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THE LINK BETWEEN PROVIDER PAYMENT AND QUALITY OF MATERNAL HEALTH SERVICES

A FRAMEWORK AND LITERATURE REVIEW

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USAID's Health Finance and Governance (HFG) project helps to improve health in developing countries by expanding people's access to health care. Led by Abt Associates, the project team works with partner countries to increase their domestic resources for health, manage those precious resources more effectively, and make wise purchasing decisions. The five-year, $209 million global project is intended to increase the use of both primary and priority health services, including HIV/AIDS, tuberculosis, malaria, and reproductive health services. Designed to fundamentally strengthen health systems, HFG supports countries as they navigate the economic transitions needed to achieve universal health care.

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ACRONYMS

ANC	Antenatal care
CPV	Clinical performance vignette
DRG	Diagnosis-related groups
FFS	Fee-for-service
HFG	Health Finance and Governance Project
HIO	Health Insurance Organization (Egypt)
HIV	Human immunodeficiency virus
PBF	Performance-based financing
PBI	Performance-based incentive
PMNCH	Partnership for Maternal, Newborn and Child Health
RBF	Results-based financing
USAID	United States Agency for International Development
WHO	World Health Organization

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EXECUTIVE SUMMARY

There is growing recognition that improvements in access alone have not solved the problem of avoidable maternal morbidity and mortality – poor quality is still a barrier to overcome. There is much discourse in the global health community surrounding quality of maternal health services, but less discussion of how provider payment designs can contribute to improved quality of maternal health services at the point of care. This paper: draws on contributions from quality and health financing experts to present a conceptual framework of how provider payment links with quality of maternal health services; and identifies, summarizes and analyzes provider payment systems in low- and middle-income countries where payment is linked with quality measurement. The analysis attempts to answer the following study questions where information is available. Annex A presents qualitative data for each of the 17 cases included in the study.

How are provider payments designed to improve quality, and what provider payment mechanisms are used?

Quarterly bonuses were the most common payment mechanism used to incentivize providers to improve quality. Most calculated the bonus by using a quality score to either inflate or deflate fee-for-service-derived potential bonus. Others based the potential bonus on a payment model other than fee-for-service, such as achievement or not of a target, or a global prospective budget. Other mechanisms identified were: per capita-derived bonus with inflation factor based on quality, pay-out of withheld funding based on quality, one-time bonus based on quality of inputs, and modified diagnosis-related groups (DRG) payments levels based on quality.

How is quality defined, measured, and monitored in relation to the provider payment mechanism?

In general, quality assessments often evaluated one or more of the following domains: infrastructure, medical technology, and commodity inputs; patient-centeredness; content of care; appropriate referral; and human resource-related issues such as appropriate level of staff performing more complex procedures. Many quality assessments evaluated specific health areas such as ANC, delivery, child health services, immunization, and others. Most cases relied on a combination of direct observation of clinical encounters, direct observation of structural inputs, and review of patient records.

Did provider behavior change in response to the payment mechanism? Has the quality of care improved?

Several evaluations found evidence that basing provider payment on quality changes provider behavior in a way that encourages better quality at the point of care (Basinga et al. 2011; Bonfrer et al. 2014; Friedman et al. 2015; Gertler et al. 2014; Gertler and Vermeersch 2012; Janssen et al. 2014; Yip et al. 2010). Two evaluations presented evidence that basing provider payment on quality produces positive provider behavior spillovers beyond the immediate program goals (Health Partners International 2015;

Janssen et al. 2014). Two evaluations presented evidence that the payment design did not change a particular provider behavior as intended (Health Partners International 2015; Toonen et al. 2009).

Why and how did the financial incentive scheme work (or not) to achieve improved quality measures?

Evaluations found evidence that basing provider payment on quality promoted better management and governance, thereby encouraging quality at the point of care (El-Khoury et al. 2015; Janssen et al. 2014; Toonen et al. 2009). Two evaluations also found evidence that basing provider payment on quality promoted better care processes, which contributed to better quality at the point of care (El-Khoury et al. 2015; Friedman et al. 2015). One evaluation discussed the difficulties in institutionalizing quality measurement (Janssen et al. 2014). Two evaluations noted additional challenges with implementing a program that bases provider payment on quality as a result of broader systems changes (Health Partners International 2015; Yip et al. 2010). In general, authors of evaluations agreed that the level of the provider payment is an important factor in promoting an improvement in quality at the point of care.

1. INTRODUCTION

Despite gains made in recent decades, too many women in low- and middle-income countries experience avoidable maternal mortality and morbidity. Through focused efforts by governments and the global health community, ante- and postnatal consultations, skilled birth attendance, and facility-based deliveries have increased markedly across all regions. But avoidable maternal mortality and morbidity still occur in facilities due to poor quality of care (Tunçalp et al. 2015). There is growing recognition that improvements in access alone have not solved the problem of avoidable maternal morbidity and mortality – poor quality is still a barrier to overcome (WHO and PMNCH 2014). Poor quality of care resulting in medical errors or inappropriate care can lead to death or disability or public mistrust of the system (National Academies 2015). As utilization and coverage of maternal health services increase, health system stewards continue to seek ways to cross the quality chasm.

The United States Agency for International Development (USAID) is interested in exploring how provider payment mechanisms can improve the quality of maternal health care in resource-constrained settings. This paper from the USAID-funded Health Finance and Governance (HFG) project summarizes quality of maternal health and provider payment concepts discussed among academics and experts in the international community. It reviews existing frameworks to develop a combined framework that shows the link between provider payment and quality of maternal health services. It then identifies and summarizes real payment systems in low- and middle-income countries where the provider's payment is directly linked to the quality of maternal health services provided. Using the conceptual framework and the cases, the authors draw lessons for policymakers considering using provider payment mechanisms to raise the bar on quality of maternal health care provision.

1.1 How quality of care links with health financing: A round-up of the literature

Quality of care in maternal health services has been conceptualized in various ways. By examining similarities and differences among models, the HFG study team identifies where provider payment best fits into a model of quality maternal health care. The focus is on quality of maternal care at the point of service – the interaction between a woman and a health worker for pre-, peri-, and postnatal care – and thus on initiatives that aim to improve quality during the patient-provider interaction, as opposed to initiatives aimed at increasing provider productivity, increasing demand for services, or reducing demand-side barriers to access.

1.1.1 Existing frameworks of quality of maternal health services

First, the study team reviewed the literature to propose a definition of quality of maternal health care. Hulton et al. (2000) defines quality of maternal health care as *the degree to which maternal health services for individuals and populations increase the likelihood of timely and appropriate treatment for the purpose of achieving desired outcomes that are both consistent with current professional knowledge and uphold basic reproductive rights*. The World Health Organization (WHO) and Partnership for Maternal, Newborn and Child Health (PMNCH) (WHO and PMNCH 2014, Tunçalp et al. 2015) take a different approach, defining quality of maternal health care by specifying six conditions that must be met in order to consider maternal health care of high quality. The first condition is that care is provided by competent

and motivated human resources. Second, care is provided where essential physical resources are available. Third, care is provided using evidence-based practices for routine and emergency care. Fourth, care is provided where actionable information systems are in place and where record keeping enables review and audit mechanisms. Fifth, care was performed within a functional referral system. Sixth, experience of care is positive, meaning that a woman (or her family if required) feels that she understands what is happening, what to expect, knows her rights, receives care with respect and dignity, and has access to the social and emotional support of her choice.

The specified criteria from the WHO and PMNCH definition can be understood as required inputs and processes that lead to provision of quality maternal health care. These inputs and processes overlap somewhat with the community-, district-, and facility-level health system inputs for quality maternal care identified in the model proposed by Austin et al. (2014). Their model identifies the following system inputs as necessary for delivering quality of maternal health care: financing platforms and strategies; health workforce training/task shifting; community engagement; outreach services or referral; audit and feedback; governance and accountability; leadership and supervision; health service information systems; facility organizational capacity; interpersonal care/social support; service infrastructure (e.g., electronic health records/electronic communication); and well-performing and motivated workforce.

1.1.2 Provider behavior: A core element of service quality

The quality of maternal care models introduced above identify health workforce motivation as a key element to quality at the point of care, even as what happens at that point of care is influenced by a complex interplay of other health system forces. Indeed, many quality improvement models are based on the premise that quality improvement is dependent on provider actions (Dayal and Hort 2015). Health workforce motivation is identified as a key element in both the WHO and PMNCH (2014) and Austin et al. (2014) models referenced above. Health workers' behaviors at the point of care are also core to the adherence to evidence-based practices for routine care and management of complications, as well as to providing care with respect and dignity. Other elements, such as leadership and supervision, are influenced directly by the behavior of health system and health facility managers. They may exercise influence over other contributors to service quality, such as infrastructure or physical resources available, by allocating the facility's budget for infrastructure improvements, drugs and commodities, or medical technology in an efficient manner.

In the absence of additional resources, health system stewards are looking for ways to maximize the quality of care that can be achieved using available resources. Given the strong links between many elements of quality and provider behavior, optimizing health care provider performance is a key strategy for quality improvement. A review by Miller and Babiarz (2013) found examples of suboptimal provider performance that contribute to low quality of care, including absenteeism; the "know-do gap" (failure to do in practice what a provider knows to do in principle); providing unnecessary or incorrect services; and failing to provide recommended prevention and outreach. In other words, although providers in resource-poor settings certainly face immense challenges and barriers, there may be room for improvement within current resource constraints.

1.1.3 The role of provider incentives

If providers can deliver higher quality at the point of care under the current resource constraints, why aren't providers doing it already? Every health system has inherent incentives – whether intentional or not – that influence health workers' observed behaviors in a way that leads the workers to deliver services of low quality, particularly in the absence of proactive system incentives that promote behaviors that lead to high quality. In low-resource systems, there are real and perceived barriers to many

provider behaviors that would link to more optimal health outcomes; the incentives for following through with the beneficial behaviors need to be compelling enough to overcome the disincentives. When the incentive environment is not weighted toward a given behavior, the behavior is discouraged.

For illustration, consider the partograph. The WHO recommends monitoring labor using a partograph to help providers identify prolonged labor and know when to take appropriate actions to reduce complications. If partographs are the recommended international standard, why might a facility-based health worker not monitor every labor with a partograph? A recent study on the Janani Suraksha Yojana program in Madhya Pradesh, India, found that only 6 percent of records in a sample of facilities indicated that a partograph had been used (Chaturvedi et al. 2015). Providers were aware that their records could be audited to determine whether pregnancies were monitored by a partograph, so they already faced an "accountability incentive." Some providers also reported knowing that a partograph could help them identify risks and problems for the patient earlier and could lead to a better health outcome for the mother and baby, so they had some intrinsic motivation for the behavior.

However, the study's qualitative findings reported barriers for providers performing this behavior that generally outweighed the incentives. Some health workers reported lack of experience or lack of appreciation for partograph use as a clinical tool; others reported the extra time and effort needed. In some cases, barriers were outside the provider's control at the point of service (e.g., woman arriving at the facility in advanced stage of labor) – so it may be unrealistic to aim for 100 percent use of partographs in certain settings. However, that need not deter policymakers from seeking improvements in those cases that can be reasonably influenced by the provider. Besides, incentives might also be used to encourage patients arriving at the facility in an earlier stage of labor.

1.1.4 How financial incentives can affect quality of care

The effect of provider payment on quality of care in general has been studied extensively. It is widely acknowledged that the way in which payments are made to a provider can affect quality of care. A 1995 study surveyed the published literature on the main alternatives for provider payment and assessed their suitability across a wide range of country environments (Barnum et al. 1995). The analysis revealed that there is no single optimal method for paying providers; all methods generate both adverse and beneficial incentives affecting the volume, quality, and mix of services. A pure fee-for-service payment model encourages overprovision of services among other issues. Payment mechanisms that seek to aggregate payments, such as case-based payment per visit or admission, capitation per person covered, or global budget or salary per period, have the unintended effects of incentivizing providers to reduce quality, underprovide, and avoid high-risk and complicated cases (Yip et al. 2010). Case-based payments, which are usually used for inpatient care in hospitals, arouse concerns that providers will reduce the amount of treatment for a patient, increase readmissions, admit outpatients who do not need to be hospitalized, and treat patients inappropriately (World Bank 2010b). In a 2013 systematic review of the effects of health insurance on the use and provision of maternal health services, authors found six studies that presented suggestive evidence of over-provision of caesarean sections in response to provider payment incentives through health insurance (Comfort et al. 2013).

