PLANNING FOR **POST-EBOLA**

LESSONS LEARNED FROM DR CONGO'S 9TH EPIDEMIC

PART I | PREPAREDNESS

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The author

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ACRONYMS AND ABBREVIATIONS

AC	Community Animators (*Animateur Communautaire*)[1]
ALIMA	Alliance for International Medical Action
ANVE	National Association of Ebola Vanquishers (*Association National des Vainqueurs d'Ebola*)
APS	Psycho-social assistant (*Assistant Psycho-social*)
AT	Territorial Administrator (*Administrateur du Territoire*)
CAC	Community outreach units (*Cellule d'Animation Communautaire*)
CBO	Community-based organization
CE	Community engagement
CODESA	Local health committees (*Comité de Développement de l'aire de Santé*)
DPS	Provisional health division (*Division Provincial de Santé*)
EP	Protective equipment (*équipement protective*)
ETC	Ebola Treatment Center
EVD	Ebola Virus Disease
FPIC	Free prior and informed consent
INRB	National Institute of Biomedical Research (*Institut National de Recherche Biomédicale*)
MPH	Ministry of Public Health
MCZ	Medical Inspector of the Health Zone (*Médecin Chef de Zone*)
MSF	Doctors Without Borders (*Médecins Sans Frontières*)
PA	Indigenous people (*Peuple Autochtone*)
PBF	Performance-based financing
PPE	Personal protective equipment
RCCE	Risk communication and community engagement
RECO	Community health workers (*relais communautaire*)
SANRU	Rural Health Program (*Projet Santé Rurale*)
SDB	Safe and dignified burial
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization
WFP	World Food Programme

[1] The original French terms are written in italics and in parentheses.

EXECUTIVE SUMMARY

This report is for supervisors managing ongoing Ebola outbreaks, or working on preparedness and recovery activities in regions at risk of, or affected by, Ebola epidemics. It is based on rapid and intensive ethnographic field research in Equateur Province, Democratic Republic of Congo, undertaken less than a month after the epidemic was declared over in July 2018. The research comprised 60 separate open-ended, semi-structured interviews with local health workers, government officials and administrators, Ebola survivors and their families, community leaders, and national and international responders.

The overall finding of the report is that an Ebola epidemic, along with the way the response itself is conducted, can have significant social, psychological, economic, and health impacts for the communities involved. By providing a close, qualitative reportage on perceptions of the epidemic and the response in Equateur Province, the report aims to render tangible the social, political and economic dimensions of an Ebola epidemic and to offer recommendations for the response which prepare communities for life 'post-Ebola' at each stage of an intervention.

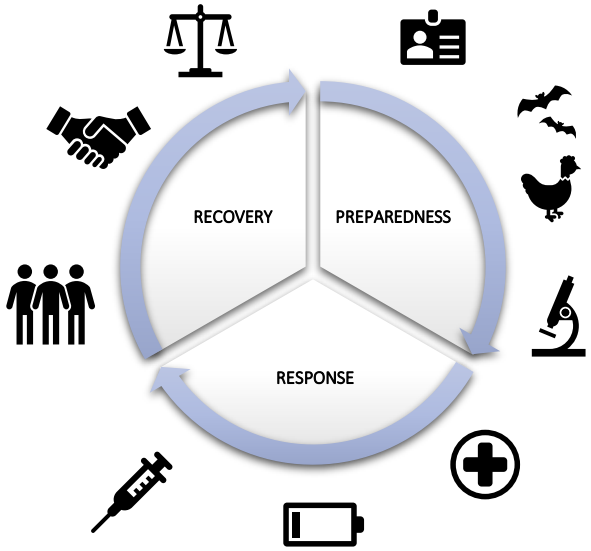
Epidemic management focuses on what needs to be done before, during and after an epidemic in order to minimize the health, social and economic impacts of the epidemic. This report, **Part One: Preparedness,** provides information and recommendations on emergence, surveillance and health system capacity, vulnerable and marginalized populations, and the political and economic context of the 2018 Equateur outbreak. It is part of a series which examines each one of the temporal stages of an epidemic from the report 'Planning for Post-Ebola' (Alcayna-Stevens 2018). The other reports in the series are: **Part Two: Response**, which provides information and recommendations on transmission, risk communication, contact tracing, vaccine deployment, case management, and burials; and **Part Three: Recovery**, which provides information and recommendations on the economic, health (including mental health), and social repercussions of the epidemic and response. An index can be found at the end of the report to locate cross-cutting themes covered in multiple sections.

