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(Review)

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[Intervention Review]

Paying for performance to improve the delivery of health interventions in low- and middle-income countries

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ABSTRACT

Background

There is a growing interest in paying for performance as a means to align the incentives of health workers and health providers with public health goals. While the volume of schemes implementing paying for performance has increased over the last decade, rigorous evidence on the effectiveness of these strategies in improving health care and health, particularly in low- and middle-income countries is lacking. This is an update on the 2012 review on this topic, which had identified a limited evidence base from which to draw conclusions.

Objectives

To summarise the current evidence for the effects of paying for performance on the provision of health care and health outcomes in low- and middle-income settings.

Search methods

We searched more than 15 databases in 2018, including the Cochrane Central Register of Controlled Trials (CENTRAL) (2018, Issue 3), the Cochrane Effective Practice and Organisation of Care (EPoC) Group Specialised Register (10 April 2018), MEDLINE, Ovid (1946 to Present) (searched 10 April 2018), EMBASE, Ovid (10 April 2018), WHOLIS, VHL (April 2018), CINAHL, EBSCOhost (1981 to present) (April 2018), Global Health, Ovid (27 April 2018), The Grey Literature Report (June 2018) and OpenGrey (June 2018). We also searched the websites and online resources of numerous international agencies, organisations and universities to find relevant grey literature and contacted experts in the field. Relevant studies identified from rerunning the strategies in 2020 are placed under Studies awaiting classification.

Selection criteria

We included randomised or quasi-randomized trials, controlled before-after studies or interrupted time series studies conducted in low- or middle-income countries (as defined by the World Bank in 2018). Pay for performance refers to the transfer of money or material goods conditional on taking a measurable action or achieving a predetermined performance target. To be included, a study had to report at least one of the following outcomes: changes in targeted measures of provider performance, such as the delivery or utilisation of healthcare services, or patient outcomes, unintended effects and/or changes in resource use.

Data collection and analysis

We extracted data as per original review protocol and narratively synthesised findings. We used standard methodological procedures expected by Cochrane. Given diversity and variability in intervention types, patient populations and analyses and outcome reporting,

meta-analysis was deemed inappropriate. Within the review, we note the range of effects associated with P4P against each outcome of interest.

Main results

We included 59 studies in this update. Evaluations were predominantly controlled before and after studies or quasi randomized trials, however we also identified cluster randomized trials and interrupted time-series studies.

Studies focused on a wide range of paying for performance (P4P) interventions, including target payments and payment for outputs as modified by quality (or quality and equity assessments). Only one study assessed results-based aid. The majority of assessed schemes were funded by the World Bank. Targeted services varied, however most of the interventions focused on indicators related to reproductive, maternal and child health. Participants were predominantly located in public or in a mix of public, non-governmental and faith-based facilities. The assessment of P4P was predominantly at health facility level, though districts and other levels were also involved.

The majority of studies assessed the effects of paying for performance (P4P) against a status quo control (49 studies); however, some studies focused on assessing effects against comparator interventions (predominantly enhanced financing intended to match P4P funds, based on 17 studies). Four studies reported on intervention effects against both comparator and status quo.

In relation to utilization and service delivery outcomes, we identify inconsistent effects overall.

P4P may have slight positive impacts on the majority of health outcomes appraised against a pure control or standard care; however, when compared against other interventions such as enhanced financing, limited to no impacts were identifiable. P4P probably increases quality of care overall, particularly when directly targeted by scheme designs, and may have positive impacts on the availability of medicines, equipment and infrastructure. However, we found limited to uncertain effects on general quality of care indicators such as providers conducting background or physical assessments, or counselling patients. P4P probably has limited to no negative distorting unintended effects, however these were assessed in a minority of studies.

For secondary effects, we note mixed effects on health worker variables, such as motivation. The evidence suggests the intervention may increase managerial autonomy, but have limited effects on quality of management or governance in general. Equity effects are also uncertain: when assessed against a pure control, P4P appears may have largely beneficial redistributive effects, but when assessed against a comparator the evidence appears mixed. Effects on user fees are also unclear.

Findings of sub-group analyses:

Based on intervention descriptions provided in reviewed documents, we classified the various designs schemes used and explored variation in effect by scheme design. Performance based contracting and results-based aid appeared to yield the greatest positive effects upon outcomes overall. However, we note that these scheme designs were used in a minority of schemes and studies, so the effects observed may be spurious.

Overall, schemes adjusting both for quality of service as well as rewarding equitable delivery of services appeared to perform best, particularly in relation to service utilization outcomes. Similarly, schemes employing payments per output with a quality adjustment, or combining a payment per output and target payment, appeared to outperform the payment per output and target payment designs.

Authors' conclusions

The evidence base on the impacts of P4P schemes has grown considerably, with study quality gradually increasing. We have identified mixed effects of P4P schemes on outcomes of interest and further noted high heterogeneity in the types of schemes implemented as well as evaluations conducted. Performance based funding is not a uniform intervention, but rather a range of approaches. Its effects depend on the interaction of several variables, including the design of the intervention (e.g. who receives payments, the magnitude of the incentives, the targets and how they are measured), the amount of additional funding, other ancillary components such as technical support, and contextual factors, including the organisational context in which it is implemented.

PLAIN LANGUAGE SUMMARY

Paying for performance to improve the delivery of health interventions in low- and middle-income countries

Researchers in the Cochrane Collaboration conducted a review of the effects of paying for performance on the delivery of healthcare services in low- and middle-income countries.

After searching for all relevant studies, they found 59 studies that met their requirements. The findings of this review are summarised below.

What is pay for performance? In a 'pay for performance' approach, people are given money or other rewards if they carry out a particular task or accomplish a particular target. This approach is usually directed at health workers or healthcare organisations. Health workers and healthcare organisations may be rewarded if they offer particular services, if they deliver care that is of a certain quality, or if their patients make use of particular services and achieve better health as a result.

What happens when health workers and healthcare organisations are paid for performance?

The review authors searched literature up to 2018 and identified 59 studies which answer this research question. The studies originated from a wide range of countries, however the majority were from Sub-Saharan Africa and Asia. The pay for performance schemes which were reviewed were predominantly funded by the World Bank. Overall, the majority of studies included were of low to moderate quality. 49 studies compared the effects of paying for performance against doing business as usual (a so-called status quo) and 17 compared effects against a different type of intervention (usually providing matched funding to facilities not implementing pay for performance); these figures include the four studies for which both a status quo comparison and alternate intervention comparison were reported. The pay for performance scheme designs varied greatly, however the majority involved paying health facilities for providing a service and for the quality of service. Overall, the review notes that paying health workers and healthcare organizations for performance is likely to have some positive effects: it may lead to increased uptake of some health services, better structural quality of care, and strengthen the availability of resources and of management autonomy in healthcare organizations. Effects on health, equity, provider satisfaction, facility governance, procedural aspects of quality of care and financial access for users are uncertain.

SUMMARY OF FINDINGS

Summary of findings 1. *Comparison 1: Summary of findings on effects of paying for performance against standard care*

Outcome	Summary of impacts	Certainty of the evidence (GRADE)*
Review primary outcomes		
Utilization and delivery of health services	<p>Evidence on the effects of P4P on the utilization and delivery of services is largely inconsistent: the intervention may improve some utilization and delivery indicators but may lead to poorer results for other indicators.</p> <p>When targeted:</p> <ul style="list-style-type: none"> Proportion of persons receiving HIV testing (range 6-600%) and delivery of PMTCT (range 3.8 to 21%) may be affected positively; proportion of persons receiving ART and children (up to 120% decline) and households protected with bednets may decline (up to 7.3%); effects on tuberculosis adherence are uncertain given very low certainty evidence; effects on family planning outreach may be positive (moderate certainty evidence, increase up to 300%) Evidence on mother and child immunizations and antenatal care utilization is mixed. <p>Effects on indicators when they are not targeted are largely uncertain or neutral.</p>	⊕⊕⊕⊕ Low
Quality of care	<p>The effects of the intervention on procedural quality of care are largely uncertain. Overall, effects on quality of care indicators appear to be sustained only when indicators are targeted.</p> <p>Indicators for which moderate certainty evidence was found include:</p> <ul style="list-style-type: none"> P4P probably improves quality of care scores (range 5 to 300% relative increases); P4P probably improves the quality scores of available medicine and equipment, effects ranged from 2.7% to 220% ; Overall quality of service by specific departmental area/service: P4P probably improves the average quality of service scores in specific targeted areas (effects ranged from 39% to 15-fold increase in scores). <p>P4P may make little or no difference to staff knowledge and skills (low certainty evidence), and its effects on staff responsiveness (as observed by researchers/P4P scheme verifiers) are uncertain overall (very low certainty evidence.)</p>	⊕⊕⊕⊕ Low
Health outcomes	<p>When targeted:</p> <ul style="list-style-type: none"> P4P may reduce child mortality (range: 0.2-6.5%); P4P may lead to a modest reduction of 2-3% in the proportion of children with reported anaemia; P4P may increase the likelihood of tuberculosis treatment success (range: 12-20% improvement in treatment success). Evidence neonatal mortality is inconsistent: P4P may have desirable effects and ensure reduction in neonatal mortality in implementing clinics by up to 22% in one study, however, another study identified increases in region of 6.5% across catchment areas of P4P incentivized providers. 	⊕⊕⊕⊕ Low
Unintended effects	Paying for performance may have no distorting unintended effects.	⊕⊕⊕⊕ Low

Changes in resource use	<p>Overall certainty in evidence across indicators is low, for those where moderate certainty observed:</p> <ul style="list-style-type: none"> P4P probably has a positive effect on human resource availability (range: 19-44%, moderate certainty evidence). P4P probably affects infrastructure functionality and medicine availability positively. 	⊕⊕⊕⊕	Low
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Review secondary outcomes

Provider motivation, satisfaction, absenteeism and acceptability	<p>P4P probably makes little or no difference to provider absenteeism (range: 0.7-2%, low certainty evidence). Effects on overall motivation scores and satisfaction are largely neutral (low certainty evidence).</p> <p>Where these outcomes were not directly targeted, the intervention may have desirable effects.</p>	⊕⊕⊕⊕	Low
Patient satisfaction and acceptability	<p>P4P may have desirable effects on targeted outcomes, with only two outcomes noting limited to no effect in relation to the intervention (satisfaction with care quality and provider communication). When not targeted, effects may be largely positive, except for satisfaction with provider-patient contact time and facility opening hours.</p>	⊕⊕⊕⊕	Low
Impacts on management or information systems (if not a targeted measure of performance)	<p>P4P may positively affect facility managerial autonomy (low certainty evidence), probably makes little to no difference to management quality or facility governance.</p>	⊕⊕⊕⊕	Low
Equity considerations: evidence of differential impacts on different parts of the population	<p>When targeted: P4P may increase the proportion of poor persons utilizing child immunization services, however the intervention may potentially decrease the proportion of poor persons utilizing antenatal care. P4P may make little to no difference to the utilization of institutional deliveries by poorest groups.</p> <p>If not explicitly targeted, effects are mixed.</p>	⊕⊕⊕⊕	Low

* GRADE ratings here refer to summative judgments of the authors across multiple outcomes. Please see [Table 1](#) for a detailed account of all outcomes and relevant evidence ratings.

Summary of findings 2. Comparison 2: Summary of findings on effects of paying for performance against comparator interventions

Outcome	Summary of impacts	Certainty of the evidence (GRADE)*
Review primary outcomes		
Utilization and delivery of health services	<p>P4P may positively affect the probability of persons utilizing care (range: 2 to 10%, however, evidence on immunization utilization is indicative of little to no effect or uncertain).</p> <p>P4P may have little to no important effect on the utilization of any family planning services or the overall rates of antenatal care utilization; however, P4P may positively affect the timeliness of ANC care-seeking (range: 1 to 10% women accessing care earlier).</p> <p>Evidence on the effects of P4P on % women utilizing institutional deliveries is uncertain (range between -9% and 23%).</p>	⊕⊕⊕⊕ Low

	P4P may have negative effects on postnatal care utilization. Evidence on effects on non-targeted utilization outcomes is sparse.		
Quality of care	P4P probably leads to improved quality of care in relation to family planning or antenatal care (moderate certainty evidence, range). P4P may also increase procedural care quality, e.g. increasing the proportion of staff conducting appropriate patient background and physical assessments during consultations.	⊕⊕⊕⊕	Low
Health outcomes	P4P may have little to no effect on health outcomes, both when targeted and when not targeted.	⊕⊕⊕⊕	Low
Changes in resource use	P4P may increase equipment availability by 75%, however medicine availability may be reduced by up to 160%.	⊕⊕⊕⊕	Low

Review secondary outcomes

Provider motivation, satisfaction, absenteeism and acceptability	We did not identify studies assessing directly targeted indicators for this outcome. Available evidence suggests that paying for performance may make little to no difference to these outcomes.	⊕⊕⊕⊕	Low
Patient satisfaction and acceptability	We did not identify studies assessing directly targeted indicators for this outcome. Available evidence suggests desirable effects on cleanliness, waiting and contact time indicators, but the intervention may make little to no difference to overall patient satisfaction scores.	⊕⊕⊕⊕	Low
Impacts on management or information systems (if not a targeted measure of performance)	Where indicators have been targeted, paying for performance may have desirable effects. For untargeted outcomes, effects are uncertain due to very low certainty evidence.	⊕⊕⊕⊕	Low
Equity considerations: evidence of differential impacts on different parts of the population	The intervention may have little or no effect on equity or may worsen equity, for example, paying for performance may lead to increased utilization of family planning services and institutional deliveries among wealthier population groups.	⊕⊕⊕⊕	Low

* GRADE ratings here refer to summative judgments of the authors across multiple outcomes. Please see [Table 2](#) for a detailed account of all outcomes and relevant evidence ratings.

BACKGROUND

Description of the condition

Improving the performance of healthcare delivery systems is an important objective, both in high-income settings and, even more critically, in low- and middle-income country (LMIC) settings, where resources for health are much more constrained. Performance-based payment (P4P) has for more than a decade now received increased attention as a strategy for improving the performance of healthcare providers, organisations and governments. It is also promoted as an important tool for wider health system reforms (Meessen 2011, Soucat 2017). However, the last Cochrane Review found limited rigorous evidence on its effectiveness (Witter 2012) and while there has been a growth in studies of P4P since that review, there is a gap in relation to synthesised evidence of its effectiveness in different contexts and for different services in LMICs.

Description of the intervention

Pay for performance refers to the transfer of money or material goods conditional on taking a measurable action or achieving a predetermined performance target (Eichler 2006). Paying for performance is also sometimes referred to as results-based financing (RBF), performance-based funding (PBF) and output-based aid (OBA). While paying for performance is a relatively simple concept, it includes a wide range of interventions that vary with respect to the level at which the incentives are targeted (recipients of health care, individual providers of health care, healthcare facilities, private sector organisations, public sector organisations and national or sub-national levels) and the type of reward (payment based on fee-for-service, other monetary payments and non-monetary rewards) (Musgrove 2011). Paying for performance interventions can also reward a wide range of measurable actions, including health outcomes, delivery of effective interventions (for instance, immunisation), utilisation of services (such as prenatal visits or births at an accredited facility) and quality of care. Paying for performance interventions typically also include ancillary components such as increasing the availability of resources to health care, education, supplies, technical support or training, monitoring and feedback, increasing health worker pay, construction of new facilities, improvements in planning and management or information systems etc (Oxman 2008).

While it is conceivable that pay increases designed to increase motivation and retention of staff might fall within this definition, in this review we focus on reforms which are explicitly linked to changing patterns of activity, output or outcome indicators (thus excluding routine changes to pay or public funding flows, or user fee regimes). Another systematic review has addressed the use of conditional cash transfers for service users (demand-side paying for performance) for improving the uptake of health interventions in LMICs (Lagarde 2011, currently being updated). This review therefore focuses on updating the evidence originally appraised by Witter and colleagues in 2012 of the impacts of supply-side paying for performance aimed at improving the delivery of health interventions (New Reference). In this review, paying for performance includes both paying for performance schemes (including ancillary components) and paying for performance per se (where any ancillary components are controlled for).

How the intervention might work

Paying for performance by individuals is not new – it has taken the form of user fees, and in many low- and middle-income countries it remains one of the main forms of health financing. However, public funding for health has commonly taken the form of budget flows, which are linked to indicators such as staffing levels or bed numbers (for facilities), inputs (such as estimated drug needs), population numbers (for regions and districts, in some cases) and also historical trends in expenditure (all modified by overall budget constraints).

These bureaucratic mechanisms offer the advantage of stability and predictability, and rely on local clinical judgement as to how and what services to offer. The disadvantage, however, is that health systems based on budget funding and salaried staff can lack incentives to improve quality, to increase outputs and to improve outcomes. Paying for performance aims to reintroduce those incentives by linking pay (at individual or facility level) to desired activities and/or outcome indicators. It may in addition increase resources (by providing supplementary funding) or may be an alternative mechanism for channelling existing funding resources (substituting for existing funds).

In Organisation for Economic Co-operation and Development (OECD) countries, paying for performance is generally described as a tool for improving performance and accountability (Christianson 2007, Cashin 2014). In LMICs, however, it can have wider objectives (Witter 2009; Witter 2013). These include

- to increase the allocative efficiency of health services (by encouraging the provision of high-priority and cost-effective services);
- to increase the technical efficiency (by making better use of existing resources such as health staff);
- to improve equity of outcomes (for example, by encouraging expansion of services to hard-to-reach groups).

Others emphasise the potential of paying for performance to transform health sectors, introducing client-oriented public finance models inspired by the new public management mode (Meessen 2011). A review of the potential mechanisms of change for P4P emphasises their complexity, the lack of consensus on how P4P might work, and the importance of local norms and values in how P4P will function (Renmans 2016).

Paying providers for performance is clearly premised on the assumption that a change in behaviour on the provider side is required for allocative and technical efficiency and equity of outcomes to change. However, if substantive demand-side barriers exist (such as low affordability of services), then paying for performance for providers alone will not be effective.

Paying providers for performance in LMICs can operate at a number of levels. It can be offered directly to community health workers or to professional health workers (in public, private or private not-for-profit sectors) or to facilities. It can be used to set budgets or supplement budgets at higher organisational units, such as health districts or regions. It can also be used at national level, in particular by donor organisations negotiating aid to a national health sector. Clearly, incentives would be expected to operate differently at these different levels: incentives to individuals are likely to be

more directly motivating (incentives to organisations only affect behaviour indirectly, if passed on in some way to individuals), but may undermine cooperation (unlike organisational incentives, which might be expected to reinforce co-operation).

It seems intuitive that paying more money for the delivery of effective services will improve health care, but health care does not operate like a classic free market. Human behaviour is complex and there are many theories that attempt to explain both health behaviour and professional behaviour. Principal-agent theory addresses relationships where one individual (the patient) cannot directly observe or know the level of skill or effort expended by the other individual (the professional) doing the contracted work. Patients do not have perfect knowledge of their medical condition, their need for care, or the expected outcome of healthcare services. They therefore are willing to have healthcare professionals act as their agents in providing information and services and patient demand for health care may be unresponsive to technical quality. One theoretical advantage of performance pay is that explicit financial incentives are provided even when patient demand for health care is unresponsive to quality. In other words, professional effort in providing high quality is rewarded, regardless of whether patients recognise it. This theoretical advantage relies, however, on a host of assumptions, including the ability to assess quality, the linkage of paying for performance systems with quality measures, and the absence of adverse consequences. Moreover, as indicated above, in LMICs in particular, paying for performance is being deployed for a wide range of reasons other than improving quality. It is envisaged more ambitiously as a tool to increase the responsiveness of staff and the health system generally to priority areas, and in some settings is the main funding mechanism for primary care (Witter 2019).

It is also important to note that although financial incentives and healthcare payment systems are likely to have an important influence on professional behaviour, this influence is far from exclusive. In economic terms, professionals are viewed as maximising their utility function (i.e. their well-being). Important factors in their utility function, besides income, include professional and social status (or self-image), altruism (doing what they perceive to be best for their patients), the burden of efforts to change their behaviour, and their uncertainty about the benefits of changing their behaviour. Moreover, there may be other barriers to changing professional behaviour, even when professionals are motivated, including patient factors, lack of time, lack of technical skills, lack of resources and organisational constraints.

It is generally accepted that professionals are motivated by the satisfaction of doing their jobs well (intrinsic motivation). Indeed, it is doubtful whether some valued-but-difficult-to-observe dimensions of quality (such as empathy or listening in the medical encounter) would be provided at all if physicians were solely interested in income. Health professionals therefore have both monetary and non-monetary incentives, all of which affect their performance. It is possible that financial incentives may dilute professionals' intrinsic motivation and this is the subject of widespread debate around public sector motivation in higher-income countries (Marquand 2004). Psychological studies also highlight the risks to intrinsic motivation of extrinsic rewards (Deci 1999). The risk of coercion for patients – for example, when specific family planning methods are incentivised – is also highlighted by some studies (for example, Blacklock 2016). On the other hand,

where health workers' pay is low in absolute terms, incentives may be an important channel to improve motivation through increasing their income levels. There is a small but growing literature on the effects of pay for performance (P4P) on provider motivation, the results of which are so far ambiguous (for example, Dale 2014), highlighting the importance of understanding different contexts and models.

The timescale of evaluation is another important consideration. Financial incentives might be effective in the short run for simple and distinct, well-defined behavioural goals, but these are not necessarily sustained in the longer run. Some studies have now focused on the period after the end of P4P programmes, giving a longer-term perspective on their effects (Huillery 2014). Paying for performance schemes are often accompanied by ancillary features, such as training initiatives and enhanced supervision arrangements. When paying for performance schemes including these features are compared to no intervention, it may be impossible to disentangle the impact of paying for performance per se from the impact of these ancillary components. It is also important to capture systemic effects, where possible: P4P is increasingly recognised to be a complex package of measures, influenced by and potentially influencing the wider health system (Witter 2013).

Why it is important to do this review

The first systematic review of the impacts of supply-side paying for performance in LMICs was published in 2012, and found the evidence base to be weak. Since then the number of P4P programmes in LMICs has expanded considerably, as have the number of studies examining different aspects of these programmes. In particular, the World Bank-managed Health Results Innovation Trust Fund has spent 307.1 million USD on programs in 28 countries and supported 24 impact evaluations alongside these programs (RBF Health 2020). With this growth in interest, funding and potentially robust studies, it is timely to review the evidence base.

While reviews of schemes in high-income countries can help to inform decisions in LMICs, there are several reasons for undertaking a review of the impacts of paying for performance in LMICs specifically. The potential benefits, harms and costs of paying for performance may be greater in LMICs, where there are fewer resources than in high-income countries, weak health systems, inadequate supplies, facilities and human resources, and greater inequities, and where paying for performance schemes are often introduced by donors and include ancillary components, such as increased resources and technical support.

Paying for performance is a complex intervention with uncertain benefits and potential harms. It may, for example, lead to the concentration of resources in areas where targets are easier to meet (which typically are better served areas), thus increasing inequity of provision, or lead to neglect of unincentivised services. The extent to which benefits attributed to paying for performance in LMICs are attributable to conditionality (versus ancillary components of paying for performance schemes in LMICs, such as increased resources and technical support) is also uncertain. Paying for performance may not be a good use of resources, even when it is effective, due to potentially small effects and high costs. For these reasons an updated systematic review of evaluations of the impacts of paying for performance is needed to inform decisions about

whether and when to use paying for performance, how to design these schemes, and how to monitor and evaluate them in LMICs.

OBJECTIVES

To assess the effects of paying for performance on the provision of health care and health outcomes in low- and middle-income countries.

METHODS

Criteria for considering studies for this review

Types of studies

A brief outline of inclusion and exclusion criteria follows; a full list of exclusion reasons is available in [Appendix 1](#).

Types of studies

The review includes:

- Randomised trials
- Non-randomised trials (experimental studies in which people are allocated to different interventions using methods that are not random)
- Controlled before-after (CBA) studies where:
 - at least two clusters are included in each comparison group;
 - pre and post intervention periods for study and control groups are the same;
 - choice of the control site is appropriate: i.e. sites have similar socio-economic characteristics and/or there are no major differences evident in the baseline groups.
- Interrupted time series (ITS) studies with at least three measurements before and after introducing the intervention

Well-designed cluster-randomised trials protect against selection bias and are likely to provide the most rigorous estimates of the impacts of paying for performance schemes. However, cluster randomised trials may not be practical for evaluating some paying for performance schemes (e.g. when there is simultaneous system-wide implementation). Although CBA studies are often at high risk of bias, we believe it is important, at least at this time, to include these studies. ITS studies may be problematic due to changes in information systems and the reliability of information systems used in paying for performance schemes in LMICs. However, they potentially have a lower risk of bias than CBA studies. Other study designs may provide useful information about acceptability, potential effects or explanations for observed effects of paying for performance, but are unlikely to provide useful estimates of the impact of paying for performance on the main outcomes of this review.

Types of participants

Participants in P4P schemes include providers of healthcare services (health workers and facilities), sub-national organisations (health administrations, non-governmental organisations or local governments), national governments and combinations of these.

All sectors (public, private and private not-for-profit) have been included in the review.

Types of interventions

Paying for performance takes three main forms.

- Conditional cash payment
- Conditional provision of material goods
- Target payments (payments for reaching a certain level of coverage, which can be defined in absolute terms or relative to a starting point)

We have included evaluations of paying for performance schemes (including ancillary components), compared to any alternative (including non-conditional financial incentives and different levels of conditional financial incentives). We have included comparisons with alternatives where there may be differences in ancillary components, such as increased resources, as well as differences in paying for performance.

We have excluded studies in which:

- The primary focus of the financing scheme is the demand-side of healthcare (e.g. conditional cash transfers targeted at specific population groups) or where demand-side interventions are purposefully run concurrently with a P4P intervention but effects of the latter cannot be untangled.
- Payment to health workers or facilities not explicitly linked to changing patterns of performance (e.g. for coming to work; salary increases; routine increases in activity-based payments such as Diagnosis-Related Groups (DRGs) or fees for service; or changes to budget flows which are routine or intended to motivate, but without being conditional on specific activity or output measures)

Studies for which full-texts could not be obtained have been identified as such under Studies awaiting assessment.

Types of outcome measures

Primary outcomes

To be included, a study must report at least one of the following outcomes:

- Patient health outcomes (for example mortality rates, treatment success);
- Changes in targeted measures of provider performance, such as the utilization, delivery or quality of healthcare services;
- Unintended effects, including motivating unintended behaviours, distortions (ignoring important tasks that are not rewarded with incentives), cherry-picking/cream-skimming (prioritising patients that are most profitable over those who release fewer financial rewards), gaming (improving or cheating on reporting rather than improving performance), increased inequities and dependency on financial incentives
- Changes in resource use, including for incentives, administration and services

Secondary outcomes

The following outcomes are included if reported in included studies or in publications or reports ancillary to the main impact evaluation:

- Impacts on provider motivation, satisfaction, absenteeism and acceptability
- Impacts on patient satisfaction and acceptability (such as satisfaction scores)
- Impacts on overall financing or resource allocation
- Impacts on management or information systems (if not a targeted measure of performance)
- Equity-consideration: evidence of differential impact on different parts of the population

Given the focus on effectiveness, the results of qualitative studies conducted alongside impact evaluations have not been included. However, we have included estimates of health economic evaluations conducted alongside impact evaluations as they report on changes in resource use linked to P4P schemes.

Search methods for identification of studies

Electronic searches

Searches for all studies were carried out in 2018 and then updated in 2020. Studies from the initial 2018 search are incorporated in this review. Studies identified in subsequent search updates have been marked as relevant and are listed under [Studies awaiting classification](#).

We searched the following electronic databases:

- The Cochrane Central Register of Controlled Trials (CENTRAL) 2018, Issue 3, part of the Cochrane Library (www.thecochranelibrary.com) including the Cochrane Effective Practice and Organisation of Care (EPOC) Group Specialised Register (searched 10 April 2018)
- MEDLINE, Ovid Epub Ahead of Print, In-Process & Other Non-Indexed Citations, MEDLINE Daily and MEDLINE, Ovid (1946 to Present) (searched 10 April 2018)
- EMBASE, Ovid (1974 to 2018 April 09) (searched 10 April 2018)
- PsycINFO, Ovid (1806 to April Week 1 2018)
- EconLit, EBSCOhost (1886 to present) (searched 27 April 2018)
- LILACS, VHL (searched 10 April 2018)
- WHOLIS, VHL (searched 10 April 2018, not updated as no results retrieved in previous search)

We revised the original review protocol to expand the number of databases searched. For this review update, we also searched:

- CINAHL, EBSCOhost (1981 to present) (searched 10 April 2018)
- 3ie Database of Impact Evaluations (searched 7 June 2018)
- BLDS British Library for Development Studies (searched 18 June 2018)
- Global Health, Ovid (1973 to 2018 Week 15) (searched 27 April 2018)

Two grey literature databases (The Grey Literature Report, and OpenGrey) and two clinical trials databases (ICTRP (WHO) and ClinicalTrials.gov) were searched in June 2018.

We did not search International Pharmaceutical Abstracts, so it is possible that studies relating to pharmaceuticals were missed. However, the general searches, including in websites focused on this topic, did not suggest that we had missed any relevant studies.

We developed strategies that incorporated the methodological component of the EPOC search strategy combined with selected index terms and free-text terms. The updated search strategy incorporated new terms recently cited in the literature to describe pay for performance interventions. We placed no language or date restrictions on the search strategy. We translated the MEDLINE search strategy into the other databases using the appropriate controlled vocabulary; filters related to study design and setting (low- and middle-income countries) were applied.

The full search strategies for all databases are included in [Appendix 2](#).

Searching other resources

We contacted international experts in the field, including the authors of relevant articles that were retrieved. We asked them to identify additional websites, experts, academic (or other) institutions active in this field, as well as additional relevant studies.

In addition, the websites of organisations likely to be active in the field were searched in May and June 2018 (and checked for update in November-December 2020), including: the World Bank and RBFHEALTH, the African Development Bank, the Inter-American Development Bank, U.S. Agency for International Development (USAID), Cordaid, Management Sciences for Health (MSH), Centre for Global Development, World Health Organization (WHO), Swiss Tropical and Public Health Institute (Swiss TPH), Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), KfW Entwicklungsbank, Department for International Development (DFID), The Global Alliance for Vaccines and Immunization (GAVI), The Global Fund to Fight AIDS, Tuberculosis and Malaria, Asian Development Bank and Pan American Health Organization (PAHO).

In 2018 (and for the 2020 update), we additionally searched the websites of academic institutions active in this field, such as the London School of Hygiene and Tropical Medicine, the Harvard School of Public Health, University of Cape Town, Institute of Policy Studies of Sri Lanka (IPS), the Kenya Institute of Policy Analysis and Research (IPAR) and Institute of Tropical Medicine, Belgium. Given the sparse results obtained from these sources, we revised the list of websites to be searched for updates in December 2019. Updated searches included websites of the University of Heidelberg, University of Bergen and University of Rotterdam.

We additionally conducted a Web of Science citation search for the studies included in the review and checked references from included studies and other relevant articles, to identify other relevant studies that met the inclusion criteria.

Data collection and analysis

Selection of studies

Two authors independently screened abstracts in order to identify studies which met the inclusion criteria. We then retrieved studies

which were selected as meeting or possibly meeting the criteria in full and two authors again checked them independently in order to produce a final list of included studies.

Data extraction and management

Data extraction was carried out by one author using a modified version of the Cochrane EPOC Group data collection checklist; a second reviewer independently verified all extractions. Disagreements were settled by discussion.

A data extraction template is available in [Appendix 3](#). Among others, we extracted data on: the performance based financing scheme (including P4P scheme type, targeted sectors and levels, scope and funding source of the scheme, relative and absolute magnitude of incentives, verification mechanisms and ancillary components), study design and setting, study participants, study methods (including units of allocation and analysis, data sources, power calculations, analytic methods), outcome measures (as pre-specified above) and associated results, and comments by authors on interpretation of findings.

Assessment of risk of bias in included studies

Two authors independently used criteria recommended by the Cochrane EPOC Group to assess the risk of bias for each main outcome in all studies included in the review ([EPOC 2017a](#)).

Measures of treatment effect

For randomised and non-randomised trials and CBA studies, we recorded the effect estimates reported by investigators. Most commonly reported were the relative effects of the intervention obtained from difference in difference regression models adjusting for multiple covariates and confounders. These relative effects were reported in the form of regression betas, however measures of precision (confidence intervals, standard errors or deviations) were frequently not reported. For all such betas, we opted to re-calculate a more easily interpretable relative effect measure denoting the attributable % change in an outcome indicator due to the intervention in comparison to the control group baseline mean: i.e. we divide the effect estimate beta by control group mean and multiply by 100 to obtain a % change in outcome attributable to the intervention. Throughout, we therefore report this relative effect measure, rather than absolute percentage point differences.

If papers with CBA design did not provide an appropriate analysis or reporting of results, but presented the data for each district/region in the intervention and control groups respectively, we reanalysed the data using a difference-in-difference design. We created a dataset with the same number of events and non-events per district/region pre- and post-intervention as reported in the paper. We estimated the post intervention relative risk for the event (intervention relative to control), adjusted for the difference in risk between intervention and control pre-intervention, and pre- versus post intervention (underlying trend). In line with the above, we estimated the relative effect of the intervention as pr above.

For ITS studies we recorded changes in level and in slope. If papers with ITS design did not provide an appropriate analysis or reporting of results, but presented the data points in a graph or in a table that could be scanned or file as supplied by authors, we reanalysed the data using methods described in the Cochrane EPOC

group guidance ([EPOC 2017b](#)). Specifically, we used piecewise linear regression and estimated post-interruption changes in level and slope using the ITSA add-on command for STATA 15. For multiple group designs, we adjusted as per [Linden 2015](#). For all models fitted, we conducted robustness checks to assess whether autocorrelation considerably affected findings; if this was the case, we report adjusted values of the ITS analyses. All analyses were carried out in STATA 15 and results of analyses were included in summary of findings as relevant. All calculations use raw data as presented in reviewed studies.

Unit of analysis issues

For cluster-randomised trials and CBA studies we appraised whether an appropriate analysis had been done that adjusted for clustering in calculating confidence intervals or P values. If an analysis had not done this, we considered whether the effect estimate was likely to be affected by such issues and appropriately noted this as a potential source of bias relating to the outcome in question.

Dealing with missing data

We have contacted the authors of included studies where substantive concerns over missing data were noted. Authors were given two weeks to reply and supply data for re-analysis; if we did not hear back from authors, we attempted to contact them a second time. If this was also unsuccessful, we did not include data provided by the study in our Summary of Findings, however otherwise include the study in the review and describe the study and intervention in principal descriptive tables.

Assessment of heterogeneity

Upon completion of data extraction, the author group considered the diversity in intervention designs and also the clinical and methodological diversity across studies as per the Cochrane Handbook (Chapter 10.10.1). We noted high levels of diversity (see Description of Included studies) and also considered limitations in how data is reported (effect estimates not being accompanied by measures of precision) and decided against conducting a statistical assessment of heterogeneity or meta-analysis.

Assessment of reporting biases

Selective outcome reporting is a risk for pay for performance studies, where information on many indicators was recorded in the intervention, but not all indicators are reported in studies. We assessed risks qualitatively: for each study we considered the outcomes incentivised by P4P schemes, noted which outcomes were captured by the evaluations and identified outcomes that were not reported on. We additionally compared the stated aims of each evaluation with the outcomes reported on. If we suspected reporting bias, we logged this as appropriate in our assessment.

We also assessed publication bias qualitatively for each outcome and indicator reviewed, based on the results and characteristics of the included studies, including the extent to which only effects in favour of the intervention are reported, the extent to which funders or investigators are advocates of paying for performance or have a vested interest in the results, and the extent to which the authors' interpretations of the results are supported by the actual results.

Data synthesis

Studies of paying for performance are heterogeneous in relation to context, study design, characteristics of the participants and the interventions, follow-up time periods and the outcome measures. We therefore judged it to be uninformative to calculate average effects across studies. We additionally note substantive gaps in data reported by study authors, principally relating to precision measures (standard errors, standard deviation and confidence intervals), thus precluding any potential for data pooling or meta-analysis. We therefore decided to use narrative synthesis and report on this as per SWIM guidelines (Campbell 2019).

Grouping of studies for main comparison

We aimed to review the evidence on P4P against the primary and secondary outcomes as formulated, however upon initial review of included studies noted two sources of diversity that had not been pre-specified in the study protocol and which required us to deviate from initially specified analyses approaches.

Identifying main comparisons

First, some studies assessed intervention effects against either a standard care or status quo control group, whereas others assessed effects against a comparator intervention (usually enhanced financing). Other studies assessed effects against both a control and comparator. We therefore chose to report on P4P effects against control and P4P effects against comparator interventions, drawing on the information and effect data reported by studies against each comparison as relevant.

Defining level of synthesis

Second, effects of the intervention are reported at more granular level than anticipated. For example, we aimed to consider effects on delivery and utilization of care services, however numerous individual indicators relating to this outcome were reported on, including: utilization of one or more antenatal care visits, delivery of HIV-testing and delivery of modern family services among others.

We therefore extracted data on each of these more granular indicators and established that when synthesising and presenting evidence, we would do so at different hierarchical levels.

Specifically, we aimed to present the effects of P4P against a control or comparator at:

- indicator level: i.e. summarising range of effects for each indicator which was formulated and assessed in a comparable manner across studies (see Criteria used to prioritise results for synthesis);
- clinical area level: i.e. grouping clinically similar indicators together to summarise the effects of the intervention on a clinical area, e.g. reviewing and grouping individual vaccination indicators for BCG, DTP and tetanus and narratively summarising evidence against the area of vaccinations;
- outcome level: i.e. reviewing effects across the different individual indicators and emerging patterns by clinical areas, summarising how the intervention affects the macro-level outcomes as formulated in our initial study protocol.

Distinguishing between targeted and untargeted effects

At any of the above levels, and as per our original review protocol, we aimed to distinguish between effects of the intervention on targeted vs. untargeted indicators. The need to distinguish between such effects relates to debates around the broader theory of change for the intervention. On one hand, should P4P schemes directly incentivise an indicator, i.e. by making payments conditional upon achieving a specified target or otherwise, we would expect health professionals to change their practice and performance around this indicator to respond favourably. On the other hand, depending on design, overall budgets involved and wider inclusion of quality of carer indicators, P4P schemes are likely to contribute to broader health system strengthening, thus creating an environment where other indicators – even not targeted – respond positively.

Given the above, we additionally therefore decided to summarise intervention effects across targeted and untargeted indicators separately. The former specifically relate to indicators which P4P schemes include in their designs; i.e. payments made to facilities and health workers are conditional based on performance for these specific indicators. We define an indicator to be targeted if it is directly included among indicators specified by the scheme design, or indirectly targeted; e.g. if a scheme rewards four or more antenatal consultations, we consider that the first three antenatal consultations are also targeted.

Indicators that are not targeted are those that are assessed by the evaluation and defined by authors of reviewed studies as not targeted or identified by the review team as not relating to targeted indicators.

For details on how we grouped studies and synthesised information for sub-group and sensitivity analyses, please see relevant headings.

Standardised metric

At any of the above levels, we do not generate pooled estimates, given limited reporting of precision estimates, but instead report the range of relative effects noted across reviewed studies. See Measures of Treatment Effect for further details.

Criteria used to prioritise results for synthesis

Given the volume of data retrieved and need to systematically and meaningfully compare effects, we restricted our synthesis only to those indicators that were comparable and reported in 2 or more studies. To be deemed comparable, indicators needed to be similarly specified (in terms of measurement instruments and time-points) and appraised via similar means (in terms of data collection mechanisms).

Synthesis method and presentation of findings

For each comparison (P4P against control or comparator), for each indicator, we reviewed the effect sizes noted to identify the range of relative effects of the intervention, noting at the same time whether these are predominantly suggestive of desirable, neutral, undesirable or uncertain effects. We present this detailed information by indicator and clinical area specific Summary of Findings tables in [Appendix 4](#) and [Appendix 5](#)

For each indicator, we deemed effects predominantly suggestive of benefits of introducing the intervention as desirable. This meant reviewing all the effects contributing to a comparison against a

specific indicator and judging whether effects were consistently positive, or in cases where negative effects were also noted, whether these were small (under 5%) and present in a minority of cases only. We judged undesirable effects as those where studies predominantly suggest the intervention may imply more harms than benefits: this meant that effects were predominantly negative and positive effects relatively small (under 5%). In order to judge effects as suggestive of neutral, we applied a contextualized judgment dependent on outcome, however generally considered effects under 5% to be of this nature. For some indicators, where both the range of effects identified were suggestive of both potential benefit and harm, and were beyond 5%, we classified the overarching effect of the intervention as uncertain.

To prepare summaries of findings across main outcomes - as presented in the main Summary of Findings tables, we first created Meta-Summary graphics, summarising desirable, undesirable or neutral effects and certainty of evidence against each indicator. We further summarise information narratively across all indicators associated with a specific outcome, offering a general overview of effects, commenting on whether these change based on whether indicators are targeted or not. We reached an overarching judgment on the certainty of evidence against each outcome by considering the relative distribution of certainty ratings across an outcome.

Subgroup analysis and investigation of heterogeneity

For both comparisons of P4P effects against control and those against comparator interventions, we stated that we would explore the extent to which the magnitude of incentives and/or ancillary components might explain differences in the impacts of paying for performance, along with the level at which they were paid (Witter 2012). However, studies did not consistently report the magnitude of incentives and the presence of ancillary components. It was therefore not possible to conduct sub-group analyses based on magnitude of incentives.

We did however conduct a sub-group analysis by level at which performance is assessed and paid, which links to the P4P scheme design and mechanism. We classified all studies according to their broad scheme design - distinguishing, for example, between performance related pay, payment per output, and target payments. For each of the indicators assessed (whether targeted or untargeted), we then set a minimum certainty threshold - i.e. we restrict sub-group analyses to indicators for certainty in evidence is at minimum low across both targeted and untargeted outcomes. We then assessed whether the range of effects reported in the reviewed studies varied by classification of the P4P scheme. Against each indicator, we thus assessed whether any pattern was evident in relation to the scheme designs contributing information to the comparison. We noted indicators for which no pattern was evident and for those indicators where a pattern was distinguishable, we assigned the best performing scheme (schemes securing positive relatively high magnitude of effect) a rank of 1- and second-best performing scheme a rank 2 and so forth. We thus reached a qualitative judgment on relative performance of diverse schemes types in comparison to one another. To comment on broader patterns across outcomes of the review, we then calculated a median rank for each scheme design, across the indicators associated with each outcome, in order to establish an overarching relative rank for each type of P4P scheme design. We further review the ranking patterns across schemes and comment on these.

Sensitivity analysis

For all indicators, we present summaries across the whole body of evidence and separately summarise the evidence from RCT studies in the comments section and additional tables in order to probe whether results differ if less robust studies are excluded.

Summary of findings and assessment of the certainty of the evidence

We summarize the effects of P4P for each indicator and against each of the above comparators (control and comparator) in summary of findings tables, distinguishing principally between whether indicators were targeted or not, and further summarize interpretation of results against review outcomes in meta-summary tables and the overarching Summary of Findings tables. We provide the range of effects corresponding to intervention impacts noted across studies against each indicator, however do not calculate a single effect estimate of the intervention against either control or comparators.

We assessed the certainty of the evidence (high, moderate, low, and very low) using the five GRADE considerations (risk of bias, inconsistency of results, imprecision, indirectness, and publication bias) as per Section 77.6 and Chapter 14 of the Cochrane Handbook for Systematic Reviews of interventions (Higgins 2019), and the EPOC worksheets (EPOC 2017c). Given the absence of meta-estimates, our GRADE assessment corresponds to an assessment of certainty in the overall direction of effect of the intervention. We present the range of effects noted by study authors across the reviewed literature and used the approach noted by Murad 2017 to consider methodological limitations of studies, issues of indirectness, imprecision, inconsistency, likelihood of publication bias and appropriateness of raising certainty ratings. Alongside summary of findings tables, we provide justification for decisions to down- or upgrade the ratings using notes in the table and make comments to aid readers' understanding of the review where necessary.

As per ongoing research and recommendations (Hultcrantz 2017), we assess certainty in whether the intervention has a desirable (positive), neutral, undesirable (negative) or uncertain effect (see Data Synthesis), and further refer readers to the identified range of effect sizes for interpretation (Hultcrantz 2017). To reach a judgment on certainty we proceeded stepwise. First, we considered all evidence to be of high quality (4-point GRADE rating).

Second, we systematically appraised the evidence collated against each outcome in light of the five GRADE criteria, down-grading evidence as appropriate (EPOC 2017c; Higgins 2019). In relation to risk of bias criteria specifically and as per Murad 2017, this implied downgrading evidence by 2 points for indicators where the majority of evidence was from controlled before and after studies. In addition to the criteria listed, we further down-graded evidence provided by one study only (downgraded by 1 point). Third, we proceeded to upgrade evidence by 1 point if the magnitude of effect was particularly large (i.e. corresponding to a relative risk of 2 or above) (as per section 5.3.1 in Schünemann 2013). Fourth, we consistently reviewed judgments made on effects (whether they are desirable, undesirable, neutral or uncertain) in light of GRADE ratings. For all indicators where certainty in evidence was deemed very low, we revised our assessment and noted effects as uncertain.

Given the diversity of study designs, we further reviewed the evidence across RCT studies only (see sensitivity analyses) and applied GRADE again as per the above principles.

All GRADE assessments were done independently by two authors, with disagreements being resolved by discussion and in consultation with a third author.

RESULTS

Description of studies

Results of the search

Searches in the specified databases and websites yielded 11,529 unique references, which two researchers examined independently (See [Figure 1](#)). We retrieved 912 complete articles which were independently assessed by two researchers. We included 59 studies in the review.

For Preview Only

Figure 1. PRISMA Flowchart

Figure 1. (Continued)

Upon updating searches, we identified additional studies for which full texts need to be reviewed in the next review update and have listed these under [Studies awaiting classification](#).

Included studies

59 studies were included (see Characteristics of included studies [Table 3](#) and [Table 4](#)). The majority are studies assessing the effects of P4P against a control group. 24% (n=14) of studies were randomized control trials, 27% (n=16) non-randomized trials, a further 32% (n=19) controlled before-and after studies. 15% (n=9) were interrupted time series studies, with one further study including both an interrupted time series and controlled before-after analysis. Most studies followed up and assessed the effects of P4P schemes 3 years post initiation, however this varied considerably across the reviewed literature, with some evaluations being conducted as soon as one-year post scheme start and others following up trends as long as 17 years post initial implementation.

Intervention characteristics

Geography, context and location of care

Interventions were implemented across 25 countries overall (see Characteristics of interventions [Table 5](#) and [Table 6](#)); however, the majority of studies were impact evaluations focused on the P4P schemes implemented in Rwanda (17%, n=10), China (12%, n=7) and Tanzania (8.4%, n=5).

Studies predominantly studied interventions implemented across both urban and rural locations (29%, n=18), however two focused specifically only on urban environments ([Brock 2018](#); [Wu 2014](#)). A substantive proportion of studies (37%, n=24) did not offer a precise description of locations.

Over half of the reviewed studies described P4P schemes focused on reproductive, maternal and child health services only; eight schemes were more focused in relation to clinical area (e.g. as in [Kliner 2015](#) and [Yao 2008](#) where the focus was on tuberculosis.)

61% (n=36) of studies reported on schemes operating at both in- and out-patient levels with a further 15% focused on outpatient care (n=9) or inpatient care (n=9) respectively. Two studies focused on community-based care exclusively ([Kliner 2015](#); [Witvorapong 2016](#)).

Participants

91% (n=54) of studies reported on P4P schemes involving public or not for profit facilities (usually faith-based). Few studies included a mix of public, private and not-for-profit ([Brock 2018](#); [Huillery 2017](#)) and only one study focused on private health providers exclusively ([Mohan 2017](#)).

Scheme funders

Overall, studies noted a high proportion of schemes funded by national governments and Ministries (37%, n=23); 33% (n=20) were funded by external agencies (33%, n=23). As per [Table 6](#), none of the schemes were funded without some level of national support; no schemes were funded only by sub-national or local funds. Three further (5%) studies noted that schemes were co-financed by national governments and external donors or non-governmental organizations, and across 13 studies (22%) no clear details on scheme funders were provided. Across schemes funded by external agencies, the World Bank and Government of Norway were the main funders, having supported 11 (19%) and 5 (7%) schemes respectively. The latter two actors are also the main funders of the impact evaluations included in the review, having contributed to the financing of roughly 17 (29%) and 5 (10%) respectively of the studies included in this review. Four studies (7%) were further funded by the US National Institute of Health and the remainder by a varied mix of funders, including the Bill and Melinda Gates Foundation, Cordaid and the European Union.

Scale of intervention

The scale of implementation differed by country. The majority of studies (42%, n=26) focused on studying intervention effects

across a range of districts (e.g. as [de Walque 2017](#) in Cameroon). Other studies focused on studying effects across one particular province (20%, n=12, e.g. as [Yip 2014](#)) or a particular facility (13%, n=8, e.g. as [Wu 2014](#)); others studied national level roll-out and implementation of P4P (21%, n=13, e.g. as [Gertler 2012](#)). For the majority of P4P schemes described across studies (76%, n=45), purchasing arrangements were integrated into the national purchasing functions of the relevant Ministry of Health.

Target setting and incentive payments

Schemes targeted a wide range of indicators, which varied in number among schemes. Very few schemes focused on one indicator only (e.g. [Celhay 2015](#), Argentina) while others noted that schemes had used as many as 42 indicators (e.g. as in the case of [Burundi](#) as reported by [Falisse 2015](#)). On average, schemes targeted approximately 8-12 core indicators, which related to the delivery or utilization of services.

Over half of included studies (57%, n=34) did not include details on why and how indicators were chosen and set. Studies which included details on these processes suggest that consultative processes between national Ministry of Health actors, non-governmental and aid organizations were employed to set targets based on emerging priorities or in line with best locally or internationally available evidence.

Magnitude of incentives

The absolute magnitude of incentives appears to range between 0.5 to 10US\$/per indicator. However, for some indicators which require repeat contact with the health service, or imply specialist skills, capita costs were used. These were consistently priced at higher rates: e.g. correct tuberculosis patient management and skilled birth attendance were incentivized at 20US\$/patient (e.g. in [Bonfrer 2014a](#)) and at 35.63US\$ (e.g. in [Engineer 2016](#)) respectively.

54% (n=32) of included studies report on the relative magnitude of incentives. Of these, 10 studies note the relative magnitude of incentives in relation to facility funding; the majority of studies estimate that P4P incentives equate to 14-50% of funds available to facilities overall. 14 studies further note the relative magnitude of incentives in relation to health worker salaries; incentives are estimated to equate to anything between 1-78% of health worker salaries, however the majority of studies report on incentives equal to approximately 10% of overall annual pay.

Measurement and verification of performance

61% (n=38) of studies reported that performance against incentivized indicators was assessed using data routinely reported by health facilities. 16% (n=10) of studies similarly noted using data captured by the national health management information systems or equivalent electronic health record systems as the basis for performance measurement. 32 of these studies additionally described verification procedures, which included assessments by district level management teams, study teams active in assessing the effectiveness of P4P schemes or by teams including community and purchaser representatives.

6.4% (n=4) of these studies described verification via national level statistics or via bespoke community and household surveys.

In 16% (n=10) of studies it was unclear how performance was measured and verified.

Assessment and purchasing arrangements

Across schemes, the focus of scheme assessment and payment was largely at health facility level (n=33, 55%). Seven studies reported on schemes where P4P performance was assessed at both district and health facility levels; a further 6 studies noted performance being assessed at health worker level directly.

The majority of studies (85%, n=50) reported that P4P payments were additional to normal wages or funding received. Only 2 studies conducted in China, both focused on containment of unnecessary health related services and expenditures, reported on schemes whereby health facilities or health workers may be penalized (i.e. fines would need to be paid if outcomes were not achieved) as a result of P4P schemes.

Predominantly payments appear to be made to health facilities directly; the latter then cascade payments to health care workers as agreed in the setup of the P4P scheme. This may be at the discretion of the facility (e.g. as in [Zeng 2013](#) in [Haiti](#)) or may be according to an agreed principle whereby a proportion of the overall bonus is shared with staff and the rest is reinvested (e.g. as in [Steenland 2017](#) in [Burkina Faso](#)).

Intervention classification

Schemes operated according to an assortment of designs (see Intervention Classification [Table 7](#) and [Table 8](#)). The majority of schemes focused on assessing performance at facility level and on providing a payment per incentivized indicator. However even within this group, some schemes focused on incentivizing both the volume and quality of outputs, while others focused on incentivizing outputs only. Other schemes operated on a payment to target principle; while in the majority of cases this meant that bonuses were released upon targets being met, one scheme applied penalties if targets were not achieved and consequently withheld income ([Wu 2014](#)). A minority of studies focused on schemes which included assessments of performance at district or national levels. Only one study focused on assessing the effects of results-based aid ([Bernal 2018](#)).

Ancillary components

A third of all studies reported that P4P schemes had no ancillary outcomes. However, the majority of schemes included multiple ancillary components. Among these, quality improvement strategies, training, enhanced supervision activities and technical support were noted most commonly. Other components, such as receiving additional funding or in-kind support (e.g. supplies), or putting in place strategies for consultation with other stakeholders in order to enhance the efficacy of processes needed to support P4P, were mentioned infrequently.

Comparator characteristics

44 studies focused on assessing P4P against a control, usually described as standard care within the respective country and health facilities. Other studies reported against comparator interventions predominantly focused on providing facilities with enhanced financing: i.e. funding matched to what facilities in the P4P arm were due to receive was disbursed to comparator facilities in order to isolate the effect of incentivization and performance assessment (e.g. as in [Friedman 2016a](#)). In other cases, comparators included an existing P4P scheme (e.g. as in [Celhay 2015](#) or [Shapira 2017](#)) or provision of in-kind support (e.g. as in [Soeters 2011](#)).

Outcomes reported

Schemes may target an indicator both directly, such as utilization of four or more antenatal care visits, as well as indirectly (e.g. by incentivizing four or more antenatal care visits, the area of antenatal care and care quality in general may in practice be incentivized). Studies therefore predominantly reported on a range of both directly and indirectly targeted indicators to assess the effects of P4P. Some studies (e.g. [Binyaruka 2015](#)) additionally focused on assessing the effects of P4P on explicitly untargeted indicators. Overall, studies report on a range of indicators; some report specifically on one primary indicator (e.g. as [Celhay 2015](#)), while others include data on up to 386 indicators (e.g. as in [Friedman 2016a](#)).

Sources of heterogeneity and diversity

We did not formally assess statistical heterogeneity, however as per the above sections note substantial sources of diversity in relation to study designs, clinical areas and patient groups studied and also intervention designs and outcomes assessed.

Excluded studies

A list of all excluded studies can be obtained from the authors upon request. The majority of studies were excluded due to study design issues (n=402). Full references of the 36 studies excluded due to other reasons are included under [Excluded studies](#).

Risk of bias in included studies

Drawing on assessments outlined in [Appendix 6](#), we present a summary of the risk of bias assessment in the Risk of Bias Graphic ([Figure 2](#)) and in the Risk of Bias Summary ([Figure 3](#)). While multiple studies may have reported on the same scheme, studies themselves frequently included diverse populations and we therefore assessed the risk of bias for each study. As expected, CBAs were recorded to be at higher risk of bias than other study designs, particularly due to lacking randomization and allocation concealment. However, some RCT studies were also downgraded on specific risk of bias criteria, predominantly due to differences in the baseline characteristics of P4P implementing areas versus control sites. ITS studies were noted to provide insufficient information (or attempt to control for) other concurrent changes going on in the countries or sites where P4P was implemented.