The Barnum et al. (1995) study concluded that quality assurance programs are required in all methods of provider payment to monitor the effects of adverse incentives. The Aama program in Nepal is a good example of such monitoring. When it replaced a fee-for-service payment system with a fixed payment per case, policymakers were concerned that the new payment model would incentivize reduced length of stay and underprovision. To mitigate this risk, policymakers designed a quality measurement system to monitor against this behavior (Witter et al. 2011).

The current study expands upon previous work that articulated the links between quality and provider payment. In particular, it brings greater focus to the role of quality measurement in provider payment mechanisms that aim to encourage high quality.

In many ways, systems that build an explicit link between provider payments and achievement of measurable quality targets can be understood as performance-based financing (PBF) or results-based financing (RBF). A provider payment that is conditional on the result of the quality measurement is performance-based payment. Performance-based payments are *monetary payments or other material rewards that are provided on the condition that one or more indicators of performance change, that predetermined targets are met, or both* (Eichler and Levine 2009). These payments might be made to a health care facility (for use by the health manager) or to health care workers directly. The financial incentive can take various forms, such as paying a bonus, withholding reimbursement when unnecessary or inappropriate services are rendered, or assessing a penalty on fee-for-service or capitation payments. It also could also take the form of an opportunity for more business, such as getting accredited to participate in a health insurance scheme or voucher program if the provider meets quality standards.

Historically, few provider payment systems in low- and middle-income countries appear to have measured and based payments on quality. The published literature is sparse. A 2012 Cochrane Systematic Review of PBF studies that reported on performance or patient outcomes identified nine PBF interventions, and only one linked payments to quality of care (Witter et al. 2012). USAID's 2012 Maternal Health Evidence Summit reviewed the knowledge on how financial incentives enhance the quality and uptake of maternal health care; researchers found that few studies explicitly discussed whether quality was incentivized in the programs they evaluated, and few reported on quality effects (Morgan et al. 2013). And a 2013 systematic review of the effect of health insurance on maternal and neonatal health found that few studies focused on the relationship between health insurance and the quality of maternal health services (Comfort et al. 2013).

However, with the recent focus on quality of care (Tunçalp et al. 2015), more systems have started undertaking quality measurement, and some have started experimenting with linking it to provider payments. This topic represents a gap in the literature, which this study seeks to fill.

1.1.5 Measuring quality of maternal health services

Quality measurement is fundamental to any initiative that links payment to quality. Evaluating quality increases provider accountability for the level of quality or for adhering to practices that lead to high quality; it ensures that payers of health services (a government, a health insurer, an international donor, etc.) are purchasing high-quality health services from providers (Dayal and Hort 2015).

There are many methods used globally for measuring maternal health care quality. Quality evaluators in some developed countries use claims data to perform analysis on the content, timing, and appropriateness of care provided to patients (O'Beirne et al. 2012). This method requires a sophisticated and highly detailed health service delivery data system, such as an insurance scheme's fee-for-service claims payment system. Health management information systems in low- and middle-income countries may not contain sufficient detail to perform this type of secondary data analysis; as a result these countries rely on other methods involving primary data collection or in-person secondary data analysis (Brown et al. no date). Table 1 briefly describes the methods commonly applied in such countries.

Table 1: Common Methods of Measuring Quality at the Point of Care in Low-resource Settings

Element of Care	Measurement Method	Description
Content of care	Standardized patients	Evaluators are trained to act as real patients and simulate a set of symptoms or problems in order to evaluate the care provided by the health care worker. This method is considered the gold standard for evaluating quality and the point of care because it eliminates Hawthorne observation effects. However, this method is very resource-intensive.
	Clinical performance vignettes	Evaluator uses a prescribed scenario to have the health worker simulate a clinical encounter.
	Direct observation of clinical encounters	Evaluator directly observes a clinical encounter between a health worker and patient.
	Review of patient records	Evaluator reviews all or a sample of patient records to evaluate whether standard care processes were followed during patient encounters.
Structural inputs	Direct observation of structural inputs	Evaluator directly observes infrastructure, available medical technology, and available commodities to determine whether structural inputs are sufficient to deliver quality services.
Patient experience	Patient surveys	Evaluator interviews patients to gather information about care provided during a clinical encounter.

Sources: Dayal and Hort (2015), WHO and PMNCH (2014), Brown et al. (no date)

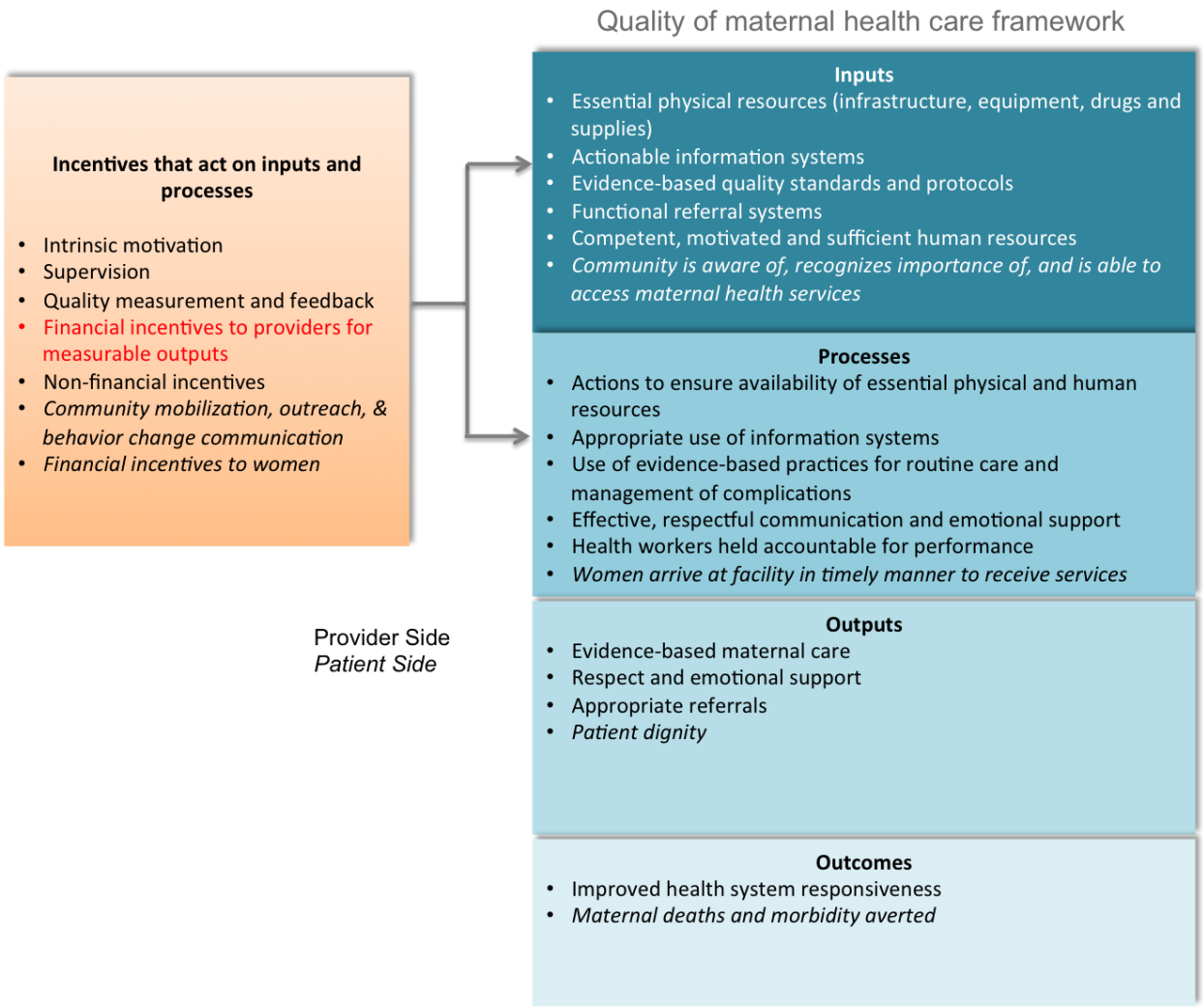
Purchasers that aim to buy high-quality health services need to make upfront investments in quality of care measurement. Quality measurement involves time and effort, as well as other costs (Dayal and Hort 2015). In many settings, quality measurement has taken the form of a team of evaluators physically visiting health facilities. Some of the upfront costs may be recovered in downstream savings. O'Beirne et al. (2012) identified evidence that quality improvement and accreditation in primary health care can result in cost efficiency and lower costs in some settings.

1.1.6 A conceptual framework

Based on the literature on quality of maternal health care and the effect of provider payments on behavior, the authors propose a conceptual framework in Figure 1 that links provider payment to quality of maternal health care. The framework is based around quality of maternal health care, and shows how incentives act on that quality of care framework at the input and process level. On the provider side (non-italics), the framework shows how incentives –including financial incentives (red text) – act on health workers and health facility managers who contribute to inputs and processes. On the patient side (italics), the framework shows how incentives affect patient behaviors that also affect quality. The system of inputs and processes in turn produces outputs and outcomes. The inputs and processes included in the framework are adapted from the WHO's Quality of Care Framework (WHO and PMNCH 2014) for maternal and newborn health.

The framework highlights financial incentives for measureable outputs: one of the key incentives that act on providers. Although other incentives exist under the broader framework for quality of maternal health care, financial incentives for providers are important influencers over provider-side behavior contributing to inputs and processes. Our study focuses on this type of incentive.

Figure 1: Conceptual Model for Quality of Maternal Health Services at the Point of Care



Source: Adapted from WHO Quality of Care Framework for maternal and newborn health.

The conceptual model shows how incentives like financial incentives and quality measurement influence provider performance, which contributes to the elements of quality maternal care. When incentives outweigh barriers for providing high-quality care, improved health worker and manager performance will contribute to better care processes and ultimately better outcomes. Financial incentives can serve as a powerful policy lever for improving quality of care in low- and middle-income countries. An important area of research is how to improve quality of maternal health care by linking provider payment to quality measurement.

1.2 Systems that link provider payment with quality of maternal health services

The purpose of the literature review was to gather and summarize qualitative data on key design elements of payment systems in low- and middle-income countries that link payment to quality measurement. Through the evidence found, this report seeks to address the study topics listed in Table 2.

Table 2: Study Topics

1	How are provider payments designed to improve quality, and what provider payment mechanisms are used?
2	How is quality defined, measured, and monitored in relation to the provider payment mechanism?
3	(As available) Did provider behavior change in response to the payment mechanism? Has the quality of care improved?
4	(As available) Why and how did financial incentives work (or not) to achieve improved quality measures?

The remainder of this report is organized into three main sections: methods, results, and discussion. Annex A contains detailed information.

2. METHODS

Given the topic of research, the HFG study team opted for a literature review methodology over a systematic review methodology in order to allow for a broad-based search strategy and inclusion of cases presently described only in gray literature and unpublished program reports. The team considered French- and English-language published articles from peer-reviewed journals and published and unpublished program reports that included details on how a specific provider payment system linked quality measurement to provider payment and, if available, the quality and health outcomes of that system.

2.1 Inclusion criteria

The study team included cases in which one of the design objectives of the provider payment mechanism was to improve quality of care, including maternal health care. Maternal health care quality indicator(s) must be regularly measured as part of the system, and at least part of the provider payment must be based on the quality of maternal health care indicator(s). Provider payment mechanisms that do not specifically measure and base payment on quality of *maternal health care* indicators were excluded. Provider payment mechanisms that focus solely on measures of *volume of services* or *access to services*, regardless of the provider's quality at the point of care, were also excluded.

2.2 Search strategy

The team searched the following electronic reference libraries to identify potential cases for inclusion: PubMed, ProQuest, World Bank's RBFhealth.org Database, Google, and Google Scholar. They used a broad search strategy that included a combination of appropriate key words and free text terms. They also performed detailed examination of cross-references and bibliographies of available data and publications to identify additional sources of information, and drew on author and other experts' knowledge.

2.3 Analytic strategy

Once all eligible cases were identified, the team extracted available qualitative data on the four topics listed in Table 2 from the sources identified during the initial search and supplementary sources found through Google searches. They entered qualitative information into a matrix in Microsoft Excel. To the extent possible, they collected comparable qualitative information across all cases and included information in the matrix in a standardized format to aid in cross-case analysis.

