OR "budget credibility" OR "budget transparency" OR "Country Policy and Institutional Assessment" OR "open budget index" OR "Government Spending Watch" OR "Medium-Term Framework" OR "fiscal transparency" OR "financial transparency" OR "Financial Accountability" OR "governance" OR "corruption" OR "rule of law" OR "donor relations" OR "extra-budgetary" OR "extra budgetary" OR "earmarked" OR "Financial Management Information" OR " Medium-Term Expenditure Framework" OR "Country Financial Accountability" OR "Financial Management Information" OR "CPIA" OR "Public Expenditure Tracking" OR "medium-term expenditure framework" OR "system of health accounts " OR "financial management assessment" OR "Procurement" OR "audit" OR "Sector Wide Approach" OR "disbursement" (all text)

AND
Public (abstract)

AND
Health (abstract)

A search limit of articles published 1996-2016 was applied; only English-language articles were reviewed.

Additional

EconLit search strategy and keywords

"health outcomes" OR "cure rate" OR "treatment failure" OR "vaccination" OR "immunization" OR "prevention" OR "cancer" OR "life expectancy" OR "infant mortality" OR "maternal mortality" OR "waiting time" OR "case fatality rate" OR "patient satisfaction" OR "health services" OR "health system" OR "health systems" OR "efficiency" OR "cost effectiveness" OR "stochastic frontier analysis" OR "data envelopment analysis" OR "preventable mortality" OR "preventable hospitalization" OR "hospitalizations" OR "quality of care" OR "health care" OR "utilization" OR "utilisation" (all text)

AND
"activity-based budgeting" OR "performance budgeting" OR "Financial management information" OR "Treasury Single Account" OR "Internal audit" OR "internal control" OR "payroll" OR "budget classification" OR "accounting standards" (all text)

AND
Public (all text)

AND
Health (all text)

A search limit of articles published 1996-2016 was applied; only English-language articles were reviewed.

PubMed search strategy and keywords

"health outcomes"[All Fields] OR "cure rate"[All Fields] OR "treatment failure"[MeSH Terms] OR "vaccination"[MeSH Terms] OR "prevention and control"[Subheading] OR "early detection of cancer"[MeSH Terms] OR "life expectancy"[MeSH Terms] OR "infant mortality"[MeSH Terms] OR "maternal mortality"[MeSH Terms] OR "waiting time"[All Fields] OR "mortality"[MeSH Terms] OR "case fatality rate"[All Fields] OR "patient satisfaction"[MeSH Terms] OR "health services"[MeSH Terms] OR "health system"[All Fields] OR "efficiency"[MeSH Terms] OR "cost effectiveness"[All Fields] OR "stochastic frontier analysis" OR "data envelopment analysis"[All Fields] OR "preventable mortality"[All Fields] OR "preventable hospitalization" OR "hospitalization"[MeSH Terms] OR "quality of care" [All Fields] OR "health care" [All Fields] OR "utilization"[Subheading]

AND
"activity-based budgeting"[All Fields] OR "performance budgeting"[All Fields] OR "Financial management information"[All Fields] OR "Treasury Single Account"[All Fields] OR "Internal audit"[All Fields] OR "internal control" OR "payroll" OR "budget classification"[All Fields] OR "accounting standards"[All Fields]

AND
Public[Title/Abstract]

AND
"health care economics and organizations"[MeSH Terms] OR finance[Title/Abstract] OR financial[Title/Abstract] OR financing[Title/Abstract]

A search limit of articles published 1996-2016 was applied; only English-language articles were reviewed.

Google Scholar

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "activity-based budget" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "performance budgeting" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "Financial management information" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "Treasury Single Account" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "payroll" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "payroll controls" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "Internal control" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "Internal audit" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "budget classification" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "accounting standards" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "Gender responsive budget analysis" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "procurement systems" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "Country Procurement Assessment" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "competitive procurement" -book

health OR healthcare OR immunization OR vaccination OR mortality OR hospitalisations OR hospitalizations "decentralisation" -book

The search was restricted to 1996-2016 and English-language publications only. Articles were sorted by relevance, and the first 200 results for each combination were reviewed for relevance.