Figure 2.

Figure 3. Risk of bias summary by study

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding (performance bias and detection bias): All outcomes	Incomplete outcome data (attrition bias): All outcomes	Selective reporting (reporting bias)	Other bias	Baseline outcome measurement: All outcomes	Matched characteristics for control study sites	Protection against contamination (intervention and controls)	Intervention independent (ITS)?	Shape of effect pre-specified (ITS)?	Unlikely to affect data collection (ITS)?	Incomplete outcome data addressed (ITS)?
Basinga 2011	+	+	+	?	+	+	+	+	+				
Bernal 2018	+	+	+	?	+	+	+	+	+				
Binyaruka 2015	+	+	+	+	+	+	+	+	+				
Binyaruka 2017	+	+	+	?	+	+	+	+	+				
Binyaruka 2018	+	+	+	+	+	+	+	+	+				
Bonfrer 2014a	+	+	+	?	+	+	+	+	+				
Bonfrer 2014b	+	+	+	?	+	+	+	+	+				
Brock 2018	+	+	+	+	+	?	+	+	+				
Celhay 2015	+	+	+	+	+	+	+	+	+				
Chang 2017			?		+	?				+	+	+	?
Chansa 2015			+		+	+				?	+	+	+
Cruzado de la Vega 2017	+	+	+	?	+	+	+	+	+				
Das 2017	+	+	?	+	+	+	+	+	+				
de Walque 2015	+	+	+	?	+	+	+	+	+				
de Walque 2017	+	+	?	?	+	+	+	+	+				
Duysburgh 2016	+	+	+	?	+	?	+	+	+				
Engineer 2016	+	+	+	?	+	+	+	+	+				
Falisse 2015	+	+	+	+	+	?	+	+	+				
Friedman 2016a	+	+	+	+	+	+	+	+	+				
Friedman 2016b	+	+	+	?	+	+	+	+	+				
Gertler 2012	+	+	+	+	+	+	+	+	+				
Gertler 2014	+	+	+	+	+	+	+	+	+				
Huillery 2017	+	+	+	?	+	+	+	+	+				
Ir 2015			?		+	+				+	+	?	?
Khim 2018			+		+	?				?	+	?	?
Kliner 2015	+	+	+	?	+	?	+	+	+				
Kliner 2015	+	+	+	?	+	?	+	+	+				

Figure 3. (Continued)

Kliner 2015	-	-	+	?	+	?	+	-	-										
Lagarde 2015	?	?	?	?	+	?	-	-	+										
Lannes 2015	-	+	+	?	+	+	?	-	+										
Lannes 2016	-	+	+	?	+	+	+	+	+										
Liu 2005			+		+	+				-	+	+	+	+					
Matsuoka 2014			?		+	?				?	+	?	?	?					
Mayumana 2017	-	-	?	-	+	+	+	+	+										
McMahon 2016			?		+	+				?	+	-	-	-					
Menya 2015	+	+	+	?	+	+	?	-	+										
Mohanan 2017	+	+	+	?	+	+	?	+	?										
Peabody 2011	+	+	+	?	+	+	+	-	+										
Peabody 2014	+	+	+	?	+	?	+	+	+										
Powell-Jackson 2014	-	+	?	?	+	?	+	+	+										
Priedeman Skiles 2013	-	+	+	?	+	?	+	+	+										
Priedeman Skiles 2015	-	+	+	?	+	?	+	+	+										
Quimbo 2016	+	+	+	?	+	+	+		+										
Rudasingwa 2014	-	-	?	+	+	?	+	-	+										
Rusa 2009			?		+	+				-	+	?	?						
Shapira 2017	+	+	-	+	+	+	+	+	+										
Shen 2017	+	+	-	?	+	+	+	-	+										
Sherry 2017	-	+	+	?	+	?	+	+	+										
Soeters 2011	-	-	+	?	+	+	+	+	-	+									
Steenland 2017	-	-	+	+	+	?	+	-	+										
Sun 2016	-	+	+	?	+	?	+	+	+										
Van de Poel 2016	-	-	+	?	+	?	+	+	+										
Viñuela 2015			+		+	?				?	+	?	?						
Wagner 2018	+	+	+	+	+	+	+	+	+										
Witvorapong 2016	+	+	+	-	+	?	?	-	+										
Wu 2014			+		+	?				?	+	+	?						
Yao 2008	-	-	+	?	+	+	?	-	+										
Yip 2014	+	+	+	?	+	+	+	+	+										
Zang 2015	-	-	?	?	+	+	+	+	+										
Zeng 2013	-	-	+	?	+	?	+	-	+										
Zeng 2018a	-	-	+	?	+	+	+	-	+										

Overall, we note that selective outcome reporting was assessed as low: study authors consistently reported on the effects of P4P on the outcomes identified at the outset of their impact evaluations. However, the majority of authors fail to provide clear reports on how missing or incomplete data was handled during their studies or analyses.

Other potential sources of bias

We considered the potential bias introduced by unit of analysis issues, more specifically the absence of clustering or clustering at level different to allocation (e.g. clustering by region when allocation was at facility level). The majority of reviewed studies reported on facility level clustered difference in difference regression models, thus appropriately accounting for unit of analysis issues, however for few studies we noted potential high

risk of bias due to clustering at different levels (See [Appendix 6](#) for detailed judgments on risk of bias assessments).

Effects of interventions

See: [Summary of findings 1 Comparison 1: Summary of findings on effects of paying for performance against standard care](#); [Summary of findings 2 Comparison 2: Summary of findings on effects of paying for performance against comparator interventions](#)

Within the 59 studies included in this review update, 42 reported on the effects of P4P against a standard care or status quo control group, 13 reported on the effects against an enhanced financing control or alternative financing intervention and 4 reported on effects against both a control and matched or otherwise enhanced financing comparator. Of the 59 studies which were included in

the review, 41 studies noted that P4P schemes were accompanied by a diverse range of ancillary components. Predominantly these components focused on training and supervision initiatives and, in some cases, increases in overall resources allocated to facilities to assist with the roll-out of P4P schemes. Interpretation of the estimates of the impact of paying for performance therefore has to bear this in mind. We have highlighted differences in context, intervention design, resourcing and ancillary components in the Discussion.

Comparison 1: Effects of P4P against standard care

Overarching trends

A meta-summary of the effects of P4P on individual indicators assessed against standard care, grouped by each of the primary outcomes of the review, is presented in Meta-Summary: Effects of P4P against control (Table 1) and Summary of findings 1. All individual summary of findings tables, by outcome, are available in Appendix 4. We extracted effects on indicators directly targeted by P4P schemes (see Appendix 4 Tables 1-23) and indicators not explicitly targeted (see Appendix 4 tables 24-45).

Comparison 1a: Effects on targeted outcomes

Summary of findings tables 1-24 in Appendix 4 present the evidence collated for each of the primary and secondary outcomes.

1. 1. Targeted measures of provider performance

1. 1. 1. Delivery and utilization of services

Evidence on the effects of P4P on the utilization and delivery of services (see Table 1 and Appendix 4, Tables 1-8) is largely inconsistent across the indicators reviewed: the intervention may improve some utilization and delivery indicators but may lead to poorer results for other indicators (overall certainty of the evidence is low).

Effects on HIV/AIDS, malaria and TB services are overall mixed (low certainty evidence, Table 1): HIV testing and PMTCT delivery may be positively affected, however ART delivery may decline. P4P may have negative effects on the proportion of children and households protected by bednets (low certainty evidence), and effects on tuberculosis treatment adherence are uncertain (very low certainty evidence).

Moderate certainty evidence for improvements in indicators was found for the delivery of family planning services by health providers. P4P probably improves the number of outreach activities on family planning services offered by health providers and probably increases the likelihood of providers supplying contraception to clients (effects ranging between 10-300%, see Table 4).

Undesirable effects were noted for a minority of utilization and delivery indicators (low certainty evidence).

Findings are inconsistent overall for two of the areas of service delivery and utilization most commonly targeted by P4P schemes: mother and child immunizations (see Table 2) and antenatal care (see Table 5) (low certainty evidence).

1. 1. 2. Quality of care

Overall, the evidence suggests that quality of care indicators may improve where P4P is implemented (see Table 1 and Appendix 4, Tables 9-12). Across the indicators for which evidence was available, improvements were noted for the majority and only one indicator suggested that quality of care may decrease (this was in relation to waiting times). Generally the evidence for this outcome was of low certainty. Further, the methods for quality of care assessment were inconsistent across studies, however data is sourced predominantly from direct observation by scheme supervision teams or data collectors. In some cases, e.g. quality of child health care or quality of service by specific service area, data from structured patient exit interviews have also been used.

Indicators for which moderate certainty evidence was found include:

- quality of child health care: P4P probably improves quality of care scores (moderate certainty evidence; effects ranged from 5 to 300% relative increases) (see Table 12);
- quality of medicine and equipment: P4P probably improves the quality scores of available medicine and equipment, effects ranged from 2.7% to 220% (moderate certainty evidence) (see Table 12);
- overall quality of service by specific departmental area/service: P4P probably improves the average quality of service scores in specific targeted areas (moderate certainty evidence; effects ranged from 39% to 15-fold increase in scores (Table 12)).

In general, the effects of P4P schemes on a range of procedural quality of care indicators is uncertain, including the likelihood of providers carrying out background and physical assessments, managing patients correctly or counselling patients appropriately (very low certainty evidence - see Table 9). However, P4P may improve specific aspects of the quality of antenatal care, particularly the likelihood of receiving immunizations or being prescribed iron or folic acid in pregnancy (low certainty evidence).

The intervention may make little or no difference to staff knowledge and skills (see Table 10, low certainty evidence), and its effects on staff responsiveness (as observed by researchers/P4P scheme verifiers) are uncertain overall (very low certainty evidence; range: -2% to 49% change in responsiveness).

1. 2. Health outcomes

The available evidence suggests that overall P4P may improve some health outcomes (see Table 1 and Appendix 4, Tables 13-17).

- child mortality: P4P may reduce child mortality (range: 0.2-6.5%, low certainty evidence; Table 14);
- anaemia in children: P4P may lead to a modest reduction of 2-3% in the proportion of children with reported anemia (low certainty evidence; Table 15).
- the likelihood of tuberculosis treatment success (low certainty evidence; range: 12-20% improvement in treatment success, Table 16).

Evidence neonatal mortality is inconsistent: P4P may have desirable effects and ensure reduction in neonatal mortality in implementing clinics by up to 22% in one study, however, another study identified increases in region of 6.5% across catchment areas of P4P incentivized providers (low certainty evidence, Table 14).

The effects of the intervention on outcomes such as unwanted pregnancies are uncertain because the certainty of the evidence is very low (Table 11).

1. 3. Resource use

In relation to resource use (see Table 1 and Appendix 4, Tables 17-18), the intervention seems to predominantly affect indicators positively. P4P probably has a positive effect on human resource availability (range: 19-44%, moderate certainty evidence, Table 17). Effects on curative visits logged per health care professional are uncertain (very low certainty evidence, Table 17). P4P probably affects infrastructure functionality and medicine availability positively (moderate certainty evidence, Table 18).

1. 4. Secondary outcomes

P4P may have neutral or positive effects on secondary outcomes (low certainty evidence, see Table 1 and Appendix 4, Tables 19-23).

P4P probably makes little or no difference to provider absenteeism (range: 0.7-2%, low certainty evidence, Table 19). Effects on overall motivation scores and satisfaction are largely neutral (low certainty evidence, Table 19).

Overarching, P4P may have little to no or positive impacts on measures of patient satisfaction (low certainty evidence, Table 20).

In relation to impacts on financing, limited evidence is available and all is sourced from one study exploring the impacts of a P4P scheme where income may be withheld if targets are not achieved (Table 21). Patient expenditure on medicine and equipment may increase for insured patients (estimate 2.5%), but may decrease for the uninsured (estimate 0.9%), suggesting small positive redistributive effects (low certainty evidence).

P4P may positively affect facility managerial autonomy (low certainty evidence, see Table 22). However, the intervention probably makes little to no difference to management quality or facility governance, using the number of staff meetings held in the last 3 months as a proxy (low certainty evidence).

Effects on indicators focused on assessing care equity are predominantly neutral (see Table 23). P4P may increase the proportion of poor persons utilizing child immunization services (low certainty evidence), however the intervention may potentially decrease the proportion of poor persons utilizing antenatal care (low certainty evidence). P4P may make little to no difference to the utilization of institutional deliveries by poorest groups (low certainty evidence).

Comparison 1b: Effects on untargeted outcomes

Evidence on the effects of P4P on untargeted outcomes is presented in Tables 24-45 in Appendix 4 and also summarized in the Meta-Summary Graphic: Effects of P4P against control (Table 1).

1. 5. Changes in untargeted measures of provider performance

1. 5. 1. Untargeted delivery and utilization

In relation to service utilization (see Table 1 and Appendix 4, Tables 24-30), P4P may improve the rate of HIV testing (low certainty evidence), however probably has no important effect on bed-net use (moderate certainty evidence) (see Table 25). The former

finding is inconsistent with when the same indicator is targeted; in the latter case, P4P had negative effects.

We further note that P4P:

- may make little to no difference to the probability of services being utilized and frequency of visits by elderly populations in particular (low certainty evidence);
- has uncertain effects on the frequency of outpatient consultations overall (low certainty evidence, see Table 25);
- probably makes little or no difference to utilization of modern family planning methods (moderate certainty evidence), but may increase the rate of family planning outreach delivery by up to 10% (low certainty evidence) (see Table 26);
- may have little to no effect on utilization of antenatal care (up to 5%, low certainty evidence), with most other effects on antenatal care being uncertain (see Table 27);
- may have little to no effect on institutional deliveries (low certainty evidence); effects on the delivery of C-sections are uncertain (very low certainty evidence) (see Table 28);
- has overwhelmingly inconsistent effects on postnatal care: P4P may improve the delivery and coverage of postnatal care (low certainty evidence), however probably slightly decreases the overall utilization of such services (moderate certainty evidence) and may have desirable effects on the timeliness of postnatal care utilization (low certainty evidence) (see Table 29).

1. 5. 2. Untargeted quality of care

Overall, estimates presented on quality of care (see Table 1 and Appendix 4, Tables 31-35) indicate P4P may have neutral or uncertain impacts, suggesting that quality of care indicators must be explicitly targeted for outcomes to be achieved (overarching low certainty evidence). Effects on total care quality scores are uncertain in relation to maternity care, outpatient services and medicine and equipment quality, however P4P probably has negative effects on general quality of care scores when such indicators are not explicitly targeted (moderate certainty evidence).

1. 6. Untargeted health outcomes

The effects of P4P on health outcomes are largely consistent with those reported when indicators are targeted (moderate certainty evidence, see Table 1 and Appendix 4, Tables 36-37). Moderate certainty evidence suggests that P4P probably:

- reduces child mortality by up to 1% (moderate certainty evidence, Table 36)
- reduces the proportion of children with anaemia (approximately 5%, moderate certainty evidence, Table 37)
- reduces the proportion of children with wasting (range 5.9-9.25%, moderate certainty evidence, Table 37).

P4P probably has no important effect on the incidence of neonatal mortality or pregnancies recorded (effects under 1%, moderate certainty evidence, Tables 36-37).

1. 7. Unintended effects

P4P may have little to no distorting unintended effects (see Table 1 and Appendix 4, Table 38), with studies suggesting that free riding

and unwanted task shifting were slightly lowered (low certainty evidence).

1. 8. Untargeted resource use

Effects of P4P on non-targeted resource use indicators appear largely uncertain (very low certainty evidence, see [Table 1](#) and [Appendix 4](#), Tables 39-40).

1. 9. Untargeted secondary outcomes

Effects on the majority of secondary untargeted indicators are largely inconsistent (see [Table 1](#) and [Appendix 4](#), Tables 41-45). However, P4P may positively affect patient satisfaction scores on quality of care and provider communication, despite indicators not being directly targeted (low certainty evidence). P4P probably has little to no impact on expenditure related to medicines and equipment (moderate certainty evidence), however impacts on out of pocket payments are inconsistent across service areas ([Table 43](#), low certainty evidence). In relation to impacts on facility governance and equity promoting distributive effects ([Tables 44-45](#)), evidence is overwhelmingly inconsistent (low certainty evidence).

Comparison 2: Effects of P4P against comparator interventions

Overarching trends

The Meta-Summary: Effects of P4P against comparator ([Table 2](#)) and [Summary of findings 2](#) outline the effects of P4P on individual indicators assessed against comparator interventions. Individual Summary of Findings tables by indicator are available in [Appendix 5](#). Comparator interventions predominantly consisted of enhanced financing interventions within which comparator health facilities received funding matched to P4P groups.

Comparison 2a: Effects on targeted outcomes

2. 1. Targeted measures of provider performance

2. 1. 1. Delivery and utilization

In contrast to the findings on the effects of P4P against a pure control, P4P has largely neutral or desirable effects on utilization and delivery indicators (see [Table 2](#) and [Appendix 5](#), Tables 46-51).

P4P may positively affect the probability of persons utilizing care (range: 2 to 10%, low certainty evidence, see [Table 50](#)), however, evidence on immunization utilization is indicative of little to no effect or uncertain ([Table 46](#)).

Evidence on family planning is largely consistent with that presented on the effects of P4P against standard care ([Table 47](#)): P4P may have little to no important effect on the utilization of any family planning services (low certainty evidence).

Effects on the overall rates of antenatal care utilization are indicative of little to no important effect ([Table 48](#)), however, P4P may positively affect the timeliness of ANC care-seeking (range: 1 to 10% women accessing care earlier, low certainty evidence).

Evidence on the effects of P4P on % women utilizing institutional deliveries is uncertain (range between -9% and 23%, low certainty evidence, [Table 49](#)). However, P4P may have negative effects on postnatal care utilization (low certainty evidence, [Table 49](#)).

2. 1. 2. Quality of care

Evidence on the effects of P4P on quality of care indicators is largely positive for specific clinical areas and overall quality (see [Table 2](#) and [Appendix 5](#), Tables 51-54). P4P probably leads to improved quality of care in relation to family planning or antenatal care (moderate certainty evidence, see [Table 53](#)). P4P may also have positive effects on care processes, such as leading to increases in the proportion of staff conducting appropriate patient background and physical assessments during consultations, however effects on quality of counselling during consultations are uncertain (low certainty evidence, see [Table 51](#)). P4P may slightly increase the quality of care of immunizations as well as staff knowledge and skills, however impacts on patient knowledge outcomes are uncertain (low certainty evidence, [Table 52](#)).

2. 2. Health outcomes

Effects on health outcomes are suggestive of little or no impact (see [Table 2](#) and [Appendix 5](#), [Table 54](#)). P4P may have little to no impact on the proportion of breastfeeding among mothers seeking care in P4P implementing facilities versus comparator facilities (low certainty evidence).

2. 3. Resource use

In relation to resource use indicators, the evidence is mixed (see [Table 2](#) and [Appendix 5](#), [Table 55](#), low certainty evidence). While P4P may increase equipment availability by 75%, medicine availability may be reduced by up to 160%. The latter effect is likely due to scheme design, as the Zambia scheme offered supplies as an ancillary component of the intervention but not medication.

2. 4. Secondary outcomes

P4P seems to have mixed effects on secondary outcome indicators (see [Table 2](#) and [Appendix 5](#), Tables 56-58). Similar to the effects of P4P against a pure control, P4P may positively affect facility autonomy (low certainty evidence, [Table 56](#)); however impacts on patient satisfaction and acceptability are uncertain (very low certainty evidence, see [Table 57](#)). P4P may have little to no effect on the equitable utilisation of curative and antenatal care visits (low certainty evidence), however may have negative redistributive effects in relation to institutional delivery utilisation (i.e. utilization appears to increase in least poor groups) and family planning (see [Table 58](#), low certainty effect).

Comparison 2b: Effects on untargeted outcomes

2. 5. Untargeted measures of provider performance

2. 5. 1. Untargeted delivery and utilization

Evidence on the effects of P4P on untargeted utilization is only available for two indicators ([Table 2](#) and [Appendix 5](#), Tables 59-60). For both, the evidence suggests P4P may make little to no difference (low certainty evidence).

2. 5. 2. Quality of care

Effects of P4P on untargeted quality of care appear uncertain due to very low certainty in evidence ([Appendix 5](#), [Table 61](#)).

2. 6. Untargeted health outcomes

In relation to untargeted health outcomes ([Table 2](#) and [Appendix 5](#), [Table 62](#)), P4P may have little to no effect on the proportion of women breastfeeding (low certainty evidence). P4P may positively

affect the incidence of reported illness in children (range -5 to 10.5%, low certainty evidence).

2. 7. Unintended effects

No evidence on distorting unintended effects is available.

2. 8. Untargeted resource use

In relation to both equipment and medicine availability, certainty in evidence is very low and effects are therefore uncertain (Table 2 and Appendix 5, Table 63).

2. 9. Untargeted secondary outcomes

In relation to secondary outcomes (Table 2 and Appendix 5, Tables 64-66), limited evidence is available. Effects of P4P on facility and managerial autonomy are uncertain (very low certainty in evidence, Table 64). P4P may have largely positive effects on patient satisfaction and acceptability even when indicators are not explicitly targeted (low certainty evidence, see Table 65). However, there may be little to no effect on staff motivation or satisfaction when not targeted (low certainty evidence, see Table 66).

Sensitivity analyses

Across Summary of Findings Tables 1-66, we include comments on the range of the intervention's effects on each of the reviewed indicators based on RCT studies only; where relevant, these findings have been GRADEd separately.

For a more complete overview, the Sensitivity Analyses Summary tables (Table 9 and Table 10) illustrate the effects recorded in RCTs. Overall, the certainty of evidence reviewed is assessed as low to moderate. Concerns over the risk of bias in individual studies and the limited availability of studies, with the majority of indicators being reported on in only one study, are the primary reason for downgrading evidence to 'low'.

Table 9 illustrates and comments on effects of P4P against a status quo control. Overall, effects are largely consistent, however some deviations are notable when appraising the effects of P4P against a control (see Table 9) in relation to utilization and quality of care indicators. In particular, effects on specific immunization and quality of care indicators are now more clearly distinguishable (and appear largely positive). However, in relation to antenatal care, the evidence from RCTs seems to indicate that P4P may have negative effects on utilization of such services. Only one study appraised a health outcome indicator, and here we note that P4P may have a very slight effect only. Further, RCT evidence suggests P4P may have only limited (<5%) effects on secondary outcomes such as provider motivation and patient satisfaction.

In relation to the effects of P4P as assessed against comparator interventions (see Table 10), relatively limited evidence was available, the majority of which has been assessed as low certainty. In relation to service utilization and delivery a mixed picture emerges. Evidence suggests effects on immunization are overall inconsistent, effects on utilization overall appear neutral, however effects on institutional delivery and postnatal care utilization seem negative. In relation to quality of care, mixed effects are also notable.

Sub-group analyses

Upon reviewing the Characteristics of Interventions in detail, we further classified the P4P schemes according to the design reported in reviewed documents (see Table 7 and Table 8; Please note that to ensure consistency, we have chosen to classify all studies based on descriptions provided in the reviewed documents). We reviewed findings presented in Tables 1-66 and sought to identify patterns which would explain variation in effect given the P4P scheme classification. The results of this exercise are presented in the Sub-group analyses findings tables (Table 11 and Table 12)

Similar patterns emerged across both the studies assessing the effects of P4P against control as well as those assessing effects against a comparator (Table 11). Performance based contracting and results-based aid appeared to yield the greatest effects upon outcomes overall. However, we note that these scheme designs were used only in a minority of studies, so the effects observed may be spurious.

Payment per output designs were most commonly implemented, however, and clear patterns in relation to the relative effects of such schemes emerged. Overall, schemes adjusting both for quality of service as well as rewarding equitable delivery of that service appeared to perform best, particularly in relation to service utilization outcomes. Similarly, schemes employing payments per output with a quality adjustment, or combining a payment per output and target payment, appeared to outperform the payment per output and target payment designs.

Differential effects by outcome were evident however (see Table 12): health outcome indicators, for example, appeared to respond best to target payment, and payment per output designs where adjustments for quality scoring took place. However, we caution that health outcome indicators were appraised in a minority of reviewed studies, therefore patterns observed here may be due to chance.

DISCUSSION

In recent years, the literature on the theory, effects and implementation of P4P programmes has expanded dramatically. Our search strategies retrieved over 11 thousand results, of which 10% were of potential relevance to this review.

Increasingly, P4P is being framed not as one intervention, but as a class of interventions using a collection of mechanisms (Renmans 2016). Our Intervention Classification illustrates that a wide range of scheme designs are used with the fundamental idea to align the incentives of providers with those of the commissioners of care. However, our typology is necessarily simplified and the details and mechanisms by which results are achieved (or not) will vary. The effects and impacts of P4P likely depend on a range of factors, including how and why schemes are designed, the degree of participation in setting targets, what targets are used, how they are measured, the level of rewards they attract and by the context in which the schemes take place, including the efficiency of implementation systems and underlying factors such as starting levels of pay and funding. For that reason, this review has presented considerable detail on the design and implementation of the P4P schemes, as these factors are key to interpreting results. Considering the intervention Complexity Assessment Tool

for Systematic Reviews (Lewin 2017), P4P scores highly in every domain.

We note that while many details of schemes (e.g. funders, verification processes among others) are consistently reported on, some critical reporting gaps in relation to scheme design exist. For example, only 40% of studies describe the location of care provision and a minority of studies report on scheme costs. Further, explicit theories of change or programme theories detailing how and why schemes are designed, and how they are fit for specific contexts are often not provided. To illustrate this point, it is often unclear how schemes set their targets or choose indicators, including why some schemes would incorporate over 200 quality of care markers for assessment, while others include under 100. Similarly, it is not always clear what aspects of schemes are core mechanisms versus additional features, e.g. it is often unclear whether auditing processes and procedures are designed for verification only, as opposed to wider initiatives intended to strengthen managerial capacity and oversight. Setting of 'prices' of indicators is another area lacking clarity in relation to how these were calculated, and based on what rationale (e.g. to replace user fee revenues, or based on an understanding of facility cost structures, to give just two possible examples).

Summary of main results

This review included 59 studies for which evidence has been assessed to be of low to moderate certainty. Increasingly however, more robust study designs are being used to assess the effects of P4P, including, for example, controlled ITS and cluster-RCTs.

Findings identify some evidence of scheme success as well as evidence on some areas and indicators which appear to be less responsive to P4P. However, findings additionally indicate that the choice of comparator intervention (whether control or a different comparator intervention) and scheme design are critical in interpreting results.

In relation to utilization and service delivery outcomes, we identify inconsistent effects overall. P4P may have differential desirable as well as undesirable effects: e.g. while indicators relating to HIV testing, family planning, and postnatal care appear to be positively impacted, evidence on the effects of P4P on indicators such as ART, antenatal care or immunization utilization is mixed. These findings are surprising as antenatal care and immunization are frequently targeted by P4P schemes, however we note that in the case of the latter indicator, findings may be due to broader circumstances surrounding vaccine availability. Overall, we noted that performance-based contracting, results-based aid and P4P designs including both payment per output and quality and equity adjustments performed best in relation to securing increased service delivery and utilization.

While health outcomes were appraised in a minority of studies, we note interesting effects in relation to these. Whether targeted or not, P4P may have slight positive impacts on health outcomes appraised against a pure control or standard care; however, when compared against other interventions such as enhanced financing, limited to no impacts were identifiable.

P4P probably increases quality of care overall, especially when directly targeted. However, indicators which are clinical-area specific (e.g. quality of ANC consultations) or which are broadly

related to medicine and equipment quality appear to respond best. We have noted limited to uncertain effects on general quality of care indicators such as providers conducting background or physical assessments, or counselling patients.

Further, P4P schemes may have positive impacts overall on the availability (and as relevant functionality) of medicines, equipment and infrastructure and probably have limited to no negative distorting unintended effects.

In relation to secondary outcomes, we have identified surprising results. P4P's effects on provider satisfaction and motivation are overall mixed, however the evidence suggests the intervention may increase managerial autonomy, but have limited effects on quality of management or governance in general. Equity effects are also uncertain: when assessed against a pure control, P4P appears may have largely beneficial redistributive effects, but when assessed against a comparator the evidence appears mixed. We identified little to no effect or uncertain effects on user fees are found, which is disappointing as this is an important intended mechanism of change for P4P schemes.

Sub-group analyses

Sub-group analyses suggest that different scheme designs may be more effective than others in securing effects against assessed outcomes. Among promising scheme designs, we note payment per output with quality and/or equity adjustment, performance based contracting and results-based aid. We caution however that the latter designs were implemented and studied in a small range of contexts, therefore effects observed may be due to contextual differences and drivers rather than scheme design.

We had expected to conduct sub-group analyses by magnitude of incentive (either absolute or relative) and also to attempt to isolate the effects of ancillary components (such as supervision). However, given limited reporting on these characteristics, we were unable to conduct such analyses.

Overall completeness and applicability of evidence

This study is an update of the original review on the effects of P4P in low- and middle-income countries and therefore capitalises on the additional research carried out over the last 7 years. As noted previously, this research area has seen an exponential increase in interest and the evidence base overall has been strengthened.

In comparison to the original review, which included 9 studies, 6 times as many studies have been included in this update (n=59). While the predominant focus of evaluations is still on the schemes from Rwanda, Tanzania and China, a broader range of country settings are represented, including increasingly studies from Latin America. Most studies continue to focus on schemes targeted at strengthening reproductive, maternal and child health services, but increasingly evidence on schemes focused on other areas, such as HIV and TB, is becoming available.

Overall, we note a clear focus on evidence reflecting the effects of P4P implementation in the public sector; only one of the reviewed studies focused on the private sector only. However, we note a more heterogeneous picture emerging in terms of the types of P4P schemes being assessed (although only one eligible study on the effects of results-based aid was located), as well as the study types, comparators and time-frames of assessment. While

these developments are encouraging, and suggestive of a broader interest in P4P effects, both in the short- and long-term and on targeted and not-targeted outcomes, they imply added complexity for the synthesis of evidence and interpretation of effects. Further, both the proliferation and heterogeneity of evidence available makes it difficult to detect publication bias. Given that most studies report on over 10 core outcomes each, from schemes which may target even more indicators (as illustrated in [Josephson 2017](#)), within varying population groups or clinical areas, it is difficult to assess whether reporting is purposefully restricted to positive effects or pragmatically restricted to indicators where data is available and analysable.

During searches we identified health economic evaluations estimating costs of P4P schemes in Tanzania ([Borghi 2015](#)), the Philippines ([Peabody 2017](#)) and Zambia ([Zeng 2018b](#)). Alongside information presented in [Gertler 2014](#), these studies estimate the approximate expenditure per capita of the P4P programme to be 7-10\$US; total costs per program vary widely between approximately 2.6 million \$US(2012) in Tanzania to 20.45 million \$US in Argentina. We note that P4P appears to incur slightly higher costs in implementing facilities compared to those implementing enhanced financing interventions. The increment ranges from 0.57 \$USD extra for consumables to 10% higher expenditure in the PBF groups ([Lagarde 2015](#), [Zeng 2018b](#)). The only two studies ([Borghi 2015](#), [Peabody 2017](#)) providing a comprehensive breakdown of implementation expenditure within the PBF scheme indicate that 22% and 52% of scheme costs were spent on bonus payments in Tanzania and the Philippines respectively. In Tanzania specifically, 37% of costs were spent on data generation, and 28% on management of the scheme, highlighting potentially high health system costs for implementation. [Gertler 2014](#) and [Peabody 2017](#) additionally respectively estimate the cost-utility of programs at 814 \$US (ranging from 442-5086)/DALY averted and 1.58 DALY/\$US spent, further highlighting potentially high variability in cost-utility of schemes.

Similar to other research on the cost-effectiveness of P4P schemes ([Turcotte-Tremblay 2016](#)), we conclude evidence on costs and health economic impacts of P4P schemes to be relatively scarce; this is something that other evaluators and future review updates should carefully consider. Similarly, evidence on health outcomes is also sparse.

Certainty of the evidence

The certainty of reviewed evidence differed by indicator; however, across the majority of indicators, evidence was down-graded due to concerns related to risk of bias, indirectness or imprecision. In relation to risk of bias, we note that the majority of available studies are still of a controlled before and after or quasi-randomized design. Across this body of evidence, lack of randomization and allocation concealment were the primary reasons for downgrading the quality of evidence. However, the increased availability of RCT and ITS designs meant the certainty of evidence could be judged as moderate for a greater number of indicators in comparison to the original 2012 review.

Potential biases in the review process

We identify two biases in the review process. First, given the volume of studies and indicators evaluated, we had to restrict the focus of the review and only report on those indicators

which were comparable and assessed across two or more studies. Comparability of indicators is a subjective judgment, and while two reviewers conducted this process and submitted all materials for review by the wider group, researcher bias may be present. We further note that this will remain a potentially problematic area unless there is harmonization in reported indicators.

Second, we restrict reporting to relative effects and acknowledge a major limitation in being unable to supplement this with information on absolute effects. The majority of reviewed studies restricted their reporting to beta coefficients obtained from clustered regression, accounting for multiple covariates associated with both intervention and population characteristics. Given the clustered nature of the data and lack of reporting on cluster characteristics overall (e.g. coefficients of variation of cluster sizes and intra-cluster correlation coefficients) we could not re-do analyses and instead have opted to use the relative effect measures (as provided by study authors themselves, or re-calculated).

Several other external limitations apply. First, we note substantive lack of harmonization across schemes – e.g. several child immunization indicators were reported on, however utilization rates referred to different age-groups, making synthesis difficult. Second, the assessment of effects on health outcomes is a clear gap area: it is unclear why such outcomes were assessed across a minority of studies, when data should have been more generally available given the wide range of indicators targeted. Third, we were unable to produce a meta-estimate on the effects of P4P against each of the assessed indicators as we judged this uninformative given the aforementioned comparability issues. While similar analyses techniques were used across studies (principally difference in difference analyses), the effect estimates derived from equations adjusting for multiple covariates could not be meaningfully synthesised. Additionally, studies did not consistently report on measures of precision, thus precluding the possibility of comprehensively attempting pooling of estimates.

Fourth, we note two further areas which demand exploration via analyses which account for the inherent complexity of P4P scheme design. One area concerns itself with how P4P may have interacted with other ongoing interventions (e.g. the expansion of health insurance coverage); another relates to accounting for the implementation of ancillary components alongside the main P4P scheme. To adequately assess the impacts of both of these on P4P effects, as well as impact of diverse contexts and scheme designs, complexity science methods may be required. Further, we have restricted this review to evidence collated in quantitative impact evaluations only; qualitative and health economic studies conducted alongside these evaluations would need to be consulted to appropriately investigate variations in scheme design, roll-outs and further implementation as well as explore how schemes have been received by health and allied professionals at different system levels. Last, we note that it was difficult to conduct a comprehensive sub-group analysis given the data volume available and multitude of scheme designs implemented. We urge readers to consider our attempt here cautiously.

Agreements and disagreements with other studies or reviews

Several findings are of particular interest when compared with the original 2012 review on this topic (New Reference) and to other available evidence on the effects of P4P. First, in relation to the

original 2012 review, we note that available evidence has multiplied and also somewhat improved in quality.

Our findings differ across several of the outcomes assessed. In the original review, evidence on quality of care was mixed, however we currently assess that P4P may have positive impacts on this outcome. This is particularly interesting as the general debate in the P4P community has focused on how to shift from volume to effective quality measures (Josephson 2017). A priori, we would therefore have expected the opposite patterns from the findings of this review, with utilisation indicators responding more than quality ones. While the quality of care indicators assessed were numerous and diverse (Josephson 2017), and included both structural and process quality measures, we generally noted findings similar to those of Das, Gopalan and Chandramohan in their 2016 review on the topic (Das 2016).

Our findings suggest that P4P may have positive effects on health outcomes (relative to pure controls, if not matched comparators) and also on some utilization indicators, such as those related to modern family planning (Blacklock 2016) and postnatal care, which were previously noted to be unresponsive. In relation to the effects of P4P on the more commonly targeted utilization outcomes such as antenatal care and institutional deliveries, our findings are largely consistent with the 2012 review.

In relation to motivation and satisfaction, we note findings similar to those of Dale 2014. However, we acknowledge particular methodological challenges surrounding the appraisal of this evidence: certainty in our findings may be compromised by indirectness in particular. As Dale (2014) points out, motivation is often assessed and measured using different scales. Indeed, in our review, we have attempted to synthesise information across a range of different outcomes and measurement.

AUTHORS' CONCLUSIONS

Implications for practice

The evidence around P4P has grown considerably since the last review (Witter 2012), with researchers and practitioners gradually focused on unpacking the wider health system effects and impacts of P4P schemes. Study quality has gradually improved, with more RCT designs being used, however the overarching evidence base to date is still dominated by CBAs. This, alongside the heterogeneity of schemes implemented and reviewed here, makes any conclusions and implications tentative.

Overall, this review suggests that in comparison to a status quo control P4P may have some positive effects on service utilization and delivery, for example in relation to family planning; however, impacts on other service areas (e.g. antenatal care, immunization, institutional delivery) may be difficult to secure. P4P may also have positive effects on health outcomes when compared to a status quo control, however limited evidence on health outcomes is available from comparisons of P4P against other interventions such as matched financing. We further note that technical inputs (e.g. infrastructure functionality, equipment and medicine availability) may be positively affected by the introduction of P4P schemes; facility autonomy may be fostered as well, although effects on procedural care and governance are uncertain.

Few studies focused on assessing P4P impacts against a comparator intervention, however our findings to date tentatively suggest that some indicators react to the influx of funding itself and not the performance-related conditionality of payment. Sub-group analyses additionally suggest that specific scheme designs may perform better at achieving targeted outcomes. For example, target payments were noted to outperform other scheme designs in relation to health outcomes in particular (e.g. payments being conditional on tuberculosis success rates), whereas utilization and delivery outcomes seemed to increase most in schemes adjusting for both service quality and equity.

Implications for research

As noted above, we acknowledge the exponential growth in studies focused on assessing and exploring the impacts of P4P schemes since the publication of the last review (Witter 2012). Conclusions presented here are limited as we have focused on quantitative impact evaluations only, however these are presented as complementary to the work of other groups focused, for example, on conducting realist syntheses of P4P schemes (Borghi 2018).

The evidence base has expanded to consider a greater range of P4P scheme designs and modalities, covering diverse scales of magnitude, levels of implementation within the health system, types of services and providers, comparator groups as well as contexts. Increasingly, cluster RCTs are used to assess the effects of P4P schemes: this is a welcome development; however, we caution that such studies must be complemented by thorough theory-based evaluations so as to understand how the schemes were designed (and by whom) and their ex ante theory of change, compared with the mechanisms which were triggered ex post. It is also important to document the interaction of P4P with the wider health system (Witter 2013) how it affects components such as supervision, referrals and health information systems, and is affected by them in turn.

Multi-arm or stepped wedge RCT designs, as well as controlled ITS, may be needed to additionally unpack the effects of diverse P4P implementation pathways or alternative scheme designs going forward. This implies a shift in focus from research assessing whether P4P may or may not work, to research focused on both establishing P4P effects and identifying, understanding and unpacking the contextualized pathways to scheme impact, using dynamic approaches.

Longer-time frames of inquiry and diverse and alternative comparator groups would also be of particular interest. The evidence base on impacts of P4P is still dominated by studies assessing impacts after approximately 3 years, however little is known on how schemes change once they are embedded in systems, how they are affected by their coherence (or lack of it) with wider health financing policies, and on whether they are sustainable and maintain impacts long term.

Few studies to date explored the equity effects of schemes and heterogeneity of P4P results for different provider types, areas and populations sub-groups; when this was done, studies noted challenges in relation to study design and power as restricting their conclusions (e.g. as in Binyaruka 2018).

Further, few studies to date purposefully assessed effects against a realistic enhanced financing comparator (such as direct facility financing embedded in routine planning and reporting systems) or demand-side interventions; given the drive to expand universal health coverage, these types of studies – when robustly designed and allowing for the isolation of P4P effects – are greatly needed.

Another important area for future research is that of the cost-effectiveness of P4P schemes. We have identified a small number of studies focused on this, which we have not been able to review, however a comprehensive search for such evidence will be warranted in future. Similarly, the sustainability of schemes, as well as cost and budgetary implications, remains an under-researched topic.

To fully explore the impacts of P4P schemes, evaluations should continue to adopt rigorous research designs and take a broad perspective in considering wider intended or unintended system effects; the focus for research going forward should be on identifying for whom, under what conditions, via what mechanism,

at what cost and compared to what other interventions, does P4P work?

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CHARACTERISTICS OF STUDIES

Characteristics of included studies [ordered by study ID]

Basinga 2011

Study characteristics

Methods

Participants

Interventions

Outcomes

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Randomization compromised
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Blinded assessments
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	

Basinga 2011 (Continued)

Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Bernal 2018

Study characteristics

Methods
Participants
Interventions
Outcomes
Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Low risk	Bernal 2018 Section 6 outlines sensitivity analyses and details quality checks on data
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	Reforms were taking place at the same time
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences

Bernal 2018 (Continued)

Matched characteristics for control study sites	High risk	Bernal 2018 Table 2 and page 9 highlight the differences between results based aid provinces and those with national funding
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Binyaruka 2015

Study characteristics

Methods
Participants
Interventions
Outcomes
Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	High risk	Authors note that this may have biased results
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Low except for: ANC visits and IPT during ANC, outpatient visits per month under/over 5, patient assessments of staff kindness, probability of payment for delivery care, satisfaction with interpersonal care
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Binyaruka 2017

Study characteristics

Methods

Participants

Interventions

Outcomes

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Low except for: availability and stockouts of medicines and medical supplies
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Binyaruka 2018

Study characteristics

Methods

Participants

Binyaruka 2018 (Continued)

Interventions

Outcomes

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	High risk	Authors note that this may have biased results
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Low except for: ANC visits and IPT during ANC, outpatient visits per month under/over 5, patient assessments of staff kindness, probability of payment for delivery care, satisfaction with interpersonal care
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Bonfrer 2014a

Study characteristics

Methods

Participants

Interventions

Outcomes

Notes

Bonfrer 2014a (Continued)

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	Authors recognize they only assess impacts of 6 out of 23 targeted services
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	High risk	Bonfrer 2014a Appendix Table 6 suggests differences exist between the different districts, e.g. population characteristics (poverty) varies between 28.7% and 82.3%
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Bonfrer 2014b

Study characteristics

Methods
Participants
Interventions
Outcomes
Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance

Bonfrer 2014b (Continued)

Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Low risk	Blinded assessments
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	Authors recognize they only assess impacts of 6 out of 23 targeted services
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Brock 2018

Study characteristics

Methods
Participants
Interventions
Outcomes
Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Sequence described in enough detail
Allocation concealment (selection bias)	Low risk	Assignment by health care professional, done post baseline assessment
Blinding (performance bias and detection bias) All outcomes	Low risk	Blinded assessments

Brock 2018 (Continued)

Incomplete outcome data (attrition bias) All outcomes	Low risk	Drop-out pre-assignment 12%, but post only 3%
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	The initial design was changed given few clinicians saw sufficiently high number of patients to be of relevance. Initial provider pool convenience sample
Baseline outcome measurement All outcomes	Low risk	Comparable
Matched characteristics for control study sites	High risk	Brock 2018 Tables 2 and 3 suggest some differences between providers and patients
Protection against contamination (intervention and controls)	Low risk	Assignment by health care professional

Celhay 2015

Study characteristics

Methods
Participants
Interventions
Outcomes
Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Sequence described in enough detail
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	Low risk	Authors use routine data and perform robustness analyses
Selective reporting (reporting bias)	Low risk	

Celhay 2015 (Continued)

Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Comparable
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Chang 2017

Study characteristics

Methods
Participants
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Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	Three PBF schemes were implemented, only one assessed
Intervention independent (ITS)?	High risk	Other interventions concurrent (including further PBF + introduction of database)
Shape of effect pre-specified (ITS)?	Low risk	Specified as per guidance
Unlikely to affect data collection (ITS)?	High risk	Intervention introduced alongside an HMIS intervention
Incomplete outcome data addressed (ITS)?	Unclear risk	Not specified

Chansa 2015

Study characteristics

Methods

Participants

Interventions

Outcomes

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely allocation affects data collection
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Intervention independent (ITS)?	Unclear risk	Not specified
Shape of effect pre-specified (ITS)?	Low risk	Specified as per guidance
Unlikely to affect data collection (ITS)?	High risk	Intervention introduced alongside audits
Incomplete outcome data addressed (ITS)?	Low risk	HMIS data

Cruzado de la Vega 2017

Study characteristics

Methods

Participants

Interventions

Outcomes

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
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Cruzado de la Vega 2017 *(Continued)*

Random sequence generation (selection bias)	High risk	No randomization
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Das 2017
Study characteristics

Methods
Participants
Interventions
Outcomes
Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance

Das 2017 (Continued)

Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not specified
Incomplete outcome data (attrition bias) All outcomes	High risk	Sub-set analyses with particularly small samples
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

de Walque 2015

Study characteristics

Methods
Participants
Interventions
Outcomes
Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Randomization compromised
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Blinded assessments
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified

de Walque 2015 (Continued)

Selective reporting (re-reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

de Walque 2017
Study characteristics

Methods
Participants
Interventions
Outcomes
Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Sequence described in enough detail
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not specified
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (re-reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement	Low risk	Analyses methods adjust for differences

de Walque 2017 (Continued)

All outcomes

Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Duysburgh 2016
Study characteristics

Methods
Participants
Interventions
Outcomes
Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Low risk	Indicators assessed objectively by trained health workers not working in assessed facilities
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	This was re-analysed because initial analyses were inappropriate. And did not account for baseline differences
Baseline outcome measurement All outcomes	Unclear risk	Paper re-analysed; re-analysed results noted as low (analyses methods adjust for differences)
Matched characteristics for control study sites	High risk	Duysburgh 2016 Appendix Table S1 suggests differences between intervention and control sites but unclear what effect this would have on outcomes

Duysburgh 2016 (Continued)

Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster
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Engineer 2016

Study characteristics

Methods

Participants

Interventions

Outcomes

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Sequence described in enough detail
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Blinded assessments
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Falisse 2015

Study characteristics

Methods

Participants

Interventions

Outcomes

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Low risk	Blinded assessments
Incomplete outcome data (attrition bias) All outcomes	Low risk	Authors note outcomes to focus on chosen based on completeness and sensitivity analyses conducted
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	Authors chose which indicators to report on based on data availability
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	High risk	Data not presented
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Friedman 2016a

Study characteristics

Methods

Participants

Interventions

Friedman 2016a (Continued)

Outcomes

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Sequence described in enough detail
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	High risk	Authors note that high data collection costs meant that population based data was only included in 18/30 study districts
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	High risk	Not specified
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Friedman 2016b
Study characteristics

Methods

Participants

Interventions

Outcomes

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
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Friedman 2016b (Continued)

Random sequence generation (selection bias)	High risk	No randomization, though stratification and matching
Allocation concealment (selection bias)	High risk	Allocation was done by MoH via matching
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified (authors note that for household expenditure data there was high missingness)
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable. (Friedman 2016b Appendix 3 tests parallel trends, though baseline characteristics are dissimilar at times)
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Gertler 2012
Study characteristics

Methods
Participants
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Outcomes
Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Randomization compromised
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster

Gertler 2012 (Continued)

Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	Low risk	Authors note similar levels of attrition
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Gertler 2014
Study characteristics

Methods
Participants
Interventions
Outcomes
Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Low risk	Indicators assessed objectively
Incomplete outcome data (attrition bias) All outcomes	Low risk	Paper mentions missingness of 3%, similar across groups. Complete case analyses are conducted which may compromise results but no reporting of missingness by outcome

Gertler 2014 (Continued)

Selective reporting (re-reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Low except high for neonatal mortality (noted imbalance only for this outcome).
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Huillery 2017
Study characteristics

Methods
Participants
Interventions
Outcomes
Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Sequence described in enough detail
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (re-reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement	Low risk	Comparable (see Huillery 2017 Appendix)

Huillery 2017 (Continued)

All outcomes

Matched characteristics for control study sites	Low risk	Comparable (see Huillery 2017 Appendix)
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Ir 2015

Study characteristics

Methods
Participants
Interventions
Outcomes
Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Health workers themselves appear to be reporting
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Intervention independent (ITS)?	High risk	Multiple PBF reforms introduced alongside voucher schemes, changes to health service delivery (more trained professionals) also occurred
Shape of effect pre-specified (ITS)?	High risk	As per guidance, effect shape not specified
Unlikely to affect data collection (ITS)?	Unclear risk	Intervention may have affected data collected as same source was used for payments and for outcome assessment.
Incomplete outcome data addressed (ITS)?	Unclear risk	Not specified

Khim 2018

Study characteristics

Methods

Khim 2018 (Continued)

Participants

Interventions

Outcomes

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Blinking (performance bias and detection bias) All outcomes	Low risk	Unlikely allocation affects data collection
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	Several other schemes were implemented at the same time and high variability in implementation of this scheme noted
Intervention independent (ITS)?	Unclear risk	Not specified
Shape of effect pre-specified (ITS)?	Low risk	Specified as per guidance
Unlikely to affect data collection (ITS)?	Unclear risk	Intervention may have affected data collection
Incomplete outcome data addressed (ITS)?	Unclear risk	Not specified

Kliner 2015

Study characteristics

Methods

Participants

Interventions

Outcomes

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	No randomization

Kliner 2015 (Continued)

Allocation concealment (selection bias)	High risk	Allocation was pragmatic
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	We are unclear if this is a CBA or a quasi-non randomized trial (the authors themselves describe both as randomized and then as 'randomization not possible') + this is not going to be generalizable, given it was in one main hospital population
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	High risk	Kliner 2015 Table 2 suggests differences in populations and outcomes exist
Protection against contamination (intervention and controls)	High risk	Allocation was pragmatic and unclear how patients moving would have been dealt with

Lagarde 2015
Study characteristics

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Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not specified
Allocation concealment (selection bias)	Unclear risk	Not specified

Lagarde 2015 (Continued)

Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not specified
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	Authors specify ceiling effects for some outcomes
Baseline outcome measurement All outcomes	High risk	Analyses methods do not adjust for baseline differences in outcomes, but do adjust for facility and health worker differences
Matched characteristics for control study sites	High risk	Lagarde 2015 Appendix Table 6 suggests differences exist between the different districts, e.g. population characteristics (poverty) varies between 28.7% and 82.3%.
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Lannes 2015
Study characteristics

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Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Randomization compromised
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Blinded assessments
Incomplete outcome data (attrition bias)	Unclear risk	Not specified, using data from Basinga 2011

Lannes 2015 (Continued)

All outcomes

Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Unclear risk	Not specified
Matched characteristics for control study sites	High risk	Not specified
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Lannes 2016
Study characteristics

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Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Randomization compromised
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Blinded assessments
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	

Lannes 2016 (Continued)

Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Liu 2005
Study characteristics

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Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Blinding (performance bias and detection bias) All outcomes	Low risk	Blinded and random assessments
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Intervention independent (ITS)?	High risk	Other changes in the country likely to affect trends
Shape of effect pre-specified (ITS)?	Low risk	Specified as per guidance
Unlikely to affect data collection (ITS)?	Low risk	No effects on data collection
Incomplete outcome data addressed (ITS)?	Low risk	Panel dataset

Matsuoka 2014

Study characteristics

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Outcomes

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	Note: data re-analysed
Intervention independent (ITS)?	Unclear risk	Not specified
Shape of effect pre-specified (ITS)?	Low risk	Specified as per guidance
Unlikely to affect data collection (ITS)?	Unclear risk	Intervention may have affected data collection
Incomplete outcome data addressed (ITS)?	Unclear risk	Not specified

Mayumana 2017

Study characteristics

Methods

Participants

Interventions

Outcomes

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
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Mayumana 2017 (Continued)

Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not specified
Incomplete outcome data (attrition bias) All outcomes	High risk	Authors note that this may have biased results
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Low except for: medical supply stockouts, disruptions due to broken equipment, governance outcomes (committee meetings, content of supervision, existence of community health fund)
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

McMahon 2016

Study characteristics

Methods
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Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	

McMahon 2016 (Continued)

Other bias	Low risk	
Intervention independent (ITS)?	Unclear risk	Not specified
Shape of effect pre-specified (ITS)?	Low risk	Specified as per guidance
Unlikely to affect data collection (ITS)?	High risk	Intervention directly targets improvements in data
Incomplete outcome data addressed (ITS)?	High risk	Several indicators excluded due to missingness

Menya 2015

Study characteristics

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Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Sequence described in enough detail
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	One facility excluded due to discontinuation (no laboratory technician available)
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Unclear risk	Not specified

Menya 2015 (Continued)

Matched characteristics for control study sites	High risk	Menya 2015 Table 2 suggestive of differences between facilities and coverage
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Mohanan 2017
Study characteristics

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Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Sequence described in enough detail
Allocation concealment (selection bias)	Low risk	Assignment by health care professional
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Unclear risk	Not specified
Matched characteristics for control study sites	Low risk	Comparable (see Mohanan 2017 Appendix)
Protection against contamination (intervention and controls)	Unclear risk	Contamination could have occurred

Peabody 2011

Study characteristics

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Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Sequence described in enough detail
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Blinded assessments
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	High risk	Peabody 2011 Table 1 suggests differences in providers
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Peabody 2014

Study characteristics

Methods

Participants

Peabody 2014 (Continued)

Interventions

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Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Sequence described in enough detail
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	Outcome specified as 'not wasting' affected by seasonal variations
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Powell-Jackson 2014

Study characteristics

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Risk of bias

Powell-Jackson 2014 (Continued)

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	No randomization, though matching occurred
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not specified
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	1 year into scheme so early impacts
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Priedeman Skiles 2013

Study characteristics		
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Participants		
Interventions		
Outcomes		
Notes		
Risk of bias		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Randomization compromised
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster

Priedeman Skiles 2013 (Continued)

Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	Rollout of community based health insure may be affecting equity outcomes in particular
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Priedeman Skiles 2015
Study characteristics

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Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Randomization compromised
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias)	Unclear risk	Not specified

Priedeman Skiles 2015 (Continued)

All outcomes

Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	Assessment time may be too short, seasonal variations also relevant
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Quimbo 2016
Study characteristics

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Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Sequence described in enough detail
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Blinded assessments
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	

Quimbo 2016 (Continued)

Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Rudasingwa 2014
Study characteristics

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Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not specified
Incomplete outcome data (attrition bias) All outcomes	Low risk	Authors note outcomes to focus on chosen based on completeness
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	Authors note small facility sample size, resulting in "a higher probability of Type II error" (p25). Authors have not considered that results may be influenced by the removal of user fees from certain services at a similar time to when the PBF programme was introduced. Potential conflict of interest: funding for data collection by Cordaid, one of the implementing agents of the PBF scheme.
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences

Rudasingwa 2014 (Continued)

Matched characteristics for control study sites	High risk	Data not presented
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Rusa 2009
Study characteristics

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Risk of bias

Bias	Authors' judgement	Support for judgement
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Intervention independent (ITS)?	High risk	Other changes in the country (user fee removal) likely to affect trends
Shape of effect pre-specified (ITS)?	Low risk	Specified as per guidance
Unlikely to affect data collection (ITS)?	Unclear risk	Intervention may have affected data collection
Incomplete outcome data addressed (ITS)?	Unclear risk	Not specified

