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Ebola outbreak 2014–2016: **Effects on other health services**

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The Ebola outbreak in West Africa in 2014-2016 resulted in more than 28,000 reported cases and more than 11,000 reported deaths[1]. The outbreak quickly overwhelmed the health system, which was massively under resourced at the outset. This note summarizes evidence on the effects of the outbreak on the provision of other health services. The aim is to obtain insights of relevance for the current covid-19 pandemic. The note is based on a rapid review of the literature conducted in the period 20-30 April 2020.

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KEY MESSAGES

- Ebola significantly reduced the provision of other health services. The average reduction across all services was estimated to 18%. In patient services and facility-based deliveries were most strongly affected.
- Despite the huge burden of Ebola, there was no collapse in the provision of other health services. Areas with few cases were rather unaffected.
- Maintaining health service provision during epidemics requires careful attention to demand side barriers, in addition to supply side constraints.
- Despite significantly lower provision of health services and projections of massive excess mortality as a result, excess mortality was not documented in empirical studies of short-term impacts. Long-term impacts may still be significant.

Effects on health service provision

Ebola had a strong negative impact on the provision of other health services. A meta-study covering research from both Liberia, Guinea and Sierra Leone reports 18% reduction in service delivery[2]. This figure is the average of 236 different estimates obtained from 22 studies, covering services such as outpatient visits, deliveries, other inpatient care, malaria services, HIV and tuberculosis services, and immunization. 48 of the estimates are at country level, while the remaining cover smaller geographical units, down to single health facilities. The median measurement period was three months, typically around the peak of the outbreak. The figures may thus conceal a sharper decline in services through shorter periods of time within this three-month period. None of the figures from this study should be taken as precise estimates but rather as indicative of the magnitude of the effects.

There is large variation across studies and geographical sites. Estimates of 50% reduction or more are not uncommon, in particular in studies covering single facilities. National level estimates tend to show a more moderate decline. Liberia, where many facilities were closed for a while, experienced a 14 percentage points larger decline in service provision than Sierra Leone, where services were least affected.

The decline in service provision was higher in areas with a high exposure to Ebola. In areas with more than 2.5 Ebola cases per 100,000 per week, service provision declined by 28% on average. In areas with less than 0.5 cases per 100,000 per week, there was no effect on service delivery, suggesting that the effect did not spill over to areas with little or no Ebola.

Inpatient services were most seriously affected, with an average decline of 44%, followed by facility-based deliveries (-28%). Malaria services declined by 18%. While part of the reduction in use of formal health services was replaced by increased utilization of informal providers such as drug shops[3], the decline was largest for procedures with no alternative source of care.

The overall picture thus seems to be that despite facility closure in some areas, and despite a significant decline in the provision of other health services, many facilities were able to maintain a large share of their services.

There is little evidence on the duration of the decline in service provision. A study from Monrovia, which was badly hit by the outbreak, suggests that health service utilization resumed close to normal levels within few months after the outbreak[4].

Driving forces at both supply and demand side

Ebola had a negative impact on the use of other health services both through supply side and demand side factors.

Health care personnel were reallocated from routine health services to emergency Ebola control and treatment units. The evidence suggests that resource reallocations largely took place within districts, as districts with few cases typically were able to maintain their services [2]. The absorption of human resources to Ebola prevention and control was particularly strong at the district management level, leaving limited capacity to oversee and supervise other services[5].

Multiple cases were reported of health workers abandoning their jobs or refusing to work due to perceived risk or dispute over hazard pay or other conditions. However, surveys in Sierra Leone and Guinea found low to moderate absence levels[6]. Many health workers kept

working despite the harsh and frightening conditions[7], [8]. *Psychosocial support is believed to be a key not only to address mental health needs of the health workers but also to keep them on duty*[9], [10].