3. RESULTS

3.1 Search results

Using a combination of search terms, the HFG study team identified approximately 100 peer-reviewed articles covering information from over 30 low- and middle-income countries in PubMed, ProQuest, and Google Scholar. The team identified 36 RBF programs in 31 countries using the RBFhealth.org database. They also identified several additional potential programs not otherwise identified through these methods by using cross-references and bibliographies and author knowledge, including ongoing programs in various stages of implementation in Malawi, Senegal, and Uganda. In the end, 17 cases from 16 countries met the inclusion criteria. Table 3 lists the country, program name, and program timeframe for the 17 cases. Cases are alphabetized by country name.

The study team excluded accreditation models from the main study but this report describes this type of model in Box 1 (see Section 3.2). This model does not generally meet two of the inclusion criteria for this study: that quality indicator(s) must be regularly measured as part of the system and that at least part of the provider payment must be based on the quality of maternal health care indicator(s). An accreditation model does not quite meet the first criterion because quality measurement for accreditation purposes generally occurs once or very infrequently. Nor does the model fully meet the second criterion because achievement of accreditation is often the mechanism by which a provider becomes eligible to participate in a payment system (such as a health insurance program or a voucher program) – it is generally not intended to affect a provider's regular payment. The accreditation model also serves a different purpose than the other included cases: unlike the included cases, the accreditation model is not designed to change health workers' day-to-day behavior to promote quality at the point of care; rather, it intends to ensure that minimum structural and managerial inputs are in place. Nevertheless, given the model is tangentially related to the topic area of our study, in Box 1 this report briefly describes a published methodology where performance-based incentives (PBI) are contingent on achieving steps toward accreditation and discusses an example in Egypt.

Also excluded from the main study is a case in the Philippines because it measured child health care quality, not maternal health care quality. However, given its unique program design and potential application for maternal health quality, it is described in Box 2 (Section 3.2).

Table 3: Cases Meeting Inclusion Criteria for the Study

Case No.	Country	Program Name	Program Sponsors	Program Time Period
1	Argentina	Plan Nacer	Argentina Ministry of Health	Launched in 2004 in 9 provinces in northern Argentina; expanded nationally beginning 2007

Case No.	Country	Program Name	Program Sponsors	Program Time Period
2	Benin	Benin Results Based Financing, Health System Performance Project (*Financement Basé sur les Résultats (FBR) au Bénin, Renforcement de la Performance du Système de Santé*)	General Secretariat of the Benin Ministry of Health; Departmental Health Directorate	RBF program launched in 2011 for public sector facilities; 2014 decision to launch program for private sector facilities by 2015
3	Burundi	Performance based financing (*Financement basé sur la performance*)	Government of Burundi	Gradual scale-up of PBF to national level between 2006 and 2010
4	Cameroon	Performance based financing (PBF) initiative in Cameroon	Cameroon Ministry of Public Health; World Bank	3-year pilot in 4 districts, starting March 2012; 2-year impact evaluation of PBF in 14 districts starting March 2012
5	China	"Separation of revenue and charges" or "separating revenue and expenditure" for community health centers and Rural Mutual Health Care village clinics	Chinese Ministry of Health	Piloted in Changning and Songjiang districts of Shanghai in 2005, applied to all districts by 2007
6	India	Improving Maternal and Child Health in India: Evaluating Demand and Supply Side Strategies	International Initiative for Impact Evaluation (3IE), DFID-India and the World Bank	Roll-out of experimental intervention of incentives to private obstetric care providers in Karnataka started in February 2013
7	Kyrgyz Republic	Health and Social Protection Project: RBF pilot for hospitals	World Bank	Pilot funding received in 2012; 3-year pilot
8	Malawi	RBF4MNH Initiative	USAID	Pilot started 2012
9	Nigeria	Nigerian State Health Investment Project (NSHIP)	Nigeria Ministry of Health; Ondo, Nasarawa and Adamawa State Ministries of Health; World Bank	Pilots occurred in 2011; scale-up to three states in 2014
10	Rwanda	Rwanda national P4P scheme for primary health centers	Rwandan Ministry of Health	National scale-up starting in 2005
11	Rwanda	Rwanda national PBF scheme for district hospitals	Rwandan Ministry of Health	Four hospitals in 2006, national scale up after 2008

Case No.	Country	Program Name	Program Sponsors	Program Time Period
12	Senegal	Senegal Results Based Financing	Senegal Ministry of Health and Social Action Pilot: USAID, KFW Scale up: World Bank	Pilot in 2 regions 2012-2014, scale-up to 4 additional regions in 2015
13	Sierra Leone	Reproductive and Child Health Project: PBF for peripheral health units	Sierra Leone Ministry of Health and Sanitation, World Bank	Launched in April 2011
14	Tanzania	Tanzania Results Based Financing System	Tanzania Ministry of Health and Social Welfare, World Bank	Pilot launch likely 2015, national phased roll-out across the country's 25 regions likely 2016
15	Uganda	Northern Uganda Health Programme	UK aid	2011–2015
16	Zambia	Zambia Results Based Financing Scheme	Zambia Ministry of Health, World Bank	Two-year pilot March 2012–September 2014
17	Zimbabwe	Zimbabwe Health Results Based Financing	Zimbabwe Ministry of Health and Child Care, World Bank	Pilot launched in 16 rural districts in 2012

3.2 Analytic findings

This section contains this study's main findings based on analysis of the 17 included cases and organized by the four study topics.

How are provider payments designed to improve quality, and what provider payment mechanisms are used?

Annex A presents short descriptions of the payment mechanism design used by each case and then lists the major steps of how the system's quality measurement affects the calculation of the provider payment. To the extent possible, the steps are presented in a standardized manner across cases. Table 4 lists the payment mechanism designs identified.

Table 4: Cases by Design Type

Design Type	Country (Case No.)
Bonus for achievement of quantity targets with deflation factor based on quality	Senegal (12)
Fee-for-service (FFS)-derived bonus based primarily on output measures related to quality at the point of care	Malawi (8)
FFS-derived bonus with deflation factor based on quality	Benin (2); Rwanda (10); Sierra Leone (13); Tanzania (14); Uganda (15); Zimbabwe (17)
Per capita-derived bonus with inflation factor based on quality	Argentina (1)
FFS-derived bonus with inflation factor based on quality	Burundi (3); Cameroon (4); Nigeria (9); Zambia (16)
Pay-out of withheld funding based on quality	China (5)
One-time bonus based on quality of inputs	India (6)
Modified diagnosis-related groups (DRG) payments levels based on quality	Kyrgyz Republic (7)
Global prospective budget-derived bonus with inflation factor based on quality	Rwanda (11)

Quarterly bonuses were the most common payment mechanism used to incentivize providers to improve quality: 13 of the 17 cases used quarterly bonuses. The country programs calculated the quarterly bonuses differently. Most calculated the bonus by using a quality score to either inflate or deflate fee-for-service-derived potential bonus. Others based the potential bonus on a payment model other than fee-for-service, such as achievement or not of a target (Senegal), or a global prospective budget (Rwanda, Case No. 11).

The most common design type was "fee-for-service-derived bonus with deflation factor based on quality," with six cases falling under that type: Benin; Rwanda (Case No. 10); Sierra Leone; Tanzania; Uganda; Zimbabwe. The bonus calculation usually worked as follows, with slight variation between cases:

- Health care facilities were eligible to earn a PBI payment once per quarter. This payment was considered a bonus because it was additional to the facility's traditional input-based financing.
- A limited number of health care services (e.g., antenatal care (ANC) consultation; outpatient consultation; vaccine provided) were assigned a fee per service. The facility tallied up the fees it earned based on the number of service it provided (also referred to as the quantitative outputs) and submitted a claim for a bonus payment.
- Prior to payment, a third party assessed the health facility's quality. The quality score ranges from 0 to 100 percent; any score lower than 100 percent serves as a deflation factor for the total bonus paid to the facility.

There are several reasons why "fee-for-service-derived bonus with deflation factor based on quality" was the most common. First, the World Bank favors this design type and sponsored all of these cases with the exception of Uganda. Second, Rwanda's program (Case No. 10) was one of the first national-level supply-side RBF programs in sub-Saharan Africa. It has been evaluated by multiple research teams using different methodologies, resulting in an abundance of detailed information about program design, quality measurement methodology, and program outcomes. It is generally touted as a successful model for low-resource settings, despite well-documented limitations. The wide availability of this model's methodology and results may be a reason why other low-resource countries in sub-Saharan Africa have adopted it.

Box 1: How the accreditation model links to provider payment and improves quality at the point of care: examples from Safecare Initiative, UNIMED-Belo Horizonte, and Egypt Health Insurance Organization.

Most accreditation programs involve an assessment of a health facility to ensure that the facility meets minimum requirements. Requirements are usually related to management practices at the facility; the availability of adequate structural inputs such as infrastructure, medical technology, and commodity supply; and other requirements such as adherence to data reporting. Assessments for meeting accreditation standards sometimes involve evaluating content of care provided by the facility or patient satisfaction, but these measures of quality are less common. An accreditation assessment generally occurs one time per facility, or very infrequently. The result of the accreditation assessment determines if the provider can participate or not in a program and is the link between provider payment and accreditation. A provider might have an incentive to ensure the health facility meets quality standards in order to allow it to capture some of the program's financing. An accreditation assessment is generally not intended to modify the amount of a provider's regular payment, thus the accreditation assessment is probably less likely to influence a health worker's or facility manager's daily behaviors like other quality-based payment mechanisms. An example of a variation on this model is the Safecare Initiative, a collaboration of the Joint Commission International of the U.S.A., the PharmAccess Foundation of the Netherlands, and the Council for Health Service Accreditation of Southern Africa, to develop a step-wise accreditation model that can be combined with performance-based incentives to promote higher quality in a way that is affordable and feasible for health facilities in low-resource settings.

A similar model was implemented in Brazil under the Service Network Qualification Project, where providers had reported that the older accreditation model to quality them for UNIMED-Belo Horizonte's health insurance and medical cooperative did not provide sufficient reimbursements to pay for the investments that the accreditation program demanded. Hospitals that requested renewed accreditation were awarded an increased per diem rate for the duration of the accreditation assessment period. The per diem rate increased as the hospital reached higher levels of accreditation, providing an incentive for hospitals to reach higher steps and an offset to costs incurred by hospitals for quality improvement investments (Borem et al. 2010).

The Health Insurance Organization (HIO) in Egypt implemented another variant on this model. HIO contracted with health facilities to deliver services covered under the social health insurance scheme and to ensure those services were of high quality. HIO implemented a medical audit system, similar to the way accreditation works, that allowed it to audit primary health care centers and hospitals seeking to join the scheme, audit the facilities periodically to determine if facilities continued to meet requirements, and perform for-cause audits. The audit methodology included: a) review of documents including policies, procedures, and plans; b) review of medical records; c) direct observation of facility safety, environmental safety, infection control deficiencies, and patient rights issues; d) staff interviews on infection prevention, medication management, medical records, staff qualifications, and quality improvement; and e) patient interviews (Schwark et al. 2010).

Three cases, also sponsored by the World Bank, had a very similar design type but used the quality score as an inflation factor. In Burundi, Cameroon, Nigeria, and Zambia, a facility was eligible for a quarterly bonus for meeting standards on quality indicators, with the total amount for the bonus also being linked to a fee-for-service payment model.

Three additional cases used quarterly bonuses as the provider payment mechanism: Senegal, Malawi, and Rwanda's hospitals (Case No. 11). These programs had different designs than the programs using a fee-for-service-derived potential bonus. While Senegal's program used a deflation factor based on quality, the potential PBI payment prior to that deflation was derived using output targets instead of a fee-for-service-derived calculation. Malawi's program did not apply a quality modifier to quantitative outputs per se – rather it specifically designed the quantity indicators to include quality of care. Finally, Rwanda's

hospitals were eligible to receive quality-based bonuses that are based on the hospital's prospective global budget for that year.

The cases in Argentina, China, India, and Kyrgyz Republic applied quality measurement to payment mechanisms in different ways. In Argentina, Plan Nacer uses provinces as the purchasers of quality health services by passing quality-based incentive payments along to facilities in the form of fee-for-service payments for the desired quality. In a program in China, hospitals received part or all of a withheld portion of their fixed budget on the basis of a year-end quality assessment. In a program in India, private obstetric providers could receive an annual bonus based on quality. In the Kyrgyz Republic, results of a quality assessment modified DRG levels paid to hospitals.

How is quality defined, measured, and monitored in relation to the provider payment mechanism?

Annex A presents qualitative findings on this topic in two different columns. The first of the columns describes what quality domains the program assesses and, when available, presents three maternal health quality indicators measured. The second of the two columns briefly describes the process and methods of the quality assessment (see Table 1 for commonly used quality measurement methods).