Shapira 2017
Study characteristics

Methods

Shapira 2017 (Continued)

Participants

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Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Sequence described in enough detail
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	High risk	Outcomes are partly self-assessed
Incomplete outcome data (attrition bias) All outcomes	Low risk	Unbalanced attrition addressed
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Comparable, except for institutional deliveries and number of pregnancies
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Shen 2017

Study characteristics

Methods

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Interventions

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Notes

Shen 2017 (Continued)

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Sequence described in enough detail
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	High risk	Outcomes are self-scored
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	High risk	Shen 2017 Table 2 suggestive of differences between facilities and health worker characteristics
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Sherry 2017

Study characteristics

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Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Randomization compromised

Sherry 2017 (Continued)

Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	Rollout of national immunization campaigns, increased HIV funding coincides with study periods and may affect results
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Soeters 2011
Study characteristics

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Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Low risk	Low except concerns relating to patient reported outcomes

Soeters 2011 (Continued)

Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	High risk	Not specified
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Steenland 2017
Study characteristics

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Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Low risk	HMIS
Incomplete outcome data (attrition bias) All outcomes	Low risk	See Steenland 2017 Appendix Table 4
Selective reporting (reporting bias)	Low risk	

Steenland 2017 (Continued)

Other bias	Unclear risk	Author raises concerns that PBF may have incentivized additional reporting, therefore data is more available in intervention districts. Potential conflict of interest: funding for data collection by Cordaid, one of the implementing agents of the PBF scheme
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	High risk	Steenland 2017 Table 1 suggests differences between comparison and intervention exist - e.g. number of health facilities/100,000 people consistently higher in intervention than in comparator
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Sun 2016
Study characteristics

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Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	Randomization compromised
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	Authors themselves note political interference in process

Sun 2016 (Continued)

Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Van de Poel 2016

Study characteristics

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Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Low risk	Indicators assessed objectively
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	Multiple PBF schemes that overlap and potentially introduced alongside budget increases
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable

Van de Poel 2016 (Continued)

Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster
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Viñuela 2015

Study characteristics

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Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Blinking (performance bias and detection bias) All outcomes	Low risk	Unlikely allocation affects data collection
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	Data is aggregated at high level - this may impact analyses and findings
Intervention independent (ITS)?	Unclear risk	Other reforms were happening in the education and justice sectors which could contribute as well
Shape of effect pre-specified (ITS)?	Low risk	Specified as per guidance
Unlikely to affect data collection (ITS)?	Unclear risk	Intervention may have affected data collection
Incomplete outcome data addressed (ITS)?	Unclear risk	Not specified

Wagner 2018

Study characteristics

Methods

Participants

Interventions

Wagner 2018 (Continued)

Outcomes

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Sequence described in enough detail
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	Low risk	2% of sample missing only
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Witvorapong 2016
Study characteristics

Methods

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Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
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Witvorapong 2016 (Continued)

Random sequence generation (selection bias)	Low risk	Sequence described in enough detail
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	High risk	408 of 7131 observations excluded due to missing data
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	Potential selection bias and additionally unclear if authors had access to baseline data
Baseline outcome measurement All outcomes	Unclear risk	Baseline measurement not specified
Matched characteristics for control study sites	High risk	Characteristics not specified
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Wu 2014
Study characteristics

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Risk of bias

Bias	Authors' judgement	Support for judgement
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely allocation affects data collection
Selective reporting (reporting bias)	Low risk	

Wu 2014 (Continued)

Other bias	Unclear risk	Not generalizable, study conducted in one setting
Intervention independent (ITS)?	Unclear risk	Other reforms happening but robustness checks performed to ascertain impacts and effects are consistent
Shape of effect pre-specified (ITS)?	Low risk	Specified as per guidance
Unlikely to affect data collection (ITS)?	Low risk	No effects on data collection
Incomplete outcome data addressed (ITS)?	Unclear risk	Not specified

Yao 2008
Study characteristics

Methods

Participants

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Outcomes

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Low risk	Blinded assessments
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	(Re-analysis cannot be adjusted for the GDP/country make-up)
Baseline outcome measurement All outcomes	Unclear risk	Paper re-analysed; re-analysed results noted as low (analyses methods adjust for differences)

Yao 2008 (Continued)

Matched characteristics for control study sites	High risk	Yao 2008 Table 1 suggests the intervention is done in areas that are more populated and poorer compared to control
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Yip 2014
Study characteristics

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Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Sequence described in enough detail
Allocation concealment (selection bias)	Low risk	Assignment by province/district/cluster
Blinding (performance bias and detection bias) All outcomes	Low risk	Unlikely outcome assessment affected by allocation knowledge
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Constrained matched randomization
Matched characteristics for control study sites	Low risk	Comparable (see Yip 2014 Appendix)
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Zang 2015

Study characteristics

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Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not specified
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	(Note: we classify this as CBA, however could be non-randomized trial, but no allocation mentioned)
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	Low risk	Comparable
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Zeng 2013

Study characteristics

Methods

Zeng 2013 (Continued)

Participants

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Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Low risk	Indicators assessed objectively
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Unclear risk	NGO facilities may not be a suitable comparator to public facilities
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	High risk	Data not presented
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Zeng 2018a

Study characteristics

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Participants

Interventions

Outcomes

Notes

Zeng 2018a (Continued)

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	As per guidance
Allocation concealment (selection bias)	High risk	As per guidance
Blinding (performance bias and detection bias) All outcomes	Low risk	Low except concerns relating to patient satisfaction and quality reported outcomes
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not specified
Selective reporting (reporting bias)	Low risk	
Other bias	Low risk	
Baseline outcome measurement All outcomes	Low risk	Analyses methods adjust for differences
Matched characteristics for control study sites	High risk	Zeng 2018a Table 3 suggests significant differences, e.g. in household size, daily spending and age of mother
Protection against contamination (intervention and controls)	Low risk	Assignment by province/district/cluster

Characteristics of excluded studies [ordered by study ID]

Study	Reason for exclusion
Aninanya 2016	Study does not include major outcomes of interest
Anselmi 2017	Study complementary to, or superseded by, other included study.
Aung 2015	Study does not include major outcomes of interest
Banerjee 2008	Study intervention does not cover relevant payments
Basinga 2010	Study complementary to, or superseded by, other included study
Biai 2012	Study focussed only on payments which are not explicitly linked to changing patterns of performance
Borghi 2015	Study is complementary to included evaluations, excluded based on study type
Canavan 2008	Study design is not CBA/RCT/ITS

Study	Reason for exclusion
Department for International Development 2017	Study a CBA but choice of control not appropriate
Kumar 2016	Study a CBA but choice of control not appropriate
Liu 2003	Full text not available
Morisky 1985	Study a CBA but only 1 cluster/site in each comparison group
Ngo 2017	Study complementary to, or superseded by, other included study
Nguyen 2015	Study does not include major outcomes of interest
Not reported 1962	Study does not include relevant health care providers
Olken 2012	Study does not include relevant health care providers
Peabody 2010	Study superseded by already included study.
Peabody 2017	Study is complementary to included evaluations, excluded based on study type
Phillips 1975	Study does not include relevant health care providers
Prakarsh 2017	Study does not include relevant health care providers
Quy 2003	Study is an ITS but more time points for assessment needed
Rahman 2017	Study focussed only on payments which are not explicitly linked to changing patterns of performance
RBF Health 2017	Study does not include relevant health care providers
Rusa 2009b	Study complementary to, or superseded by, other included study
Shen 2015	Study complementary to, or superseded by, other included study
Singh 2015	Study does not include relevant health care providers
Soeters 2005	Study design CBA but insufficient clusters.
Soeters 2008	Study design CBA but insufficient clusters.
Soeters 2009	Study is CBA but has insufficient clusters.
Sylvia 2015	Study does not include relevant health care providers
Valadez 2015	Study a CBA but choice of control not appropriate
Vergeer 2008	Study superseded by other included study.
World Bank 2015	Insufficient information available to determine inclusion
Zeng 2018b	Study is complementary to included evaluations, excluded based on study type
Zhang 2017	Study an ITS but not have ≥ 3 data points before or after the intervention

Study	Reason for exclusion
Zhao 2013	Study a CBA but only 1 cluster/site in each comparison group

ADDITIONAL TABLES

Table 1. Meta-summary: Effects of P4P against control

Out- come	Indicator	Direction of relative effect and GRADE as- sessment for targeted and un-targeted out- comes			
		Targeted outcomes		Un-targeted out- comes	
		Direc- tion of effect	Certain- ty of the evi- dence	Direc- tion of effect	Certain- ty of the evi- dence
Primary: Utili- zation and de- livery	Provision of HIV testing (%)	▲	⊕⊕⊕⊕	▲	⊕⊕⊕⊕
	Provision of ART services (%)	▼	⊕⊕⊕⊕	No evidence	
	Provision of PMTCT (%)	▲	⊕⊕⊕⊕	No evidence	
	Bednet use (% of children and households using bednets)	▼	⊕⊕⊕⊕	—	⊕⊕⊕⊕
	TB adherence rate	□	⊕⊕⊕⊕	No evidence	
	Child immunization: % at least one vaccine	—	⊕⊕⊕⊕	No evidence	
	Child immunization: % fully vaccinate	□	⊕⊕⊕⊕	No evidence	
	Child immunization: % receiving BCG	▲	⊕⊕⊕⊕	No evidence	
	Child immunization: % receiving DTP	▼	⊕⊕⊕⊕	No evidence	
	Child immunization: % receiving measles vaccine	▲	⊕⊕⊕⊕	No evidence	
	Child immunization: % receiving polio vaccine	▲	⊕⊕⊕⊕	No evidence	
	Child immunization: % receiving pentavalent vaccine	—	⊕⊕⊕⊕	No evidence	
	Mothers receiving immunizations (%)	▲	⊕⊕⊕⊕	No evidence	
	Probability of any utilization (%)	—	⊕⊕⊕⊕	—	⊕⊕⊕⊕
	Frequency of curative utilization (%)	▲	⊕⊕⊕⊕	□	⊕⊕⊕⊕
	Frequency of outpatient utilization (%)	▲	⊕⊕⊕⊕	—	⊕⊕⊕⊕
	Frequency - all visits (number of visits)	—	⊕⊕⊕⊕	—	⊕⊕⊕⊕

Table 1. Meta-summary: Effects of P4P against control (Continued)

Frequency - elderly visits	No evidence	■	⊕⊕⊕⊕		
Antenatal care (% of women utilizing ANC)	▲	⊕⊕⊕⊕	■	⊕⊕⊕⊕	
Total number ANC visits	□	⊕⊕⊕⊕	No evidence		
At least one ANC (utilization rates)	▲	⊕⊕⊕⊕	□	⊕⊕⊕⊕	
At least two ANC (utilization rates)	■	⊕⊕⊕⊕	□	⊕⊕⊕⊕	
At least four ANC (utilization rates)	▲	⊕⊕⊕⊕	□	⊕⊕⊕⊕	
ANC from qualified provider (utilization rate)	■	⊕⊕⊕⊕	No evidence		
Delivery of iron supplementation during ANC (% women receiving)	▼	⊕⊕⊕⊕	No evidence		
Women accessing ANC in first trimester (% women receiving)	▲	⊕⊕⊕⊕	▲	⊕⊕⊕⊕	
Family planning (% using of any method)	□	⊕⊕⊕⊕	No evidence		
Family planning (% women utilizing modern methods)	□	⊕⊕⊕⊕	■	⊕⊕⊕⊕	
Family planning (% of services delivered)	▲	⊕⊕⊕⊕	▲	⊕⊕⊕⊕	
Institutional delivery (rates or coverage)	□	⊕⊕⊕⊕	■	⊕⊕⊕⊕	
Institutional delivery: C section (%)	▲	⊕⊕⊕⊕	□	⊕⊕⊕⊕	
Institutional delivery: skilled attendance	▲	⊕⊕⊕⊕	No evidence		
Delivery and coverage of postnatal care	▲	⊕⊕⊕⊕	▲	⊕⊕⊕⊕	
Postnatal care (overall utilization rate)	▲	⊕⊕⊕⊕	▼	⊕⊕⊕⊕	
Postnatal care: skilled attendance (% women receiving)	▲	⊕⊕⊕⊕	No evidence		
Postnatal care: timely access (%women receiving)	▲	⊕⊕⊕⊕	▲	⊕⊕⊕⊕	
Utilization rate of consultations in children	▲	⊕⊕⊕⊕	□	⊕⊕⊕⊕	
Utilization rate of curative consultations in children	▼	⊕⊕⊕⊕	No evidence		
Vitamin A supplementation in children (rate)	▲	⊕⊕⊕⊕	No evidence		
Primary: Health outcomes	Child mortality (per 1000 children born alive)	▲	⊕⊕⊕⊕	▲	⊕⊕⊕⊕
	Neonatal mortality (rate)	□	⊕⊕⊕⊕	■	⊕⊕⊕⊕
	Incidence of sickness	No evidence	▲	⊕⊕⊕⊕	
	Child wasting (%)	No evidence	▲	⊕⊕⊕⊕	
	Unwanted pregnancy rate (targeted); overall pregnancy rate(non-targeted)	□	⊕⊕⊕⊕	■	⊕⊕⊕⊕

Table 1. Meta-summary: Effects of P4P against control (Continued)

	Reported illness in children: anemia (%)	▲	⊕⊕⊕⊕	▲	⊕⊕⊕⊕
	Tuberculosis treatment success rate	▲	⊕⊕⊕⊕	No evidence	
Primary: Quality of care	Background and physical assessment (scores general, across ANC, PNC, child care and for other consultations).	□	⊕⊕⊕⊕	No evidence	
	Correct patient management by health care providers (scores in relation to ANC, child care and PNC)	□	⊕⊕⊕⊕	—	⊕⊕⊕⊕
	Patient counselling (scores on ANC and PNC related counselling)	□	⊕⊕⊕⊕	No evidence	
	Immunizations (score for receiving any tetanus and nr. Of tetanus vaccinations)	▲	⊕⊕⊕⊕	▲	⊕⊕⊕⊕
	Women in ANC given or prescribed folic acid/iron	▲	⊕⊕⊕⊕	No evidence	
	Prescription quality of care (index score when targeted, %women receiving correct prescription in case of illness for non-targeted)	▲	⊕⊕⊕⊕	No evidence	
	Staff knowledge and skills (scores)	—	⊕⊕⊕⊕	—	⊕⊕⊕⊕
	Staff responsiveness (scores)	▲	⊕⊕⊕⊕	No evidence	
	Patient knowledge (score)	▲	⊕⊕⊕⊕	—	⊕⊕⊕⊕
	Contact time (% change)	—	⊕⊕⊕⊕	—	⊕⊕⊕⊕
	Waiting time (% change)	▼	⊕⊕⊕⊕	□	⊕⊕⊕⊕
	Length of stay (% change)	No evidence		▼	⊕⊕⊕⊕
	Overall composite quality of care score	▲	⊕⊕⊕⊕	▼	⊕⊕⊕⊕
	Quality family planning (score)	▲	⊕⊕⊕⊕	No evidence	
	Quality of ANC (score)	□	⊕⊕⊕⊕	No evidence	
	Quality maternity care (score)	▲	⊕⊕⊕⊕	□	⊕⊕⊕⊕
	Quality of child health care (score)	▲	⊕⊕⊕⊕	No evidence	
	Quality of outpatient services (score)	□	⊕⊕⊕⊕	□	⊕⊕⊕⊕
	Quality of medicine and equipment (score)	▲	⊕⊕⊕⊕	□	⊕⊕⊕⊕
	Quality by department and/or service (score)	▲	⊕⊕⊕⊕	No evidence	
Primary: Unintended effects	Overall impacts on free riding and task shifting	No evidence		—	⊕⊕⊕⊕
Primary: Changes in re-	Human resource availability (persons available)	▲	⊕⊕⊕⊕	□	⊕⊕⊕⊕
	Curative health visits per health care professional	□	⊕⊕⊕⊕	□	⊕⊕⊕⊕

Table 1. Meta-summary: Effects of P4P against control (Continued)

source use	Equipment availability (index)	▲	⊕⊕⊕⊕	□	⊕⊕⊕⊕
	Equipment functionality (index)	—	⊕⊕⊕⊕	□	⊕⊕⊕⊕
	Infrastructure functionality (index)	▲	⊕⊕⊕⊕	—	⊕⊕⊕⊕
	Medicine availability (index)	▲	⊕⊕⊕⊕	▲	⊕⊕⊕⊕
	Vaccine availability (index)	□	⊕⊕⊕⊕	□	⊕⊕⊕⊕
	Stockout of equipment	▲	⊕⊕⊕⊕	□	⊕⊕⊕⊕
	Stockout of medicines	No evidence		□	⊕⊕⊕⊕
	Stockout of vaccines	▲	⊕⊕⊕⊕	No evidence	
	Stockout of vaccines	▲	⊕⊕⊕⊕	No evidence	
Se- condary: Provider moti- vation, satis- faction, absen- teeism and ac- cept- ability	Provider absenteeism (%)	—	⊕⊕⊕⊕	▲	⊕⊕⊕⊕
	Provider motivation (score)	—	⊕⊕⊕⊕	▲	⊕⊕⊕⊕
	Provider satisfaction (score)	—	⊕⊕⊕⊕	□	⊕⊕⊕⊕
Se- condary: Patient satisfac- tion and accept- ability (satis- faction scores)	Patient satisfaction with facility cleanliness (score)	▲	⊕⊕⊕⊕	□	⊕⊕⊕⊕
	Patient satisfaction with contact time (score)	□	⊕⊕⊕⊕	▼	⊕⊕⊕⊕
	Patient satisfaction with opening hours (score)	▲	⊕⊕⊕⊕	▼	⊕⊕⊕⊕
	Patient satisfaction with waiting time (score)	□	⊕⊕⊕⊕	□	⊕⊕⊕⊕
	Patient satisfaction with privacy (score)	▲	⊕⊕⊕⊕	No evidence	
	Overall patient satisfaction with quality of care (score)	—	⊕⊕⊕⊕	▲	⊕⊕⊕⊕
	Overall patient satisfaction with welcome and reception at facility (score)	No evidence		▲	⊕⊕⊕⊕
	Patient satisfaction with staff: Communication (score)	—	⊕⊕⊕⊕	▲	⊕⊕⊕⊕
	Patient satisfaction with staff: Trust (score)	No evidence		▲	⊕⊕⊕⊕
	Patient satisfaction with staff: Attitude (score)	▲	⊕⊕⊕⊕	▲	⊕⊕⊕⊕
	Overall satisfaction (score)	▲	⊕⊕⊕⊕	▲	⊕⊕⊕⊕
	Overall satisfaction (score)	▲	⊕⊕⊕⊕	▲	⊕⊕⊕⊕
Se- condary: Impacts on over- all fi- nancing	Fees	No evidence		▼	⊕⊕⊕⊕
	Expenditure on medicine and equipment	—	⊕⊕⊕⊕	—	⊕⊕⊕⊕
	Probability of payment for users	No evidence		□	⊕⊕⊕⊕

Table 1. Meta-summary: Effects of P4P against control *(Continued)*

Se- condary: Impacts on man- age- ment or infor- mation systems (if not a target- ed mea- sure of perfor- mance)					
	Facility or managerial autonomy	▲	⊕⊕⊕⊕	▲	⊕⊕⊕⊕
	Facility governance	—	⊕⊕⊕⊕	▼	⊕⊕⊕⊕
	Quality of management	—	⊕⊕⊕⊕	▼	⊕⊕⊕⊕
Se- condary: Equi- ty-con- sidera- tion: Ev- idence of dif- ferential impact on dif- ferent parts of the pop- ulation	Equity of child immunization delivery (wealth related)	▲	⊕⊕⊕⊕	□	⊕⊕⊕⊕
	Equity in ANC delivery (wealth related)	▼	⊕⊕⊕⊕	No evidence	
	Equity in institutional delivery (wealth related)	—	⊕⊕⊕⊕	▼	⊕⊕⊕⊕
	Equity in institutional delivery (by educational status of mother)	—	⊕⊕⊕⊕	□	⊕⊕⊕⊕

Direction of effect key

- ▲ Desirable
- ▼ Non-desirable
- Neutral
- Uncertain

Certainty in evidence key

- ⊕⊕⊕⊕ Moderate
- ⊕⊕⊕⊕ Low
- ⊕⊕⊕⊕ Very low

Table 2. Meta-summary: Effects of P4P against comparator

Outcome	Indicator	Direction of effect and GRADE rating for targeted and un-targeted outcomes			
		Target- ed	GRADE rating	Not-tar- geted	GRADE rating
Primary: Utiliza- tion and delivery	Child immunization (likelihood of being vaccinated)	□	⊕⊕⊕⊕	No evidence	
	Child immunization: % receiving BCG	—	⊕⊕⊕⊕	No evidence	

Table 2. Meta-summary: Effects of P4P against comparator (Continued)

	Child immunization: % receiving DTP	■	⊕⊕⊕⊕	No evidence
	Child immunization: % fully vaccinated	□	⊕⊕⊕⊕	No evidence
	Immunization during ANC - % receiving tetanus injection	▲	⊕⊕⊕⊕	■ ⊕⊕⊕⊕
	Probability of any utilization (generic)	▲	⊕⊕⊕⊕	No evidence
	Antenatal care: % receiving at least one ANC	■	⊕⊕⊕⊕	No evidence
	Antenatal care: % receiving four or more ANC	■	⊕⊕⊕⊕	No evidence
	Antenatal care: % receiving ANC in first trimester	▲	⊕⊕⊕⊕	No evidence
	Child (<5) curative visits (rates)	■	⊕⊕⊕⊕	No evidence
	Family planning: % using any method	■	⊕⊕⊕⊕	No evidence
	Family planning: % using modern methods	■	⊕⊕⊕⊕	No evidence
	Institutional delivery (rates and coverage)	□	⊕⊕⊕⊕	No evidence
	Postnatal care (rates and coverage)	▼	⊕⊕⊕⊕	■ ⊕⊕⊕⊕
Primary: Changes in resource use	Equipment availability (composite score)	▲	⊕⊕⊕⊕	□ ⊕⊕⊕⊕
	Medicine availability (composite score)	▼	⊕⊕⊕⊕	□ ⊕⊕⊕⊕
Primary: Health outcomes	Proportion of women breastfeeding	■	⊕⊕⊕⊕	■ ⊕⊕⊕⊕
	Reported illness in children (%)	No evidence	▲	⊕⊕⊕⊕
Primary: Quality of care	Background and physical assessment (score)	▲	⊕⊕⊕⊕	No evidence
	Knowledge Outcomes (index)	▲	⊕⊕⊕⊕	No evidence
	Counselling (score)	□	⊕⊕⊕⊕	No evidence
	Immunizations quality (score)	▲	⊕⊕⊕⊕	No evidence
	Staff knowledge and skills (score)	▲	⊕⊕⊕⊕	□ ⊕⊕⊕⊕
	Total quality family planning (score)	▲	⊕⊕⊕⊕	No evidence
	Total quality antenatal care (score)	▲	⊕⊕⊕⊕	No evidence
	Total quality composite (score)	▲	⊕⊕⊕⊕	No evidence
Secondary: Equity-consideration: Evidence of differential impact on different parts of the population	Wealth related: Antenatal care (utilization)	■	⊕⊕⊕⊕	No evidence
	Wealth related: Curative visits (utilization)	■	⊕⊕⊕⊕	No evidence
	Wealth related: Family planning (utilization)	▼	⊕⊕⊕⊕	No evidence
	Wealth related: Institutional delivery (utilization)	▼	⊕⊕⊕⊕	No evidence

Table 2. Meta-summary: Effects of P4P against comparator *(Continued)*

Secondary: Impacts on management or information systems (if not a targeted measure of performance)	Facility and managerial autonomy (score)	▲	⊕⊕⊕⊕	□	⊕⊕⊕⊕
Secondary: Patient satisfaction and acceptability	Cleanliness	No evidence	▲	⊕⊕⊕⊕	
	Contact time	No evidence	▲	⊕⊕⊕⊕	
	Waiting time	□	⊕⊕⊕⊕	▲	⊕⊕⊕⊕
	Patient satisfaction with staff communication (index)	□	⊕⊕⊕⊕	—	⊕⊕⊕⊕
Secondary: Provider motivation, satisfaction, absenteeism and acceptability	Motivation (score)	No evidence	—	⊕⊕⊕⊕	
	Satisfaction (score)	No evidence	—	⊕⊕⊕⊕	

Direction of effect key

- ▲ Desirable
- ▼ Non-desirable
- Neutral
- Uncertain

Certainty in evidence key

- ⊕⊕⊕⊕ Moderate
- ⊕⊕⊕⊕ Low
- ⊕⊕⊕⊕ Very low

Table 3. Characteristics of included studies - table A

Country	Study design	Study ID	Aim	Funders of study	Location of care	Urban or rural areas	Study population	Sample details	Intervention: type of PBF
Afghanistan	RCT	Engineer 2016	To evaluate the effectiveness of PBF on maternal and child health.	Ministry of Health Afghanistan and third party evaluation by John Hopkins	Mixed - in and out-patient	Unclear	Women and children	Intervention group: 81 facilities for exit interviews (727 patients), overall 285 health workers, 72 facilities for household interviews (3421 households). Control group: 81 facilities for exit interviews (727), overall 285 health workers, 71 facilities for household surveys (3427 households).	Payment per output modified by quality score
		Witvora 2016	To evaluate the impacts of PBF on non-targeted services.	Unclear	Community based care	Rural	Women of reproductive age who had institutional delivery or brought a child to a BPHS facility for DPT-3 vaccination, and their families.	Across all 4 study arms, 6649 women and their households. In the intervention group (CHW arm) 1556 women; in the control group 1571 women. Number of CHWs not specified	Payment per output
Argentina	CBA	Gertler 2014	To evaluate the impacts of PBF on birth outcomes and neonatal mortality.	World Bank	Mixed - in and out-patient	Unclear	Pregnant women, mothers, and children	Varies across outcomes. Sample size from 108,535 for tetanus toxoid vaccine, to 282,042 for caesarean section. Sample constructed from medical records of beneficiaries and non-beneficiaries of Plan Nacer, across Argentina.	Target payment
	RCT	Celhay 2015	To evaluate the effects of PBF on early initiation of antenatal care.	World Bank	Outpatient	Unclear	Pregnant women accessing care in facilities in	37 Clinics including 1240 pregnant women accessing care.	Payment per output

Table 3. Characteristics of included studies - table A (Continued)

Benin	Quasi/non-randomized trial	Lagarde 2015	To identify causal pathways of how PBF may work and evaluate impacts on range of outcomes.	World Bank	Mixed - in and out-patient	Mixed - urban and rural	Misiones, who were beneficiaries of Plan Nacer at the time of their first visit. Patient groups affected - appears to be patients using RMCH services and other curative services (curative consultations, HIV treatment, IST diagnosis and treatment, TB detection and treatment)	135 Health facilities including 433 providers and 3331 patients	Payment per output modified by quality score
Brazil	ITS	Viñuela 2015	To explore if any systematic change in outcome measures can be attributed to PBF	World Bank	Unclear	Mixed - urban and rural	Neonates	27 states plus the federal district. Other sample details unclear	Performance related pay
Burkina Faso	CBA	Steenland 2017	To examine the effect of PBF pilot 2011 to 2013 in Burkina Faso.	World Bank, Health Results Innovation Trust Fund	Mixed - in and out-patient	Rural	Women accessing antenatal and postnatal care	186 health providers in the 3 districts, 8074 women in the analytic sample	Payment per output modified by quality and equity score
Burundi	CBA	Bonfrer 2014a	To examine the staggered rollout of PBF in Burundi.	Unclear	Mixed - in and out-patient	Unclear	Women, infants and households;	For studying incentivized outcomes, the population under study consists: Phase 1 - 274 women who de-	Payment per output modified

Table 3. Characteristics of included studies - table A (Continued)

					observations of care-seeking episodes	livered in the preceding year, 265 infants, 1329 women 15-49 accessing FP, 1000 households, 49 health facilities; Phase 2: 715 women who delivered in the preceding year, 712 infants, 3690 women 15-49 accessing FP, 2700 households 130 health facilities; Pooled: 845 women who delivered in the preceding year, 835 infants, 4341 women 15-49 accessing FP, 3200 households, 159 health facilities. For studying non-incentivized outcomes: Phase 1: 1000 households, 1440 episodes of illness and between 1291-1300 episodes of illness appraised for care; Phase 2: 2700 households, 3770 illness episodes, between 3237 and 3259 episodes appraised for care; Pooled: 3200 households, 4555 episodes of illness and between 3928 and 3950 illness episodes appraised for care.	by quality score
Bonfrer 2014b	To examine the effect of PBF on utilization and quality of maternity care in Burundi.	Unclear	Mixed - in and out-patient	Unclear	Women accessing antenatal, maternal and child health care services	4916 women, representative sample nationally overall: 3603 in no pbf, 1299 in PBF group	Payment per output modified by quality score
Falisse 2015	To examine the effect of PBF on the use of health care services.	COR-DAID	Mixed - in and out-patient	Mixed - urban and rural	Women accessing antenatal, maternal and child health care services	68 (reported per 10,000)	Payment per output modified by quality score
Rudasingwa 2015	To examine the effect of PBF on the quality of selected health services.	COR-DAID	Mixed - in and out-patient	Unclear	Women accessing antenatal, maternal and child health care services.	16 facilities with PBF and 13 without - quality of care assessment	Payment per output modified by quality score

Table 3. Characteristics of included studies - table A *(Continued)*

Cambodia	CBA	Van de Poel 2015	To identify the effect of PBF on utilization of maternal and child health	EU Re-search Grant	Mixed - in and out-patient	Mixed - urban and rural	Mothers and children - focus of most of the schemes	In 2010, 45 Operational Districts with no experience of PBF and 32 Operational Districts exposed to PBF	Performance based contracting
	ITS	Ir 2015	To examine the effects of the Government Midwifery Incentive Scheme on deliveries	Funding from the Belgian Technical Co-operation and the Institute of Tropical Medicine in Antwerp. Two co-authors benefited from the support of the HEF-PA (Health Eq-	Inpatient	Mixed - urban and rural	Women giving birth at institutions	Nation-wide rollout	Payment per output

Table 3. Characteristics of included studies - table A *(Continued)*

		uity and Fi- nan- cial Pro- tec- tion in Asia) project fund- ed by the Seventh Frame- work Pro- gramme of the Euro- pean Com- mis- sion.					
Khim 2018	To compare the ef- fects and process of PBF implementation in three areas	The Au- sAid Aus- tralian Lead- er- ship Award Schol- ar- ship pro- gram	Mixed - in and out- patient	Rural	Patient groups affect- ed are outpa- tients at pri- mary care fa- cilities, chil- dren under 1 year old, new-borns, and pregnant women.	72 data points. No further informa- tion available	Perfor- mance based ser- vice agree- ments
Matsuoka 2014	To examine the effect of PBF in achieving intended goals	JICA	Mixed - in and out- patient	Unclear	Population coverage	Unclear	Payment per output

Table 3. Characteristics of included studies - table A (Continued)

Cameroon	Quasi/non-randomized trial	De Walque 2017	To estimate impact of PBF on MCH service coverage, quality of services	World Bank	Mixed - in and out-patient	Mixed - urban and rural	Pregnant women and mothers, children under 5	434 facilities, with 185 children, 187 caretakers, and 258 pregnant women	Payment per output modified by quality and equity score
	CBA	Zang 2015	To explore the effects of the PBF scheme in Littoral region.	World Bank	Mixed - in and out-patient	Mixed - urban and rural	Health facilities and pregnant women and children under 5 - unclear if further inclusion/exclusion criteria apply	40 health facilities out of 52.	Payment per output modified by quality and equity score
China	CBA	Yao 2008	To examine the effects of PBF on TB case detection and treatment	COMDIS - Dfid	Outpatient	Rural	Tuberculosis patients - suspected and diagnosed depending on outcome	Total sample not reported. New smear-positive cases in intervention group 3190 at baseline and 5449 during intervention. In control group, 1864 at baseline, and 3745 during intervention period.	Payment per output
	ITS	Chang 2017	To assess the effects of PBF on adverse drug reaction reporting	No funding	Inpatient	Unclear	All patients admitted to First Affiliated Hospital of Zhengzhou University (Henan Province)	Total patient reports included 2882. 128 in pre-intervention period (2006-2009); 753 in first intervention (2009-2011); 2001 in second intervention (2012-2014)	Payment per output
		Wu 2014	To examine the effects of PBF (with mismeasurement) in China	Unclear	Mixed - in and out-patient	Urban	Patients attending the hospital under study	10 wards with 142 physicians and 5230 patients	Target payment
		Liu and Mills 2005	To assess the effects of PBF on productivity, cost recovery and hospital revenue	UNDP/ WB/ WHO Special Pro-	Inpatient	Unclear	Appendicitis and pneumonia patients	6 hospitals, 2303 patients (1161 appendicitis patients and 1142 pneumonia patients)	Payment per output

Table 3. Characteristics of included studies - table A (Continued)

			gramme for Re- search and Train- ing in Trop- ical Dis- eases + DfID					
Qua- si/Non- random- ized trial	Pow- ell-Jack- son 2014	To assess the im- pacts of a PBF policy experiment in Ningx- ia	Bill and Melin- da Gates Foun- da- tion and EC grant.	Mixed - in and out- patient	Rural	Patients, no further details	75 towns, 917 villages, 357,400 households and 30, 393 individuals included in surveys	Payment per out- put and for target
	Sun 2014	To test alternatives to fee for service to inform policy	EU Re- search Grant	Outpa- tient	Rural	Patients at- tending vil- lage clinics and township health centres	29-township health centres (14 in- tervention, 15 control); 3162 pre- scriptions (Intervention: 572 town- ship health centre, and 1040 village clinic. Control: 527 township health centre, and 1023 village clinic.)	Capitation and PBF
RCT	Yip 2014	To assess the effects of reforming provider payments from fee for service to capi- tation with P4P on prescribing, health expenditure, outpa- tient visits and pa- tient satisfaction	Bill and Melin- da Gates Foun- da- tion; EU Health- F2-2009-223166- HEF-	Mixed - in and out- patient	Rural	All patients requiring an- tibiotic based care	16866 patients, with 440473 episodes of care at township health centres, and 714661 episodes of care at village posts	Capitation and PBF

Table 3. Characteristics of included studies - table A *(Continued)*

PA; World Bank Strategic Impact Evaluation Fund provided seed funding at planning stage									
Congo	CBA	Zeng 2018a	To evaluate the impacts of PBF on reproductive, maternal and child care.	World Bank	Mixed - in and out-patient	Mixed - urban and rural	Mothers with children under 2 years old	100 enumeration zones, with 1325 households, 1307 mothers and 1859 children at endline (1349 households, 1344 mothers and 1841 children at baseline)	Payment per output modified by quality score
DRC	CBA	Soeters 2011	To explore changes due to PBF in indicators between 2005 and 2008 in the control and intervention groups	Unclear	Mixed - in and out-patient	Unclear	Mothers and young children	240 households in intervention group and 200 in control group at baseline.	Payment per output modified by quality score
	RCT	Huillery 2017	To evaluate impact of OBF scheme on utilization, efficiency	Unclear	Mixed - in and out-patient	Mixed - urban and rural	Women and children	87 health areas, 123 facilities, 332 facility staff, 1014 patients and 9234 households	Payment per output
El Salvador	CBA	Bernal 2018	To identify the impacts of results based aid on delivery of services and effectiveness	IADB	Mixed - in and out-patient	Unclear	Low income mothers and children	Unclear	Results based aid

Table 3. Characteristics of included studies - table A *(Continued)*

Haiti	CBA	Zeng 2013	To assess the impacts and costs of PBF delivery	MSH and USAID	Mixed - in and out-patient	Unclear	Assumed patients using services at health facilities in study.	4 departments, which covered 217 health facilities (of which 15 were implementing PBF)	Performance based contracting
India	RCT	Mohanan 2017	To estimate impacts of different incentive models on maternal care	Unclear	Inpatient	Rural	Women who had recently given birth, and their newborns	135 providers (53 in output arm; 38 in input arm; 44 in control arm), and 2895 patients.	Target payment or payment per input
Kenya	RCT	Menya 2015	To estimate the impacts of PBF on malaria prevention and care	National Institute of Health US	Outpatient	Unclear	Patients with a laboratory test for malaria, or who received artemether-lumefantrine	14939 patient observations	Target payment
Malawi	CBA and ITS	McMahon 2016	To assess the fidelity and impacts of the PBF strategy in Malawi	USAID	Mixed - in and out-patient	Unclear	Patients attending reproductive and child health services	17 health facilities in intervention group and 17 health facilities in control group.	Payment per output modified by quality score
Multiple - Burkina Faso, Ghana and Tanzania	CBA	Duysburgh 2015	To document the effects of PBF on quality of antenatal and childcare.	European Union	Mixed - in and out-patient	Rural	Mothers and neonates	Unclear	Financial and non-financial incentives + clinical decision guide
Peru	Quasi/Non-randomized trial	Cruzado de la Vega, 2017	To estimate the effects of PBF on indicators of health service coverage and nutritional status in children.	Self-funded	Outpatient	Unclear	Children 0-59 months; depending on the indicator in question, restricted to 0-36 months and	3 regions and 54 districts, no more detail provided	Payment per output and for target

Table 3. Characteristics of included studies - table A (Continued)

							0-24 months, or preg- nant women between 2010-2014		
Philip- pines	RCT	Peabody 2011	To examine the effect of bonus payments on quality of care.	US Na- tion- al In- sti- tutes of Health through an R01 grant (No. HD042117).	Inpatient	Unclear	Physicians ac- tive at hospi- tals in study - approx. 3 per hospital	30 hospitals overall in the study.	Target payment
		Quimbo 2016	To investigate long- term effects of the QIDS intervention on quality of care.	US Na- tion- al In- sti- tutes of Health through an R01 grant (No. HD042117).	Inpatient	Unclear	Health providers en- gaged in QIDS	81 of the 89 doctors who previously participated, including new doctors: 43	Target payment
		Wagner 2018	To estimate effect of QIDS bonus pay- ment intervention in comparison to an in- creased access inter- vention and to a con- trol.	US Na- tion- al In- sti- tute for Child Health	Inpatient	Unclear	Children af- fected by pneumo- nia and di- arrhoea, fol- lowed-up	3121 children affected treated at one of the 30 facilities (10 per interven- tion and control) within. Study in- cludes 479 children in bonus inter- vention arm, 447 in expanded inter- vention and 467 in control.	Target payment

Table 3. Characteristics of included studies - table A *(Continued)*

				and Hu- man De- vel- op- ment					
		Peabody 2014	To assess the impact of a P4P programme on paediatric health outcomes in the Philippines.	US Na- tion- al In- sti- tutes of Health through an R01 grant (No. HD042117).	Inpatient	Unclear	All (caregiver consent- ing) children younger than 5 treated at hospitals in study and dis- charged. In- tervention group: 61 physicians at baseline and follow-up; 496 children at baseline and 596 at follow-up. In control group 58 physicians, 501 children at baseline and 560 at fol- low-up.	30 hospitals overall in the study.	Target payment
Rwanda	ITS	Rusa 2009	To evaluate the ef- fect of PBF on health care worker perfor- mance from 2005 to 2007	Un- clear	Outpa- tient	Rural	Differs by indicator - women and children and those access- ing curative consultations	6 districts initially rolling out in pilot, remaining districts in country later on.	Payment per output modified by quality score
	Qua- si/non- random- ized trial	Basinga 2011	To assess the ef- fect of perfor- mance-based pay- ment of health-care providers (payment	World Bank, Bank of Nether-	Mixed - in and out- patient	Mixed - predomi- nantly rur- al	Households with children under 5, for health facili-	166 health facilities in 19 districts, al- located to intervention (80, 12 dis- tricts) vs. control (86, 7 districts) and conducting household surveys: inter- vention baseline 1002 vs. 1007 at fol-	Payment per output modified by quality score

Table 3. Characteristics of included studies - table A *(Continued)*

	for performance; P4P) on use and quality of child and maternal care services in health-care facilities in Rwanda	lands Partnership Program, the British Economic and Social Research Council, the Government of Rwanda, and the World Bank's Spanish Impact Evaluation Fund			ties all 166 facilities	low-up; for control 1114 at baseline and 1115 at endline.	
Lannes 2016	To examine distributional impacts of PBF in Rwanda.	World Bank, Bank of Netherlands Partnership	Mixed - in and out-patient	Mixed - predominantly rural	Households with children under 5, for health facilities all 166 facilities	166 health facilities, 2145 households and person observations for three populations, which feed into diverse analyses: married women (15-49) for family planning analysis, women with pregnancies in last 2 years for maternal service analysis,	Payment per output modified by quality score

Table 3. Characteristics of included studies - table A *(Continued)*

						ship Pro- gram, the British Eco- nom- ic and So- cial Re- search Coun- cil, the Gov- ern- ment of Rwan- da, and the World Bank's Span- ish Im- pact Eval- ua- tion Fund	children up to 5 for child health ser- vices.
Priede- man Skiles 2013	To examine the ef- fects of PBF on equi- ty in maternal health service use	Un- clear	Mixed - in and out- patient	Mixed - predomi- nantly rur- al	Women aged 18-49	7899 women 15-49years old - 4477 in intervention and 3422 in control, across 12 intervention and 7 control districts, clustered into 86 interven- tion clusters and 64 control clusters.	Payment per output modified by quality score
Priede- man Skiles 2015	To estimate the ef- fects of Rwanda's PBF program on the prevalence of child-	Un- clear	Outpa- tient	Mixed - predomi- nantly rur- al	Children un- der 5	5781 children less than 5 years of age at the time of each survey who lived in either an intervention (3307) or comparison district (2474).	Payment per output modified

Table 3. Characteristics of included studies - table A *(Continued)*

							by quality score
Sherry 2017	To estimate the impacts of PBF scheme in Rwanda.	Unclear	Mixed - in and out-patient	Mixed - predominantly rural	Women and children utilizing RMCH services	Across 19 districts (12 intervention and 7 control) 10272 households. At baseline and 7377 at endline, including data of 11321 women at baseline and 7313 at endline.	Payment per output modified by quality score
Lannes 2015	To study the effects of PBF on patient satisfaction regarding quality assurance	Unclear	Unclear	Rural	Pregnant women and adults seeking care for themselves/children	Across 157 primary care facilities, 77 intervention and 80 control, patients attending for prenatal care, child curative and adult curative care	Payment per output modified by quality score
Gertler 2012	To provide evidence on the effect of incentives on provider productivity and on health outcomes in Rwanda	World Bank, Bank of Netherlands Partnership Program, the British Economic and Social Research Council, the Government	Mixed - in and out-patient	Mixed - urban and rural	Women giving birth during study periods and their children; health providers involved in study	Unclear	Payment per output modified by quality score

Table 3. Characteristics of included studies - table A *(Continued)*

		of Rwan- da, and the World Bank's Span- ish Im- pact Eval- ua- tion Fund					
de Walque 2015	To evaluate the im- pact of Rwanda's na- tional P4P scheme on individual and couple HTC.	World Bank, Bank of Nether- lands Part- ner- ship Pro- gram, the British Eco- nom- ic and So- cial Re- search Coun- cil, the Gov- ern- ment of Rwan- da,	Outpa- tient	Mixed - ur- ban and rural	Facilities, households of HIV + patients and their cou- ples tested for HIV and households randomly sampled from neighbour households in the catch- ment area of the facility	Across 9 intervention districts and 7 controls: 24 facilities in total (10 in intervention, 14 in control) associat- ed with 675 households in interven- tion, 705 in control. Total number of observations: 1075 for individual testing and 287 observations for cou- ple testing (intervention arm) and 1140 observations for individual and 285 observations for couple testing (comparator arm).	Target payment

Table 3. Characteristics of included studies - table A *(Continued)*

				and the World Bank's Span- ish Im- pact Eval- ua- tion Fund					
	RCT	Shapira 2018	To evaluate the im- pact of tying pay- ments to perfor- mance	World Bank	Mixed - commu- nity and health fa- cility	Mixed - ur- ban and rural	Mothers and community health work- ers	Baseline sample 2005 community health workers (84% of target). 2200 CHW at follow-up and 197 coopera- tive presidents. Baseline household sample 2376, follow-up sample in- cluded 2157 of original sample and additionally 2343 of newly sampled women with recent births or preg- nancy in the village.	Payment per output
Swaziland	Qua- si/non- random- ized trial	Kliner 2015	Compare outcomes for patients with a treatment support- ed receiving incen- tives vs. those pa- tients with a non-in- centivised supported	Glob- al Fund, COMDIS, DfID	Communi- ty based care	Rural	Tuberculosis patients	1077 tuberculosis (161 in interven- tion and 916 in control) patients di- agnosed between study dates and living in the communities of treat- ment supporters	Payment per output
Tanzania	CBA	Binyaruka 2015	To examine the ef- fect of a government P4P scheme on util- isation, quality, and user costs of health services in Tanzania.	Gov- ern- ment of Nor- way, grant num- bers: TAN-3108 and TAN 13/0005. http://	Mixed - in and out- patient	Mixed - ur- ban and rural	Patients and households of women accessing care in study health facili- ties.	1500 patients and 3000 households surveyed across 11 districts, 150 health facilities	Target payment

Table 3. Characteristics of included studies - table A *(Continued)*

www.no-rad.no/en/.

Binyaruka 2017	To evaluate the effects of payment for performance on the availability and stock-out rate of reproductive, maternal, newborn and child health medical commodities in Tanzania and assess distributional effects	Govern-ment of Norway and the Re-search Council of Norway and the UK De-part-ment for Inter-na-tional De-vel-op-ment as part of the Con-sor-tium for Re-search on Re-silient and.	Mixed - in and out-patient	Mixed - urban and rural	Health facili-ties	75 intervention and 75 control fa-cilities (in each arm: 6 hospitals, 16 health centres and 53 dispensaries)	Target payment
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Table 3. Characteristics of included studies - table A *(Continued)*

Re-spon-sive Health Sys-tems sup-ported the fund-ing of the au-thors time un-der-tak-ing data analy-sis and writ-ing							
Binyaruka 2018	To examine the heterogeneity of P4P effects on service utilisation across population subgroups and its implications for inequalities in Tanzania.	Govern-ment of Norway	Mixed - in and out-patient	Mixed - urban and rural	Women having given birth in the last 12 months in catchment areas of included facilities.	75 intervention and 75 control facilities (in each arm: 6 hospitals, 16 health centres and 53 dispensaries). 3000 households surveys of women giving birth in the last 12 months at baseline and also follow-up	Target payment
Mayu-mana 2017	To interrogate whether P4P improves internal and external accountability mechanisms	Govern-ment of Norway (re-search) and	Mixed - in and out-patient	Mixed - urban and rural	Health facilities	75 intervention and 75 control facilities (in each arm: 6 hospitals, 16 health centres and 53 dispensaries)	Target payment

Table 3. Characteristics of included studies - table A (Continued)

				DfID RESYST con- sor- tium (pub- lica- tion)					
	Qua- si/non- random- ized trial	Brock 2018	To compare the value of non-monetary gifts (immediate unconditional, delayed unconditional, conditional) as a way to improve health worker performance	Mary- land Agricultural extension station grant - Government of Norway, World Bank	Outpa- tient	Urban	Health providers engaged in study and patients treated	Intervention group: 21 providers and 940 patients; Unconditional gift 23 providers, 1155 patients; Delayed unconditional gift 25 providers and 1167 patients; Control 25 providers and 1176 patients.	Condition- al provi- sion of material goods
Zambia	ITS	Chansa 2015	To evaluate the effects of the PBF pre-pilot in Katete district	World Bank	Mixed - in and out-patient	Mixed - urban and rural	Women accessing RM-NCH services and children.	25 health facilities, including 6 health posts, 18 rural health centres and one urban health centre.	Payment per output modified by quality score
	RCT	Friedman 2016a	To provide an estimate of PBF impacts vs. input financing vs. pure control	World Bank	Mixed - in and out-patient	Unclear	Differs by outcome - mothers or children	10 PBF intervention districts, 10 matched financing and equipment districts, and 10 control districts	Payment per output modified by quality score
		Shen 2017	To estimate effects of PBF scheme on health worker moti-	World Bank	Unclear	Unclear	Three different groups of providers:	186 health centres (86 in PBF group, 49 in enhanced financing group and 51 in pure control group) and 683	Payment per output modified

Table 3. Characteristics of included studies - table A *(Continued)*

			vation, job satisfaction and staff attrition				those in the PBF facilities, those in enhanced financing control and the pure control. Patients affected would be those attending the participating facilities.	staff in total (baseline: 147 in PBF, 87 in finance control, 92 in pure control; endline: 166 PBF, finance control 92, pure control 99)	by quality score
Zimbabwe	CBA	Das, 2017	To establish impact of PBF on ANC service and process outcomes	No funding	Mixed - in and out-patient	Rural	Mothers to be in facilities selected	705 total facilities (374 intervention: 105 baseline, 116 follow-up, 331 control: 84 baseline, 82 follow-up) and research set 41 facilities in panel intervention, 36 facilities in panel control. 1011 clients total (565 intervention baseline, 414 intervention follow-up, 446 control baseline, 336 control follow-up) and research set: intervention 208 baseline, 200 follow-up, control 177 baseline and 174 follow-up	Payment per output modified by quality and satisfaction score
	Quasi/Non-randomized trial	Friedman 2016b	To identify the effects of the RBF pilot program on the utilization and quality of maternal and child health services as well as its effects on health system functioning.	World Bank	Mixed - in and out-patient	Unclear	Households and patients seeking RMCH care	197 health facilities at baseline, 222 at follow up. 597 health worker interviews at baseline, 415 at follow up. Patient exit interviews: for ANC 1864 at baseline and 550 at follow-up; for child health 1865 at baseline and 844 at follow-up. 1610 household surveys at baseline and 1836 at follow up.	Payment per output modified by quality and equity score

Table 4. Characteristics of included studies - table B

Country	Study design	Study ID	Intervention: type of PBF	Control or comparison	Data collection	Time period	Analysis	Outcomes reported
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Table 4. Characteristics of included studies - table B (Continued)

				tor in- ter- ven- tion	meth- ods			
Afghanistan	RCT	Engineer 2016	Payment per output modified by quality score	Control: Standard care or status quo	Household surveys, health facility surveys, balanced score-card assessments. Data collected by trained interviewers and data collection teams.	Baseline: 2010. End-line: 2012. Follow-up: 23-25 months after initial rollout of P4P.	Intention to treat (Wilcoxon signed rank matched pair) and difference in difference models as extended analyses. Difference in Difference available for this outcome.	28 outcomes reported - around RMNCH utilization and delivery, and quality of care
		Witvo-rapong 2016	Payment per output	Control: Standard care or status quo	Surveys (assumed household). Collected by HOPE World-wide.	Baseline: 2009. End-line: 2011. Follow-up: Unclear.	Regression analysis (4 probit models). Sample-level analysis, exogeneity model, reported here. Control variables include wealth quartiles, age, age ² , race, ability to read, no. children, proportion of children still alive, proportion of children delivered at facility, proportion of children having had DPT, distance to nearest BPHS facility, whether the respondent feels safe going to facility, awareness of reproductive health education programs and of family planning programs)	2 outcomes around unintended effects
Argentina	CBA	Gertler 2014	Target payment	Control: Standard care or status quo	Database populated using birth and medical	Baseline: 2004. End-line: 2008. Follow-up: NA.	Difference in difference models - one Intention to Treat to estimate effect of Plan Nacer on all patients in relevant hospitals, the either Treatment-on-treated to estimate effect on the beneficiaries only, or Treatment-on-treated with spill over to estimate effect on beneficiaries AND non-beneficiaries. All models control for clinic fixed effects, time-province fixed effects, maternal age, and	6 RMCH outcomes and 9 further health economic outcomes

Table 4. Characteristics of included studies - table B *(Continued)*

				records, beneficiary status, pharmaceutical records, administrative records, population census.		number of previous births. Standard errors clustered at clinic level. ITT results extracted	
RCT	Celhay 2015	Payment per output	Comparator: Standard care under Plan Nacer	Patient records from clinics and hospitals.	Baseline: (i) a 16-months pre-intervention period from January 2009 to April 2010, (ii) an 8-month intervention period from May 2010 to December 2010, (iii) a 15-month "post-intervention period I" from January 2011 to March 2012 and (iv) a 9-month "post-intervention period II" from April 2012 to December 2012. Endline: 15 months post intervention	Intention to treat but reporting based on local average treatment. Clustered at the health clinic level. Given small number of clusters, Wild bootstrap method used, as a method that is robust to randomized assignment of treatment among a small number of clusters.	7 outcomes around RMNCH utilization and delivery, RMNCH health outcomes, and unintended effects of incentives on immunizations and overall visits.

