

From “never again” to the “new normal”:

What does the 2018–2019 Ebola outbreak in the Democratic Republic of the Congo tell us about the state of global epidemic and pandemic preparedness and response?

A report by the *"Independent Oversight and Advisory Committee for the WHO Health Emergencies Programme"* as a contribution to the work of the *"Global Preparedness Monitoring Board"*.

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Any assessment of the state of the Ebola response in North Kivu and Ituri must start with a recognition of the bravery and dedication of the individuals working for the Ministry of Health, Congolese civil societies, UN agencies, and non-governmental organizations in a complex and insecure operational environment.

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Executive summary

About this report

The scale of the tragedy caused by the 2013–2016 Ebola epidemic in West Africa exposed serious failings in the way the world prepares for, and responds to, health emergencies. In the wake of the crisis the UN system and a constellation of international organizations, national governments, and international NGOs embarked on several initiatives to reform key aspects of global epidemic preparedness and response, from financing to clinical research. “Never again” was the collective refrain.* And yet, in June 2019, a typical headline in the UK press read “‘Terrifying’ Ebola epidemic out of control in the Democratic Republic of the Congo”.†

What has happened, why, and what do the answers to those questions tell us about the state of the world’s preparedness for pandemic threats? Those are the three overarching questions posed by the [Global Preparedness and Monitoring Board](#) (GPMB), and which we set out to explore in this report. We are the [Independent Oversight and Advisory Committee](#) of the WHO Health Emergencies (WHE) Programme; since 2016 we have been providing independent advice on the performance of the WHE programme to WHO’s Director-General and WHO’s governing body, the World Health Assembly.

In the process of researching this report, we travelled from Kinshasa, the capital of the Democratic Republic of the Congo (DRC), 1500 kilometres east, to the city of Butembo, a historic trading hub in North Kivu that has found itself at the centre of the outbreak. Along the way we spoke with representatives from a broad cross section of affected communities; representatives of local and international non-governmental organizations; Ministry of Health staff, from the Minister of Health to coordinators and responders in the field; donors; WHO leadership and staff; and staff and leadership from other UN technical agencies. We used these conversations to supplement and validate desk-based literature reviews and phone interviews.

Findings

Contrary to the predominately negative coverage of the response since the outbreak in North Kivu and Ituri was first declared on 1 August 2018, it is important to note that many of the fundamentals of an effective response were put in place within days of the declaration of the outbreak. The response in the first weeks of August was the fastest, best equipped, and best-funded in the history of Ebola outbreak response, in no small part due to the effect of some of the reforms that followed the wake of West Africa tragedy. And yet the outbreak in North Kivu and Ituri persisted and spread, crossing the national border to Uganda in June 2019, and reaching Goma, the capital of North Kivu in July 2019.

The outbreak now stands, more than one year, 3000 cases, and 2000 deaths since its declaration, as a complex manifestation of the national and global successes and failures in health emergency preparedness and response since West Africa, and of the intersection in eastern DRC of insecurity, regional and international geopolitics, fragile and fragmented health systems, and the legacy of humanitarian need left by more than three decades of conflict in which civilians continue to be deliberately targeted.

Eastern DRC is in the grip of a protracted humanitarian crisis. Just over 25% of the country’s current \$1.65 billion humanitarian appeal had been funded at the time of writing‡, although this figure is rising. The previous annual appeal was under 50% funded. Crisis-affected communities have largely had to fend for themselves.

The response to date has not been able to control the outbreak because it has been unable to gain adequate access to affected communities for the activities that form the backbone of an effective response – contact tracing and surveillance, safe and dignified burials, and vaccination – to gain traction. Two primary barriers have limited access to affected communities. First, security, and in particular attacks on communities and the response by armed groups. Horrific attacks

* For a selection of reports and recommendations made during and after the 2013–2016 West Africa Outbreak, see:

Never Again (Oxfam briefing paper): https://www.oxfam.org/sites/www.oxfam.org/files/file_attachments/bs-never-again-resilient-health-systems-ebola-160415-en.pdf

The Review Committee on the Role of the International Health Regulations (2005) in the Ebola Outbreak and Response (pdf): http://apps.who.int/gb/ebwha/pdf_files/WHA69/A69_21-en.pdf?ua=1

Report of the Ebola Interim Assessment Panel: <https://www.who.int/csr/resources/publications/ebola/ebola-panel-report/en/>

The Harvard Global Health Institute and London School of Hygiene and Tropical Medicine Independent Panel on the Response to Ebola: [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(15\)00946-0/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(15)00946-0/fulltext)

The US National Academy of Medicine Commission on a Global Health Risk Framework: <https://www.nap.edu/initiative/commission-on-a-global-health-risk-framework-for-the-future-for-the-future>

The WHO Executive Board Special Session on the Ebola Emergency: <https://apps.who.int/iris/handle/10665/253468>

The UN Secretary General’s High-Level Panel on the Global Response to Health Crises (pdf): https://www.un.org/News/dh/infocus/HLP/2016-02-05_Final_Report_Global_Response_to_Health_Crises.pdf

† See Guardian (accessed 13 June 2019): <https://www.theguardian.com/world/2019/may/15/terrifying-ebola-epidemic-out-of-control-in-drc-say-experts>

‡ See UN OCHA appeal portal for DRC: <https://www.unocha.org/drc>

against communities in affected areas in September and October 2018 led to the temporary shut down of the response.

In December 2018, the previous national government postponed national elections in North Kivu and Ituri on the pretext of the ongoing outbreak (despite advice that this was unnecessary from a public health standpoint).^{*} Since then, threats and sporadic attacks against the response and affected communities have increased in frequency and severity. The motives that underlie these attacks are often opaque, but several reports have cited political disenfranchisement as a factor.[†] The idea that Ebola is a tool that serves corrupt political and financial ends has also taken root in many communities. After decades of neglect, the sudden surge of governmental and international attention towards affected communities has aroused suspicion.

To date, seven health workers directly involved in the response have lost their lives to violence. The death toll among civilians, UN peacekeepers, Congolese security forces and their assailants is higher. Each attack is a tragedy for those directly affected, and a tragedy for those who will come to be affected by the outbreak as a result, as each temporary shut down of the response helps the virus spread.

The second, and arguably more important, barrier that has limited the effectiveness of the response has been the limited community acceptance of the response. By their nature, the interventions that form the backbone of an effective response go to the very heart of community life, and require the explicit consent of individuals and implicit consent of affected communities.

The interventions at the core of the response are intrusive in the sense that they touch on many aspects of daily life in affected communities, some of which, such as the burial of the dead, are of profound personal and cultural significance to those involved. The degree to which affected communities

accept these interventions can vary widely, both within and between different communities. To be effective, a response has to first be able to elicit the views and concerns of affected communities, and second, use this intelligence to adapt interventions to community needs. Although there have been some successes, as yet, the response in North Kivu and Ituri has not yet been able to do this consistently.

As in West Africa, part of the problem can be attributed to a lack of involvement on the part of the broader humanitarian systems. This is now starting to change, but the fact that it has taken almost 12 months to replicate best practices from West Africa points to deficiencies in the way the international response has been coordinated. Crucial decisions on when to transition from a disease-focused health response to an integrated health and humanitarian response, when to activate various UN interagency mechanisms, when to appoint empowered UN leadership, and even, to some extent, when to implement new vaccination strategies, have been made on an ad hoc, reactive basis.

In more benign conditions it is fair to say that the speed and the scale of the initial response would have put a rapid end to the outbreak, as it did in DRC's next most recent Ebola outbreak in Equateur province in May 2018, which was brought to an end in under 3 months.[#] But if the May outbreak in Equateur province painted a flattering picture of progress since West Africa, the North Kivu and Ituri outbreak has provided another reality check. There are substantial issues around how a public health response should operate in the context of a humanitarian crisis that are yet to be satisfactorily addressed: who coordinates and leads what and when in the field, which partners are included when, how best to manage the flow of funds to the frontline, and how to put communities at the centre of the response. Many of these issues were left unresolved after West Africa, leaving gaps that are manageable in small outbreaks but untenable in a crisis on the scale of the North Kivu and Ituri outbreak.

^{*} See BBC: <https://www.bbc.co.uk/news/world-africa-46686870>

[†] See Social Science in Humanitarian Action briefing note: https://opendocs.ids.ac.uk/opendocs/bitstream/handle/123456789/14497/SSHAP_Local_and_social_media_brief_3%20February_April_2019

[#] See WHO Disease Outbreak News: <https://www.who.int/csr/don/25-july-2018-ebola-drc/en/>

At this point, however, it might be best to pause and reflect on some of the wisest words written in the wake of the West Africa outbreak. Writing in the preface to the 2016 report *The Neglected Dimension of Global Security: A Framework to Counter Infectious Disease Crises*,* the authors acknowledged the need to reinforce international mechanisms to lead, coordinate, and resource the response to infectious disease crises. But, they cautioned, “we should avoid the temptation to see such initiatives as being in any respect a complete answer. These may be the most visible actions, and perhaps the least difficult to achieve, but that does not mean they are the most important.”

Although much of what we focus on here speaks to those “most visible actions”, we must also recognise that ultimately, the most consequential drivers of this outbreak have been the “least visible inactions”: a failure to invest in national health systems, address broad development needs in Eastern DRC, achieve and strengthen IHR core capacities. To make a “truly significant impact to humanity and to human prosperity”, the authors wrote, “we must catalyse the building of stronger public health capabilities and infrastructure at a national level, even in failed and fragile states, and do so in a way that establishes effective community engagement.” The outbreak in North Kivu and Ituri is, in almost every respect, testament to the wisdom of those words.

Recommendations

In light of our findings, we have identified a number of recommendations for broad consideration.

Preparedness

- In 2015, the Commission on a Global Health Risk Framework for the Future challenged the world to “turn fine words into action” on health emergency preparedness.* The North Kivu and Ituri outbreak must bring about a new call to action. The success of the IHR Monitoring and Evaluation Framework,

including the voluntary Joint external Evaluation initiative,† has given us an idea about how far we are from where we need to be. WHO has supported national governments to develop National Action Plans for Health Security,‡ but governments have been slow to fund and implement these plans. To kick start that progress, WHO, the World Bank, the UN, international and national NGOs and national governments should work to identify a priority list of the most fragile countries, and areas within countries, to receive core IHR capacity strengthening as part of a broader package of context-specific, community-centred health and development initiatives. This would directly benefit global health security, and should be funded as a global public good via an international pooled fund presided over by the World Bank and WHO. It is past time to put emergency preparedness on an equal footing, politically and financially, with emergency response.

- National governments should consider the possibility of separate health security action plans in subnational areas that have substantially different health system characteristics, security dynamics, and epidemiological risk factors compared with the rest of the country under evaluation. WHO should assist Member States to share best practices and approaches for subnational IHR capacity assessments and action plans, including plans for conflict areas.

- In 2015, the Report of the Ebola Interim Assessment Panel§ recommended that WHO adopt a new approach to staffing in country offices, noting that “the country circumstances must be taken more fully into account, and the highest level of capacity must be ensured for the most vulnerable countries. At country level, the WHO Representative must have an independent voice and be assured of the full support of the Regional Director and the Director-General, if challenged by governments.” This remains an urgent priority, and is a prerequisite to building the institutional relationships between WHO and humanitarian partners at national level than can be called on during emergencies.

* See: The US National Academy of Medicine Commission on a Global Health Risk Framework: <https://www.nap.edu/initiative/commission-on-a-global-health-risk-framework-for-the-future-for-the-future>

† See WHO: <https://extranet.who.int/sph/ihrmf>

And <https://www.who.int/ihr/procedures/joint-external-evaluations/en/>

See WHO: <https://www.who.int/ihr/procedures/health-security-national-action-plan/en/>

§ Report of the Ebola Interim Assessment Panel: <https://www.who.int/csr/resources/publications/ebola/ebola-panel-report/en/>

Leadership, partnership, and coordination

- In West Africa, the wider humanitarian system came to the response very late. In North Kivu and Ituri, the same is true despite the outbreak occurring in the midst of one of the world's most protracted and complex humanitarian crises. There is clearly still a fundamental problem with the way the UN humanitarian system and WHO interact during health emergencies.