Table 2. Summary of articles selected for review

Reference	Type of study	Country/ region	Goal of research	Methodology	Main findings	Quality of evidence	Other comments
Ablo and Reinikka, 1998	Qualitative	Uganda	To test the hypothesis that actual service delivery (output) is much worse than budgetary allocations would imply because public funds (inputs) do not reach the intended facilities as expected, and hence outcomes cannot improve.	Analysis of a field survey of 19 districts covering 250 government-aided primary schools and almost 100 health clinics. The survey was conducted in 1996 and covered the period 1991-95.	The field surveys confirmed the hypothesis that input flow suffers from serious problems which are related, to a large extent, with governance and lack of accountability.	Good. Large, probably well-conducted field survey.	
Akin et al., 2005	Quantitative	Uganda	To determine whether decentralisation leads to greater allocative efficiency in the health sector.	This paper approaches the question by modelling local government budgeting decisions under decentralisation.	District planners are allocating declining proportions of their budgets to public goods activities. Spillover effects cause spending on public goods in one district to reduce spending on public goods in neighbouring districts.	Good. Published article in a respected academic journal.	
(Asfaw et al., 2007)	Quantitative	India	To assess the impact of fiscal decentralisation (estimated using factor analysis) on population health (infant mortality).	Random effect multivariate regression	Fiscal decentralisation plays a statistically significant role in reducing rates of rural infant mortality. However, this effect also depends on or relates to the degree of political decentralisation.	Good	
Azfar and Gurgur, 2008	Quantitative	The Philippines	To examine the effects of corruption on health outcomes in the Philippines.	Econometric analysis	Corruption was found to have the following effects on health outcomes: reduced rates of immunisation; delays in the vaccination of newborns; discouragement of the use of public health clinics; reduced satisfaction of households with public health services; and increases waiting times at health clinics. Corruption was found to affect public services in rural areas in different ways than urban areas. Corruption harms the poor more than the wealthy.	Good. Published article in a peer-reviewed journal.	Corruption can be a strong determinant or proxy indicator of PFM quality.
Baiocchi et al., 2006	Quantitative and qualitative	Brazil	To assess the impact of participatory budgeting on health spending.	Analysis of data from 5,700 municipalities. A five matched pairs qualitative case study.	Participatory budgeting was found to lead to significant improvements in services for the poor, including an increase in the percentage of municipal expenditures on health.	High quality	
Bellver and Kaufmann, 2005	Quantitative	Global sample (cross-country)	To assess the impact of transparency (measured by Transparency Index) on population health (life expectancy and child immunisation rates).	Econometric analysis	Transparency was found to be positively and significantly related to both health outcomes, even after controlling for income per capita.	Good	
Bentes et al., 2004	Descriptive	Portugal	To assess the impact of activity-based budgeting in hospitals on efficiency outcomes.	Unclear	Activity-based budgeting in Portugal was found to have limited impact on cost-effectiveness and cost containment.	Questionable	Unclear how conclusion was reached.
Bevan and Palomba, 2000	Quantitative	Uganda	To assess the impact of introducing an MTEF on budgetary allocations, including for health services.	Analysis of governmental statistics	The introduction of an MTEF was found to lead to a fall in the share of budget expenditure on health. This may be due to a perception on the part of central financial agencies that health is a less reliable user of funds than education. It may also be due to differences in the extent to which the two sectors depend on donor finance. This in turn has led to the Ministry of Health looking to donors rather than the Ministry of Finance, Planning and Economic Development for budgetary assistance.	Good. World Bank Working Paper, with detailed analysis of data.	