Table 4. Characteristics of included studies - table B (Continued)

						and further 9 months. Follow-up: 24 months.		
Benin	Quasi/non-randomized trial	Lagarde 2015	Payment per output modified by quality score	Control and Comparator. Control: Standard care or status quo. Comparator: additional funding matching core elements of PBF.	Facility surveys, person questionnaires and exit interviews. Data collected by study field-workers.	Baseline: 2011. End-line: 2015. Follow-up: 4 years.	Econometric model. Health worker control variables covered role, level of experience, primary household income, and household wealth. Facility control variables covered other nearby facilities, rural or non-rural, qualified staff, facility size and access to electricity.	38 individual outcomes assessed against control and 28 against alternative comparator; covering quality of care, utilization and delivery and facility management/resources
Brazil	ITS	Viñuela 2015	Performance related pay	Over time: Comparison over time.	National registry data, obtained from routine sources.	Baseline: 2002. End-line: 2011. Follow-up: 9 years.	Regression models. Model without control variables, and model with control variables: state management reforms, sector expenditure per capita, poverty rate and GDP per capita, GDP per square km, and population density.	1 health outcome reported on - child mortality.
Burkina Faso	CBA	Steenland 2017	Payment per output modified by quality and equity score	Control: Standard care or	Data from health management in-	Baseline: Data set extracted starts from Jan-	Difference in difference controlling for time trends, seasonal effects and clustering	4 utilization and delivery outcomes

Table 4. Characteristics of included studies - table B *(Continued)*

				status quo	formation system.	uary 2009. PBF was started in April 2011. Endline: Extracted data ends in December 2012. Follow-up: April 2011-December 2012.		around RMNCH
Burundi	CBA	Bonfrer 2014a	Payment per output modified by quality score	Control: Standard care or status quo	Household surveys. Unclear who collected the data	Baseline: 2006. Endline: 2010. Follow-up: 4 years.	Difference in difference controlling for time trends, seasonal effects and clustering; Bonferroni corrections applied	15 outcomes - utilization and delivery outcomes around RMNCH and immunizations; quality of care outcomes; and health outcomes
		Bonfrer 2014b	Payment per output modified by quality score	Control: Standard care or status quo	Data from Burundi Demographic and Health Survey 2010.	Baseline: 2005. Endline: 2010. Follow-up: 5 years.	Difference-in-differences. Looking at the effect of whether a province had or did not have PBF when an individual child was born. Standard errors were adjusted for at the province level. Control variable household size, wealth quintiles, whether child is first born, mother age at birth, age of household head in year, mother having primary education, male household head, access to safe drinking water, household having electricity. Robustness confirmed using ordinary least squares regression.	11 outcomes on utilization and delivery of RMNCH, including RMNCH immunizations
		Falisse 2015	Payment per output modified	Control: Stan-	Data from National	Baseline: 2005. Endline: 2009.	Difference in difference controlling for province and year trends, but no controls. A second model includes con-	12 outcomes, primari-

Table 4. Characteristics of included studies - table B (Continued)

			by quality score	dard care or status quo	Health Information System, and from Cordaid and the EU, who implemented PBF in seven provinces.	Follow-up: 3 years.	trols, however problematic as 32% missingness registered there, so more conservative model reported.	ly around utilization and delivery of RM-NCH and vaccinations, plus outpatient and malaria visits; one of these outcomes on perinatal deaths
		Rudasingwa 2015	Payment per output modified by quality score	Control: Standard care or status quo	Administrative data review, medical records review, documents and records review, direct observation. Data obtained from Cordaid Netherlands.	Baseline: 2006. Endline: 2008. Follow-up: 2 years.	Differences in scores between 2006-2008 explored through descriptive statistics, paired non-parametric Wilcoxon Signed Ranks test, and difference-in-difference analysis at a significance level of 5%.	8 general quality of care outcomes
Cambodia	CBA	Van de Poel 2015	Performance based contracting	Comparator: unclear	Cambodian DHS surveys. Data collected by national	Baseline: 2005/2000. Endline: 2005 and 2010. Follow-up:	Difference in difference. Standard error adjusted for clustering at the OD level (model 1). Extended model (model 2 - focussed on in the results) also accounts for geographic variation in access to public services, which may constrain extent to which even incentivized providers can influence utilization rates. Covariates included in the model which contain child, mother and	5 RMCH outcomes

Table 4. Characteristics of included studies - table B (Continued)

ITS				authorities.	5 and 10 years.	household characteristics such as birth interval <24 months; mother's age at birth <20 years; education level of mother; and wealth index (see table II for complete list)	
	Ir 2015	Payment per output	Over time: Comparison over time.	Data from existing National Health Information System database and DHS data.	Baseline: Jan 2006. Endline: Dec 2011. Follow-up: 4 years and 3 months.	Segmented linear regression to identify both level and trend changes, accounting for auto-correlation	1 principal outcome reported on
	Khim 2018	Performance based service agreements	Over time: Comparison over time.	Data exported from Health Management Information Systems.	Baseline: 2006. Endline: 2012. Follow-up: 2 or 3 years.	Interrupted time series, using segmented linear regression, which estimated pre intervention trend and level, and post intervention trend for each indicator. Changes in level and slope were calculated, controlling for pre-intervention level, trend, and autocorrelation. Autocorrelation and serial correlation corrected using Prais-Winsten transformation.	4 RMCH outcomes
	Matsuoka 2014	Payment per output	Over time: Comparison over time.	Data review of existing records obtained from Kroch Chhmar OD (health administration) office; interviews; focus groups;	Baseline: January 2006/2007. Endline: June 2009. Follow-up: Depending - 2 or 3 years.	Descriptive data analysis. Outcomes compared before and after intervention using the chi-square test where appropriate.	2 ANC and immunization indicators

Table 4. Characteristics of included studies - table B (Continued)

					health centre visits. Data collected by study team.			
Cameroon	Quasi/non-randomized trial	De Walque 2017	Payment per output modified by quality and equity score	Control: Standard care or status quo	Interviews with household members, facility-based survey, patient-provider observations and client exit interviews. Data collected by Institut de Formation et de Recherche Démographiques (IFORD) and research team.	Baseline: Unclear - pre PBF start. Endline: 3 years. Follow-up: Unclear.	Difference in difference. Regression models adjusted for control variables. Facility level controls included type of health facility (public/religious/private) and location of health facility (urban/rural). Household level control variables included number of individuals in the household, housing type, house ownership, water source, and type of sanitation. Individual level controls included age, marital status, education level, religion, ethnicity, working status and type of work.	102 outcomes, around RMNCH, vaccination, HIV, malaria, financing, patient and provider satisfaction, equipment and medicine availability, and quality of care.
	CBA	Zang 2015	Payment per output modified by quality and equity score	Control: Standard care or	Household and facility surveys.	Baseline: Jan 2011. Endline: Feb 2013. Fol-	Propensity score matching for (catchment area population size, square of catchment area population size, number of qualified health personnel, square of number of qualified health personnel and	21 outcomes. 9 around quality of care;

Table 4. Characteristics of included studies - table B (Continued)

				status quo		low-up: Unclear.	number of qualified health personnel to catchment area population size) and difference in difference.	4 around number of staff; 6 around RMNCH utilization and delivery; remaining 2 around utilization of outpatient consultations, and drug availability.
China	CBA	Yao 2008	Payment per output	Control: Standard care or status quo	Data from County-based TB reporting data, collected by health care workers.	Baseline: January-September 2004. Endline: January-September 2005. Follow-up: 1 year.	Comparison of proportions and "Descriptive analyses of independent t-tests, x2 test and Kruskal-Wallis rank test were used when appropriate."	2 outcomes on treatment success and case notification
	ITS	Chang 2017	Payment per output	Over time: Comparison over time.	Adverse Drug Reaction reports from hospital pharmacovigilance programme database, collect-	Baseline: 2006. Endline: 2014. Follow-up: 5 years.	Time series analysis using autoregressive integrated moving average models	3 outcomes on adverse drug reactions

Table 4. Characteristics of included studies - table B (Continued)

					ed from pharma- cists and admis- sions.		
	Wu 2014	Target pay- ment	Over time: Com- par- ison over time.	Rou- tine da- ta from tertiary general hospital dataset.	Baseline: July 2004. Endline: May 2006. Follow-up: Approx. 2 years.	Difference in Difference and regression analysis to check for trends. All regressions control for patient age, gen- der, marriage, the number of conditions, a dummy variable for whether the patient is in severe condition, length of stay, and a set of principal diagnosis fixed ef- fects.	4 out- comes on expendi- ture and length of stay
	Liu and Mills 2005	Payment per output	Over time: Com- par- ison over time.	Inpa- tient records from the six pan- el hospi- tals. Da- ta col- lected by study team.	Baseline: 1978. End- line: 1997. Follow-up: 17 years (First bonus payment made 1981).	Trend analysis, correlation and regression analysis; stepwise regression, with the following indicators en- tered in: "besides indicators of revenue, cost recovery, unnecessary care and productivity, the year, names of hospitals and bonus type were put into the regression models as independent variables"	4 revenue and pro- ductivi- ty related outcomes
Quasi/Non- randomized trial	Pow- ell-Jackson 2014	Payment per output and for tar- get	Con- trol: Stan- dard care or status quo	2 rounds of house- hold sur- vey. Da- ta col- lected by research teams.	Baseline: Feb 2009. Endline: Early 2011. Follow-up: Approx. 2 years.	Difference in difference approach - regression with treatment effects estimated by ordinary least squares, with clustered nature of data accounted for by cluster- ing standard errors at village level. Analysis controlled for individual chronic disease, age, age squared, gen- der, gender of the household head, household size, as- set wealth, education, distance from the nearest health facility of each type, ethnicity, whether the individual is the household head, and migrant status.	14 out- comes on in and out- patient care and processes
	Sun 2014	Capitation and PBF	Con- trol: Status quo (glob- al cap- itated bud- get)	Routine monitor- ing and study specific surveys. Data col- lected	Baseline: April 2011. Endline: April 2012. Follow-up: 1 year.	Difference in Difference, fixed-effects, controlling for sex and gender	8 prescrip- tion and cost out- comes

Table 4. Characteristics of included studies - table B (Continued)

	RCT	Yip 2014	Capitation and PBF	Control: Standard care or status quo	Data from electronic management information system; household survey; township health centre and village post survey.	Baseline: Unclear. Endline: January 30th 2012. Follow-up: Unclear.	Logistic regression and least squares regressions for binary and continuous outcomes; report unadjusted estimates and those adjusted for sex, age, and dummy variable for cluster-paired fixed effects. SE at town level. Subgroup analysis by sex. Also for patients with a cold for antibiotic use	11 prescription outcomes including expenditure per visits
Congo	CBA	Zeng 2018a	Payment per output modified by quality score	Control: Standard care or status quo	Household and health facility surveys. Data collected by study teams.	Baseline: March 2012. Endline: March 2014. Follow-up: 2 years.	Difference in difference - multivariate regression model, which controlled for characteristics which "measured financial and physical accessibility of households and respondents' awareness of and education on health care", which included the location of households, house ownership, household size, mother's age, education, status of living with a partner, status of having a regular job, and distance of households from health facilities. Models adjusted for clustering at the village level. Results from model without village fixed effects. Bonferroni correction included.	22 variables around utilization of RMNCH, immunizations, and quality of care
DRC	CBA	Soeters 2011	Payment per output modified by quality score	Comparator: in-kind medicine and equipment donation,	Stratified household cluster survey.	Baseline: Nov 2005. Endline: Feb 2008. Follow-up: 2 years 2 month.	Difference in difference. Logistic regression models; unclear whether adjusted.	26 outcomes - RMNCH, quality of care, patient satisfaction, financial,

Table 4. Characteristics of included studies - table B *(Continued)*
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	RCT	Huillery 2017	Payment per output	Control: Other (some payment to facilities made based on staff numbers)	Surveys. Collected by study team.	Baseline: September and November 2009. Endline: December 2012 and February 2013. Follow-up: 30 months.	Regression model. "In all regressions we control for the health zone, and for whether the health facility is rural or urban, religious or non-religious, private or public, health post or health centre. At the individual level, we add controls for the sex and age of the individual, grade and experience if the respondent is a health worker, reason for visiting if the respondent is a patient, and whether the individual is literate if the respondent is an adult household member."	77 outcomes around general utilization and delivery, RM-NCH, quality of care, patient satisfaction, and provider motivation
El Salvador	CBA	Bernal 2018	Results based aid	Control: Standard care or status quo	Extraction from routine data sources; health visits; hospitals data; family records. Collected by hospitals and health workers.	Baseline: Depending on source - for health visits 2009; hospitals from 2005 and family records from 2010. Endline: Depending on source - for health visits 2015, for hospitals 2015, for family records 2013. Follow-up: 3 years to 6 years.	Difference in Difference - linear regression with time fixed effects, municipality fixed effects, and unobservable characteristics that vary within municipality and across time	36 outcomes. General utilisation including preventive, curative, outpatient and family planning visits; plus outcomes around human resources

Table 4. Characteristics of included studies - table B (Continued)

Haiti	CBA	Zeng 2013	Performance based contracting	Control: Standard care or status quo	Routine health information system data. Collected by health workers.	Baseline: 2008. End-line: 2010. Follow-up: 2 years.	Random effects regression model using quarterly observations and controlling for time effects + DID	7 outcomes around consultations for incentivized and non-incentivized services among different patient groups.
India	RCT	Mohanan 2017	Target payment or payment per input	Control: Other (payment for participation in study)	Interviews; provider and patient records. Data collected by study team.	Baseline: 1st pre-contract data collection (provider and personnel surveys) Oct 2012 - Jan 2013. End-line: Post contract visit 2 between August-November 2014. Follow-up: 19 months between introduction of intervention and beginning of post-contract visit 2.	Regression analysis clustering at provider level. P-values adjusted for multiple hypotheses tested and calculated using the free step-down resampling method. Models include district and enumerator fixed effects. Models given with and without household-level control variables (mother's age and education; household's caste and house type; head of household's religion; mother's history of hypertension, diabetes, asthma, hyper- or hypothyroidism, and convulsions; whether mother has had a previous stomach surgery; whether it is the mother's first pregnancy, number of previous pregnancies, whether the mother has had a stillbirth or abortion, and number of previous children birthed; whether the household owns land, has no literate adults, and owns a Below Poverty Line card) and provider-level controls (primary provider's gender, professional qualifications, number of years in practice, and number of years that the facility has been in operation.	18 RMCH outcomes
Kenya	RCT	Menya 2015	Target payment	Control: Standard	Data from facility	Baseline: September 2012-Octo-	Mixed effects logistic regression model of individual patients with random intercepts for each facility. Adjusted for quarter, age category (except for stratified analysis),	2 malaria specific outcomes

Table 4. Characteristics of included studies - table B *(Continued)*

				standard care or status quo	registers.	ber 2012. Endline: October 2012-November 2013. Follow-up: 1 year.	gender, mode of diagnosis (RDT or microscopy), transmission zone (except for stratified analysis) and average monthly volume of slides read in the facility in the preceding year.	
Malawi	CBA and ITS	McMahon 2016	Payment per output modified by quality score	Control: Standard care or status quo	Data from Health Management Information Systems, President's Emergency Plan for AIDS Relief, Service Provision Assessment, and primary data collection.	Baseline: "Performance-Based Incentive program officially started in August 2014". Primary data collected March 2016; Secondary data collection began in Autumn 2015. Endline: Unclear. Follow-up: 18 months.	Interrupted time series analysis and difference in difference analysis. Not specified whether analyses adjusted.	17 outcomes around RMNCH, HIV, and vaccination
Multiple - Burkina Faso, Ghana and Tanzania	CBA	Duysburgh 2015	Financial and non-financial incentives + clinical decision guide	Control: Standard care or status quo	Health facility surveys; observation; patient satisfaction surveys; patient records review. Data collected	Baseline: 2010. Endline: Late 2013/early 2014. Follow-up: 4 years.	Testing for pre-post via Wilcoxon Mann Whitney when comparing intervention with control and then for intervention and non-intervention paired signed rank when comparing at same facility	32 outcomes on antenatal and childbirth quality of care, including management of comorbidities and complications

Table 4. Characteristics of included studies - table B (Continued)

Table 1. Characteristics of included studies								
Table 2. (continued)								
					by study team.			
Peru	Quasi/Non-randomized trial	Cruzado de la Vega, 2017	Payment per output and for target	Control: Regions without the PBF support programme, but in a similar poverty quintile	Demo-graphic and Family Health Survey 2008-2014 data.	Baseline: 2008 and 2009. End-line: inter-vention in place be-tween 2010 and 2012. Follow-up: 2013 to 2014.	difference in difference of the average treatment effect of the treated	24 RMNCH outcomes, particularly around child vac-cination, growth, and mal-nutrition
Philippine	RCT	Peabody 2011	Target pay-ment	Control: Stan-dard care or status quo	Clinical perfor-mance vignette assess-ments; physi-cian sur-vey. Col-lected by study teams.	Baseline: 2003. End-line: 2007. Follow-up: 3 years (inter-vention in-troduced in 2004).	Descriptive statistics and difference in difference mod-els testing for intervention effects controlling for clus-tering at hospital level and size of facility; as relevant al-so for repeat testing and physician characteristics (age, gender, specialization)	4 out-comes - quality scores for four age groups
		Quimbo 2016	Target pay-ment	Control: Stan-dard care or status quo	Clinical perfor-mance vignette assess-ments; physi-cian sur-vey. Col-lected	Baseline: 2003. End-line: 2013. Follow-up: 9 years (inter-vention in-troduced in 2004).	Difference in difference model across the 8 study peri-ods, random effects, adjusting for clustering.	1 quality score out-come

Table 4. Characteristics of included studies - table B (Continued)

		by study teams.						
		Wagner 2018	Target payment	Control: Standard care or status quo	Patient exit survey; follow-home survey (4-6 weeks post discharge). Collected by QIDS investigators.	Baseline: 2003/4. End-line: 2007/8. Follow-up: 2 years.	Comparison of means and multivariate models (difference in difference), including facility fixed effects and control variables. Include dependents (0-14 ratio, and 65+ ratio), duration of stay, child having pneumonia/diarrhoea, child being female, age. Of child, maternal education, per capita monthly income and household size.	6 outcomes on medical expenditures
		Peabody 2014	Target payment	Control: Standard care or status quo	Household surveys. Data collected by independent interview teams.	Baseline: 2003. End-line: 2007. Follow-up: 3 years (intervention introduced in 2004).	Logistic difference in difference models adjusting for (1) PhilHealth (insurance) membership, (2) age of child (months), (3) mother's education (years of schooling), and (4) household income (PhP), (5) initially visited a lower-level facility prior to hospitalization and (6) length of stay in hospital. The individual effects control for individual, household and area specific factors that are fixed over time. Clustering by facility.	4 general health outcomes
Rwanda	ITS	Rusa 2009	Payment per output modified by quality score	Over time: Comparison over time.	Routine health facilities reports and supervision logs.	Baseline: 2005 (monthly basis). End-line: 2007 (December). Follow-up: Depending on start - in pilot districts 3 years.	Descriptive - graphic only. Additional data requested, no data provided.	8 outcomes around RMNCH and vaccinations - regarding utilization and delivery and quality of care
	Quasi/non-randomized trial	Basinga 2011	Payment per output modified	Comparator: Traditional	Facility survey; household survey	Baseline: Unclear - P4P started in 2006.	Multivariate regression specification of the difference-in-difference model in which an individual's outcome is regressed against a dummy variable, indicating whether the facility received P4P that year, a facility	8 RMNCH outcomes - 6 relating to utilization

Table 4. Characteristics of included studies - table B *(Continued)*

	by quality score	tional input-based budgets allocated to the facilities in the control group were increased by the average amount of P4P payments that facilities in the intervention group received every 3 months during the 23-month assessment window.	vey. Collected by enumerators hired by external firms.	Endline: 25 months after baseline survey. Follow-up: Max 25 months.	fixed effect, a year indicator, and a series of individual and household characteristics. Robust standard errors, clustered at the district by year level to correct for correlation of the error terms across facilities within districts.	tion and delivery, and 2 to quality of care.
Lannes 2016	Payment per output modified by quality score	Comparator: Tradition-	Household survey. Database ob-	Baseline: 2006. Endline: 2008. Follow-up:	Clustered T-tests and difference in difference models (linear probability, SURE, robustness checks with fixed effects and clustering) - reporting here on clustered fixed effects models.	6 outcomes on equity of RMNCH services

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Table 4. Characteristics of included studies - table B *(Continued)*

		al in- put-based bud- gets al- locat- ed to the fa- cilities in the control group were in- creased by the aver- age amount of P4P pay- ments that facili- ties in the in- terven- tion group re- ceived every 3 months during the 23- month assess- ment win- dow.	tained from Basinga 2011.	2 years (23 months).		across different parts of the popu- lation.
Priedeman Skiles 2013	Payment per output modified by quality score	Com- para- tor: Tradi- tional in-	Survey. DHS da- ta.	Baseline: 2005. End- line: 2007-8. Follow-up: 18 months.	Bivariate descriptive analyses for outcomes by year/ wealth quintile to capture inequity; difference in dif- ference models. Cluster-robust standard errors. Com- munity fixed effects to control for time invariant unob- served community differences. For ANC visits covari- ates include age, education, marital status, parity, insur-	12 out- comes - RMNCH regard- ing utiliza- tion of ser-

Table 4. Characteristics of included studies - table B *(Continued)*

			put-based bud-gets al-located to the fa-cilities in the control group were in-creased by the aver-age amount of P4P pay-ments that facili-ties in the in-terven-tion group re-ceived every 3 months during the 23-month assess-ment win-dow.		ance and prior facility birth. For facility delivery, covari-ates included are education, marital status, parity, in-surance, prior facility births, and ANC. For modern con-traception, covariates include age, education, marital status, parity, insurance, prior facility birth and previous child death.	vices, with addition-al equity considera-tions
Priedeman Skiles 2015	Payment per output modified by quality score	Com-parator: Tradi-tional in-put-based	Collation of sur-vey da-ta from DHS sur-vey.	Baseline: 2005. End-line: 2008. Follow-up: 2 or 1 years or less (ear-ly imple-	Difference in difference, fixed effects, and standard er-rors clustered at district level. Reported illnesses DID adjusts for: child's age, birth order, gender, and facili-ty birth; mother's age, education, marital status; house-hold wealth, toilet facilities, drinking water source, and bed net use. Facility care seeking and treatment re-ceived DIDs adjust for child's age, birth order, gender,	10 out-comes - RMNCH re-garding reporting of illness, care seek-

Table 4. Characteristics of included studies - table B (Continued)

Study	Intervention	Comparator	Setting	Population	Outcomes	Notes
Sherry 2017	Payment per output modified by quality score	Comparator: Traditional input-based budget	Routine DHS data.	Baseline: February and July 2005. Endline: December 2007 and April 2008. Follow-up: January 2006-November 2007)	Difference in difference analysis among intention to treat lines, including adjustment for household and individual level control variables and fixed effects (including for birth years), standard errors clustered at district levels.	26 outcomes around RMNCH and vaccination - health outcomes, including, and treatment

utilization and delivery outcomes and quality of care outcomes.

low-up:
18-22
months post
rollout.

gets allocated to the facilities in the control group were increased by the average amount of P4P payments that facilities in the intervention group received every 3 months during the 23-month assessment window.

Lannes 2015	Payment per output modified by quality score	Comparator: Traditional input-based budgets al-	Data from original Basin-ga 2011 dataset.	Baseline: 2006. End-line: 2008. Follow-up: Varied scheme follow-up, max 23 months.	Derivation of satisfaction measures using polychoric correlation; ordinary least squares regression used to regress satisfaction index on each sample.	12 outcomes around satisfaction of care around curative, prenatal, and
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Table 4. Characteristics of included studies - table B *(Continued)*

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vices.

Table 4. Characteristics of included studies - table B *(Continued)*

Gertler 2012	Payment per output modified by quality score	Com- para- tor: Tradi- tional in- put-based P4P pro- bud- gets al- locat-	Surveys, conduct- ed in- depen- dently from the P4P pro- gram.	Baseline: 2006. End- line: 23 months later. Fol- low-up: Maximum 18 months.	Difference in difference methods including individual controls and facility fixed effects. We consider two age groups: (1) children 0-11 months at endline, and (2) children 24-47 months at endline. We estimated 2 versions of equation (6): one without controls and a second with controls. The controls include the child's age and sex, maternal height, mother's age, whether the mother has completed primary school, whether the father lives in the household, whether the family is a member of a Mutuelle (health insurance fund), the total number of	7 RMNCH outcomes around growth, quality of care, and efficiency
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Table 4. Characteristics of included studies - table B *(Continued)*

			ed to the facilities in the control group were increased by the average amount of P4P payments that facilities in the intervention group received every 3 months during the 23-month assessment window.		household members, the number of household members under the age of 6, whether the household owns land, and dummy variables for quartiles of the household asset value. ¹³ The child's age was entered as a series of dummy variables that represent one-month increments."	
de Walque 2015	Target payment	Comparator: Traditional input-based by budgets allocated to	Facility survey; household surveys. Collected by University of Rwanda School	Baseline: August until November 2006. End-line: April until July 2008. Follow-up: Unclear.	Repeated cross-sections using difference-in-difference analysis, facility fixed effects. "We compute robust standard errors using multi-way cluster-adjustment by districts, survey year and their intersection following the method developed by Cameron et al. (2011) to account for potential correlation of the error terms at both the cross-section and the temporal level."	7 outcomes around utilization and delivery of HIV testing and counselling

Table 4. Characteristics of included studies - table B *(Continued)*

RCT	Shapira 2018	Payment per output	Comparator: Standard care - co-operatives here are paid	Household surveys. Surveys by community health workers.	Baseline: February to May 2010. Endline: November 2013 to June 2014. Follow-up: Payment started in October 2010, and	Regression model including outcomes measured (either by woman, CHW or cooperative), sector assignment and error term clustering at the sector level.	27 outcomes focused on utilization and delivery, co-operative functioning
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the facilities in the control group were increased by the average amount of P4P payments that facilities in the intervention group received every 3 months during the 23-month assessment window.

Table 4. Characteristics of included studies - table B (Continued)

				for re- port- ing on- ly, this is the back- ground PBF pro- gramme.		continued until post follow-up survey, sug- gesting min. 3.5 years fol- low-up.		
Swaziland	Quasi/non- randomized trial	Kliner 2015	Payment per output	Con- trol: Stan- dard care or status quo	Extrac- tion from TB registry. Collect- ed by study authors.	Baseline: 1st January 2010. End- line: 30th September 2011. Fol- low-up: 21 months.	Logistic regression with stepwise selection of covariates into models (Age (0-14, 15-24 vs over 35 reference cat- egory), TB (any new case or previously treated/TB with meningitis) with children under 8 as reference), HIV sta- tus, being on ART)	8 TB spe- cific out- comes
Tanzania	CBA	Binyaruka 2015	Target pay- ment	Con- trol: Stan- dard care or status quo	House- hold sur- veys; ex- it inter- views; facility surveys. Collec- tion by study authors.	Baseline: January 2012 (after P4P train- ing took place in sec- ond half of 2011). End- line: March 2013. Fol- low-up: 13 months.	Difference in difference, ordinary least squares, clus- tered at facility level or facility catchment area. Con- trolling for individual level characteristics (education, religion, marital status, occupation, age, number of pregnancies) and household characteristics (insurance, number of household members, household head edu- cation, wealth based on ownership of household assets and housing particulars)	146 out- comes around medicine and equip- ment re- sources, cost of care, pa- tient sat- isfaction, and RM- NCH ser- vices
		Binyaruka 2017	Target pay- ment	Con- trol: Stan- dard care or status quo	Health facility surveys; house- hold sur- vey. Un- clear who col- lected data.	Baseline: January 2012. End- line: March 2013. Fol- low-up: 13 months.	Difference in difference regression models controlling for time invariant determinants, facility fixed effects.	103 out- comes around medicine and equip- ment re- sources, includ- ing equity

Table 4. Characteristics of included studies - table B (Continued)

							consideration.
	Binyaruka 2018	Target payment	Control: Standard care or status quo	Household surveys. Unclear who collected data.	Baseline: January 2012. Endline: February 2013. Follow-up: 13 months.	Difference in difference model controlling for time invariant characteristics including facility fixed effects and individual and household characteristics.	20 outcomes around equity of immunization and RMNCH services
	Mayumana 2017	Target payment	Control: Standard care or status quo	Interviews; focus group discussions; quantitative surveys at facility and health worker levels. Data collected by study team.	Baseline: January 2012. Endline: February 2013. Follow-up: 13 months.	Difference in difference, adjusted models for facility fixed effects	38 outcomes looking at management, medicine and equipment, and utilization and delivery of general outpatient services
Quasi/non-randomized trial	Brock 2018	Conditional provision of material goods	Comparator: Unconditional gifts (either immediate or delayed) as alternative in-	Patient survey. Data collected by study team.	Baseline: Nov 2008. Endline: Aug 2010. Follow-up: 22 months.	Multilevel regression models with nested random effects at patient and clinician level	1 quality of care outcome

Table 4. Characteristics of included studies - table B *(Continued)*

				terven- tions and control (all re- ceive a stan- dard en- cour- age- ment inter- ven- tion)				
Zambia	ITS	Chansa 2015	Payment per output modified by quality score	Over time: Com- par- ison over time.	HMIS da- ta export by study team.	Baseline: January 2006. End- line: March 2012. Fol- low-up: 14 quarters (3.5 years).	ITS - simulated modelling analysis	4 out- comes looking at utilization and deliv- ery of im- muniza- tion, RM- NCH, and outpatient services
	RCT	Friedman 2016a	Payment per output modified by quality score	Con- trol and Com- para- tor. Con- trol: Stan- dard care or status quo. Com- para- tor: Matched	House- hold and health facility surveys; process evalu- ation data; counter exter- nal eval- uation. Enumer- ators hired as part of	Baseline: October-No- vember 2011. End- line: Novem- ber 2014- January 2015. Fol- low-up: 3 years.	Difference in difference and regression models - depen- dent on outcome, controls for district stratification or at province level, and errors clustered at the Primary Sam- pling Unit or district level.	386 out- comes around staff sat- isfaction, manage- ment, pa- tient sat- isfaction, quality of RMNCH care, uti- lization of RMNCH services, medicine and equip-

Table 4. Characteristics of included studies - table B *(Continued)*

				financ- ing and equip- ment	impact evalua- tion			ment re- sources, curative visits, and immuniza- tion.
		Shen 2017	Payment per output modified by quality score	Con- trol and Com- para- tor. Con- trol: Stan- dard care or status quo. Com- para- tor: En- hanced financ- ing	Health worker surveys. Unclear who col- lected data.	Base- line: Octo- ber-Novem- ber 2011. Endline: September November 2014. Fol- low-up: 3 years.	Difference in difference, facility fixed effects, with stan- dard errors clustered at district level. District grouping taken into account using stratification controls.	38 out- comes around staff sat- isfaction and hu- man re- sources
Zimbabwe	CBA	Das, 2017	Payment per output modified by quality and satisfaction score	Con- trol: Stan- dard care or status quo	Health facility assess- ments; patient exit in- terviews. Data col- lected by survey teams from lo- cal re- search firm.	Baseline: December 2011-Feb- ruary 2012. Endline: May to Au- gust 2014. Follow-up: 2.5 years of implemen- tation.	Intention to treat with difference in difference estimates (through multilevel linear regression). Multilevel regres- sion models accounted for clustered data	176 out- comes around Total Quality and Pa- tient Sat- isfaction, with eq- uity con- sidered across sub- groups. Includes individ- ual quali- ty items,

structural quality indices plus a composite structural quality index, process quality indices and a composite process quality index, individual satisfaction items and composite satisfaction index. Also above subgrouped by facility ownership, facility type, provider cadre, provider gender, patient characteristics and wealth quintile.

Quasi/Non-randomized trial	Friedman 2016b	Payment per output modified by quality and equity score	Control: Standard care or status quo	Facility and household surveys; direct observations. Data	Baseline: Dec 2011 - Feb 2012. Endline: Midline: May-August 2014. Follow-up: 2.5	Difference in difference and regression models - dependent on outcome, controls for district stratification or at province level, and errors clustered at the district level.	354 outcomes including utilization outcomes, quality of care, facility management,
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Table 4. Characteristics of included studies - table B *(Continued)*

Table 4. Characteristics of included studies - table B (Continued)

from MOH, HMIS, DHS and collected by study team.

years - 3 years.

patient and staff satisfaction

Table 5. Characteristics of interventions - table A

Country	Study ID	Intervention - PBF type	Scale	Source of funding for PBF scheme	Purchasing arrangement	Sectors contracted	Primary clinical or population group targeted	Level at which PBF performance is assessed and paid	Indicators incentivized
Afghanistan	Engineer 2016	Payment per output modified by quality score	11 out of 34 provinces	World Bank	NGOs managing facilities were contracted by the MOPH to provide services. Funds channelled to health workers through the NGOs, whose central offices retained 10% of performance payment.	Public and NGO	RMCH	Facilities	9 performance indicators incentivized, and 20 quality indicators included on Balanced Scorecard, along with contraceptive prevalence rates as an additional measure of equity.
	Witvo- rapong 2016	Payment per output	Four rural provinces in the North and Central region	Ministry of Public Health and GAVI	Unclear	Public	RMCH	Community health workers	2 indicators: institutional delivery and third dose of DPT-3 vaccination
Argentina	Celhay 2015	Payment per output	One province (for this experiment)	Plan Nacer - nation-	Integrated - Plan Nacer	Public	RMCH	Facilities	1 - early initiation of prenatal care

Table 5. Characteristics of interventions - table A (Continued)
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surer

	Gertler 2014	Target pay- ment	National roll- out	Nation- al Min- istry of Health	Integrated - Plan Nacer	Public	RMCH	Province	10 indicators focused on reproduc- tive maternal and child health and inclusion of indigenous popula- tions
Benin	Lagarde 2015	Payment per output modified by quality score	8 districts out of 34	World Bank	Integrated - Min- istry of Health	Public and not for prof- it (includ- ing faith based)	RMCH	Facilities	28 service indicators around RMCH and other curative services (HIV/ TB) and quality of care indicators (124 items)
Brazil	Viñuela 2015	Perfor- mance relat- ed pay	Two states within the country	Feder- al/lo- cal gov- ern- ment	Unclear - appears integrated.	Public	RMCH	Facility- or team- based for assess- ment but paid to staff	Unclear - depends on mutually agreed targets.
Burkina Faso	Steenland 2017	Payment per output modified by quality and equity score	3 districts	World Bank	Integrated - Health facilities signed contracts with the central level of the Ministry to provide packages of ser- vices in line with in- centivized targets.	Public	RMCH; HIV/TB	Facilities	17 indicators incentivized for pri- mary care facilities; 21 for sec- ondary care facilities; 7 for commu- nity health workers. Indicators pri- marily focused on RMNCH and TB/ HIV.
Burundi	Bonfrer 2014a	Payment per output modified by quality score	3 provinces 2006; 6 more in 2008; fur- ther 9 in 2014. As of 2014 im- plemented in almost 700 health facili- ties.	Un- clear	Management re- sponsibility tran- sitioning out from NGO to Ministry	Public and not for prof- it (includ- ing faith based)	RMCH	Facilities	Quantity measured through 23 out- put indicators, focused on RMNCH, TB/HIV and malaria. Quality check- list includes 220 items.
	Bonfrer 2014b	Payment per output	3 provinces 2006; 6 more	Un- clear	Management re- sponsibility tran-	Public and not	RMCH	Facilities	Quantity measured through 23 out- put indicators, focused on RMNCH,

Table 5. Characteristics of interventions - table A *(Continued)*

	modified by quality score	in 2008; fur- ther 9 in 2014. As of 2014 im- plemented in almost 700 health facili- ties.		sitioning out from NGO to Ministry	for prof- it (includ- ing faith based)			TB/HIV and malaria. Quality check- list includes 220 items (from Bonfr- er 2014a)
Falisse 2015	Payment per output modified by quality score	17 provinces of Burundi	Min- istry of Health in col- labo- ration with inter- na- tional NGOs, such as Cor- daid and Health- Net TPO	Management re- sponsibility tran- sitioning out from NGO to Ministry	Public and not for prof- it (includ- ing faith based)	RMCH	Facilities	Noted that over 42 different indica- tors have been used (Table 1 lists 18 key indicators around curative services, reproductive health, pre- ventive health and HIV/AIDS)
Rudasing- wa 2015	Payment per output modified by quality score	Unclear	Min- istry of Health in col- labo- ration with inter- na- tional NGOs, such as Cor- daid and Health- Net TPO	Management re- sponsibility tran- sitioning out from NGO to Ministry	Public and not for prof- it (includ- ing faith based)	General	Facilities	Example of 20 output indicators covering RMCH, TB, HIV and malar- ia and noted that 58 indicators for quality assessment were used.

Table 5. Characteristics of interventions - table A (Continued)

Cambodia	Ir 2015	Payment per output	National roll-out from October 2007.	Royal Government of Cambodia	Integrated - Ministry of Health	Public	RMCH	Health workers	10 RMCH indicators
	Khim 2018	Performance based service agreements	National roll-out	Unclear	External contracting with aid agencies	Public	General; RMCH	Facilities	4 RMCH indicators
	Matsuoka 2014	Payment per output	Ten districts	GAVI	External contracting with GAVI and internal purchasing supplementing	Public	RMCH	Facilities	2 ANC and immunization indicators
	Van de Poel 2015	Performance based contracting	Depends on period of roll-out - most of Cambodia	Unclear	Management responsibility transitioning out from NGO to Ministry	Public	RMCH	District	Unclear - different types of targets noted for the different schemes.
Cameroon	Zang 2015	Payment per output modified by quality and equity score	One region	World Bank	Unclear - precursor of program de Walque assesses, so likely similar purchasing through autonomous purchasing agencies.	Unclear	Unclear	Health workers	Unclear
	De Walque 2017	Payment per output modified by quality and equity score	26 districts	World Bank	Autonomous purchasing agencies with contractual agreement to MoH and government	Public	Unclear	Facilities	23 indicators; 7 around curative care; 10 around preventive services - vaccinations, HIV and TB, STIs etc.; 6 around reproductive health
China	Chang 2017	Payment per output	Hospital	Unclear	Integrated - hospital level	Public	General	Health workers and facilities	Reporting of adverse drug reactions

Table 5. Characteristics of interventions - table A (Continued)

	Yao 2008	Payment per output	One province	Fidelis project	Integrated - Ministry of Health	Public	TB	Health workers and village leaders	2 tuberculosis outcomes
	Powell-Jackson 2014	Payment per output and for target	One region - Ningxia province	Unclear	Integrated - Ministry of Health	Public	Unclear	Facilities	Multiple antibiotic prescription indicators, patient satisfaction indicators and process of care measures for common acute and chronic conditions.
	Yip 2014	Capitation and PBF	One region	New Cooperative Medical Scheme	Integrated - Ministry of Health	Public	General	Facilities	Unclear - see Powell Jackson 2014
	Wu 2014	Target payment	Hospital	Unclear	Integrated - hospital level	Public	General	Health workers	One drug sale ratio to revenue related indicator
	Liu and Mills 2005	Payment per output	National roll-out	Ministry of Health	Integrated - Ministry of Health	Public	General	Health workers	Under flat bonus - no indicators incentivized. Under quantity-related bonus 7 indicator areas around service provision. Under revenue-related bonus, bonus for revenue over a revenue target (revenue from provision of services and drugs)
	Sun 2014	Capitation and PBF	Two provinces	New Cooperative Medical Scheme	Integrated - Ministry of Health	Public	General	Facilities	10 prescription related quality of care indicators
Congo	Zeng 2018a	Payment per output modified by quality score	Three regions	World Bank	External purchaser - CORDAID	Unclear	General	Facilities and district	25 indicators covering general population services, HIV/AIDS, RMNCH

Table 5. Characteristics of interventions - table A (Continued)

Democrat- ic Repub- lic of the Congo	Huillery 2017	Payment per output	Unclear	Un- clear	Integrated - Min- istry of Health	Mix - pub- lic, private and faith based	RMCH	Facilities	10 RMCH indicators
	Soeters 2011	Payment per output modified by quality score	Two districts	COR- DAID	Unclear	Public and not for prof- it (includ- ing faith based)	RMCH	Facilities	Unclear - appears 9 indicators for RMCH and malaria
El Sal- vador	Bernal 2018	Results based aid	14 municipal- ities	Salud MesoAmer- icana	External purchaser Salud Mesoamer- icana, via MoH channels	Public	RMCH	Municipal- ity	10-11 indicators on delivery of RM- CH care and quality
Haiti	Zeng 2013	Perfor- mance based con- tracting	All NGOs sup- ported by USAID	USAID via MSH	External NGO man- agement and pur- chasing	NGO	RMCH; HIV/TB	Facilities	14 potential indicators covering RMCH, TB/HIV services and their quality
India	Mohanan 2017	Target pay- ment or payment per input	Karnataka state	Un- clear	External - study au- thors	Private	RMCH	Health workers	Inputs for offering care or 4 out- puts related to minimizing adverse events during pregnancy/child birth
Kenya	Menya 2015	Target pay- ment	One city and 18 health cen- tres	Un- clear	Unclear - presum- ably via routine mechanism	Public	RMCH	Facilities	7 malaria specific indicators
Malawi	McMahon 2016	Payment per output modified by quality score	Three districts	USAID, with JPHIEGO as im- ple- menter	Integrated - Min- istry of Health	Public	RMCH; HIV/TB	Facilities	13 RMCH indicators and 13 quality dimensions
Multiple - Burki- na Faso, Ghana and Tanzania	Duysburgh 2015	Financial and non-fi- nancial in- centives + clinical deci- sion guide	6 rural dis- tricts 2 per each of three countries	Un- clear	Unclear	Unclear	RMCH	Book awards to health workers; health fa- cilities are	Unclear - likely to differ by country

Table 5. Characteristics of interventions - table A (Continued)

								receiving money (Burkina); others are not clear	
Peru	Cruzado de la Vega, 2017	Payment per output and for target	Sub-national three regions in Peru with the highest rates of chronic malnutrition (CM) in children in 2008—Apurimac, Ayacucho, and Huancavelica	Peruvian government	Integrated nationally - Contracting with regional governments and Ministry of Finance	Public	RMCH	Sub-national organisations (health administrations, NGOs or local governments)	12 RMCH indicators, focus on child health
Philippines	Peabody 2011	Target payment	10 hospitals	Phil-Health	Integrated - National Health Insurance	Public	RMCH	Facilities	Vignette scores focused on common childhood conditions
	Quimbo 2016	Target payment	10 hospitals	Phil-Health	Integrated - National Health Insurance	Public	RMCH	Facilities	Vignette scores focused on common childhood conditions
	Wagner 2018	Target payment	10 hospitals	Phil-Health	Integrated - National Health Insurance	Public	RMCH	Facilities	Vignette scores focused on common childhood conditions
	Peabody 2014	Target payment	10 hospitals	Phil-Health	Integrated - National Health Insurance	Public	RMCH	Facilities	Vignette scores focused on common childhood conditions
Rwanda	Basinga 2011	Payment per output modified by quality score	National roll-out (expansion to 19 districts which did not have PBF yet)	Governmental organisation	Integrated - Ministry of Health	Public and not for-profit (including faith based)	RMCH	Facilities	7 outreach indicators, 7 content of care indicators, 13 quality domains
	Lannes 2016	Payment per output modified	National roll-out (expansion to 19 dis-	Governmental	Integrated - Ministry of Health	Public and not for prof-	RMCH	Facilities	7 outreach indicators, 7 content of care indicators, 13 quality domains

Table 5. Characteristics of interventions - table A *(Continued)*

	by quality score	tracts which did not have PBF yet)	organisation		it (including faith based)			
Priedeman Skiles 2013	Payment per output modified by quality score	National roll-out (expansion to 19 districts which did not have PBF yet)	Governmental organisation	Integrated - Ministry of Health	Public and not for profit (including faith based)	RMCH	Facilities	7 outreach indicators, 7 content of care indicators, 13 quality domains
Priedeman Skiles 2015	Payment per output modified by quality score	National roll-out (expansion to 19 districts which did not have PBF yet)	Governmental organisation	Integrated - Ministry of Health	Public and not for profit (including faith based)	RMCH	Facilities	7 outreach indicators, 7 content of care indicators, 13 quality domains
Sherry 2017	Payment per output modified by quality score	National roll-out (expansion to 19 districts which did not have PBF yet)	Governmental organisation	Integrated - Ministry of Health	Public and not for profit (including faith based)	RMCH	Facilities	7 outreach indicators, 7 content of care indicators, 13 quality domains
Lannes 2015	Payment per output modified by quality score	National roll-out (expansion to 19 districts which did not have PBF yet)	Governmental organisation	Integrated - Ministry of Health	Public and not for profit (including faith based)	RMCH	Facilities	7 outreach indicators, 7 content of care indicators, 13 quality domains
Shapira 2018	Payment per output	19 districts	Ministry of Health	Integrated - Ministry of Health	Public and not for profit (including faith based)	RMCH	Cooperatives and community health workers	5 RMCH indicators as primary focus of scheme, later supplemented with HIV/TB indicators
Rusa 2009	Payment per output modified by quality score	Eventual national rollout, reporting here on pilot in five rural and one	Ministry of Health in Rwanda and	External NGO management and purchasing	Public	RMCH	Facilities	6 RMCH indicators

Table 5. Characteristics of interventions - table A (Continued)

			semi-rural district	the Belgian Technical Cooperation					
	Gertler 2012	Payment per output modified by quality score	National roll-out	Ministry of Health	Integrated - Ministry of Health	Public	RMCH	Facilities	7 outreach indicators, 7 content of care indicators, 13 quality domains
	de Walque 2015	Target payment	National roll-out	Ministry of Health	Integrated - Ministry of Health	Public and not for profit (including faith based)	RMNCH; HIV/TB	Facilities	10 HIV specific indicators
Swaziland	Kliner 2015	Payment per output	Hospital	Unclear	Integrated - National TB programme	Public	TB	Community health workers	Support of directly observed treatment
Tanzania	Brock 2018	Conditional provision of material goods	One region	Unclear	External - study authors	Mix - public, private and faith based	General	Health workers	Adherence to guidelines
	Binyaruka 2015	Target payment	One region	Government of Norway	Integrated - Ministry of Health	Public and not for profit (including faith based)	RMCH	Facilities and district	7 outreach indicators, 7 content of care indicators, 13 quality domains
	Binyaruka 2017	Target payment	One region	Government of Norway	Integrated - Ministry of Health	Public and not for profit (including faith based)	RMCH	Facilities and district	7 outreach indicators, 7 content of care indicators, 13 quality domains

Table 5. Characteristics of interventions - table A *(Continued)*

	Binyaruka 2018	Target payment	One region	Government of Norway	Integrated - Ministry of Health	Public and not for profit (including faith based)	RMCH	Facilities and district	7 outreach indicators, 7 content of care indicators, 13 quality domains
	Mayumana 2017	Target payment	One region	Government of Norway	Integrated - Ministry of Health	Public and not for profit (including faith based)	RMCH	Facilities and district	7 outreach indicators, 7 content of care indicators, 13 quality domains
Zambia	Friedman, 2016a	Payment per output modified by quality score	Pre-pilot in one district; following this PBF expanded to 10 additional districts. By end of project, 203 health centres covered.	World Bank - Health Results Innovation Trust Fund	Integrated - Ministry of Health	Public	RMCH	Facilities and district	9 directly incentivized services via unit payments (RMCH indicators) and 10 areas for quality assessment (RMCH care, HIV services, general management and info systems, community participation)
	Shen 2017	Payment per output modified by quality score	Pre-pilot in one district; following this PBF expanded to 10 additional districts. By end of project, 203 health centres covered.	World Bank - Health Results Innovation Trust Fund	Integrated - Ministry of Health	Public	RMCH	Facilities and district	9 directly incentivized services via unit payments (RMCH indicators) and 10 areas for quality assessment (RMCH care, HIV services, general management and info systems, community participation)
	Chansa, 2015	Payment per output modified by quality score	Katete district pre-pilot	World Bank through the Health Results Innovation	Integrated - Ministry of Health	Public	RMCH	Facilities	9 indicators incentivised around RMCH, and 10 incentivised areas for quality assessment

Table 5. Characteristics of interventions - table A *(Continued)*

				Trust Fund.					
Zimbabwe	Friedman 2016b	Payment per output modified by quality and equity score	Initially in two districts in 26 RHCs, then scaled up to 18 districts	World Bank and co-fund- ing from the Min- istry of Fi- nance and Eco-nom- ic De-vel- op-ment	Integrated into MoH, with COR- DAID technical sup- port	Public and not for prof- it (includ- ing faith based)	RMCH	Facilities + district + provincial	17 indicators in rural health cen- tres and 6 in hospitals, focused on RMCH; quality scorecard.
	Das 2017	Payment per output modified by quality and satisfaction score	18 districts	World Bank and co-fund- ing from the Min- istry of Fi- nance and Eco-nom- ic De-vel- op-ment	Integrated - Min- istry of Health	Public and not for prof- it (includ- ing faith based)	RMCH	Facilities + district + provincial	17 indicators overall for facilities and 134 quality indicators.

Table 6. Characteristics of interventions - table B

Country	Study ID	Design of PBF scheme	How are the PBF incentives used and cascaded?	Who set the target and how were the targets set?	Measurement of targets: how and where from? Verification procedures	Magnitude of incentives	Relative size of incentive	Are bonuses additional to normal wages or funding?
Afghanistan	Engineer 2016	Payment per output modified by quality score (payment per output, additional payment based on balanced scorecard and contraceptive prevalence rates, all adjusted by a quality score - details of adjustment not provided)	Bonuses quarterly to health workers, based on volume of 9 health services. Additional annual payments based on quality, equity, and contraceptive prevalence rates. Health workers funds channelled through NGOs. Total payments adjusted by quality score.	Unclear though negotiation of targets allowed for balanced scorecard. NGOs and MOPH negotiated to adjust payments taking into account baseline conditions and expected improvements.	Monthly reports from health facilities verified quarterly by independent monitors, record-matching, and random patient home visits.	From USD 1.30 to USD 10.37 per unit (initial); from USD 2.67 to USD 35.63 per unit (revised)	6-11% above salary (2011), increasing to 14-28% (cadre dependent)	Yes
	Witvo-rapong 2016	Payment per output	Unclear	Unclear	Unclear	150 Afghanis (approx. USD 3) per referral	Unclear	Unclear
Argentina	Cellhay 2015	Payment per output - in addition to Plan Nacer, the experiment pays financial incentives to clinics at 200%	Bonuses to providers set by national government according to services in the benefits package. Health facilities choose how to use revenues – some pay bonuses to personnel.	National government according to clinical guidelines based on international evidence.	Electronic record management system	Unclear	Unclear	Unclear

Table 6. Characteristics of interventions - table B *(Continued)*

		premium for early initiation (pre 13 weeks) of ANC.						
	Gertler 2014	Target payments for enrolments and specific indicators, including health outcomes	National government reimburses provinces every four months, on per capita basis, to max \$8 per person per month - \$5 per eligible individual enrolled in Plan Nacer, plus \$3 if health targets achieved. Provinces pay clinics for RMCH services on fee-for-service basis. Payments used at discretion of providers, within guidelines.	Targets set with provinces in annual agreements between parties, based on indicators from best practice clinical protocols.	National statistics resources	Unclear	1.4-3.5% increase in public health expenditure	Yes
Benin	Lagarde 2015	Payment per output modified by quality score (quality score index with 124 quality criteria bounded between 0-1)	Unclear	Unclear	Facility reports subject to verification by MoH	From 340 FCFA (malaria cases detected and treated with RDT in children under 5 years) to 19,250 FCFA (HIV+ children initiated on ARV in last month)	Unclear	Yes
Brazil	Viñuela 2015	Performance-related pay (results-based management) involving different types of agreement. In Minas Gerais between	In relation to health sector, rewards group-based at level of the hospital. Portion of employees pay lined to achievement of goal set for the group.	Targets set by level, in discussion, and based on priorities	Unclear	Unclear	As large or higher than a month's salary (per year)	Yes

Table 6. Characteristics of interventions - table B (Continued)

governor and secretaries to follow strategic priorities of multi annual plans and second level agreements between secretaries and implementing teams with self-defined targets. Bonuses constitute sizeable incentives, up to one-month salary. In Pernambuco description not available								
Burkina Faso	Steenland 2017	PBF: combined CCT and quality (ranging 0-1) and equity adjustment (ranging 1-1.75) - all multiplicative	60% of payment given to health care providers, 40% for facility improvements. Allocation of payments between staff was weighted according to level of responsibility, training, absenteeism, and individual evaluation.	Unclear	Teams performed quarterly site visits.	Primary care facilities: 75 francs (well-child visits for children <5 years) to 1000 francs (children <5 found to have malnutrition) per service. Secondary care facilities: 1125 francs (smear positive TB cases treated) to 20000 francs (caesarean sections) per	For nurses, approx. 16% of average government salary. Otherwise Unclear.	Unclear

Table 6. Characteristics of interventions - table B (Continued)

service. Community health workers: -50 francs (number of patients who did not return to HF for vaccination) and 400 francs (number of patients diagnosed with malaria referred to CSPS).								
Burundi	Bonfrer 2014a	Payment per output and quality adjustment (ranges 1 - 1.25) - multiplicative	Payments made to facilities	Unclear	Health facilities report monthly to MoH. Local regulatory authorities do quarterly checks of quality on a random day.	From USD 0.05 (per child receiving vit A) to USD 20 (per TB patient correctly treated during 6 months).	Approx. 40% of the total health facility budget.	Yes
	Bonfrer 2014b	Payment per output and quality adjustment (ranges 1 - 1.25) - multiplicative	Health facilities allocate PBF revenue between staff remuneration (up to 50%) and service quality improvements.	Presumed MoH	Health facilities report monthly to MoH. Local regulatory authorities do quarterly checks of quality on a random day.	From USD 0.05 (per child receiving vit A) to USD 20 (per TB patient correctly treated during 6 months).	Approx. 40% of the total health facility budget	Yes
	Falisse 2015	Payment per output and quality adjustment (ranges 1 - 1.25) - multiplicative	Unclear	Appear to be set by NGOs or the MoH.	Unclear	Unclear	Unclear	Yes

Table 6. Characteristics of interventions - table B (Continued)

	Rudasingwa 2015	Payment per output and quality adjustment (ranges 1 - 1.25) - multiplicative	Facility managers distributed bonuses to staff of facilities included in PBF scheme, based on profile and performance criteria of each staff member - e.g. qualifications, experience, years of employment, responsibility, and worked hours.	Unclear	Quality assessed quarterly by evaluation team from district and provincial health authorities.	From USD 0.05 (per child receiving vit A) to USD 20 (TB patient correctly treated during 6 months).	Approx. 20% of health facilities total revenues	Yes
Cambodia	Ir 2015	Payment per output	Incentives paid to health facility through public financial reimbursement channels, who then distributed to midwives, physicians, and other trained health personnel attending deliveries in public health facilities. Of this up to 30% had to be shared further with other health personnel in the facility, and workers such as traditional birth attendants.	Set by government (Ministry of Health)	Monthly reports from health facility through routine health information system.	USD 15 (per live birth attended in health centre) and USD 10 (per live birth in hospitals)	Unclear	Yes
	Khim 2018	PBF (other) - service agreement	Unclear	Initially meant to be performance agreements between Ministry of Health (MOH) and Provincial Health Department (PHD), service delivery agreement between PHD and Special Operating Agencies (SOAs), and agreements between Director of SOA, heads of fa-	Unclear	USD 1.18 to USD 1.24 (district dependent) per capita Service Delivery Grant allocation.	Unclear	Yes

Table 6. Characteristics of interventions - table B (Continued)

				cilities and individual staff members. However, enforcement was actually weak, so this did not happen.				
	Matsuoka 2014	Payment per output	Unclear	Unclear	Appears to be nationwide statistics	USD 0.5 (per outpatient consultation visit to each Health Centre), USD 1 (per ANC visit; per immunization dose).	Unclear	Yes
	Van de Poel 2015	Performance based contracting	Unclear	Appears to be donor and government	Unclear	Unclear	Unclear	Yes
Cameroon	Zang 2015	PBF (unclear) - though the same scheme is covered by de Walque	Unclear	Unclear	Unclear	Unclear	Unclear	Unclear
	De Walque 2017	PBF (combined CCP and quality bonus and equity adjustment)	Payment at discretion of facility	Unclear	Facility reports submitted, and then verified by purchasing agency; purchaser and district assess quality scores.	From 20 FCFA (distribution of vitamin A supplementation) to 20,000 FCFA (cases of TB treated and healed).	Unclear	Yes

Table 6. Characteristics of interventions - table B (Continued)

China	Chang 2017	Payment per output (income withheld)	Bonuses are paid for reporting of adverse drug reactions, fines if reports withheld; bonuses apply to both physicians and wards but unclear how distributed to each.	Unclear	Routine retrospective review of charts by pharmacists	20 RMB for a spontaneous Adverse Drug Reaction report; fine of 5RMB for a withheld report	<1% of physician's salary	Unclear
	Yao 2008	Payment per output	Incentives provided to doctors, and to village leaders for disseminating TB knowledge - further details not specified.	Unclear	Appears to be routine data	USD 3 (for doctors for referral of new smear-positive TB patient), USD 8 (for village doctors for DOT for 6 months to new smear-positive patient), USD 1 (village leaders to disseminate TB knowledge).	Unclear	Yes (assessed by reviewers but not explicitly stated)
	Powell-Jackson 2014	Payment reform: conditional cash payment and target payment	Unclear, however Yip 2014 suggests that the health centres are paid and they then cascade payments to village clinics	Appears to be researchers with Ningxia province decision makers	Unclear	2 RMB (for village doctors per visit at clinic) or 4 RMB (per home visit). Amounts to average 12,000 RMB per village doctor.	Unclear	Yes (assessed by reviewers but not explicitly stated)
	Yip 2014	Payment reform to capitation with PBF)	Township health centres and village posts underwent performance assessments at twice yearly – New Cooperative Medical Scheme (NCMS) dispersed 70% of budget to health centres based at the beginning of the year and withheld the remaining 30% pending the results of these assessments. Health centres disbursed a share of this funding to village posts. Centres obtaining higher than average performance scores received more than the 30% of the budget	Targets set by New Cooperative Medical Scheme	Representatives of the supervising township health centre, the county department of health and the county New Cooperative Medical Scheme office	Unclear	Unclear	Yes

Table 6. Characteristics of interventions - table B (Continued)

that had been withheld; centres scoring below average received less than this 30%. Village post performance affected health centre performance.