In general, programs assessed a variety of quality domains across a variety of health areas. Specifically, quality assessments often evaluated one or more of the following domains: infrastructure, medical technology, and commodity inputs; patient-centeredness; content of care; appropriate referral; and human resource-related issues such as appropriate level of staff performing more complex procedures. Many quality assessments evaluated specific health areas such as ANC, delivery, child health services, immunization, and others when relevant to the country setting (such as tuberculosis and HIV care).

Most cases relied on a combination of direct observation of clinical encounters, direct observation of structural inputs, and review of patient records. Five of the 17 cases used patient surveys (China, India, Tanzania, Uganda, Zimbabwe), and none of them relied on standardized patients or clinical vignettes. Box 2 describes the program in the Philippines that used clinical vignettes to measure quality of child health services. (As explained earlier, this case was excluded from the main findings because it did not measure maternal health care quality.)

We identified information from the reviewed cases to support the notion that the quality measurement arm of the program needs to mitigate several risks. First, there is a risk that facilities prepare for the assessment so that their quality score is not a true reflection of the quality they provide on a daily basis. In Burundi, the program mitigated this risk by designing unannounced visits to facilities. Second, there is a risk that the team of evaluators collude with the facility to inflate the facility's quality score. The Kyrgyz Republic program mitigated this risk by rotating evaluation teams, and Benin's program invited community-based organizations to perform counter-verification of the quality assessments done by the district health teams. Third, there is risk that facilities avoid higher-risk patients to make it easier to adhere to standards of care practices. The program in India minimized this risk by including a clause in the contracts between the program and facilities that if evidence of refusal to provide care is detected in the local population, the contract will be voided and the provider will be ineligible for the reward payment.

Box 2: Combining Clinical Performance Vignette Scores with Provider Payment Mechanisms Improved Quality of Care in the Philippines

The Quality Improvement Demonstration Study, funded by the U.S. National Institutes of Health, tested whether combining regular quality measurement with two types of provider payment mechanisms improved quality of child health care in the Philippines. The program used clinical performance vignettes (CPVs) as a primary quality measurement method. CPVs use a prescribed scenario to simulate a clinical encounter and judge clinical competence. The program also used patient satisfaction surveys to measure quality. The two types of provider payment mechanisms studied were bonuses and higher health insurance reimbursement. Under the experiment, physicians in hospitals randomly selected for bonuses could directly receive extra pay based on average clinical competence scores of randomly selected physicians, facility caseload, and average patient satisfaction. Hospitals randomly selected for expanded insurance intervention sites received greater revenue in the form of PhilHealth insurance benefits. Semi-annually, three randomly selected physicians from each hospital took a total of three CPVs, one for each child medical condition of dermatitis, diarrhea, and pneumonia. The expanded insurance intervention physicians know that bringing a greater number of insured patients into their facility translates into greater reimbursement for the hospital. The authors found that CPV scores were significantly improved in hospitals in the bonus intervention and in hospitals in the expanded insurance intervention that increased overall physician reimbursement. By the final assessment, quality had improved approximately 10 percentage points in both intervention groups. The study provides evidence that pay-for-performance has a significant effect on clinical performance; similar quality effects may be possible through indirect financial incentives that operate at the system level (Peabody et al. 2011).

Did provider behavior change in response to the payment mechanism? Has the quality of care improved?

Annex A presents findings on quality of care improvement from impact evaluations and research studies. When available, it presents the maternal health-related findings from these studies.

Evaluations of these cases found evidence that basing provider payment on quality changes provider behavior in a way that encourages better quality at the point of care. In Argentina, Plan Nacer's payment design increased the probability of a woman receiving a tetanus vaccine during an ANC visit and reduced her probability of birth by cesarean section (Gertler et al. 2014). In Burundi, PBF significantly increased the probability of institutional delivery for a woman where PBF was in place from the start of her pregnancy, suggesting that providers are encouraging women during ANC visits to deliver in the facility (Bonfrer et al. 2014). In Rwandan health centers, basing provider payment on quality in health centers reduced the gap between provider knowledge and actual practice of the appropriate clinical procedures (Gertler and Vermeersch 2012), and patient surveys found that quality of ANC visits improved (Basinga et al. 2011). In Rwandan hospitals, basing provider payment on quality improved continuity of care for patients, with better interactions between all levels of care through improved referral and counter referral mechanisms (Janssen et al. 2014). In Zimbabwe, PBF was associated with a significant increase in the rate of pregnant women receiving a full package of ANC services including urine and blood tests and tetanus shots (Friedman et al. 2015). Evaluations of China's case did not look at maternal health services, but basing payment on quality was associated with higher rates of follow-up for patients with hypertension and diabetes mellitus (Yip et al. 2010).

We also found some evidence that basing provider payment on quality produces positive provider behavior spillovers. In Uganda, PBF was associated with greater long-term investment in infrastructure and equipment. Additionally, some staff in Ugandan PBF facilities noted a number of such non-financial

changes that helped to improve their work experience and provide a greater sense of job satisfaction and job security. For example, they reported receiving their appointment letters on time and being praised publicly by the management team, having the equipment and resources they needed to provide quality services and being able to take lunch and tea breaks (Health Partners International 2015). In Rwandan hospitals, PBF induced a behavioral change by introducing mechanisms to take initiatives resulting in better performance, such as appropriate archiving, additional staff recruitment, and improved welcoming conditions for patients (Janssen et al. 2014).

In a few cases, findings suggest that the PBF design did not change a particular provider behavior as intended. In Uganda, there were no statistically significant differences of improvement in quality of care for more complex procedures, such as the use of a partograph in either simple or complicated deliveries (Health Partners International 2015). And in Burundi, some facilities were found to be more responsive to PBF than others (Toonen et al. 2009).

Why and how did the financial incentive scheme work (or not) to achieve improved quality measures?

Annex A presents hypotheses and study conclusions from the available impact evaluations and research studies that seek to describe why and how the program worked or did not work to improve quality measures.

Evaluations found evidence that basing provider payment on quality promoted better management and governance, thereby encouraging quality at the point of care. In Burundi, the program improved monitoring systems at all facility and district levels, put in place governance structures to analyze results and hold the service providers accountable for results, put in place verification activities and evaluations to measure the effects at household level, and introduced instruments to make the changes institutional at the facility (Toonen et al. 2009). In Rwandan hospitals, PBF helped to clarify the responsibilities and roles of all parties involved in the production, monitoring, and evaluation of health services (Janssen et al. 2014). The program in Senegal was found to strengthen the leadership role of the health post chief, increase involvement of community health workers, encourage more transparent financial management of the facility, and improve recording and monitoring of services provided (El-Khoury et al. 2015).

Evaluations also found evidence that basing provider payment on quality promoted better care processes, which contributed to better quality at the point of care. In Zimbabwe, qualitative research conducted in five districts found improved teamwork facilitated by the team-based incentives, improved health worker performance due to more regularly received structured supervision and feedback, and enhanced community participation (Friedman et al. 2015). The program in Senegal was found to improve communication and promote better division of labor among facility staff, improve working conditions (hygiene, infrastructure, equipment), and improve monitoring of drugs stocks and procurement (El-Khoury et al. 2015).

One evaluation found that basing provider payment on quality had mixed results across facilities. In Uganda, incentives were seen to have the most positive results in facilities that had more transparent communication between management and clinical staff. However, when a staff incentive was anticipated but not provided, staff demotivation, and in some cases boycotts, were observed (Health Partners International 2015).

One evaluation discussed the difficulties in institutionalizing quality measurement. An evaluation of the program for Rwandan hospitals reported some operational challenges. First, hospitals and evaluators had difficulty understanding some indicators and their composite criteria. An operations manual was not

available, and peer evaluators had to rely heavily on central government staff technical assistance. Second, gathering of information and uniform interpretation of data was difficult due to the non-standardization of medical files and forms in the hospitals, and the evaluation tool was initially very complex. Third, the evaluation found that hospitals were able to achieve high-quality scores quickly, which prompted two revisions of the evaluation grid over three years in order to make the evaluation criteria more specific, precise, and measurable and to adapt to changing needs observed at hospitals (Janssen et al. 2014).

Evaluations noted additional challenges with implementing a program that bases provider payment on quality as a result of broader systems changes. The program in China brought additional patients into the participating hospitals, but hospitals' efforts to re-organize staff to cope with the increased workload had some lag time (Yip et al. 2010). The program in Uganda encouraged facilities to have better staff retention given the effort required to train staff in providing higher-quality care. However, the evaluation found that loss of staff was a repeated challenge across the program as staff in participating facilities continued to transition to public sector positions due to a perception that the workload in the participating private clinics was considerably higher than at public facilities in the area, while salaries were lower. As a result, gains in quality of care that had been achieved were often lost when a health worker left the facility (Health Partners International 2015).

Authors of evaluations agreed that the level of the provider payment is an important factor in promoting an improvement in quality at the point of care. In all of the cases, the provider payment that is tied to quality results is considered a "subsidy," or a payment above and beyond the cost of inputs required to provide care. This subsidy is intended to promote the provider behaviors that lead to high quality at the point of care or to improvements in utilization. The authors of the Burundi evaluation found that the probability of institutional delivery improved in Rwanda and not in Burundi. They posit that this finding could be explained by the relatively low subsidy for institutional deliveries in Burundi compared with other services, unlike in Rwanda, where the subsidy for institutional deliveries was higher (Bonfrer et al. 2014). Although not related to maternal health, the authors of the China evaluation posit that the incentive payments in the program might not have been large enough to induce behavioral change in the providers dealing with chronic illness management (Yip et al. 2010). Authors of the evaluation in Rwandan hospitals found that subsidies were considered inefficient for the requisite efforts made (Janssen et al. 2014).

Evaluations found that performance-based provider payments are more effective at improving quality at the point of care than improving utilization of certain services. While the central focus of this study is on improvement in quality at the point of care, one might also consider an increase in utilization of key services as a quality improvement. Authors of an evaluation of the Rwanda program suggest that the effect on quality depends not only on the relative payment rates, but also on how hard it is to increase utilization among a facility's catchment population. The services that increased under the Rwandan program were those more in the provider's control and less in the patient's control (Gertler and Vermeersch 2012). Evaluations in Rwanda and Burundi found that the programs did not improve targeting of unmet needs for ANC (Bonfrer et al. 2014, Sherry et al. 2013). Authors of the Burundi evaluation concluded that larger improvements were found in services that required a behavioral change of health care workers when the patient is already in the clinic (Bonfrer et al. 2014). Improvement in utilization was also found to occur unevenly among the population. Authors of an evaluation in Rwanda found that for most services, performance-based provider payments achieved efficiency gains by inciting health care providers to focus on the easier-to-reach patients (the less poor) (Lannes et al. 2015).

4. DISCUSSION

This study identified 17 cases where quality at the point of care for maternal health services is regularly measured, and the results of that measurement affect provider payment. This type of arrangement can be called performance-based financing, results-based financing, value-based purchasing, or other terms. Several recent literature and systematic reviews have sought to build the evidence base for PBF in low- and middle-income countries. This study complements that literature by building evidence of how quality of care measurement links to provider payment to achieve quality improvement goals. It focused on those provider payment systems that incorporate quality of maternal health care measurement. This focus allowed us to delve into the maternal health quality aspects of these programs.

We found that a facility-based quarterly bonus is the most common provider payment mechanism linking quality of care measurement to provider payment, but other types of payment mechanisms were also linked to quality measurement. Most of the cases included in the study were in sub-Saharan Africa and used the quarterly bonus as the payment mechanism. This finding suggests that quarterly bonuses may be the most feasible option for implementation in low-resource settings. Alternatively, this model may have prevailed because close variations of the Rwandan model are rapidly spreading throughout sub-Saharan Africa.

The operational challenges of regular quality measurement are considerable in low-resource settings. In these settings, quality measurement usually involves human resources: a team of people travel to facilities to perform quality assessments using a (paper) checklist, because detailed information on processes of care is generally not reported electronically and requires verification in person. Quality assessment checklists reviewed for this study used mixed methods approaches, and did not always include patient surveys. This is likely because carrying out patient surveys requires additional human resources. The design of the quality measurement arm of a program also needs to mitigate several risks, including that facilities game the quality assessment through day-of preparations or through collusion with evaluators and that facilities avoid more difficult patients.

This study identifies evidence that basing provider payment on quality can change provider behavior in a way that encourages better care delivery. Many evaluations of the cases reviewed suggest that providers responded to the quality-based payment mechanisms by improving their performance on processes of care that are known contributors of high quality. A key conclusion from this study is that provider payment mechanisms linked to quality of care measurement can improve quality at the point of care in low- and middle-income countries.