As an outbreak evolves, there is a need to decouple decisions on when to transition from a health-focused response to a broader health-humanitarian response, and when to appoint empowered whole-of-UN leadership, from internal and external political pressures. This need is most acute in insecure settings, and when dealing with communities with a broad constellation of unmet humanitarian needs, where the consequences for delaying decisions can be most severe. At present, there seem to be no clear decision-making algorithms that govern how and when different UN agencies and partners become involved in an emergency health response, and when broader UN leadership is required to coordinate that response. We propose that, at the risk assessment stage, or at the strategic planning stage of an outbreak response, WHO, partners (including humanitarian partners), and national authorities agree thresholds for key indicators, beyond which a cascade of pre-agreed actions would be taken, including but not limited to the involvement of humanitarian partners, high-level political advocacy, and the appointment of UN-wide leadership from a roster of pre-qualified emergency coordinators.

Financing

- At the time of writing, the North Kivu outbreak is in the paradoxical position of being big enough, as the second largest of its type in history, and lethal enough, to satisfy UN [Central Emergency Response Fund](#) (CERF) funding criteria originally intended for large-scale humanitarian disasters, but falling short of the World Bank's [Pandemic Emergency Financing](#)

[Facility](#) (PEF) criteria designed specifically to “fill the financing gap that occurs after the initial outbreak and before large-scale humanitarian relief assistance can be mobilized”. Clearly this gap remains to be filled in a coherent and predictable way. We urge WHO and World Bank to ensure that the second incarnation of the PEF is designed to do so.

Community engagement

- As late as February 2019, WHO and the DRC Ministry of Health acknowledged that the “poor monitoring of community feedback, the low utilization of Knowledge, attitudes and practices (KAP) surveys, and other studies and surveys” was hampering the ability of the response to gauge and adapt to community attitudes and concerns.* The use of these tools, and the quantitative and qualitative expertise provided by partners such as the [Social Science in Humanitarian Action Platform](#), should be an integral part of the strategic planning process, with thresholds linked to community attitudes and sentiment beyond which pre-agreed course-correction procedures would be triggered. Surveillance of community attitudes and perceptions must be treated with as high a priority as epidemiological surveillance from the outset of an outbreak.

Community engagement must be a two-way process that both shapes community behaviour and shapes the response strategy. It must be integral to response structure, technical design and decision making, rather than a standalone tool used to persuade communities to adapt to the requirements of a response. Engagement of local health care providers is key, given their knowledge of their community's health-seeking behaviours, and the need to gain their support in implementing infection prevention and control measures that are fundamental to outbreak containment and workforce protection.

Security

- Insecurity and conflict pose a profound challenge for public health outbreak response and preparedness. In these contexts, humani-

* See the Strategic Response plan for the Ebola Response February to July 2019: <https://www.who.int/emergencies/crises/cod/drc-ebola-srp-v20190225-en.pdf?ua=1>

† See A Closer Look at Acceptance, Humanitarian Practice Network: <https://odihpn.org/magazine/a-closer-look-at-acceptance/>

tarian actors have traditionally been able to operate by adopting an acceptance model as the core part of their security management strategy.* Most commonly, this relies on negotiating consent from all parties, with a particular focus on groups that might seek to obstruct humanitarian actors. Success with this approach can take time, and is dependent on accurate and comprehensive analyses of context, conflict dynamics, and the perceptions of local populations.

Applying the acceptance model of security management to an outbreak response presents several challenges. The skills required in terms of political negotiation, conflict analysis, and social science are not currently part of outbreak emergency operational culture. The dependence of the acceptance model on starting with a small operational footprint, and building trust by cultivating a perception of political neutrality and independence, are also difficult to reconcile with the usual mode of public health outbreak response, which is government-led and seeks to rapidly scale to a size that matches the size of the outbreak.

The [Polio Eradication Initiative](#) provides an interesting model of how an infectious disease public health programme can be adapted, with variable success, to deal with some of the problems posed by insecurity and conflict. As part of preparedness for inevitable future outbreaks in conflict settings, it will take research, innovation, experimentation and

collaboration between international NGOs, the UN's security system, humanitarian actors and WHO to identify the most appropriate models of security management for outbreak responses at different scales.

Innovation

- Given the opportunities afforded by biomedical innovations, all countries should be prepared to implement investigational diagnostic, vaccine and treatment protocols, and consider biomedical and social behavioural science research as an integral component of their public health emergency preparedness plans. There needs to be ongoing support for lower-income and middle-income countries to develop their research, regulatory, ethics and operational capacities, learning from the experience of Guinea, Liberia, and Sierra Leone during the 2013–2016 outbreak, and DRC in 2018–2019.

The [WHO Blueprint for Research and Development](#) has enabled patients to access cutting edge therapeutics from the onset of the outbreak, and ensured that a coordinated trial of rationally prioritized therapeutics was able to enroll patients within 3 months of the onset of the outbreak. A similar approach is now required for non-biomedical interventions, to coordinate and prioritize operational and social science research.

* See A Closer Look at Acceptance, Humanitarian Practice Network: <https://odihpn.org/magazine/a-closer-look-at-acceptance/>

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Introduction

About this report

The 2013–16 epidemic of Ebola virus disease (EVD) in West Africa was a watershed moment. Over the course of three years, an EVD outbreak in a remote Guinean village escalated into a major health emergency and a humanitarian crisis affecting three neighbouring West African countries — Guinea, Liberia, and Sierra Leone. Imported cases were reported in a further seven countries. The scale of the tragedy caused by the outbreak — over 28 000 cases and 11 000 deaths — exposed serious failings in the way the world prepares for, and responds to, health emergencies. “Never again” was the collective refrain, and myriad high-level panels and commissions made the case for sweeping reforms of almost every aspect of the world’s ecosystem of epidemic and pandemic preparedness and response, from financing to clinical research.*

The World Health Organization (WHO), in particular, instituted a programme of structural reforms to address wide-ranging criticisms of its early role in the response, launching the [WHO Health Emergencies Programme](#) in 2016. The United Nations system moved to clarify the roles and responsibilities of its various technical and humanitarian agencies during health emergencies in the context of humanitarian crises. The World Bank launched new mechanisms for funding preparedness for, and response to, [pandemic threats](#). Under the aegis of the [WHO Blueprint for Action to Prevent Epidemics](#), a consortium of funders, researchers, UN agencies and NGOs came together to agree new protocols and insurance mechanisms to ensure that cutting-edge experimental vaccines and therapies could be made available to populations affected by emerging and re-emerging pathogens. The [Global Preparedness Monitoring Board](#) (GPMB) was established in May, 2018, to monitor emergency preparedness across national governments, UN agencies, civil society and the private sector.

And yet, on 15 May 2019, almost a year to the day that the GPMB was launched, a typical headline in the UK press read “Terrifying” Ebola epidemic out of control in DRC”.†

What has happened, why, and what do the answers to those questions tell us about the state of the world’s preparedness for infectious threats? Those are the three overarching questions posed by the GPMB, and which we set out to explore to inform the work of the GPMB. We are the IOAC (Panel 1) — the [Independent Oversight and Advisory Committee](#), established in 2016 to provide independent feedback and advice to the WHO Director-General and the World Health Assembly about the functioning of the WHO Health Emergencies Programme.

Approach

The GPMB is primarily concerned with national and global preparedness for health emergencies. At present, Ebola is not a disease that is likely to cause a global pandemic (panel 2), but is capable of causing a major regional epidemic with international consequences. For this report, we have tried to focus on what the response to the current outbreak tells us about the world’s preparedness for dangerous, highly lethal pathogens in general, rather than its ability to respond to outbreaks of viral haemorrhagic fever specifically.

We approached the research phase of the report in two parts. Throughout March and April, we used desk research and several face-to-face meetings in Geneva to narrow our field of enquiry down to a number of key areas. Between 24 April and 2 May, we travelled first to Kinshasa, then to Goma, and finally to Butembo. We spoke with representatives from a broad cross section of affected communities; representatives of local and international non-governmental organizations; Ministry of Health staff, from the Minister of Health to coordinators and responders in the field; donors; and leadership and staff from WHO and other UN technical agencies. Our conclusions draw on their testimony, and we are extremely grateful to everyone we spoke with for their time, their trust, and their candor.

Our areas of focus were initially guided by desk research and interviews in Geneva, and subsequently further narrowed down in the field to six distinct, but interrelated themes.

* For a selection of reports and recommendations made during and after the 2013–2016 West Africa Outbreak, see:

Never Again (Oxfam briefing paper): https://www.oxfam.org/sites/www.oxfam.org/files/file_attachments/bp-never-again-resilient-health-systems-ebola-160415-en.pdf

The Review Committee on the Role of the International Health Regulations (2005) in the Ebola Outbreak and Response (pdf): http://apps.who.int/gb/ebwha/pdf_files/WHA69/A69_21-en.pdf?ua=1

Report of the Ebola Interim Assessment Panel: <https://www.who.int/csr/resources/publications/ebola/ebola-panel-report/en/>

The Harvard Global Health Institute and London School of Hygiene and Tropical Medicine Independent Panel on the Response to Ebola: [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(15\)00946-0/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(15)00946-0/fulltext)

The US National Academy of Medicine Commission on a Global Health Risk Framework: <https://www.nap.edu/initiative/commission-on-a-global-health-risk-framework-for-the-future-for-the-future>

The WHO Executive Board Special Session on the Ebola Emergency: <https://apps.who.int/iris/handle/10665/253468>

The UN Secretary General’s High-Level Panel on the Global Response to Health Crises (pdf): https://www.un.org/News/dh/infocus/HLP/2016-02-05-Final_Report_Global_Response_to_Health_Crises.pdf

† See Guardian (accessed 13 June 2019): <https://www.theguardian.com/world/2019/may/15/terrifying-ebola-epidemic-out-of-control-in-drc-say-experts>

Reaction time

How quickly and effectively did the response get off the mark? And how well has the response been able to anticipate and adjust to events on the ground?

Community engagement: access, consent, and security

Ultimately, everything about Ebola boils down to community. The virus spreads through close contact within social networks. It can only be stopped with the consent and engagement of affected communities. How effectively the response is able to negotiate access and consent, and adapt to the concerns of affected communities in such a complex context, will determine when and where this outbreak ends. How well the health response adjusts to social and political contexts also tells us a lot about our collective ability to respond to future outbreaks of pathogens with pandemic potential in areas afflicted by conflict and competing politicized narratives about the cause of the outbreak and the motivations of national and international responders.

Leadership, coordination, partnership

The failure of various parts of the UN system to work effectively with each other and with partners was one of the defining features of the early response to the West African Ebola outbreak. Have things changed? Have the health and the humanitarian communities learnt how to work together? Who makes the plan, who calls the shots, and who does what?

Financing

The speed at which financing is available determines the speed of the response. The amount of financing available determines the scale. And the distribution of financing determines the make-up of the response. Are we getting this crucial area right?

Preparedness

Does the way we evaluate and strengthen national preparedness need to change? And how are countries adjacent to the current outbreak preparing for potential imported cases?

Innovation

One of the success stories of West Africa was the groundbreaking trial of an experimental vaccine against the disease. We looked at how technical and policy innovations developed during and after West Africa have been translated into action in the current outbreak.