Wu 2014	Target payment (negative)	Specialties required to keep drug percentage below a certain threshold. Physician's compensation is deducted if their drug percentage exceeds the threshold, with greater excess resulting in greater punishment. If exceeds threshold by <20%, deduction of CNY 100 (~USD 15) per percentage point over threshold; if exceeds threshold by >20%, punishment is CNY 150 (~USD 22) per percentage point over. No financial reward for being below threshold.	Initially Chinese government, as well as hospital from July 2004 to May 2005.	Hospital records	Deduction of CNY 100 (USD 15) per percentage point over threshold if actual drug percentage exceeds threshold by <20%; Deduction of CNY 150 (~USD 22) per percentage point over threshold if actual drug percentage exceeds threshold by >20%.	Approx. 2.5% decrease in attending physician's official income (1.4% decrease in total income) for each percentage above drug prescription threshold.	No
Liu and Mills 2005	Payment per output (including revenue)	Three types of bonus system: 1. Flat bonus distributed among hospital staff roughly equally, with the amount depending on overall financial status of hospital; 2. Quantity-related bonus according to quantity of services provided, usually with a target above which the bonus is paid; 3. Revenue-related bonus, depending on revenue generated by doctors through provision of services and drugs over a revenue target.	Unclear	Unclear	Unclear	Approx. 10% of salary	Yes
Sun 2014	Payment reform: capitation with negative performance payments	Township health centres received 80% of capitated global budget (CGB) quarterly. Quality of care assessment taken at beginning of next quarter, and report sent to payer – portion of remaining 20% of CGB paid based on assessment performance.	Appear to have been set through discussions between providers, research team, provincial	Study team via structured observation	Unclear	20% of operating budget of clinic	No

Table 6. Characteristics of interventions - table B (Continued)

					and country officials, and New Cooperative Medical Scheme officials.				
Congo	Zeng 2018a	Payment per output modified by quality score	Unclear		Unclear	Facility registers, with verification by CORDAID, who also carry out quarterly quality checks	From USD 0.40 (curative visits; HIV/AIDS cases with opportunistic infections treated), to USD 60 (tuberculosis and leprosy cases cured).	Unclear	Yes
Democratic Republic of the Congo	Huillery 2017	Conditional cash payment	Unclear		Unclear	Facility registers	From USD 0.6 (curative care visit) to USD 5 (complex case referral)	Total incentives represent approx. half of facilities' budget.	Yes (assessed by reviewers but not explicitly stated)
	Soeters 2011	Payment per output modified by quality score	Unclear		Targets appear to have been set by external consultants. Health facilities submitted business plans quarterly outlining strategies for delivering health packages.	Unclear	USD 200 to USD 4000 per facility per month - variation between facilities according to quality and remoteness.	Unclear	Yes (assessed by reviewers but not explicitly stated)
El Salvador	Bernal 2018	PBF (fixed element alongside a	Specification that 25% bonus received upon achieving a weighted 80% of targets is to be spent in the health sector		Targets agreed between gov-	Independent third party	Total incentive tranche USD	25% of total value of funding en-	Yes

Table 6. Characteristics of interventions - table B (Continued)

		targeted element)		ernment and Salud Mesoamerica Initiative based on indicators around inputs and quality of care, service utilization and health outcomes.	household survey	1,625,000 for first phase.	velope offered to governments.	
Haiti	Zeng 2013	Performance based contracting, with indicators for performance chosen at year end to avoid distortion	Facility given autonomy on use of money	MSH worked to set targets with NGO each year based on historical performance	Monthly reports by health facility	Unclear	5%-10% of budget, depending on performance	Yes
India	Mohanan 2017	Payment for health outcome targets (combining negative target payments and incremental payments for lower levels of maternal mortality from specific causes); second arm tested payment for adherence	2 payment mechanisms in intervention arms: In both arms, providers given incentive payment only at end of study period, with no interim payments. For output based arm, payment based on rewards for each of 4 outcomes. For input based arm, payment based on rewards for each of 5 domains of care.	All incentives and contracts are set to allow equal maximum level of payment + to ensure that the project could afford it all.	Experimental setting; measured through household surveys and repeated provider surveys	Maximum of INR 150,000 (USD 2,700 at time of contract) for doctors	Approx. 15% of specialist doctor salary	Yes

Table 6. Characteristics of interventions - table B (Continued)

		to WHO protocols for maternal health care (payment according to score against five domains of care)						
Kenya	Menya 2015	Target payments (positive and negative)	Intervention facilities received payments based on 7 performance indicators. Incentives had to be used for equipment, supplies, repairs, and basic labour, rather than payments to employees or clinicians.	Study team - to foster co-operation between departments and harmonize their working	Appears to be from facility registers during study team visits	Maximum USD 1,175 (100,000 KSh) per quarter per facility.	Approx. equivalent to money saved if overuse of ACT curbed.	Yes
Malawi	McMahon 2016	Payment per output modified by quality score	Rewards paid to facilities based on achievement of set targets. Rewards to be used for facility improvements or other strategies outlined in annual business plans developed by facility staff and Support for Service Delivery Integration (SSDI) staff. Rewards cannot be redistributed to health workers as performance bonuses.	Unclear	Quality is measured by communities and patient interviews. Further details unclear.	Unclear	Unclear	Yes
Multiple - Burkina Faso, Ghana and Tanzania	Duysburgh 2015	Clinical decision guide + PBF (financial and non-financial incentives)	Unclear	Based on qualitative research with stakeholders involved, for instance health workers and policy makers.	Emphasis on routine measurement of indicators	Unclear	Unclear	Unclear
Peru	Cruzado de la Vega, 2017	Combinations of the above - appears to	Agreements used to transfer resources to the budgets of these regions with the condition of fulfilling management commitments and coverage goals with a	Programme is based on agreement made be-	Unclear	Unclear	Unclear	Unclear

Table 6. Characteristics of interventions - table B *(Continued)*

		be a mix of conditional cash payment and target payment: "El CAP estaba compuesto por dos tramos: uno "variable", que pagaba de acuerdo al cumplimiento de metas en los indicadores de coberturas de los servicios de salud priorizados y uno "fijo", que pagaba de acuerdo al cumplimiento de compromisos de gestión orientados a mejorar los procesos operativos de la oferta de las prestaciones en los centros de salud."	view toward improving the nutritional status of children.	tween the national and regional governments				
Philippines	Peabody 2011	Target payment (quality scores)	The total bonus payments received by the hospital were distributed among physicians and other hospital staff and were paid quarterly.	Unclear	Measured using clinical performance vignette (CPV)	100 pesos (USD 49 in 2006) per patient per day of confinement	5% of total physician salaries.	Yes

Table 6. Characteristics of interventions - table B (Continued)

				<p>scores (focussed on dermatitis, diarrhoea and pneumonia) plus quarterly case-load scores and patient satisfaction scores. Biannually 2 trained physician abstractors scored 3 CPVs from randomly selected physicians at each hospital.</p>	<p>(eligible intervention B hospitals).</p>		
Quimbo 2016	Target payment (quality scores)	The total bonus payments received by the hospital were distributed among physicians and other hospital staff and were paid quarterly.	Unclear	<p>Measured using clinical performance vignette (CPV) scores (focussed on dermatitis, diarrhoea and pneumonia) plus quarterly case-load scores and patient satisfaction scores. Biannually 2 trained physician abstractors scored 3 CPVs from randomly selected physicians at each hospital.</p>	<p>100 pesos (USD 49 in 2006) per patient per day of confinement (eligible intervention B hospitals).</p>	<p>5% of total physician salaries.</p>	<p>Yes</p>

Table 6. Characteristics of interventions - table B (Continued)

Wagner 2018	Target pay- ment (qual- ity scores)	The total bonus payments received by the hospital were distributed among physicians and other hospital staff and were paid quarterly.	Unclear	Measured us- ing clinical performance vignette (CPV) scores (fo- cussed on dermatitis, di- arrhoea and pneumonia) plus quar- terly case- load scores and patient satisfac- tion scores. Biannually 2 trained physi- cian abstrac- tors scored 3 CPVs from randomly se- lected physi- cians at each hospital.	100 pesos (USD 49 in 2006) per patient per day of confinement (eligible inter- vention B hos- pitals).	5% of total physician salaries.	Yes
Peabody 2014	Target pay- ment (qual- ity scores)	The total bonus payments received by the hospital were distributed among physicians and other hospital staff and were paid quarterly.	Unclear	Measured us- ing clinical performance vignette (CPV) scores (fo- cussed on dermatitis, di- arrhoea and pneumonia) plus quar- terly case- load scores and patient satisfac- tion scores. Biannually 2 trained physi- cian abstrac- tors scored 3 CPVs from	100 pesos (USD 49 in 2006) per patient per day of confinement (eligible inter- vention B hos- pitals).	5% of total physician salaries.	Yes

Table 6. Characteristics of interventions - table B (Continued)

Rwanda	Basinga 2011	Payment per output modified by quality score (ranging 0-1)	Payments are made directly to facilities and are used at each facility's discretion. On average, facilities in intervention group allocated 77% of funds to increase personnel compensation; facilities in control group allocated 73% of the additional input based funds to increase personnel compensation.	Unclear	Facilities submit monthly reports and quarterly requests for payment to district P4P steering committee. Verification by steering committee.	From USD 0.09 (number of first prenatal care visit) to USD 4.59 (number of deliveries in facility; number of emergency transfers to hospital for obstetric care during delivery).	Unclear	Yes
	Lannes 2016	Payment per output modified by quality score (ranging 0-1)	Payments are made directly to facilities and are used at each facility's discretion. On average, facilities in intervention group allocated 77% of funds to increase personnel compensation; facilities in control group allocated 73% of the additional input based funds to increase personnel compensation.	Unclear	Facilities submit monthly reports and quarterly requests for payment to district P4P steering committee. Verification by steering committee.	From USD 0.09 (number of first prenatal care visit) to USD 4.59 (number of deliveries in facility; number of emergency transfers to hospital for obstetric care during delivery).	Unclear	Yes
	Priedeman Skiles 2013	Payment per output modified by quality score (ranging 0-1)	Payments are made directly to facilities and are used at each facility's discretion. On average, facilities in intervention group allocated 77% of funds to increase personnel compensation; facilities in control group allocated 73% of the additional input based funds to increase personnel compensation.	Unclear	Facilities submit monthly reports and quarterly requests for payment to district P4P steering committee. Verification by steering committee.	From USD 0.09 (number of first prenatal care visit) to USD 4.59 (number of deliveries in facility; number of emergency transfers to hospital for obstetric care during delivery).	Unclear	Yes

Table 6. Characteristics of interventions - table B (Continued)

Priedeman Skiles 2015	Payment per output modified by quality score (ranging 0-1)	Payments are made directly to facilities and are used at each facility's discretion. On average, facilities in intervention group allocated 77% of funds to increase personnel compensation; facilities in control group allocated 73% of the additional input based funds to increase personnel compensation.	Unclear	Facilities submit monthly reports and quarterly requests for payment to district P4P steering committee. Verification by steering committee.	during delivery). From USD 0.09 (number of first prenatal care visit) to USD 4.59 (number of deliveries in facility; number of emergency transfers to hospital for obstetric care during delivery).	Unclear	Yes
Sherry 2017	Payment per output modified by quality score (ranging 0-1)	Payments are made directly to facilities and are used at each facility's discretion. On average, facilities in intervention group allocated 77% of funds to increase personnel compensation; facilities in control group allocated 73% of the additional input based funds to increase personnel compensation.	Unclear	Facilities submit monthly reports and quarterly requests for payment to district P4P steering committee. Verification by steering committee.	From USD 0.09 (number of first prenatal care visit) to USD 4.59 (number of deliveries in facility; number of emergency transfers to hospital for obstetric care during delivery).	Unclear	Yes
Lannes 2015	Payment per output modified by quality score (ranging 0-1)	Payments are made directly to facilities and are used at each facility's discretion. On average, facilities in intervention group allocated 77% of funds to increase personnel compensation; facilities in control group allocated 73% of the additional input based funds to increase personnel compensation.	Unclear	Facilities submit monthly reports and quarterly requests for payment to district P4P steering committee. Verification by steering committee.	From USD 0.09 (number of first prenatal care visit) to USD 4.59 (number of deliveries in facility; number of emergency transfers to hospital for obstetric care during delivery).	Unclear	Yes

Table 6. Characteristics of interventions - table B (Continued)

Shapira 2018	Conditional cash payment to community cooperatives	Indication is that the extra PBF program operates similarly to the background PBF programme operational since 2009, however implementers themselves are noted to have been confused: 30% of the cooperative payments under the usual PBF scheme could be given to members; 70% minim had to be reinvested in the cooperative.	Unclear	Cooperative reporting (incentivized as part of a background PBF programme)	Varies 2010-2014. 2010: From USD 2.11 (per regular family planning user) to USD 3.24 (per child monitored for nutritional status). 2014: From USD 0.43 (per child monitored for nutritional status) to USD 1.05 (per new family planning user).	Approx. 1% of gross national income (7.3 USD on average, compared to gross national income 690 USD/capita)	Yes
Rusa 2009	Payment per output modified by quality score (quality score can only decrease the payment)	Unclear	Unclear who set targets – presumed Ministry of Health with support of Belgian Technical Cooperation. Indicators linked to services delivered and service quality.	District Supervisors (DS) collected monthly data on quantity and quality of services. Verification by 2 DS trained by central level supervisors.	From 100 to 2500 FRW (USD 0.18-4.5) per unit for basic activities.	Subsidy/salary ratio 39% in 2005, 84% in 2006, 40% in 2007 (all personell confounded). Approx. 32–78% of the base salary of an auxiliary nurse A2.	Yes
Gertler 2012	Payment per output modified by quality score (ranging 0-1)	Payments are made directly to facilities and are used at each facility's discretion. On average, facilities in intervention group allocated 77% of funds to increase personnel compensation; facilities in control group allocated 73% of the additional input based funds to increase personnel compensation.	Unclear	Facilities submit monthly reports and quarterly requests for payment to district P4P steering committee. Verification by	From USD 0.18 (e.g. per curative care visit) to USD 4.59 (e.g. per delivery in the facility)	24.6% increase in funding above the base budget	Yes

Table 6. Characteristics of interventions - table B (Continued)

	de Walque 2015	Payment per output	Payments are made directly to facilities and are used at each facility's discretion. On average, facilities in intervention group allocated 60-80% of funds to increase personnel compensation.	The Ministry of Health	Facilities submit monthly reports and quarterly requests for payment to district P4P steering committee. Verification by steering committee.	From USD 0.46 (per HIV+ patient treated with co-trimoxazole each month) to USD 9.17 (per infant born to HIV+ mothers tested)	14% of overall expenditures in 2007.	Yes
Swaziland	Kliner 2015	Payment per output	Community Support Workers (CSWs) given monthly financial incentives to cover travel to the clinic with (or on behalf of) the patient, and cover other supplies for the patient.	Unclear	Appears to be TB register	USD 5.75 per month/per patient plus USD 34.40 per patient who completed treatment or was cured after 6 months	Unclear	Yes (assessed by reviewers but not explicitly stated)
Tanzania	Brock 2018	PBF (conditional provision of material goods)	NA - this is about receiving gifts both conditional or not	Study team	Study team	Book	Not applicable (incentive a book)	Yes
	Binyaruka 2015	PBF (target payment)	Full payment made to facilities if 100% of target achieved. If less than 100% but at least 75% of targets achieved, 50% of payment is made. 75% of bonus payments required to be distributed among health workers. Remaining 25% retained by facility – used for drugs, supplies, renovations.	Unclear	National Health Management Information System	Maximum USD 820 for dispensaries; USD 3,220 for health centres; and USD 6,790 for hospitals.	Approx. 10% of health worker monthly salary.	Yes
	Binyaruka 2017	PBF (target payment)	Full payment made to facilities if 100% of target achieved. If less than 100% but at least 75% of targets achieved, 50% of payment is made. 75% of bonus payments required to be distributed among	Unclear	National Health Management Information System	Maximum USD 820 for dispensaries; USD 3,220 for health centres; and	Approx. 10% of health worker monthly salary.	Yes

Table 6. Characteristics of interventions - table B (Continued)

			health workers. Remaining 25% retained by facility – used for drugs, supplies, renovations.			USD 6,790 for hospitals.		
Binyaruka 2018	PBF (target payment)	Full payment made to facilities if 100% of target achieved. If less than 100% but at least 75% of targets achieved, 50% of payment is made. 75% of bonus payments required to be distributed among health workers. Remaining 25% retained by facility – used for drugs, supplies, renovations.	Unclear	National Health Management Information System	Maximum USD 820 for dispensaries; USD 3,220 for health centres; and USD 6,790 for hospitals.	Approx. 10% of health worker monthly salary.	Yes	
Mayumana 2017	PBF (target payment)	Full payment made to facilities if 100% of target achieved. If less than 100% but at least 75% of targets achieved, 50% of payment is made. 75% of bonus payments required to be distributed among health workers. Remaining 25% retained by facility – used for drugs, supplies, renovations.	Unclear	National Health Management Information System	Maximum USD 820 for dispensaries; USD 3,220 for health centres; and USD 6,790 for hospitals.	Approx. 10% of health worker monthly salary.	Yes	
Zambia	Friedman, 2016a	Conditional payment with quality adjustment (based on thresholds for quality scores of 61% and above. Quality scores additional to quantity. Contracting done by provincial steering committees	Health facilities authorised to use at least 40% of PBF payments for operational activities, and to increase service delivery. Up to 60% of payments could be used for staff motivation bonuses.	Assumed Ministry of Health and RBF Steering Committees.	Measurement through facility level data. Verification by District Medical Officers (on quantity indicators) and District (General) Hospitals (on quality). Additional verification by District RBF Steering Committees.	From USD 0.2 (curative consultation) to USD 6.4 (institutional deliveries by skilled birth attendant)	10% of staff salaries	Yes
	Shen 2017	Conditional payment with quality adjustment	Health facilities authorised to use at least 40% of PBF payments for operational activities, and to increase service	Assumed Ministry of Health and RBF Steer-	Measurement through facility level data. Verifica-	From USD 0.2 (curative consultation) to USD 6.4 (institu-	10% of staff salaries	Yes

Table 6. Characteristics of interventions - table B (Continued)

		(based on thresholds for quality scores of 61% and above. Quality scores additional to quantity. Contracting done by provincial steering committees	delivery. Up to 60% of payments could be used for staff motivation bonuses.	ing Committees.	tion by District Medical Officers (on quantity indicators) and District (General) Hospitals (on quality). Additional verification by District RBF Steering Committees.	tional deliveries by skilled birth attendant)		
Chansa, 2015	Conditional cash payment + quality adjustment (multiplicative, not additional)	Unclear		Price of each indicator set based on baseline coverage, MoH targets and complexity of delivery	Measured via Health Management Information System (HMIS). Verification by a hospital contracted by the District Medical Officer; DMO verified self-reporting of facilities into HMIS; University of Zambia conducted external quality audits.	From USD 0.2 (curative consultation) to USD 6.4 (institutional deliveries by skilled birth attendant)	Between 2-56% of staff salary, dependent on area	Yes
Zimbabwe	Friedman 2016b	Combination of conditional cash payment (payment per targeted service) and quality ad-	According to Government's guidelines, facilities could share maximum of 25% of PBF income among staff as salary supplements. Remaining 75% spent on improving facility working conditions, such as infrastructure, supplies, and equipment.	Set by programme based on priorities for improvement	Facility records verified by MoH and also implementing NGOs and University of Zimbabwe	From USD 0.05 (new OPD consultation) to USD 140 (cesarean section).	Unclear	Yes

Table 6. Characteristics of interventions - table B *(Continued)*

		justment (quality per service additional to the main CCP, capped at 25% of the main CCP, scores are scaled and quality. score must. be. over 50% to receive min 15%). Additional remoteness bonus for facilities.					
Das 2017	Combination of conditional cash payment + addition of quality (weighted 75%) and patient satisfaction (weighted 25%) bonus.	According to Government's guidelines, facilities could share maximum of 25% of PBF income among staff as salary supplements. Remaining 75% spent on improving facility working conditions, such as infrastructure, supplies, and equipment.	Set by programme based on priorities for improvement	Facility records verified by MoH and also implementing NGOs and University of Zimbabwe	Unclear	Unclear	Yes

Table 7. Intervention classification - table A

Scheme classification (as based on descriptions provided in reviewed documents)	Details on scheme	Nr. Studies	Studies reporting	Countries included (n)	Study types (n)	Comparators against which scheme impacts assessed (n)
Capitation and PBF	Payment reforms including capitation and PBF elements	2	Yip 2014 and Sun 2016	China (2)	RCT (1) and quasi-randomized trial (1)	Fee for service (1) and global capitated budget only (1)
Conditional provision of material goods	Conditional provision of material goods alongside supervision and quality improvement strategies	1	Brock 2018	Tanzania (1)	Quasi-randomized trial (1)	Unconditional gifts (either immediate or delayed) as alternative interventions and control (all receive a standard encouragement intervention) (1)
Financial and non-financial incentives + clinical decision guide	Mix of financial and non-financial incentives, alongside clinical decision guide and supervision/technical support	1	Duysburgh 2016	Burkina Faso, Ghana and Tanzania (all in 1)	CBA (1)	Control as standard care (1)
Performance related pay	Performance-related pay (results-based management) involving different types of agreement according to province implemented (ranging from multi-level agreements with strategic targets to not specified)	1	Vinuela 2015	Brazil (1)	ITS (1)	Comparison of impact over time in implementing provinces. (1)
Performance based contracting or service agreements	Service agreements introduced as part of reform and in case of contracting, with indicators for performance chosen at year end to avoid distortion	3	Van den Poel 2016, Khim 2018 and Zeng 2013	Cambodia (2), Haiti (1)	CBA (2), ITS (1)	Routine practice as control (2) and comparison of indicators over time. (1)
Hybrid scheme	Payment per output and for target	2	Powell-Jackson 2014,	China (1), Peru (1)	Quasi/non random-	Control as standard care (2)

Table 7. Intervention classification - table A *(Continued)*

			Cruza- do de la Vega 2017		ized trials (2)	
Results based aid	Fixed element alongside a targeted ele- ment as part of results based aid	1	Bernal 2018	El-Sal- vador (1)	CBA (1)	Control as status quo (1)

Table 8. Intervention classification - table B

Scheme classification (as based on descriptions provided in reviewed documents)		Details on scheme	Nr. Studies	Studies reporting	Countries included (n)	Study types (n)	Comparators against which scheme impacts assessed (n)
Payment per output	Payment per output	Payment for each output	9	Huillery 2017, Shapira 2018, Witvorapong 2016, Ir 2015, Matsuoka 2014, Yao 2008, Kliner 2015, Celhay 2015, Walque 2015	Afghanistan (1), Argentina (1), China (1), Cambodia (2), DRC (1), Swaziland (1), Rwanda (2)	RCT (4), Quasi/non-randomized (2), ITS (2), CBA (1)	Control as status quo/standard care (4), comparison over time in implementing locations (2), comparator of matched funding or background PBF programmes into which experiments nested (3)
		Payment per output with income potentially withheld	1	Chang 2017	China (1)	ITS (1)	Comparison of impact over time in implementing hospital. (1)
		Payment per output including revenue	1	Liu and Mills 2009	China (1)	ITS (1)	Comparison over time in implementing provinces (1)
	Payment per output modified by quality score	Payment per output with quality as multiplicative adjuster (between 0-1)	11	Zeng 2018a, Chansa 2015, Lagarde 2015, Basinga 2011, Lannes 2015, Lannes 2016, Priedeman Skiles 2013, Priedeman Skiles 2015, Sherry 2017, Rusa 2009, Gertler 2013	Congo (1), Zambia (1), Benin (1), Rwanda (8)	Quasi/non-randomized trial (8), CBA (1), ITS (2)	Control with standard care (2), Over time comparison in implementation areas (2), Comparator of matched funding (7)
		Payment per output with quality bonuses (quality adjuster an additional but not deducting component)	7	Bonfrer 2014a, Bonfrer 2014b, Falisse 2015, Rudasingwa 2015, Shen 2017, Friedman 2016a	Burundi (4), Zambia (2)	RCT (2) and CBA (4)	Control as standard care (5), Comparator of enhanced matched financing (2)
		No description of payment equation - quality adjustment noted	1	Engineer 2016	Afghanistan (1)	RCT (1)	Control with standard care (1)

Table 8. Intervention classification - table B *(Continued)*

	Payment per output modified by quality and equity score	Modification to payment equation based on population equity or remoteness of facilities	5	Steenland 2017, Soeters 2011, de Walque 2017, Zang 2015, Friedman 2016b	Burkina Faso (1), Cameroon (2), DRC (1), Zimbabwe (1)	Quasi/non randomized trials (2), CBA (3)	Control as standard care (4) and comparator including equipment and other in kind support (1)
	Payment per output modified by quality and satisfaction score	Modification to payment including bonuses for enhanced patient satisfaction	2	McMahon 2016, Das 2017	Malawi (1), Zimbabwe (1)	CBA (2) and ITS (1) (one study does both)	Control as standard care (2)
Target payment	Target payment	Potential for income gain only	12	Gertler 2014, Menya 2015, Peabody 2011, Peabody 2014, Quimbo 2016, Wagner 2018, Binyaruka 2015, Binyaruka 2017, Binyaruka 2018, Mayumana 2017	Argentina (1), Kenya (1), Philippines (4), Tanzania (4)	RCT (5), CBA (5)	Control as standard care/status quo (12)
		Potential for income withheld	1	Wu 2014	China (1)	ITS (1)	Over time (1)
		Target payment or payment per input	1	Mohanan 2017	India (1)	RCT (1)	Control as status quo (1)

Table 9. Sensitivity analyses against control: Direction of relative effect and GRADE rating for targeted outcomes across RCT studies only

Direction of relative effect and GRADE rating for targeted outcomes across RCT studies only				
Outcome	Indicator (if indicator not named, no RCT evidence available)	Comment on effect (desirable, undesirable, neutral or uncertain)	Certainty of the evidence	Commentary on intervention effect [SIMON: please make it clear below where you are referring to a range rather than a single result]
Primary: Utilization and delivery	Child immunization: receiving at least one vaccine	—	⊕⊕⊕⊕	P4P probably has no important effect on outcome (1%).
	Child immunization: fully vaccinated	▲	⊕⊕⊕⊕	P4P may lead to higher rate of full vaccination (16.1%)
	Child immunization: receiving BCG	▲	⊕⊕⊕⊕	P4P may lead to higher rate of BCG vaccination (1-7%)
	Child immunization: receiving DTP	▲	⊕⊕⊕⊕	P4P may lead to higher rate of DTP vaccination (6.1%)
	Child immunization: measles	—	⊕⊕⊕⊕	P4P may have little to no important effect on measles vaccination rates (-3.6%).
	Child immunization: polio	▲	⊕⊕⊕⊕	P4P may lead to higher rate of polio vaccination (21%)
	Child immunization: pentavalent	▼	⊕⊕⊕⊕	P4P reduces the pentavalent immunization rate (-5.7%)
	Probability of any utilization (% utilising)	—	⊕⊕⊕⊕	P4P may have slight positive effects on overall utilization of services (4.2%)
	Antenatal care (delivery and utilization rates overall)	—	⊕⊕⊕⊕	P4P may have a slight positive effect on the ANC utilization rate (4%)
	Total number ANC visits	▼	⊕⊕⊕⊕	P4P may lead to a decrease in the total number of ANC visits, estimated at -35% to -4.60%.
	At least one ANC (utilization rates)	▼	⊕⊕⊕⊕	P4P probably leads to a reduction in the utilization of at least 1 ANC visit (-10% to -1.5%)
	At least four ANC (utilization rates)	▼	⊕⊕⊕⊕	P4P may lead to a decrease in rate of women utilizing 4 or more ANC sessions (-5.4%)
	ANC from qualified provider (% receiving)	—	⊕⊕⊕⊕	P4P may lead to an increase in the delivery of ANC by a qualified provider (4.7%).
	Family planning (% using any method)	▼	⊕⊕⊕⊕	P4P may have slight negative or no impact on family planning utilization (-6.3% to null effect).
	Family planning (% using modern methods)	—	⊕⊕⊕⊕	P4P may have no important effect on utilization of modern family planning (0.2%).

Table 9. Sensitivity analyses against control: Direction of relative effect and GRADE rating for targeted outcomes across RCT studies only (Continued)

	Institutional delivery (rates or coverage)	▲	⊕⊕⊕⊖	P4P probably has positive effects on the rate of institutional deliveries (effects range from -3% to 18.1%, but are predominantly positive)
	Institutional delivery: % using C section	■	⊕⊕⊕⊖	P4P probably has limited effect on the rate of C-sections within the institutional deliveries (2%)
	Institutional delivery: likelihood of skilled attendance at birth	▲	⊕⊕⊕⊖	P4P probably improves the likelihood of having a skilled birth attender (4 to 16.2%).
	Postnatal care (overall utilization rate)	▲	⊕⊕⊕⊖	P4P probably has positive impacts on postnatal care utilization (effects from -2% to 10.8%, predominantly positive).
	Postnatal care: likelihood of skilled attendance	▲	⊕⊕⊕⊖	P4P may have a positive effect on skilled attendance during postnatal care (15.79%).
	Postnatal care: % receiving timely access	■	⊕⊕⊕⊖	P4P has no important effect on this outcome (effect 0.8%).
	Curative consultations in children (rates)	▼	⊕⊕⊕⊖	P4P may reduce the utilization of curative care visits for children by up to 10.9%.
Primary: Health outcomes	Neonatal mortality	■	⊕⊕⊕⊖	P4P probably has no significant impact on neonatal mortality (0.03%).
Primary: Quality of care	Background and physical assessment (scores general, across ANC, PNC, child care and for other consultations).	▼	⊕⊕⊕⊖	P4P may have negative effects on quality of care scores associated with background and physical assessments (-17% to 4%, predominantly negative).
	Correct patient management by health care providers (scores in relation to ANC, child care and PNC)	■	⊕⊕⊕⊖	P4P probably has no effect on quality of care scores associated with correct patient management (0.03%).
	Patient counselling (scores on ANC and PNC related counselling)	□	⊕⊕⊕⊖	P4P effects on quality of care scores range between -37% to 6%.
	Immunizations (score for receiving any tetanus and nr. of tetanus vaccinations)	■	⊕⊕⊕⊖	P4P may have little to no important effect on quality of care relating to immunizations (2.25%).
	Women in ANC being given or prescribed folic acid/iron (%)	▲	⊕⊕⊕⊖	P4P may improve the likelihood of being prescribed folic acid/iron during ANC by up to 5.5%.
	Staff knowledge and skills (score)	■	⊕⊕⊕⊖	P4P may have little to no effect on staff knowledge and skills.
	Patient knowledge (score)	▲	⊕⊕⊕⊖	P4P's may have positive effects on patient knowledge: effects range from -3 to 116%, overall positive.
	Contact time	■	⊕⊕⊕⊖	P4P probably has no significant impact upon contact time (2.5%).

Table 9. Sensitivity analyses against control: Direction of relative effect and GRADE rating for targeted outcomes across RCT studies only (Continued)

	Overall composite quality of care (score)	■	⊕⊕⊕⊕	P4P probably has little to no effect on overall care quality scores (1.6% to 4%).
	Quality of ANC (score)	■	⊕⊕⊕⊕	P4P may have slight positive effects on quality of ANC (2%).
	Quality of child health (score)	▲	⊕⊕⊕⊕	P4P probably has positive effects on the quality of child health scores (300%).
	Quality of medicine and equipment (score)	▲	⊕⊕⊕⊕	P4P probably increases the quality of medicines and equipment by up to 220%.
	Quality by department/service (score)	▲	⊕⊕⊕⊕	P4P probably increases the quality of specific departments and services up to 15 fold.
Primary: Unintended effects	Overall impacts on free riding and task shifting	■	⊕⊕⊕⊕	P4P may have little distorting effects.
Primary: Changes in resource use	Equipment availability (index)	▲	⊕⊕⊕⊕	P4P probably increases equipment availability by up to 300%.
	Equipment functionality (index)	■	⊕⊕⊕⊕	P4P probably has little to no effect on equipment functionality (1.4%)
	Infrastructure functionality (index)	▲	⊕⊕⊕⊕	P4P probably leads to improvements in infrastructure functionality scores by up to 345%.
	Medicine availability (index)	▲	⊕⊕⊕⊕	P4P probably has positive impacts on medicine availability, increasing this by up to 200%.
	Vaccine availability (index)	▲	⊕⊕⊕⊕	P4P may have positive effects on vaccine availability (21.95%).
Secondary: Provider motivation, satisfaction, absenteeism and acceptability	Provider motivation (score)	■	⊕⊕⊕⊕	P4P probably has no important effect on outcome.
	Provider satisfaction (score)	■	⊕⊕⊕⊕	P4P probably has no important effect on outcome.
Secondary: Patient satisfaction and acceptability (satisfaction scores)	Overall patient satisfaction with quality of care (score)	■	⊕⊕⊕⊕	P4P probably has no important effect on outcome.
	Overall satisfaction (score)	■	⊕⊕⊕⊕	P4P probably has no important effect on outcome.

Table 9. Sensitivity analyses against control: Direction of relative effect and GRADE rating for targeted outcomes across RCT studies only (Continued)

Se- condary: Impacts on man- agement or infor- mation systems (if not a targeted measure of perfor- mance)	Facility or managerial autonomy (score)	▲	⊕⊕⊕⊕	P4P may have positive impacts on facility autonomy (score increases up to 146%).
	Facility governance (score)	—	⊕⊕⊕⊕	P4P may have little to no effect on this outcome.
	Quality of management (score)	—	⊕⊕⊕⊕	P4P may have little to no effect on this outcome.

Direction of effect key

- ▲ Desirable
▼ Non-desirable
— Neutral
□ Uncertain

Certainty in evidence key

- ⊕⊕⊕⊕ Moderate
⊕⊕⊕⊕ Low

Table 10. Sensitivity analyses against comparator: Direction of relative effect and GRADE rating for targeted outcomes across RCT studies only

Direction of relative effect and GRADE rating for targeted outcomes across RCT studies only				
Outcome	Indicator (if indicator not named, no RCT evidence available)	Comment on effect desirable, undesirable, neutral or uncertain)	Certainty in evidence	Commentary on intervention effect
Primary: Utilization and deliv- ery	Child immunization	▼	⊕⊕⊕⊕	P4P may decrease the likelihood of children being immunized by up to 7.4%.
	Child immunization: BCG	—	⊕⊕⊕⊕	P4P may have little to no effect on utilization of BCG vaccination (+3.1%).
	Child immunization: DTP	—	⊕⊕⊕⊕	P4P may have little to no effect on utilization of DTP vaccination (-1%).
	Child immunization: fully vaccinated	▲	⊕⊕⊕⊕	P4P may have positive effects on the likelihood of children being fully vaccinated (39.8%).
	Probability of any utilization	▲	⊕⊕⊕⊕	P4P may have slight positive effects on probability of care seeking (8.3%) but overall other effects are inconsistent.
	Family planning (% utilizing any)	—	⊕⊕⊕⊕	P4P may have little to no effect on the utilization of family planning services.

Table 10. Sensitivity analyses against comparator: Direction of relative effect and GRADE rating for targeted outcomes across RCT studies only (Continued)

	Antenatal care: % utilising at least one ANC	■	⊕⊕⊕⊕	P4P may have little to no effect on utilization of ANC (-1.5%).
	Antenatal care: % utilising four or more	■	⊕⊕⊕⊕	P4P may have little to no effect on utilization of 4 or more ANC appointments (-0.6%).
	Antenatal care: % accessing ANC in first trimester	▲	⊕⊕⊕⊕	P4P may have a positive effect on timely care initiation by women (1-10% initiating care earlier, approx. 1 month earlier)
	Utilization of curative services in children	■	⊕⊕⊕⊕	P4P may have little to no effect on utilization of curative visits for children (-3.1%).
	Institutional delivery (utilization rate)	▼	⊕⊕⊕⊕	P4P may have negative effects on the utilization of institutional deliveries (-8.7%)
	Postnatal care (utilization rate)	▼	⊕⊕⊕⊕	P4P may have negative effects on the utilization of postnatal care (-10%)
Primary: Changes in resource use	Equipment availability (composite score)	▲	⊕⊕⊕⊕	P4P may improve equipment availability scores by up to 75%.
	Medicine availability (composite score)	▼	⊕⊕⊕⊕	P4P may decrease medicine availability scores by up to 160%.
Primary: Health outcomes	Likelihood of women breastfeeding	■	⊕⊕⊕⊕	P4P may have little to no effect on the likelihood of women breastfeeding.
Primary: Quality of care	Background and physical assessment (score)	▼	⊕⊕⊕⊕	P4P may decrease the likelihood of providers conducting background and physical assessments by up to 5.4%.
	Counselling (score)	▼	⊕⊕⊕⊕	P4P may have negative effects on providers counselling patients appropriately (-40%).
	Immunizations quality (score)	▲	⊕⊕⊕⊕	P4P may have slight positive effects on immunization quality (5.2%).
	Knowledge outcomes (score)	▼	⊕⊕⊕⊕	P4P may have slight negative effects on patient knowledge outcomes (-5.4% to -2.4%)
	Total quality family planning (score)	▲	⊕⊕⊕⊕	P4P probably has positive effects on the quality of family planning (500%).
	Total quality antenatal care (score)	▲	⊕⊕⊕⊕	P4P may have positive effects on ANC quality scores (40%).
Se- condary: Impacts on man- agement or infor- mation systems (if not a targeted	Facility and managerial autonomy (score)	▲	⊕⊕⊕⊕	P4P may increase facility and managerial autonomy scores by up to 46%.

Table 10. Sensitivity analyses against comparator: Direction of relative effect and GRADE rating for targeted outcomes across RCT studies only (Continued)

measure
of perfor-
mance)

▲ Desirable
▼ Non-desirable
■ Neutral
□ Uncertain
Certainty in evidence key
⊕⊕⊕⊕ Moderate
⊕⊕⊕⊕ Low

Table 11. Sub-group analyses - table A

Type of PBF	Average rank of scheme	
	Control	Comparator
Performance based contracting or service agreements	1.33	1.33
Results based aid	1.33	N/A
Payment per output (quality and equity adjustment)	1.57	N/A
Payment per output (quality adjustment)	1.66	1.50
Payment per output and for target	1.75	N/A
Payment per output (quality and satisfaction adjustment)	1.92	N/A
Payment per output	2.17	1.83
Target payment	2.17	N/A
Capitation and P4P	2.50	N/A
Financial and non-financial incentives + decision guide	3.00	N/A
Performance related pay	N/A	N/A

Lower rating better

Table 12. Sub-group analyses - table B

Findings of sub-group analyses (P4P against control) by outcome - b									
Scheme design	Average rank by outcome								
	P: Utiliza- tion and delivery	P: Health outcomes	P: Quality of care	P: Changes in re- source use	S: Provider moti- vation, satis- faction, absen- teeism and ac- cept- ability	S: Pa- tient satisfac- tion and accept- ability (satis- faction scores)	S: Im- pacts on overall financ- ing or re- source al- location	S: Impacts on manage- ment or in- formation systems (if not a tar- geted mea- sure of per- formance)	S: Equi- ty-consid- eration: Ev- idence of differential impact on different parts of the population
Performance based contracting or service agreements	1.33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Results based aid	1.33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Payment per output (quality and equity ad- justment)	1.47	2.00	1.55	1.67	1.00	2.00	1.50	1.67	1.00
Payment per output and for target	1.50	2.00	N/A	2.00	N/A	N/A	N/A	N/A	2.00
Payment per output (quality adjustment)	1.65	1.00	1.64	1.40	2.00	1.78	3.00	1.33	2.00
Payment per output	2.00	N/A	2.60	N/A	2.00	2.00	N/A	N/A	N/A
Target payment	2.50	1.00	2.20	2.33	3.00	N/A	1.33	3.00	1.50
Capitation and PBF	N/A	N/A	N/A	N/A	N/A	3.00	2.00	N/A	N/A
Financial and non-financial incentives + deci- sion guide	N/A	N/A	3.00	N/A	N/A	N/A	N/A	N/A	N/A
Performance related pay	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Payment per output (quality and satisfaction adjustment)	N/A	N/A	2.33	N/A	N/A	1.57	N/A	N/A	N/A

Lower rating better

Paying for performance to improve the delivery of health interventions in low- and middle-income countries (Review)

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APPENDICES

Appendix 1. Reasons for Exclusion at Full Text Screening

Exclusions Based on Type of Study

1. Study not **a)** RCT, **b)** Quasi-randomized trial, **c)** Controlled before and after study (CBA), or **d)** interrupted time series (ITS)
2. Study is a CBA, but there is only 1 cluster/site in each comparison group
3. Study is a CBA, but the pre- and post- intervention periods for study and control groups are not the same
4. Study is a CBA, but the choice of control site is not appropriate – e.g. different socio-economic characteristics, or major differences in the baseline group
5. Study is an ITS, but does not have clearly defined time of intervention
6. Study is an ITS but not have **a)** at least 3 data points before or after the intervention, nor is it likely that **b)** at least 3 data points before and after the intervention could be retrieved from the authors

Exclusions based on study population/participants:

1. The study population/participants/health care providers are not from Low and Middle Income Countries (as classified by the World Bank)

Exclusions based on intervention components:

1. Study is not an impact evaluation of P4P schemes (including ancillary components), compared to any alternative (including non-conditional financial incentives and different levels of conditional financial incentives)
2. Study intervention does not cover **a)** conditional cash payment, **b)** conditional provision of material goods, **c)** target payments (payments for reaching a certain level of coverage, which can be defined in absolute terms or relative to a starting point)
3. Study focussed on the demand side of health care only (i.e. payments to consumers, not producers),
4. Study focussed only on payment to health workers or facilities which are not explicitly linked to changing patterns of performance (e.g. for coming to work; salary increases; routine increases in activity-based payments such as DRGs or fees for service)
5. Study focussed only on changes to budget flows which are routine or intended to motivate, but without being conditional on specific activity or output measures

Exclusions based on type of provider:

1. Study does not include **a)** Health workers/Providers of health care services, **b)** Public health facilities, **c)** Private for profit/not for profit health facilities, **d)** Non-governmental organizations, **e)** Sub-national governments (municipalities or provinces), **f)** National governments (Ministries of Health), or **g)** Multiple levels of health care provision

Exclusions based on primary outcomes of this systematic review:

1. Study does not report on our major outcome measures of interest: **a)** Changes in targeted measures of provider performance, the delivery or utilization of healthcare services, or patient outcomes, **b)** Unintended effects, including motivating unintended behaviours, distortions (ignoring important tasks that are not rewarded with incentives), cherry-picking/cream-skimming (prioritising patients that are most profitable over those who release fewer financial rewards), gaming (improving or cheating on reporting rather than improving performance), increased inequities, and dependency on financial incentives, **or c)** Changes in resource use, including for incentives, administration and services

Other:

1. Insufficient detail given in paper to determine inclusion/exclusion. More information needed.
2. Duplicate
3. Ongoing study for which relevant results not yet available
4. Study complementary to, or superseded by, other included studies

Appendix 2. Search strategies

CENTRAL, Cochrane Library

ID Search

#1 MeSH descriptor: [Reimbursement, Incentive] this term only

#2 MeSH descriptor: [Physician Incentive Plans] this term only

#3 MeSH descriptor: [Employee Incentive Plans] this term only

#4 "p4p":ti,ab,kw

- #5 ((performance or result or results) near/3 (pay* or paid or money or monetary or cash or financ* or fund* or econom* or disbursement* or remunerat* or reimburs* or compensat*)):ti,ab,kw
- #6 ((performance or result or results) near/3 (nonmonetary or voucher* or token or tokens or goods)):ti,ab,kw
- #7 ((performance or result or results) near/3 (reward* or bonus* or initiative* or incentive* or contract or contracts)):ti,ab,kw
- #8 (indicator* near/3 (pay* or disbursement* or remunerat* or reimburs*)):ti,ab,kw
- #9 ((performance or merit) next based):ti,ab,kw
- #10 ((payment or financial or monetary or nonmonetary or economic or disbursement or remuneration or reimbursement or reward* or bonus) next incentive*):ti,ab,kw
- #11 ((payment or financial or monetary or nonmonetary or economic or disbursement or remuneration or reimbursement) next (reward* or bonus*)):ti,ab,kw
- #12 (pay* near/3 quality):ti,ab,kw
- #13 (bonus next payment*):ti,ab,kw
- #14 ((incentive* or compensatory or reimbursement) next (plan or plans)):ti,ab,kw
- #15 ((incentiv* or motivat* or positive* next reinforc*) near/3 (quality or output* or outcome* or delivery or utilisation or utilization)):ti,ab,kw
- #16 ((incentiv* or motivat* or positive* next reinforc*) near/3 (target or targets or "health goal" or "health goals" or measurable next action* or behaviour* or behavior* or "best practice" or practice next pattern* or standard or standards or recommendation* or guideline*)):ti,ab,kw
- #17 (conditional near/3 (pay* or money or monetary or cash or financ* or fund* or econom* or disbursement* or remunerat* or reimburs* or nonmonetary or voucher* or token or tokens or goods or reward* or bonus* or incentive* or motivat*)):ti,ab,kw
- #18 (incentive next payment*):ti,ab,kw
- #19 ((target or targets or targeted) near/3 (pay* or reward*)):ti,ab,kw
- #20 ((chang* or enhanc* or improve*) near/6 (provider* or practitioner* or "health personnel" or "health care personnel" or "healthcare personnel" or health next worker* or "health care" next worker* or healthcare next worker* or physician* or doctor or doctors or nurse or nurses or health next facilit* or "health care" next facilit* or healthcare next facilit* or hospital or hospitals or health next service* or "health care" next service* or healthcare next service* or health next sector* or "health care" next sector* or healthcare next sector* or "health administrations" or government* or nongovernment*) near/6 performance):ti,ab,kw
- #21 ("provider recognition" next program*):ti,ab,kw
- #22 "cash on delivery":ti,ab,kw
- #23 ("output based aid" or "result based aid" or "results based aid"):ti,ab,kw
- #24 ("program for result" or "program for results" or "programs for result" or "programs for results" or "programme for result" or "programme for results" or "programmes for result" or "programmes for results"):ti,ab,kw
- #25 #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24
- #26 (Africa or Asia or Caribbean or "West Indies" or "South America" or "Latin America" or "Central America"):ti,ab,kw
- #27 (Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brasil or Brazil or Bulgaria or "Burkina Faso" or "Burkina Fasso" or "Upper Volta" or Burundi or Urundi or Cambodia or "Khmer Republic" or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or "Cape Verde" or "Central African Republic" or Chad or Chile or China or Colombia or Comoros or "Comoro Islands" or Comores or Mayotte or Congo or Zaire or "Costa Rica" or "Cote d'Ivoire" or "Ivory Coast" or Croatia or Cuba or Cyprus or Czechoslovakia or "Czech Republic" or Slovakia or "Slovak Republic"):ti,ab,kw
- #28 (Djibouti or "French Somaliland" or Dominica or "Dominican Republic" or "East Timor" or "East Timur" or "Timor Leste" or Ecuador or Egypt or "United Arab Republic" or "El Salvador" or Eritrea or Estonia or Ethiopia or Fiji or Gabon or "Gabonese Republic" or Gambia or Gaza or Georgia or Georgian or Ghana or "Gold Coast" or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or "Isle of Man" or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or "Kyrgyz Republic" or Kirghiz or Kirgizstan or "Lao PDR" or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania):ti,ab,kw
- #29 (Macedonia or Madagascar or "Malagasy Republic" or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or "Marshall Islands" or Mauritania or Mauritius or "Agalega Islands" or Mexico or Micronesia or "Middle East" or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or "Netherlands Antilles" or "New Caledonia" or Nicaragua or Niger or Nigeria or "Northern Mariana Islands" or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or "Puerto Rico"):ti,ab,kw
- #30 (Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or "Saint Kitts" or "St Kitts" or Nevis or "Saint Lucia" or "St Lucia" or "Saint Vincent" or "St Vincent" or Grenadines or Samoa or "Samoan Islands" or "Navigator Island" or "Navigator Islands" or "Sao Tome" or "Saudi Arabia" or Senegal or Serbia or Montenegro or Seychelles or "Sierra Leone" or Slovenia or "Sri Lanka" or Ceylon or "Solomon Islands" or Somalia or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadjhikistan or Tadjikistan or Tadjhik or Tanzania or Thailand or Togo or "Togolese Republic" or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or "Soviet Union" or "Union of Soviet Socialist Republics" or Uzbekistan or Uzbek or Vanuatu or "New Hebrides" or Venezuela or Vietnam or "Viet Nam" or "West Bank" or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia):ti,ab,kw

#31 (developing or less* next developed or "under developed" or underdeveloped or "middle income" or low* next income or underserved or "under served" or deprived or poor*) next (countr* or nation* or population* or world):ti,ab,kw
 #32 (developing or less* next developed or "under developed" or underdeveloped or "middle income" or low* next income) next (economy or economies):ti,ab,kw
 #33 low* next (gdp or gnp or "gross domestic" or "gross national"):ti,ab,kw
 #34 (low near/3 middle near/3 countr*):ti,ab,kw
 #35 (Imic or Imics or "third world" or "lami country" or "lami countries"):ti,ab,kw
 #36 ("transitional country" or "transitional countries"):ti,ab,kw
 #37 #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35 or #36
 #38 #25 and #37 in Trials
 #39 #25 and #37 with Cochrane Library publication date Between Jan 2018 and Jul 2019, in Trials
 #40 #25 and #37 with Publication Year from 2018 to 2019, in Trials
 #41 #39 or #40

MEDLINE and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily 1946 to June 18, 2019, Ovid

ID Search

1 Reimbursement, Incentive/
 2 Physician Incentive Plans/
 3 Employee Incentive Plans/
 4 or/1-3
 5 "p4p":ti,ab,kw.
 6 ((performance or result? based) adj3 (pay* or paid or money or monetary or cash or financ* or fund* or econom* or disbursement? or remunerat* or reimburs* or compensat*)):ti,ab,kf.
 7 ((performance or result? based) adj3 (nonmonetary or voucher? or token? or goods)):ti,ab,kf.
 8 ((performance or result? based) adj3 (reward* or bonus? or initiative? or incentive? or contract?)):ti,ab,kf.
 9 (indicator? adj3 (pay* or disbursement? or remunerat* or reimburs*)):ti,ab,kf.
 10 ((performance or merit) adj based):ti,ab,kf.
 11 ((payment or financial or monetary or nonmonetary or economic or disbursement or remuneration or reimbursement or reward* or bonus) adj incentive?):ti,ab,kf.
 12 ((payment or financial or monetary or nonmonetary or economic or disbursement or remuneration or reimbursement) adj (reward* or bonus?):ti,ab,kf.
 13 (pay* adj3 quality):ti,ab,kf.
 14 bonus payment?:ti,ab,kw.
 15 ((incentive or compensatory or reimbursement) adj plan?):ti,ab,kf.
 16 ((incentiv* or motivat* or positive* reforc*) adj3 (quality or output? or outcome? or delivery or utilisation or utilization)):ti,ab,kf.
 17 ((incentiv* or motivat* or positive* reforc*) adj3 (target or targets or health goal? or measurable action? or behaviour? or behavior? or best practice or practice pattern? or standard? or recommendation? or guideline?):ti,ab,kf.
 18 (conditional adj3 (pay* or money or monetary or cash or financ* or fund* or econom* or disbursement? or remunerat* or reimburs* or nonmonetary or voucher? or token? or goods or reward? or bonus? or incentive? or motivat*)):ti,ab,kf.
 19 incentive payment?:ti,ab,kw.
 20 ((target or targets or targeted) adj3 (pay* or reward*)):ti,ab,kw.
 21 ((chang* or enhanc* or improve*) adj6 (provider? or practitioner? or health personnel or health care personnel or healthcare personnel or health worker? or health care worker? or healthcare worker? or physician* or doctor? or nurse? or health facilit* or health care facilit* or healthcare facilit* or hospital? or health service? or health care service? or healthcare service? or health sector? or health care sector? or healthcare sector? or health administrations or government* or nongovernment*) adj6 performance):ti,ab,kf.
 22 provider recognition program*:ti,ab,kw.
 23 cash on delivery:ti,ab,kw.
 24 (output based aid or result? based aid):ti,ab,kw.
 25 program* for result?:ti,ab,kw.
 26 or/5-25
 27 4 or 26
 28 Developing Countries.sh,kf.
 29 (Africa or Asia or Caribbean or West Indies or South America or Latin America or Central America).hw,kf,ti,ab,cp.
 30 (Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brasil or Brazil or Bulgaria or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cambodia or Khmer Republic or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Chile or China or Colombia or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Costa Rica or Cote d'Ivoire or Ivory Coast or Croatia or Cuba or Cyprus or Czechoslovakia or Czech Republic or Slovakia or Slovak Republic or Djibouti or French Somaliland or Dominica or Dominican Republic or East Timor or East Timur or Timor Leste or Ecuador or Egypt or United Arab Republic or El Salvador or Eritrea or Estonia or Ethiopia or Fiji or Gabon or Gabonese Republic or Gambia or Gaza or Georgia Republic or Georgian Republic or Ghana or Gold Coast or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana

or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Isle of Man or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or Lao PDR or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or Marshall Islands or Mauritania or Mauritius or Agalega Islands or Mexico or Micronesia or Middle East or Moldova or Moldavia or Moldovan or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Netherlands Antilles or New Caledonia or Nicaragua or Niger or Nigeria or Northern Mariana Islands or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or Saint Kitts or St Kitts or Nevis or Saint Lucia or St Lucia or Saint Vincent or St Vincent or Grenadines or Samoa or Samoan Islands or Navigator Island or Navigator Islands or Sao Tome or Saudi Arabia or Senegal or Serbia or Montenegro or Seychelles or Sierra Leone or Slovenia or Sri Lanka or Ceylon or Solomon Islands or Somalia or South Africa or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadjhikistan or Tadjikistan or Tadjhik or Tanzania or Thailand or Togo or Togolese Republic or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or Soviet Union or Union of Soviet Socialist Republics or Uzbekistan or Uzbek or Vanuatu or New Hebrides or Venezuela or Vietnam or Viet Nam or West Bank or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia).hw,kf,ti,ab,cp.

31 ((developing or less* developed or under developed or underdeveloped or middle income or low* income or underserved or under served or deprived or poor*) adj (countr* or nation? or population? or world)).ti,ab.

32 ((developing or less* developed or under developed or underdeveloped or middle income or low* income) adj (economy or economies)).ti,ab.

33 (low* adj (gdp or gnp or gross domestic or gross national)).ti,ab.

34 (low adj3 middle adj3 countr*).ti,ab.

35 (lmic or lmics or third world or lami countr*).ti,ab.

36 transitional countr*.ti,ab.

37 or/28-36

38 randomized controlled trial.pt.

39 controlled clinical trial.pt.

40 multicenter study.pt.

41 pragmatic clinical trial.pt.

42 non-randomized controlled trials as topic/

43 interrupted time series analysis/

44 controlled before-after studies/

45 (randomis* or randomiz* or randomly or groups or trial or multicenter or multi center or multicentre or multi centre or intervention? or effect? or impact? or controlled or control group? or (before adj5 after) or (pre adj5 post) or ((pretest or pre test) and (posttest or post test)) or quasiexperiment* or quasi experiment* or pseudo experiment* or pseudoexperiment* or evaluat* or time series or time point? or time trend? or repeated measur*).ti,ab.

