



Maternal Health Care in the Time of Ebola: A Mixed-Method Exploration of the Impact of the Epidemic on Delivery Services in Monrovia

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Summary. — Public health emergencies like major epidemics in countries with already poor health infrastructure have the potential to set back efforts to reduce maternal deaths globally. The 2014 Ebola crisis in Liberia is claimed to have caused major disruptions to a health system not fully recovered after the country’s civil war, and is an important and relevant case for studying the resilience of health systems during crises. We use data on the utilization of maternal health care services from two representative surveys, one conducted before the outbreak of Ebola, the 2013 Liberian DHS, and another, smaller survey conducted in Monrovia in December 2014, during the height of the epidemic. We focus exclusively on data for women aged 18–49 residing in urban Monrovia, restricting our samples to 1,073 and 763 respondents from the two surveys respectively. We employ a mixed methods approach, combining a multinomial logit model with in-depth semi-structured interviews. Our regression analyses indicate that deliveries in public facilities declined whereas they increased for private facilities. Furthermore, overall facility delivery rates remained stable through the Ebola epidemic: the proportion of home births did not increase. Drawing on insights from extensive qualitative interviews with medical personnel and focus groups with community members conducted in Monrovia in August–September 2015 we attribute these survey findings to a supply side “substitution effect” whereby private clinics provided an important cushion to the shock leading to lower supply of government services. Furthermore, our interviews suggest that government health care workers continued to work in private facilities in their local communities when public facilities were closed. Our findings indicate that resources to shore up healthcare institutions should be directed toward interventions that support private facilities and health personnel working privately in communities during times of crisis so that these facilities are safe alternatives for women during crisis.

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1. INTRODUCTION AND BACKGROUND

Despite gradual improvements in maternal health outcomes in West Africa (WHO, UNICEF, United Nations Population Fund, World Bank, & the World Bank Group and the United Nations Population Division, 2015), exogenous shocks in the form of public health emergencies in countries risk jeopardizing these positive trends. Such shocks present a major challenge for governments to provide basic public goods, especially to the most vulnerable segments of the population, such as pregnant women and infants. In this study, we explore how a relatively fragile health system in post-conflict Monrovia, Liberia responded during the exogenous shock of Ebola in 2014. Liberia has one of the highest maternal mortality rates in the world (Moseson *et al.*, 2014). During the Ebola crisis, it had the highest count and death toll of all the countries that experienced the epidemic, but also the steepest decline in new cases.¹ As such, it represents a useful case allowing us to study how sudden shocks affect the use of maternal health care services.

There are several accounts claiming that Ebola completely overwhelmed the health systems in Liberia, implying particularly severe consequences for maternal health outcomes (e.g., Hayden, 2015; Menéndez, Lucas, & Langer, 2015). Others, however, question the sweeping transformative effect of Ebola on maternal health (e.g., Streifel, 2015: 2), highlighting the need for more detailed data. Our study builds on new, rich data to address the Ebola–maternal health nexus in a more

nuanced way in metropolitan Monrovia. More specifically, we draw on two surveys conducted before (in 2013) and during the Ebola epidemic (in December 2014) to assess whether the epidemic led to a decrease in the use of maternal health services, such as deliveries in public facilities. We combine the surveys with more than 20 in-depth interviews with local health professionals and other stakeholders and eight focus groups with community members in four townships/sections of metropolitan Monrovia in August and September of 2015.

We find that access to public delivery sites declined during the Ebola epidemic, but that overall use of maternal services did not change much because there was a shift from public to private services. During the epidemic, there was an increase in the use of private delivery services, which was a result of private facilities—including medicine stores, pharmacies, and

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clinics—substituting for public facilities. Additionally, health care professionals who worked in the public sector provided delivery services at these private facilities during the epidemic. Our findings suggest that resources to bolster health institutions should ensure that private facilities and healthcare personnel working independently receive attention during times of crisis, especially to ensure that these facilities are safe alternatives for women during crisis.

(a) *Exogenous shocks and maternal health*

Sub-Saharan Africa remains the region with the highest levels of maternal mortality, with a staggering 546 deaths per 100,000 live births in 2015 (WHO *et al.*, 2015). In addition to poverty, negative exogenous shocks to a country's health care systems also contribute to poor health outcomes. Exogenous shocks are unexpected or unpredictable events that affect an economy and/or political system either positively or negatively. Negative exogenous shocks might include civil wars, natural disasters, or diseases (e.g., Ness, 2016, p. 58). Such negative shocks have the potential to disrupt development on many different levels including impeding improvements in maternal health.

Armed conflict might be an important reason for the relatively slow rate of reduction of maternal deaths compared to other regions such as South-East Asia (Urdal & Chi, 2013). In a study of 42 African countries, O'Hare and Southall (2007) found that Maternal Mortality Ratios (MMRs) were 45% higher in post-conflict countries than in non-conflict countries. Conflict may affect maternal health both directly and indirectly. Direct effects include reduced supply of health care services, including facilities having to close down because of the security situation or as a direct result of health personnel fleeing. It may also lead to changes in behavior related to the use, or demand, of health services, for instance patients are not able to reach the health facilities because of restrictions on movement (Lori & Starke, 2012; McCarthy & Maine, 1992, p. 23; Silasi *et al.*, 2015).

