



Who benefits from removing user fees for facility-based delivery services? Evidence on socioeconomic differences from Ghana, Senegal and Sierra Leone



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ABSTRACT

Coverage of skilled delivery care has been increasing across most low-income countries; however, it remains far from universal and is very unequally distributed according to socioeconomic position. In an effort to increase coverage of skilled delivery care and reduce socioeconomic inequalities, governments of several countries in sub-Saharan Africa have recently adopted policies that remove user fees for facility-based delivery services. There is little rigorous evidence of the impact of these policies and few studies have examined effects on socioeconomic inequalities. This study investigates the impact of recent delivery fee exemption policies in Ghana, Senegal, and Sierra Leone on socioeconomic differences in the use of facility-based delivery services. Using Demographic and Health Survey data from nine sub-Saharan African countries, we evaluated the user fee policy changes using a difference-in-differences approach that accounts for underlying common secular trends and time invariant differences among countries, and allows for differential effects of the policy by socioeconomic position. Removing user fees was consistent with meaningful increases in facility deliveries across all categories of household wealth and maternal education. We found little evidence of differential effects of removing user fees across quartiles of household wealth, with increases of 5.4 facility deliveries per hundred live births (95% CI: 2.1, 8.8) among women in the poorest quartile and 6.8 per hundred live births (95% CI: 4.0, 9.7) for women in the richest quartile. However, our results suggest that educated women benefited more from removing user fees compared to women with no education. For women with at least some secondary education, the estimated effect was 8.6 facility deliveries per hundred live births (95% CI: 5.4, 11.9), but only 4.6 per hundred live births (95% CI: 2.2, 7.0) for women with no education (heterogeneity p -value = 0.04). Thus, while removing fees at the point of service increased facility deliveries across the socioeconomic gradient, it did not reduce inequalities defined by household wealth and may have contributed to a widening of educational inequalities. These findings emphasize the need for concerted efforts to address financial and other barriers that contribute to large and persistent socioeconomic inequalities in delivery care.

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1. Introduction

Increasing skilled delivery care is one of the highest priorities in global efforts to reduce maternal and neonatal mortality (United Nations, 2014). A skilled provider (midwife, nurse, doctor) can administer essential life-saving maternal and newborn interventions and refer to higher-level care in cases of emergency. It

has been estimated that universal coverage of midwifery services and access to emergency obstetric and newborn care when complications arise would result in up to 74% fewer maternal deaths and 30–45% fewer neonatal deaths (Darmstadt et al., 2005; Wagstaff and Claeson, 2004). However, utilization of skilled delivery care in most low-income countries is far from universal and unequally distributed according to socioeconomic position. Across forty-five developing countries, there was a nearly four-fold difference in the proportion of births attended by a skilled provider between women in the richest and poorest quintiles of wealth (Houweling et al., 2007). In some countries these inequalities are

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even larger—in Nigeria over 80% of women in the richest quintile gave birth in a health facility compared to 7.7% in the poorest quintile between 2003 and 2008 (Wang et al., 2011).

Many of the poorest women live far from health facilities and are often deterred from seeking care due to facility user fees and other costs such as transportation. Research across several low-income countries has found that the cost of normal delivery services in health facilities places an enormous burden on poor families (Borghi et al., 2006; Pearson and Shoo, 2005; Richard et al., 2009). Direct costs of maternal health care have been estimated at between 1 and 5% of total annual household expenditures (Richard et al., 2009). And when complications during childbirth occur, the cost of emergency care is often catastrophic (in excess of 10% of yearly household income) (Borghi et al., 2006, 2003). In much of sub-Saharan Africa, where only around half of all women receive skilled care at birth, charging user fees for delivery services in public facilities has been a common practice for decades. However, there is increasing consensus that user fees represent an inefficient and inequitable way to finance a health system and are a major barrier to increasing utilization of life-saving obstetric services, especially among the poor (Robert and Ridde, 2013). Abolishing user fee payments for maternity services represents one strategy to increase utilization of skilled delivery care, reduce socioeconomic inequalities, and protect the poor from deepening poverty due to high health care costs. Governments of several countries in sub-Saharan Africa, including Senegal, Kenya, Burundi, Sierra Leone, and Ghana, have recently adopted this strategy (Richard et al., 2013; Yates, 2009).