46 or/38-45

47 exp Animals/

48 Humans/

49 47 not (47 and 48)

50 review.pt.

51 meta analysis.pt.

52 news.pt.

53 comment.pt.

54 editorial.pt.

55 cochrane database of systematic reviews.jn.

56 comment on.cm.

57 (systematic review or literature review).ti.

58 or/49-57

59 46 not 58

60 27 and 37 and 59

61 (201705* or 201706* or 201707* or 201708* or 201709* or 201710* or 201711* or 201712* or 2018* or 2019*).dt,dp,ed,ep,yr.

62 60 and 61

Embase 1974 to 2019 June 18, Ovid

ID Search

1 "p4p".ti,ab,kw.

2 ((performance or result? based) adj3 (pay* or paid or money or monetary or cash or financ* or fund* or econom* or disbursement? or remunerat* or reimburs* or compensat*)).ti,ab,kw.

3 ((performance or result? based) adj3 (nonmonetary or voucher? or token? or goods)).ti,ab,kw.

4 ((performance or result? based) adj3 (reward* or bonus? or initiative? or incentive? or contract?)).ti,ab,kw.

5 (indicator? adj3 (pay* or disbursement? or remunerat* or reimburs*)).ti,ab,kw.

6 ((performance or merit) adj based).ti,ab,kw.

- 7 ((payment or financial or monetary or nonmonetary or economic or disbursement or remuneration or reimbursement or reward* or bonus) adj incentive?).ti,ab,kw.
- 8 ((payment or financial or monetary or nonmonetary or economic or disbursement or remuneration or reimbursement) adj (reward* or bonus?)).ti,ab,kw.
- 9 (pay* adj3 quality).ti,ab,kw.
- 10 bonus payment?.ti,ab,kw.
- 11 ((incentive or compensatory or reimbursement) adj plan?).ti,ab,kw.
- 12 ((incentiv* or motivat* or positive* reforc*) adj3 (quality or output? or outcome? or delivery or utilisation or utilization)).ti,ab,kw.
- 13 ((incentiv* or motivat* or positive* reforc*) adj3 (target or targets or health goal? or measurable action? or behaviour? or behavior? or best practice or practice pattern? or standard? or recommendation? or guideline?)).ti,ab,kw.
- 14 (conditional adj3 (pay* or money or monetary or cash or financ* or fund* or econom* or disbursement? or remunerat* or reimburs* or nonmonetary or voucher? or token? or goods or reward? or bonus? or incentive? or motivat*)).ti,ab,kw.
- 15 incentive payment?.ti,ab,kw.
- 16 ((target or targets or targeted) adj3 (pay* or reward*)).ti,ab,kw.
- 17 ((chang* or enhanc* or improve*) adj6 (provider? or practitioner? or health personnel or health care personnel or healthcare personnel or health worker? or health care worker? or healthcare worker? or physician* or doctor? or nurse? or health facilit* or health care facilit* or healthcare facilit* or hospital? or health service? or health care service? or healthcare service? or health sector? or health care sector? or healthcare sector? or health administrations or government* or nongovernment*) adj6 performance).ti,ab,kw.
- 18 provider recognition program*.ti,ab,kw.
- 19 cash on delivery.ti,ab,kw.
- 20 (output based aid or result? based aid).ti,ab,kw.
- 21 or/1-20
- 22 Developing Country.sh.
- 23 (Africa or Asia or Caribbean or West Indies or South America or Latin America or Central America).hw,ti,ab,cp.
- 24 (Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brasil or Brazil or Bulgaria or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cambodia or Khmer Republic or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Chile or China or Colombia or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Costa Rica or Cote d'Ivoire or Ivory Coast or Croatia or Cuba or Cyprus or Czechoslovakia or Czech Republic or Slovakia or Slovak Republic or Djibouti or French Somaliland or Dominica or Dominican Republic or East Timor or East Timur or Timor Leste or Ecuador or Egypt or United Arab Republic or El Salvador or Eritrea or Estonia or Ethiopia or Fiji or Gabon or Gabonese Republic or Gambia or Gaza or Georgia Republic or Georgian Republic or Ghana or Gold Coast or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Isle of Man or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or Lao PDR or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or Marshall Islands or Mauritania or Mauritius or Agalega Islands or Mexico or Micronesia or Middle East or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Netherlands Antilles or New Caledonia or Nicaragua or Niger or Nigeria or Northern Mariana Islands or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Philippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or Saint Kitts or St Kitts or Nevis or Saint Lucia or St Lucia or Saint Vincent or St Vincent or Grenadines or Samoa or Samoan Islands or Navigator Island or Navigator Islands or Sao Tome or Saudi Arabia or Senegal or Serbia or Montenegro or Seychelles or Sierra Leone or Slovenia or Sri Lanka or Ceylon or Solomon Islands or Somalia or South Africa or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadjhikistan or Tadjikistan or Tadjhik or Tanzania or Thailand or Togo or Togolese Republic or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or Soviet Union or Union of Soviet Socialist Republics or Uzbekistan or Uzbek or Vanuatu or New Hebrides or Venezuela or Vietnam or Viet Nam or West Bank or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia).hw,ti,ab,cp.
- 25 ((developing or less* developed or under developed or underdeveloped or middle income or low* income or underserved or under served or deprived or poor*) adj (count* or nation? or population? or world)).ti,ab.
- 26 ((developing or less* developed or under developed or underdeveloped or middle income or low* income) adj (economy or economies)).ti,ab.
- 27 (low* adj (gdp or gnp or gross domestic or gross national)).ti,ab.
- 28 (low adj3 middle adj3 countr*).ti,ab.
- 29 (Imic or Imics or third world or lami countr*).ti,ab.
- 30 transitional countr*.ti,ab.
- 31 or/22-30
- 32 Randomized Controlled Trial/
- 33 Controlled Clinical Trial/
- 34 Quasi Experimental Study/
- 35 Pretest Posttest Control Group Design/
- 36 Time Series Analysis/

37 Experimental Design/
38 Multicenter Study/
39 (randomis* or randomiz* or randomly or groups or trial or multicenter or multi center or multicentre or multi centre or intervention?
or effect? or impact? or controlled or control group? or (before adj5 after) or (pre adj5 post) or ((pretest or pre test) and (posttest or post
test)) or quasiexperiment* or quasi experiment* or pseudo experiment* or pseudoexperiment* or evaluat* or time series or time point?
or time trend? or repeated measur*).ti,ab.
40 or/32-39
41 exp animals/ or exp invertebrate/ or animal experiment/ or animal model/ or animal tissue/ or animal cell/ or nonhuman/
42 human/ or normal human/ or human cell/
43 41 and 42
44 41 not 43
45 (systematic review or literature review).ti.
46 "cochrane database of systematic reviews".jn.
47 or/44-46
48 40 not 47
49 21 and 31 and 48
50 limit 49 to embase
51 (201705* or 201706* or 201707* or 201708* or 201709* or 201710* or 201711* or 201712* or 2018* or 2019*).dd.
52 ("2017" or "2018" or "2019").yr.
53 51 or 52
54 50 and 53

PsycINFO 1806 to June Week 2 2019, Ovid

ID Search

1 Monetary Incentives/
2 Monetary Rewards/
3 "p4p".ti,ab.
4 ((performance or result? based) adj3 (pay* or paid or money or monetary or cash or financ* or fund* or econom* or disbursement? or
remunerat* or reimburs* or compensat*).ti,ab.
5 ((performance or result? based) adj3 (nonmonetary or voucher? or token? or goods)).ti,ab.
6 ((performance or result? based) adj3 (reward* or bonus? or initiative? or incentive? or contract?)).ti,ab.
7 (indicator? adj3 (pay* or disbursement? or remunerat* or reimburs*).ti,ab.
8 ((performance or merit) adj based).ti,ab.
9 ((payment or financial or monetary or nonmonetary or economic or disbursement or remuneration or reimbursement or reward* or
bonus) adj incentive?).ti,ab.
10 ((payment or financial or monetary or nonmonetary or economic or disbursement or remuneration or reimbursement) adj (reward*
or bonus?)).ti,ab.
11 (pay* adj3 quality).ti,ab.
12 bonus payment?.ti,ab.
13 ((incentive or compensatory or reimbursement) adj plan?).ti,ab.
14 ((incentiv* or motivat* or positive* reforc*) adj3 (quality or output? or outcome? or delivery or utilisation or utilization)).ti,ab.
15 ((incentiv* or motivat* or positive* reforc*) adj3 (target or targets or health goal? or measurable action? or behaviour? or behavior?
or best practice or practice pattern? or standard? or recommendation? or guideline?)).ti,ab.
16 (conditional adj3 (pay* or money or monetary or cash or financ* or fund* or econom* or disbursement? or remunerat* or reimburs*
or nonmonetary or voucher? or token? or goods or reward? or bonus? or incentive? or motivat*).ti,ab.
17 incentive payment?.ti,ab.
18 ((target or targets or targeted) adj3 (pay* or reward*).ti,ab.
19 ((chang* or enhanc* or improve*) adj6 (provider? or practitioner? or health personnel or health care personnel or healthcare personnel
or health worker? or health care worker? or healthcare worker? or physician* or doctor? or nurse? or health facilit* or health care facilit* or
healthcare facilit* or hospital? or health service? or health care service? or healthcare service? or health sector? or health care sector? or
healthcare sector? or health administrations or government* or nongovernment*) adj6 performance).ti,ab.
20 provider recognition program*.ti,ab.
21 cash on delivery.ti,ab.
22 (output based aid or result? based aid).ti,ab.
23 or/1-22
24 Developing Countries/
25 (Africa or Asia or Caribbean or West Indies or South America or Latin America or Central America).id,ti,ab,hw.
26 (Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or
Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or
Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brasil or Brazil or Bulgaria or Burkina Faso or Burkina Fasso or Upper
Volta or Burundi or Urundi or Cambodia or Khmer Republic or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or Cape
Verde or Central African Republic or Chad or Chile or China or Colombia or Comoros or Comoro Islands or Comores or Mayotte or Congo or

Zaire or Costa Rica or Cote d'Ivoire or Ivory Coast or Croatia or Cuba or Cyprus or Czechoslovakia or Czech Republic or Slovakia or Slovak Republic or Djibouti or French Somaliland or Dominica or Dominican Republic or East Timor or East Timor or East Timor or Ecuador or Ecuador or Egypt or United Arab Republic or El Salvador or Eritrea or Estonia or Ethiopia or Fiji or Gabon or Gabonese Republic or Gambia or Gaza or Georgia Republic or Georgian Republic or Ghana or Gold Coast or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Isle of Man or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or Lao PDR or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or Marshall Islands or Mauritania or Mauritius or Agalega Islands or Mexico or Micronesia or Middle East or Moldova or Moldavia or Moldovan or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Netherlands Antilles or New Caledonia or Nicaragua or Niger or Nigeria or Northern Mariana Islands or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philippines or Philippines or Philippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or Saint Kitts or St Kitts or Nevis or Saint Lucia or St Lucia or Saint Vincent or St Vincent or Grenadines or Samoa or Samoan Islands or Navigator Island or Navigator Islands or Sao Tome or Saudi Arabia or Senegal or Serbia or Montenegro or Seychelles or Sierra Leone or Slovenia or Sri Lanka or Ceylon or Solomon Islands or Somalia or South Africa or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadzhikistan or Tadzhikistan or Tadzhik or Tanzania or Thailand or Togo or Togolese Republic or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or Soviet Union or Union of Soviet Socialist Republics or Uzbekistan or Uzbek or Vanuatu or New Hebrides or Venezuela or Vietnam or Viet Nam or West Bank or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia).ti,ab,hw.

27 ((developing or less* developed or under developed or underdeveloped or middle income or low* income or underserved or under served or deprived or poor*) adj (countr* or nation? or population? or world)).ti,ab.

28 ((developing or less* developed or under developed or underdeveloped or middle income or low* income) adj (economy or economies)).ti,ab.

29 (low* adj (gdp or gnp or gross domestic or gross national)).ti,ab.

30 (low adj3 middle adj3 countr*).ti,ab.

31 (lmic or lmics or third world or lami countr*).ti,ab.

32 transitional countr*.ti,ab.

33 or/24-32

34 Treatment Outcome.md.

35 Empirical Study.md.

36 Prospective Study.md.

37 Quantitative Study.md.

38 experimental design/

39 between groups design/

40 quantitative methods/

41 quasi experimental methods/

42 pretesting/

43 posttesting/

44 repeated measures/

45 time series/

46 (posttest or posttests or post test or post tests or pretest or pretests or pre test or pre tests or "pretest/posttest" or quasi experimental or repeated measure or repeated measurement or repeated measurements or repeated measures or time series).id.

47 (randomis* or randomiz* or randomly or groups or trial or multicenter or multi center or multicentre or multi centre or intervention? or effect? or impact? or controlled or control group? or (before adj5 after) or (pre adj5 post) or ((pretest or pre test) and (posttest or post test)) or quasiexperiment* or quasi experiment* or pseudo experiment* or pseudoexperiment* or evaluat* or time series or time point? or time trend? or repeated measur*).ti,ab.

48 or/34-47

49 23 and 33 and 48

50 (201804* or 201805* or 201806* or 201807* or 201808* or 201809* or 201810* or 201811* or 201812* or 2019*).up.

51 ("2018" or "2019").yr.

52 50 or 51

53 49 and 52

CINAHL 1981 to present, EbscoHost

ID Search

S49 S47 AND S48

S48 EM 201804-

S47 S21 AND S31 AND S45

Limiters - Exclude MEDLINE records

S46 S21 AND S31 AND S45

S45 S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43 OR S44

S44 TI ((randomis* or randomiz* or randomly or trial or effect* or impact* or intervention* or before N5 after or pre N5 post or ((pretest or "pre test") and (posttest or "post test")) or quasiexperiment* or quasi W0 experiment* or pseudo experiment* or pseudoexperiment* or evaluat* or "time series" or time W0 point* or repeated W0 measur*)) OR AB ((randomis* or randomiz* or randomly or trial or effect* or impact* or intervention* or before N5 after or pre N5 post or ((pretest or "pre test") and (posttest or "post test")) or quasiexperiment* or quasi W0 experiment* or pseudo experiment* or pseudoexperiment* or evaluat* or "time series" or time W0 point* or repeated W0 measur*))

S43 (MH "Health Services Research")

S42 (MH "Multicenter Studies")

S41 (MH "Quasi-Experimental Studies+")

S40 (MH "Pretest-Posttest Design+")

S39 (MH "Experimental Studies")

S38 (MH "Nonrandomized Trials")

S37 (MH "Intervention Trials")

S36 (MH "Clinical Trials")

S35 (MH "Randomized Controlled Trials")

S34 PT research

S33 PT clinical trial

S32 PT randomized controlled trial

S31 S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30

S30 TI transitional N0 countr* OR AB transitional N0 countr*

S29 TI (lmic or Imics or "third world" or lami N0 countr*) OR AB (lmic or Imics or "third world" or lami N0 countr*)

S28 TI low N3 middle N3 countr* OR AB low N3 middle N3 countr*

S27 TI (low* N0 (gdp or gnp or "gross domestic" or "gross national")) OR AB (low* N0 (gdp or gnp or "gross domestic" or "gross national"))

S26 TI ((developing or less* N0 developed or "under developed" or underdeveloped or "middle income" or low* N3 income) N0 (economy or economies)) OR AB ((developing or less* N0 developed or "under developed" or underdeveloped or "middle income" or low* N3 income) N0 (economy or economies))

S25 TI ((developing or less* N0 developed or "under developed" or underdeveloped or "middle income" or low* N0 income or underserved or "under served" or deprived or poor*) N0 (countr* or nation* or population* or world)) OR AB ((developing or less* N0 developed or "under developed" or underdeveloped or "middle income" or low* N0 income or underserved or "under served" or deprived or poor*) N0 (countr* or nation* or population* or world))

S24 TX Afghanistan or Albania or Algeria or Angola or Antigua or Barbuda or Argentina or Armenia or Armenian or Aruba or Azerbaijan or Bahrain or Bangladesh or Barbados or Benin or Byelarus or Byelorussian or Belarus or Belorussian or Belorussia or Belize or Bhutan or Bolivia or Bosnia or Herzegovina or Hercegovina or Botswana or Brasil or Brazil or Bulgaria or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cambodia or Khmer Republic or Kampuchea or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Chile or China or Colombia or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Costa Rica or Cote d'Ivoire or Ivory Coast or Croatia or Cuba or Cyprus or Czechoslovakia or Czech Republic or Slovakia or Slovak Republic or Djibouti or French Somaliland or Dominica or Dominican Republic or East Timor or East Timur or Timor Leste or Ecuador or Egypt or United Arab Republic or El Salvador or Eritrea or Estonia or Ethiopia or Fiji or Gabon or Gabonese Republic or Gambia or Gaza or Georgia Republic or Georgian Republic or Ghana or Gold Coast or Greece or Grenada or Guatemala or Guinea or Guam or Guiana or Guyana or Haiti or Honduras or Hungary or India or Maldives or Indonesia or Iran or Iraq or Isle of Man or Jamaica or Jordan or Kazakhstan or Kazakh or Kenya or Kiribati or Korea or Kosovo or Kyrgyzstan or Kirghizia or Kyrgyz Republic or Kirghiz or Kirgizstan or Lao PDR or Laos or Latvia or Lebanon or Lesotho or Basutoland or Liberia or Libya or Lithuania or Macedonia or Madagascar or Malagasy Republic or Malaysia or Malaya or Malay or Sabah or Sarawak or Malawi or Nyasaland or Mali or Malta or Marshall Islands or Mauritania or Mauritius or Agalega Islands or Mexico or Micronesia or Middle East or Moldova or Moldovia or Moldovian or Mongolia or Montenegro or Morocco or Ifni or Mozambique or Myanmar or Myanma or Burma or Namibia or Nepal or Netherlands Antilles or New Caledonia or Nicaragua or Niger or Nigeria or Northern Mariana Islands or Oman or Muscat or Pakistan or Palau or Palestine or Panama or Paraguay or Peru or Philippines or Philipines or Phillipines or Phillippines or Poland or Portugal or Puerto Rico or Romania or Rumania or Roumania or Russia or Russian or Rwanda or Ruanda or Saint Kitts or St Kitts or Nevis or Saint Lucia or St Lucia or Saint Vincent or St Vincent or Grenadines or Samoa or Samoan Islands or Navigator Island or Navigator Islands or Sao Tome or Saudi Arabia or Senegal or Serbia or Montenegro or Seychelles or Sierra Leone or Slovenia or Sri Lanka or Ceylon or Solomon Islands or Somalia or South Africa or Sudan or Suriname or Surinam or Swaziland or Syria or Tajikistan or Tadjhikistan or Tadjikistan or Tadzhiik or Tanzania or Thailand or Togo or Togolese Republic or Tonga or Trinidad or Tobago or Tunisia or Turkey or Turkmenistan or Turkmen or Uganda or Ukraine or Uruguay or USSR or Soviet Union or Union of Soviet Socialist Republics or Uzbekistan or Uzbek or Vanuatu or New Hebrides or Venezuela or Vietnam or Viet Nam or West Bank or Yemen or Yugoslavia or Zambia or Zimbabwe or Rhodesia

S23 TX Africa or Asia or Caribbean or "West Indies" or "South America" or "Latin America" or "Central America"

S22 (MH "Developing Countries")

S21 S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20

S20 TI ("output based aid" or "output based aid" or "result based aid" or "results based aid") OR AB ("output based aid" or "output based aid" or "result based aid" or "results based aid")

S19 TI "cash on delivery" OR AB "cash on delivery"

S18 TI "provider recognition" N0 program* OR AB "provider recognition" N0 program*

S17 TI ((chang* or enhanc* or improve*) N6 (provider* or practitioner* or "health personnel" or "health care personnel" or "healthcare personnel" or "health N0 worker*" or "health care" N0 worker* or healthcare N0 worker* or physician* or doctor or doctors or nurse or nurses or health N0 facilit* or "health care" N0 facilit* or healthcare N0 facilit* or hospital or hospitals or health N0 service* or "health care" N0 service* or healthcare N0 service* or health N0 sector* or "health care" N0 sector* or healthcare N0 sector* or "health administrations" or government* or nongovernment*) N6 performance) OR AB ((chang* or enhanc* or improve*) N6 (provider* or practitioner* or "health personnel" or "health care personnel" or "healthcare personnel" or health N0 worker* or "health care" N0 worker* or healthcare N0 worker* or physician* or doctor or doctors or nurse or nurses or health N0 facilit* or "health care" N0 facilit* or healthcare N0 facilit* or hospital or hospitals or health N0 service* or "health care" N0 service* or healthcare N0 service* or health N0 sector* or "health care" N0 sector* or healthcare N0 sector* or "health administrations" or government* or nongovernment*) N6 performance)

S16 TI (target or targets or targeted) N3 (pay* or reward*) OR AB (target or targets or targeted) N3 (pay* or reward*)

S15 TI (incentive N0 payment*) OR AB (incentive N0 payment*)

S14 TI (conditional N3 (pay* or money or monetary or cash or financ* or econom* or disbursement* or remunerat* or reimburs* or nonmonetary or voucher* or token or tokens or goods or reward* or bonus* or incentive* or motivat*)) OR AB (conditional N3 (pay* or money or monetary or cash or financ* or econom* or disbursement* or remunerat* or reimburs* or nonmonetary or voucher* or token or tokens or goods or reward* or bonus* or incentive* or motivat*))

S13 TI ((incentiv* or motivat* or positive* N0 reinforc*) N3 (target or targets or "health goal" or "health goals" or measurable N0 action* or behaviour* or behavior* or "best practice" or practice N0 pattern* or standard or standards or recommendation* or guideline*)) OR AB ((incentiv* or motivat* or positive* N0 reinforc*) N3 (target or targets or "health goal" or "health goals" or measurable N0 action* or behaviour* or behavior* or "best practice" or practice N0 pattern* or standard or standards or recommendation* or guideline*))

S12 TI ((incentiv* or motivat* or positive* N0 reinforc*) N3 (quality or output* or outcome* or delivery or utilisation or utilization)) OR AB ((incentiv* or motivat* or positive* N0 reinforc*) N3 (quality or output* or outcome* or delivery or utilisation or utilization))

S11 TI ((incentive* or compensatory or reimbursement) N0 (plan or plans)) OR AB ((incentive* or compensatory or reimbursement) N0 (plan or plans))

S10 TI (bonus N0 payment*) OR AB (bonus N0 payment*)

S9 TI (pay* N3 quality) OR AB (pay* N3 quality)

S8 TI ((payment or financial or monetary or nonmonetary or economic or disbursement or remuneration or reimbursement) N0 (reward* or bonus*)) OR AB ((payment or financial or monetary or nonmonetary or economic or disbursement or remuneration or reimbursement) N0 (reward* or bonus*))

S7 TI ((payment or financial or monetary or nonmonetary or economic or disbursement or remuneration or reimbursement or reward* or bonus) N0 incentive*) OR AB ((payment or financial or monetary or nonmonetary or economic or disbursement or remuneration or reimbursement or reward* or bonus) N0 incentive*)

S6 TI ((performance or merit) N0 based) OR AB ((performance or merit) N0 based)

S5 TI (indicator* N3 (pay* or disbursement* or remunerat* or reimburs*)) OR AB (indicator* N3 (pay* or disbursement* or remunerat* or reimburs*))

S4 TI (((performance or "result based" or "results based") N3 (reward* or bonus* or initiative* or incentive* or contract or contracts))) OR AB (((performance or "result based" or "results based") N3 (reward* or bonus* or initiative* or incentive* or contract or contracts)))

S3 TI ((performance or "result based" or "results based") N3 (nonmonetary or voucher* or token or tokens or goods)) OR AB ((performance or "result based" or "results based") N3 (nonmonetary or voucher* or token or tokens or goods))

S2 TI ((performance or "result based" or "results based") N3 (pay* or paid or money or monetary or cash or financ* or fund* or econom* or disbursement* or remunerat* or reimburs* or compensat*)) OR AB ((performance or "result based" or "results based") N3 (pay* or paid or money or monetary or cash or financ* or fund* or econom* or disbursement* or remunerat* or reimburs* or compensat*))

S1 (MH "Reimbursement, Incentive")

Global Health Library (WHO)

ID Search

1 "performance based" or "reward based" or "result based" or "results based" or "performance incentive" or "performance incentives" or "reimbursement incentive" or "reimbursement incentives" or "p4p" or "pay for performance" or "paying for performance" or "payment for performance" or "payments for performance" or "pay by performance" or "paying by performance" or "payment by performance" or "payments by performance" or "performance related payment" or "performance related payments" or "incentive payment" or "incentive payments" or "payment incentive" or "payment incentives" or "financial incentive" or "financial incentives" or "economic incentive" or "economic incentives" or "monetary incentive" or "monetary incentives" or "financial reward" or "financial rewards" or "economic reward" or "economic rewards" or "monetary reward" or "monetary rewards" or "rewarding performance" or "performance reward" or "performance rewards" or "bonus payment" or "bonus payments" or "conditional cash"

AND

"randomised" or "randomized" or "groups" or "trial" or "controlled" or "control group" or "control groups" or "effect" or "effects" or "impact" or "impacts" or "evaluat" or "evaluation" or "time series" or "quasiexperiment" or "quasiexperiments" or "quasi experiment" or "quasi experiments" or "repeated measure" or "repeated measures" or "repeated measurement" or "repeated measurements"

ClinicalTrials.gov, NIH (<https://clinicaltrials.gov>)

Advanced search in Intervention/treatment (6 individual strategies/searches)

ID Search

- 1 "performance based" OR "reward based" OR "result based" OR "results based" OR "performance incentive" OR "performance incentives" OR "reimbursement incentive" OR "reimbursement incentives" OR "p4p"
- 2 "pay for performance" OR "paying for performance" OR "payment for performance" OR "payments for performance" OR "pay by performance" OR "paying by performance" OR "payment by performance" OR "payments by performance"
- 3 "performance related payment" OR "performance related payments" OR "incentive payment" OR "incentive payments" OR "payment incentive" OR "payment incentives"
- 4 "financial incentive" OR "financial incentives" OR "economic incentive" OR "economic incentives" OR "monetary incentive" OR "monetary incentives"
- 5 "financial reward" OR "financial rewards" OR "economic reward" OR "economic rewards" OR "monetary reward" OR "monetary rewards"
- 6 "rewarding performance" OR "performance reward" OR "performance rewards" OR "bonus payment" OR "bonus payments" OR "conditional cash"

ICTRP, WHO (<http://apps.who.int/trialsearch/AdvSearch.aspx>)

Advanced search in the Intervention with Recruitment status: ALL (6 individual strategies/searches)

ID Search

- 1 performance based OR reward based OR result based OR results based OR performance incentive OR performance incentives OR reimbursement incentive OR reimbursement incentives OR p4p
- 2 pay for performance OR paying for performance OR payment for performance OR payments for performance OR pay by performance OR paying by performance OR payment by performance OR payments by performance
- 3 performance related payment OR performance related payments OR incentive payment OR incentive payments OR payment incentive OR payment incentives
- 4 financial incentive OR financial incentives OR economic incentive OR economic incentives OR monetary incentive OR monetary incentives
- 5 financial reward OR financial rewards OR economic reward OR economic rewards OR monetary reward OR monetary rewards
- 6 rewarding performance OR performance reward OR performance rewards OR bonus payment OR bonus payments OR conditional cash

Global Health 1973 to 2019 Week 43, Ovid

ID Search

- 1 "p4p".af.
- 2 ((result based or results based) adj (pay* or fund* or reward*)).af.
- 3 (pay* adj3 perform*).af.
- 4 ((performance or merit) adj based).af.
- 5 ((performance or payment or financial or monetary or nonmonetary or economic or disbursement or remuneration or reimbursement or reward* or bonus) adj incentive?).af.
- 6 incentive payment?.af.
- 7 ((performance or payment or financial or monetary or nonmonetary or economic or disbursement or remuneration or reimbursement) adj (reward* or bonus?)).af.
- 8 (pay* adj3 quality).af.
- 9 ((incentive or compensatory or reimbursement) adj plan?).af.
- 10 (conditional adj3 (pay* or money or monetary or cash or financ* or fund* or econom* or disbursement? or remunerat* or reimburs* or nonmonetary or voucher? or token? or goods or reward? or bonus? or incentive? or motivat*)).af.
- 11 ((target or targets or targeted) adj3 (pay* or reward*)).af.
- 12 ((chang* or enhanc* or improve*) adj6 (provider? or practitioner? or health personnel or health care personnel or healthcare personnel or health worker? or health care worker? or healthcare worker? or physician* or doctor? or nurse? or health facilit* or health care facilit* or healthcare facilit* or hospital? or health service? or health care service? or healthcare service? or health sector? or health care sector? or healthcare sector? or health administrations or government* or nongovernment*) adj6 performance).af.
- 13 or/1-12
- 14 (random* or intervention? or control* or evaluat* or (before adj5 after) or (pre adj5 post) or ((pretest or pre test) and (posttest or post test)) or quasiexperiment* or quasi experiment* or time series or time point? or time trend? or repeated measur*).ti,ab.
- 15 (trial or effect? or impact?).ti.
- 16 or/14-15
- 17 13 and 16

EconLit 1886 to present, EBSCOhost

ID Search

S27 S15 AND S16 AND S25 AND S26

S26 TI (randomis* OR randomiz* OR randomly OR groups OR trial OR multicenter OR "multi center" OR multicentre OR "multi centre" OR intervention* OR effect* OR impact* OR controlled OR "control group" OR "before and after" OR quasiexperiment* OR quasi W0 experiment* OR pseudo W0 experiment* OR pseudoexperiment* OR evaluat* OR "time series" OR time W0 point* OR time W0 trend* OR repeated W0 measur*) OR AB (randomis* OR randomiz* OR randomly OR groups OR trial OR multicenter OR "multi center" OR multicentre OR "multi centre" OR intervention* OR effect* OR impact* OR controlled OR "control group" OR "before and after" OR quasiexperiment*

OR quasi W0 experiment* OR pseudo W0 experiment* OR pseudoexperiment* OR evaluat* OR "time series" OR time W0 point* OR time W0 trend* OR repeated W0 measur*)

S25 S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24

S24 TI ("transitional country" or "transitional countries") OR AB ("transitional country" or "transitional countries")

S23 TI (lmc or lmc's or "third world" or "lami country" or "lami countries") OR AB (lmc or lmc's or "third world" or "lami country" or "lami countries")

S22 TI (low N3 middle N3 countr*) OR AB (low N3 middle N3 countr*)

S21 TI (low* W0 (gdp or gnp or "gross domestic" or "gross national")) OR AB (low* W0 (gdp or gnp or "gross domestic" or "gross national"))

S20 TI ((developing or "less developed" or "lesser developed" or "under developed" or underdeveloped or "middle income" or "low income" or "lower income") W0 (economy or economies)) OR AB ((developing or "less developed" or "lesser developed" or "under developed" or underdeveloped or "middle income" or "low income" or "lower income") W0 (economy or economies))

S19 TI ((developing or "less developed" or "lesser developed" or "under developed" or underdeveloped or "middle income" or "low income" or "lower income" or underserved or "under served" or deprived or poor*) W0 (countr* or nation* or population* or world)) OR AB ((developing or "less developed" or "lesser developed" or "under developed" or underdeveloped or "middle income" or "low income" or "lower income" or underserved or "under served" or deprived or poor*) W0 (countr* or nation* or population* or world))

S18 TX (Afghanistan OR Albania OR Algeria OR Angola OR Antigua OR Barbuda OR Argentina OR Armenia OR Armenian OR Aruba OR Azerbaijan OR Bahrain OR Bangladesh OR Barbados OR Benin OR Byelarus OR Byelorussian OR Belarus OR Belorussian OR Belorussia OR Belize OR Bhutan OR Bolivia OR Bosnia OR Herzegovina OR Hercegovina OR Botswana OR Brasil OR Brazil OR Bulgaria OR "Burkina Faso" OR "Burkina Fasso" OR "Upper Volta" OR Burundi OR Urundi OR Cambodia OR "Khmer Republic" OR Kampuchea OR Cameroon OR Cameroons OR Cameron OR Camerons OR "Cape Verde" OR "Central African Republic" OR Chad OR Chile OR China OR Colombia OR Comoros OR "Comoro Islands" OR Comores OR Mayotte OR Congo OR Zaire OR "Costa Rica" OR "Cote d'Ivoire" OR "Ivory Coast" OR Croatia OR Cuba OR Cyprus OR Czechoslovakia OR "Czech Republic" OR Slovakia OR "Slovak Republic" OR Djibouti OR "French Somaliland" OR Dominica OR "Dominican Republic" OR "East Timor" OR "East Timur" OR "Timor Leste" OR Ecuador OR Egypt OR "United Arab Republic" OR "El Salvador" OR Eritrea OR Estonia OR Ethiopia OR Fiji OR Gabon OR "Gabonese Republic" OR Gambia OR Gaza OR Georgia OR Georgian OR Ghana OR "Gold Coast" OR Greece OR Grenada OR Guatemala OR Guinea OR Guam OR Guiana OR Guyana OR Haiti OR Honduras OR Hungary OR India OR Maldives OR Indonesia OR Iran OR Iraq OR "Isle of Man" OR Jamaica OR Jordan OR Kazakhstan OR Kazakh OR Kenya OR Kiribati OR Korea OR Kosovo OR Kyrgyzstan OR Kirghizia OR "Kyrgyz Republic" OR Kirghiz OR Kirgizstan OR "Lao PDR" OR Laos OR Latvia OR Lebanon OR Lesotho OR Basutoland OR Liberia OR Libya OR Lithuania OR Macedonia OR Madagascar OR "Malagasy Republic" OR Malaysia OR Malaya OR Malay OR Sabah OR Sarawak OR Malawi OR Nyasaland OR Mali OR Malta OR "Marshall Islands" OR Mauritania OR Mauritius OR "Agalega Islands" OR Mexico OR Micronesia OR "Middle East" OR Moldova OR Moldovia OR Moldovian OR Mongolia OR Montenegro OR Morocco OR Ifni OR Mozambique OR Myanmar OR Myanma OR Burma OR Namibia OR Nepal OR "Netherlands Antilles" OR "New Caledonia" OR Nicaragua OR Niger OR Nigeria OR "Northern Mariana Islands" OR Oman OR Muscat OR Pakistan OR Palau OR Palestine OR Panama OR Paraguay OR Peru OR Philippines OR Philipines OR Phillipines OR Phillippines OR Poland OR Portugal OR "Puerto Rico" OR Romania OR Rumania OR Roumania OR Russia OR Russian OR Rwanda OR Ruanda OR "Saint Kitts" OR "St Kitts" OR Nevis OR "Saint Lucia" OR "St Lucia" OR "Saint Vincent" OR "St Vincent" OR Grenadines OR Samoa OR "Samoa Islands" OR "Navigator Island" OR "Navigator Islands" OR "Sao Tome" OR "Saudi Arabia" OR Senegal OR Serbia OR Montenegro OR Seychelles OR "Sierra Leone" OR Slovenia OR "Sri Lanka" OR Ceylon OR "Solomon Islands" OR Somalia OR Sudan OR Suriname OR Surinam OR Swaziland OR Syria OR Tajikistan OR Tadzhikistan OR Tadjikistan OR Tadjik OR Tanzania OR Thailand OR Togo OR "Togolese Republic" OR Tonga OR Trinidad OR Tobago OR Tunisia OR Turkey OR Turkmenistan OR Turkmen OR Uganda OR Ukraine OR Uruguay OR USSR OR "Soviet Union" OR "Union of Soviet Socialist Republics" OR Uzbekistan OR Uzbek OR Vanuatu OR "New Hebrides" OR Venezuela OR Vietnam OR "Viet Nam" OR "West Bank" OR Yemen OR Yugoslavia OR Zambia OR Zimbabwe OR Rhodesia)

S17 TX (Africa OR Asia OR Caribbean OR "West Indies" OR "South America" OR "Latin America" OR "Central America")

S16 TI (health* OR medical OR practitioner* OR physician* OR doctor OR doctors OR nurse OR nurses OR hospital OR hospitals) OR AB(health* OR medical OR practitioner* OR physician* OR doctor OR doctors OR nurse OR nurses OR hospital OR hospitals)

S15 S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14

S14 TI ((chang* OR enhanc* OR improve*) N6 (provider* OR practitioner* OR "health personnel" OR "health care personnel" OR "healthcare personnel" OR "health worker" OR "health workers" OR "health care worker" OR "health care workers" OR "healthcare worker" OR "healthcare workers" OR physician* OR doctor OR doctors OR nurse OR nurses OR "health facility" OR "health facilities" OR "health care facility" OR "health care facilities" OR "healthcare facility" OR "healthcare facilities" OR hospital OR hospitals OR "health service" OR "health services" OR "health care service" OR "health care services" OR "healthcare service" OR "healthcare services" OR "health sector" OR "health sectors" OR "health care sector" OR "health care sectors" OR "healthcare sector" OR "healthcare sectors" OR "health administrations" OR government* OR nongovernment*) N6 performance) OR AB ((chang* OR enhanc* OR improve*) N6 (provider* OR practitioner* OR "health personnel" OR "health care personnel" OR "healthcare personnel" OR "health worker" OR "health workers" OR "health care worker" OR "health care workers" OR "healthcare worker" OR "healthcare workers" OR physician* OR doctor OR doctors OR nurse OR nurses OR "health facility" OR "health facilities" OR "health care facility" OR "health care facilities" OR "healthcare facility" OR "healthcare facilities" OR hospital OR hospitals OR "health service" OR "health services" OR "health care service" OR "health care services" OR "healthcare service" OR "healthcare services" OR "health sector" OR "health sectors" OR "health care sector" OR "health care sectors" OR "healthcare sector" OR "healthcare sectors" OR "health administrations" OR government* OR nongovernment*) N6 performance)

S13 TI ((target OR targets OR targeted) N3 (pay* OR reward*)) OR AB ((target OR targets OR targeted) N3 (pay* OR reward*))

S12 TI (conditional N3 (pay* OR money OR monetary OR cash OR financ* OR fund* OR econom* OR disbursement* OR remunerat* OR reimburs* OR nonmonetary OR voucher* OR token OR tokens OR goods OR reward* OR bonus* OR incentive* OR motivat*)) OR AB

(conditional N3 (pay* OR money OR monetary OR cash OR financ* OR fund* OR econom* OR disbursement* OR remunerat* OR reimburs* OR nonmonetary OR voucher* OR token OR tokens OR goods OR reward* OR bonus* OR incentive* OR motivat*))

S11 TI ((incentive* OR compensatory OR reimbursement) W0 (plan OR plans)) OR AB ((incentive* OR compensatory OR reimbursement) W0 (plan OR plans))

S10 TI (pay* W3 quality) OR AB (pay* W3 quality)

S9 TI ((payment OR financial OR monetary OR nonmonetary OR economic OR disbursement OR remuneration OR reimbursement) W0 (reward* OR bonus*)) OR AB ((payment OR financial OR monetary OR nonmonetary OR economic OR disbursement OR remuneration OR reimbursement) W0 (reward* OR bonus*))

S8 TI (incentive W0 payment*) OR AB (incentive W0 payment*)

S7 TI ((payment OR financial OR monetary OR nonmonetary OR economic OR disbursement OR remuneration OR reimbursement OR reward* OR bonus) W0 incentive*) OR AB ((payment OR financial OR monetary OR nonmonetary OR economic OR disbursement OR remuneration OR reimbursement OR reward* OR bonus) W0 incentive*)

S6 TI ((performance OR merit) W0 based) OR AB ((performance OR merit) W0 based)

S5 TI ("result based" OR "results based") W0 (pay* OR fund* OR reward*) OR AB ("result based" OR "results based") W0 (pay* OR fund* OR reward*)

S4 TI ("p4p" OR (pay* N3 perform*)) OR AB ("p4p" OR (pay* N3 perform*))

S3 (SU(Compensation) AND SU(Incentives))

S2 SU ("Personnel Economics: Compensation and Compensation Methods and Their Effects")

S1 SU ("Compensation Packages; Payment Methods")

The Grey Literature Report (<http://www.greylit.org/>) (individual strategies/searches)

ID Search

- 1 "pay for performance"
- 2 "p4p"
- 3 "reimbursement incentive"
- 4 "payment incentive"
- 5 "payment reward"
- 6 "performance incentive"
- 7 "performance reward"
- 8 "performance payment"
- 9 "performance based financing"
- 10 "result based payment"
- 11 "result based funding"
- 12 "result based financing"

BLDS British Library for Development Studies (<http://blids.ids.ac.uk>) (individual strategies/searches)

ID Search

- 1 pay for performance
- 2 paying for performance
- 3 p4p
- 4 reimbursement incentive
- 5 reimbursement incentives
- 6 payment incentive
- 7 payment incentives
- 8 payment reward
- 9 payment rewards
- 10 performance incentive
- 11 performance incentives
- 12 performance reward
- 13 performance rewards
- 14 performance payment
- 15 performance payments
- 16 performance based financing
- 17 result based payment
- 18 results based payment
- 19 result based payments
- 20 results based payments
- 21 result based funding
- 22 results based funding
- 23 result based financing
- 24 results based financing

OpenGrey (<http://www.opengrey.eu/>)

ID Search

1 "pay for performance" OR "paying for performance" OR "p4p" OR "reimbursement incentive" OR "reimbursement incentives" OR "payment incentive" OR "payment incentives" OR "payment reward" OR "payment rewards" OR "performance incentive" OR "performance incentives" OR "performance reward" OR "performance rewards" OR "performance payment" OR "performance payments" OR "performance based financing" OR "result based payment" OR "results based payment" OR "result based payments" OR "results based payments" OR "result based funding" OR "results based funding" OR "result based financing" OR "results based financing"

3ie Database of Impact Evaluations (<http://www.3ieimpact.org/en/>) (individual strategies/searches)

ID Search

1 "pay for performance" OR "paying for performance" OR "p4p" OR "reimbursement incentive" OR "reimbursement incentives"
2 "payment incentive" OR "payment incentives" OR "payment reward" OR "payment rewards" OR "performance incentive" OR "performance incentives" OR "performance reward" OR "performance rewards" OR "performance payment" OR "performance payments"
3 "performance based financing"
4 "result based payment" OR "results based payment" OR "result based payments" OR "results based payments" OR "result based funding" OR "results based funding" OR "result based financing" OR "results based financing"

African Development Bank (<https://www.afdb.org/en/>) (individual strategies/searches)

ID Search

1 "pay for performance"
2 "p4p"
3 "reimbursement incentive"
4 "payment incentive"
5 "payment reward"
6 "performance incentive"
7 "performance reward"
8 "performance payment"
9 "performance based financing"
10 "result based payment"
11 "result based funding"
12 "result based financing"

USAID (<https://www.usaid.gov/>) (individual strategies/searches)

ID Search

1 "pay for performance"
2 "paying for performance"
3 "p4p"
4 "reimbursement incentive"
5 "reimbursement incentives"
6 "payment incentive"
7 "payment incentives"
8 "payment reward"
9 "payment rewards"
10 "performance incentive"
11 "performance incentives"
12 "performance reward"
13 "performance rewards"
14 "performance payment"
15 "performance payments"
16 "performance based financing"
17 "result based payment"
18 "results based payment"
19 "result based payments"
20 "results based payments"
21 "result based funding"
22 "results based funding"
23 "result based financing"
24 "results based financing"

Cordaid (<https://www.cordaid.org/en/>) (individual strategies/searches)

ID Search

1 pay for performance
2 paying for performance

- 3 p4p
- 4 reimbursement incentive
- 5 reimbursement incentives
- 6 payment incentive
- 7 payment incentives
- 8 payment reward
- 9 payment rewards
- 10 performance incentive
- 11 performance incentives
- 12 performance reward
- 13 performance rewards
- 14 performance payment
- 15 performance payments
- 16 performance based financing
- 17 result based payment
- 18 results based payment
- 19 result based payments
- 20 results based payments
- 21 result based funding
- 22 results based funding
- 23 result based financing
- 24 results based financing

Management Sciences for Health (<https://www.msh.org/>) (individual strategies/searches)

ID Search

- 1 "pay for performance"
- 2 "p4p"
- 3 "reimbursement incentive"
- 4 "payment incentive"
- 5 "payment reward"
- 6 "performance incentive"
- 7 "performance reward"
- 8 "performance payment"
- 9 "performance based financing"
- 10 "result based payment"
- 11 "result based funding"
- 12 "result based financing"

Centre for Global Development (<https://www.cgdev.org/>) (individual strategies/searches)

ID Search

- 1 "pay for performance"
- 2 "p4p"
- 3 "reimbursement incentive"
- 4 "payment incentive"
- 5 "payment reward"
- 6 "performance incentive"
- 7 "performance reward"
- 8 "performance payment"
- 9 "performance based financing"
- 10 "result based payment"
- 11 "result based funding"
- 12 "result based financing"

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) (<https://www.giz.de/de/html/index.html>) (individual strategies/searches)

ID Search

- 1 "pay for performance"
- 2 "paying for performance"
- 3 "p4p"
- 4 "reimbursement incentive"
- 5 "reimbursement incentives"
- 6 "payment incentive"
- 7 "payment incentives"

- 8 "payment reward"
- 9 "payment rewards"
- 10 "performance incentive"
- 11 "performance incentives"
- 12 "performance reward"
- 13 "performance rewards"
- 14 "performance payment"
- 15 "performance payments"
- 16 "performance based financing"
- 17 "result based payment"
- 18 "results based payment"
- 19 "result based payments"
- 20 "results based payments"
- 21 "result based funding"
- 22 "results based funding"
- 23 "result based financing"
- 24 "results based financing"

KfW Entwicklungsbank (<https://www.kfw-entwicklungsbank.de/International-financing/KfW-Entwicklungsbank/>) (individual strategies/searches)

ID Search

- 1 pay-for-performance
- 2 paying-for-performance
- 3 p4p
- 4 reimbursement-incentive
- 5 reimbursement-incentives
- 6 payment-incentive
- 7 payment-incentives
- 8 payment-reward
- 9 payment-rewards
- 10 performance-incentive
- 11 performance-incentives
- 12 performance-reward
- 13 performance-rewards
- 14 performance-payment
- 15 performance-payments
- 16 performance-based-financing
- 17 result-based-payment
- 18 results-based-payment
- 19 result-based-payments
- 20 results-based-payments
- 21 result-based-funding
- 22 results-based-funding
- 23 result-based-financing
- 24 results-based-financing

Department for International Development (<https://www.gov.uk/government/organisations/department-for-international-development>) (individual strategies/searches)

ID Search

- 1 "pay for performance"
- 2 "p4p"
- 3 "reimbursement incentive"
- 4 "payment incentive"
- 5 "payment reward"
- 6 "performance incentive"
- 7 "performance reward"
- 8 "performance payment"
- 9 "performance based financing"
- 10 "result based payment"
- 11 "result based funding"
- 12 "result based financing"

Global Fund to Fight AIDS (<https://www.theglobalfund.org/en/>) (individual strategies/searches)

ID Search

- 1 "pay for performance"
- 2 "paying for performance"
- 3 "p4p"
- 4 "reimbursement incentive"
- 5 "reimbursement incentives"
- 6 "payment incentive"
- 7 "payment incentives"
- 8 "payment reward"
- 9 "payment rewards"
- 10 "performance incentive"
- 11 "performance incentives"
- 12 "performance reward"
- 13 "performance rewards"
- 14 "performance payment"
- 15 "performance payments"
- 16 "performance based financing"
- 17 "result based payment"
- 18 "results based payment"
- 19 "result based payments"
- 20 "results based payments"
- 21 "result based funding"
- 22 "results based funding"
- 23 "result based financing"
- 24 "results based financing"

University of Cape Town (<https://www.uct.ac.za/search/>) (individual strategies/searches)

ID Search

- 1 "pay for performance"
- 2 "paying for performance"
- 3 "p4p"
- 4 "reimbursement incentive"
- 5 "reimbursement incentives"
- 6 "payment incentive"
- 7 "payment incentives"
- 8 "payment reward"
- 9 "payment rewards"
- 10 "performance incentive"
- 11 "performance incentives"
- 12 "performance reward"
- 13 "performance rewards"
- 14 "performance payment"
- 15 "performance payments"
- 16 "performance based financing"
- 17 "result based payment"
- 18 "results based payment"
- 19 "result based payments"
- 20 "results based payments"
- 21 "result based funding"
- 22 "results based funding"
- 23 "result based financing"
- 24 "results based financing"

Kenya Institute of Policy Analysis and Research (IPAR) (<http://iparkenya.blogspot.co.uk/>) (individual strategies/searches)

ID Search

- 1 "pay for performance"
- 2 "paying for performance"
- 3 "p4p"
- 4 "reimbursement incentive"
- 5 "reimbursement incentives"
- 6 "payment incentive"

- 7 "payment incentives"
- 8 "payment reward"
- 9 "payment rewards"
- 10 "performance incentive"
- 11 "performance incentives"
- 12 "performance reward"
- 13 "performance rewards"
- 14 "performance payment"
- 15 "performance payments"
- 16 "performance based financing"
- 17 "result based payment"
- 18 "results based payment"
- 19 "result based payments"
- 20 "results based payments"
- 21 "result based funding"
- 22 "results based funding"
- 23 "result based financing"
- 24 "results based financing"

Institute of Tropical Medicine Belgium (<http://www.itg.be/E>) (individual strategies/searches)

ID Search

- 1 pay for performance
- 2 paying for performance
- 3 p4p
- 4 reimbursement incentive
- 5 reimbursement incentives
- 6 payment incentive
- 7 payment incentives
- 8 payment reward
- 9 payment rewards
- 10 performance incentive
- 11 performance incentives
- 12 performance reward
- 13 performance rewards
- 14 performance payment
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- 16 performance based financing
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- 21 result based funding
- 22 results based funding
- 23 result based financing
- 24 results based financing

Appendix 3. Data extraction template

Category	Extracted data	Page/Figure/Location in Text	Reviewer notes	Procedural notes
Doubts over inclusion?				
Comment on any inclusion criteria you think this paper may violate			If you have serious doubts, discuss before proceeding!	

(Continued)

General descriptors

Name of reviewer

Date

dd/mm/yyyy

Study ID

surname of first author and year first full report of study was published e.g. Smith 2001

Other reports of this study (entire reference)

First author

Surname, Initial

Year of publication

yyyy

Publication type

Report author contact details

Name; Email; Phone; Address

Data repository

Funders of study

Setting

Country

Free text

PBF scheme

Exact data or NR or unclear (specify page)

Level at which PBF incentive is paid?

How are the PBF incentives used and cascaded?

Describe the mechanism of payment to everyone involved

Scale of PBF intervention + rationale

Descriptive: e.g. national to X districts, or populations

Context

E.g. urban and rural, poverty levels, etc

Sector

E.g. public, private, mixes, faith based organizations

Clinical or population group targeted

E.g. MCH or TB patients or mothers attending with children under 5

Type of PBF

Who set the targets/how were the targets set?

E.g. Who made the decisions re: targets and based on what?

(Continued)

Payment frequency	
Payment formula	
Measurement of targets: how and where from?	E.g. Data source for measurement
Verification mechanisms	E.g. how is the data verified, by whom?
Magnitude of incentives	E.g. price per indicator (if table then copy in separate sheet and link)
Relative size of incentive	E.g. compared to health worker salary, overall funding of health facility
Are incentives additional to normal wage/funding?	Extract data on the whole scheme budget + the facility/health worker incentive elements
Ancillary components:	Yes if done
Increased funding	
Increased health facility autonomy	
Training	
Supervision	
Supplies	
Technical support	
Management support	
Other quality improvement strategies	
Increasing salaries	
Construction of new facilities	
Improvements in information systems	
Changes in governance, priority setting or rationing	
Processes to involve stakeholders	Specify if consumers/others are involved
Complementary demand-side incentives	
Other (specify)	
Overall cost	E.g. Per person budget or national cost of scheme

(Continued)

Source of funding

More details

Optional to fill in

Impact evaluation: Participants, methods, data and analysis

Type of study

Aim of study

Describe aim

Location of care

Sector

Urban or rural areas?

Choice of study setting selection

Describe why the study settings were chosen

Data

Data collection methods

Data source

E.g. house hold surveys, DHS

Who collected data?

E.g study authors, survey company, DHS etc

Time of baseline data collection

Time of endline data collection

Follow-up of the PBF scheme

Participants

Level at which outcomes are assessed

Description of patient-group(s) affected by the intervention

Inclusion/exclusion criteria relating to participants

Total sample

Number of providers

Specify number of health care workers

Number of patients

(Continued)

Number of episodes of care

Clustering level (overall)

Copy rows as much as needed to capture all clustering

Level 1

From the most macro to micro

Units per level 1

e.g. 17 households

Level 2

Units per level 2

Level 3

Units per level 3

Proportion of eligible
providers (or allocation units)
who participated in evaluation

Other setting-specific factors
that may be of relevance when
assessing external validity

Analytic methods

Unit of allocation (EPOC item:
6.1)

Unit of analysis (EPOC item:
6.2)

Power calculation (EPOC item:
6.3)

Score done if the study is powered; not done if underpow-
ered; unclear if calculation missing + COPY calculation

Type of statistical analysis

Equations

Copy it here!

Group descriptions

**COPY
OVER
FOR EACH
GROUP**

Study arm/group

Interven-
tion group
1

Description of study arm/
group intervention

E.g. scheme detailed above + payments to demand side
OR control description

Participant characteristics in group

(Continued)

Baseline

Number of providers

Number of patients

Number of episodes of care

Notes

Any notes on participant groups that may affect generalizability

Clustering level (overall)

Copy rows as much as needed to capture all clustering

Level 1

e.g. households

Units per level 1

e.g. 17 households

Level 2

Units per level 2

Endline (+ copy if needed for follow up)

Number of providers

Number of patients

Number of episodes of care

Notes

Any notes on participant groups that may affect generalizability

Clustering level (overall)

Copy rows as much as needed to capture all clustering

Level 1

e.g. households

Units per level 1

e.g. 17 households

Level 2

Units per level 2

More detail about intervention

If it deviates from the normal scheme then add in more info here

Results
**COPY
OVER
FOR EACH
OUT-
COME**

Type of outcome

(Continued)

Specific indicator	List the exact indicator assessed
Summative findings	Interpretation of findings (direction, magnitude)
<i>Explanatory notes</i>	
Comments from authors	E.g. what to keep in mind when interpreting
Comments from us	
COPY THE RESULTS	
Overall interpretation/ implications	
Comments from authors	
Comments from us	
QUALITY CRITERIA: RISK OF BIAS (Cochrane EPOC, 'Suggested risk of bias criteria for EPOC reviews', 2017)	
<i>Risk of bias for studies with a separate control group (randomised trials; non-randomised trials; controlled before-after studies)</i>	
Random sequence generation	Score “Low risk” if a random component in the sequence generation process is described (e.g. Referring to a random number table). Score “High risk” when a nonrandom method is used (e.g. performed by date of admission). Non-randomised trials and controlled before-after studies should be scored “High risk”. Score “Unclear risk” if not specified in the paper.
Allocation concealment	Score “Low risk” if the unit of allocation was by institution, team or professional and allocation was performed on all units at the start of the study; or if the unit of allocation was by patient or episode of care and there was some form of centralised randomisation scheme, an on-site computer system or sealed opaque envelopes were used. Controlled before-after studies should be scored “High risk”. Score “Unclear risk” if not specified in the paper.
Baseline outcome measurement similar	Score “Low risk” if performance or patient outcomes were measured prior to the intervention, and no important differences were present across study groups. In randomised trials, score “Low risk” if imbalanced but appropriate adjusted analysis was performed (e.g. Analysis of covariance). Score “High risk” if important differences were present and not adjusted for in analysis. If randomised trials have no baseline measure of outcome, score “Unclear risk”.