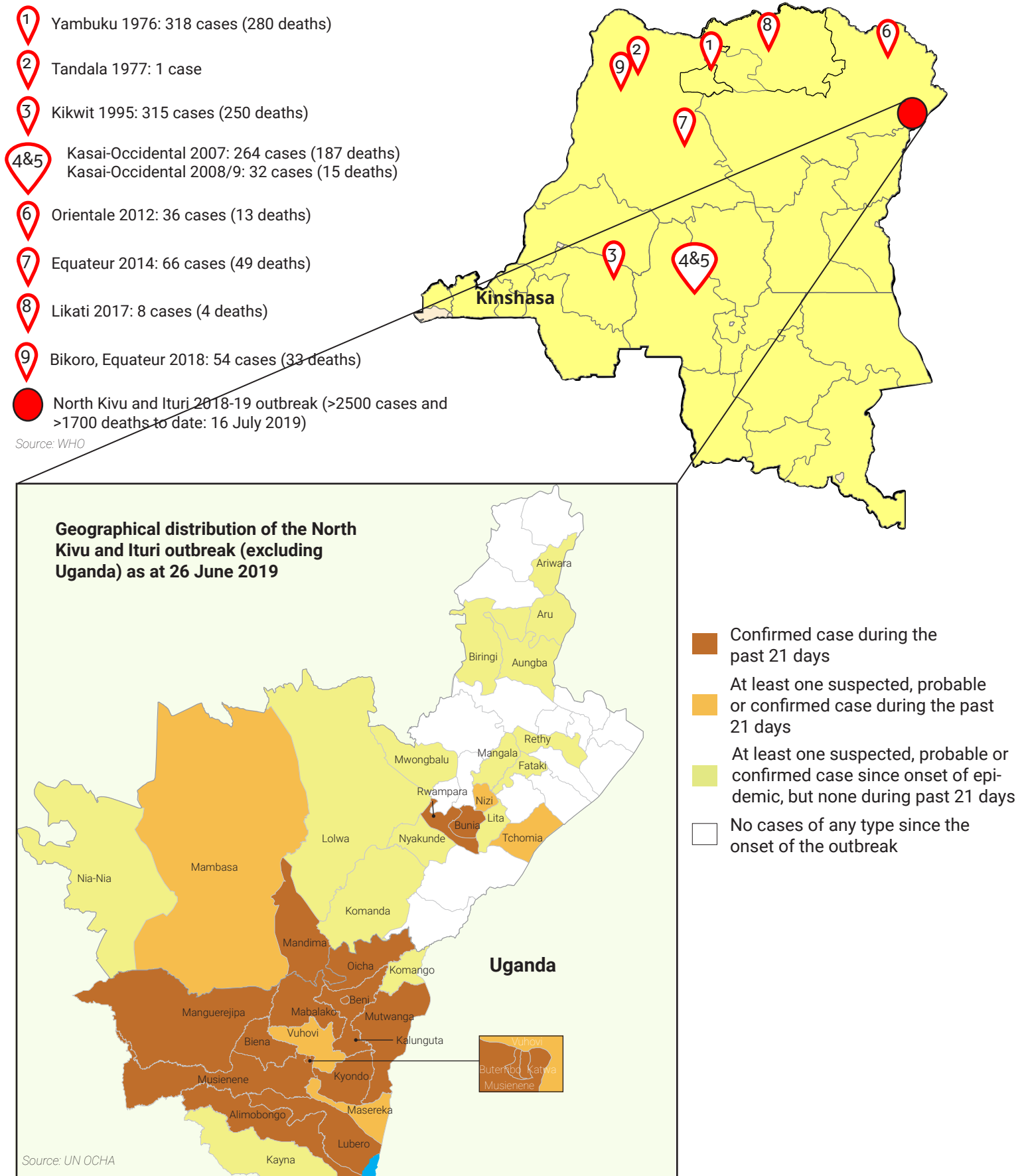
In the wake of the West Africa outbreak, these areas were identified by a number of high-level panels and reports as crucial to address in order to prevent a recurrence of that tragedy, and each has influenced, to a greater or lesser extent, the trajectory of the North Kivu and Ituri outbreak.

Inevitably, any assessment of the response will focus heavily on the actions of WHO. In 2016, WHO's Member States reaffirmed

Panel 1 | About the authors

The Independent Oversight and Advisory Committee for the WHE Programme (IOAC) was created in 2016 to provide independent scrutiny of the WHO Health Emergencies Programme, and its management of health emergencies. The IOAC advises the WHO Director-General, and regularly reports to the World Health Assembly and WHO's Executive Board.

Members of the IOAC serve in a personal and independent capacity. For more on the IOAC's terms of reference, and its members, see: https://www.who.int/about/who_reform/emergency-capacities/oversight-committee/en/.

Figure 1 | **Past and present Ebola virus disease outbreaks in Democratic Republic of the Congo**

their intent that WHO be the world's lead agency in health emergency response. The creation of the WHO Health Emergencies Programme, at the request of Member States, was designed to ensure WHO was able to fulfill that mandate.

The creation of the WHO Health Emergencies Programme is probably the highest profile of the reforms to the international mechanism of outbreak response since West Africa; it has played a central role during the response to this outbreak, and we scrutinize that role here. There is, however, an inherent danger of "action bias" in the way we frame the outbreak and the response. Writing in the preface to the 2016 report *The Neglected Dimension of Global Security: A Framework to Counter Infectious Disease Crises*, one of the authors, Peter Sands, acknowledged the need to reinforce international mechanisms to lead, coordinate, and resource the response to infectious disease crises. But, he cautioned, "we should avoid the temptation to see such initiatives as being in any respect a complete answer. These may be the most visible actions, and perhaps the least difficult to achieve, but that does not mean they are the most important."

Although much of what we focus on here speaks to Sands' "most visible actions", we must also recognise that ultimately, the most consequential drivers of this outbreak have been the "least visible inactions": a failure to invest in national health systems, address broad development needs in Eastern DRC, and strengthen IHR core capacities. To make a "truly significant impact to humanity and to human prosperity", Sands wrote, "we must catalyse the building of stronger public health capabilities and infrastructure at a national level, even in failed and fragile states, and do so in a way that establishes effective community engagement." The outbreak in North Kivu and Ituri is, in almost every respect, testament to the wisdom of those words.

From Yambuku to Kivu – a brief history of Ebola in the Democratic Republic of the Congo

Ebola is not new to the Democratic Republic of the Congo – the country has nine previous outbreaks to its name since its first in 1976 (figure 1), with a mean case count of 124. The past three years alone have seen three outbreaks. In 2017, five confirmed cases were

Panel 2 | Ebola: a primer

Ebola virus disease (EVD) is a severe, often fatal illness in humans. Outbreaks almost always start when the virus jumps from wild animals to humans, and spreads from human to human through direct contact with infected bodily fluids. It is often difficult to trace the exact source of each outbreak, but direct contact with uncooked infected bush meat is often cited as the most likely culprit. Since the first outbreak in 1976, outbreak control has relied on applying a standard package of interventions:

- Rapid diagnosis, treatment and isolation of infected patients (often called "case management");
- Strict adherence to infection prevention and control practices in health facilities;
- Disease surveillance, and the tracing and monitoring of any people who may have had contact with an infected person;
- An accurate and rapid laboratory service (a confirmed diagnosis relies on laboratory testing);
- Ensuring that communities are informed and equipped to conduct safe and dignified funeral rites (people are at their most infectious – that is their bodily fluids contain the heaviest load of viral particles – shortly after death);
- Social mobilization – making sure people are aware of the risk posed by the virus, and know the steps they can take to protect themselves.
- Since the large outbreak in West Africa from 2013 to 2016, an effective vaccine for the most common form of the virus – often called the Zaire strain – has also been available, and has been used from the beginning of the outbreak in North Kivu and Ituri in the DRC.

As is probably already clear from the above list, these interventions are intrusive in the sense that they touch on many aspects of daily life in affected communities, some of which, such as the burial of the dead, are of profound personal and cultural significance to those involved. The degree to which affected communities accept these interventions can vary widely, both within and between different communities, and is often cited as the single most important factor that determines the effectiveness of the response to the outbreak. To be effective, a response has to first be able to elicit the views and concerns of affected communities, and second, use this intelligence to adapt interventions to community needs. The shorthand used for this process, which can be done in a variety of ways, is "community engagement".

No drug or therapy is licensed to treat Ebola. Until very recently treatment has relied solely on supportive care – keeping patients hydrated and as comfortable as possible while their immune system tries to fight off the virus. For patients who are diagnosed quickly and receive supportive care in a purpose-built EVD treatment facility, the rate of survival is around 50%. However, in the North Kivu and Ituri outbreak, for the first time, investigative therapeutics have been available to use by clinicians from early on in the outbreak, either through a monitored compassionate use protocol or as part of a clinical trial.

reported from Likati, in the northern province of Bas-Uélé. This mini-outbreak, most likely the tail end of an isolated transmission chain, was largely self-limiting, and was controlled with minimal outside intervention; nobody was vaccinated against Ebola during this outbreak.

In May 2018 an outbreak was reported in Equateur province, in the country's northwest. After the first cases were detected in the market town of Bikoro, the outbreak spread to the large inland port of Mbandaka, infecting a total of 54 people before being declared over on 24 July.* This time the rVSV-EBOV vaccine, which had shown a high level of protection against Ebola virus in the final stages of the West African epidemic, was deployed in the early stages of the outbreak. Over 3300 contacts, and contacts of contacts, were vaccinated before the end of the outbreak.

Then, on 1 August 2018, just days after the end of the Equateur outbreak was announced, a cluster of cases was reported from six health zones (administrative areas) in the east of the country, centred around the urban conurbations of Beni, Butembo, Oicha, Musienene and Mabalako in North Kivu province, and Mandima in the neighbouring province of Ituri (figure 1).

Investigations now suggest that the outbreak probably began in May,[†] at the same time as the Equateur outbreak, although there is no link between the two outbreaks via a human-to-human chain of transmission. The delay in raising the alarm was likely caused by compromised surveillance brought about in part by a strike by health workers in the area because of the non-payment of salaries.

The initial response succeeded in suppressing transmission in the initial epicentres of Mangina, Mandima and Beni, and in some secondary focal points, but was unable to prevent the outbreak from spreading to new areas. The beginning of December saw a significant increase in the incidence of new cases, with transmission centred on the urban areas of Butembo and Katwa. Since then, the outbreak has also emerged or re-emerged to the north, in the health zones of Beni, Kalunguta, Mabalako, and Mandima, to the southwest in the health zone of Musienene, and to the south, between Butembo and the city of Goma, the capital of North Kivu Province (figure 1).

Now, almost a year since the first cases were reported, the country's tenth outbreak has grown in scale and complexity to a degree unprecedented in the country's history. With over 2500 confirmed and probable cases at the time of writing (July 2019) and over 1700 deaths, the outbreak is now larger than all of the country's previous outbreaks combined, and is the second largest outbreak in history after the 2013–16 West Africa epidemic (the country's biggest previous outbreak was in 1976 in Yambuku, with 318 reported cases). On 11 June, Uganda reported a cluster of three imported cases.

Findings

Reaction time – why the fastest, best-equipped Ebola response in history failed to stop the outbreak

From zero to Plan A in 48 hours

In emergencies, delay costs lives. In West Africa in 2013 and 2014, delay was ubiquitous. Ministries of health in affected countries were too slow to detect and report the outbreak, partly because of weak health systems, and partly because of a lack of familiarity with the disease. Once WHO was notified, the organization was too slow to recognize the potential severity of the outbreak. When WHO declared the outbreak a Public Health Emergency of International Concern in August 2014, the Organization had neither the systems nor the personnel to finance, deploy and coordinate a large-scale operational response. Support from WHO, UN organizations, and Member States was late into the field, leaving overwhelmed ministries of health and NGOs in affected countries to fend for themselves for too long.

