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# Increasing maternal healthcare use in Rwanda: Implications for child nutrition and survival

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ABSTRACT

Rwanda has made great progress in improving maternal utilization of health care through coordination of external aid and more efficient health policy. Using data from the 2005 and 2010 Rwandan Demographic and Health Surveys, we examine three related questions regarding the impact of expansion of health care in Rwanda. First, did the increased use of health center deliveries apply to women across varying levels of education, economic status, and area of residency? Second, did the benefits associated with being delivered at a health center diminish as utilization became more widespread? Finally, did inequality in child outcomes decline as a result of increased health care utilization? Propensity score matching was used to address the selectivity that arises when choosing to deliver at a hospital. In addition, the regression models include a linear model to predict child nutritional status and Cox regression to predict child survival. The analysis shows that the largest increases in delivery at a health center occur among less educated, less wealthy, and rural Rwandan women. In addition, delivery at a health center is associated with better nutritional status and survival and the benefit is not diminished following the dramatic increase in use of health centers. Finally, educational, economic and residential inequality in child survival and nutrition did not decline.



Access to healthcare is seriously deficient in low-income countries, particularly among the disadvantaged populations of Africa. In 2010, The World Health Organization (WHO) estimates that 287,000 women died during pregnancy and childbirth. Almost all of these deaths occurred in low-resource settings, and most could have been prevented (WHO, 2012). In addition, more than half of these deaths occurred in Africa (Mavalankar and Rosenfield, 2005). As pointed out by Chambers and Booth in their publication by the Africa Power and Politics Programme (APPP) (2012: 1), "Safe motherhood is a key objective for developing countries but, despite recent improvements, Africa has experienced and continues to endure a history of unequal medical access for its women, granting it the most dangerous place in the world to give birth."

In addition, every year 4 million children die in Sub-Saharan Africa. More than one million newborns die before they reach one month of age, and 3.2 million children who survive their first month of life die before their fifth birthday. This amounts to about 13,000 deaths per day. Sub-Saharan Africa accounts for half of the world's maternal, newborn, and child deaths. In addition, an estimated 900,000 babies in this area of the world are stillborn, but remain largely invisible on the African policy agenda (Kinney et al., 2010). Many scientifically proven health interventions are available for maternal, newborn, and child health yet many African governments do not implement these interventions that can save women's and children's lives (Kinney et al., 2010).

Delivery at a health center is one of these key health care interventions that can reduce the risk of maternal and infant death, but their use is limited in developing countries (Say and Raine, 2007). In addition, inadequate access to healthcare is exacerbated by socioeconomic inequalities such that the most disadvantaged mothers and children in Africa have by far the least favorable health outcomes. This paper focuses on one country that has made impressive gains in the percentage of women who deliver children at a health center. This paper addresses three related questions regarding the impact of increased utilization to health care in Rwanda. First, did the increased use of health center deliveries apply to women across varying levels of education, economic status, and area of residency? Second, did the benefits for children who were delivered at a health center diminish relative to children born at home as utilization became more widespread? Finally, did inequality in child outcomes decline as a result of increased health care utilization?

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## 1. Literature review

### 1.1. Utilization of health care in Rwanda

Rwanda is a country with a population of about 11 million people. It has made impressive progress in social and economic development since the 1994 genocide when 1 million people were killed and 2 million became refugees. Living standards have reached, or surpassed, their pre-1994 levels, corruption is declining, infrastructure has improved, and access to education has greatly increased. In addition, its economic growth rate (presently 7%) has helped to reduce poverty, but income is unequally distributed with a distinct urban to rural divide. Despite this progress, 37% of Rwandans (mostly rural) live in extreme poverty, unable to afford basic foods, and 56–59% live below the national poverty line (Logie et al., 2008).

Many of the country's health facilities were destroyed as a result of the killings, and the shadow of genocide remains because money is still spent on the prisons, the village court system, reconciliation between Rwandans, and orphan and widow care which arose as result of the 1994 genocide (Logie et al., 2008). In response to these problems, in 2002 the Government of Rwanda developed an ambitious plan titled Vision 2020. This plan aims to quadruple the Gross Domestic Product (GDP), making economic recovery a priority, and ending external aid by 2020. In order to meet this goal, the government recognized that a healthy population is needed. Vision 2020 therefore included three innovations aimed to improve health-service delivery and increase equity of access: linkage of donor and government programs; a nationwide community based health insurance; and a performance-based pay initiative to improve quality of health care.