(Continued)

Baseline characteristics similar	Score “Low risk” if baseline characteristics of the study and control providers are reported and similar. Score “Unclear risk” if it is not clear in the paper (e.g. characteristics are mentioned in text but no data were presented). Score “High risk” if there is no report of characteristics in text or tables or if there are differences between control and intervention providers. Note that in some cases imbalance in patient characteristics may be due to recruitment bias whereby the provider was responsible for recruiting patients into the trial.
Incomplete outcome data	Score “Low risk” if missing outcome measures were unlikely to bias the results (e.g. the proportion of missing data was similar in the intervention and control groups or the proportion of missing data was less than the effect size i.e. unlikely to overturn the study result). Score “High risk” if missing outcome data was likely to bias the results. Score “Unclear risk” if not specified in the paper (Do not assume 100% follow up unless stated explicitly).
Knowledge of the allocated interventions adequately prevented during study (blinding)	Score “Low risk” if the authors state explicitly that the primary outcome variables were assessed blindly, or the outcomes are objective, e.g. length of hospital stay. Primary outcomes are those variables that correspond to the primary hypothesis or question as defined by the authors. Score “High risk” if the outcomes were not assessed blindly. Score “Unclear risk” if not specified in the paper.
Protection against contamination	Score “Low risk” if allocation was by community, institution or practice and it is unlikely that the control group received the intervention. Score “High risk” if it is likely that the control group received the intervention (e.g. if patients rather than professionals were randomised). Score “Unclear risk” if professionals were allocated within a clinic or practice and it is possible that communication between intervention and control professionals could have occurred (e.g. physicians within practices were allocated to intervention or control)
Selective outcome reporting	Score “Low risk” if there is no evidence that outcomes were selectively reported (e.g. all relevant outcomes in the methods section are reported in the results section). Score “High risk” if some important outcomes are subsequently omitted from the results. Score “Unclear risk” if not specified in the paper.
Other risks of bias	Score “Low risk” if there is no evidence of other risk of biases.
<i>Risk of bias for interrupted time series studies</i>	
Intervention independent of other changes	Score “Low risk” if there are compelling arguments that the intervention occurred independently of other changes over time and the outcome was not influenced by other confounding variables/historic events during study period. If Events/variables identified, note what they are.

(Continued)

	Score “High risk” if reported that intervention was not independent of other changes in time.
Shape of the intervention effect pre-specified	Score “Low risk” if point of analysis is the point of intervention OR a rational explanation for the shape of intervention effect was given by the author(s). Where appropriate, this should include an explanation if the point of analysis is NOT the point of intervention. Score “High risk” if it is clear that the condition above is not met.
Intervention unlikely to affect data collection	Score “Low risk” if reported that intervention itself was unlikely to affect data collection (for example, sources and methods of data collection were the same before and after the intervention); Score “High risk” if the intervention itself was likely to affect data collection (for example, any change in source or method of data collection reported).
Knowledge of the allocated interventions adequately prevented during the study	Score “Low risk” if the authors state explicitly that the primary outcome variables were assessed blindly, or the outcomes are objective, e.g. length of hospital stay. Primary outcomes are those variables that correspond to the primary hypothesis or question as defined by the authors. Score “High risk” if the outcomes were not assessed blindly. Score “Unclear risk” if not specified in the paper.
Incomplete outcome data adequately addressed	Score “Low risk” if missing outcome measures were unlikely to bias the results (e.g. the proportion of missing data was similar in the pre- and post-intervention periods or the proportion of missing data was less than the effect size i.e. unlikely to overturn the study result). Score “High risk” if missing outcome data was likely to bias the results. Score “Unclear risk” if not specified in the paper (Do not assume 100% follow up unless stated explicitly).
Selective outcome reporting	Score “Low risk” if there is no evidence that outcomes were selectively reported (e.g. all relevant outcomes in the methods section are reported in the results section). Score “High risk” if some important outcomes are subsequently omitted from the results. Score “Unclear risk” if not specified in the paper.
Other risks of bias	Score “Low risk” if there is no evidence of other risk of biases. E.g. should consider if seasonality is an issue (i.e. if January to June comprises the pre-intervention period and July to December the post, could the “seasons” have caused a spurious effect).

Appendix 4. Comparison 1: Summary of findings tables 1-45

1. 1. Targeted measures of provider performance

1. 1. 1. Delivery and utilization

Table 1: Delivery and utilization of HIV-AIDS, malaria and TB services

Outcome	Utilization and delivery: HIV-AIDS, malaria and TB
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(Continued)

Patient group	Households and patients exposed to HIV/TB/malaria and seeking care at health facilities			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of paying for performance (P4P)			
Settings	Burundi, Cameroon, China, Congo, Swaziland, Tanzania			
	Impact summary	Nr of studies	Certainty of the evidence (GRADE)	Comments
Provision of HIV testing (% of persons tested)	P4P may have a desirable effect on the % of persons tested for HIV, with relative increases in testing rates ranging from 6-600%.	3 (Zeng 2018a, de Walque 2017, McMahon 2016)	Low ¹	Indicators assessed differently and over the course of different time points: de Walque provision of HIV testing from facility registers, Zeng % of patients receiving test when offered and McMahon considers different populations (males, females - both pregnant and not); effects consistent at end-points of studies. No RCT reported this outcome for this comparison.
Provision of ART (% of persons receiving)	P4P may have undesirable effects: ART provision in the general population is noted to decline by 121%; in pregnant women, effects on utilization and delivery of ART at health centres estimated at 0, at hospitals -13%.	2 (de Walque 2017, McMahon 2016)	Low ²	Indicators differ, and there is inconsistency over time in impacts. No RCT reported this outcome for this comparison.
Provision of PMTCT (% of women receiving)	P4P may have desirable effects: the % of women receiving PMTCT ranges from -3.8% to 21%.	2 (Binyaruka 2015, de Walque 2017)	Low ³	Indicators differ: Binyaruka assesses PMTCT in ANC clients only, de Walque at facility levels. No RCT reported this outcome for this comparison.
Bed-net use (% children and households using bed-nets)	P4P may have undesirable effects: the effect of P4P on the % of children or households using bednets (ranges from 0 to negative 7.3%).	2 (Zeng 2018a, Bonfrer 2014a)	Low ⁴	Two distinct criteria, though targeting same concept so no indirectness suspected. Authors of one paper note ceiling effects. No RCT reported this outcome for this comparison.
TB adherence rate (%)	The effects of the intervention on TB adherence are uncertain: we note inconsistent effects, ranging from a positive effect (-2 % reduction in loss to follow-up compared to control) in all patients; to 62% increase in loss to follow-up in smear positive patients.	2 (Kliner 2015, Yao 2008)	Very low ⁵	Indicators differ: one assesses defaulting in general and the other in smear+ patients. No RCT reported this outcome for this comparison.

(Continued)

Summary: Overall certainty in evidence is low; P4P may have desirable effects on the proportion of persons undergoing HIV testing, as well as PMTCT. However, it may worsen ART delivery.

¹Majority of studies with limitations for 1 or more criteria in RoB and indirectness

²Limitations for 1 or more criteria in RoB and inconsistency of indicators

³Limitations for 1 or more criteria in RoB and indirectness

⁴Critical limitations for 1 or more criteria in RoB

⁵Critical limitations for 1 or more criteria RoB and indirectness

Table 2: Delivery and utilization of immunizations

Outcome	Utilization and delivery: Immunizations			
Patient group	Children and mothers undergoing vaccinations, reports for different age-groups			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of paying for performance (P4P)			
Settings	Afghanistan, Argentina, Burundi, Cambodia, Cameroon, Congo, DRC, Malawi, Peru, Zambia, Zimbabwe			
	Impact summary	Nr of studies	Certainty of the evidence (GRADE)	Comments
Child immunization: % receiving at least one vaccine	P4P may make little to no difference to outcome: effects inconsistent of small magnitude, ranging between -1 to 1%.	2 (Bonfrer 2014a , Huillery 2017)	Low ¹	Indicators assessed across different age groups, one in children and one in infants. Sensitivity analysis: One RCT reports positive effect 1%, moderate certainty in evidence (one study only).
Children fully vaccinated (%)	Effects of the intervention are uncertain: literature notes effect sizes ranging from -18% to 38.9%	8 (Bonfrer 2014b , de Walque 2017 , Zeng 2018a , McMahon 2016 , Cruzado de la Vega 2017 , Friedman 2016a and Friedman 2016b , Chansa 2015)	Low ²	Exact indicators differ across population groups assessed (age groups) and ITS slope and level change captured within range. Sensitivity analysis: One RCT estimate at 16.1%, certainty in evidence is low (serious concerns over two or more RoB criteria, one study only)
Children receiving BCG (%)	P4P may have small desirable effects: effects range from small negative effects (-3.4%) to positive (7%).	8 (Bonfrer 2014a , Bonfrer 2014b , Falisse 2015 , Huillery 2017 , Zeng 2018a , Friedman 2016a and Friedman 2016b)	Low ¹	Exact indicators differ, summary over indicators in coverage, children 12-24 months, and different time points. Sensitivity analysis: RCT evidence ranges between 1-7% (two studies); certainty in evidence is low (critical limitations RoB and indirectness.)

(Continued)

Children receiving DTP (%)	P4P may have undesirable effects, ranging from -19.7% to +9%.	6 (Bonfrer 2014b, Falisse 2015, Zeng 2018a, Friedman 2016a, Matsuoka 2014)	Low ³	Exact indicators differ, summary draws on data across coverage and % indicators for children of different age groups receiving DTP 1, 2, 3 and ITS slope and level change captured within range. Sensitivity analysis: RCT effect is 6.1%; certainty in evidence is low (one study, concerns over RoB)
Children receiving measles vaccination (%)	P4P may have desirable effects, ranging from -5% to 18.7%	6 (Bonfrer 2014b, de Walque 2017, Binyaruka 2015, Friedman 2016a, Friedman 2016b, Matsuoka 2014)	Low ³	Indirectness likely as indicators assessed across different populations and ITS slope and level change captured within range. Sensitivity analysis: RCT effect is -3.6%; certainty in evidence is low (one study, RoB concerns).
Children receiving polio vaccination (%)	P4P may have desirable effects, ranging from -7.1% to +23%	7 (Bonfrer 2014b, Falisse 2015, McMahon 2016, Binyaruka 2015, de Walque 2017, Friedman 2016a and Friedman 2016b)	Low ¹	Indicators different, ranging from coverage to % receiving specified number of doses. Sensitivity analysis: RCT effect is 21% (low certainty evidence - concerns over 1 criteria among RoB and one study only)
Children receiving pentavalent vaccination (%)	P4P may make little to no difference to the outcome, with effects ranging from -5.7% to 3.1%	3 (Engineer 2016, Binyaruka 2015, McMahon 2016)	Low ¹	Sensitivity analysis: RCT effect is -5.7%; certainty in evidence is moderate (downgraded, as one study only).
Mothers receiving immunizations (%)	P4P may have desirable effects, ranging from -2.2% to 65.5%	9 (Gertler 2014, Bonfrer 2014a, Bonfrer 2014b, Falisse 2015, de Walque 2017, Zang 2015, Zeng 2018a, McMahon 2016, Binyaruka 2015)	Low ⁴	Indicators are substantively different, ranging from coverage rates, to % of women vaccinated at facilities, to % of women giving birth who had received vaccine. No RCT reported this outcome for this comparison.
Summary:	Effects on overarching likelihood of children being vaccinated appear inconsistent; some vaccinations such as polio, measles, BCG may be positively affected, while others such as DTP may be negatively affected. Certainty in evidence is low.			

¹Limitations for 1 or more criteria in RoB and indirectness

²Limitations for 1 or more criteria in RoB and indirectness, upgraded for appreciable benefit

³Limitations for 1 or more criteria in RoB and indirectness, one study re-analysed)

⁴Critical limitations for 1 or more criteria in RoB and noted indirectness, +1 for potential of large effect, -1 for suspected publication bias)

Table 3: General service utilization and delivery (any, curative, outpatient)

Outcome	Utilization and delivery: general
Patient group	Overall patients utilizing clinics
Comparison	Pure control group (standard practice, status quo, no additional financing)
Intervention	Any type of paying for performance (P4P)

(Continued)

Settings		Burundi, Cameroon, China, Congo, Zambia		
	Impact summary	Nr of studies	Certain-ty of the evidence (GRADE)	Comments
Probability of any utilization (% rate)	P4P may make little to no difference to the outcome, effects noted are consistently positive ranging from 2-4.2%.	2 (Bonfrer 2014a , Friedman 2016a)	Low ¹	Sensitivity analysis: RCT suggests impacts around 4.2%; certainty in evidence is low (concerns over RoB criteria, one study only)
Frequency of curative utilization (% rate)	P4P may have desirable effects: literature notes 83% increase in utilization.	1 (Zeng 2018a)	Low ²	No RCT reported this outcome for this comparison.
Frequency of outpatient utilization (% rate)	P4P may have desirable effects, ranging from -3% to up to 15%	3 (Falisse 2015 , Zang 2015 , Chansa 2015)	Low ¹	ITS slope and level change captured within range. No RCT reported this outcome for this comparison.
Frequency of all visits (number of visits)	P4P may have little to no impact on the outcome of interest, with effects in number of total visits in range of 0.8-3.6%	1 (Powell-Jackson 2014)	Low ³	No RCT reported this outcome for this comparison.
Summary:	P4P may have desirable effects of curative and outpatient utilization, however appears to make little to no difference to utilization or frequency of visits overall. Certainty in evidence is low.			

¹Critical limitations for 2 RoB criteria

²Concerns over 2 or more RoB criteria and suspected publication bias, one study only, upgraded for large effect

³Critical concerns over 1 RoB criterion, one study only

Table 4: Delivery and Utilization of Family Planning services

Outcome	Utilization and delivery: RMNCH - family planning			
Patient group	Women of reproductive age (15-49) in study districts.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of paying for performance (P4P)			
Settings	Burundi, Cameroon, Congo, DRC, Zambia, Zimbabwe			
	Impact summary	Nr of studies	Certainty of the evidence	Comments

(Continued)

Any family planning (% persons using any method)	Effects of the intervention are uncertain: Inconsistent effects on the utilization rate of any contraceptives, ranging from -6.37 to 6.7% overall.	5 (Zeng 2018a, Bin-yaruka 2015, Friedman 2016a, Friedman 2016b, Huillery 2017)	Low ¹	Sensitivity analysis: Two RCT report estimates suggestive of no or negative impacts ranging from -6.3% to 0%; certainty in evidence is low (concerns over RoB, two studies)
Modern family planning utilization (% women utilizing modern methods)	Overarchingly, effects of the intervention are uncertain. P4P may have positive effects on the coverage of modern family planning services, with effects ranging from 3.6 to 19.5%. However, effects of the intervention on facility utilization rates are uncertain: effects range from -20.5% to 36%.	7 (de Walque 2017, Zang 2015, Friedman 2016a, Friedman 2016b, Bonfrer 2014a, Falisse 2015, Zeng 2018a)	Low ¹	Sensitivity analysis: RCT estimates relative effect of 0.2% in household survey; certainty in evidence is low (one study, RoB concerns)
Family planning (% of services delivered)	P4P probably improves the delivery of family planning services, with effects ranging from 10% to 300% increase in delivery of family planning services at health facility.	2 (Friedman 2016b, de Walque 2017)	Moderate ²	No RCT reported this outcome for this comparison.
Summary:	Moderate certainty that delivery of family planning services is increasing, consistent with the positive effects noted in relation to utilization of modern family planning methods among women (low certainty). Low certainty on the use of any family planning method, however.			

¹Critical limitations over 2 or more RoB criteria

²Critical RoB limitation on one criterion, study design + large effect in large sample size

Table 5: Delivery and utilization of antenatal care

Outcome	Utilization and delivery: RMNCH - antenatal care			
Patient group	Pregnant women enrolled in study within specified time frames.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of paying for performance (P4P)			
Settings	Afghanistan, Benin, Burkina Faso, Burundi, Cambodia, Cameroon, DRC, El-Salvador, India, Malawi, Peru, Rwanda, Zambia, Zimbabwe			
	Impact summary	Nr of studies	Certainty of the evidence (GRADE)	Comments
Antenatal care (% of women utilizing ANC)	P4P may have desirable effects, ranging from -4.9% to 15%.	5 (de Walque 2017, Mohanan 2017, Chansa 2015, Fried-	Low ¹	Indicators overall consistent. ITS slope and level change captured within range. Sensitivity analysis: RCT estimates 4%, certainty in evidence is low (concerns over

(Continued)

		man 2016b, Zeng 2018a)		RoB limited information and one study only).
Total number of ANC visits	Effects of the intervention are uncertain: relative effects range from -16.4% to 37.6%.	7 (Gertler 2014, Lagarde 2015, Huillery 2017, Bernal 2018, Friedman 2016a, Friedman 2016b, Matsuoka 2014)	Low ¹	Some differences in indicator specifications and populations data collected in. ITS slope and level change captured within range Sensitivity analysis: RCT estimates range from -35% to -4.6%; certainty in evidence is low (critical limitations RoB criteria for one study, two studies overall)
At least one ANC (utilization rates)	P4P may have desirable effects, ranging from -1.5% to 26.9% (median is 1.1% (IQR 3)).	10 (Engineer 2016, Bonfrer 2014a, Bonfrer 2014b, Falisse 2015, Huillery 2017, Bernal 2018, Friedman 2016a, Friedman 2016b, Matsuoka 2014)	Low ²	Differences in specification of indicators, though not substantive. ITS slope and level change captured within range. Sensitivity analysis: Three RCTs suggest effects ranging from -10 to -1.5%; certainty in evidence is moderate (limitations for RoB criteria)
At least two ANC (utilization rates)	P4P may make little to no difference on utilization of two or more ANC visits (effects ranging from -1.1 to 1.1%).	3 (de Walque 2017, Zang 2015, Matsuoka 2014)	Low ³	No RCT reported this outcome for this comparison.
At least four ANC (utilization rates)	P4P may have desirable effects, ranging from -5.4% to 27% overall (though short term impacts estimated to be higher in some cases).	4 (Steenland 2017, McMahon 2016, Friedman 2016a, Matsuoka 2014)	Low ¹	ITS slope and level change captured within range. Sensitivity analysis: RCT estimate is -5.4%; certainty in evidence is low (concerns over RoB, 1 study only)
ANC from qualified provider (utilization rates)	P4P may make little to no difference on utilization of ANC from a qualified provider, effects ranging from 2.5 to 4.7%.	2 (Friedman 2016a, Friedman 2016b)	Low ¹	Sensitivity analysis: RCT estimate is 4.7%; certainty in evidence is low (concerns over RoB, 1 study only)
Delivery of iron supplementation during ANC (% women receiving)	P4P may have undesirable effects, differing over the time-span of assessment and also by facility type; effects range between -109% to 6%.	2 (McMahon 2016, Cruzado de la Vega 2017)	Low ²	No RCT reported this outcome for this comparison.
Women accessing care in first trimester (% women receiving)	P4P may have desirable effects, ranging from -0.1% to 37.7%;	4 (Steenland 2017, Bernal 2018, McMahon 2016, Friedman 2016b)	Low ¹	No RCT reported this outcome for this comparison.
Summary:	Certainty in evidence is low overall, however it appears P4P may have positive effects on accessing ANC in general.			

¹Critical limitations over 2 or more RoB criteria

²Critical limitations over 2 or more RoB criteria and indirectness

³Serious limitations over 1 criteria and lack of information in ITS

Table 6: Delivery and utilization of institutional deliveries

Outcome	Utilization and delivery: RMNCH - institutional deliveries			
Patient group	Women giving birth in study periods.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of paying for performance (P4P)			
Settings	Afghanistan, Burkina Faso, Burundi, Cambodia, Cameroon, DRC, India, Malawi, Tanzania, Zambia, Zimbabwe			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Institutional delivery utilization (utilization rate)	Effects of the intervention are uncertain, and range from -3% to 27% (median 9.45, IQR 17.5); majority of studies reporting positive effects on utilization or coverage rates overall.	13 (Steenland 2017, Ir 2015, Huillery 2017, Friedman 2016a, Friedman 2016b, Bonfrer 2014a, Bonfrer 2014b, Falisse 2015, Zang 2015, Zeng 2018a, Mo-hanan 2017, Binyaruka 2015, Chansa 2015)	Very low ¹	Indicators specified differently, which introduces issues with interpretation. ITS slope and level change captured within range. Sensitivity analysis: Three RCTs provide estimates that are inconsistent but P4P may have desirable effects, range from -3 to 18.1%; certainty in evidence is moderate (concerns over RoB)
Institutional delivery: C section (utilization rate)	P4P may have desirable effects, ranging from 2% to 146%.	2 (Huillery 2017, Friedman 2016b)	Low ²	Sensitivity analysis: RCT estimate is 2%; certainty in evidence is moderate (one study only)
Institutional delivery: skilled attendance (utilization rate)	P4P may have desirable effects, ranging from -5% to 42%.	6 (Engineer 2016, de Walque 2017, McMahon 2016, Friedman 2016a, Friedman 2016b, Zeng 2018a)	Low ³	Sensitivity analysis: Effects positive across the two RCTs (4% to 16.2%); certainty in evidence is low (RoB concerns)
Summary:	Very low to low certainty in results surrounding overall utilization of institutional deliveries and skilled attendance at these, suggestive of potential desirable effects on C-section delivery and skilled attendance at deliveries.			

¹Serious concerns over RoB, indirectness and suspected publication bias

²Serious concerns over RoB criteria

³Concerns over more than 2 RoB criteria

Table 7: Delivery and utilization of postnatal care

Outcome	Utilization and delivery: RMNCH - postnatal care			
Patient group	Women who have given birth in enrolled facilities.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of paying for performance (P4P)			
Settings	Afghanistan, Burkina Faso, DRC, India, Malawi, Tanzania, Zambia, Zimbabwe			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Postnatal care: overall utilization rate	P4P may have desirable effects, ranging from -2.88% to 25% overall.	5 (Steenland 2017 , Mohan 2017 , Huillery 2017 , Friedman 2016a , Friedman 2016b)	Low ²	Sensitivity analysis: Three studies are RCT and estimates range from -2% to 10.8%; moderate certainty in evidence (serious concerns over 2 RoB criteria in one of the studies)
Postnatal care: proportion of women receiving skilled attendance	P4P may have desirable effects, ranging from 15.79% to 26.4%.	2 (Friedman 2016a , Friedman 2016b)	Low ²	Sensitivity analysis: RCT estimate is 15.79%; low certainty in evidence (RoB concerns and one study only)
Postnatal care: proportion of women with timely access	P4P may have desirable effects, ranging from -3% to 25%.	4 (Engineer 2016 , McMahon 2016 , Bin-yaruka 2015 , Friedman 2016b)	Low ³	Comparability of indicators compromised; some estimate at facility level and other household and for different time frames. Sensitivity analysis: RCT result suggestive of no impact (-0.8%); moderate certainty evidence (one study only).
Summary:	Low certainty in evidence overall, however indicative of potential positive effects of P4P on postnatal care.			

¹Based on RCT - [Friedman 2016b](#), downgraded - one study only, RoB

²Serious concerns over RoB criteria

³Serious concerns over RoB criteria and indirectness

Table 8: Delivery and utilization of child care

Outcome	Utilization and delivery: Child care
Patient group	Households with children in study catchment areas.
Comparison	Pure control group (standard practice, status quo, no additional financing)
Intervention	Any type of paying for performance (P4P)
Settings	Congo, Haiti, Malawi, Zambia

(Continued)

	Impact summary	Nr of studies	Certainty of the evidence	Comments
Utilization rate of consultations in children	Effects of the intervention are uncertain: consultation rates for children under 1 increasing by 9.4%, and for those between 1-4 by 5.7%.	1 (Zeng 2013)	Very low ¹	No RCT reported this outcome for this comparison.
Utilization rate of curative consultations in children	P4P may have slight undesirable effects: estimated at 10.9% reduction in utilization.	1 (Friedman 2016a)	Low ²	Study is an RCT.
Vitamin A supplementation in children(rate)	P4P may have desirable effects: consistently positive impacts on children receiving vitamin A supplementation; impact on rates ranging between 50 to 155%.	2 (Zeng 2018a, McMahon 2016)	Low ²	Indicators not directly comparable, given different estimation (by facility or population). No RCT reported this outcome for this comparison.
Summary:	Overall inconsistent effects: evidence of desirable impacts for Vitamin A supplementation, however uncertain and undesirable effects for utilization of child consultations.			

¹Serious concerns over 2 or more RoB criteria, one study only

²Serious concerns over 2 or more RoB criteria

1. 1. 2. Quality of care

Table 9: Adherence to procedures and guidelines and adverse drug reaction management

Outcome	Quality of care: adherence to procedures and guidelines and adverse drug reaction management			
Patient group	Predominantly mothers and children seeking care or living in the districts where assessments occurred.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of paying for performance (P4P)			
Settings	Afghanistan, Benin, Burundi, Zambia, Zimbabwe, Multiple			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Background and physical assessment (scores general, across ANC, PNC, child care and for other consultations)	Effects of the intervention are uncertain, ranging from -17% to 23% change in scores.	7 (Friedman 2016a, Friedman 2016b, Engin 2016, Lagarde 2015, Bonfrer 2014b, Duysburgh 2016, Das 2017)	Very low ¹	Substantial variation in specified indicators, calculated averages across a range of measures, which may not be directly comparable but speak to same underlying concept. Sensitivity analysis: Two RCT suggest impacts range from -17% to 4%, low certainty in evidence (serious concerns over RoB).

(Continued)

Correct patient management by health care providers (scores in relation to ANC, child care and PNC)	Effects of the intervention are uncertain: Engineer estimates difference to be minor at 0.8%, Friedman observes differences across diverse items ranging from -75% (for management of children with anaemia) up to 225% for management of a child with HIV; Duysburgh notes similar differences from -12 to 26% change in scores.	3 (Engineer 2016, Friedman 2016b, Duysburgh 2016)	Very low ¹	Sensitivity analysis: RCT estimates impact at 0.6%, moderate certainty evidence (one study only, no other concerns)
Patient counselling (scores on ANC and PNC related counselling)	Effects of the intervention are uncertain, ranging from -37% to 17.25% change in scores, depending on the service and type of patient counselling conducted, however high levels of heterogeneity in the way indicators are specified.	6 (Friedman 2016a, Friedman 2016b, Engineer 2016, Lagarde 2015, Das 2017, Duysburgh 2016)	Very low ¹	Sensitivity analysis: RCT estimates suggest impacts between -37 to 6%, low certainty in evidence (serious concerns over RoB, indirectness).
Quality of care in delivery of immunizations in ANC (%)	P4P may have desirable effects, ranging from 2.25% to 14% change in scores overall.	2 (Friedman 2016a, Friedman 2016b)	Low ²	Sensitivity analysis: RCT estimates 2.25% on average; low certainty in evidence (serious RoB concerns, one study only)
Women in ANC given or prescribed folic acid/iron or both (%)	P4P may have desirable effects, ranging from 5.5% to 19.2% change in scores.	2 (Friedman 2016a, Friedman 2016b)	Low ²	Sensitivity analysis: RCT estimates 5.5%, low certainty in evidence (serious RoB concerns, one study only).
Prescription quality of care (index score)	P4P may have desirable effects, effects on scores in PBF groups estimated at 7% change in score compared to control.	1 (Das 2017)	Low ²	No RCT reported this outcome for this comparison.
Summary:	Very low to limited certainty in results across this area – indicators on quality of care for ANC and prescriptions responding positively, across three other areas effects are noted to be inconsistent though to be expected given indirectness.			

¹Serious concerns over the RoB and indirectness

²Concerns over RoB criteria

Table 10: Human resource skills and responsiveness

Outcome	Quality of care: human resource inputs
Patient group	Predominantly patients using RMCH and curative care services at targeted health facilities
Comparison	Pure control group (standard practice, status quo, no additional financing)
Intervention	Any type of paying for performance (P4P)
Settings	Afghanistan, Benin, Burundi

(Continued)

	Impact summary	Nr of studies	Certainty of the evidence	Comments
Staff knowledge and skills (score)	P4P may make little to no difference, effect estimated at 0.2% difference in knowledge scores.	1 (Engineer 2016)	Low ¹	Study is an RCT.
Staff responsiveness (score)	P4P may have desirable effects, ranging from -2 to 49%	2 (Bonfrer 2014a , La-garde 2015)	Very low ²	No RCT reported this outcome for this comparison.
Summary:	Overall very low to low certainty in evidence, however suggestive of desirable effects in relation to staff responsiveness.			

¹No concerns over RoB but imprecision likely, one study only

²Serious concerns over RoB criteria and indirectness

Table 11: Patient knowledge outcomes and perceptions

Outcome	Quality of care: patient outcomes and perceptions and contact and waiting time			
Patient group	Predominantly women and households accessing care in facilities included in studies			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of paying for performance (P4P)			
Settings	Afghanistan, Benin, Burundi, Tanzania, Zambia			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Patient knowledge (score)	P4P may have desirable effects, ranging from -3% to 116%, however majority is positive. Average across area is 37%.	1 (Friedman 2016a)	Low ¹	Study is an RCT.
Contact time	P4P may make little to no difference to indicator, effects ranging from -5.1% to 5.9%.	3 (Engineer 2016 , La-garde 2015 , Binyaruka 2015)	Low ²	Sensitivity analysis: RCT estimates at 2.5%; certainty in evidence moderate (one study only)
Waiting time	P4P may have undesirable effects, as increases in dissatisfaction with waiting times range from 10.8 to 12%.	2 (Bonfrer 2014a , Binyaruka 2015)	Low ³	No RCT reported this outcome for this comparison.
Summary:	Low certainty in evidence overall, however indicative of desirable effects on patient knowledge, limited to negative effects on contact and waiting time.			

¹Concerns over RoB criteria, one study only

²Serious concerns over RoB and indirectness

³Serious concerns over RoB

Table 12: Quality scores

Outcome	Quality of care: Quality composite scores (assessed via a mix of direct observation and patient exit interviews)			
Patient group	Mixed groups - varies according to study and scheme.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of paying for performance (P4P)			
Settings	Afghanistan, Burundi, Cameroon, Philippines, Tanzania, Zambia, Zimbabwe, Multiple			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Overall composite quality of care score	P4P may have desirable effects, ranging from -4% to 20% change in scores in majority of studies, one study notes outlier of 15 times increase.	8 (Engineer 2016 , Bonfrer 2014a , Das 2017 , de Walque 2017 , Peabody 2011 , Quimbo 2016 , Friedman 2016b , Zang 2015)	Low ¹	Sensitivity analysis: Two RCTs suggest impacts between 1.6% to 4%; moderate certainty evidence (some concerns over RoB)
Quality family planning (score)	P4P may improve the quality of family planning services (range: 9-32% change in score increases in quality of family planning scores).	3 (Rudasingwa 2014 , Zang 2015)	Low ²	No RCT reported this outcome for this comparison.
Quality of ANC (score)	Effects of the intervention are uncertain, ranging from -11.3% to 27.3% change in scores.	7 (Friedman 2016a , Friedman 2016b , de Walque 2017 , Zang 2015 , Binyaruka 2015 , Duysburgh 2016)	Low ³	Sensitivity analysis: RCT estimates increase of 4%; low certainty in evidence (one study, concerns over RoB).
Quality maternity care (score)	P4P may have desirable effects, ranging from 6.4% to 31% change in scores.	2 (Zang 2015 , Friedman 2016b)	Low ²	No RCT reported this outcome for this comparison.
Quality of child health care (score)	P4P probably improves quality of child health care scores, relative impact on scores ranging from 6.1% to 300% change in scores.	3 (Friedman 2016a , Friedman 2016b , Duysburgh 2016)	Moderate ⁴	Sensitivity analysis: RCT suggests 300%; moderate certainty evidence (downgraded 2 - RoB concerns, one study + upgraded for effect)
Quality of outpatient services (score)	Effects of the intervention are uncertain, relative effect is 23% change in score.	1 (Zang 2015)	Very low ⁵	No RCT reported this outcome for this comparison.

(Continued)

Quality of medicine and equipment (score)	P4P probably improves quality of medicine and equipment scores, effects ranging from 2.7-220% change in scores overall.	5 (Bonfrer 2014a, Friedman 2016a, Friedman 2016b, Duysburgh 2016, Das 2017)	Moderate ⁶	Sensitivity analysis: RCT suggests 220%; moderate certainty evidence (downgraded 2 - RoB concerns, one study + 1 effect)
Quality by department and/or service (score)	P4P probably improves quality of care scores by department, relative effects vary from increases of 39% to 15-fold change in score increases in the indices across outpatient care, delivery room, referral services, IPC and waste management.	3 (Friedman 2016a, Friedman 2016b, Das 2017)	Moderate ⁶	Sensitivity analysis: RCT impact suggests 15 fold increase; moderate certainty evidence (downgraded 2 - RoB concerns, one study + 1 effect)
Summary	Family planning, maternal and child health, medicine and equipment and department quality appear to respond positively, however ANC effects are mixed. Overall certainty is moderate for few indicators only.			

¹Serious concerns over RoB, indirectness and potential publication bias, upgraded for large effect

²Serious concerns over RoB criteria

³Serious concerns over RoB criteria and indirectness

⁴Serious concerns over RoB but upgraded for large effect

⁵Serious concerns over RoB criteria, one study only

⁶Serious concerns over RoB and indirectness, but upgraded for large effect

1. 2. Health outcomes

Table 13: Burden of disease measures

Outcome	Health outcomes: burden of disease measures			
Patient group	Mothers and children.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of paying for performance (P4P)			
Settings	Argentina, Philippines			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Disability adjusted life-years	P4P may avert 25401 (4064 - 46738) (due to a mix of neonatal mortality and low-birth weight reduction)	1 (Gertler 2014)	Low ¹	No RCT reported this outcome for this comparison.

¹Critical concerns over 3 RoB criteria

Table 14: Mortality and incidence of sickness

Outcome	Health outcomes: mortality and incidence of sickness			
Patient group	Mothers and children			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of paying for performance (P4P)			
Settings	Argentina, Brazil, India			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Child mortality (per 1000 children born alive)	P4P may have desirable effects; reduction in mortality ranging from 0.2-6.5%.	1 (Viñuela 2015)	Low ¹	Study is an ITS.
Neonatal mortality (see text)	P4P effects are inconsistent: P4P may have desirable effects and ensure reduction in neonatal mortality in implementing clinics by up to 22%. However, another study identified increase in region of 6.5% across catchment areas of P4P incentivized providers.	2 (Gertler 2014 , Mohan 2017)	Low ²	Sensitivity analysis: RCT shows slight increase in neonatal mortality estimated beta of 0.0079 increase (standard error, 0.0067, re-calculated effect 6.5%), moderate certainty in evidence (one study only, no substantive concerns).
Summary:	Low certainty evidence, suggestive of desirable effects.			

¹Concerns over RoB, one study only

²Concerns over RoB

Table 15: Reproductive maternal and child health outcomes

Outcome	Health outcomes: RMNCH outcomes			
Patient group	Mothers and children			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of paying for performance (P4P)			
Settings	Cameroon, Peru			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Unwanted pregnancy (rate)	Effects of the intervention are uncertain. An increase of 1% in unwanted pregnancies noted.	1 (Zang 2015)	Very low ¹	No RCT reported this outcome for this comparison.

(Continued)

Reported anaemia in children (%)	P4P may have desirable effects, ranging from 2-3% reduction in children with anaemia.	1 (Cruzado de la Vega 2017)	Low ²	No RCT reported this outcome for this comparison.
Summary:	Overall, inconsistent impacts - relatively small increase in unwanted pregnancies (very low certainty in estimate) but positive impacts on reported anaemia in children (reduction of 2-3% with low certainty).			

¹Serious concerns over the RoB criteria, one study only)

²Concerns over RoB, one study only)

Table 16: Tuberculosis treatment success

Primary outcome	Health outcomes: Tuberculosis treatment success			
Patient group	Tuberculosis patients			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of paying for performance (P4P)			
Settings	China, Swaziland			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Tuberculosis treatment success rate	P4P may have desirable effects, treatment success in PBF districts increased by 12-20% in comparison to controls.	2 (Kliner 2015, Yao 2008)	Low ¹	No RCT reported this outcome for this comparison.
Summary:	Limited certainty evidence, however indicative of desirable effects.			

¹Serious concerns over the RoB criteria

Table 17: Human resource inputs

Outcome	Changes in resource use: human resources			
Patient group	Schemes targeting maternal and child health.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of paying for performance (P4P)			
Settings	Cameroon, El Salvador			
	Impact summary	Nr of studies	Certainty of the evidence	Comments

(Continued)

Human re- source avail- ability	P4P probably has desirable effects on nurse availability, approx. 1-2 extra nurses in absolute numbers, increasing proportion of qualified staff by 19-44%.	2 (de Walque 2017, Zang 2015)	Moderate ¹	No RCT reported this outcome for this comparison.
Curative health visits per health care professional	Effects of the intervention are uncertain, there is an estimated decrease of 66%.	1 (Bernal 2018)	Very low ²	No RCT reported this outcome for this comparison.
Summary:	HR availability appears to increase if targeted (moderate certainty); limited certainty in estimates on curative health visits/health professional ratio.			

¹Some limitations for RoB across half the studies and imprecision

²Serious limitations for RoB and for imprecision, one study only

Table 18: Medicine and equipment availability

Outcome	Changes in resource use: Medicine and equipment			
Patient group	Schemes targeting maternal and child health predominantly.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of paying for performance (P4P)			
Settings	Afghanistan, Cameroon, Tanzania, Zambia, Zimbabwe			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Equipment availability (index)	P4P may have desirable effects, ranging in magnitude from approx. 3-308%.	4 (de Walque 2017, Binyaruka 2017, Friedman 2016a, Friedman 2016b)	Low ¹	Sensitivity analysis: RCT estimate is 308%; low certainty evidence (downgraded 2 - RoB concerns)
Equipment functionality (index)	P4P may have little to no impact on the indicator, slight positive effect (range 1.4%) difference in equipment functionality compared to control.	1 (Engineer 2016)	Low ²	Study is an RCT.
Infrastructure functionality (index)	P4P may have desirable effects, ranging from 4.5% to 345%.	3 (Engineer 2016, Friedman 2016a and Friedman 2016b)	Low ¹	Sensitivity analysis: Two RCTs suggest impacts between 4.5% to 345%; low certainty in evidence (downgraded due to RoB)
Medicine availability (index)	P4P may have desirable effects, ranging from 4.3 to 977%.	4 (Engineer 2016, de Walque 2017, Zang 2015, Friedman 2016a and Friedman 2016b)	Low ¹	Sensitivity analysis: Two RCT provide estimates from 0.6% to 200%; low certainty in evidence (downgraded due to RoB).

(Continued)

Vaccine availability (index)	Effects of the intervention are uncertain, ranging from -89% to 24.7%.	4 (de Walque 2017, Binyaruka 2017, Friedman 2016a, Friedman 2016b)	Low ³	Sensitivity analysis: RCT estimate is 21.95%; low certainty in evidence (RoB concerns, one study)
Stock out equipment	P4P may have desirable effects, reduction of stock-out estimated at 33%	1 (Binyaruka 2017)	Low ⁴	No RCT reported this outcome for this comparison.
Stock out vaccines	P4P may have desirable effects, reduction of stock-outs estimated at 47.4%.	1 (Binyaruka 2017)	Low ⁴	No RCT reported this outcome for this comparison.
Summary:	Low certainty in evidence, however generally suggestive of desirable effects.			

¹Serious concerns over RoB and imprecision

²Concern over imprecision, one study only

³Serious concerns over RoB and imprecision, indirectness

⁴Serious concerns over RoB and imprecision, indirectness, one study only

1. 4. Secondary outcomes

Table 19: Provider motivation, satisfaction, absenteeism and acceptability

Outcome	Provider motivation, satisfaction, absenteeism and acceptability			
Participants	Health care workers at the facilities where studies conducted.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of paying for performance (P4P)			
Settings	Afghanistan, Benin			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Provider absenteeism (%)	P4P may have little to no effect on indicator, estimated to range between 0.7-2% increases in absenteeism rate.	1 (Lagarde 2015)	Low ¹	No RCT reported this outcome for this comparison.
Provider motivation (score)	P4P probably has little to no effect on indicator.	1 (Engineer 2016)	Moderate ²	Study is an RCT.
Provider satisfaction (score)	P4P probably has little to no effect on indicator.	1 (Engineer 2016)	Moderate ²	Study is an RCT.
Summary	Certainty in evidence is low to moderate, relative effects suggestive of neutral effects overall.			

¹ Serious concerns over RoB and imprecision, one study only

²One study only, no other concerns

Table 20: Patient satisfaction and acceptability

Outcome	Patient satisfaction and acceptability (satisfaction scores)			
Patient group	Patients that had accessed ANC, child or curative care at study facilities.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of paying for performance (P4P)			
Settings	Afghanistan, Benin, Cameroon, China, Tanzania, Zimbabwe			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Patient satisfaction with facility cleanliness (score)	P4P may have desirable effects, ranging from 19.5% to 30%.	2 (de Walque 2017, Das 2017)	Low ¹	No RCT reported this outcome for this comparison.
Patient satisfaction with contact time (score)	Effects of the intervention are uncertain: positive impacts (approx. 2.25%) in satisfaction score with consultation times.	1 (Das 2017)	Very low ²	No RCT reported this outcome for this comparison.
Patient satisfaction with opening hours (score)	P4P may have desirable effects, ranging from under 1%-17.11% (for the opening hours for ANC consultations)	2 (de Walque 2017, Das 2017)	Low ¹	No RCT reported this outcome for this comparison.
Patient satisfaction with waiting time (score)	Effects of the intervention are uncertain, positive effect estimated at 32%.	1 (Das 2017)	Very low ²	No RCT reported this outcome for this comparison.
Patient satisfaction with privacy (score)	P4P may have desirable effects, ranging from 4.6% to 44.6%.	2 (de Walque 2017, Das 2017)	Low ¹	No RCT reported this outcome for this comparison.
Overall patient satisfaction with quality of care (score)	P4P may have little to no effect: slight positive effect reported in range of 0.4%.	1 (Engineer 2016)	Low ²	Study is RCT
Patient satisfaction with staff: Communication (score)	P4P may have little to no effect on the indicator: average effects ranging from 0.2% to 5.3% in comparison to control (politeness of staff during ANC and childcare and communication during delivery).	2 (Lagarde 2015, Bin-yaruka 2015)	Low ¹	No RCT reported this outcome for this comparison.
Patient satisfaction with staff: Attitude (score)	P4P may have desirable effects, ranging from 3.3% to 13.3% (for ANC and curative care).	2 (Das 2017, Lagarde 2015)	Low ¹	No RCT reported this outcome for this comparison.
Overall satisfaction (score)	P4P may have desirable effects, ranging from -0.05 to absolute increase in scores in range of 0.6 standard deviations.	2 (Yip 2014, Das 2017)	Low ¹	Sensitivity analysis: RCT estimate between negative 0.03% and 0.1%, both crossing no effect line; GRADE moderate (one study only, no other concerns)

(Continued)

Summary: Certainty in evidence is low overall, however evidence suggestive of some desirable effects.

¹Concerns over RoB criteria

²Concerns over RoB criteria, one study only

Table 21: Impacts on overall financing and resource allocation

Outcome	Impacts on overall financing or resource allocation			
Patient group	Households accessing care (except for remuneration, for which health care workers are reporting)			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	China			
	Impact summary	Nr of studies	Certainty in evidence	Comments
Expenditure on medicine and equipment	P4P may have little to no effect on drug expenditures for insured patients rising by 2.5%, dropping for uninsured by 0.9%.	1 (Wu 2014)	Low ¹	Study is an ITS. No RCT reported this outcome for this comparison.
Summary:	Low certainty in evidence, however suggestive of slight desirable effects.			

¹Some limited concerns over generalizability and RoB, one study only

Table 22: Management or information systems

Outcome	Impacts on management or information systems			
Patient group	Health care workers and management staff in PBF and control facilities			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	Afghanistan, Zambia			
	Impact summary	Nr of studies	Certainty in evidence	Comments
Facility or managerial autonomy (index)	P4P may have desirable effects, estimate on autonomy index 136%.	1 (Friedman 2016a)	Low ¹	Study is an RCT.

(Continued)

Facility governance (index)	P4P may have little to no effect on the indicator, intervention group has lower mean than controls, difference of 0.7%.	1 (Engineer 2016)	Low ²	Study is an RCT.
Quality of management (index)	P4P may have little to no effect on the indicator, impacts on management functionality index is positive, around 0.6%.	1 (Engineer 2016)	Low ²	Study is an RCT.
Summary:	Low certainty evidence, however suggestive of desirable effects on managerial autonomy, little to no effect on governance and quality of management.			

¹Downgraded for RoB, imprecision, one study only, upgraded for large effects

²Downgraded for imprecision, one study only

Table 23: Equity impacts

Outcome	Equity-consideration: Evidence of differential impact on different parts of the population			
Patient group	Same as for main utilization outcomes; primarily mothers and children in PBF and control districts.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	Peru, Zimbabwe			
	Impact summary	Nr of studies	Certainty in evidence	Comments
Equity of child immunization delivery (wealth related)	P4P may have desirable effects that are pro poor, ranging from increasing utilization of immunizations by 4.5% to 42% among the poorest groups in comparison to wealthiest.	2 (Cruzado de la Vega 2017 , Friedman 2016b)	Low ¹	No RCT reported this outcome for this comparison.
Equity in ANC delivery (wealth related)	P4P may have undesirable effects: impacts suggest households below median wealth/poorest households benefit less in ANC utilization compared to those of median wealth.	2, Friedman 2016b)	Low ¹	No RCT reported this outcome for this comparison.
Equity in institutional delivery (wealth related)	P4P may have little to no effect, estimate suggestive of slight pro-poor effect (under 2% compared to above median wealth group).	1 (Friedman 2016b)	Low ²	No RCT reported this outcome for this comparison.
Equity in institutional delivery (by educational status of mother)	P4P may have little to no effect: 0.3% more institutional deliveries among mothers with primary education or less compared to mothers with secondary education or above.	1 (Friedman 2016b)	Low ²	No RCT reported this outcome for this comparison.
Summary:	Mixed picture in relation to equity effects overall, however some desirable effects in relation to child immunization, undesirable in relation to ANC.			

¹Concerns over consistent RoB and imprecision

²Concerns over RoB, one study only

1. 5. Changes in untargeted measures of provider performance

1.5.1. Untargeted delivery and utilization

Table 24: Delivery and utilization of HIV-AIDS, malaria and TB services

Outcome	Utilization and delivery: HIV-AIDS, malaria and TB			
Patient group	Households and patients exposed to HIV/TB/malaria and seeking care at health facilities			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	Cameroon, Malawi			
	Impact summary	Nr of studies	Certainty in evidence	Comments
Provision of HIV testing (%)	P4P may have desirable effects, ranging from long term (-2 to 15%), though consistently positive at hospital levels in the range of 12-15%.	1 (McMahon 2016)	Low ¹	Indicators assessed at different time points and different health facility types. No RCT reported this outcome for this comparison.
Bednet use (%children and households)	P4P probably has little to no impact on the outcome, effect estimated at 0.12%.	1 (de Walque 2017)	Moderate ²	Indicator concerns children sleeping under a bed net. No RCT reported this outcome for this comparison.
Summary:	Limited influence on bednet use, however may have desirable effects on provision of HIV testing.			

¹Non-critical limitations for 1 or more criteria in RoB, one study only

²No substantive concerns, one study only

Table 25: Untargeted delivery of services (generic)

Primary outcome	Utilization and delivery: general
Patient group	Overall patients utilizing clinics
Comparison	Pure control group (standard practice, status quo, no additional financing)
Intervention	Any type of PBF
Settings	Cambodia, China, DRC, El-Salvador, Haiti, Tanzania

(Continued)

	Impact summary	Nr of studies	Certainty in evidence	Comments
Probability of any utilization (%)	P4P may have little to no effect, impacts inconsistent across studies, ranging from -6 to 2.4% overall.	2 (Powell-Jackson 2014, Huillery 2017)	Low ¹	Sensitivity analysis: RCT estimate is -6%; moderate certainty in evidence (one study only, no further concerns).
Frequency of curative utilization (%)	Effects of the intervention are uncertain: decrease overall (range of 2%) and in women 15-49 (0.2%); non-significant increase in children <5 (0.06%)	1 (Bernal 2018)	Very low ²	No RCT reported this outcome for this comparison.
Frequency of outpatient utilization (%)	P4P may have little to no effect, range appears -4% to 6.7% overall, but likely small effects over longer time periods.	4 (Khim 2018, Yip 2014, Bernal 2018, Bin-yaruka 2015)	Low ³	Differences exist in indicator specification - e.g. visits per day/month. Sensitivity analysis: RCT evaluation suggests negative effects, reduction in absolute number of patients per day range of 1%; moderate certainty in evidence (one study only, no further concerns)
Frequency - all visits (number of visits)	P4P may have little to no effect, 2.7% increase in consultations for non-incubated services noted.	1 (Zeng 2013)	Low ³	No RCT reported this outcome for this comparison.
Frequency - elderly visits (number of visits)	P4P may have little to no effect, increases in visits in range of 2.8-5.7% noted.	2 (Bernal 2018, Zeng 2013)	Low ³	No RCT reported this outcome for this comparison.
Summary:	If not targeted, impacts as to be expected, P4P may have little to no effect.			

¹Concerns over lack of comparability between indicators and RoB criteria

²Concerns over RoB criteria and potential for imprecision, one study only

³Concerns over RoB criteria

Table 26: Untargeted delivery of reproductive maternal and child health

Outcome	Utilization and delivery: RMNCH - family planning			
Patient group	Women of reproductive age (15-49) in study districts.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	Afghanistan, Zambia			
	Impact summary	Nr of studies	Certainty in evidence	Comments

(Continued)

Family planning (% women utilizing modern methods)	P4P probably has little to no effect on the outcome, Negative effect, estimated at -0.1%	1 (Engineer 2016)	Moderate ¹	Study is an RCT.
Family planning (% services delivered)	P4P may have desirable effects, a 9.7% increase in the range of services delivered was noted.	1 (Friedman 2016a)	Low ²	Study is an RCT.
Summary:	Non-targeted effects largely consistent with ones noted as when targeted.			

¹No serious limitations, one study only

²Limitations noted in RoB, one study only

Table 27: Untargeted delivery and utilization of antenatal care

Outcome	Utilization and delivery: RMNCH - antenatal care			
Patient group	Pregnant women enrolled in study within specified time frames.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	Burundi, Cameroon, India, Tanzania, Zambia			
	Impact summary	Nr of studies	Certainty in evidence	Comments
Antenatal care (utilization rate)	P4P may make little to no difference to the outcome: small, but not significant, reduction in P4P group compared to control (range of 5%)	1 (Mohanani 2017)	Low ¹	Study is an RCT.
At least one ANC (utilization rates)	Effects of the intervention are uncertain: positive impact, estimated at 3.4%.	1 (Binyaruka 2015)	Very low ²	No RCT reported this outcome for this comparison.
At least two ANC (utilization rates)	Effects of the intervention are uncertain: both substantial level and trend increases and decreases noted across different districts.	1 (Khim 2018)	Very low ²	Authors attribute changes more to increased financing availability throughout country. No RCT reported this outcome for this comparison.
At least four ANC (utilization rates)	Effects of the intervention are uncertain: effect estimated at 6%.	1 (Binyaruka 2015)	Very low ²	No RCT reported this outcome for this comparison.
Women accessing care in first trimester (% women receiving)	P4P may have desirable effects, ranging between 1.4% and 12%.	2 (Bonfrer 2014b, Friedman 2016a)	Low ³	Sensitivity analysis: RCT estimate at 12% reduction in time of first ANC visit; GRADE at 2 (concerns over 2 RoB criteria, one study only)
Summary:	Overall largely uncertain effects, however timeliness of ANC care seeking may be positively affected.			

¹Concerns over RoB, one study only

²Critical concerns over more than 2 criteria, one study only

³Critical concerns over more than 2 criteria

Table 28: Untargeted delivery of institutional deliveries

Outcome	Utilization and delivery: RMNCH - institutional deliveries			
Patient group	Women giving birth in study periods.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	India, Rwanda			
	Impact summary	Nr of studies	Certainty in evidence	Comments
Institutional delivery utilization or coverage rates	P4P may make little to no difference to the outcome of interest, impact (-2%) overall.	1 (Mohanan 2017)	Low ¹	Study is an RCT.
Institutional delivery: C section (%)	Effects of the intervention are uncertain; utilization of C sections decreasing by 21%.	1 (Gertler 2014)	Very low ²	No RCT reported this outcome for this comparison.
Summary:	Very low certainty in the impacts on institutional delivery utilization (consistent with when outcome is targeted), utilization of C-sections noted to be decreasing from an average of 26% to 5%, though unclear if impacts positive.			

¹Minor RoB concerns across 2 or more criteria, one study

²Serious concerns over 2 or more criteria, one study only

Table 29: Untargeted delivery of postnatal care

Outcome	Utilization and delivery: RMNCH - postnatal care			
Patient group	Women who have given birth in enrolled facilities.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	Burundi, Cameroon, Congo, DRC, El-Salvador, India, Tanzania			
	Impact summary	Nr of studies	Certainty in evidence	Comments

(Continued)

Delivery and coverage of postnatal care	P4P may have desirable effects, ranging from 7.2 to 85%.	3 (de Walque 2017, Zeng 2018a, Falisse 2015)	Low ¹	No RCT reported this outcome for this comparison.
Postnatal care (overall utilization rate)	P4P probably has undesirable effects, ranging from -8.9 to -0.02%.	3 (Huillery 2017, de Walque 2017, Mohanan 2017)	Moderate ²	Sensitivity analysis: Two RCTs estimate impact between -2% to -1.4%; moderate certainty evidence (some concerns over RoB)
Postnatal care: timely access (% women receiving)	P4P may have desirable effects, ranging from -5.8 to 49.45%.	2 (Bernal 2018, Binyaruka 2015)	Low ³	No RCT reported this outcome for this comparison.
Summary:	Inconsistent effects noted across this area, with limited to moderate certainty in evidence.			

¹Concerns over more than 2 criteria in RoB and imprecision, 2 of 3 studies non-RCT, upgraded due to large effect

²Downgraded for indirectness

³Concerns over RoB and indirectness

Table 30: Untargeted delivery of child care

Outcome	Utilization and delivery: Child care			
Patient group	Households with children in study catchment areas.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	Tanzania			
	Impact summary	Nr of studies	Certainty in evidence	Comments
Utilization rate of consultations in children	Effects of the intervention are uncertain: Impacts on child consultations (under 5s) -18.4% in Tanzania.	1 (Binyaruka 2015)	Very low ¹	No RCT reported this outcome for this comparison.
Summary:	Negative impacts on overall utilization of child consultations, suggesting outcome must be targeted to achieve impacts; very low certainty in evidence.			