The contrast with the current outbreak in North Kivu and Ituri is striking. In August 2018, when the Ministry of Health notified WHO of the outbreak, the response assets from the country's previous outbreak in Equateur province, declared over just a several days earlier, were still in place. These included mobile laboratories (run by the country's Institut National de Recherche Biomédicale; INRB), vaccine, cold chain equipment and vaccination teams, a Ministry of Health emergency operations and

* See WHO Disease Outbreak News: <https://www.who.int/csr/don/25-july-2018-ebola-drc/en/>

† See Relief Web: <https://reliefweb.int/report/democratic-republic-congo/drc-2018-ebola-outbreaks-crisis-update-march-2019>

Figure 2 | **WHO performance against Emergency Response Framework standards**





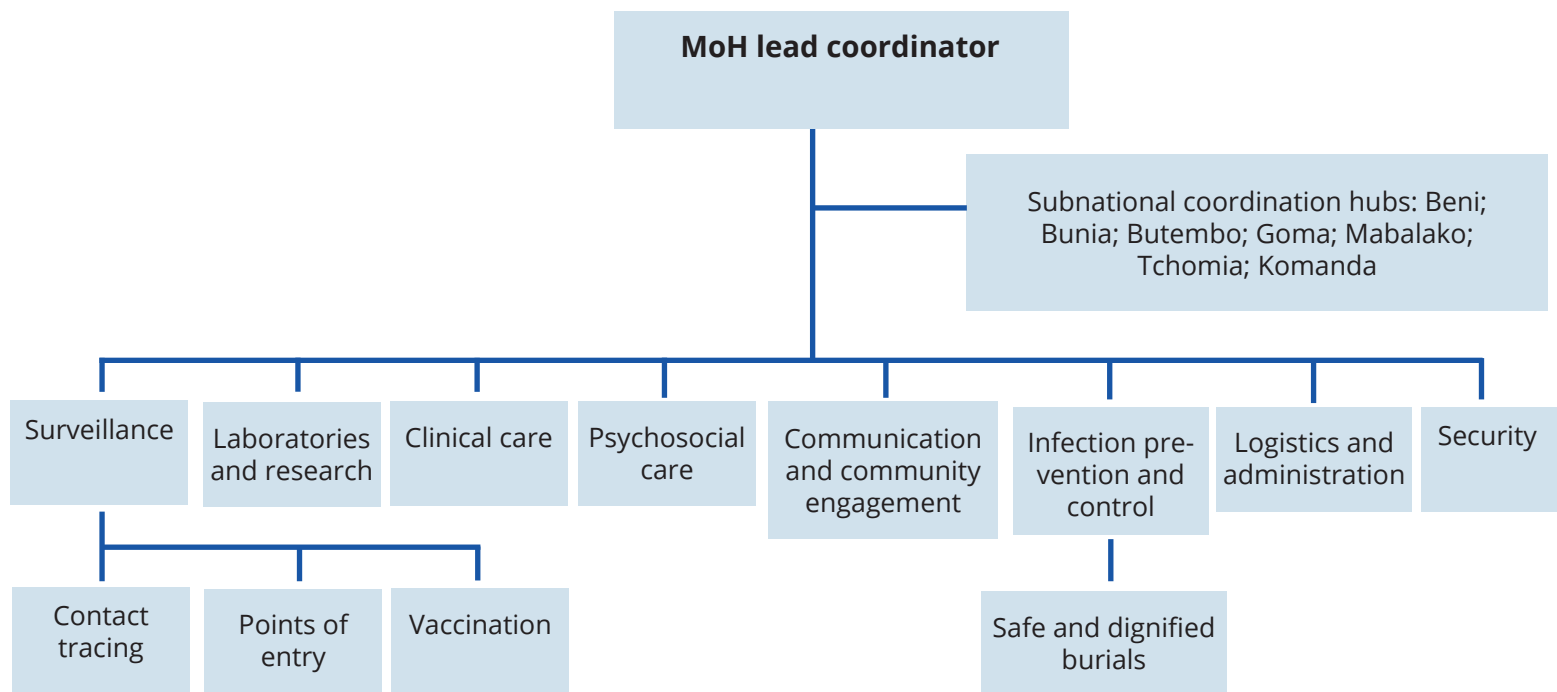
Performance standard	 Target timeframe: 24 hours	Achieved
Ensure safety and security of all staff; activate cascade of calls with all WHO personnel, their dependents, and visitors to ensure their safety and whereabouts, and liaise with UN Department of Safety and Security (UNDSS) locally		<24 h
Appoint national Incident Manager		<24 h
Activate national Incident Management Team (IMT) and assign critical functions by repurposing WHO country office		24 h
Activate rosters; initiate surge		24 h
	 Target timeframe: 24–72 hours	
Convene first health sector / Health Cluster meeting		24 h
Issue initial response strategy, objectives and action plan		<24 h
Issue initial internal situation report		24 h
Review CFE request and, if appropriate, clear it		24 h
Issue global donor alert		48 h
	 Target timeframe: 3–10 days	
Establish / strengthen the Early Warning Alert and Response System (EWARS)		N/A
Agree with Ministry of Health and partners on priority interventions		<3 days
	 Target timeframe: 10–30 days	
Establish monitoring framework for response, including key performance indicators (KPIs)		<10 days
Finalize and issue the strategic response plan and joint operations plan		<10 days
Develop Operations Support and Logistics and procurement plan		<10 days

Figure 3 | **Response structure (as at April 2019)**

Source: DRC Ministry of Health

coordination structure, and WHO's incident management team. WHO's contingency fund for emergencies was able to disburse rapid bridge financing to set up a new incident management system within 48 hours of the confirmation of the first cases, whilst approximately US\$13 million of residual funding from the Equateur outbreak was reprogrammed. This enabled, in essence, the transplantation of the response footprint at the end of the Equateur outbreak to North Kivu and Ituri. Additional funding was secured against the first Strategic Response Plan (SRP1)* within weeks of the first alert cases, which put the response on a sustainable footing for the first 3 months. Every one of the response milestones in the WHO Emergency Response Framework† – the publication that guides the response activities of WHO and health partners – were met (figure 2).

The design of the response follows a similar template to previous outbreaks, with eight pillars – surveillance (including contact tracing, points of entry, and vaccination), laboratories, case management, communication and community engagement, psychosocial support, infection prevention and control (including safe and dignified burials), logistics, and security (figure

3). Each of these pillars feed information up, and receive instruction from, a coordination cell led by the Ministry of Health with support from WHO.

In none of our interviews was anyone critical of the speed with which the initial response was deployed. By contrast, many praised the commitment of the government, WHO, and key health emergency partner organizations for the speed and scale of the initial response. For WHO in particular, this is evidence of marked progress since 2014, and shows that the so-called no regrets policy outlined in WHO's Emergency Response Framework is being routinely implemented. (Briefly, in this context, no regrets means that “at the onset of all emergencies, WHO ensures that predictable levels of staff and funds are made available ... even if it is later realized that less is required ... without blame or regret. This policy affirms that it is better to err on the side of over-resourcing the critical functions rather than risk failure by under-resourcing.”)

What, if anything, does all this tell us about the lessons that have been learned since the West Africa outbreak? In terms of emergency

* See WHO: https://www.who.int/docs/default-source/documents/spr-ebola-2019/srp1-drc-ebola-disease-outbreak-response-plan.pdf?sfvrsn=40799796_4

† See WHO Emergency Response Framework: (pdf): <https://www.who.int/hac/about/erf.pdf>

response, WHO is a very different organization to the one it was in 2013, 2014, and 2015. Not only in this outbreak, but in many cases over the past two years, WHO has demonstrated its ability to coordinate the deployment of multidisciplinary response teams in support of ministries of health and in tandem with key partners from the [Global Outbreak Alert and Response Network](#). In North Kivu, however, the rapid response strategies that had previously succeeded elsewhere in the country in previous outbreaks were insufficient. The question then becomes, at what point, and through what process of deliberation, did the MoH and WHO come to realize that the initial approach to the outbreak – rapid, large in scale but narrow in focus – needed to change?

A word on context

Before we delve into the reasons that the response faltered, it is important to ground our analysis in the context that the response is operating in. The Democratic Republic of the Congo is a vast country, almost the size of Western Europe. At over 1500 km, the distance between the capital, Kinshasa, and Goma, the capital of North Kivu province, is greater than the distance between London and Algiers. And, of course, more than distance separates the western capital and the eastern provinces: culture, language, history, and politics are potent sources of division.

Eastern Democratic Republic of the Congo has seen continuous, very often horrifying conflict since the mid-1990s, fuelled by ethnic violence, political grievances, and regional geopolitics. Civilians have not just been caught in the middle of these conflicts, they have been deliberately targeted.* A patchwork of homegrown and foreign rebel groups operate in Ituri and North and South Kivu, hostile to each other, the Congolese government, and the [United Nations Organization Stabilization Mission in the Democratic Republic of the Congo](#) (MONUSCO). Adding to the volatility are a multitude of local, ethnically aligned armed militias, known as Mai Mai, whose activities and interests intersect, often opaquely, with local economies and politics.

The country is in the grip of a protracted humanitarian crisis, with the vast majority of the 9 million people targeted for humanitarian

assistance concentrated in the east of the country. However, only 25% of the country's current \$1.65 billion humanitarian appeal had been funded at the time of writing†. The previous annual appeal was under 50% funded.

Communities in the east of the country have been forced to fend for themselves, with little support from the national government and often, as they see it, inadequate protection from MONUSCO. With this independence, born of necessity and neglect, comes a degree of understandable suspicion of outside intervention.

To complicate matters further, although DRC has dealt with nine previous outbreaks of Ebola, the populations of North Kivu and Ituri have never experienced the disease. The healthcare system in the provinces is weak, fragmented and unregulated. There are many hundreds of private and publicly run health facilities throughout the affected areas, ranging from small one-bed and two-bed facilities to clinics for up to 40 patients, dispensing care based on an amalgamation of traditional and modern practices. Standards of training and infection prevention and control are very poor.

Missed opportunities

It is often said that even the best-laid plans rarely survive first contact with reality. In North Kivu and Ituri, it was more a case of applying a tried and tested plan without sufficiently taking into account the context of North Kivu and Ituri. DRC's ninth and tenth outbreaks of EVD were separated by just a few days and provincial borders, but they differed in several important ways. The effects of decades of trauma and conflict, profound insecurity, a sense of injustice and of mistrust of authorities within affected communities make eastern DRC one of the most challenging contexts in the world in which to undertake an outbreak response.

The initial response, though rapid, well structured and well resourced, faltered because it misjudged the context, or contexts, it was about to operate in. In emergency response there is always a tension between, on one hand, the need to act fast, and on the other, the need to reach consensus about how to act and when to bring others with you. The decision was taken early on in North Kivu and Ituri to rapidly establish the traditional pillars of an

* For summary see Council on Foreign Relations report on eastern DRC: <https://www.cfr.org/interactives/eastern-congo/#/?cid=soc-at-interactive-the-eastern-congo-infogu-ide-121015>

† See UN OCHA appeal portal for DRC: <https://www.unocha.org/drc>

Figure 4 | Increase in security incidents over time (August 2018 to end April 2019)