Similar to other studies on PBF in low- and middle-income countries, this study found evidence that this provider payment mechanism is less effective for improving utilization indicators. Utilization is highly contingent on demand-side behavior (e.g., a patient's care-seeking behavior, a patient's access barriers, etc.). Authors of an evaluation of the Rwanda program found that incentive payments did not increase ANC use because that service has a high marginal cost and low payoff for providers. It takes more work to convince a pregnant woman to come to the clinic for ANC than to give the woman a tetanus shot once she is there (Gertler and Vermeersch 2012), and it might be easier to convince a woman from a higher-income family than a woman from a lower-income family to spend the time and money for another visit. Rather, findings suggest that a quality-based payment mechanism may best be used for encouraging better delivery of care once the patient is already at the facility.

Impact evaluations on the cases reviewed for this study are building evidence for what many maternal health quality advocates already believe: that improved quality at the point of maternal health care leads to better health outcomes. The evaluation of Plan Nacer in Argentina showed how improved ANC was associated with improved birth outcomes; authors observe a significant increase in average birth weight and a reduction of the share of low birth weight babies (Gertler et al. 2014). In Rwanda, PBF was associated with an increase of 0.53 standard deviations in the weight-for-age of children 0–11 months and 0.25 standard deviations in the height-for-age of children 24–49 months (Gertler and Vermeersch 2012).

Improving quality of care is a key part of the agenda for the global health community and for policymakers in low- and middle-income countries. The community is now looking beyond increasing utilization as a sole strategy for improving maternal and child health outcomes and is opting to expand the strategy to encourage quality at the point of care. This study shows that provider payment mechanisms could play a prominent role in such a strategy.

ANNEX A: PROGRAMS IN LOW- AND MIDDLE-INCOME COUNTRIES UNDER WHICH PROVIDER PAYMENT IS LINKED TO QUALITY AT THE POINT OF MATERNAL HEALTH CARE

Program Location	Program Name	Program Sponsors	Program Time Period	1. How is the Provider Payment Designed to Improve Quality, and What is the Payment Mechansism Used?	2. How is Quality Defined, Measured, and Monitored in Relation to the Provider Payment Mechanism?		3. (As Available) Did Provider Behavior Change in Response to the Payment Mechanism? Has the Quality of Care Improved?	4. (As Available) Why and How Did the Financial Incentive Scheme Work (or not) to Achieve Improved Quality Measures?
					What Maternal Health Care Quality Indicators Are Included?	How Are Quality Indicators Measured and Monitored?		
Argentina	Plan Nacer	Argentina Ministry of Health, World Bank	Launched in 2004 in nine provinces in northern Argentina and then expanded to cover the rest of the country beginning in 2007	DESIGN TYPE: FFS-derived deflation factor based on quality • Plan Nacer provides insurance for maternal and child health care to uninsured families. • The program allocates funding to provinces based on enrollment of beneficiaries and on performance on indicators of the use and quality of maternal and child health care services and health outcomes. • The performance payment is divided equally among the ten tracers, with four percentage points assigned to each, totaling up to 40 percent. • If the target is met, the province receives the full 4 percent for that tracer. If it does not meet the target, it receives nothing for that tracer. • Payments to provinces are made every four months. • Provinces then pass these incentives on to health clinics and hospitals by paying them FFS for beneficiary use of maternal and child medical services at a quality indicated by the provision of clinical service. • General guidelines for the use of the additional Plan Nacer resources by providers are set at a national level, and provinces are allowed to impose additional restrictions. However, within these guidelines, resources may be used at the discretion of the provider to improve the quality of health services.	Health targets for provinces are measured using ten specific indicators called tracers. Quality of maternal care could be considered part of the following tracers: 1. Early detection of pregnancy: First prenatal checkup before week 20 of pregnancy 2. Effectiveness of obstetric care: Five-minute APGAR scores of over 6 3. Effectiveness of prenatal care: Birth weight of over 2,500 grams 4. Effectiveness of prenatal care: Mother given VDRL test and tetanus toxoid vaccination prior to delivery 5. Proper cause of death review of infant and maternal deaths 6. Sexual and reproductive health: Mothers receive counseling within 45 days of delivery 7. Inclusion of the indigenous population: Providers with staff trained to provide care to indigenous population	• Performance targets for the province associated with each tracer is set in the annual agreement with the province. • Performance is measured using national statistical sources. • Additionally, the program includes an intensive process for auditing and verifying clinic records to ascertain the validity of payments made to providers.	Gertler et. al. 2014: • The provinces by and large met most but not all of the tracer targets. Except for a few periods, the provinces meet between 70 and 80 percent of the targets and as a result were rewarded with most of the maximum payment possible. • Plan Nacer increased the quality of prenatal care as measured by the probability of receiving a tetanus vaccine during an ANC visit. Improved prenatal care appears to be translated into improved birth outcomes as authors observe a significant increase in average birth weight and a reduction of the share of low birth weight babies. • Plan Nacer appears to have increased quality of deliery care as measured by a reduced probability of birth by cesarean section. • Estimate that being a beneficiary reduces the probability of low birth weight by 19 percent and in-hospital neonatal mortality by 74 percent.	Information not available: Gertler et. al. 2014 did not discuss possible reasons for why the PBF mechanism for provinces translated into changes in provider behavior and quality at the point of care.
Benin	Benin Results Based Financing, Health System Performance Project (*Financement Basé sur les Résultats (FBR) au Bénin, Renforcement de la Performance du Système de Santé*)	General Secretariat of the Benin Ministry of Health; Departmental Health Directorate, World Bank	RBF program launched in 2011 for public sector facilities; 2014 decision to launch program for private sector facilities by 2015	DESIGN TYPE: FFS-derived bonus with deflation factor based on quality • Quantitative outputs with unit fees are reported by hospitals and health centers and verified monthly. • Quality for hospitals, health centers and community health workers (as part of health centers) is assessed quarterly. • Facilities may also be eligible for a geographic-based equity inflation • Quarterly RBF credit = [Quantitative total] * [Quality deflation] * [geographic inflation]	Mix of composite management indicators, infrastructure/technology/equipment indicators, personnel-related indicators, and clinical care processes indicators. See three examples below. For full quality checklist for private sector facilities, refer to: http://www.beninfbr.org/articles/item/117.html *(in French)* For full quality checklist for public sector facilities, refer to: http://www.beninfbr.org/articles/item/85.html *(in French)* Hospital infrastructure/technology/equipment indicator: • Episiotomy material available: At least 2 boxes with episiotomy scissors, anatomical and surgical tweezers, needles, needle holder, and nonabsorbable suture Health center clinical care process indicator: • Delivery referral is adequate: analysis of 5 cases referred for complications: 1) the patient is actually treated in the referral facility; 2) the record of the patient is complete and notes the complication justifying the reference; 3) the patient received a properly filled BEmONC form. •	• Quality assessment occurs quarterly. Public health centers assessed by the District Health Authority and zone controllers, public hospitals assessed by peer review and zone controllers. • Counter-verification of quality assessment occurs semiannually by community-based organizations • Measurement methods include direct observation and reviewing patient records and registers.	Information not available: Impact evaluation on the RBF pilot is currently underway - no results had been published in peer-reviewed journals at time of this literature review.	Information not available: Impact evaluation on the RBF pilot is currently underway - no results have been published in peer-reviewed journals at time of this literature review.

Program Location	Program Name	Program Sponsors	Program Time Period	1. How is the Provider Payment Designed to Improve Quality, and What is the Payment Mechansism Used?	2. How is Quality Defined, Measured, and Monitored in Relation to the Provider Payment Mechanism?		3. (As Available) Did Provider Behavior Change in Response to the Payment Mechanism? Has the Quality of Care Improved?	4. (As Available) Why and How Did the Financial Incentive Scheme Work (or not) to Achieve Improved Quality Measures?
					What Maternal Health Care Quality Indicators Are Included?	**How Are Quality Indicators Measured and Monitored?**		
					Health center clinical care process indicator: • Correct prescription of: 1) iron and folic acid 2) Mebendazole 3) insecticide-treated net 4) Compliance with sulfadoxine pyrimethamine protocol (refer to 10 ANC records)			
Burundi	Performance-based financing / *Financement basé sur la performance*	Government of Burundi, World Bank	Gradual scale up of PBF to national level between 2006 to 2010	DESIGN TYPE: FFS-derived bonus with inflation factor based on quality • Facilities (hospitals and health centers) receive performance related funding which on average makes up 40 percent of the total facility budget. • Monthly, facility receives performance related funding for quantitative (output) indicators. • Quarterly, facility receives a quality bonus ranging from 0 to 25 percent of the quantity-based bonus - i.e. the better a facility performs in terms of quantity, the larger the potential gain through quality-related payments.	Mix of composite facility management indicators, infrastructure/technology/ equipment indicators, personnel-related indicators, and clinical care processes indicators. See three examples below. For the full quality checklist for health centers, refer to http://www.sciencedirect.com/science/article/pii/S0277953614007278. Infrastructure/technology indicator: • Availability of a functional vacuum extractor & nurse trained in its use and vacuum extractor effectively used Personnel-related indicator: • All deliveries performed by skilled personnel (Identification of the obstetricians from names in the register) Clinical care process indicator: • Blood pressure taken during delivery labor (BP taken during labor and noted in partogram – at least once an hour – supervisor verifies 3 partograms)	• Health care facilities report monthly to the MoH about the quantity of incentivized services delivered. • A provincial committee verifies and validates the reported quantities through unannounced visits to facilities. • On a quarterly basis, facilities can receive an additional quality bonus ranging from 0 to 25 percent of the quantity-based payment. • Local regulatory authorities assess the quality every three months on a randomly chosen day using a standardized checklist. Methods include direct observation and reviewing patient records and registers.	Toonen et. al 2009 • **Quality at POC:** Health providers explained that they feel more responsible for the results and more motivated to attain these. • **Quality at POC:** PBF was only implemented in some regions at first, which meant that the workers in PBF areas got twice as much pay; created a shift of workers to the PBF areas when regulation was still weak • **Quality at POC:** Some facilities were more responsive to PBF than others and made larger changes in management; helped with staff retention Bonfrer et. al. 2014 • **Quality at POC:** PBF associated with significant rise in the likelihood of BP measurement and anti-tetanus vaccination as part of the ANC • **Quality at POC & Usage:** PBF improved the utilization and quality of most maternal and child care, mainly among the better off, but did not improve targeting of unmet needs for ANC • **Usage:** The probability of an institutional delivery increased significantly with 4 percentage points among the better off but no effects were found among the poor • **Usage:** PBF significantly increased the probability of institutional delivery for women where PBF was in place from the start of their pregnancy, suggesting that women are encouraged during ANC visits to deliver in the facility	Toonen et. al. 2009 • **Quality at POC:** Better management and governance contributing to higher quality: • Monitoring systems have improved considerably at all facility and district levels. • Governance structures have been put in place to analyze results and hold the service providers accountable for results. • Verification activities and evaluations are undertaken to measure effects on household level. • Instruments have been introduced to make the changes institutional at the facility. Bonfrer et. al. 2014 • **Quality at POC:** Larger improvements found in types of care which require a behavioral change of health care workers when the patient is already in the clinic. • **Usage:** Smaller improvements for services which require effort from the provider to change patients' utilization choices. • **Usage:** Greater effects on institutional deliveries among the better off could indicate that PBF might not improve equity in outcomes as it does not overcome demand side barriers. While in principle fees for delivery care are waived, it is likely that other costs, like transportation, might constrain poor women more to deliver in a facility. • **Usage:** Analysis suggests that PBF needs to be in place at the start of a pregnancy to have an effect on institutional deliveries • • **Usage:** Compare to Rwanda findings (Sherry et. al. 2013): institutional delivery probability improved in Rwanda and not in Burundi; could be explained by the relatively low subsidy for institutional deliveries in Burundi compared to other services, unlike in Rwanda.
Cameroon	Performance based financing (PBF) initiative in Cameroon	Cameroon Ministry of Public Health; World Bank	3 Year PBF Plot in 4 Districts, starting March 2012. 2 Year Impact Evaluation of PBF in 14 Districts starting March 2012.	DESIGN TYPE: FFS-derived bonus with inflation factor based on quality • In intervention districts, facilities receive PBIs, independent monitoring of results, systematic supervision, and managerial autonomy over use of resources and ability to hire and fire staff. • Quantitative outputs with unit fees are reported by the facility monthly • •	Mix of facility management indicators, infrastructure/technology/equipment indicators, personnel-related indicators and clinical care process indicators. See three examples below. For full quality checklist for public sector health centers, refer to: http://www.fbrcameroun.org/articles/item/4.html Hospital infrastructure/technology/equipment indicator:	• For health centers, a quality assessment with a pre-conceived and validated checklist performed by the District Medical Team with the support of the Fund Holder Agency (AEDES/IRESCO) quarterly. • For District Hospitals and assimilated Hospitals, peer- assessment will be carried out. • •	Information not available: Impact evaluation is currently underway - no results had been published in peer-reviewed journals at time of this literature review.	Information not available: Impact evaluation is currently underway - no results had been published in peer-reviewed journals at time of this literature review.