Reference	Type of study	Country/ region	Goal of research	Methodology	Main findings	Quality of evidence	Other comments
Bjorkman and Svensson, 2007	Randomised controlled trial (RCT)	Uganda	To assess the impact on health outcomes of implementing community-based monitoring of primary care providers.	Statistical analysis of trial data	The randomised field experiment conducted in Uganda for 50 communities showed positive effects related to the weight of infants receiving services from monitored health providers, as well as a 33% decrease in under-five mortality rates. These results were found only one year after the first round of baseline community meetings.	Very high-quality evidence (RCT)	
Bodart et al., 2001	Literature review; quantitative	Burkina Faso	To explore the reasons for the declining use of health services in Burkina Faso.	Literature review; analysis of governmental statistics.	Healthcare performance should be improved through financial management of the health sector. However, the authors found that such a sector-wide approach was not feasible in the country at the time of the study.	Case study; difficult to generalise to other settings.	
Brixi et al., 2013	Quantitative; case study	China	To review the extent to which sub-national governments – which are largely responsible for health financing in China – address health inequities.	Analysis of governmental statistics	China's health sector would benefit from a number of PFM reforms. These reforms include: (1) consolidating key health financing responsibilities at provincial level and strengthening the accountability of provincial governments; (2) defining targets for expenditure on primary healthcare outputs and outcomes for each province; and (3) using independent sources to monitor and evaluate policy implementation and service delivery.	Case study; difficult to generalise to other settings.	
Brumby et al., 2013	Literature review; data analysis	Mostly LMICs	To assess the impact of PFM reforms on the operational efficiency of health service delivery.	Literature review; data analysis.	Only the implementation of the most developed form of MTEF, i.e. a medium term performance framework (MTPF), was found to show any significant correlation with operational efficiency (as measured by the cost-effectiveness of public health expenditure).	Good. A range of approaches are employed, including IV regression to address reverse causality.	
Burnside and Dollar, 1998	Quantitative	Global sample (cross-country data)	To assess the impact of foreign aid on infant mortality rates.	Ordinary least squares (OLS) analysis	When management is good, additional aid worth 1% of GDP was found to reduce infant mortality by 0.9%. However, in developing countries with weak economic management, e.g. with poor property rights and high levels of corruption, no relationship was found.	Good	
Barata and Cain, 2001	Qualitative	Sub-Saharan Africa	To assess the impact of the automation of financial functions on financial accountability.	Unclear	The automation of financial functions in sub-Saharan Africa was not found to lead to improvements in financial accountability.	Questionable	Unclear how conclusions were reached.
Channa and Faguet, 2016	Quality-adjusted literature review	Not applicable (NA)	To review assessments of the impact of fiscal decentralisation on population health outcomes.	NA	Fiscal decentralisation was found to improve the technical efficiency of service delivery leading to reduced infant mortality rates. This effect was found mainly in studies of higher quality.	Good	
Chansa et al., 2008	Case study	Zambia	To assess the impact of sector-wide approaches (SWAps) on the efficiency of the health sector.	Interviews; analysis of secondary data.	Minor improvements in the administrative efficiency of the health sectors were found to result from introducing SWAps. The indicator for technical efficiency showed a drop in hospital bed utilisation rates and in the government's share of funding for drugs. No improvements in allocative efficiency or budget execution were found to arise through the introduction of SWAps. However, there were large variations between both donors and years. Funding levels apparently improved at district level, but funding for hospitals declined. Despite a strong commitment in Zambia to the implementation of the SWAps, the hoped-for improvements in efficiency were not found to have been achieved.	Good case study; difficult to generalise to other settings.	

