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The effects of performance incentives on the utilization and quality of maternal and child care in Burundi

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ABSTRACT

Africa's progress towards the health related Millennium Development Goals remains limited. This can be partly explained by inadequate performance of health care providers. It is therefore critical to incentivize this performance. Payment methods that reward performance related to quantity and quality, called performance based financing (PBF), have recently been introduced in over 30 African countries. While PBF meets considerable enthusiasm from governments and donors, the evidence on its effects is still limited. In this study we aim to estimate the effects of PBF on the utilization and quality of maternal and child care in Burundi. We use the 2010 Burundi Demographic and Health Survey (August 2010–January 2011, $n = 4916$ women) and exploit the staggered rollout of PBF between 2006 and 2010, to implement a difference-in-differences approach. The quality of care provided during antenatal care (ANC) visits improved significantly, especially among the better off, although timeliness and number of ANC visits did not change. The probability of an institutional delivery increased significantly with 4 percentage points among the better off but no effects were found among the poor. PBF does significantly increase this probability (with 5 percentage points) 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. PBF also led to a significant increase of 4 percentage points in the probability of a child being fully vaccinated, with effects more pronounced among the poor. 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. Especially types of care which require a behavioral change of health care workers when the patient is already in the clinic show improvements. Improvements are smaller for services which require effort from the provider to change patients' utilization choices.

1. Introduction

Africa's progress towards the health related Millennium Development Goals (MDGs) remains limited. The goal of reducing child mortality from 178 to 59 deaths per 1000 live births by 2015 is unlikely to be met given the current rate of 109 deaths per 1000 live births (United Nations, 2013). One of the reasons for this stagnation in health improvements is the inadequate performance of health care providers in low income countries (LICs) (Miller and Babiarz, 2013; Rowe et al., 2005). A study across a set of LICs found, through unannounced visits, a staggering 35 percent of absenteeism among health care providers. Since many of the providers actually present in the facility were not working, this percentage may still paint a too favorable picture (Chaudhury et al., 2006). Even if providers are delivering health care services, these are often of insufficient quality – referred to as the know-do gap (Leonard and Masatu, 2010; Peabody et al., 2006). Das and Gertler (2007), for example, compared doctor knowledge in Tanzania through a clinical vignettes study to their performance in actual daily practice. Results showed that doctors completed only 24 percent of the elements they knew how to do (as apparent from a vignettes study) when presented with a patient with malaria and 38 percent for a child with diarrhea (Das and Gertler, 2007). A similar result was found for Rwanda where providers knew on average 63 percent of appropriate procedures but delivered only 45 percent (Gertler and Vermeersch, 2012).

Given these examples of inadequate performance, it is critical to incentivize health care providers to behave in line with the best interest of their patients. A large number of African governments is currently piloting payment methods that reward performance in

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the health care sector; Burundi and Rwanda have been the first countries to implement these methods nationwide (The World Bank Health Results Innovation Trust Fund, 2013). Through these performance based financing (PBF) schemes, health care facilities are paid retrospectively based on the quantity and quality of services provided. This is different from traditional health care financing mechanisms where budget flows are linked to for example number of beds or estimated drug needs. The PBF schemes typically affect health care provision in two ways: first, through incentives for providers to expend more effort in specific activities and second, through an increase in the amount of financial resources (Gertler and Vermeersch, 2012).

Over the last decade PBF has gained popularity among practitioners and governments (Magrath and Nichter, 2012; Meessen et al., 2011; Meessen et al., 2006; Soeters and Vroeg, 2011). More than 30 Sub Saharan African (SSA) countries are now in the process of introducing payment methods that reward performance or have already done so (Fritsche et al., 2014; Meessen, 2013). This enthusiasm is likely to be sparked further by the World Bank's recent pledge of 700 million dollar to be spent on women and children's health through performance based financing by 2015 (Kim, 2013). While the World Bank has initiated several PBF pilots across Africa with associated impact evaluations, the current knowledge base about the effects of PBF in LMIC is still quite limited (Eldridge and Palmer, 2009; Ireland et al., 2011; Kalk et al., 2010). A recent study by Miller and Babiarz confirmed that no formal evaluations are available for eighteen African countries where PBF has been piloted, including Burundi (Miller and Babiarz, 2013). A systematic review by Witter et al. (2012) on pay for performance in low and middle income countries, identified only one study (Peabody et al., 2011) – on the effects of bonuses for doctors in the Philippines – meeting high quality impact evaluation standards, with low risk of any bias. It found PBF to improve children's general self-assessed health and to reduce wasting but showed no effect on patient volumes. However, in this experiment similar effects were observed in another intervention group for which health insurance reimbursements to the hospitals were increased, suggesting that the effect mainly derived from increased resources. Though not considered low risk of bias by Witter et al., rigorous evidence has also been generated on the effects of PBF in Rwanda. Basinga et al. (2011) and Gertler & Vermeersch (2012) use a difference-in-differences analysis to show that PBF increased the use and quality of maternal and child services, and child nutritional outcomes. Sherry et al. (2013) use the same experimental design, but a different dataset and find a significant increase in the proportion of women delivering in facilities but no impact of PBF on antenatal care utilization, child vaccinations and contraceptive use.