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				• Facility must exceed a minimum threshold of quality for each type of output indicator to be eligible for PBI payment on that indicator. • Facility can also receive a quality bonus. Total potential bonus pool is 30% of the quantitative outputs PBI total. Facility quality score is applied to the potential 30% pool to determine the bonus. • Quality bonus = [PBI total from quantitative outputs] * 30% * [Quality score percentage]	• Enough water and soap in the delivery room / Flowing water or at least 20 liters of water in a container Hospital infrastructure/technology/equipment indicator: • Availability of Partogram forms (at least 10) • Health center clinical care process indicator: • Systematic APGAR score assessment during delivery (filled in the partogram in the 1st, 5th and 10th minutes: the evaluator verifies 3 partograms)	• Measurement methods include direct observation and reviewing patient records and registers.		
China	"Separation of revenue and charges" or "separating revenue and expenditure" for community health centers and Rural Mutual Health Care village clinics	Chinese Ministry of Health	Piloted in Changning and Songjiang districts of Shanghai in 2005, applied to all districts by 2007	DESIGN TYPE: Pay-out of withheld funding based on quality (quasi deflation factor)• "Separation of revenue and charges" intends to disconnect the revenue of primary health facilities from their service revenue. • All revenues generated from user charges are submitted to the government, which in return provides a fixed budget to cover volume-adjusted operating expenses.• District health bureau allocates funds to each community health center on the basis of the population served by the center and its social insurance expenditures in the previous year.• Every center receives a share (50–70%) of its budget at the beginning of the year. • Part or all of the withheld portion is disbursed on the basis of a year-end assessment by the district health bureau of performances in cost control, volume of services, delivery of preventive and primary care, and patient satisfaction.	Performance indicators include mix of volume of services, content of care, and patient satisfaction. Quality of maternal services is included only as part of quality measures of general services. See three examples below:Chronic disease management - Hypertension (general population including pregnant women)• Severe (systolic blood pressure ≥180 mm Hg, diastolic blood pressure ≥110 mm Hg): check blood pressure and visit patient in clinic or at home every month, check body- mass index every 3 months. Patients are recommended to have routine tests for blood, urine, renal function, and fasting plasma glucose, and electrocardiogram; and lipid profile checked, and fundus examination once a year.Health education• Lectures and briefings, especially to the target population, such as women of child-bearing age, pregnant women, elderly people.Public and patient satisfaction• Content of satisfaction surveys include convenience such as waiting time, ease of appointment procedure, physicians' attitudes and explanation of problems, satisfaction with cost of services, and cleanliness of facilities.	• Performance is measured through a year-end assessment by the district health bureau.• Public and patient satisfaction measured through surveys done with the general population in the service area of the community health center, patients, and employees of the social insurance program.	Yip et. al. 2010 (reported on changes in performance for chronic care indicators only): • Performance in management of patients with chronic disease varied between the pilot districts.• Rates of follow-up for patients with hypertension and diabetes mellitus increased in Changning up to 2007. However, the rate of control of diabetes mellitus was low (no data were available for hypertension control rate). • In Songjiang, rates of follow-up and control in patients with hypertension were low compared with Changning and Zhabei, and they did not improve during the study."Separation of revenue and expenditure" impact studies are scarce partly because of relatively recent implementation, but it appears likely to have had positive impacts on medical costs, health workers' behavior, health care utilization, and public satisfaction.	Yip et. al. 2010:• Unclear whether study design contributed to the finding that rates of follow-up and control in patients with hypertension fell in Zhabei. Some possible reasons include: • A large number of patients with hypertension and diabetes mellitus may have been identified for management as the community health centers did more health examinations• Lag times in re-organization of staff to cope with the increased workload; the conditions of the newly identified patients with hypertension or diabetes mellitus were not serious and the patients did not comply with the advice for follow-up• Perhaps, the emphasis on management of chronic disease with pay for performance might not be big enough to induce behavioral change in the providers
India	Improving Maternal and Child Health in India: Evaluating Demand and Supply Side Strategies (randomized controlled experiment)	International Initiative for Impact Evaluation (3IE), DFID-India and the World Bank	Roll out of experimental intervention of incentives to private obstetric care providers in Karnataka started in February 2013	• DESIGN TYPE: One-time bonus based on quality of inputs • Private obstetric care providers in rural Karnataka, India randomized into 3 intervention groups. • Arm 1: providers offered a contract that provides financial rewards based on the incidence of four adverse maternal and neonatal health outcomes among their patients • Arm 2: providers offered a contract that provides financial rewards based on quality of healthcare inputs provided to their patients (i.e. "input quality"). For each domain of care the reward payment is structured as an increasing linear function of the quality level achieved in the provider's patient population, starting at a minimum threshold performance level %. Each provider's total reward payment is the sum of rewards earned for their performance in each of the five domains of	Arm 2: Input Quality • Input quality is measured separately in the five domains: Pregnancy Care, Childbirth Care, Postnatal Maternal Care, Newborn Care, and Postnatal Newborn Care • Detailed information on quality indicators was not available at the time of this study.	Arm 2: Input Quality • Pre-intervention average rates for each of the five domains of care were determined using existing data from government surveys and calibrated through piloting with doctors in Karnataka and Delhi to ensure that they were locally appropriate. • Input quality measured through household surveys of patients who come to her for care over the following year. • To minimize the likelihood that providers selectively refuse high-risk patients, the contract contains a clause that if evidence of refusal to provide care is detected in the local population, the contract will be voided and the provider will be ineligible for the reward payment.	Information not available: Impact evaluation is currently underway - no results had been published in peer-reviewed journals at time of this literature review.	Information not available: Impact evaluation is currently underway - no results had been published in peer-reviewed journals at time of this literature review.

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				care. At the end of the year, providers receive a one-time reward payment based on their performance in the five domains of care. • Arm 3: providers offered a contract to participate in the study, but no incentive payments.				
Kyrgyz Republic	Health and Social Protection Project - RBF pilot for hospitals	World Bank	Pilot funding received in 2012; 3 year pilot	DESIGN TYPE: Modified DRG payments levels based on quality Few details about the pilot design was available at the time of this study. However, based on grey literature the pilot appears to have the following design elements: • The intervention group in the pilot design will receive PBF on the existing diagnosis-related group (DRG) system at rayon hospitals. • Payments modified per a factor determined by a quality assessment done using the Balanced Score Card Approach. • Hospital directors have autonomy over use of performance based payments	Hospital Quality Balanced Score Card: a list of 29 composite indicators to capture both structural dimensions and clinical processes in quality of care Structural dimension: • hospital management; • QA activities; • availability of drugs equipment, medical supplies, blood products; hygiene/cleanliness; • etc. Clinical processes: • criterion-based clinical audit for (i) normal and complicated deliveries (ii) normal & complicated neonatal care • (Example – Normal delivery: oxytocin within 1 minute of delivery, controlled cord traction, blood loss recorded, uterine massage)	Quarterly peer review using Balanced Score Card • Peer review teams: • senior clinicians, chief nurse, and chief accountant from each of two rayon hospitals peer evaluate a third hospital • Rotating to reduce collusions • Observers: Mandatory Health Insurance Fund officials, Ministry of Health officials, development partners • Mandatory participation of rayon hospitals in peer evaluation: part of the hospital performance	Information not available: Impact evaluation is currently underway - no results had been published in peer-reviewed journals at time of this literature review.	Information not available: Impact evaluation is currently underway - no results had been published in peer-reviewed journals at time of this literature review.
Malawi	RBF4MNH Initiative	Malawi Ministry of Health, Government of Norway, Government of Germany	2011-2014	DESIGN TYPE: FFS-derived bonus based primarily on output measures related to quality at the point of care • Quarterly performance based incentives paid to BEmONC and CEmONC facilities for a total of 18 output indicators, of varying weights, that are designed to explicitly include a component of quality at the point of care	Most of the 18 output indicators are designed to explicitly incentivize quality at the point of care. Three of the indicators specific to maternal health are listed below: Output indicators designed to explicitly include a component of quality at the point of care: • On the day of the verification visit, percentage of broken maternity equipment which have been reported in writing to the district health office (DHO and/or Maintenance Supervisor) within 72 hours after damage or dysfunction occurred. • Percentage of women who deliver in the facility showed signs of pre-eclampsia or eclampsia who received methyldopa to control pre-eclampsia and Magnesium Sulphate to control eclampsia • Percentage of women who deliver in the facility and who receive uterotonic in third stage of labour during the reporting period	Quarterly verification of output indicators that include quality elements at the point of care	Information not available at the time of data collection	Information not available at the time of data collection

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Nigeria	Nigerian State Health Investment Project (NSHIP)	Nigeria Ministry of Health; Ondo, Nasarawa and Adamawa State Ministries of Health; World Bank	Pilots occurred in 2011; scale up to three states in 2014	DESIGN TYPE: FFS-derived bonus with inflation factor based on quality • Quantitative outputs with unit fees are reported by hospitals and health centers and verified monthly. • Quality for hospitals and health centers is assessed quarterly. • Facilities may also be eligible for a geographic-based equity inflation. • One subsidy payment is made quarterly, which is the sum of the quantitative outputs plus the quality bonus of up to 25% of the quantitative output earnings. • If quality score for that quarter is 100%, receive full 25% • If quality score is 49% or less, the quality bonus is automatically 0. Between 50% and 100% is prorated. • Facilities may receive penalties on future PBF subsidies if fraud is detected.	Health center and hospital quality assessments include a mix of facility management indicators, infrastructure/technology/ equipment indicators, personnel-related indicators and clinical care process indicators. See two examples from the health center checklist and one example from the hospital checklist below. For the full quality checklist and scoring methodology for health centers and general hospitals, refer to: https://nphcda.thenewtechs.com/cside/contents/docs/PBF_User_Manual-_2014.pdf Health Center: Infrastructure/technology/ equipment indicator: • Sufficient water with antiseptic soap and liquid antiseptic in delivery room: A functioning water source or at the least 20L Health Center: Clinical care process indicator: • Availability and use of the Partographs: At the least 10 forms available for use, and verify three randomly selected Partographs to determine whether filled according to the norms Hospital: Content of care indicator: • In-patient Care Gyn/Obs ward: systematic random sample of 5 patient files from discharged patients who have delivered from the delivery register from the last quarter, includes: Justification of clinical diagnosis and elaborate description of obstetrical proceedings (including post-partum hemorrhage; pre-eclampsia; premature birth etc.). Compliance with MSF 'obstetric guidelines'.	• For health centers, a quality checklist is applied by the local government health authority once per quarter to each contracted facility • For general hospitals, quality is measured through a peer-evaluation mechanism. Key technical and administrative staff from other hospitals, with representatives from the State Ministry of Health, State Primary Health Care Development Agency and civil society, will peer-evaluate each other's performance. • Measurement methods include direct observation and reviewing patient records and registers.	Information not available: Impact evaluation is currently underway - no results had been published in peer-reviewed journals at time of this literature review.	Information not available: Impact evaluation is currently underway - no results had been published in peer-reviewed journals at time of this literature review.