Several studies have reported increases in facility-based deliveries after the removal of user fees (De Allegri et al., 2010; Dzakpasu et al., 2012; El-Khoury et al., 2011; Witter et al., 2008). Less is known about the effect of this type of policy change on socioeconomic inequalities in utilization of delivery services, and existing research has shown mixed results (De Allegri et al., 2012; Dzakpasu et al., 2012, 2014; El-Khoury et al., 2011; Witter et al., 2008). Moreover, most previous evaluations have been simple pre-post designs that compare the magnitude of inequality before and after the policy change. In this type of design, underlying secular trends in inequality cannot be separated from effects of the policy. Quasi-experimental designs, such as difference-in-differences (DD), can account for secular trends in the outcome by using a control group to estimate the counterfactual outcome trajectories (i.e., the outcome trend in the post-policy period had the policy change not occurred). We recently used a DD design to evaluate the effects of user fee exemption policies, finding evidence that removing fees increased facility-based deliveries and possibly contributed to a reduction in neonatal mortality (McKinnon et al., 2015). In this paper, we extend our previous work to investigate whether there are differential effects of the fee exemption policy across socioeconomic groups.

2. Materials and methods

We used data from Demographic and Health Surveys (DHS) conducted in nine sub-Saharan African countries between 2003 and 2013. The DHS are nationally representative household surveys that are generally repeated in a country approximately every 5 years in order to monitor trends in population health and utilization of health services (<http://www.measuredhs.com/>). All women aged 15–49 living in each household are asked to provide complete birth histories and to report on the use of maternal and child health services for all live births that occurred in the past 5 years. A household questionnaire provides information on the demographic, socioeconomic, and environmental conditions of each household surveyed. We used available surveys that provided

information on 150,541 live births that occurred between 2000 and 2012. Ethics approval was not required for this study, as it involved secondary analysis of DHS data.

Women who participated in the DHS were asked to report the location of delivery for each birth in the past 5 years. Births reported to have taken place in a public or private health facility (hospital, health center, maternity, clinic) were coded as one and births that took place at home (either the woman's or someone else's) were coded as zero. We considered singleton births to the same mother within the 5-year period as separate observations, but used only one observation for multiple births.

Our main exposure was whether each live birth occurred after the adoption of a policy exempting user fees for deliveries in health facilities. Senegal, Ghana, and Sierra Leone removed fees for delivery services (including normal delivery services, Caesarean section, and complications during pregnancy and labor) over the period of observation and thus contribute outcomes to the “intervention” group (Dzakpasu et al., 2014; Richard et al., 2013). In Ghana and Senegal, the policy was implemented first in selected regions/provinces and subsequently rolled out in the rest of the country. For these two countries we defined the exposure based upon region of residence. The policy in Ghana was implemented first in September 2003 in the four poorest regions (Northern, Upper East, Upper West, Central) and then subsequently rolled out to the rest of the country in April 2005 (Witter et al., 2008, 2007). Similarly, the policy change in Senegal was implemented first in January 2005 in the five most deprived provinces (Kolda, Ziguinchor, Tambacounda, Matam and Fatick) and then extended to the rest of the country one year later in January 2006 (Witter et al., 2010). The Government of Sierra Leone abolished all charges to pregnant women and children less than 5 years of age as of April 2010 (Sierra Leone Ministry of Health and Sanitation, 2012). Kenya was also considered as a potential intervention country, having introduced a national policy to abolish delivery fees in all public dispensaries and health centers in July 2007. However, evidence that this policy was not implemented as intended from the start led us to exclude Kenya from the analysis (Richard et al., 2013). In addition to the three intervention countries, we selected a control group of six countries that did not pass a policy exempting user fees for deliveries during the study period. The control countries were: Cameroon, Congo (Brazzaville), Ethiopia, Guinea, Mozambique, and Tanzania. We used the following criteria to select potential control countries: at least two available DHS surveys covering the study time period, with the most recent conducted in 2008 or later; 2) sub-Saharan African countries; 3) no evidence of major reforms affecting maternal health care financing (e.g., Burkina Faso subsidized delivery services by 80%, Mali and Benin removed fees for Caesarean sections). The availability of birth history data for the intervention and control countries is shown in Fig. 1.

We examined differential effects of the policy according to three measures of socioeconomic position: household wealth, number of household assets, and level of education. For household wealth, wealth quartiles were constructed from the continuous asset-based wealth index provided in the DHS. The asset index is based on a set of variables related to household conditions (e.g., water source, sanitation facilities, electricity) and ownership of consumer goods (e.g., a bicycle, a telephone, a refrigerator) and is constructed for each survey using factor analysis (Rutstein and Johnson, 2004). We generated wealth quartiles separately for each policy area used in the analysis, so that the wealth index is a measure relative to other households within the same area. This type of relative wealth measure is useful for examining the distribution of health outcomes within a population; however, we were also interested in an absolute measure of wealth that would be comparable across countries. Given that the DHS program does not collect measures of

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