The report provides recommendations relevant for supervisors working on risk communication, coordination, surveillance and contact tracing, infection prevention and control, case management, and safe & dignified burials (SDBs). Recommendations are divided into those that are operational (i.e. immediately applicable in the event of an outbreak) and those that are orientated toward long-term capacity building. Key recommendations are presented at the beginning of each section and are brought together in the overall conclusion.

The series proposes a Grassroots Model for Epidemic Response, based on four key principles: (1) **A 'whole society' approach** that attends not only to those individuals directly affected by the outbreak, but also to their broader communities; (2) **a commitment to inclusivity** appreciates that 'communities' are not homogenous, and prioritizes the engagement of marginalized and vulnerable populations; (3) **an attention to local stakes** that can help responders appreciate why Ebola epidemics are understood through the lens of broader issues such as politics, economics and religion; and finally, (4) **a commitment to utilizing pre-existing epidemic response capacity** in order to coordinate an effective response and ensures that interventions build on the social and cultural resources of the communities they seek to support.

PLANNING FOR **POST-EBOLA**

Epidemic management focuses on what needs to be done before, during and after an epidemic. Each of the reports in this series examines one of these temporal stages. During 'preparedness', the focus is on reducing vulnerability to disaster and strengthening capacity, surveillance and early detection. 'Response' begins with a coordinated and rapid investigation, and then the implementation of appropriate control and case management, which is supported at each step and in every aspect by robust, clear and two-way communication. Finally, 'recovery' focuses on evaluation and accompanies affected communities in their lives 'post-Ebola.' Each stage should seek to minimise the health, social and economic impacts of the epidemic.



GRASSROOTS MODEL FOR EPIDEMIC RESPONSE

(1) A 'WHOLE SOCIETY' APPROACH attends not only to those individuals directly affected by the outbreak, but also to their broader communities.

(2) A COMMITMENT TO INCLUSIVITY appreciates that 'communities' are not homogenous
and prioritizes the engagement of marginalized and vulnerable populations.

(3) ATTENDING TO LOCAL PERSPECTIVES can help responders appreciate why Ebola epidemics
are understood through alternative lenses and broader issues, such as politics, economics and religion.

(4) UTILIZING PRE-EXISTING EPIDEMIC RESPONSE CAPACITY ensures that interventions build on
the social and cultural resources of the communities they seek to support.

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PLANNING FOR POST-EBOLA:

PREPAREDNESS

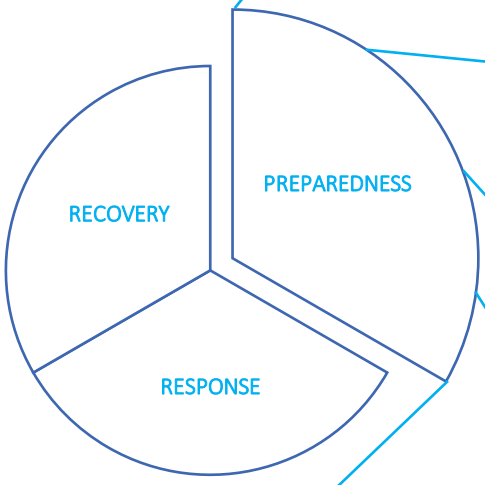
Epidemic preparedness constitutes all the activities that must be undertaken at multiple levels (from the national to the health facility level) to be ready to respond effectively to an outbreak. Epidemic preparedness ensures that the routine surveillance system can detect an outbreak as soon as it occurs, and that staff are organized to confirm, investigate, and respond to an outbreak. Stocks of drugs and essential equipment, emergency finances, materials and supplies should also be maintained as part of epidemic preparedness. This section provides detail on the kinds of preparedness which would have facilitated an earlier detection of Ebola in the 2018 Equateur outbreak, as well as a more coordinated early response and a greater level of community engagement in the early stages of the outbreak. Outlined below are the key recommendations.

Operational recommendation

Utilize pre-existing capacity by **seeking out local health, administrative and social science officials and experts** when building response strategy.

Capacity-building recommendation

Encourage **vulnerable and marginalized populations to trust and use the health system** by setting up a special fund to subsidize their health care and establish long-term funding to train these populations as nurses, midwives and doctors.

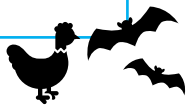


Capacity-building recommendation

Pilot a variety of **informal alert systems** for churches, leaders, traditional health practitioners and community health workers to report concerns which have not yet been picked up by state health facilities.

Capacity-building recommendation

Train and deploy **veterinarians** in rural regions to monitor the health of wild and domestic animal populations.