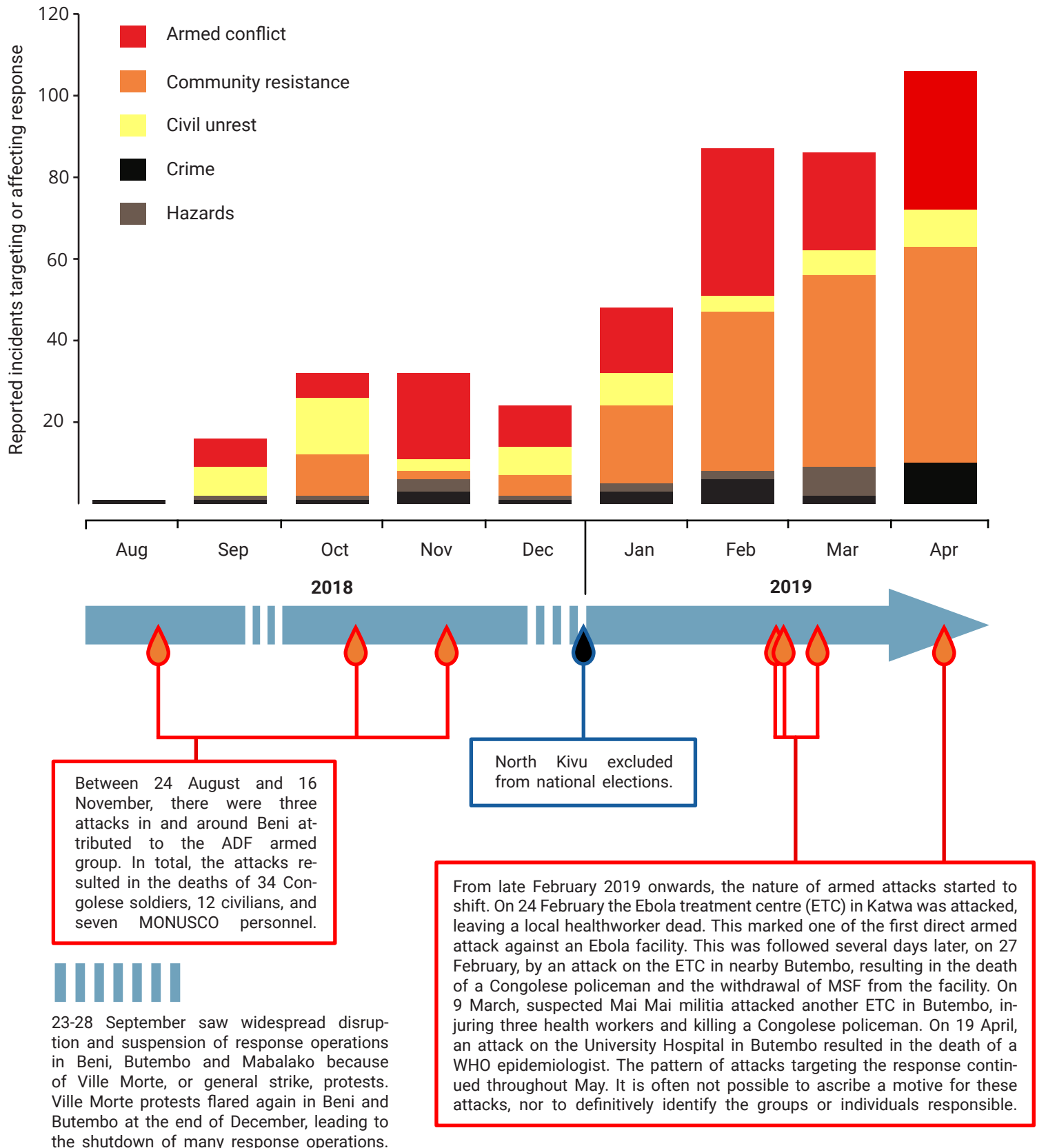
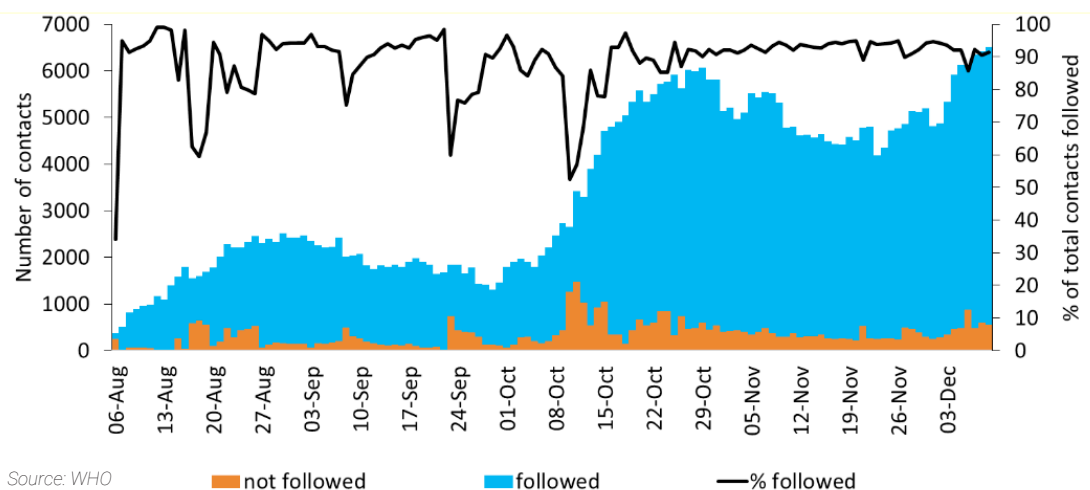


Figure 5 | **Impact of security incidents on proportion of contacts followed per day**

The impact of security incidents on the response is apparent here, with marked reductions in the proportion of contacts followed (black line) in August, September and October coinciding with attacks on affected communities and associated civil unrest.

Ebola response in affected communities, in the context of a humanitarian crisis and ongoing armed conflict, without the formal involvement of humanitarian partners.

Based on our interviews and research, the judgement made by the Ministry of Health and WHO in August 2018 was that humanitarian actors, with the exception of specialized organizations such as [ALIMA](#) and [MSE](#), did not have sufficient presence in the initially affected areas, nor sufficient technical capacity to make an operational contribution to an Ebola response. With hindsight it is easy to find fault with this decision, but Ebola is lethal, the outbreak was close to international borders, and all of the assets for a disease-focused response were in place, including an effective vaccine within days of the declaration of the outbreak.

The initial decision to move rapidly with a large-scale but solely Ebola-focused response was made in good faith. The error was not to revisit this judgment sooner, and not to begin cultivating, at the outset, the capacity of and relationships with humanitarian actors in case they had to be called on later. This must be one of the main lessons learned from the North Kivu and Ituri outbreak. In the midst of a humanitarian crisis, conflict, shattered health systems and widespread deprivation, a narrow, disease-focused response will always be at a

huge disadvantage. There may be some circumstances in which it is not possible to wait until all the players are in line to proceed with a fully inclusive response that addresses a broader set of the priorities of affected communities. But there must now be a recognition that rapid outbreak containment is not possible in the context of widespread unmet humanitarian needs unless the aspects of a broader based response can be brought on stream. The question, in similar circumstances, should not be whether to include humanitarian partners, but rather how soon they can be included. That, in turn, gives rise to more questions: how best to gauge the priorities of affected communities, and how best, and who best, to coordinate a hybrid health-humanitarian response?

The response to date has not been able to control the outbreak for two primary reasons. First, responders have been unable to gain adequate access to affected communities for the core activities of contact tracing, alert investigation, safe burial, and vaccination to gain traction. The two primary barriers that have limited access to affected communities are first, security, and in particular attacks on communities and the response by unidentified armed groups, and second, resistance to the response from communities themselves. Both of these barriers have different drivers, which we explore in more detail later, and their

relative impacts on the response have changed over time. Second, the lack of minimum standards of infection prevention and control in the fragmented and chaotic health system has amplified transmission, whilst the combination of a lack of record keeping in local health facilities and a highly mobile population has masked chains of transmission.

As figure 4 shows, between August and December 2018, a series of horrific armed attacks on civilians and government and UN security forces resulted in the forced shut down of the response. The first attacks came towards the end of September, when an armed attack on civilians in the Ebola-affected city of Beni left 21 people dead.* In the immediate aftermath, security concerns and a period of community mourning resulted in a temporary shutdown. Health workers were unable to reach and monitor contacts (figure 5), investigate alerts of suspected cases, or carry out safe and dignified burials. Crucially, the effectiveness of the ring vaccination strategy depends on the rapid identification and vaccination of the contacts,

and contacts of contacts, around each case.

At around the same time as the September attack, the outbreak started to appear in new areas, and each time the virus emerged in a new area, the painstaking process of trying to understand and engage a new community, and identifying new interlocutors, had to start afresh. This stood in tension with the need to act quickly to implement primary response measures such as vaccination and contact tracing, with the result that as the response ramped up activities in new areas, it often had to do so without a full appreciation of the new context.

Each time the response was wrong-footed by a new location or security incident, the effectiveness of contact tracing, case finding, and ring vaccination fell. More cases went un-reported; more people delayed seeking help at specialized Ebola treatment units until their disease was already at an advanced stage, and often only after exhausting every other treatment option in local health facilities lacking rudimentary

* See WHO: <https://www.who.int/news-room/detail/26-09-2018-who-calls-for-protection-of-humanitarian-workers-and-civilians-in-democratic-republic-of-the-congo>

Figure 6 | **Weekly confirmed case count 2019**

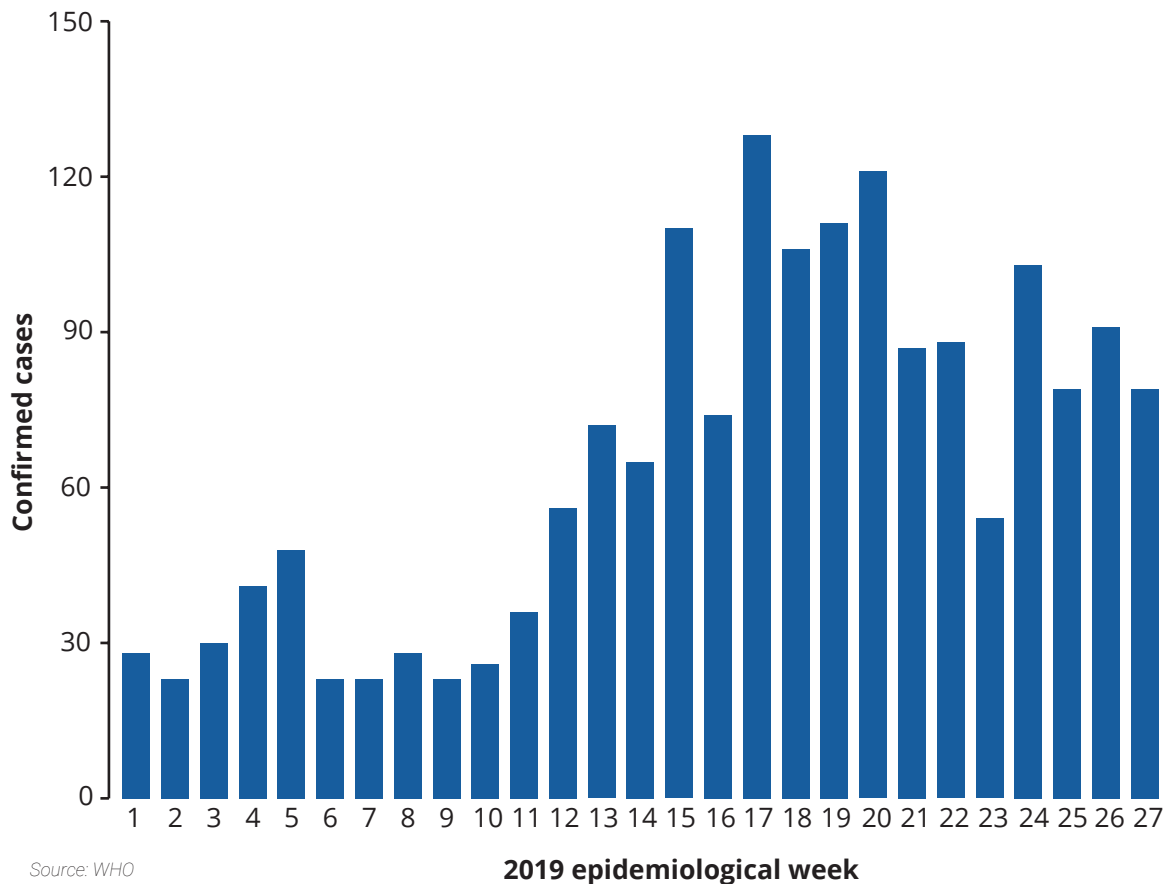


Figure 7 | **Geographical distribution in North Kivu and Ituri: epidemiological week 2 (6 January 2019)**