Reference	Type of study	Country/ region	Goal of research	Methodology	Main findings	Quality of evidence	Other comments
Chaulagai et al., 2005	Case study	Malawi	To assess the impact of health management information systems (HMIS) on health service delivery.	Unclear	Little evidence was found that the HMIS programme was effective in improving decisions regarding the planning and management of health services.	Questionable	
Cimpoeru, 2015	Quantitative study	Global sample	To examine the links between human development (as measured by the Human Development Index) and a country's level of fiscal transparency (as measured by the Open Budget Index (OBI)) and control of corruption.	Econometric analysis (cross-section for year 2012)	A high level of human development (as measured by access to quality healthcare and political rights, civil liberties and quality education) was found to be correlated with a high level of budgetary transparency and control of corruption.	Insufficiently robust statistical approach	
de Renzio et al., 2005	Case studies; data analysis	Global sample	To assess the association between budget transparency and human development.	Bivariate regression analysis	A positive association was found between budget transparency and human development.	No controls for potential confounders	Health is only one component of human development.
Dickinson, 2011	Conceptual framework; literature review	NA	To review the literature on the impact of aid effectiveness on health.	Literature review	The review found evidence that aid effectiveness improves sector planning and budgeting, strengthening national systems and increasing resource allocations. The review found that more efficient funding of the health sector through programme-based approaches, including SWAps, helps in the implementation of health sector reforms and thus contributes to better health results.	Low	The effectiveness of aid is likely to be closely linked to the quality of PFM.
Edward et al., 2011	Quantitative	Afghanistan	To assess the impact of a balanced scorecard programme on health system performance.	Generalised estimation equation (GEE) modelling used to assess trends	The authors concluded that balanced scorecards led to improvements in health system capacity and service delivery.	Poor	It appears that the authors' finding was based simply on observing changes in trends for various indicators over a five-year period without any comparison with control communities or controlling for potential confounders.
Feeny and Rogers, 2008	Quantitative	Global sample (cross-country data)	To assess the impact of the governance index on public sector efficiency in increasing life expectancy (estimated using a stochastic production function approach). The governance index used for this study was composed of the following equally weighted dimensions: voice and accountability; political stability; government effectiveness; regulatory quality; control of corruption).	OLS	The authors found that quality of governance was positively associated with efficiency. Accountability was found to be particularly strongly related to greater efficiency.	Good	

Reference	Type of study	Country/ region	Goal of research	Methodology	Main findings	Quality of evidence	Other comments
Filmer and Pritchett, 1999	Quantitative	Global sample	To assess the impact of public spending on health on rates of infant mortality.	Cross-national data analysis	The impact of public spending on health was found to be minor, with a coefficient that is typically both numerically small and statistically insignificant at conventional levels. Independent variation in public spending was found to account for less than one seventh of 1% of the observed differences in mortality across countries. The study found that this lack of impact may be attributable to the inefficiency of public institutions.	Good	The study concludes that the amount of money spent matters less than the quality of institutions, including PFM systems.
Fonchamnyo and Sama, 2016	Quantitative	Cameroon, Chad, and the Central African Republic	To assess the impact of PFM quality (as measured by the CPIA quality score for budgetary and financial management) on the efficiency of public spending in the health sector.	The study first estimated public sector efficiency scores by using non-parametric Data Envelopment Analysis. In the second stage, the study used the panel data Tobit model and fractional logit regression techniques to determine the impact of institutional and economic factors on the efficiency of public spending.	The results indicate that the quality of budgetary and financial management has a positive and statistically significant influence on efficiency. The study found that corruption has a significant negative influence on the efficiency of public spending in the education and health sectors.	Good	
Fritz et al., 2012	8 case studies: Afghanistan DR Congo Liberia West Bank and Gaza Cambodia Tajikistan Kosovo Sierra Leone	Post-conflict countries	To assess the impact of PFM reforms on PFM quality/operational efficiency, as well as on some health outcomes.	Case studies	No correlation was found between better or worse PFM systems and improvements in service delivery in health and education.	The case studies are specific to post-conflict countries and the findings are thus difficult to generalise to other settings.	
Fritz et al., 2014	Quantitative	Global sample (cross-country)	To assess the impact of PFM quality (as measured by PEFA scores) on health service delivery.	Cross-national econometric analysis, controlling for GDP per capita.	The study found no evidence that health results relative to public sector spending are better in countries with stronger PFM systems, when controlling for GDP per capita.	Good	Some form of intermediate data points, rather than only final outcomes, may be needed to identify the steps in the causal chain that are directly influenced by PFM systems.
Fukuda-Parr et al., 2011	Quantitative	Global sample (cross-country)	To assess the impact of PFM institutions on per capita spending on health.	OLS regression of different mortality indicators on OBI scores	The authors found that countries with greater budget openness tend to be more affluent and also to spend more per capita on health and education. The Legislative Strength Index and the Supreme Audit Institution Strength Index were found to have a significant and positive association with the public health expenditure variable.	Questionable because the range of control variables is limited.	
Gauthier, 2006	Qualitative	Africa	To assess the impact of Public Expenditure Tracking Systems (PETS) on health service financing (including leakages).	Unclear	The authors find that the use of PETS in Africa helped uncover leakages and gaps between declared and actual levels of health service financing at facility level.	Questionable	