Operational recommendation

Response teams should endeavor to **employ women and other marginalized populations** (e.g. community mobilization, contact tracing, psycho-social support, cooking for the response, selling agricultural produce, etc.).

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1. PREPAREDNESS

1.1 UNPACKING 'COMMUNITY'

Response teams often refer to the local people with whom they work using the concept of 'community.' This may also be a salient concept for the people with whom they work themselves; for example, in Equateur Province, ordinary people often refer to themselves as part of '*la communauté,*' using the French term. The term will be used throughout this report. However, it should always be used in a way which does not overlook the fact that rural villages and urban neighborhoods are made up of many different populations with different needs – some of which are more vulnerable than others. The following section therefore outlines the issues faced during an epidemic by some of the most marginalized and vulnerable populations. It provides recommendations for effective engagement of these populations.

1.1.1 DEMOGRAPHY & CAPACITY

The population of Equateur Province is 2,543,936. Half of the population live in the provincial capital of Mbandaka, located on the Congo River along an important trade route which connects to Central African Republic, the Republic of Congo and DRC's capital, Kinshasa. The population of Mbandaka City is ethnically diverse, and more than 40 languages are spoken in and around Mbandaka.[2]

Valuable information about the population, ethnicity, health and education structures and more can be found in the administrative and governmental ministries and departments. Despite this, some of the earliest reports produced by response teams contained errors and omissions in demographics and maps.[3]

These errors were to do with the speed at which the initial contextual reports needed to be issued. However, they could have been avoided if local administrative and health authorities had been enlisted to help in their production.

Response teams should coordinate with local government structures to access information about the socio-political and economic context, and work with local social scientists (such as those working at the universities and technical colleges of Mbandaka) to determine whether there are important ethnic or political conflicts in the region which could affect the response strategy.

1.1.2 ETHNIC MINORITIES

During the early stages of the Equateur outbreak, response teams expressed concern about 'resistance' to the response from an ethnic group they referred to as 'pygmies' or 'Twa'.[4] Both of these terms can be used pejoratively or derogatorily and thus become offensive to such communities, depending on the context in which they are used.

Response teams should always refer to people by the name they prefer. Using the term 'pygmies' further stigmatizes and alienates vulnerable and marginalized populations.

The term 'PA' or '*peuples autochthones*' (indigenous people) should be used by response teams. These people often refer to themselves as 'Twa'.[5] However, the term 'PA' was identified by people who participated in this research (both Twa and non-Twa) as the most respectful form of address for Twa people. This term may change or be disregarded in later years but should be used by response teams in the meantime as a sign of sensitivity and respect.[6]

In this report, I use the term 'Twa' (pl. Batwa), which is more prominent in the literature. However, during all research interviews with both Twa and non-Twa, the term 'PA' was used.

In terms of ethnic identity, both Twa and non-Twa (called 'Nkundo' or 'Bantu' by Twa),[7] identify as members of either the Ntomba (to the west) or

[2] Alcayna-Stevens & Bedford (2018).
[3] Yong (2018).
[4] Anoko & Falero (2018).
[5] The complex history of migration and inter-ethnic relations is beyond the scope of this paper. Cf.Hulstaert (1961); Vansina (1965); Pagezy (1975); Sulzmann (1986); Duda (2018).
[6] The use of this politically-correct term is to denote respect and is not an indication of Twa ethnic identity.
[7] Both terms are confusing, as they denote a linguistic group (Bantu) of which Twa are a part, and an ethnic group (Nkundo) which is found further east. Cf. Duda & Alcayna-Stevens (2018).

Ekonda (to the east) ethnic groups. They share the same language – either Lontomba or Lokonda.

Rather than a separate ethnic group with a distinct language, it can be useful to think of Batwa as a distinct *caste*. Twa families have a relationship of interdependence with Nkundo/Bantu families, often providing hunted meat or agricultural labor for a Nkundo/Bantu family in exchange for money or agricultural produce and Twa villages are often found on the outskirts Bantu/Nkundo villages.[8]

Batwa are often marginalized by Nkundo/Bantu; they are paid less for the same work, physically and sometimes verbally harassed or assaulted (with little legal recourse) and excluded from political activity and engagement. Bantu/Nkundo families may refer to themselves as the masters (*nkolo* in Lingala) of Twa lineages, and one young Twa woman described this relationship to us in terms of slavery and colonialism. In her words:

"They colonise and enslave us"

When bushmeat was highlighted as the source of the Ebola (EVD) outbreak, some Batwa hunters told us they had experienced stigmatization. Furthermore, the emergence of EVD cases in Ikoko Impenge was initially connected by the families involved to a family land dispute, in which it was said that one family had sought the services of a powerful Twa healer, who had put a curse on the other family. The family of this man continues to be almost totally ostracized by the Nkundo villagers to this day.[9]

One of the primary reasons Batwa gave for their initial resistance to the response was their suspicion that Ebola was a fabrication which Nkundo/Bantu would use to get rich, while killing or sterilizing Batwa. This led them to resist tests, vaccinations, treatment at biomedical facilities and Ebola Treatment Centers (ETCs), and secure burials. They also found free health care suspicious and initially refused to attend health centers and posts.