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Rwanda	Rwanda national P4P scheme for primary health centers	Rwanda Ministry of Health, World Bank	National scale up starting in 2005	DESIGN TYPE: FFS-derived bonus with deflation factor based on quality • Primary health center is eligible for a quarterly P4P payment that is reduced by the facility's quarterly quality score • Quarterly P4P payment based on total units delivered for 14 pre-defined outputs; each unit has an assigned monetary amount • Facility receives a quality score between 0 and 1 every quarter based on an index of structural and process-related measures of care; quarterly P4P payment is reduced by the facility's quality index if the score is less than 1	The quality index is calculated using a mix of facility management indicators, infrastructure/technology/equipment indicators, personnel-related indicators and clinical care process indicators. See three examples below.For the full quality checklist and scoring methodology, refer to: http://siteresources.worldbank.org/EXTPBFTOOLKIT/Resources/7364043-1386179789832/090227_QuartQualSupChecklist_EN.pdf Infrasture/technology/equipment indicator: • Available and functional equipment and supplies: 1) consultation table 2) blood pressure cuff 3) stethoscope 4) tape measure 5) scale with height gauge 6) fetoscope 7) unused and non-torn surgical gloves [all materials must be available and functional, otherwise score 0]Personnel-related indicator: • Prenatal consultation done by qualified staff (qualification: at least a nurse A2) [verified through direct observation]Clinical care process indicator:• Group IEC/BCC: 1) group discussion prior to prenatal consultation 2) existence of up-to-date IEC report notebook with: a) topic b) number of participants c) activity leader d) date and e) signature [verified through direct observation]	• District hospitals monitor the quality of facilities in their district. • Facility is visited by a district hospital team on an unannounced, randomly chosen day. • Team assesses facility's quality through direct observation and a review of patients' records with a standardized assessment method.• At the end of the visit, the team discusses their findings with the facility's personnel and provides recommendations to improve quality • The structural quality indices are the share of drugs and equipment available at the facility among those that the Ministry of Health guidelines define as necessary in order to deliver each type of care. Process measures capture the clinical content of care provided for the listed service per standard treatment guidelines published by the Ministry of Health (Ministère de la Santé du Rwanda 1993, 1997, 2003 and 2009) (Gertler and Vermeersch 2012)	Gertler and Vermeersch 2012: • **Quality at POC:** More provider efficiency because the incentives reduced the gap between provider knowledge and actual practice of the appropriate clinical procedures by approximately 20 percent. • **Quality at POC & Usage & Health Outcomes:** Better health outcomes: P4P led to an increase of 0.53 standard- deviations in the weight-for-age of children 0-11 months and 0.25 standard deviations in the height-for-age of children 24-49 months.Basinga et. al. 2011. • **Quality at POC:** P4P associated with an increase of 0·157 standard deviations (95% CI 0·026–0·289) in prenatal quality (i.e. compliance with Rwandan prenatal care clinical practice guidelines; measured through patient exit interviews and household surveys performed for the impact evaluation)Lannes et. al. 2015. • **Usage:** For institutional deliveries, PBF favored those who did not have a financial barrier to access the service (the wealthier women and poorer women who have health insurance)Sherry et. al. 2013. • **Usage:** PBF had significant increase in the proportion of women delivering in facilities but no impact on antenatal care utilization, child vaccinations and contraceptive use.	Gertler and Vermeersch 2012: • **Quality at POC:** There is evidence of complementarity between the P4P incentive and the knowledge (skill) of health care providers. Suggests that effects of P4P incentives would be higher if completed with interventions that improve provider skill, such as training. • **Quality at POC & Usage & Health Outcomes:** Performance incentives significantly increased the use and quality of prenatal and postnatal medical services, and that these effects translated into large and significant improvements in child health outcomes. • **Quality at POC & Usage:** The effect of the introduction of the P4P payments depends not only on the relative payment rates, but also on how hard it is to increase the levels of services. The services that increased were those with higher prices as well as more in the provider's control and less in the patient's control. • **Quality at POC & Usage:** E.g. P4P did not increase prenatal care usage because it has a high marginal cost and low payoff for providers. It takes more work to convince a pregnant woman to come to the clinic for prenatal care than to give the woman a tetanus shot once she is there.Lannes et. al. 2015. • **Usage:** For most services, PBF achieved efficiency gains by inciting healthcare providers to focus on the easier to reach (the less poor). Equity remains an issue. • **Usage:** As health insurance removes demand side barriers to health services and PBF improves the supply, results show improved usage of institutional deliveries among the poor (for which the cost of services is a major barrier to care)
Rwanda	Rwanda national PBF scheme for district hospitals	Rwanda Ministry of Health	Four hospitals in 2006, national scale up after 2008	DESIGN TYPE: Global prospective budget-derived bonus with inflation factor based on quality • PBF scheme provided district hospitals additional funds beyond their normal input-based financing • Each hospital receives a unique global prospective PBF budget based on management inputs and expected volume of services • PBF can be earned based on a quarterly assessment by peer-evaluation teams from other hospitals and supported by technical coaches of the MoH coordination unit for PBF • The assessment looked at quality indicators under three categories: hospital management, support to health centers and quantity and quality indicators for clinical services provided • The hospital receives one collective subsidy at the end of each quarter	Maternal health care quality could be affected by general indicators from all three categories (hospital management indicators, support to health centers indicators, and quantity and quality of clinical services indicators). See examples below: • Hospital management indicator of drugs, consumables and vaccines • Service: Referral consultations for pregnant women. Criteria included complete standard medical record including content of care indicators; referral form; counter-referral form signed by both the hospital and health center For more examples of specific indicators, see Janssen et. al. 2014	• PBF based on a quarterly assessment by peer-evaluation teams from other hospitals and supported by technical coaches of the MoH coordination unit for PBF • Evaluation grid: Where a service is evaluated on the basis of multiple criteria, non-compliance with one criterion leads to non-validation for that service. All validated services are scored and points are assigned for each indicator. The total number of points equals the number of validated services multiplied by the index (weight) assigned to each indicator by the Ministry of Health. • The evaluated hospital initiates the process with a self-assessment, using the evaluation grid for the three components. The next step is peer evaluation. Peer evaluators included a	Janssen et. al. 2014: • **Quality at POC:** PBF induced a behavioral change in the studied sites by: a) introducing mechanisms to take initiatives resulting in better performance (appropriate archiving, additional staff recruitment, improved welcoming conditions for patients); and/or b) or developing new services (e.g. installation of a dental surgery, physiotherapy services) • **Quality at POC:** Continuity of care for patients improved, with better interactions between all levels of care through improved referral and counter referral mechanisms	Janssen et. al. 2014: • **Quality at POC:** Hospitals were able to achieve high quality scores quickly; the evaluation grid was revised in 2008 and 2010 in order to make the evaluation criteria more specific, precise and measurable and allowed for adaptation to changing needs observed at hospitals • **Quality at POC:** PBF helped to clarify the responsibilities and roles of all parties involved in the production, monitoring and evaluation of health services • **Quality at POC**: Some operational challenges were reported: • Hospitals and evaluators had difficulty understanding some indicators and their composite criteria. An operations manual was not available and peers had to rely heavily on central level staff technical assistance.

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						hospital director, administrator, head of nursing and chief HC supervisor from another hospital. Peer evaluators gave immediate feedback. Self-assessment was compared with peer evaluation. Each evaluation ended with a summary of observations and recommendations for each component, signed by the peer-evaluator's team leader and the hospital director. • Clinical activities verified through random patient sampling		• Gathering of information and uniform interpretation of data was difficult due to the non-standardization of medical files and forms in the hospitals • The evaluation tool was initially too complex • Subsidies were considered inefficient for the requisite efforts made • Activities that were not included in PBF evaluation were relatively neglected by health staff
Senegal	Senegal Results Based Financing	Senegal Ministry of Health and Social Action Pilot: USAID, KFW Scale up: World Bank	Pilot in 2 regions 2012 - 2014, scale up to 4 additional regions in 2015	DESIGN TYPE: Bonus for achievement of quantity targets with deflation factor based on quality • Health centers and health posts receive PBI if quarterly and annual targets for output indicators are met • Targets are based on the individual facility's previous year's performance • Facility PBI payment deflated by the facility's quarterly quality score based on a checklist	The quality checklist for health centers and health posts includes a mix of infrastructure/technology/equipment indicators and clinical care process indicators. Three maternal health indicators are listed below. Infrastructure indicator: • Delivery Room in good condition and ensures privacy: 1) solid walls without cracks with oil paint or wall tiles up to height of about 1.80m 2) tiled floors 3) room not visible from the outside (or from other compartments if partitioned room) Clinical care indicator: • Correct use of the partograph (check 10 randomly selected deliveries in the register) 1) the partograph was completed correctly and includes: information identifying the parturient, the heartbeat of the fetus, the color of amniotic fluid, the presentation of the fetus contraction modes, drugs given, cervical dilatation 2) the partograph was used properly (recommended measures are in line with standards) Clinical care process indicator: • Appropriate delivery referrals - analysis of 5 referred complications cases 1) the record of the patient is filled out comprehensively (notably the complication justifying the reference) 2) the patient received a properly filled reference form	Quality checklist performed for each facility by assessment team once per quarter using a combination of direct observation and review of patient records.	El-Khoury et. al. 2015: • Gradual improvement in the facilities' quality scores over the course of the pilot • Many facilities met their target for incentivized indicators related to maternal health. In Q4 2013, • 42% of facilities met target for postnatal care attendance • 7% met target for skilled birth attendance • World Bank is currently undertaking a randomized controlled trial impact evaluation. Results of the impact evaluation not yet available.	El-Khoury et. al. 2015: • Strengthened leadership role for the health post chief • Improved communication and better division of labor among facility staff • Increased involvement of community health workers • More transparent financial management of the facility • Better monitoring of drugs stocks and procurement • Better recording and monitoring of the services provided • Marked improvements in working conditions (hygiene, infrastructure, equipment) • Better quality of services
Sierra Leone	Reproductive and Child Health Project - PBF for peripheral health units	Sierra Leone Ministry of Health and Sanitation, World Bank	Launched in April 2011	DESIGN TYPE: FFS-derived bonus with deflation factor based on quality Sierra Leone has chosen to implement a "light-PBF", with a limited set of indicators and a highly simplified quality component. • Quantitative outputs with unit fees are reported by hospitals and health centers and verified quarterly. • Quality of peripheral health units is assessed quarterly. • The quantity of each service is adjusted to clinical quality factor scaled from 0-1.	There are no maternal health-specific care quality indicators in the quality assessment. The cross cutting criteria are: 1. Recording of staff attendance. 2. Timely submission of DHIS, attendance and PBF reports. 3. A functioning Health Management Committee. 4. Display of up-to-date performance information at the facility. 5. All paperwork kept in good order at the facility. 6. Maintenance of appropriate standards of	• Quarterly quality assessment is carried out through "internal verifiers" made up of District health management teams and Council officials • A retrospective external evaluation of the PBF system in 2014 noted some issues with the application of the quality assessment, suggesting that quality of care measurement was not well-implemented in this program: • Standard criteria were not applied during quarterly quality assessments	Information not available: Impact evaluation is currently underway - no results had been published in peer-reviewed journals at time of data collection.	Information not available: Impact evaluation is currently underway - no results had been published in peer-reviewed journals at time of data collection.

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					What Maternal Health Care Quality Indicators Are Included?	How Are Quality Indicators Measured and Monitored?		
				• A general cross cutting quality score is applied to the quarterly payment. • PBF funds are divided between incentives for staff and investment or operational costs for the facility	cleanliness. 7. Appropriate procedures for medical waste management in place and being observed. 8. Maintenance of up-to-date and accurate drugs records. 9. No stock-out of essential drugs for the three childhood diseases with highest mortality.	across all participating facilities • Quality scores awarded during quarterly quality assessments were higher than scores that would have been awarded using standardized criteria from the external evaluation. • The external evaluation of the PBF system in 2014 recommended that the quality of internal verification has to improve: uniform case definitions have to be applied, and district health management team members involved should understand their tasks well.		
Tanzania	Tanzania Results Based Financing system	Tanzania Ministry of Health and Social Welfare, World Bank	Pilot launch likely 2015, national phased roll out across the country's 25 regions likely 2016	DESIGN TYPE: FFS-derived bonus with deflation factor based on quality • Hospitals, health centers and health dispensaries eligible for a quarterly P4P payment that is reduced by the facility's quarterly quality score • Quarterly P4P payment based on total units delivered for 17 pre-defined outputs; each unit has an assigned monetary amount • Facility receives a quality score between 0 and 100% every quarter; quarterly P4P payment is reduced by the facility's quality index if the score is less than 100% • Facilities subject to a maximum PBF payment each quarter. Rural and hard-to-reach facilities will have a slightly higher ceiling for the maximum RBF payment • Payments will also be made to Community Health Workers on a fee-for-service basis, however there was no quality measurement mechanism envisioned at the time of this study.	The quality assessment for dispensaries, health centers and hospitals includes a mix of infrastructure/technology/equipment indicators and clinical care process indicators. Three maternal health indicators are listed below. The patient survey questionnaire includes questions to measure patient care, communication, and out of pocket payments. One of the questions is listed below. Health dispensary assessment ANC indicators: • Analyze RCH card number 4 of 5 women present. I. Confirm that following have been noted for first visit: (5 Pts) 1) Height of the mother in CMs, 2) Gravida and Parity, 3) LNMP and EDD, 4) Filling of the danger signs (vidokezo vya hatari), 5) HIV Check ☐ PMTCT; II. Confirm that following have been noted for all visits: (5 Pts) 1) Hemoglobin, 2) VDRL/RPR, 3) Blood pressure checks, 4) IPT for malaria (If pregnancy <20 wks), 5) Tetanus vaccine administered accordingly, 6) Fetal heart rate/lie/presentation, 7) Ferrous sulphate/Folic acid Health centers and hospitals assessment obstetric emergencies indicator: • Emergency Drugs Availability: 1) Magnesium Sulphate, 2) Nifedipine/ Hydralazine Health centers and hospitals kangaroo mother care indicator: • Implementation of kangaroo mother care: Availability of: 1) Room for Kangaroo care with heater [in areas with cold weather], 2) Table with special weighing scale for premature 3) Sunflower oil, 4) Vital signs tray, 5) Observation charts, 6) Wall clock, 7) Graduated feeding cups Patient survey indicator: • When being attended to, were the medical staffs taking time to listen to you carefully? Y/N	• Community health management teams perform assessment of health dispensaries, health centers and hospitals carried out quarterly using a quality assessment tool and using direct observation methods and random sample of cases from registers • Separate assessment tool developed for health dispensaries versus health centers and hospitals. • Additionally, assessors will conduct patient tracing as part of the quarterly quality assessment • Patient satisfaction survey as a part of internal verification will be conducted by a dedicated local NGO contracted by the internal verifier as a part and parcel of quality check list. The survey will have two parts: patient tracing and patient satisfaction part.	Information not available at the time of data collection	Information not available at the time of data collection

