



Lessons learned from Ebola outbreak 9 in Equateur Province, Democratic Republic of the Congo

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Question

What are the relevant lessons for future interventions from the delivery of humanitarian and development operations in Equateur province of DRC, with specific reference to the response to Ebola outbreak #9 in 2018.

Contents

1. Summary
2. Background
3. Timeliness and coordination
4. Lessons learned on Ebola vaccination effectiveness
5. Ebola health seeking behaviour in Equateur Province
6. Social and economic considerations in Ebola response
7. Appendix
8. References

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1. Summary

Reviews of the humanitarian response to the 9th Ebola outbreak in the Democratic Republic of the Congo (DRC) in Equateur province show that shortcomings in previous responses, such as timeliness and coordination, were largely addressed in this response, although a number of outstanding issues, particularly relating to contextualisation of the response could have been improved. This report draws on lessons learned from interventions to address the 9th outbreak in 2018, as well as related humanitarian and development interventions, to provide insights into best practice in the current outbreak and possible future outbreaks.

The report begins with a brief background on situational factors in Equateur province of relevance to emergency health interventions, and a short summary of the 2018 Ebola outbreak and sequencing of the response. Section 3 highlights lessons learned from assessments on the timely and coordinated response in the 2018 outbreak, drawing out considerations on how to build on these achievements in future responses. Section 4 explores the limited available evidence on the effectiveness of the rVSV-ZEBOV vaccine that was used on an 'emergency use' basis for the first time in the Equateur response of 2018.

The bulk of reports on lessons learned from the Equateur response of 2018 reflect limitations in information on contextual factors that inhibit or facilitate the effectiveness of Ebola response, therefore the remaining sections explore key contextual themes of relevance to the Equateur region. Section 5 reviews available information on health seeking behaviours in Equateur and section 6 explores key political, social and economic factors in the region that may impact transmission, surveillance, treatment and indirect effects of Ebola response in the region.

Key lessons learned from the 2018 Equateur response and related humanitarian interventions are:

- Immediacy of the response and coordination of agencies is critical to effectiveness, particularly around the release of funds and appropriate communication of the disease to affected and neighbouring communities.
- There is evidence indicating that the rVSV-ZEBOV vaccine was effective in reducing the risk of spread of the virus in Equateur. Further evidence is needed to understand the extent of its effectiveness and community perceptions of Ebola vaccination programmes.
- Health seeking behaviour is highly context specific. A detailed understanding of local perceptions on the causes, spread and treatment of illnesses is needed to effectively respond to an Ebola outbreak.
- Certain social groups are at a greater risk of exposure and transmission of Ebola in Equateur due to gender norms and discrimination towards Twa indigenous groups. Practices relating to exposure to the virus, the care of ill people in homes, communities and health facilities and body preparation for burial are key considerations for contact tracing, surveillance and treatment.

Given the limited availability of evidence on this response, a key finding to be emphasised is the need for a rapid situational analysis at the outset of and any future outbreaks and regular updating of that analysis as the situation unfolds. This rapid review of secondary evidence from the last outbreak in Equateur in 2018 is a step towards that, but does not replace a primary, up-to-date situational analysis. Gaps in the literature identified in this review that might also be

addressed for future Ebola responses are: the mechanisms behind which the immediacy and adequacy of finance and cooperation were possible in this particular response; the uptake and effectiveness of the Ebola vaccine; secondary social, political and economic impacts of Ebola response; and the sustainability of prevention measures after the outbreak has been declared over and international actors transition to other humanitarian crises.

2. Background

An Ebola outbreak was declared by the DRC's Ministry of Health (MoH) on 31 May 2020 in the southern part of Mbandaka city, the city's surrounding area, and Bikoro. This is the 11th outbreak in the DRC since the virus was first discovered in 1976. As of 12 June 2020, a total of 17 cases have been reported of which 11 have died (Ministry of Health, 2020). This review focuses on details and lessons learned from the 9th outbreak in 2018.