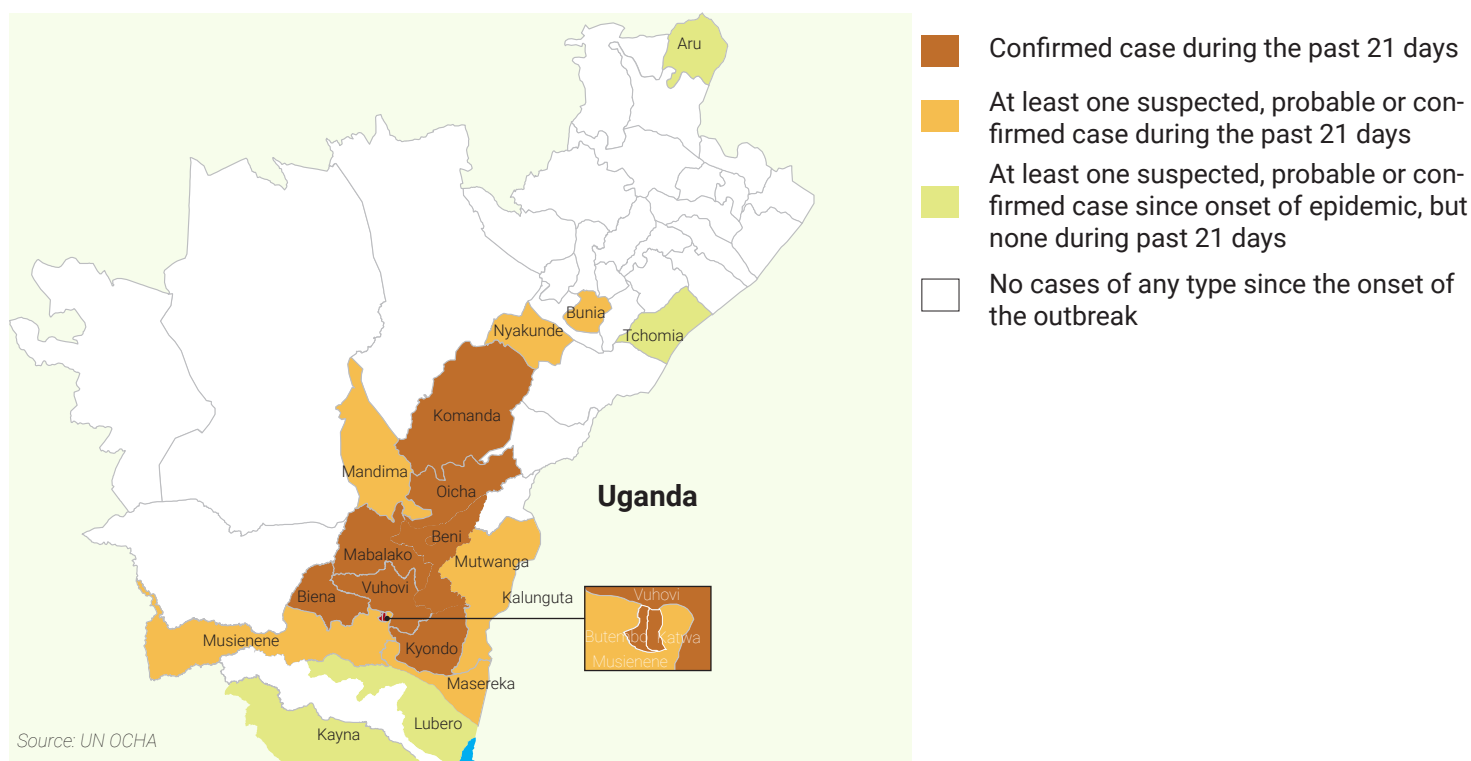


Figure 8 | **Geographical distribution in North Kivu and Ituri: epidemiological week 14 (1 April 2019)**

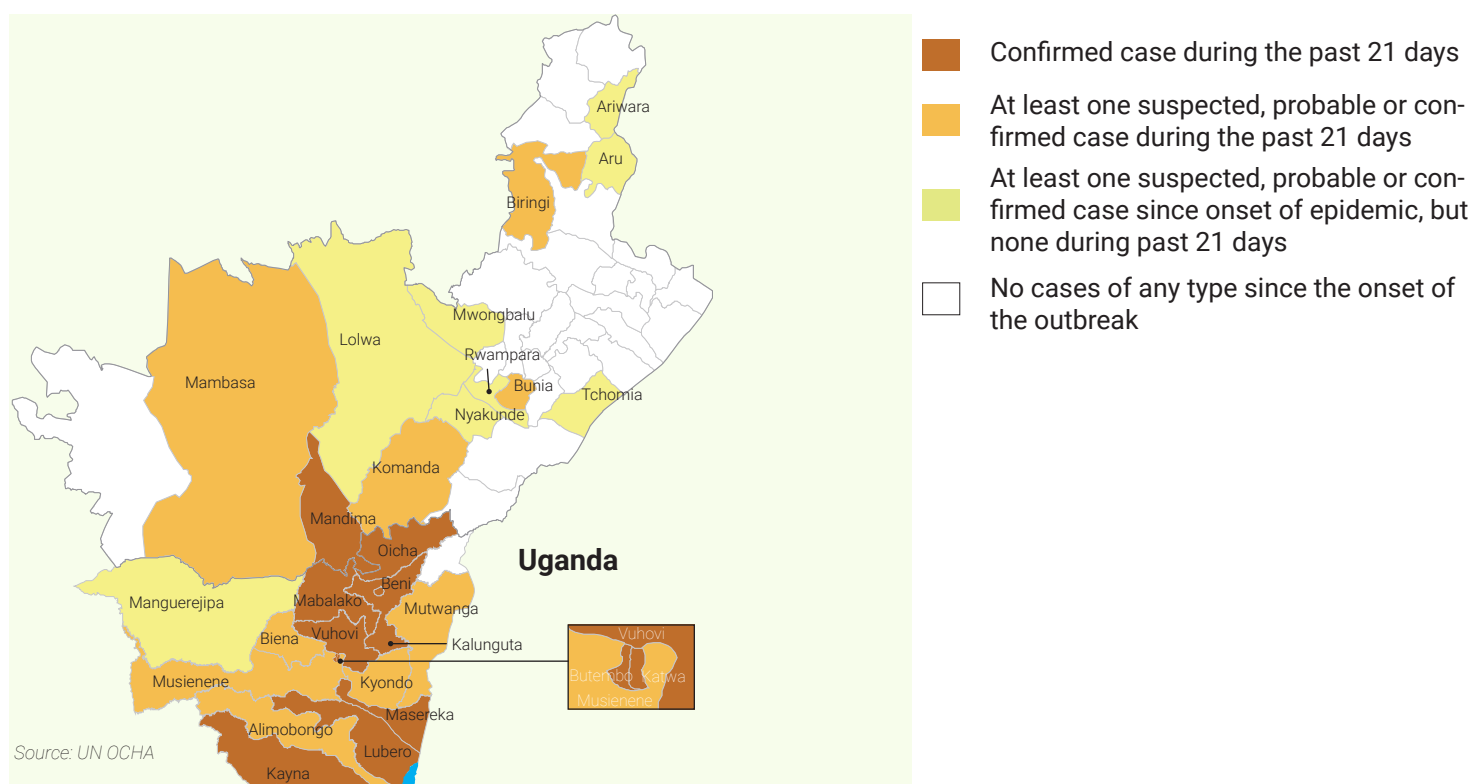
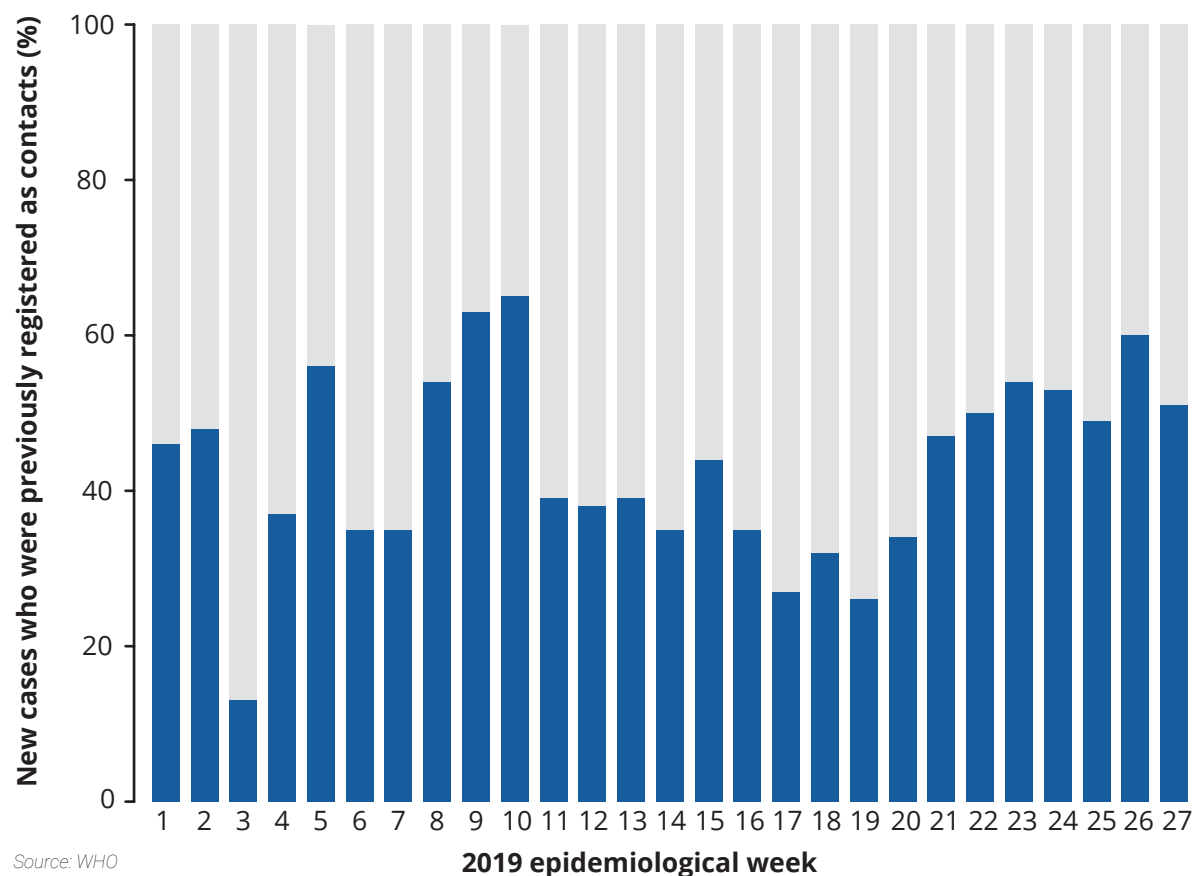


Figure 9 | **Weekly proportion of confirmed cases previously registered as contacts**

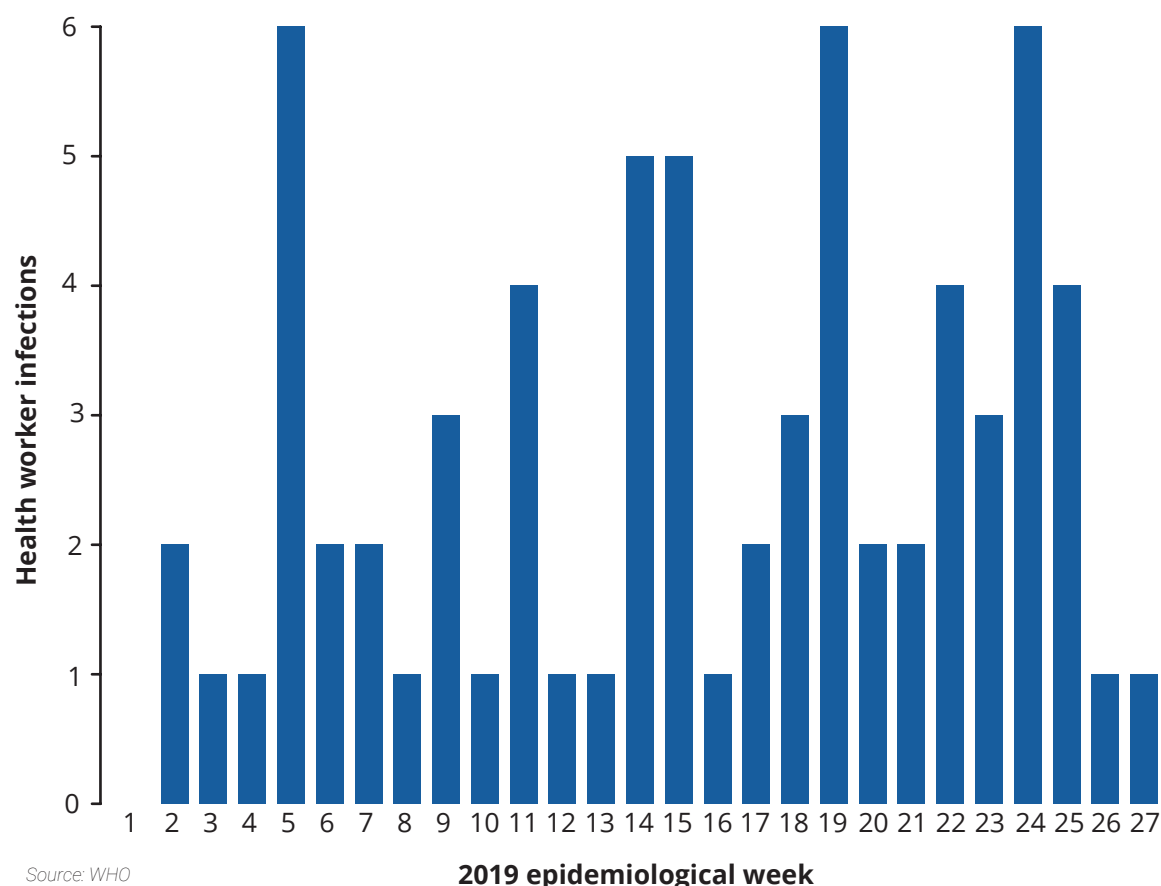
infection prevention measures.