More recently Bonfrer et al. (2014) have examined the effects of a pilot PBF program in Burundi with implementation support from the Dutch Non-Governmental Organization (NGO) Cordaid in 9 out of 17 provinces (Bubanza, Bururi, Cankuzo, Gitega, Karuzi, Makamba, Muramvya, Rutana and Ruyigi). Using three waves of data, they study the effects of PBF on antenatal care, institutional deliveries, vaccinations, modern family planning, reported patient satisfaction and a quality score based on a checklist for health care facilities. They find positive effects of PBF on institutional deliveries, antenatal care utilization, modern family planning and the quality score, though this latter finding is not reflected in an increased reported patient satisfaction. The present study builds on this earlier work and extends the analysis in several respects. First, and perhaps most importantly, we evaluate the *nationwide* effects of PBF, i.e. including provinces where NGOs other than Cordaid provided technical support to the Ministry of Health (MoH) for implementation. Furthermore, the use of the Burundi Demographic and Health Survey (BDHS) offers important advantages over the data collected by Cordaid. Not only is the sample size about 9 times larger (7742 births), the BDHS also provides a broader range of outcome measures related to (the timing of) vaccinations and the content of ANC provided. In addition to the number of ANC visits, it registers whether the mother's blood pressure was taken, whether she received an anti-tetanus vaccination and whether the first visit was in the first trimester of pregnancy. Finally, it is important to note that the BDHS data were collected independently from the PBF program, while the earlier study used data collected by the implementing agency Cordaid, which might potentially have affected reporting and induced bias. Independent data collection is especially important in a context of PBF, where random visits and interviews are conducted to verify quantity and quality of care which are used as parameters to determine payments to facilities.

Given the limited evidence on the effectiveness of PBF in SSA and the considerable expansion of this financing mechanism across the continent, there is an urgent need for evidence on impact. This study contributes evidence on the effects of PBF in Burundi, a country where PBF has gradually become a nationwide policy in the period from 2006 to 2010. Burundi is a post-conflict country, among the lowest income countries in the world with a GDP of barely 251 current US$ per capita (World Bank, 2012) and located in central Africa. The case of Burundi is especially interesting as health systems in post-conflict states are often forced to innovate which can generate useful lessons for other settings (Witter, 2012). The health status of the population is poor as reflected in an infant mortality rate of 67 per 1000 live births compared to 35 per 1000 worldwide (World Bank, 2012).

The primary aim of the PBF scheme in Burundi was to improve maternal and child health (Busogoro and Beith, 2010). We therefore study its effects on the quantity of child and maternal care use and its quality based on the reported services provided during antenatal care (ANC) visits. We use the BDHS and exploit the staggered rollout of PBF across provinces between 2006 and 2010, to implement a difference-in-differences approach.

In the following sections we first discuss the details of the PBF scheme introduced in Burundi, followed by a description of the data and the statistical analyses. Then we discuss the common tend assumption, followed by the estimated effects. These effects are discussed and we end with some concluding remarks.

2. Performance based financing in Burundi

Starting from the end of 2006, PBF was implemented in almost 700 health care facilities in Burundi (The World Bank Health Results Innovation Trust Fund, 2013). Based on quantity and quality of services provided, facilities receive performance related funding (Bertone and Meessen, 2012) which on average makes up 40 percent of the total facility budget (The World Bank Health Results Innovation Trust Fund, 2013). Quantity is measured using various output indicators including ANC, vaccinations, family planning, and HIV care (Ministère de la santé publique Republique du Burundi, 2010). Different levels of PBF payments are associated with these output indicators as shown in Table 1.

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 top of the quantity based payments, facilities receive a quality bonus ranging from 0 to 25 percent. Local regulatory authorities assess the quality every three months on a randomly chosen day using a standardized checklist (Appendix 1) procedure for availability of medical supplies, equipment, administrative procedures, prescription behavior, lab services and hygiene (Busogoro and Beith, 2010; Kamana, 2012; Soeters, 2013; The World Bank, 2010). Based on information about quantity and