A review of Rwanda's health care system (Chambers and Booth, 2012) noted three common obstacles to the effective implementation of health services in Africa. First, delays in seeking health care; women and their families are often slow to seek medical assistance. This delay can result from suspicion or ignorance of modern health services, financial costs, and weak incentives to use public health facilities. The second obstacle is transfer delays. The lengthy time it takes to refer and transfer women to health facilities in addition to the lack of ambulances causes many delays in necessary, immediate emergency obstetric interventions. And third are the shortcomings in the quality of care. Even when women come to health facilities like they are advised, they can be greeted by shortages of equipment and supplies, inadequately trained staff, no drugs or blood supply, and poor staff motivation (Chambers and Booth, 2012).

Rwanda implemented several policies to diminish these obstacles. In order to promote the use of modern services, policy makers noticed the negative effect of traditional birth attendants (TBAs) on health center attendance. Traditional birth attendants are often untrained women who are local and offer more personalized care. Their close proximity to women in the villages and the attention they can give deters mothers from delivering at a health center. The detrimental effects of these TBAs arise because they are untrained in handling complications, often putting the mother and baby at risk. Use of traditional birth attendants are discouraged in many African countries but they remain popular with local populations in most of the countries except Rwanda. This is because Rwanda integrated the TBAs into the village community health system which has effectively convinced them to take part as workers in clinics (Chambers and Golooba-Mutebi, 2012; Leedam, 1985). In order to battle the problems of lengthy transfers and expense of care, the Rwandan government regulated the ambulance system. They subsidize 90% of the ambulance cost through their community health insurance plan. Finally, quality of care has improved by respecting health center opening hours, maintaining good hygiene procedures, and training staff to be more respectful of patients. Monitoring and supervisions take place to ensure these changes are implemented (Chambers and Golooba Mutebi, 2012).

Rwanda uses several techniques to make their policy changes effective. Their policy reforms strongly encourage citizens to subscribe to the nationwide health insurance program which has been critical to the local uptake in maternal health services. Government led, sector wide planning has ensured donor support to plug precious resource gaps. Professional performance of health care center staff includes regular supervision with results-based health financing paired with moral rewards and sanctions. Staff also set performance targets and local officials pledge publically to achieve certain objectives. The monitoring system includes local officials and health professionals, uniting them while disallowing public sector workers to run private health care facilities. Finally, Rwanda uses local problem solving to involve local participation and provides mechanisms for feeding lesson-learning back into policy (Chambers and Golooba Mutebi, 2012).

As a result of these policy changes, Rwandans are surging above many Africans in their use of maternal health care. In 2005 only 28% of women were giving birth at health facilities in Rwanda, whereas 69% reported using them in 2010 (Chambers and Booth, 2012). Although an increase in health expenditure per capita is often proposed as a requirement for improving health, trends show that this correlation is not observed in some African countries. For example, health expenditures have increased in Uganda, but outcomes have shown only slight improvement. Outcomes remain unaffected in Niger despite health spending doubling between 2004 and 2009 (Chambers and Booth, 2012). Rwanda's gains were achieved by pairing expenditure with a focus on health education and policy changes, aiming to equalize access among all demographic groups. The significant improvement in maternal health utilization in Rwanda provides evidence that the implementation of maternal health interventions in low-income countries without large increases in expenditures is feasible (Bulatao and Ross, 2002). Pearson and Shoo (2004) found that in order to make sustained progress towards better maternal health care the system requires support from national policy, health systems, human and financial resources, basic infrastructure, equipment, emphasis on equality, and regular monitoring and evaluation of progresses. The increasing numbers of women delivering in the health facilities in Rwanda demonstrate that policies have had a major impact on behavior. We address two key questions regarding the consequences of increased utilization. First, does the impact on children's health diminish as more women deliver at clinics? The dramatic increase in use of clinics may dilute the quality of care people receive if staff become overburdened, there is a shortage of materials, or new health workers do not receive adequate training. Second, does increased utilization affect social inequality in children's health?

### 1.2. Social inequalities in health care

Women do not always get the proper care that could easily prevent maternal mortality as well as the deaths of their infants. As noted by Knippenberg et al. (2005, p. 87), "Ideally, every woman should be able to choose to deliver with a skilled attendant present, and if either the mother or her newborn baby have complications, both have the right to access safe professional care." Unfortunately, socioeconomic factors limit access such that use of maternal health care varies greatly within countries. We examine three key social determinants as they relate to utilization of maternal health and consequences for the children, namely wealth, maternal education and urban residence.