Equateur Province

Equateur province is one of the 25 provinces of the Democratic Republic with a population of approximately 2.5 million. The province is subdivided into seven territories including the Bikoro territory where the first cases of the 2018 Ebola outbreak were reported, and is generally inaccessible by road (WHO, 2018g). The province is governed by the provincial government, led by a Governor and Provincial Ministers. Rural areas have both state and customary political leadership. The Bikoro territory has a population of approximately 800,000 (Translators Without Borders, 2018) divided into three secteurs, each governed by a Chef de Secteur and each subdivided into several groupements, then subdivided into villages, with elected Chefs de Village. Mbandaka city is Equateur province's capital city.

There is a lack of basic infrastructure across the province, including poor road networks, lack of electricity, unreliable telephone networks and insufficient health facilities to service the population. The province has 284 health centres across 16 health zones. Mbandaka has five medical or hospital facilities and 55 health centres (Bedford, 2018a, p.3). Health facilities face frequent shortages of medicines, equipment, including personal protective equipment and other materials, although health services have received increased supplies for the COVID-19 response (ACAPS, 2020). Mbandaka city has a very low proportion of health care workers for the size of the population with two nurses and one doctor per 10,000 inhabitants (ACAPS, 2020, p.2).

The population of Equateur is primarily Mongo, the DRC's largest ethnic group, with the Twa, a minority indigenous group, living primarily in rural areas in the territories of Bikoro, Ingende, Iboko, Lotumbe and Ntongo health zones. The Twa have been disproportionately affected by previous Ebola outbreaks and face compounding risk factors due to limited resources or rights to land, marginalisation and exploitation including in accessing health services, and their interests are rarely incorporated into customary or administrative arrangements (Samdong, 2016). Equateur's diversity also means that many languages are spoken, with French as the language of administration and Lingala used by most people, particularly those with lower education levels (Bedford, 2018c, p2).

Livelihoods and related population movements in the region are important factors in the spread of the virus in the region. Bushmeat hunting among Twa communities increases their vulnerability to infection as well as to discrimination on the basis of being blamed for previous

outbreaks (Ripoll et al., 2018). Fishing at Lake Tumba is the primary economic activity in Bikoro, with fish being transported to Brazzaville, Kinshasa, and Mbandaka requiring the movement of people between these areas. Fishers from Ingende and Iboko health zones are reported to pass through Bikoro on a daily basis (IFRC, 2018).

Overview of the 2018 Ebola response

Equateur province experienced an outbreak of Ebola from May to July 2018 with 54 people infected and 33 fatalities (UNICEF, 2020). On 8 May 2018, 17 people were reported to have died from Ebola near the town of Bikoro, with the WHO confirming the virus had spread to Mbandaka by 17 May 2018. This outbreak differed from previous outbreaks as it involved four separate locations, including the urban centre Mbandaka with river connections to the capital Kinshasa and to neighbouring countries. These geographic factors led to heightened concerns about the potential spread of the disease to other parts of DRC and neighbouring countries (WHO, 2018h).

National and international response was rapid, leading up to and following the MoH's declaration of the Ebola outbreak. The MoH, supported by WHO and Médecins Sans Frontières (MSF), visited Ikoko-Impenge health area on 5 May 2018 where five case-patients were identified. The outbreak was declared by the MoH on the 8 May 2018. The WHO released US\$2 million from its Contingency Fund for Emergencies within hours of the declaration, deployed a team to augment capacity in the field and activated an emergency incident management system (WHO, 2018h). The response initially focused on expeditionary surveillance, contact tracing and vaccination in villages surrounding the town of Itipo.

The 2018 Equateur response was the first to employ a vaccine under 'emergency use authorisation' using ring vaccination involving the vaccination of health workers, contacts of patients and contacts of contacts (Ripoll et al., 2018, p.23). The vaccine rVSV-ZEBOV was administered to 3,017 contacts of cases and frontline healthcare workers within two weeks of the first case confirmation (Wells et al., 2019. p.10178).

The remaining people exposed to the last Ebola case were confirmed to be without symptoms following a 21 day follow up on the 27th of June, and the outbreak was declared over on the 24th of July 2018 (WHO, 2018i). The WHO warned of a risk of resurgence from potentially undetected transmission chains and possible sexual transmission of the virus (WHO, 2018i).

3. Timeliness and coordination

The 2018 Ebola outbreak in Equateur has been held as a positive example of timely response with efficiency of coordination among international actors and government agencies. Building on lessons learnt from earlier responses to Ebola in West Africa, improvements in the timely release of funds, movement of personnel, communication to local communities and coordination across a range of agencies were key features of the response.