Program Location	Program Name	Program Sponsors	Program Time Period	1. How is the Provider Payment Designed to Improve Quality, and What is the Payment Mechansism Used?	2. How is Quality Defined, Measured, and Monitored in Relation to the Provider Payment Mechanism?		3. (As Available) Did Provider Behavior Change in Response to the Payment Mechanism? Has the Quality of Care Improved?	4. (As Available) Why and How Did the Financial Incentive Scheme Work (or not) to Achieve Improved Quality Measures?
					What Maternal Health Care Quality Indicators Are Included?	How Are Quality Indicators Measured and Monitored?		
Uganda	Northern Uganda Health Programme	UK aid	2011 - 2015	DESIGN TYPE: FFS-derived bonus with deflation factor based on quality • RBF pilot which included 21 eligible Private-Not-For-Profit facilities (PNFPs) in the Acholi sub-region of Northern Uganda and control facilities • Participating private not for profit facilities eligible for a PBF payment quarterly based on quantity of 16 services delivered • Some of the 16 services have quality element embedded (e.g. First ANC visit before 4 months pregnancy and completed 4+ visits) and some were strictly service-based (e.g. caesarean section conducted) • Total PBF payment is a sum of a separate calculation for each of the 16 services. PBI for each service delivered per patient includes a portion that is reimbursed regardless of quality plus a portion that is deflated by the facility's quality score.	11 health areas underwent qualitative assessment on a quarterly basis with checklists for each level of facility. Maternal health covered in 2 of the 11 areas in antenatal care (ANC) and delivery. The detailed qualitative assessment tool was not available in the public domain at the time of this study. The following information was reported in Health Partners International 2015. Antenatal care quality elements assessed: • Antenatal care with defined quality parameters – starting before 16 weeks, 4+ visits, including provision of tetanus vaccination and malaria prevention, with appropriate measures for the prevention of mother-to-child transmission (PMTCT) of HIV. Delivery quality elements assessed: • Delivery in the health facility – using a partograph, with emergency obstetric care provided as needed, early breastfeeding, appropriate postnatal care. Cross-cutting quality elements assessed: • A range of cross-cutting areas to reflect general quality of care including hygiene, privacy and record-keeping	On a quarterly basis, district health teams and Northern Uganda Health program managers visit each facility to perform a data quality assessement and a quarterly quality assessment Methods included: • checklist • reviewing physical facility records • patient exit interviews • health worker interviews • clinical observations • Direct Client Verification (sample of clients from each health facility were contacted by mobile phone to verify service delivered and satisfaction with service)	Health Partners International 2015: • Monitoring progress in labor using a partograph was uncommon at baseline but improved substantially over time in both RBF and control group, and more so in the RBF group • Greater long term infrastructure and equipment investment • Some facility staff noted a number of such non-financial changes which helped to improve their work experience and provide a greater sense of job satisfaction and job security (e.g. receiving their appointment letters on time and being praised publically by the management team, having the equipment and resources they needed to provide quality services and being able to take lunch and tea breaks) • Quality scores were higher in the RBF facilities than in control facilities • A child in the RBF region was three times more likely to be treated correctly for malaria than a child in the IBF region; almost seven times more likely to be treated correctly for pneumonia; and over eight times more likely to be treated correctly for diarrhea • There were no statistically significant differences of improvement in quality of care for more complex procedures, such as the use of a partograph in either simple or complicated deliveries	Health Partners International 2015: • Incentives were seen to have the most positive results in facilities which had more transparent communications between management and clinical staff; where a staff incentive was anticipated but not provided, staff demotivation, and in some cases boycotts, were observed • A move to wider RBF programming should include support to the facility planning, beyond the initial annual business plan • Despite the improvement in the number of appropriately skilled staff in place, the loss of staff was a repeated challenge across the program. Existing staff often complained that the workload in the PNFPs was considerably higher than at public facilities, while salaries were lower – this was reflected in a transition of staff from private to public sector positions. As a result, gains in quality of care which had been achieved, were often lost • Insight into why improvement in quality of care for the more complex procedures may come with an independent assessment due to be undertaken by Liverpool School of Tropical Medicine
Zambia	Zambia Results Based Financing Scheme	Zambia Ministry of Health, World Bank	Two-year pilot March 2012 -- September 2014	DESIGN TYPE: FFS-derived bonus with inflation factor based on quality • Quantitative outputs with unit fees are reported by district hospitals and rural health centers and verified monthly. • Quality for health centers and hospitals is assessed quarterly. • Quarterly RBF payment = [Quantitative total] + [Quantitative total * Quality score] • Individual staff also assessed on quality, which informs their individual motivation bonus. Bonus = [Staff salary index] * [Total amount available for staff performance incentives at the facility] * [Individual Evaluation quality deflation] • Individual staff bonuses are based on the employees' individual staff's salary and the percentage score from an individual performance evaluation • Pilot also seeks to measure the effect of external evaluation on data quality. Facilities are assigned to either 100%, 30%, or 10% likelihood of audit.	The quality checklist for health centers includes a mix of facility management indicators, infrastructure/technology/ equipment indicators, personnel-related indicators and clinical care process indicators. Three maternal health indicators are listed below. To view the full quality checklist and scoring methodology, refer to http://siteresources.worldbank.org/EXTPBFTOOLKIT/Resources/7364043-1386179789832/100929_HC_Quality_tool_ZM.pdf ANC visit indicator: • (Review 5 cases from patient records and directly observe 2 patients) Obstetric examination: 1) Height of uterus 2) Presentation (from 36 weeks) 3) Fetal heartbeat (from 20 weeks) Delivery room indicator: • Privacy: Curtains or painted windows, room divider (if shared room), doors that close, running water (tap or bucket with tap), 3 buckets for Infection prevention, labeled Delivery room indicator: • Analysis of 10 randomly selected partograms: 1) Partogram filled out according to the rules 2) Decision made/documented if alert line is passed within one hour 3) Delivery by qualified	• Quarterly quality audit conducted by a Hospital contracted by the District Medical Office. • District Medical Office also receives PBF with a quality checklist to ensure adherence to responsibilities. • The health center assessment is conducted unexpectedly without notifying the health center team. • Methods of the health center quality audit include direct observation and gathering of documentation. • Individual staff evaluated quarterly based on Individual Evaluation Form for Health Facility Staff	Friedman et. al. 2016: • Health workers in facilities with the new payment mechanism spent significantly more time during consultations with their patients as compared to conrol health facilities. • Timing of the first ANC visit was earlier by two weeks under the new payment mechanism as compared to control groups • Number of deliveries by skilled providers improved in facilities that received additional funding and facilities that used the new payment mechanism, relative to the control group that received no additional funding. • Quality of the delivery room was higher in districts with the new payment mechanism • Women residing in districts with the new payment mechanism were significantly more likely to list several out of the 12 danger signs during pregnancy. • Districts that received more funds but not using the new payment mechanism witnessed better improvements in blood tests and any iron taken during ANC as well as higher immediate initiation of breastfeeding and receipt of Vitamin A after delivery as compared to both the new payment mechanism and control districts.	Friedman et. al. 2016: • The new payment mechanism contributed to some important health gains over business as usual, but several of the gains were also achieved in the districts that received enhanced financing arm. • However, the payment mechanism positively impacted on some aspects of health systems governance and health worker satisfaction which were not observed in the enhanced financing arm: • Frequent monitoring of results provided a powerful coordinating mechanism for rural health workers. • Purchasing mechanisms were enhanced through the new payment mechanism. Examples of these mechanisms include active purchasing, internal and external verification, regular supervision, and managerial autonomy. • The new payment mechanism was implemented in a health system that already had relatively high coverage in some of the key MCH indicators. As such, it may have been more prudent to have adopted to adopted a target or coverage based performance incentive framework rather than fee-for-service, or to adopt flexible fee-based weights that could be modified to changing health system priorities.

Program Location	Program Name	Program Sponsors	Program Time Period	1. How is the Provider Payment Designed to Improve Quality, and What is the Payment Mechansism Used?	2. How is Quality Defined, Measured, and Monitored in Relation to the Provider Payment Mechanism?		3. (As Available) Did Provider Behavior Change in Response to the Payment Mechanism? Has the Quality of Care Improved?	4. (As Available) Why and How Did the Financial Incentive Scheme Work (or not) to Achieve Improved Quality Measures?
					What Maternal Health Care Quality Indicators Are Included?	How Are Quality Indicators Measured and Monitored?		
					staff (at least a nurse, midwife, Clinical Officer, doctor) Individual staff evaluated quarterly in areas: conscientiousness, team spirit, technical skills and adaptability, personal development, and participation in the results and performance of the quarter. To view the Individual Evaluation Form for Health Facility Staff, refer to http://www.rbfzambia.gov.zm/cside/contents/docs/Zambia_RBF_Project_Implementation_Manual_(PIM).pdf			
Zimbabwe	Zimbabwe Health Results Based Financing	Zimbabwe Ministry of Health and Child Care, World Bank	Pilot launched in 16 rural districts in 2012	DESIGN TYPE: FFS-derived bonus with deflation factor based on quality • Quantitative outputs with unit fees are reported by district hospitals and rural health centers and verified monthly. • Quality for health centers and hospitals is assessed quarterly. • Facilities may also be eligible for a geographic-based equity inflation • Quarterly RBF payment = [Quantitative total] * [Quality deflation] * [geographic inflation]	• Study authors did not identify a published version of the quality assessment tool in the public domain. Only summary information was available in reviewed sources. • A quality assessment tool is used to assess the quality of services provided by the rural health centers and the district hospitals The tool has a broad variety of indicators such as cleanliness, quality of recordkeeping, availability of staff and supplies etc.	• Quarterly quality assessment carried out by District Health Executives (DHEs) for rural health centers, and Provincial Health Executives (PHEs) for district hospitals. The DHEs and PHEs receive a performance-based grant that is conditional on delivering certain pre-agreed supervisory services. • Community-based organizations and NGOs will conduct patient satisfaction surveys, and patient satisfaction will be included as a criterion for the quality score. • User fees abolished at participating facilities to improve demand-side access to services. Community surveys ensure user fees are not being collected for incentivized services during implementation of the program.	Friedman et. al. 2015: Summary results from impact evaluation find improvement in RBF districts for select targeted indicators: • A 13 percentage point increase in the in-facility delivery rate due to the Zimbabwe RBF • A 12 percentage point increase in post-natal care coverage • A significant increase in the rate of pregnant women receiving a full package of ANC services including urine and blood tests and tetanus shots. However not all indicators show relative improvement in RBF districts during the pilot (both indicators where baseline coverage levels were already quite high): • No increase in ANC service coverage • Small gain in use of modern contraceptives	Friedman et. al. 2015: • Qualitative research conducted in five districts found improved teamwork facilitated by the team-based incentives, improved health worker performance due to more regularly received structured supervision and feedback, and enhanced community participation.

ANNEX B: BIBLIOGRAPHY/REFERENCES

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