Volunteer community health workers was a resource during the epidemic, but a fragile one. Many were recruited to Ebola-related activities, but in some districts in Sierra Leone it was perceived that more than 50% of community health workers had become disenfranchised and stopped working as they observed others being recruited and paid for performing Ebola-related activities[5]. *This demonstrates the importance of careful management of the human resources on the fringes of the health system, which is a potential resource during epidemics.*

The epidemic inflicted a huge death toll on health care workers, who were 21 to 32 times more likely to be infected by Ebola than the general adult population[11]. The death of health workers reduced the health workforce by 6.9%, 8.1% and 1.5% in Sierra Leone, Liberia and Guinea . A very rough assessment of the health effects of this loss suggests that it may lead to more than twice as many maternal and child deaths *annually* as Ebola did in total[12]. Although this figure is rather speculative, it underscores the *immense importance of providing protective equipment to health workers during an epidemic*. Even with less deadly epidemics, such as covid-19, infection of health workers may lead to a huge loss in work capacity due to the need for quarantine and isolation.

Demand side factors also had a major negative impact on service delivery. People feared contracting the disease from health workers or patients and they feared testing positive for Ebola, which would result in stigma in the community[3]. In addition, many were reluctant to seek health care because many illnesses were treated as potential Ebola cases. The similarity of early symptoms of Ebola with malaria and cholera, combined with lack of diagnostic equipment, made health workers cautious and applied quarantine also to people with other ailments. The prospects of 21 days of detainment was something people wished to avoid[13]. *Similar effects may be anticipated with covid-19, underscoring the importance of ensuring sufficient test capacity.*

Furthermore, a general distrust in the government, which was present both before and after the outbreak, seem to play an important role for health seeking behaviour during the epidemic. People with low level of trust in the government seemed to reduce service utilization much more than others during the outbreak, while after the outbreak this factor did not affect service delivery (Morse2016). This suggests that the general level of trust in government becomes a more critical factor for service utilization in times of high uncertainty. All else equal, *service delivery may thus be expected to fall more sharply in countries with low levels of trust in the government.*

The evidence suggests that demand effects may have been quite strong. A review of 22 articles[7] concludes that to a large extent it was not health service provision that failed, but rather the uptake of health services by the population that decreased after the onset Ebola. A study from a single HIV care facility in Guinea underscores the point; despite no disruption in service supply, there was between 40% and 53% reduction in outpatient visits, HIV tests done, new tuberculosis cases identified, and in patients enrolled to HIV care[14]. Interestingly, a study from another facility providing TB services in the same country suggested that it was *possible to sustain normal activities through the Ebola crisis*. They ascribe the success to a set of relatively simple measures; improved contingency planning and support to improve health worker knowledge about Ebola, supply of protective equipment, and screening of patients for fever at entry [15]. There may however also be other explanations, such as a higher level of trust at the outset.

A main lesson is that careful attention must be paid to maintaining demand for health services during epidemics. Experiences from the Ebola outbreak demonstrates that this includes efforts to avoid myths and misconceptions about the disease itself, how it spreads, and how it can be cured. Engaging traditional and religious leaders may be crucial for this purpose[16], [17]. One measure that significantly increased the utilization of health services in Monrovia was government-organised community outreach activities[4].

Health impacts

There is little empirical evidence on how the decline in service utilization during the Ebola outbreak affected health outcomes. There is however a number of simulations based on (often weak) assumptions about the relationship between health service delivery and health outcomes. These simulations typically suggest that the health impacts were massive and perhaps bigger than the impact of Ebola itself. For instance, in Sierra Leone reduced provision of maternal and child health services was estimated to cause 3,600 additional maternal, neonatal and stillbirth deaths[18]. A simulation of a 50% reduction in HIV and TB services (i.e., about twice the real reduction) projected more than 10,000 additional deaths in the three countries[19], and a study of the shutdown of malaria services (which is about five times the real reduction) projected more than 10,000 additional deaths[20]. Finally, reduced vaccination was

projected to cause between 2,000 and 16,000 additional measles deaths[21].

However, empirical studies of excess mortality have not been able to demonstrate any relationship. Two studies covering the capitals of Liberia and Sierra Leone find that despite a sharp reduction in health service utilization, there has been no excess mortality beyond Ebola deaths in the short term[22], [23]. One potential explanation is that better hygiene, more handwashing and social distancing reduced the mortality from other communicable diseases and diarrhoea. The simulations reported above did not take into account these and other adaptations. Note, however, that the reported studies did not measure long-term effects, for instance on TB patients.

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