Adequate and timely release of funds was a key determining factor in the effectiveness of the response. The WHO was able to liberate funds within hours of the outbreak's declaration using the newly created Contingency Fund for Emergencies. The total funds received by all partners amounted to US\$63 million, surpassing the original appeal of US\$57 million (OCHA,

2020). Total international funding to DRC doubled in 2018 to US\$1 billion from US\$0.5 billion in 2017 (OCHA, 2020). The United States Government was the largest donor in DRC at the end of 2018 (51.2%), followed by the UK (11.1%), Germany (6.8%) and the European Commission (5.9%). The health sector is the second largest recipient of aid in DRC (17.2%), preceded by food security (26.2%) (OCHA, 2020).

No analysis on the mechanisms or context within which this timeliness and adequacy of funding were identified for this review. Possible courses for further investigation to improve understanding of this achievement would be an evaluation of the newly created WHO Contingency Fund for Emergencies and how other donors might channel support for future outbreaks, the international political economy that led to adequate financial commitments for this particular Ebola response, and more in-depth analysis of sectoral spend through the response specifically and of donor funding to DRC more generally.

Coordination among national and international actors in the 9th outbreak response has been considered one of the more efficient Ebola responses to date. For example, the MoH, WHO, IOM, Africa CDC, UNICEF, and WFP coordinated a point of entry surveillance strategy to map areas at risk of transmission based on population movement and flow (WHO, 2018d). A list of partners that participated in the coordinated response can be found in Appendix 1.

Coordination with the health system and existing traditional and biomedical health providers has been identified as a critical factor in the effectiveness of Ebola response. This includes early capacity development such as training of formal and non-formal health workers, ensuring resources earmarked for Ebola do not undermine other health needs and alternative treatment models such as Community Care Centres (CCCs). CCCs typically provide free health care, food, and testing facilities to communities (Ripoll et al., 2018). Care must be taken to ensure the appropriateness and safety of alternative treatment models, but reviews of their effectiveness in the West Africa outbreak response were positive. It is also necessary to consider the implications of the closure of these alternative care facilities after the outbreak, as challenges were reported following the Equateur response with regards to the use of remaining resources between government departments, politicians and local communities (Alcanya-Stevens, 2018).

It is not clear from available analysis how this coordination was made possible in the Equateur response. Reports of the outbreak response do not indicate a lead coordinating agency managing inputs across international actors nor has there been any analysis of practical measures taken to work effectively within local health systems and how these might be replicated or improved in future responses in the region.

4. Lessons learned on Ebola vaccination effectiveness

On 21 May 2018, two weeks after the outbreak was reported, a 'ring' vaccination programme was initiated and targeted at immediate contacts of confirmed cases, contacts of contacts and frontline health workers. By 26 June 2018, a total of 3,481 people had been vaccinated (WHO, 2018a). The Equateur response of 2018 was the first to employ the recombinant vesicular stomatitis virus (rVSV)-vectored vaccine for Ebola ("rVSV-ZEBOV") under 'emergency use authorisation' (Ripoll et al., 2018, p.23). Prior to May 2018, rVSV-ZEBOV had been trialled during the final phase of the 2013 to 2016 Ebola outbreak in Guinea. The trial indicated an efficacy

estimate of 100%, with no cases among vaccinated individuals from day 10 after vaccination (Henao-Restrepo, et al., 2017).

Vaccination effectiveness and application

There is limited evidence on the efficacy of the Equateur vaccination programme. Impacts of the vaccination programme were modelled in a Proceedings of the National Academy of Sciences of the United States of America (PNAS) report, concluding that the vaccination programme reduced the level of risk in the region by 70.1% and that the geographical area at risk was contracted by up to 70.4% (Wells et al., 2019, p.10178). These figures assumed that all contacts identified in contact tracing were vaccinated, although in practice the vaccination is only administered to those over the age of 18 years and not pregnant, breastfeeding, or severely ill, which indicates limitations of vaccination for certain vulnerable groups, as well as only those who consent to the vaccination. The PNAS modelled that risk reduction fell from 70.1% to 58.9% where only 52% of contacts received a vaccination (based on the 52% of contacts who received the vaccination immediately in the 2013-2016 trial reported by Henao-Restrepo, et al. (2017) (Wells et al., 2019, p.10180). Wells et al. (2019) estimates that without vaccination, more than 87% of the area within Bikoro and Iboko, as well as 44% of the area in Wangata, would have been at risk.