Due to a combination of poverty, to the fact that there are few health posts in all-Twa villages, to discrimination experienced at biomedical facilities, and to their own skills in traditional healing, Twa communities typically have little faith in biomedicine.

A further barrier to their engagement was the fact that many community health actors are Nkundo/Bantu. Nkundo/Bantu – often more educated and more comfortable in expressing themselves to foreigners – became mediators in response teams' interactions with Twa communities, and this made them distrustful and resentful that they were not being directly engaged by the response.

Speaking retrospectively about the epidemic, many Batwa appeared resentful of the fact that few of them had been directly involved in the response's activities. Other reports by social scientists suggest that they were often engaged for unpaid services.[10] Even those who had been involved as community health workers (RECO), reported being underpaid compared with Nkundo/Bantu counterparts. Some families of victims also reported not receiving the psycho-social support and food provisions that bereaved Nkundo/Bantu families received.

Response teams were not always sympathetic to these feelings of exclusions, with some responders explaining that Batwa do not 'put themselves forward' or that they do not 'plan ahead'. The egalitarian nature of Twa societies, which often lack stable customary chiefs, can make it more difficult for response teams to immediately identify clear community leadership and representation.

Even when they were employed by response teams, there were challenges. One international doctor explained that he had employed a Twa man as a security guard, but that the man was physically attacked when he tried to stop a Nkundo/Bantu man from entering the compound; the man said, 'a Twa has no right to restrict my movement.'

Operational recommendation[11]

›› No community actor should be asked to work without appropriate payment and all people should be remunerated at the same rate, with direct payment, rather than the use of intermediaries.

[8] Duda & Alcayna-Stevens (2018); see also Samndong (2016).
[9] Ingrid Gercama (pers. comm. 2018)
[10] Duda (2018)
[11] Further, detailed recommendations on working with marginalized Twa communities can be found in Duda & Alcayna-Stevens (2018).

Capacity-building recommendation

›› Support the Ministry of Public Health to reinforce trust in biomedical services by establishing a special fund to subsidize healthcare for Batwa and long-term funding to train Twa nurses, midwives and doctors.

1.1.3 GENDER

In general, women are more emancipated in Mbandaka City than in the villages (i.e. more likely to pursue an education or own small businesses). Still, very few women hold government positions. The majority are engaged in commerce (most market sellers are women) and unpaid domestic labor. In rural areas several women's agricultural associations exist, where women take turns working in each other's fields.

Women are often important decision makers in the domestic sphere. Whether or not they control part of the household's finances varies between families. However, they are always important actors in ensuring family health and hygiene and in educating children about sanitation, health and disease. Their influence should never be overlooked during an epidemic response. One woman, a leader of women's associations in Itipo, quoted the famous saying, as she explained to me the significant role women play in rural Congo:

> *"If you educate a woman, you educate a whole nation"*

Women are also at higher risk of catching Ebola (EVD) – not due to any biological reason, but because of their social duties.[12] They are often the ones who butcher meat when preparing meals for the family, or when selling bushmeat at market (most vendors of meat and agricultural produce are women). They are also caregivers to the sick and must wash the bodies of deceased female relatives. Pregnant women have been found to be more susceptible to EVD because of their lowered immune systems, and yet they are not eligible to be vaccinated.[13]

Widows are often particularly vulnerable members of the community, and likely to be excluded from social and political process. Without their husband, they can face ostracism in their marital village – this is often particularly acute if their children have already grown and left or if they have no children. Ebola widows face particular challenges. For example, during the mourning period following their husband's death, widows must grieve and cannot leave the house or even stand up to wash or feed themselves for several days. Widows who participated in the research in both rural and urban areas said this meant that they had not been able to attend the vaccination campaign for contacts. Furthermore, widows often struggle to provide for their families without their husband's income, and may even find themselves with debts left by their husbands. *See also, 3.1.4 Debt and funerary costs.*

Women are seldom as influential in the public sphere as in the private sphere, as most ethnic groups in Equateur practice patrilocal residence and women therefore lack family support networks in their marital villages. This can lead to them being overlooked by response teams both in terms of community engagement and in terms of employment opportunities in the response.