The Ebola epidemic may be treated as an exogenous shock in that the magnitude of the event was unforeseeable and affected both the supply of and demand for services, and caused a major disruption in the economic, political, and social life of West Africans. In fact, the adverse effects of Ebola on maternal health may even be compounding given that Liberia is a post-conflict state. For example, hospitals and health clinics were closed for months during the Ebola epidemic, resulting in limited access to general health care in a country that already had a weakened health system after years of armed conflict.

(b) *Conflict, Ebola and Liberia's healthcare system*

The Liberian Civil Wars (1989–96 and 1999–2003) led to approximately 250,000 deaths, or nearly 10% of the population, the displacement of around a million people into refugee and IDP camps, the dismantling of the national economy and infrastructure, and the destruction of an effective Liberian state (Karim & Gorman, 2016). To fill the void, the UN Peacekeeping Mission in Liberia (UNMIL) arrived in 2003 and has remained, but official drawdown commenced in 2015. Because of the wars, Liberia's health care system broke down completely, and placed the Government of Liberia in a position of dependency on external medical humanitarian aid. Of the 293 public health facilities operating before the wars, 242 were deemed non-functional at the end of the wars due to destruction and looting and doctors, nurses and other health workers fled the country, leaving a total of only 30 physicians to serve a population of 3 million (Kruk

et al., 2010). To fill the gap, international actors flocked to the country to assist in the provision of health care. In 2007–2008 foreign donors financed approximately 80% of the country's health spending (Kruk *et al.*, 2010). Abramowitz and Panter-Brick (2015: 177) provide a description of the status of post-conflict Liberia's health care system where international non-governmental organizations (NGOs) like Médecins Sans Frontières (MSF) and Médecins du Monde effectively substituted the Liberian state in the provision of medical care. Liberia lacked "health sovereignty"—a state's ability to independently manage the health needs of its population (Chen, Evans, & Cash, 1999; Kickbusch & de Leeuw, 1999). International health care providers filled essential gaps without necessarily enabling Liberia's health care system to fully take on the responsibilities of health care for its citizens. Abramowitz and Panter-Brick (2015) and Luginaah *et al.* (2016) posit that when such international presence finally ends, the consequences may be grave as the local health system lacks capacity, resources, and training to fill the void.

The effects of healthcare sovereignty gap became widely apparent during the Ebola crisis in Liberia. The epidemic killed 4,809 individuals in Liberia out of a total of 10,675 registered cases.² The first Liberian case was reported in March 2014 in the Foya district of Lofa county near the border with Guinea. By June, the epidemic had spread to the capitol city of Monrovia, killing several health workers. The World Health Organization (WHO) stated that at the peak of transmission, during August and September 2014, Liberia was reporting between 300 and 400 new cases every week. People were largely left without medical care for routine sicknesses and injuries or were afraid of increased risks of infection at health facilities as medical facilities were overrun by Ebola patients (Strefel, 2015, p. 9). The loss of medical workers through death compounded this trend. The unavailability or excessive cost of medicines pushed people toward traditional and herbal treatments for malaria or other ailments, including Ebola (Ribacke, Saulnier, Eriksson, & von Schreeb, 2016).

Although the primary focus in emergencies, whether natural disasters or acute epidemics, is on the immediate, short-term effects, long-term consequences may be considerable and often interact or overlap with pre-existing social and economic conditions, further accentuating inequalities in health outcomes (Farmer, 1996; Parker, 2002). The lasting legacy of the epidemic in Liberia has been noticeable as thousands were left with missing family members, causing long-term economic insecurity for affected households (Bowles, Hjort, Melvin, & Werker, 2016). Furthermore, the loss of healthcare workers might have medium- to long-lasting negative consequences on maternal health outcomes. While one recent study finds no increase in overall non-Ebola-related mortality during and immediately after the epidemic (Kuehne *et al.*, 2016), another study suggests that maternal mortality increased by up to 28% in Liberia in the period immediately following the epidemic (Evans, Goldstein, & Popova, 2015).

For expecting women, there are two dimensions that impact the use and quality of health care: Their *demand* for health services and the *supply* (availability) of satisfactory medical facilities and trained personnel. Ebola presumably disrupted both the willingness of women to attend medical facilities, and the availability of such facilities. Drawing on the same survey used in this study, Morse, Grépin, Blair, and Tsai (2016) find that those that were affected by the Ebola virus, by witnessing dead bodies or knowing Ebola victims, were less likely to use health care services, suggesting that distrust and negative experiences reduced demand during the outbreak. Yet, it is not clear if, and for how long, these patterns persist.

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