Every new area affected increased the exposure of the response and the risk of a security incident. As those security incidents began to occur regularly from late September onwards, each unavoidable temporary shutdown of the response was akin to hitting the reset button on crucial interventions in the field (figure 5), and the virus escaped further from view.

By the beginning of October the outbreak had already resulted in almost 200 cases in two months – nearly four times the number during the previous outbreak in Equateur. The first strategic response plan (SRP1) was only intended to cover the period from August until the end of October, so drafting of a second Strategic Response Plan (the SRP2)* was under way, although the plan wouldn't be finalized and published until 22 December.

Everything is clearer with the benefit of hindsight, but SRP2, as a moment to regain the initiative in the outbreak, was a missed opportunity. This would have been the moment to move from a disease-focused, self contained, rapid response approach, to a footing that brought humanitarian partners on board to address some of the broader concerns and priorities of the affected communities. Despite acknowledging the difficulties facing the response, noting that "current tracing of contacts remains challenging in all locations [due to a high degree] of population mobility, community resistance, refusals for follow-up, and lack of reliable registers at health facilities", what SRP2 called for, in effect, was more of the same but bigger. In addition to maintaining the response in Beni, Mangina, Mabalako, Butembo and Katwa, Tchomia and Komanda, SRP2 requested resources for active response teams in 10 additional Health Zones. By the end of December, the North Kivu and Ituri response, and preparedness activities in

* See WHO (pdf): <https://www.who.int/emergencies/crises/cod/drc-srp-revised-v22december2018-EN-vF.pdf?ua=1>

Figure 10 | **Health worker infections during 2019**

surrounding countries, accounted for over half of all WHO deployments in the African region during 2018.

Perhaps most frustratingly, SRP2 did acknowledge the need for humanitarian actors in affected areas. “Compared to the scale of the response to Ebola,” the authors write, “the humanitarian funding and support provided is extremely limited. This may further alienate the local population, have a negative impact on the acceptance of Ebola response and humanitarian actors, and potentially make it difficult for actors to operate after the Ebola epidemic.” The authors go on to say that “coordination between Ebola and humanitarian actors, as well as adequate communication with communities, is therefore crucial”. It was, and still is, crucial, but nothing was done at this point to change the way the response was coordinated, nor to reach out

to humanitarian actors and formally include them in the response.

This leads us to the second major lesson that should be learned from this outbreak, and it is a thread that runs through the rest of this report, from leadership and coordination to financing: the need to set objective thresholds to trigger changes of course.

Triggers: part one

Outbreaks usually start small. Often, a well-resourced and coordinated rapid response can prevent them from getting any bigger. In extremely complex outbreaks, which the North Kivu and Ituri outbreak certainly is, the chances of such a rapid response succeeding are reduced. We must think more carefully about how, as an outbreak evolves, the response

crosses certain thresholds of operational and financial scale beyond which new actors are needed, and new models of leadership, coordination, and financing are required. And we must also consider how to use the wealth of operational and epidemiological data generated by a response to trigger strategic adjustments with greater agility.

If we jump forward in the story of the North Kivu and Ituri outbreak so far, to May 2019, we can see that WHO, the Interagency Standing Committee, and the UN implicitly acknowledged that the outbreak and the response had crossed these thresholds. They did so by activating the Humanitarian System-Wide Scale-up for Infectious Disease Events* – “an internal measure, designed to adjust the humanitarian response when it is already underway”. They did so by appointing MONUSCO Deputy UN Special Representative of the Secretary-General (DSRSG) David Gressly to the post of UN Emergency Ebola Response Coordinator (EERC)[†] in the Ebola affected areas of the DRC. And they did so by announcing that, “in partnership with the Government and all partners [the UN] is now strengthening its political engagement and operational support to negotiate access to communities”. The question is, what can be done to ensure these decisions are taken earlier, rather than delaying until an outbreak has become a crisis?

One possible solution would be to set pathogen-specific and context-specific thresholds at the beginning of an outbreak that would trigger a set of pre-agreed actions. These could range from something as simple as a high-level call with partners and donors to brief them on a significant change to the situation, to a formal transition from a disease-focused to a broader based response accompanied by UN-wide leadership and coordination through a UN Emergency Response Coordinator. Defining or advising on these thresholds could form part of the initial risk assessment process for pathogens with pandemic potential, and should certainly figure in the first iteration of a Strategic Response Plan. Defining what success and failure looks like at an early stage, ideally the planning stage, of a response would remove some of the tacit incentives in the current system to minimize bad news, and delay seeking or acknowledging

the need for help until a situation has escalated. But we will return to this subject later.

Politicization

The end of December was an inflection point. At 600 cases, the outbreak was almost twice the size of the country's first and previously worst outbreak in Yambuku in 1976. Crucially, it was at this point that the government (now previous government) in Kinshasa announced its decision to postpone national legislative elections in North Kivu, which had been scheduled for late December, until March 2019, citing the Ebola outbreak as the reason. At a stroke, this tainted the response by association with a narrative of political disenfranchisement at a point when, with the publication of the third strategic response plan (SRP3),[#] the response was about to significantly increase its footprint.

Many of the problems that have beset the response since December have their genesis, at least in part, in the intentional politicization of the outbreak. Whereas the response had been, to a large extent, caught in the crossfire of armed groups between August and December, from early 2019 onwards the response itself started to be threatened, and in some cases targeted directly, with increasing frequency (figure 4). Incidents of community resistance also began to rise significantly month on month, although the drivers of that resistance are multifaceted and explored in more detail below.

SRP3 did acknowledge the need to change the way the response interacted with affected communities. This need was also articulated by senior WHO leadership before and during December 2018. Both SRP3 and WHO leadership also flagged the potential disruption brought about by the postponement of elections in North Kivu and Ituri. But these acknowledgements did not translate into operationally significant changes in the field.

Struggling to regain the initiative

When we arrived in Goma, which at the time was the coordination hub for the response, and later Butembo at the end of April, response activities had only recently restarted after the tragic murder of Dr Richard Valéry Mouzoko

* See notes from IASC meeting 29 May: <https://interagency-standingcommittee.org/principals/documents-public/summary-iasc-principals-meeting-29-may-2019>

† See UN: <https://www.un.org/press/en/2019/sga1886.doc.htm>

See Relief Web: <https://reliefweb.int/sites/reliefweb.int/files/resources/drc-ebola-srp-v20190410-en.pdf>

Kiboung, a WHO epidemiologist. Dr Mouzoko died from a gunshot wound sustained during an attack by an armed group on 19 April 2019 at Butembo University Hospital, where he was chairing a meeting with Congolese front-line health workers involved in the response. At that time Dr Mouzoko was the third member of the response to be killed. Since then, four others have lost their lives.

After ten months of courageous, exhausting work by teams on the ground, cases were increasing at their fastest rate since the start of the response (figure 6), the outbreak was spreading geographically (figure 7, 8), and other key indicators of the effectiveness of the response were alarming. The proportion of new cases who had been previously listed as contacts, a key indicator of the effectiveness of contact tracing, had fallen to its lowest level since January, at under 30% (figure 9). And despite the vaccination of health workers, and almost 10 months of effort to improve standards of infection prevention and control in the hundreds of health facilities throughout the affected health zones, not a single full week had passed in 2019 without at least one health worker becoming infected (figure 10).

Despite the incredibly difficult circumstances, the WHO team and other responders remained fiercely committed, although many people admitted to concerns for their safety. And despite clear and increasing tensions between partners at an institutional level, there was an abundance of mutual respect amongst and between personnel from different organizations involved with the response. But there was also a pervasive and palpable sense of frustration. Everyone we spoke to, whether they were from WHO, the Ministry of Health, donors, NGOs, and nobody more so than the hundreds of representatives from the community in Butembo, pointed to the dislocation of the response from the community as the key factor that had rendered the response ineffective. But progress in translating this knowledge into operational change was frustratingly slow.

Community engagement: access, consent, and security

No solution without community

By their nature, the interventions that form the backbone of an effective response – contact tracing, safe and dignified burials, identification and treatment of the sick – go to the very heart of community life. In this outbreak, for the first time, we can also add vaccination to the list of interventions available to the response, requiring the informed consent of individuals and the tacit consent and understanding of affected communities.

In West Africa, this lesson was learned and re-learned through trial and error, at different times and in different places. The initial concept of community engagement as a process of “educating and informing” communities was gradually forced to give way to a more nuanced understanding that engagement means listening, learning, and adapting the response on a case-by-case basis. For example, many of the best practices in the design and operation of Ebola Treatment Centres to make them more humane, welcoming spaces for patients and their families, were first identified and implemented in West Africa after patients and survivors were consulted about which features they thought would improve patient experience. These community-led adaptations, and others like them, were essential precursors to changing health-seeking behaviour.

Although the scale of the outbreak in North Kivu and Ituri is still smaller than in West Africa, the dynamic relationship between the response, affected communities, national and local politics, and politically and ethnically aligned armed groups is much more complex. This is the first response to an Ebola outbreak in such an active and complex conflict zone.

Community engagement in the current response configuration falls within the remit of the communication pillar (figure 3), and until now has been seen primarily as a tool with which to change community attitudes and behaviour through a one-way, didactic process. At the time of our visit, approximately 20 anthropolo-

gists were deployed within the communication pillar through the Ministry of Health, WHO, and UNICEF, but they were used to relay messages on behalf of the response, rather than bringing their analysis to bear on how the response is perceived by communities, and how the response can be adapted to better meet the needs of affected communities. Intelligence that is gathered also tended to remain in silos, either at the pillar level or geographically, rather than translating into real-time adjustments in other arms of the response. SRP3, published in February 2018, noted the “poor monitoring of community feedback, the low utilization of knowledge, attitudes and practices (KAP) surveys, and other studies and surveys”. This had not changed significantly by the time we arrived in late April.

In parallel to the work done as part of the response, The [Social Science in Humanitarian Action Platform](#) (SSHAP) has, since the beginning of the outbreak, mobilized networks of anthropologists, social scientists, and experts in eastern Democratic Republic of the Congo to provide sociocultural analyses of the local context that explain, to a large extent, the continued tension between the response and communities, and possible paths to defusing these tensions and building trust. For example, a recent analysis of social media messaging found widespread messaging describing Ebola as dangerous, emphasising that the outbreak must be brought to an end, and expressing frustration when response teams attribute the spread of the outbreak to a lack of community buy-in*.

SSHAP analysis also suggests that communities crave more facilitated discussion forums in which “local communities can ask questions and receive further detailed information about treatment and laboratory procedures”, amongst other aspects of the response. This certainly chimes with our experience. At a town hall meeting with local civil society organisations, where we expected tens of people to turn up, we were greeted by a crowd of over 200 highly engaged and informed participants, eager to air concerns and ask questions about the response. The local WHO and Ministry of Health coordination team did an incredible job of organizing the meeting, and similar outreach

sessions have since become an important way for the response to find common ground with communities.

Security, and the danger of catch-22

The lack of a clear feedback mechanism for the community is a barrier to building trust and understanding. When given an opportunity to peacefully set out concerns about the response, the community will gladly take it, and community members expressed a strong preference for mechanisms to report perceived corruption, or rumours of the undue use of force by response teams.