The European Medicines Agency (EMA) currently states that the drug is effective in protecting adults from Ebola but that the duration of this protection is currently unknown (EMA, 2020). The vaccine was pre-qualified by the WHO on 12 November 2019 following a conditional marketing authorisation in the European Union (WHO, 2019).

Early implementation of vaccination has been found to be critical to the effectiveness of the programme. Wells et al. (2019) estimates that a delay of one week would have lowered the potential reduction in risk within the region from 70.1% to 44.8%. The geographical spread of the virus was also reported to have been markedly contained by the timeliness of the vaccination programme (p.10181).

Socio-cultural perceptions of vaccination

“Communication around the vaccine is crucial as negative community perceptions and understandings of why some people are vaccinated and others not augments social risks associated with distrust, suspicion and stigmatization” (Alcayna-Stevens, 2018, p.29).

These negative perceptions leading to higher rates of refusal include community members reportedly expressing concern that the vaccine is a lethal injection, that it will give a person Ebola, or that it can prevent women from becoming pregnant and cause sterility (Bedford, 2018b).

During the 2018 outbreak in Equateur, vaccination efforts were reportedly well accepted with a high uptake rate (Bedford., 2018a). However, communities also reported being unsatisfied with consent procedures including being unable to read the information provided (in French) to explain the consent procedures. Communities also reported the importance of being able to ask questions about the working of the vaccine after the outbreak had finished (Ripoll et al., 2018).

There is a gap in information on local perceptions and experiences of the vaccine since the 9th outbreak concluded. Bedford's (2018) review of lessons learned from health seeking

behaviour during the Equateur outbreak of 2018 suggests that future response using the vaccine should study “perceptions and experiences of the vaccine (as an intervention, its trial status, and how it was introduced and rolled-out, i.e. as a ring vaccination) must be carefully documented... after the outbreak is declared over” (p.4).

5. Ebola health seeking behaviour in Equateur Province

Reluctance and delay in local acknowledgement of Ebola’s presence among the local population is reported to have impacted response efforts in the 2018 outbreak.

Communication and community engagement strategies should work with (rather than refute) misperceptions on the source of the outbreak, mistrust of officials, including international agencies, and local beliefs about the nature of illnesses more broadly. “Listening to how people ‘speak’ of Ebola – e.g. vocabulary and idioms – and other illnesses (in contrast to biomedical language) is vital, and can be revealing of important local disease categories and logics” (Ripoll et al., 2018, p.4.). de Vries et al. (2016) suggest that the speed of detection of Ebola and the early presence of medical services can help to mitigate alternative explanations to the outbreak in combination with the development of local trust (see section 6).

Ebola has been linked to a range of culturally distinct factors in the Equateur region.

According to Bedford (2018b), many communities in Equateur Province link ill health, including Ebola, to: disrespecting or angering recently deceased parents and ancestors (bankolo in Lingala); angry water spirits (mamiwata in Lingala) or forest spirits (bilima in Lingala); jealous ‘witches’ (ndoki in Lingala); diviners or healers who have been paid to cause illness (nganga in Lingala); divine will; the breaking of social prohibitions; disrespect of taboos related to age, life stages, and childbirth.

Symptomatic people may seek treatments using traditional medicines including herbs, fumigation, scarification and massages, which are widespread in the region, particularly in rural and among Twa communities (Ripoll et al., 2018). Church leaders, particularly evangelical priests, are relied upon for treatment or information about the virus. Prescribed care can involve seclusion, fasting and purging, further increasing the risk that affected people may not be traceable or seek treatment. There is a small Islamic population in the region that may adopt different practices, though information on these communities is limited (Bedford, 2018b).

While distrust of biomedicine is common in the region, barriers to accessing formal medical care is a key factor in health seeking behaviour (Bedford, 2018b, p.2). Half of the population in Equateur province live more than 10km from a health centre, face direct and indirect costs for consultations and treatments, and service disruptions such as medicine stockouts may affect health decision-making (Bedford, 2018b, p.2).