Reference	Type of study	Country/ region	Goal of research	Methodology	Main findings	Quality of evidence	Other comments
Gauthier and Wane, 2009	Quantitative	Chad	To assess the impact of the leakage of governmental resources on health-centre prices.	Three-stage OLS	Accounting for the endogeneity of the level of competition among health centres, the leakage of government resources was found to have a significant negative impact on the price mark-up health centres charge patients for drugs.	Good	PFM quality is measured through a proxy, i.e. the extent of financial resources leakage.
Gonçalves, 2014	Quantitative	Brazil	To assess the impact of participatory budgeting on municipal expenditure and rates of infant mortality in Brazil.	Panel data regression	The author found that municipalities using participatory budgeting favoured an allocation of public expenditures that closely matched popular preferences and channelled a larger fraction of their budgets to investments in sanitation and health services. This change was accompanied by a reduction in infant mortality rates.	One of the strongest studies reviewed.	
Gupta et al., 2002	Quantitative	Global sample (cross-country data)	To assess the impact of corruption on health service delivery.	OLS, panel data and IV regression	The authors found that corruption, as measured by corruption perception indices, adversely affects the indicators for the provision of healthcare (as measured by child and infant mortality rates).	Good	
Habibi et al., 2003	Quantitative	Argentina	To assess the impact of the devolution of political and fiscal powers on infant mortality rates.	OLS, fixed effects	Fiscal devolution was found to have a positive effect on human development (including health). The effect was found to be stronger in provinces with greater tax accountability.	Good	
Ho et al., 2015	Qualitative analysis of interviews	DR Congo	To assess the impact of community scorecards on the local health system.	45 stories about changes in the health system were collected.	Community scorecards were found to lead to an increase in perceived transparency and community participation in health facility management, as well as improved quality of care (including increased access to services, improved patient–provider relationships, improved performance of service providers, and improved maintenance of physical infrastructure).	Case studies; difficult to generalise to other settings.	Community scorecards may be a measure of the responsiveness of PFM systems.
Holmberg and Rothstein, 2011	Econometric analysis	More than 120 countries	To assess the impact of the quality of government (QoG) on population health	Cross-sectional multivariate data analysis	The QoG variable was found to be positively associated with higher levels of life expectancy, lower mortality rates for children and mothers, higher healthy life expectancies, and higher levels of subjective health feelings. The study found that the relationship between good health and private health spending, as well as the private share of total health spending, was close to zero or slightly negative.	Good	QoG is a proxy for the quality of PFM.
Hu and Mendoza, 2013	Econometric analysis	136 countries in the period 1960-2005	To assess the effect of the interaction between governance and public health spending on child mortality rates.	OLS, panel data, IV regression	The study found that both public spending on healthcare and the quality of governance are important in the reduction of child mortality rates. However, mixed results on the interaction of governance with public spending throw some doubt on the conclusiveness of previous empirical studies.	Good	The interaction of public health spending with the quality of governance is likely to be a good proxy for quality of PFM.
Khaleghian, 2004	Econometric analysis	Cross-country	To assess the impact of decentralisation on population health.	GEE analysis	The political decentralisation indicator (from the Database of Political Institutions) was found to be associated with significantly higher diphtheria and measles immunisation coverage rates. However, this effect was only found in low-income countries, while in middle-income countries there was a reversal in the sign of the relationship.	Adequate. However, the study did not use fixed effects analysis. (This may be justified because there was little to no variation in decentralisation for most countries in the sample.	