Several influential women (including the president and secretary of the women's associations of Itipo and the head of the women and families service in Bikoro) participated in the research. These women felt that there had not always been sufficient engagement of local women in the response. They pointed to an absence of workshops and education sessions targeted specifically at women, and to the fact that many education materials were communicated in French or Lingala, and therefore not always accessible to women, who often have lower levels of education and literacy. This was also an issue with the vaccine consent forms, which were often written in French.

To engage women effectively, sessions should be held in their natal language, and in a setting in which they feel comfortable seeking clarifications, which is not always the case in mixed-gender meetings.

Several women (many of them teachers) were trained as psycho-social assistants by UNICEF partners and were invaluable in efforts to combat stigma and reintegrate survivors and families of victims.

[12] Menendes et al (2015).

[13] Bebell et al (2017).

Operational recommendations

›› Response teams should collaborate with local women's associations in order to provide information sessions for women on health, hygiene and risk management, with special information sessions held for pregnant and lactating women to inform them about risk and to explain to them why they are excluded from the vaccine campaign.

›› Response teams should endeavor to employ women in various domains (e.g. community mobilization, contact tracing, psycho-social support, cooking for the response, selling agricultural produce, etc.).

1.1.4 YOUTH

The DRC has a markedly young population, with around 42% of the population under the age of 15 years, and 62% under the age of 25 years.

At the beginning of the Equateur outbreak, many parents removed their children from school, fearing that they might be exposed to infected individuals. This was detrimental both to community engagement and to the children's education. Once they started attending classes again, children were provided with education on hand-washing and learned about the disease – they were able to cascade learning to their families.

School teachers should be provided with basic psychosocial skills to support their pupils, and school should be used to engage children using appropriate participatory methods to teach them about the disease, how to protect themselves, and about treatment and vaccination.

Foreign actors and increased economic activity are seen by young people (particularly young men) as opportunities to find employment and piecemeal work. Many will look for opportunities to work for or alongside response teams (helping with logistics or manual work).

It is important to note, however, that, as new employment opportunities for youth have led to greater financial emancipation from their elders, traditional leadership structures have been increasingly challenged, and inter-generational tensions may result in challenges for participatory decision-making (e.g. if elders reject the presence of foreigners whilst youth welcome them in the hope of employment opportunities).

Operational recommendation

›› The response should positively harness youth groups and other associations to support and contribute to community mobilization, contact tracing, safe and dignified burials, and to help with logistics including clearing roads. Collaboration can be established with existing youth groups and associations.

1.2 POLITICAL ECONOMY

The following section summarizes the political and economic context of Equateur Province. It examines the structures of governance which must be respected by response teams and provides recommendations on how to remain politically neutral. It also examines the economic activities (subsistence farming, bushmeat hunting and trade etc.) which can be perturbed by a large-scale economic response, and the economic conditions of poverty which can lead communities at large to view an Ebola outbreak less as an issue of public health and more as an issue of wealth and inequality.

1.2.1 GOVERNANCE AND POLITICS

The DRC is divided into 26 provinces, each governed by a provincial government led by a Governor, Vice Governor, and Provincial Ministers (e.g. of agriculture). Each province is subdivided into territories and sectors. The highest administrative authority at the territory level is the territorial administrator (AT). Within a territory, each sector is governed by a sector chief (*Chef de Secteur*).

Rural areas have a parallel governance structure of both state and customary political leadership. Within each sector are several '*groupements*', governed by a *Chef de Groupement* who is also a customary leader and can deal with both legal and customary matters at the groupement level. Within each groupement there are villages, each of which has a *Chef de Village* who is elected by the village to serve as the representative of the state for the village for several years, and several village elders (the heads of each family).

Other influential local elites include religious leaders, local civil society actors and the presidents of farming, youth, church and women's associations. Several of the people who participated in the research felt that there was too much of an emphasis on engaging health actors, and that local leaders, particularly in smaller villages, had not been sufficiently engaged. This was particular true of PA leaders.

Complex and cumbersome bureaucratic processes, many of which originate in the colonial period, mean that offense can be taken if influential local leaders, especially those in charge of the structures a response team is attempting to access, are not saluted, informed and engaged from the outset.