Engaging those who may influence or control whether a person with symptoms is or is not identified to response teams and presented for care, such as men, is critical to reaching some vulnerable groups alongside efforts to engage with those groups directly (Bedford, 2018b, p.3). Appropriate language and settings for engaging groups such as women and Twa communities must be considered, and local groups may be mobilised to engage with these groups such as women’s associations, church groups and Twa-led indigenous associations (Bedford, 2018b p.3).

Transparency about all elements of the response and among agencies working in the area is encouraged to minimise suspicions of the response. Local suspicions around political

involvement (see section 6), vaccination programmes (see section 4) and discriminatory views of specific groups or of Ebola victims were reported in the 2018 outbreak. Links have also been made between health workers and the spread of the virus, as reported in the 2014 outbreak in Equateur where “surveillance teams and contact tracers were labelled as ‘blood suckers’ and communities prevented response workers from entering villages by blocking the paths with tree trunks” (Bedford, 2018b, p.3).

6. Social and economic considerations in Ebola response

Two-way communication between response workers and affected communities has been shown to improve contact tracing, surveillance, the effectiveness of Ebola treatment and to minimise negative secondary impacts of the response. “Communities have local capacities to contain Ebola epidemics and the ability to learn with the response” (Ripoll et al., 2018, p.20). Within communities, local social structures related to political obligations and affiliations, gender, age and family are key sources of information for identification, surveillance, treatment and coordination purposes (Ripoll et al., 2018 p.6).

Community engagement

A rapid assessment of community-level social dynamics that may affect different groups’ vulnerability to exposure, challenges to accessing treatment, and secondary effects of the virus has been identified as a critical early step in effective Ebola response.

While certain social groups can be identified as higher risk in advance based on recent studies in Equateur province (see below), there is wide agreement in the literature that early rapid assessments are needed with every new outbreak to capture changes that may have occurred since the last outbreak in re-affected areas and to understand nuances of social factors in newly affected communities (Bedford, 2018b, Ripoll et al., 2018, WHO, 2019b). Regular updates to these assessments and to communication strategies used within communities are also encouraged to address new challenges that may arise at different stages of the epidemic and as people’s attitudes and priorities towards the virus shift (Ripoll et al., 2018, p.17).

Community self-imposed quarantining and social distancing has been shown to be a more effective preventative measure than mandatory or coercive measures. This requires effective collaboration with local leaders and influential people (Ripoll et al., 2018). The rapid assessment should also be used to identify regular practices that involve close contact with ill people, patient care, and body preparation for burial. Religious gatherings have been identified as an important factor for disease prevention in Equateur. During the 2018 epidemic the Catholic Church stopped giving sacraments to avoid infection in the Church (Ripoll et al., 2018, p.20).

Consideration of possible negative impacts of isolation and social distancing are important considerations in Ebola response such as loss of income and inaccessibility to basic needs such as food and safe drinking water. Response measures can work with and enable local support networks and psychosocial resources to extend these to vulnerable households (Ripoll et al., 2018, p.24).

Politics

Recognition of the political embeddedness of the Ebola response is needed to ensure its effectiveness and to minimise adverse effects. Equateur is historically an opposition

stronghold, though the ruling People's Party for Reconstruction and Democracy is the only active political group in the region. Anti-government protests in Mbandaka City by youth and other activists over the years have led to hundreds of arrests, dozens of injuries and at least one death. The public sector ranks poorly on corruption indices, leading to distrust of government in Kinshasa and state representatives in both rural and urban Equateur (Alcanya-Stevens & Bedford, 2018c, p. 1-2). This distrust can undermine the Ebola response where communities associate official interventions with previous incidents of repression and state violence. An influx of external resources through the Ebola response is susceptible to rent seeking by political actors and local health officials, and the politicisation of the response for political gain (Ripoll et al., 2018; Shepler, 2017).

Political voice and citizen participation are limited in Equateur, posing challenges to community mobilisation and access to vulnerable groups. A study of institutional choice and citizenship in Bikoro territory found that the majority of villagers lack the ability to influence local authorities due to “lack of information, material resources, and adequate platform to articulate their needs” (Samndong, 2016, p. 252). “Lack of political voice, may mean that a particular social group is not able to participate in decision-making at a local level, and hence when strategizing is made by response workers with the ‘community’, these groups may not be heard and their needs ignored” (Ripoll et al., 2018, p.9).