Reference	Type of study	Country/ region	Goal of research	Methodology	Main findings	Quality of evidence	Other comments
Lewis, 2006	Literature review, econometric analysis	Cross-country data	To assess the effect of the quality of governance and levels of corruption on health service delivery.	Literature review; OLS analysis	The study found that returns to health investments may be very low where quality of governance issues are not addressed. Government effectiveness was found to be positively and significantly associated with measles immunisation coverage (controlling for a range of potential confounders).	Good	
Mauro, 1998	Econometric analysis	Cross-country	To assess the impact on health expenditure of corruption (as measured by the index of corruption from the International Country Risk guide).	OLS	Government expenditure on health was found to be negatively and significantly associated with corruption when controlling for GDP per capita.	Good	The corruption index is a proxy for PFM quality.
McGee and Gaventa, 2010	Synthesis report/ literature review	NA	To review the literature on the impact of transparency and accountability initiatives.	NA	The study found that the preliminary evidence indicates that these initiatives helped reduce corruption and improve service quality. However, the evidence was found to be inconclusive and context specific. Among the initiatives reviewed were PETS surveys; community scorecards; community monitoring; and participatory budgeting.	Good. However, the study was a summary literature review.	
Mistra and Ramasankar, 2007	Case study	India	To assess the impact of community scorecards on health service delivery.	NA	The community scorecard exercise was found to reduce the gap between users and service providers, in turn increasing overall satisfaction levels.	Case study; difficult to generalise to other settings.	
Rajkumar and Swaroop, 2008	Econometric analysis	Cross-section of countries covering the years 1990, 1997 and 2003	To assess the role of governance (as measured by the level of corruption and the quality of bureaucracy) in determining the efficacy of public spending in improving human development outcomes.	IV regression	The study found that the differences in the efficacy of public spending can be largely explained by the quality of governance. Public health spending was found to have a stronger negative impact on child mortality rates in countries with good governance, while public spending had virtually no impact on health outcomes in poorly governed countries. As the level of corruption falls or the quality of the bureaucracy rises, public spending on health becomes more effective in lowering rates of child mortality.	Good	
Robalino et al., 2001	Quantitative	Global sample (cross-country data)	To assess the effects of decentralisation on rates of infant mortality, using panel data on infant mortality, GDP per capita and the share of public expenditure managed by local government.	Cross-country panel data analysis	Greater fiscal decentralisation is associated with lower mortality rates. The positive effects of fiscal decentralisation were found to be greater in environments that promote political rights. Fiscal decentralisation was found to help improve health outcomes in environments with high levels of corruption. In environments with high levels of ethnolinguistic fractionalisation, however, the benefits were found to be typically smaller.	Good	
Robins, 2001	Qualitative	Mental healthcare in a small US programme	This paper explores the increasing tension between 'love' and 'money' in the public mental healthcare arena and whether financial initiatives crowd out intrinsic motivation.	Participant-observation research, interviews, survey	The study found that the results suggest increasing public financial accountability can backfire, since some service providers may focus less on the quality of the services they deliver and more on producing quantitative results.	Case study; difficult to generalise to other settings.	
Robinson, 2006	Case study	Brazil, Croatia, India, Mexico, South Africa, and Uganda	To assess whether there is a link between budget transparency and resource allocations for social expenditure priorities.	Qualitative	The reviewed case studies found a link between budget transparency and increased allocations for social welfare expenditure priorities, especially for reproductive health in Mexico	Case studies; difficult to generalise to other settings.	