Corruption, nepotism and embezzlement are part of the survival strategies of those in positions of power in DRC. Particularly in rural areas, salaries are often unpaid for lengthy periods, and people capitalize on the access and benefits they can acquire from their position in order to survive. These practices have led to an erosion of trust, and many ordinary Congolese are suspicious and distrustful of the structures through which response teams may attempt to access them. Even at a more local level, inadequate accountability mechanisms mean that elites may monopolize political leadership and benefit from resources meant for community-based organizations.

Both governing and opposition parties often try to politicize an epidemic (and the resources it brings to the country), and response teams must therefore strive for political neutrality. A social scientist could accompany response teams in order to determine local populations' levels of trust towards official structures and to monitor the ways in which politicians may vie to politicize the epidemic in their favor.

Co-ordination is essential, and response teams should build on pre-existing response capacity and work through local officials and partners to ensure that interventions build on the social and cultural resources of the communities they seek to support.

Operational recommendation

›› Response teams should designate a member of the logistics or coordination team to fulfil all of the formalities required in order to be approved by the relevant government, customary and community authorities. However, responders should also aim to have relatively unmediated contact with community members once these civilities have been fulfilled.

1.2.2 INFRASTRUCTURE AND MOBILITY

There is a lack of basic infrastructure across Equateur Province including electricity and running water.[14] The province has a road network, but it is in poor condition and only 43 km of it is paved. There are no railways and long-distance travel within the province relies on the river and other waterways. Many areas (e.g. the Ikoko Impenge health area) can only be reached by motorbike or foot. People travel primarily on foot or by bicycle (sometimes up to 500km), or by dugout canoe along tributaries and rivers.

These logistical challenges not only impact response operations but must be taken into consideration when asking communities in more remote villages and forest camps to seek treatment, show up for vaccination campaigns or conduct safe burials.

During the epidemic, the World Food Programme (WFP) set up a helicopter, which would sometimes undertake 6 flights per day to bring supplies from Mbandaka to Bikoro, Itipo and Iboko. Some of the health and administrative officials who participated in this research, lamented the inefficiency of this method, as the helicopter could not transport much weight. Many communities wished that the response team had invested in rehabilitating road infrastructure – an investment which would continue to serve them today.

Local people, especially youth groups, could also have benefitted from the income they would have made from path clearing and road rehabilitation. At the beginning of the Equateur epidemic, groups of young men protested in order to petition for jobs. This was also documented in Nord Kivu.[15]

Capacity-building recommendation

›› Positively harnessing youth groups to help with logistics including clearing roads and building bridges during the epidemic, would provide the infrastructure necessary to strengthen future preparedness.

1.2.3 SUBSISTENCE AND ECONOMY

The majority of the population relies on agriculture for subsistence and cash crops.[16] People also hunt, fish and gather medicinal and edible plants from the forest, as well as wood for the production of charcoal. In and around the urban centers or larger rural centers, many people are involved in trade and commerce, some of which centers on the bushmeat trade. *See also, 1.3.4 Consumption of game meat.*

Poverty is systemic and entrenched in many parts of rural DRC. The average household lives on less than $1 per day. People struggle to find the money to pay for health care and school fees to send their children to school. Subsistence farming is hard, and many people suffer from health conditions, such as hernias and back problems, related to the work they do in the fields or when carrying water or firewood. According to the WHO, in 2015, over 22.3% of deaths of women of reproductive age were associated with childbirth.[17] Infant mortality is high (nearly 1/10 live births),[18] and malnutrition is estimated to threaten the lives of 2 million children.[19]

Crops harvests can fail, and domestic animals can be wiped out during epidemics. Many hunters report seeing fewer and fewer wild animals in the forest since the bushmeat trade intensified following the civil wars. This means that many people are hungry and undernourished. Beyond these issues related to rural poverty, DRC is facing an economic crisis on a national scale and the cost of living is becoming unmanageable for many households.

Understanding the implications of rural poverty in Equateur Province can help responders understand why Ebola epidemics (and the resources they bring) are often seen as an issue about wealth more than health.

[14] Alcayna-Stevens & Bedford (2018)
[15] Oldenburg (2018).
[16] Alcayna-Stevens & Bedford (2018)
[17] WHO (2015).
[18] World Bank (2017).
[19] UNICEF (2017).

1.3 HEALTH, SANITATION AND RISK

The following section summarizes the health context of Equateur Province. It examines the factors which exacerbated the outbreak or led to challenges in the detection and control of the epidemic. It also examines the strengths of DRC's community health networks, which mitigated the epidemic and should be harnessed during any outbreak to ensure that interventions build on the social and cultural resources of the communities they seek to support.