¹Serious concerns over 2 or more RoB criteria, one study only

1. 5. 2. Untargeted quality of care

Table 31: Adherence to procedures and guidelines and adverse drug reaction management

Outcome	Quality of care: adherence to procedures and guidelines and adverse drug reaction management
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(Continued)

Patient group	Predominantly mothers and children seeking care or living in the districts where assessments occurred.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	Congo, DRC			
	Impact summary	Nr of studies	Certainty in evidence	Comments
Correct patient management by health care providers (scores in relation to ANC, child care and PNC)	P4P probably makes little to no difference to the outcome, effects ranging from -1% to 4% on items assessing compliance with desired postnatal care procedures.	1 (Huillery 2017)	Moderate ¹	Study is an RCT
Prescription quality of care: Women receiving medication via prescription in case of illness (%)	P4P may have desirable effects, ranging from -8 to 20%	2 (Zeng 2018a, Huillery 2017)	Low ²	Sensitivity analysis: RCT suggests negative effect (-8%), moderate certainty evidence (one study only).
Summary:	Probably little to no effect on correct patient management, may have desirable effects on prescription quality of care.			

¹No serious concerns, 1 study only

²Concerns over RoB

Table 32: Human resource inputs

Outcome	Quality of care: human resource inputs			
Patient group	Predominantly patients using RMCH and curative care services at targeted health facilities			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	Benin			
	Impact summary	Nr of studies	Certainty in evidence	Comments
Staff knowledge and skills (score)	P4P may have little to no effect: positive on clinical knowledge of staff but unclear if clinically relevant (2.3% increase in vignette test scores)	1 (Lagarde 2015)	Low ¹	No RCT reported this outcome for this comparison.
Summary:	Effects on staff knowledge consistent with when outcomes are targeted, but limited certainty.			

¹Serious concerns over RoB

Table 33: Patient outcomes and perceptions

Outcome	Quality of care: patient outcomes and perceptions			
Patient group	Predominantly pregnant women			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	DRC			
	Impact summary	Nr of studies	Certainty in evidence	Comments
Patient knowledge (scores)	P4P probably has little to no effect on patient knowledge scores: impacts ranging from -5 to 2% in regards to indicators on patient knowledge of diagnosis, danger signs and medication adherence.	1 (Huillery 2017)	Moderate ¹	Study is a RCT.
Summary:	Consistent with impacts on the targeted outcomes.			

¹No serious concerns, 1 study only

Table 34: Contact and waiting time

Outcome	Quality of care: Contact and waiting time			
Patient group	Predominantly women and children using RMCH services at facilities.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	China, DRC, Tanzania			
	Impact summary	Nr of studies	Certainty in evidence	Comments
Contact time (% change)	P4P may have little to no effect on the outcome: effects ranging from -2.2% to positive 1.79%	2 (Huillery 2017, Binyaruka 2015)	Low ¹	Sensitivity analysis: RCT suggest positive effects only, ranging from 1.03 to 2.55; moderate certainty evidence (no serious concerns, one study only)
Waiting time (% change)	Effects of the intervention are uncertain: 20% reduction in waiting time of untar-geted services.	1 (Binyaruka 2015)	Very low ²	No RCT reported this outcome for this comparison.

(Continued)

Length of stay (% change)	P4P may have undesirable effects, extending length of stay relatively by 0.05 to 0.7-16% (depending on insurance status of population)	2 (Wu 2014, Huillery 2017)	Low ³	Sensitivity analysis: RCT estimates 5% increase in length of stay; low certainty evidence (no serious concerns, but likely imprecision and one study only)
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Summary: Similarly inconsistent effects on contact times as when indicators are targeted, however suggestive of positive effects on waiting time (i.e. waiting time is reduced) and negative effects on length of stay (i.e. this increases).

¹Serious concerns over RoB and indirectness

²Serious concerns over RoB criteria, one study only

³Some concerns over several RoB criteria

Table 35: Composite quality of care scores

Outcome	Quality of care: Quality composite scores			
Patient group	Mixed groups - varies according to study and scheme.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	Burundi, DRC			
	Impact summary	Nr of studies	Certainty in evidence	Comments
Overall composite quality of care score	P4P probably has undesirable effects, range of 52%.	1 (Huillery 2017)	Moderate ¹	Study is an RCT.
Quality maternity care (score)	Effects of the intervention are uncertain: 45.6% increase in score, statistically significant.	1 (Rudasingwa 2014)	Very low ²	No RCT reported this outcome for this comparison.
Quality of outpatient services (score)	Effects of the intervention are uncertain: impact indicated at 38%.	1 (Rudasingwa 2014)	Very low ²	No RCT reported this outcome for this comparison.
Quality of medicine and equipment (score)	Effects of the intervention are uncertain: ranges from -14% (material management) to 8.8% (laboratory care) impacts on scores.	1 (Rudasingwa 2014)	Very low ²	No RCT reported this outcome for this comparison.
Summary:	Overall, composite score is negative, suggesting quality must be targeted to achieve impacts. Other effects are uncertain.			

¹Concerns over imprecision of estimate, one study only, however magnitude high so upgraded

²Serious concerns over RoB and generalizability, one study only

1. 6. Untargeted health outcomes

Table 36: Mortality and incidence of sickness

Outcome	Health outcomes: mortality and incidence of sickness			
Patient group	Mothers and children			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	DRC, India, Zambia, Zimbabwe			
	Impact summary	Nr of studies	Certain-ty in evi-dence	Comments
Child mortality (% of children alive still from mothers giving birth in study period)	P4P probably has a desirable effect, achieving a reduction of approx. 1%.	1 (Huillery 2017)	Moderate ¹	Study is an RCT.
Neonatal mortality rate	P4P probably has little to no effect: Small reduction in neonatal mortality 0.07%, however model with controls suggest possible increase 0.3%.	1 (Mohan 2017)	Moderate ¹	Study is an RCT.
Incidence of sickness	P4P may have desirable effects: consistent reduction in incidence of sickness, range of -4% to -29% on average.	2 (Friedman 2016a, Friedman 2016b)	Low ²	Sensitivity analysis: RCT estimates 4% reduction, low certainty evidence. (RoB criteria, one study only)
Summary:	Moderate certainty evidence suggestive of reductions in child mortality, and low certainty in reduction of incidence of sickness.			

¹No serious concerns, one study only

²Serious concerns over 3 RoB criteria

Table 37: Reproductive maternal and child health outcomes

Outcome	Health outcomes: RMNCH outcomes			
Patient group	Mothers and children			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	Cameroon, DRC, Philippines			

(Continued)

	Impact summary	Nr of studies	Certainty in evidence	Comments
Child wasting (%)	P4P probably has a desirable effect, signalling a reduction in wasting from 5.9% to 9.25%.	2 (de Walque 2017 , Peabody 2014)	Moderate ¹	Sensitivity analysis: RCT estimates a 9.25% increase in likelihood of children not wasting; low certainty evidence (one study only, RoB significant concerns around this outcome)
Incidence of pregnancy (%)	P4P probably has little to no effect: small reduction (1%) in pregnancies.	1 (Huillery 2017)	Moderate ²	Study is an RCT.
Reported anaemia in children (%)	P4P probably has a desirable effect, approx. 5% reduction in anaemic children.	1 (Peabody 2014)	Moderate ²	Study is an RCT.
Summary:	Moderate certainty evidence suggestive of desirable effects on health outcomes, despite not being targeted.			

¹Critical concerns over 1 RoB criterion

²No serious concerns, one study only

1.7. Unintended effects

Table 38: Unintended effects

Outcome	Unintended effects
Patient group	Differs by study
Comparison	Pure control group (standard practice, status quo, no additional financing)
Intervention	Any type of PBF
Settings	China, DRC

	Impact summary	Nr of studies	Certainty in evidence	Comments
Overall impacts on free riding and task shifting	P4P may make little to no difference to the outcome: No effects or differences noted between PBF groups and control.	2 (Huillery 2017 , Yip 2014)	Low ¹	Both are RCT in different populations: women and children vs. all patients requiring antibiotic based care
Summary:	Certain that no unintended effects such as free-riding or task-shifting take place; consistent with findings when targeted.			

¹Concerns over imprecision and limited comparability of indicators

1.8. Untargeted resource use

Table 39: Human resources

Outcome	Changes in resource use: human resources			
Patient group	Schemes targeting maternal and child health.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	Benin			
	Impact summary	Nr of studies	Certainty in evidence	Comments
Human resource availability (persons available)	Effects of the intervention are uncertain: No increase in number of qualified staff available per facility is noted.	1 (Lagarde 2015)	Very low ¹	No RCT reported this outcome for this comparison.
Curative health visits per health care professional	Effects of the intervention are uncertain: estimated increase of 52%.	1 (Lagarde 2015)	Very low ²	No RCT reported this outcome for this comparison.
Summary:	Effects of the intervention are uncertain.			

¹(serious limitations for RoB, one study only)

²(serious limitations for RoB and for imprecision)

Table 40: Medicine and equipment availability and functionality

Outcome	Changes in resource use: Medicine and equipment			
Patient group	Predominantly across RMNCH schemes.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	Benin, DRC, Tanzania			
	Impact summary	Nr of studies	Certainty in evidence	Comments
Equipment availability (index)	Effects of the intervention are uncertain: ranging from negative -6.4% to positive 6.9%.	3 (Lagarde 2015 , Huillery 2017 , Binyaruka 2017)	Very low ¹	Sensitivity analysis: RCT suggests -64%; low certainty evidence (some concerns over RoB and imprecision, one study only)
Equipment functionality (index)	Effects of the intervention are uncertain: small (3%) positive effect.	1 (Mayumana 2017)	Very low ¹	No RCT reported this outcome for this comparison.

(Continued)

Infrastructure functionality (index)	P4P may have little to no effect: small increase in infrastructure functionality (magnitude not interpretable), but authors note no relevant difference to control.	1 (Huillery 2017)	Low ²	Study is an RCT.
Medicine availability (index)	P4P may have desirable effects: ranging from 0.6-13.8% increases in comparison to control.	2 (Lagarde 2015, Binyaruka 2017)	Low ¹	No RCT reported this outcome for this comparison.
Vaccine availability (%)	Effects of the intervention are uncertain: estimated at 5.6%	1 (Binyaruka 2017)	Very low ¹	No RCT reported this outcome for this comparison.
Stockout equipment	Effects of the intervention are uncertain: positive effect in reducing stock-outs (15%).	1 (Mayumana 2017)	Very low ¹	No RCT reported this outcome for this comparison.
Stockout medicines	Effects of the intervention are uncertain: positive effect in reducing stockouts (16-30%)	2 (Mayumana 2017, Binyaruka 2017)	Very low ¹	No RCT reported this outcome for this comparison.
Stockout vaccines	P4P may have desirable effects: reducing stockouts (10-60%).	2 (Mayumana 2017, Binyaruka 2017)	Low ³	No RCT reported this outcome for this comparison.
Summary:	Evidence largely consistent with when indicators are targeted, though smaller magnitude and overall weaker evidence base.			

¹ Serious concerns over RoB and imprecision

² Concerns over imprecision, one study only

³ Serious concerns over RoB and imprecision, upgrade for effect

1. 9. Untargeted secondary outcomes

Table 41: Provider motivation, satisfaction, absenteeism and acceptability

Outcome	Provider motivation, satisfaction, absenteeism and acceptability			
Participants	Health care workers at the facilities where studies conducted.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	Benin, Cameroon, DRC, Zambia, Zimbabwe			
	Impact summary	Nr of studies	Certainty in evidence	Comments

(Continued)

Provider attendance (%)	P4P probably has a desirable effect, estimated at 7%, though not different from the control sites.	1 (Huillery 2017)	Moderate ¹	Study is RCT
Provider motivation (score)	P4P may have a desirable effect, estimate at 0.7 to 8%, however noted to be largely similar to controls across studies.	5 (Huillery 2017, Lagarde 2015, Shen 2017, Friedman 2016a)	Low ²	Sensitivity analysis: RCT estimates range between 1 and 6.9%; low certainty of evidence (concerns over RoB)
Provider satisfaction (score)	Effects are uncertain and range from -81% to 31%.	7 (Friedman 2016a, Friedman 2016b, Lagarde 2015, de Walque 2017, Huillery 2017, Shen 2017)	Low ²	Sensitivity analysis: Two study RCT estimates are inconsistent overall, ranging from -81% to 5%; low certainty of evidence (concerns over RoB and imprecision)
Summary	If not targeted, provider attendance appears to increase.			

¹ No serious concerns, one study only

² Serious concerns over RoB and indirectness

Table 42: Patient satisfaction and acceptability (satisfaction scores)

Outcome	Patient satisfaction and acceptability (satisfaction scores)			
Patient group	Patients that had accessed ANC, child or curative care at study facilities.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	Cameroon, Congo, DRC, Zambia, Zimbabwe			
	Impact summary	Nr of studies	Certainty in evidence	Comments
Patient satisfaction with facility cleanliness (scores)	Effects of the intervention are uncertain: impacts on satisfaction scores range from -21.9% to 12.5%.	3 (Zeng 2018a, Friedman 2016a, Friedman 2016b)	Low ¹	Sensitivity analysis: RCT estimate at -22%; low certainty evidence (1 study, RoB concerns)
Patient satisfaction with contact time (score)	P4P may have undesirable effects: impacts on satisfaction relating to the time health care workers spend on ANC consults, ranges from -5% to 0.3%; for child care consults ranging from -11.3% to 4.7%.	2 (Friedman 2016a, Friedman 2016b)	Low ¹	Sensitivity analysis: RCT estimate ranges 1.2%; low certainty evidence (1 study, RoB concerns)
Patient satisfaction with opening hours (score)	P4P may have undesirable effects: impacts on satisfaction scores associated with facility opening hours for ANC care ranging from -11% to 9%; for child care ranging from -19.3% to 1.2%.	2 (Friedman 2016a, Friedman 2016b)	Low ¹	Sensitivity analysis: RCT estimate at -15%; low certainty evidence (1 study, RoB concerns)

(Continued)

Patient satisfaction with waiting time (score)	Effects of the intervention are uncertain: Impacts on the acceptability of waiting times for ANC appointments are consistently positive and higher in the PBF group, ranging from 10.5% to 21.8%; for child health consultations they range from -8.3% to 11.6%.	3 (de Walque 2017, Friedman 2016a, Friedman 2016b)	Low ¹	Sensitivity analysis: RCT estimate ranges 1.9%; low certainty evidence (1 study, RoB concerns)
Overall patient satisfaction with quality of care (score)	P4P may have desirable effects in relation to patients' satisfaction with quality of care, ranging from 0% to 7.4%.	2 (Zeng 2018a, Huillery 2017)	Low ²	Sensitivity analysis: RCT estimate -1%, low certainty evidence (concerns over indirectness and precision, one study only)
Overall patient satisfaction with welcome and reception at facility (score)	P4P may have desirable effects ranging from -3% to 11.7% satisfaction with welcome quality at health facilities.	2 (Zeng 2018a, Huillery 2017)	Low ²	Sensitivity analysis: RCT estimates are -3% or 0; low certainty evidence (concerns over indirectness and precision, one study only)
Patient satisfaction with staff: Communication (score)	P4P may have desirable effects, ranging between -2.2 to 7.45% on average in relation to communication satisfaction for ANC; largely positive for childcare, ranging from 1.85 to 7.1% on average.	3 (de Walque 2017, Friedman 2016a, Friedman 2016b)	Low ¹	Sensitivity analysis: RCT estimate 2.45%; low certainty evidence (1 study, RoB concerns)
Patient satisfaction with staff: Trust (score)	P4P may have desirable effects, ranging from -0.25% to 23.75% on average for scores reflecting trust in the skills of health care providers.	2 (Friedman 2016a, Friedman 2016b)	Low ¹	Sensitivity analysis: RCT estimate 24%; low certainty evidence (1 study RoB concerns)
Overall satisfaction (score)	P4P probably has desirable effects: impacts on overall patient satisfaction scores ranging from 1 to 88.5% on average across ANC and child health care.	4 (de Walque 2017, Huillery 2017, Friedman 2016a, Friedman 2016b)	Moderate ³	Sensitivity analysis: Two RCTs estimate between 1 and 88%; low certainty evidence (RoB concerns)
Summary:	When indicators not targeted, very inconsistent impacts across most indicators in area. Low certainty in evidence overall.			

¹Concerns over RoB criteria

²Serious concerns over RoB

³Some concerns over RoB and large effect

Table 43: Impacts on overall financing or resource allocation

Outcome	Impacts on overall financing or resource allocation
Patient group	Households accessing care (except for remuneration, for which health care workers are reporting)

(Continued)

Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	Benin, Cameroon, Tanzania, Zimbabwe			
	Impact summary	Nr of studies	Certainty in evidence	Comments
Out of pocket payments - user fees	P4P may have undesirable effects: impacts on user fees for consultations range from -15% to 63%; the majority of impacts were negative (i.e. user fees increased).	4 (de Walque 2017 , Binyaruka 2015 , Lagarde 2015 , Friedman 2016b)	Low ¹	No RCT reported this outcome for this comparison.
Expenditure on medicine and equipment	P4P probably has little to no effect on the outcome: impacts on drug expenditure at township health centres and health centres ranging from -2.1 to -4.7%.	1 (Yip 2014)	Moderate ²	Study is a RCT.
Probability of payment for users	Effects of the intervention are uncertain. Probability of paying for antenatal care decreased, range 15.28 to 33.3%; effect on delivery payments are inconsistent though likely largely positive, reported to range between a 30.3% reduction and 1.5% increase in probability of payment. Probability of payment for postnatal care appears to have increased consistently ranging from 35% to 61%.	2 (Binyaruka 2015 , Friedman 2016b)	Low ¹	No RCT reported this outcome for this comparison.
Summary:	Inconsistent impacts on user fees and expenditures on medicine and equipment, suggesting these need to be targeted to be influenced; probability of payments for users decreases for some services on outpatient basis but not for PNC, which may require inpatient care.			

¹ Concerns over RoB criteria

² No serious concerns, one study only

Table 44: Impacts on management or information systems

Outcome	Impacts on management or information systems
Patient group	Health care workers and management staff in PBF and control facilities
Comparison	Pure control group (standard practice, status quo, no additional financing)
Intervention	Any type of PBF
Settings	Benin, Cameroon, Tanzania, Zambia, Zimbabwe

(Continued)

	Impact summary	Nr of studies	Certain-ty in evi-dence	Comments
Facility or managerial autonomy (score)	P4P may have desirable effects, ranging from 144 to 188% overall.	2 (Lagarde 2015 , Friedman 2016b)	Low ¹	No RCT reported this outcome for this comparison.
Facility governance (score)	P4P may have undesirable effects, in relation to the number of governance meetings held at facility in last 90 days, ranging from -10.2% to -5.5%.	2 (Mayumana 2017 , Friedman 2016a , Friedman 2016b)	Low ²	Sensitivity analysis: RCT estimates -10.2%; GRADE 2 (one study only, RoB concerns)
Quality of management (score)	P4P may have undesirable effects, staff rating of management quality in facility is negatively impacted (-15%).	1 (de Walque 2017)	Low ³	No RCT reported this outcome for this comparison.
Summary:	Overall effects on autonomy are sustained as when indicator is targeted, governance is not responsive, however quality of management is negatively affected.			

¹ Downgraded for RoB, imprecision, upgraded for large effects

² Downgraded for RoB and imprecision

³ Downgraded for imprecision, one study only

Table 45: Equity-consideration: Evidence of differential impact on different parts of the population

Outcome	Equity-consideration: Evidence of differential impact on different parts of the population			
Patient group	Same as for main utilization outcomes; primarily mothers and children in PBF and control districts.			
Comparison	Pure control group (standard practice, status quo, no additional financing)			
Intervention	Any type of PBF			
Settings	Afghanistan, Tanzania			
	Impact summary	Nr of studies	Certain-ty in evi-dence	Comments
Equity of child immunization delivery (wealth related)	Effects of the intervention are uncertain: Effects towards poorest, approximately 0.4% in comparison to less poor.	1 (Binyaruka 2015)	Very low ¹	No RCT reported this outcome for this comparison.
Equity in institutional delivery (wealth related)	P4P may have undesirable effects: Studies suggest increased inequality among patients among PBF facilities; impacts on patients are higher in mid-wealth quintiles.	2 (Engineer 2016 , Binyaruka 2015)	Low ²	Sensitivity analysis: RCT estimate also supports that wealthier women were likelier to receive institutional deliveries; moderate certainty evidence (one study only, no substantial concerns)

(Continued)

Equity in institutional delivery (by educational status of mother)	Effects of the intervention are uncertain: More institutional deliveries recorded among mothers with basic education rather than none/illiterate; differential effect range of 3%.	1 (Binyaruka 2018)	Very low ¹	No RCT reported this outcome for this comparison.
Summary:	Overall estimates supportive of effects as when targeted, except for institutional deliveries where negative effect is observed if not targeted.			

¹ Concerns over RoB and imprecision, one study only

² Concerns over RoB and imprecision

Appendix 5. Comparison 2: Summary of Findings tables 46-66

2.1. Targeted Measures of provider performance

2.1.1. Delivery and utilization

Table 46: Utilization of mother and child immunization

Outcome	Utilization: mother and child immunization			
Patient group	Mother and children accessing health services			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	Cambodia, DRC, Rwanda, Zambia			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Child immunization (likelihood of being vaccinated)	Effects of P4P are uncertain, with impact on the likelihood of any vaccination ranging from -7.4 to 19%.	3 (Van de Poel 2016, Soeters 2011, Friedman 2016a)	Low ¹	Some indirectness observed across studies. Sensitivity analysis: RCT estimate suggests P4P may have undesirable effects (-7.4%); certainty in evidence is low (down-graded: RoB criteria, one study).
Child immunization: % receiving BCG	P4P may lead to little or no difference: impacts on coverage of BCG vaccination, estimated at 3.1%.	1 (Friedman 2016a)	Low ¹	Study is an RCT.
Child immunization: % receiving DTP	P4P may lead to little or no difference: effect estimated at -1%.	1 (Friedman 2016a)	Low ¹	Study is an RCT.
Child immunization: % fully vaccinated	Effects of P4P are uncertain, impacts on coverage of immunization (full immunization at 12-23 months), ranges from -8.1% to 39.8%	3 (Basinga 2011, Sherry 2017, Friedman 2016a)	Low ¹	Sensitivity analysis: P4P may have desirable effects: RCT estimates positive impact at 39.8%; low certainty in evidence (RoB criteria, one study).

(Continued)

Immunization during ANC - % receiving tetanus injection	P4P may have desirable effects on- immunization rates, effect estimated at 6.84%.	1 (Sherry 2017)	Low ²	No RCT reported this outcome for this comparison.
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Summary: Overall inconsistent effects across this area, limited certainty in estimates.

¹Concerns over RoB criteria

²Some concerns over RoB and other concurrent campaigns, one study only

Table 47: Utilization of family planning

Outcome	Utilization of family planning			
Patient group	Women and households enrolled in studies.			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	DRC, Rwanda, Zambia			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Family planning: % using any method	P4P may make little or no difference, effects on the current use of contraceptives among households in study (recent birth households or otherwise) estimated between -4.28 and 2.8%.	2 (Shapira 2017, Friedman 2016a)	Low ¹	All studies are RCTs.
Family planning: % using modern methods	P4P may have little to no effect on utilization of modern family planning methods.	3 (Sherry 2017, Friedman Skiles 2013, Soeters 2011)	Low ²	No RCT reported this outcome for this comparison.
Summary:	Inconsistent effects overall on family planning, however consistent positive effects on utilization of modern family planning.			

¹Some concerns over RoB criteria)

²Some concerns over multiple RoB criteria

Table 48: Utilization of antenatal care

Outcome	Utilization of antenatal care
Patient group	Pregnant women seeking antenatal care in enrolled facilities.

(Continued)

Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	Argentina, Cambodia, Rwanda, Zambia			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Antenatal care: % receiving at least one ANC	P4P may have little to no effect on the outcome: likelihood of any ANC being utilized among populations in the sites ranging from -1.5% to 3.2%.	3 (Van de Poel 2016 , Basinga 2011 , Friedman 2016a)	Low ¹	Sensitivity analysis: RCT estimate is -1.5%; low certainty in evidence (RoB criteria, one study only).
Antenatal care: % receiving four or more ANC	P4P may have little to no effect on the outcome: the use of four or more ANC visits by women in the study sites ranging from -5.3 to 4.4%.	5 (Basinga 2011 , Priedeman Skiles 2013 , Sherry 2017 , Shapira 2017 , Friedman 2016a)	Low ²	Sensitivity analysis: RCT estimate is -0.6%; low certainty in evidence (RoB criteria, one study only)
Antenatal care: % receiving ANC in first trimester	P4P may have desirable effects: Likelihood of ANC utilization being in the first trimester increases in PBF facilities by 1.3 to 10%; studies note that RBF facilities see women initiating antenatal care approximately 1 month earlier compared to other facilities.	4 (Celhay 2015 , Priedeman Skiles 2013 , Shapira 2017 , Friedman 2016a)	Low ³	Sensitivity analysis: Two studies, RCT estimates suggest between 1.3 to 10% of women initiate care earlier, approximately by 1 month; GRADE 3 (RoB criteria and indirectness).
Summary:	Potential desirable effects on timely utilization of ANC, however little to no effect on ANC utilization overall.			

¹Critical concerns over Low or more RoB criteria

²Some concerns over RoB

³Concerns over RoB criteria

Table 49: Utilization of institutional delivery, postnatal care and child curative care

Outcome	Utilization: institutional delivery, postnatal care and child curative care
Patient group	Pregnant women in households in facility catchment areas and children under 5.
Comparison	Comparator groups (matched financing or inputs)
Intervention	Any type of paying for performance (P4P)
Settings	Cambodia, DRC, Rwanda, Zambia

(Continued)

	Impact summary	Nr of studies	Certainty of the evidence	Comments
Institutional deliveries (rates and coverage)	Effects of the intervention are uncertain: Inconsistent effects on in facility delivery rates ranging from -8.7% to 23.2%; one study estimates effects on overall coverage (-4.9%, same study as aforementioned negative).	7 (Van de Poel 2016, Soeters 2011, Basinga 2011, Priedeman Skiles 2013, Sherry 2017, Shapira 2017, Friedman 2016a)	Low ¹	Overall impacts noted are largely positive, only Zambia studies suggest negative impacts, suggestive of potential publication bias. Sensitivity analysis: Two studies, but evidence inconsistent, between -8.7 to 1.9%; low certainty in evidence (RoB criteria).
Postnatal care (rates and coverage)	P4P may have undesirable effects: impacts on any PNC being utilized, approximately -10%.	1 (Friedman 2016a)	Low ¹	Study is an RCT.
Child (<5) curative visits (rates)	P4P may have little to no effect on the outcome, ranging from -5.76% to -3.1%.	2 (Sherry 2017, Friedman 2016a)	Low ¹	Sensitivity analysis: RCT estimate is -3.1%; low certainty in evidence (RoB criteria, one study only)
Summary:	Inconsistent effects overall in this area, low certainty in evidence.			

¹Concerns over RoB criteria

Table 50: Utilization of services (general)

Outcome	Probability of any utilization and total utilization			
Patient group	All patients accessing			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	DRC and Zambia			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Probability of any utilization (generic)	P4P may have desirable effects, estimated to range between 1.5 to 10%, however may differ according to type of health provider or facility visited.	2 (Soeters 2011, Friedman 2016a)	Low ¹	Sensitivity analysis: RCT estimate is 1.5 overall, however ranges from -6% to 9% depending on the type of facility or health care worker visited; low certainty in evidence (one study).

¹Serious concerns over RoB

2.1.2. Quality of care

Table 51: Adherence to procedure and guidelines

Outcome	Quality of care: Adherence to procedure and guidelines			
Patient group	Dependent on indicator. Largely those accessing RMNCH services. Additionally those accessing curative services.			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	Benin, Rwanda, Zambia			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Background and physical assessment (score)	P4P may have desirable effects: Ranging from -5.93% to 10.62% overall on diverse set of measures reflective of ANC, child health and adult curative consultations.	3 (Lagarde 2015 , Sherry 2017 , Friedman 2016a)	Low ¹	Sensitivity analysis: RCT estimate is -5.4% on average; low certainty evidence (RoB criteria, one study).
Counselling (score)	Effects are uncertain: Effects ranging from -37% to 26.12% overall.	3 (Lagarde 2015 , Sherry 2017 , Friedman 2016a)	Low ¹	Sensitivity analysis: RCT estimate is -40% on average; low certainty evidence (RoB criteria, one study).
Immunization quality (score)	P4P may have desirable effects: Quality index of vaccinations increasing in PBF facilities by 3.2%; overall effects on likelihood of receiving a tetanus vaccine during ANC estimated at 7.2%.	2 (Basinga 2011 , Friedman 2016a)	Low ¹	Sensitivity analysis: RCT estimate is 5.2% on average; low certainty evidence (RoB criteria, one study).
Summary:	Overall low certainty in evidence, some desirable effects noted.			

¹Serious concerns over RoB criteria

Table 52: Human resource knowledge and skills

Outcome	Quality of care: Human resource knowledge and skills, health literacy			
Patient group	Mainly from studies focused on RMNCH.			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			

(Continued)

Settings DRC, Rwanda

	Impact summary	Nr of studies	Certainty of the evidence	Comments
Staff knowledge and skills (scores)	P4P may have desirable effects on provider knowledge (or availability of knowledgeable staff in facility), ranging from an absolute increase in knowledge scores of 0.4SD, to relative impacts on availability of skilled personnel between 0.06 to 15% change in scores.	3 (Soeters 2011, Sherry 2017, Gertler 2012)	Low ¹	No RCT reported this outcome for this comparison.
Knowledge Outcomes (index)	P4P may have desirable effects on health literacy outcomes (though these are diverse, e.g. having heard about family planning vs. HIV/AIDS) ranging from -5.4% to 10% change in scores.	2 (Soeters 2011, Shapira 2017)	Low ²	Sensitivity analysis: RCT suggests impacts are consistently negative, ranging from -5.4% to -2.4%, moderate certainty evidence (data sources and one study)
Summary: Overarchingly desirable effects, low certainty evidence.				

¹Serious concerns over RoB criteria and imprecision

²Concerns over RoB criteria

Table 53: Total quality scores

Outcome	Quality of care: Total quality scores			
Patient group	Principally mothers and children.			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	DRC, Rwanda, Zambia			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Total quality family planning (scores)	P4P may have desirable effects, ranging from 1.34% to 500% change in scores increases in quality of family planning in PBF facilities.	2 (Sherry 2017, Friedman 2016a)	Low ¹	Sensitivity analysis: RCT estimate 500%; low certainty in evidence (-2 for RoB and one study)
Total quality antenatal care (scores)	P4P may have desirable effects on prenatal care scores, ranging from 3.56 to 40%.	3 (Friedman 2016a, Basinga 2011, Sherry 2017)	Low ¹	Sensitivity analysis: RCT estimate 40% increase in ANC quality of care; low certainty in evidence (2 for RoB and one study only).
Total quality composite (score)	P4P may have desirable effects, ranging from 25% to 0.13SD changes in composite scores.	2 (Soeters 2011, Gertler 2012)	Low ¹	No RCT reported this outcome for this comparison.

(Continued)

Summary: Moderate certainty in the consistently positive results across this area.

¹Serious concerns over RoB

2.2. Health Outcomes

Table 54: Reproductive maternal and child health outcomes

Outcome	Health Outcomes: RMNCH Outcomes			
Patient group	Pregnant women and children			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	Zambia			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Proportion of women breastfeeding	P4P may have little to no effect, no impacts noted.	1 (Friedman 2016a)	Low ¹	Study is an RCT.
Summary:	P4P may have no effect.			

¹Concerns over RoB criteria, one study only

2.3. Resource use

Table 55: Changes in medicine and equipment use

Outcome	Changes in Resource Use: Medicine and Equipment			
Patient group	Primarily mothers and children, and patients using other curative services			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	Zambia			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Equipment availability (composite score)	P4P may have desirable effects, estimated at 75% increase, however non significant in comparison to comparator.	1 (Friedman 2016a)	Low ¹	Study is an RCT.

(Continued)

Medicine availability (composite score)	P4P may have undesirable effects, estimated at -160% decrease in composite score.	1 (Friedman 2016a)	Low ¹	Study is an RCT.
Summary:	Inconsistent effects in relation to medicines vs. equipment, equipment availability appears to be increased; that of medicine decreased.			

¹Concerns over RoB, imprecision, one study only but upgraded for substantive effect

2.4. Secondary outcomes

Table 56: Impacts on management or information systems

Outcome	Impacts on management or information systems			
Patient group	Health care workers in PBF and comparator facilities			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	Zambia			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Facility and managerial autonomy (score)	P4P may have desirable effects: Estimated impact on autonomy index in range of 46%.	1 (Friedman 2016a)	Low ¹	Study is an RCT.
Summary:	Consistently positive effects on facility and managerial autonomy, though larger when targeted.			

¹Concerns over RoB and imprecision, one study only

Table 57: Patient satisfaction and acceptability

Outcome	S: Patient satisfaction and acceptability			
Patient group	Patients attending antenatal, child care or curative adult care in facilities.			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	Benin, DRC			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Waiting time	Effects of the intervention are uncertain: Impact in the range of 7%.	1 (Soeters 2011)	Very low ¹	No RCT reported this outcome for this comparison.

(Continued)

Patient satisfaction with staff communication (index)	Effects of the intervention are uncertain: Impacts on the satisfaction with staff politeness are estimated at 0.5%	1 (Lagarde 2015)	Very low ¹	No RCT reported this outcome for this comparison.
Summary:	Overarchingly uncertain impacts.			

¹Serious concerns over RoB, one study only

Table 58: Equity-consideration: Evidence of differential impact on different parts of the population

Outcome	Equity-consideration: Evidence of differential impact on different parts of the population			
Patient group	Women and households utilizing family planning, antenatal, delivery and child care.			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	Cambodia, Rwanda			
Patient group	Women and households utilizing family planning, antenatal, delivery and child care.			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Wealth related: Antenatal care (utilization)	P4P may have little to no effect: Inconsistent impacts regarding 4 or more ANC visits in relation to pro-poor effects (estimated at under 10% in comparison to least poor); similar in relation to utilization of ANC in first trimester.	2 (Lannes 2016, Priedeman Skiles 2013)	Low ¹	No RCT reported this outcome for this comparison.
Wealth related: Curative visits (utilization)	P4P may have little to no effect: utilization among lower socio-economic groups increased between 3.5% and 10%.	2 (Lannes 2016, Priedeman Skiles 2015)	Low ¹	No RCT reported this outcome for this comparison.
Wealth related: Family planning (utilization)	P4P may have undesirable effects, less poor and mid-status groups appear to benefit more.	2 (Lannes 2016, Priedeman Skiles 2015)	Low ¹	No RCT reported this outcome for this comparison.
Wealth related: Institutional delivery (utilization)	P4P may have undesirable effects: middle-income groups (or mid-poverty) groups benefit more than poorest.	3 (Van de Poel 2016, Lannes 2016, Priedeman Skiles 2015)	Low ¹	No RCT reported this outcome for this comparison.
Summary:	Low certainty overall, suggestive of limited to negative effects.			

¹Some concern over RoB

2.5. Changes in untargeted measures of provider performance

2.5.1. Untargeted delivery and utilization

Table 59: Utilization of mother and child immunization

Outcome	Utilization: mother and child immunization			
Patient group	Mother and children accessing health services			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	Argentina			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Cross-price spillover effect on mothers receiving tetanus vaccination	P4P probably has little to no effect, impact estimated 2%.	1 (Celhay 2015)	Moderate ¹	Study is an RCT.
Summary:	Consistent effects with when indicator on tetanus vaccination during ANC is targeted.			

¹ One study only

Table 60: Utilization of institutional delivery, postnatal care and child curative care

Outcome	Utilization: institutional delivery, postnatal care and child curative care			
Patient group	Pregnant women in households in facility catchment areas and children under 5.			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	Rwanda			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Postnatal care (rates and coverage)	P4P may make little to no difference to the outcome, effects on any PNC being utilized estimated at -0.5%.	1 (Shapira 2017)	Low ¹	Study is an RCT.
Summary:	Consistent with when indicator targeted, negative effects on the utilization on post-natal care noted.			

¹Serious RoB concerns, one study only

2.5.2. Untargeted quality of care

Table 61: Human resource inputs

Outcome	Quality of care: Human resource inputs			
Patient group	Mainly from studies focused on RMNCH.			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	Benin			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Staff knowledge and skills (score)	Effects are uncertain: estimated at 5.6%.	1 (Lagarde 2015)	Very low ¹	No RCT reported this outcome for this comparison.
Summary:	Consistent with when indicator is targeted, impacts are positive but limited certainty in estimate.			

¹Serious concerns over RoB criteria and imprecision, one study only

2. 6. Untargeted health outcomes

Table 62: Reproductive maternal and child health outcomes

Primary outcome	Health Outcomes: RMNCH Outcomes			
Patient group	Women with pregnancies in study periods			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	Rwanda, Zambia			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Proportion of women breastfeeding	P4P may have little to no effect, impact estimated at 0.29%.	1 (Sherry 2017)	Low ¹	Study is an RCT.
Reported illness in children (%)	P4P may have desirable effects, ranging from -5% to 10.5%.	2 (Priedeman Skiles 2015 , Friedman 2016a)	Low ²	Sensitivity analysis: RCT reports +10.5%; low certainty evidence (RoB criteria, 1 study only).
Summary:	Overall inconsistent effects.			

¹Some concerns over RoB, one study only

²Concerns over RoB criteria

2. 7. Untargeted resource use

Table 63: Medicine and equipment availability

Primary outcome	Changes in Resource Use: Medicine and Equipment			
Patient group	Primarily mothers and children, and patients using other curative services			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	Benin			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Equipment availability (composite score)	Effects of the intervention are uncertain: Negative effect in the range of -2.5%.	1 (Lagarde 2015)	Very low ¹	No RCT reported this outcome for this comparison.
Medicine availability (composite score)	Effects of the intervention are uncertain: Positive effect in the range of 4.8%.	1 (Lagarde 2015)	Very low ¹	No RCT reported this outcome for this comparison.
Summary:	Opposite impacts to when indicators are targeted: medicine availability appears to be increasing and that of equipment decreasing.			

¹Serious concerns over RoB and imprecision

2. 8. Untargeted secondary outcomes

Table 64: Impacts on management or information systems

Outcome	Impacts on management or information systems			
Patient group	Health care workers in PBF and comparator facilities			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	Benin			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Facility and managerial autonomy (score)	Effect of the intervention is uncertain: impact estimated at 0.3% difference compared to comparator.	1 (Lagarde 2015)	Very low ¹	No RCT reported this outcome for this comparison.
Summary:	Effects uncertain.			

¹Concerns over RoB and imprecision, one study only

Table 65: Patient satisfaction and acceptability

Outcome	Patient satisfaction and acceptability			
Patient group	Patients attending antenatal, childcare or curative adult care in facilities.			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	Rwanda, Zambia			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Cleanliness	P4P may have a desirable effect: Impacts on satisfaction scores for antenatal, child and adult curative care are consistently positive and range from 2.45% to 11.90%.	2 (Lannes 2015, Friedman 2016a)	Low ¹	Sensitivity analysis: RCT estimate 2.45%; low certainty in evidence (RoB criteria, one study only).
Contact time	P4P may have a desirable effect: Impacts on client satisfaction with contact time range from 2.1 to 7.8%, though impacts are not consistently positive within studies.	2 (Lannes 2015, Friedman 2016a)	Low ¹	Sensitivity analysis: RCT estimate 7.8%; low certainty in evidence (RoB criteria, one study only).
Waiting time	P4P may have a desirable effect: Impacts on client satisfaction with waiting times range from 0.05% to 6%, though at times negative (e.g. for childcare from -0.07 to -2.6%)	2 (Lannes 2015, Friedman 2016a)	Low ¹	Sensitivity analysis: RCT estimate 0.05%; low certainty in evidence (RoB criteria, one study only).
Patient satisfaction with staff communication (index)	P4P may have little to no effect: Impacts on client satisfaction with staff courteousness estimated at 3.35%	1 (Friedman 2016a)	Low ²	Sensitivity analysis: RCT estimate 2.35%; low certainty in evidence (RoB criteria, one study only).
Summary:	Low certainty in evidence, overwhelmingly desirable effects.			

¹Serious concerns over RoB

²Serious concerns over RoB, one study only

Table 66: Provider motivation, satisfaction, absenteeism and acceptability

Outcome	Provider motivation, satisfaction, absenteeism and acceptability
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(Continued)

Participant group	Health care workers in PBF and comparator facilities			
Comparison	Comparator groups (matched financing or inputs)			
Intervention	Any type of paying for performance (P4P)			
Settings	Benin and Zambia			
	Impact summary	Nr of studies	Certainty of the evidence	Comments
Motivation (score)	P4P may have little to no effect, impacts range from -3.8% to 2.4%	3 (Lagarde 2015 , Shen 2017 , Friedman 2016a)	Low ¹	Sensitivity analysis: RCT estimates inconsistent overall, ranging from -3.8 to 2.4% depending on item; low certainty evidence (indirectness, RoB, one study)
Satisfaction (score)	P4P may have little to no effect, impacts ranging from -4.6 to 4.3%.	3 (Lagarde 2015 , Shen 2017 , Friedman 2016a)	Low ¹	Sensitivity analysis: RCT estimates inconsistent overall, ranging from -4.6% to 4.3% depending on item; low certainty evidence (indirectness, RoB, one study)
Summary: Overall little to no effect, low certainty evidence.				

¹Concerns over RoB, indirectness and imprecision

Appendix 6. Risk of Bias Supporting Judgments

Table 1: Risk of Bias - studies with a control group

Country	Study ID	Study design	Random sequence generation (low=random, high=not random, unclear if not specified)	Allocation concealment	Baseline outcome measurement similar	Baseline characteristics similar	Incomplete outcome data
Argentina	Gertler 2014	CBA	High - as per guidance.	High - as per guidance.	Low - analyses methods adjust for differences	Low except high for neonatal mortality (noted imbalance only for this outcome).	Low: paper mentions missingness of 3%, similar across groups. Complete case analyses are conducted which may compromise results but no reporting of missingness by outcome.
Burkina Faso	Steenland 2017	CBA	High - as per guidance.	High - as per guidance.	Low - analyses methods adjust for differences	High - Table 1 suggests differences between comparison and intervention exist - e.g. number of health facilities/100,000 people consistently higher in intervention than in comparator.	Low - see Appendix Table 4.
Burundi	Bonfrer 2014a	CBA	High - as per guidance.	High - as per guidance.	Low - analyses methods adjust for differences	High - Appendix Table 6 suggests differences exist between the different districts, e.g. population characteristics (poverty) varies between 28.7% and 82.3%.	Unclear: not specified.
Burundi	Bonfrer 2014b	CBA	High - as per guidance.	High - as per guidance.	Low - analyses methods adjust for differences	Low - comparable.	Unclear: not specified.
Burundi	Falisse 2015	CBA	High - as per guidance.	High - as per guidance.	Low - analyses methods adjust for differences	High - data not presented.	Low - authors note outcomes to focus on chosen based on com-

(Continued)

							pleteness and sensitivity analyses conducted.
Burundi	Rudasingwa 2015	CBA	High - as per guidance.	High - as per guidance.	Low - analyses methods adjust for differences	High - data not presented.	Low - authors note outcomes to focus on chosen based on completeness.
Cambodia	Van de Poel 2015	CBA	High - as per guidance.	High - as per guidance.	Low - analyses methods adjust for differences	Low - comparable.	Unclear: not specified.
Cameroon	Zang 2015	CBA	High - as per guidance.	High - as per guidance.	Low - analyses methods adjust for differences	Low - comparable.	Unclear: not specified.
China	Yao 2008	CBA	High - as per guidance.	High - as per guidance.	Paper re-analysed; re-analysed results noted as low (analyses methods adjust for differences)	High - Table 1 suggests the intervention is done in areas that are more populated and poorer compared to control.	Unclear: not specified.
Congo - Republic of	Zeng 2018	CBA	High - as per guidance.	High - as per guidance.	Low - analyses methods adjust for differences	High - Table 3 suggests significant differences, e.g. in household size, daily spending and age of mother	Unclear: not specified.
Democratic Republic of the Congo	Soeters 2011	CBA	High - as per guidance.	High - as per guidance.	Low - analyses methods adjust for differences	High - not specified.	Unclear: not specified.
El Salvador	Bernal 2018	CBA	High - as per guidance.	High - as per guidance.	Low - analyses methods adjust for differences	High - Table 2 and page 9 highlight the differences between results based aid provinces and those with national funding.	Unclear: not specified.
Haiti	Zeng 2013	CBA	High - as per guidance.	High - as per guidance.	Low - analyses methods adjust for differences	High - data not presented.	Unclear: not specified.
Multiple - Burkina Faso, Ghana and Tanzania	Duysburgh 2015	CBA	High - as per guidance.	High - as per guidance.	Paper re-analysed; re-analysed results noted as low (analyses methods adjust for differences)	High - Appendix Table S1 suggests differences between intervention and control sites but unclear what effect this would have on outcomes.	Unclear: not specified.

(Continued)

Tanzania	Binyaruka 2015	CBA	High - as per guidance.	High - as per guidance.	Low - analyses methods adjust for differences	Low except for: ANC visits and IPT during ANC, outpatient visits per month under/over 5, patient assessments of staff kindness, probability of payment for delivery care, satisfaction with interpersonal care	High: authors note that this may have biased results.
Tanzania	Binyaruka 2017	CBA	High - as per guidance.	High - as per guidance.	Low - analyses methods adjust for differences	Low except for: availability and stockouts of medicines and medical supplies	Unclear: not specified.
Tanzania	Binyaruka 2018	CBA	High - as per guidance.	High - as per guidance.	Low - analyses methods adjust for differences	Low except for: ANC visits and IPT during ANC, outpatient visits per month under/over 5, patient assessments of staff kindness, probability of payment for delivery care, satisfaction with interpersonal care	High: authors note that this may have biased results.
Tanzania	Mayumana 2017	CBA	High - as per guidance.	High - as per guidance.	Low - analyses methods adjust for differences	Low except for: medical supply stockouts, disruptions due to broken equipment, governance outcomes (committee meetings, content of supervision, existence of community health fund)	High: authors note that this may have biased results.
Zimbabwe	Das, 2017	CBA	High - as per guidance.	High - as per guidance.	Low - analyses methods adjust for differences	Low - comparable.	High: sub-set analyses with particularly small samples
Benin	Lagarde 2015	Quasi/non-randomized trial	Unclear: not specified.	Unclear: not specified.	High - analyses methods do not adjust for baseline differences in outcomes, but do adjust for facility and health worker differences	High - Appendix Table 6 suggests differences exist between the different districts, e.g. population characteristics (poverty) varies between 28.7% and 82.3%.	Unclear: not specified.
Cameroon	De Walque 2017	Quasi/non-randomized trial	Low - sequence described in enough detail.	Low - assignment by province/district/cluster.	Low - analyses methods adjust for differences	Low - comparable.	Unclear: not specified.

(Continued)

China	Powell-Jackson 2014	Quasi/Non-randomized trial	High - no randomization, though matching occurred.	Low - assignment by province/district/cluster.	Low - analyses methods adjust for differences	Low - comparable.	Unclear: not specified.
China	Sun 2014	Quasi/non-randomized trial	High - randomization compromised.	Low - assignment by province/district/cluster.	Low - analyses methods adjust for differences	Low - comparable.	Unclear: not specified.
Peru	Cruzado de la Vega, 2017	Quasi/Non-randomized trial	High - no randomization.	Low - assignment by province/district/cluster.	Low - analyses methods adjust for differences	Low - comparable.	Unclear: not specified.
Rwanda	Basinga 2011	Quasi/non-randomized trial	High - randomization compromised.	Low - assignment by province/district/cluster.	Low - analyses methods adjust for differences	Low - comparable.	Unclear: not specified.
Rwanda	Lannes 2016	Quasi/non-randomized trial	High - randomization compromised.	Low - assignment by province/district/cluster.	Low - analyses methods adjust for differences	Low - comparable.	Unclear: not specified.
Rwanda	Priedeman Skiles 2013	Quasi/non-randomized trial	High - randomization compromised.	Low - assignment by province/district/cluster.	Low - analyses methods adjust for differences	Low - comparable.	Unclear: not specified
Rwanda	Priedeman Skiles 2015	Quasi/non-randomized trial	High - randomization compromised.	Low - assignment by province/district/cluster.	Low - analyses methods adjust for differences	Low - comparable.	Unclear: not specified
Rwanda	Sherry 2017	Quasi/non-randomized trial	High - randomization compromised.	Low - assignment by province/district/cluster.	Low - analyses methods adjust for differences	Low - comparable.	Unclear: not specified
Rwanda	Lannes 2015	Quasi/non-randomized trial	High - randomization	Low - assignment by	Unclear: not specified.	High - not specified.	Unclear: not specified, using

(Continued)

			compro- mised.	province/dis- trict/cluster.			data from Basin- ga 2011.
Rwanda	Gertler 2013	Quasi/non- randomized trial	High - ran- domization compro- mised.	Low - as- signment by province/dis- trict/cluster.	Low - analyses methods adjust for differences	Low - comparable.	Low - authors note similar lev- els of attrition.
Rwanda	de Walque 2015	Quasi/non- randomized trial	High - ran- domization compro- mised.	Low - as- signment by province/dis- trict/cluster.	Low - analyses methods adjust for differences	Low - comparable.	Unclear: not specified.
Swaziland	Kliner 2015	Quasi/non- randomized trial	High - no randomiza- tion.	High - alloca- tion was prag- matic.	Low - analyses methods adjust for differences	High - Table 2 suggests differences in populations and outcomes exist.	Unclear: not specified.
Tanzania	Brock 2018	Quasi/non- randomized trial	Low - se- quence de- scribed in enough de- tail.	Low - as- signment by health care profession- al, done post baseline as- sessment.	Low - comparable.	High - Tables 2 and 3 suggest some differences between providers and patients.	Low - drop-out pre-assignment 12%, but post on- ly 3%.
Zimbabwe	Friedman, 2016b	Quasi/Non- randomized trial	High - no randomiza- tion, though stratifica- tion and matching	High - alloca- tion was done by MoH via matching.	Low - analyses methods adjust for differences	Low - comparable. (Appendix 3 tests parallel trends, though base- line characteristics are dissimilar at times).	Unclear: not specified (Au- thors note that for household ex- penditure data there was high missingness.)

Table 2: Risk of Bias - interrupted time series studies

For Preview Only

Country	Study ID	Study design	Intervention independent of other changes	Shape of the intervention effect pre-specified	Intervention unlikely to affect data collection	Knowledge of the allocated interventions adequately prevented during the study	Incomplete outcome data adequately addressed	Selective outcome reporting	Other risks of bias
Brazil	Viñuela 2015	ITS	Unclear: other reforms were happening in the education and justice sectors which could contribute as well.	Low - specified as per guidance.	Unclear: intervention may have affected data collection.	Low: unlikely allocation affects data collection.	Unclear: not specified.	Low	Note: data is aggregated at high level - this may impact analyses and findings.
Cambodia	Ir 2015	ITS	High: multiple PBF reforms introduced alongside voucher schemes, changes to health service delivery (more trained professionals) also occurred.	High - as per guidance, effect shape not specified.	Unclear: intervention may have affected data collected as same source was used for payments and for outcome assessment.	Unclear: health workers themselves appear to be reporting.	Unclear: not specified.	Low	Low
Cambodia	Khim 2018	ITS	Unclear: not specified.	Low - specified as per guidance.	Unclear: intervention may have affected data collection.	Low: unlikely allocation affects data collection.	Unclear: not specified.	Low	Note: several other schemes were implemented at the same time and high variability in implementation of this scheme noted.
Cambodia	Matsuoka 2014	ITS	Unclear: not specified.	Low - specified as per guidance.	Unclear: intervention may have affected data collection.	Unclear: not specified.	Unclear: not	Low	Note: data re-analysed.

(Continued)

China	Chang 2017	ITS	High: other interventions concurrent (including further PBF + introduction of data-base).	Low - specified as per guidance.	High: intervention introduced alongside an HMIS intervention.	Unclear: not specified.	Un- clear: not speci- fied.	Low	Note: three PBF schemes were implemented, only one assessed.
China	Wu 2014	ITS	Unclear: other reforms happening but robustness checks performed to ascertain impacts and effects are consistent.	Low - specified as per guidance.	Low: no effects on data collection.	Low: unlikely allocation affects data collection.	Un- clear: not speci- fied.	Low	Note: not generalizable, study conducted in one setting.
China	Liu and Mills 2005	ITS	High: other changes in the country likely to affect trends.	Low - specified as per guidance.	Low: no effects on data collection.	Low: blinded and random assessments.	Low: panel dataset.	Low	Low
Rwanda	Rusa 2009	ITS	High: other changes in the country (user fee removal) likely to affect trends.	Low - specified as per guidance.	Unclear: intervention may have affected data collection.	Unclear: not specified.	Un- clear: not speci- fied.	Low	Low
Zambia	Chansa, 2015	ITS	Unclear: not specified.	Low - specified as per guidance.	High: intervention introduced alongside audits.	Low: unlikely allocation affects data collection.	Low: HMIS data.	Low	Low
Malawi	McMahon 2016	CBA and ITS	Unclear: not specified.	Low - specified as per guidance.	High: intervention directly targets improvements in data.	Unclear: not specified.	High: several indicators excluded due to missingness.	Low	Low

Appendix 7. Full list of studies for which no full text could be obtained

Being compiled

FEEDBACK

Update on grey literature searches, June 2020

Summary

The grey literature searches are still going on and we can update these post review process.

WHAT'S NEW

Date	Event	Description
16 December 2020	Feedback has been incorporated	Addressed reviewer comments.
12 March 2020	New citation required and conclusions have changed	This update includes 62 new studies. Previous study inclusion criteria has changed and we have excluded from this update 9 studies previously included in the review; Changes to results and conclusions, summary of findings tables, GRADE. New review authors have contributed to this update.
12 March 2020	New search has been performed	This is the first update of the Cochrane review published in 2012. We have conducted a new search and have updated other content.

HISTORY

Protocol first published: Issue 3, 2009

Review first published: Issue 2, 2012

Date	Event	Description
13 February 2012	Amended	Minor edits

CONTRIBUTIONS OF AUTHORS

All authors reviewed and updated the protocol. Marit Johanson and JF developed the search strategy. KD, AV and JF selected the studies and undertook data extraction. KD led in the drafting of the review, with the support of SW and AF. All authors have reviewed and commented on the final draft.

DECLARATIONS OF INTEREST

No conflicts of interest apply.

SOURCES OF SUPPORT

Internal sources

- Norwegian Knowledge Centre for the Health Services, Norway

External sources

- Institute of Global Health and Development, Queen Margaret University, UK, UK

The Institute offered necessary infrastructure and staff time for undertaking the review.

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

The following represent deviations from the protocol ([Witter 2009](#)) and original review ([Witter 2012](#)):

- Search strategies have been altered to include further up to date terms referring to paying for performance (see [Appendix 2](#));
- Additional databases were added to the search strategy; however, no search of DARE or IPA was conducted;
- Given the volume of data retrieved, we restricted our analyses and synthesis to those indicators which were comparable (i.e. indicators similarly formulated, calculated and which could speak to similar underlying populations so as to minimize indirectness) and discussed across two or more studies;
- Sub-group analyses: given inconsistencies in reporting of characteristics intended to be used for sub-group analyses, we used scheme design as the primary criterion by which to conduct sub-group analyses.
- Given the volume of impact evaluations, the findings of health economic evaluations or qualitative studies conducted alongside impact evaluations have not been included. We will attempt to include these studies in further work exploring the mechanisms behind P4P impacts.