Reference	Type of study	Country/ region	Goal of research	Methodology	Main findings	Quality of evidence	Other comments
Sarr, 2015	Quantitative	Global sample (cross-country data)	To assess the role of fiscal transparency on budget outcomes. Budget outcomes are defined as having a credible and reliable budget. Outcomes in health sector are examined.	Ordered logit	Fiscal transparency improves budget outcomes and the results are robust to a range of econometric specifications.	Good	
Simson, 2014	Quantitative	Global sample (cross-country data)	To assess whether budget transparency leads to better development outcomes. The study specifically looks at the relationship of budget transparency to (1) the production of usable data, and (2) levels of allocation to poverty-reducing services. A second relationship regarding the link between spending and MDG outcomes is assessed. The author assesses three MDG sectors: education, health, and water, sanitation and hygiene (WASH).	Simple correlations	The study found a strong correlation between transparency and data availability. A mixed relationship of transparency with expenditure was found. A positive relationship of expenditure and health outcomes was found, with more expenditure leading to better health outcomes.	Somewhat weak. Correlation analysis (looks at pairwise relationship and uses a simple test to assess significance).	Health-related outcomes include health expenditure, under-five mortality rates and maternal mortality rates.
Soto et al., 2012	Quantitative	Colombia	To assess the impact of fiscal decentralisation (measured in terms of locally controlled health expenditure as a proportion of total health expenditure) on infant mortality rates.	Multivariate fixed effects analysis, using data from 1,080 municipalities in the period 1998-2007.	Decentralisation was found to be negatively correlated with infant mortality rates, with the effect being stronger in richer municipalities.	Good	
Touchton and Wampler, 2014	Quantitative	Brazil	To assess the impact of participatory budgeting on population health.	Data appears to be a panel, but unclear if controls for year effects and fixed effects were included (and, if not, why not).	Cities where participatory budgeting initiatives were implemented were found to have greater health spending per capita and lower infant mortality rates, with the effect becoming stronger the longer the programme was implemented.	Questionable	
Uchimura and Jütting, 2009	Quantitative	China	To assess the impact of fiscal decentralisation on health outcomes.	Econometric panel analysis at county level	More fiscally decentralised provinces were found to have lower infant mortality rates than more centralised provinces if certain conditions are met. These conditions include the county governments having their own fiscal capacity and inter-governmental transfers. Local spending responsibilities need to be matched with county government's own fiscal capacity.	Good	The study used two indicators of fiscal decentralisation, one of them being 'local fiscal autonomy', i.e. the proportion of local expenditure accounted for by the local government's revenue.

Reference	Type of study	Country/ region	Goal of research	Methodology	Main findings	Quality of evidence	Other comments
Vian and Collins, 2006	Qualitative	South Africa	The study outlines the experiences of district health management teams in South Africa, where interventions to improve district health planning and reporting, including the integration of financial data and service utilisation statistics, proved helpful in increasing transparency and focusing attention on areas most vulnerable to abuse.	Narrative case study	The study found that South Africa's efforts to improve performance and expenditure tracking at provincial and district levels in South Africa resulted in better management control.	Case study; difficult to generalise to other settings.	The system to monitor performance by combining financial and service data in South Africa was hampered to some extent by a lack of appropriate service utilisation statistics.
Vlaicu et al., 2014	Quantitative study	Global sample (cross-country data)	To assess the impact of Medium-Term Expenditure Frameworks (MTEFs) on aggregate as well as sectoral measures of fiscal performance. The study analyses a newly-collected dataset of worldwide MTEFs adopted in the period 1990-2008.	Econometric analysis (dynamic panel)	Multiyear budgeting was found to improve the budget balance by about 2 percentage points, with more advanced MTEF phases having a greater impact. Higher-phase MTEFs also reduce health spending volatility, while only the top-phase framework has a measurable impact on health sector technical efficiency.	Good quality	
Wagstaff and Claeson, 2004	Quantitative	Global sample (cross-country data)	To assess the effect of government spending on heath in relation to institutional quality (as measured by the World Bank's Country Policy and Institutional Assessment (CPIA)).	OLS analysis	Government spending was found to have a greater impact on health outcomes at the margin in better-governed countries. In countries one standard deviation below the mean CPIA score, across-the-board additions to government health spending were found to have no significant effect. This was found to be true whether the outcome is rates of underweight, rates of infant and maternal mortality or rates of tuberculosis mortality.	Good	

ODI is the UK's leading independent think tank on international development and humanitarian issues.

All ODI Reports are available from www.odi.org

Cover photo: Aubrey Wade/Panos. Boys playing football outside the Kroo Bay Community Health Centre. The clinic lacks even the basics. It has no electricity, and clean drinking water must be fetched from the nearby well everyday. The Kroo Bay slum in Freetown has the world's worst infant and maternal mortalitly rates. One in four children die before they reach the age of five, and one in six mothers die during childbirth.

Overseas Development Institute
203 Blackfriars Road
London SE1 8NJ
Tel +44 (0) 20 7922 0300
Fax +44 (0) 20 7922 0399

odi.org