1.3.1 HEALTH SYSTEM & SURVEILLANCE

The province of Equateur has 284 health centers and 18 hospitals for a population of over 2.5 million people. Rural communities may live up to 15km from the nearest health post and 30km from the nearest health center.

There are few qualified doctors in rural areas, and almost all services at health centers and health posts are provided by nurses, midwives and auxiliary health workers, some of whom have never received formal training. Even those with formal training are not necessarily trained to spot diseases of epidemic potential. Nurses who participated in the research at the epicenter of the epidemic (Ikoko Impenge and Itipo) emphasized that they had never heard of Ebola prior to the outbreak and had no idea of the risks of contagion when they began treating the first cases.

A doctor at Bolenge hospital in Mbandaka also suggested that after the epidemic had been declared, some nurses continued to find identifying suspected cases difficult. This is in part because the early symptoms of EVD are similar to some of the most common diseases found in the region, such as malaria and bacterial or parasitic infection of the digestive system: high fever, headache, weakness, muscle pain, nausea, vomiting, diarrhea, weakness. The nurses we encountered in Mbandaka city who had felt more confident in identifying cases were those who had received some training during the 2014 Ebola outbreak in the Boende region, 450km away.

Even when nurses were concerned by patients' symptoms, they lacked the necessary protective equipment to treat suspected cases of EVD. Normally, health centers and health posts receive supplies from international bodies via the general hospital, but they experience frequent shortages and are often almost devoid of medicines, equipment and other materials. They often have limited infection prevention control mechanisms, poor sanitation and hygiene, and electricity shortages. People often travel great distances to seek adequate healthcare, if they are able, and this increases the spread of an epidemic.

Many doctors and nurses who participated in the research in both rural and urban areas emphasized the difference which could be made in early treatment of cases if they had isolation wards, personal protective equipment (PPE), decontamination materials and incinerators.

They also suggested an immediately accessible epidemic fund. The head of the provisional health division (DPS) told us that provincial epidemic investigation teams often lack the food, fuel and on-hand cash necessary for investigations of suspicious cases in rural areas. This can delay the alert which would lead to an investigation by competent and experienced INRB epidemiology teams, and thus the declaration of an epidemic.

There are two further factors which can lead to delays in national epidemic investigations: (1) many health posts are supported by the church (either Protestant or Catholic) rather than the state, and alerts at the local level are not always taken into consideration by the health zone hospital. This is what happened in Boyeka village in early 2018, which many local people still believe was the origin of the Ebola epidemic; (2) People often seek treatment from many different sources, and epidemics may take some time to become visible to biomedical health practitioners.

The greatest strength in the Congolese health system is the capacity and commitment of community health workers (RECO), community outreach units (CAC) and local health committees (CODESA) – *See also: 2.1.3 Community health workers*. As several of the local health actors interviewed for this research emphasized:

"Epidemics are nothing new"

In order to be effective, response teams must utilize these existing local health structures and actors.

Capacity-building recommendation

›› Pilot a variety informal communication and reporting systems for churches, leaders, traditional health practitioners and community health workers to report concerns which have not yet been picked up by state health facilities.

1.3.2 SANITATION

Almost no households in Equateur Province have access to running water and many rural communities struggle to access safe drinking water. Following the epidemic, in September 2018, some villages, such as Moheli, were still receiving drinking water from Oxfam. Many people suffer from chronic parasites and bacterial infections as a result of poor quality drinking water.

Many households also lack adequate pit latrines. Although most people sweep and tidy their yards once or twice per day, domestic animals and small children often defecate nearby during the day, and open-air waste pits are located near houses. While people typically bathe once per day at the nearest river or stream, few people have a habit of washing their hands before eating. Both of these factors exacerbate the transmission of disease.

Operational recommendations

›› Children should be encouraged to wash their hands after defecation and before eating when at school and health actors should encourage hand-washing, especially to mothers visiting for routine check-ups or vaccinations.

›› People can be encouraged to wash with soap made from ashes, which is affordable and readily available, and projects could be develop to stimulate local soap-making, through which women could also supplement their income.

1.3.3 HEALTH-SEEKING PRACTICES

Care-seeking practices are not static but shift and evolve in response to immediate conditions.[20] Communities are pragmatic and try multiple courses of action in an effort to effect a cure, seeking out different types of care either consecutively or in parallel (including biomedicine, prayer, self-medication and consulting traditional healers). *See also, 2.1.5 Alternative explanations.*

Whilst rural Congolese are frequently described as seeking alternative care over biomedical treatment, this is often the result of structural barriers that prevent access to biomedical services, including direct and indirect costs associated with consultations and treatment; distance from home to point of service, lack of services (e.g. drug stockouts), or discrimination. These factors are also very important in understanding why patients may choose one health facility over another (for example, while the first cases of EVD were from the health zone

Strengthening health & sanitation systems

›› Training materials should be developed on detection of epidemic diseases and case monitoring, to be integrated into the training nurses receive – particularly nurses working in rural, forested areas.