Gender

“Gendered social norms and practices may make men or women more vulnerable to infection at different stages” (Ripoll et al., 2018, p.13). Although there are no biological differences in men and women’s vulnerability to Ebola, women are primary care givers in Equateur province and are therefore more likely to come into contact with the virus when caring for ill people in their homes, communities and health facilities (Ripoll et al., 2018, p.13; Menéndez et al. 2015: e130.)

Women’s lack of agency in the region has been linked to increased risk of transmission and barriers to accessing health services. Control over sexual behaviour may increase exposure based on evidence of sexual transmission of Ebola after recovery (The Lancet, 2015, p.e130). Women in some contexts also depend on their husband’s permission to seek treatment and may therefore face barriers to accessing treatment for themselves and for children in the household (Ripoll et al., 2018, p.14). Alcanya-Stevens (2018) also found that women who mourn over their spouse in Equateur are often unable to leave their home during the mourning period, even for Ebola treatment.

Further decline to already weak access to reproductive and maternal health care during the Ebola crisis poses a threat to the lives of mothers and infants (The Lancet, 2015, p.e130). Maternal healthcare services may be restricted or suspended while services are focused on the Ebola crisis and pregnant women from Ebola affected communities are likely to face discrimination when attending health facilities for maternal care (Menéndez, Lucas et al., 2015).

Ethnicity

Twa communities have been linked to a higher risk of exposure due to their participation in bushmeat hunting and trading. While it is important to recognise this as a risk factor, care must also be taken to avoid perpetuating the perception that Twa communities are carriers of the

virus as this has exacerbated existing marginalisation and discrimination of Twa communities in Equateur (Ripoll et al., 2018).

Ethnic inequalities in access to health services, representation and involvement in the response are critical to reaching communities at heightened risk of infection and with limited access to treatment. The systematic marginalisation of the Twa in Equateur extends to discrimination at the point of service at health clinics and has led to accusations of being Ebola-bearers (Bedford 2018a). Although utilisation of health care services appear to be similar among Twa communities as compared to other ethnic groups in Equateur, this might mask a higher burden of illness among the Twa (Bedford 2018a, p.2). A study by Manjo et al. (2015) reported that Twa communities were reluctant to visit rural clinics due to discrimination from health workers.

7. Appendix

The following organisations were listed by the WHO (WHO, 2018a) as operational in the Equateur Ebola response of 2018:

The Alliance for International Medical Action (ALIMA)
The International Federation of Red Cross and Red Crescent Societies (IFRC)
The Red Cross of the Democratic Republic of the Congo (DR Congo Red Cross)
Médecins Sans Frontières (MSF)
The Disaster Relief Emergency Fund (DREF)
The Africa Centers for Disease Control and Prevention (Africa-CDC)
The US Centers for Disease Control and Prevention (US-CDC), ECHO
The Department for International Development (DFID)
Japan International Cooperation Agency (JICA)
The World Food Programme (WFP)
UNICEF
UNCERF
UNOCHA
MONUSCO
International Organization for Migration (IOM)
The FAO Emergency Management Centre – Animal Health (EMC-AH)
The International Humanitarian Partnership (IHP)
Gavi, the Vaccine Alliance
The African Field Epidemiology Network (AFENET)
The UK Public Health Rapid Support team
The EPIET Alumni Network (EAN)
The International Organisation for Animal Health (OIE)
The Emerging Diseases Clinical Assessment and Response Network (EDCARN)
The World Bank and PATH
“The Government of Guinea deployed more than 30 Ministry of Health staff to assist with the ring vaccination campaign, and Merck provided the Ebola vaccine. Additional coordination and technical support through the Global Outbreak Alert and Response Network (GOARN), Association pour le Développement de l’Epidémiologie de Terrain (EPITER), European Mobile Laboratory (EMLab), Infection Control Africa Network (ICAN), Institut Pasteur (IP), National Institute for Communicable Diseases (NICD), South Africa, Robert Koch Institut (RKI), and Emergency Medical Teams (EMT)” (WHO, 2018a).

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