›› Efforts should be made to expand the SANRU Rural Health Program (*Projet Santé Rurale*) which works to improve the quality of and access to primary health care and provides free malaria prevention and treatment projects – and to develop similar projects for diarrheal disease.

›› Hospitals should have a readily-accessible epidemic fund, which can be used in emergency contexts and to investigate suspicious cases of epidemic proportion.

›› Health centers should be stocked with kits containing chlorine and EP for suspicious cases and the protection of health actors, as well as incinerators for hazardous biological waste.[1]

›› Isolation wards should be built into all health centers to aid investigation of suspicious cases.

›› Efforts should be made to ensure access to safe drinking water (wells, natural springs) in all rural villages in DRC in collaboration with the national school and village sanitation programme (*Ecole et Village Assainis*).

›› All households should have one well-maintained pit latrine made from affordable, locally-available materials.

[20] Alcayna-Stevens & Bedford (2018)

of Bikoro – Ikoko Impenge village – most had travelled for treatment to nearby Itipo, in the health zone of Iboko, rather than the general hospital of Bikoro, which is where they had been referred but which was much further away.

Traditional medicine includes medicinal herbs and massage (to treat broken bones and fractures). Some of these treatments can be effective in treating certain illnesses, although they can also be dangerous, as dosage can be difficult to estimate, and herbal remedies can be fatal when taken along with biomedical drugs (sometimes expired or of poor quality) bought from pharmacies, markets and informal drug vendors. During the Ebola epidemic, certain communities have attributed the fact that they never became sick to the fact that they took herbal prophylaxis throughout the epidemic.

Caring for sick relatives is very important in Equateur. When a person becomes an in-patient s/he is accompanied by their family members, who feed and care for them. Both the sick and deceased must be washed by their relatives. This is a deeply emotional and cultural practices which cannot be dismissed. However, it does render people susceptible to infection. When preparing the body of a deceased relative for burial, for example, people clean not only the outside of the body, but its cavities, which greatly increases their chances of coming into contact with infected body fluids. This is especially risky with cases of EVD, which is most contagious after death.

Operational recommendation

›› Traditional healing should not be dismissed. Training should be offered to traditional healers and religious leaders about safety, sanitation and how to spot diseases of epidemic potential which may go beyond the care they can offer.

1.3.4 CONSUMPTION OF GAME MEAT

Experts have still not identified the reservoir species for Ebola, and while they have very strong hypotheses about how 'zoonotic spillovers' into human populations occur,[21] they do not yet have firm evidence. With their knowledge of forest animals and ecosystems, rural people who use the forest daily can be valuable sources of information about the emergence of such zoonotic diseases.

Game meat is a valued source of protein throughout the province. It is a source of subsistence or income, as local hunters either consume it with their households/extended families or sell it on a local or regional scale. These two factors, and the fact that most of the time that people eat game meat, they do not become sick, leads many to be resistant to the idea that it could be a source of Ebola.

Messages which prohibit or stigmatize the eating or selling of game meat can be harmful to people's health and income, because they may end up reducing their protein intake and unable to make money selling meat – they may have no alternative source of income. This is one of the reasons that some people demand work from response teams as 'compensation.'

Demonizing bushmeat can also have the effect of stigmatizing hunters, many of whom are from PA communities and already marginalized and suffering from extreme poverty. *See also, 1.3.1 Ethnic minorities.*

During the epidemic, the Health Minister, Oly Ilunga, emphasized that bushmeat hunting, trade and consumption were not prohibited, but that people were strongly discouraged from eating animals found dead or dying in the forest. While Dr Ilunga's statements were clear, some of the information and training workshops nonetheless suggested an outright ban on bushmeat consumption, and even dissuaded people from eating forest fruits.[22]

Operational recommendation

›› As in previous outbreaks, a total ban on wildlife consumption is often counterproductive, raises suspicions and is likely to be rejected by the local population.[23] The message should be about animals found dead or dying in the forest.

Capacity-building recommendation

›› Veterinarians and epidemiologists specializing in zoonotic disease and a 'One Health' approach should be deployed in rural regions to monitor the health of wild and domestic animal populations.

[21] Leroy et al (2009).
[22] Duda (2018).
[23] Bonwitt et al (2018).

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