We heard concerns from community members about the role of state security forces in the Ebola response, and we were told of instances in which members of the Congolese National Police and the national army overstepped from their role as protective escorts of the response to heavy-handed enforcement. WHO staff acknowledged that although rare, these cases had a disproportionately large negative impact on community perceptions of the response. This is also borne out by SSHAP research, which suggests the national security responses are regarded as being “poorly disciplined, and messages report instances of unnecessary force being used against civilians during the response”.

This puts the response in an extremely difficult situation. In a sense, the current response is paying for the past failures of the national and UN security forces to protect these communities. Responders must feel safe and able to operate in affected areas in the face of very real threats from the same armed groups that have attacked affected communities. At the same time, the perceived heavy involvement of the Congolese army and police is alienating many people in affected communities, and increasing the risk of push back from within the community against the response.

There is a danger that the response might, if it has not done so already, cross a threshold of securitisation from which it is not possible to step back. There is an almost impossibly delicate balance to strike here. In some areas it will be unsafe to operate without a highly

*See Social Science in Humanitarian Action briefing note: https://opendocs.ids.ac.uk/opendocs/bitstream/handle/123456789/14497/SSHAP_Local_and_social_media_brief_3%20February_April_2019.pdf?sequence=1&isAllowed=y

visible security presence, but the lack of robust contextual and situational analysis to inform the security posture of the response often means erring on the side of caution and adopting a heavy posture in areas where it may be disproportionate to risk. WHO and the Ministry of Health are not equipped, and cannot be expected to carry out, security risk analyses for a response of this scale in such a complex security environment, but there was no evidence of any meaningful and proactive engagement in the outbreak response by the [UN Department for Safety and Security](#) (UNDSS) or MONUSCO. The appointment of David Gressly (Deputy head of MONUSCO) as the UN emergency Ebola coordinator is a step in the right direction towards addressing these deficiencies.

Business and politics

The suspension of national elections in North Kivu in December was contrary to the advice of WHO,* and caused huge damage to the response. The postponement gave life to a narrative that Ebola was an invention of politicians designed to disenfranchise voters in North Kivu and Ituri, traditional strongholds of opposition to the previous national Government, from influencing the presidential election. This narrative gained increased traction in March, when candidates in local elections used Ebola as a political dividing line. Some of the organized attacks against the response have left messages citing the postponement of elections as a motive for their attack. According to SSHAP, the accurate attribution of these attacks is extremely difficult. Social media messaging and local journalists, SSHAP note, have pointed to the role of “political sponsors” as the ultimate instigators of these attacks.

Local politics also plays into the perception that the Ebola response is a sophisticated form of financial exploitation at the cost of the local population, who perceive that much of the conspicuous wealth of the response is flowing to local hoteliers, vehicle lease enterprises, and politically connected individuals. The huge disparity between the resources available to the highly visible Ebola response, and the lack of resources allocated to other areas of pressing need such as cholera, hygiene and sanitation, food and security, also increase suspicion that the response is a mechanism

for personal enrichment rather than public health and wellbeing.

Vaccines and politics

The narrative that Ebola serves some kind of political purpose also feeds into public perceptions about vaccination. Although take-up of the vaccine amongst eligible recipients is reportedly high, at around 90%, independent studies have found that vaccine acceptance is lower for the Ebola vaccine than vaccines in general, and the strategy of ring vaccination itself remains widely misunderstood.† SSHAP analyses of social messaging suggest that there is a popular narrative that the ring vaccination strategy is biased towards those involved in the response and local political and economic elites, to the detriment of the broader population. There have been many calls from within affected communities for a change to a geographical vaccination strategy.

It is beyond the scope of this report to go into the technical rationale that underpins the ring vaccination strategy, other than to note that it is still an investigative vaccine and the strategy is aligned with the advice of the WHO [Strategic Advisory Group of Experts](#) (SAGE) on Immunization. In the meeting of the SAGE on 2-4 April 2019,‡ the group recommended that “on the basis of epidemiological data and impact modeling ... ring vaccination currently remains the most effective strategy in this DRC Ebola outbreak. Geographic targeting should remain as a fall-back strategy.” On 7 May 2019, following a visit by the WHO Director-General to Butembo, SAGE issued interim guidance that the implementation of the ring vaccination strategy be altered to include limited geographical vaccination,§ with expanded eligibility criteria to include individuals who could “potentially be involved in the tertiary generation of cases”. This approach, they explained, “addresses community requests to offer vaccination to additional members of the community that they consider to be at high risk”.

To be forewarned

A visit by the WHO Director-General and the Regional Director for Africa to Butembo in April acted as a catalyst for action, with the appointment of an empowered UN-wide Ebola coordinator and the activation of a UN system-

* See BBC: <https://www.bbc.co.uk/news/world-africa-46686870>

† See Lancet Infectious Diseases: [https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(19\)30063-5/fulltext](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(19)30063-5/fulltext)

and Social Science in Humanitarian Action briefing note: [https://opendocs.ids.ac.uk/opendocs/bitstream/handle/123456789/14497/SSHAP Local and social media brief_3%20 February April 2019.pdf?sequence=1&isAllowed=y](https://opendocs.ids.ac.uk/opendocs/bitstream/handle/123456789/14497/SSHAP%20Local%20and%20social%20media%20brief%20February%20April%202019.pdf?sequence=1&isAllowed=y)

‡ See WHO: <https://www.who.int/immunization/sage/meetings/2019/april/en/>

§ See WHO (pdf): https://www.who.int/immunization/policy/po-sition_papers/interim_ebola_recommendations_may_2019.pdf

wide scale-up in the weeks that followed. The question we need to answer now is how, in the future, can a response maximize community buy-in, minimize the politicization of the response, and mitigate security risks to the greatest extent possible in an area like North Kivu, when an outbreak occurs in the context of a pre-existing humanitarian crisis in an area hostile to national authorities.

We heard from humanitarian NGOs that, prior to the outbreak, they had been able to interact with and work with communities in North Kivu and Ituri without any visible security measures. They were critical of the visible, and to their minds disproportionate, security posture adopted by the response. However, a direct comparison between the Ebola response and prior humanitarian field work is not particularly instructive. The types of activities that form the backbone of an Ebola response are unavoidably different in nature, more intrusive, compared with the work usually undertaken by humanitarian NGOs in North Kivu and Ituri. Nor were many NGOs present and active in areas such as Butembo and Katwa that were, at the time of our visit, the areas most affected by the outbreak. Added to that, the ongoing presence of a lethal haemorrhagic fever constitutes a radical and traumatic change of context for the community. Nevertheless, there is a lot to be said for the importance of bringing as much of the existing expertise in the humanitarian sector to bear on questions about community dynamics, security, and the local political economy at the outset of a public health response in the context of a humanitarian crisis.

There are competing narratives as to why health and humanitarian actors have remained in separate silos for the first 10 months of the response. It is clear that despite the ongoing humanitarian crisis in the country, and the activation of the cluster system prior to the outbreak, a relationship has not been cultivated between the Ministry of Health on one hand, and humanitarian NGOs on the other.

It is also clear that WHO does not have the in-house expertise to incorporate a rigorous political and security risk analysis or study of community dynamics into either its initial risk assessment or the subsequent design of a response strategy. It is an open question, though one that should urgently be addressed,

as to whether this capacity should be built into WHO's operational capacity at a regional level, at national level in priority countries, whether it should be harnessed through strengthened partnerships, or a combination of all the above. Indeed, a combination of these approaches is likely to yield the most robust and flexible capacity.

Leadership, coordination, and partnership

A lesson from recent history

"WHO should have engaged the support of the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) and other United Nations agencies and humanitarian actors through the United Nations' Inter-Agency Standing Committee system early in the outbreak. Had the Standing Committee been engaged earlier in spring or summer of 2014, resources could have been made available and known systems put in place. This might have averted the crisis which led to the establishment of United Nations Mission for Emergency Ebola Response (UNMEER).

The Panel observed that there were a number of places where poor partnership with other stakeholders complicated and delayed the response to the crisis. WHO's ability to partner with the United Nations, the private sector and other non-State actors in the Ebola crisis was not as strong as needed. These relationships cannot be established during crises, but need to be developed when building preparedness.

It is well understood that WHO leads the United Nations' Inter-Agency Standing Committee's Global Health Cluster in major humanitarian crises. It is unclear, however, how a public health emergency fits into the wider humanitarian system and at what point an outbreak becomes a humanitarian emergency that requires a broader United Nations-wide response that would include coordination with the many nongovernmental organizations on the ground."

The above passage is an excerpt from the Report of the Ebola Interim Assessment Panel,

published in 2015.* Almost every word still applies in the current outbreak.

Competing narratives

When we arrived in Goma, the relationship between NGOs on one hand, and WHO, the wider UN, and the Ministry of Health on the other, was strained and unproductive. NGOs were furious by what they perceived to be a failure by the Ministry of Health and WHO to seek or value their input in strategic or operational decisions that had a bearing on their ability to serve affected communities. Rather than being consulted as expert peers, they claimed, they were seen merely as service providers. For their part, Ministry staff complained that NGOs show little respect for their technical expertise, for Congo's history of having contained nine previous Ebola outbreaks, and for the government's inherent lead responsibility for addressing public health crises in its territory.

Within the UN, there was also a clear breakdown in communication between WHO and [OCHA](#). At the outset of the outbreak WHO led and coordinated the international response, with UNICEF as the lead for the communication pillar, and a small number of health-focused NGO partners – MSF, ALIMA, [IFRC](#) – to implement clinical care and safe and dignified burials. The International Organization for Migration covered points of entry, and the World Food Programme and MONUSCO were subcontracted for some logistics functions. Individuals have also been deployed to support the response from institutions within GOARN, although security concerns and the low availability of francophones have severely limited deployments to the field by some traditional Member State partners. OCHA has not been integrated into the response, nor has the national health cluster. In an echo of the West African outbreak, accounts of why OCHA remained on the periphery of the response varied widely depending on who we talked to.

The fact remains that the UN's core humanitarian response agencies and their NGO partners were under represented in the response, a fact that at least partly explains the difficulty the response has had in engaging effectively with affected communities.

Triggers: part two

At the last count (in July), over 70 different organizations, ranging from UN agencies,

government ministries, international and national NGOs, and donors were involved in the response. Clearly, managing so many moving parts in what is one of the most complex health emergencies in recent history is beyond the capacity of the planning and coordination architecture established by the MoH and WHO at the outset of the response.

By the time we arrived in Goma in April, the response had clearly exceeded the scale at which this architecture could be effective. The reams of data generated by the increasing size and scale of the outbreak and response led to coordination meetings that typically consisted of lengthy information readouts but no strategic analysis or problem-solving. The system was an impediment to strategic adjustment; was directive rather than collaborative; and operationally cumbersome where agility is at a premium.

Rectifying these diverse coordination and information-sharing deficiencies requires core capacities that do not exist, or exist only in part, at WHO, such as coordination process design, response-wide information management, and multi-stakeholder operational planning. At present within the UN system these functions fall squarely on OCHA.

We also noted the urgent need for an empowered, high-level manager to supervise the totality of the international support effort, working at a strategic level to engage with the Minister of Health, provide strategic direction to the UN bodies working on the response, and free up WHO's field operation to focus on its core comparative advantages. The appointment of a new emergency coordinator, David Gressly, during the preparation of this report is step in this direction. We also noted that the UN [Inter-Agency Standing Committee](#) unanimously decided to "activate the IASC Humanitarian System-Wide Scale-Up Protocol for the Control of Infectious Disease Events to bolster and support the humanitarian response to the outbreak" on 31 May. But both of these decisions bring us back to the need for transparent triggers for key strategic decisions. What we have witnessed over the past 11 months has been a series of decisions on when to change from a discrete health response to an integrated health and humanitarian response, when to activate various interagency mechanisms, when to appoint empowered UN leadership, and even, to some extent, when to implement

* See Report of the Ebola Interim Assessment Panel: <https://www.who.int/csr/resources/publications/ebola/ebola-panel-report/en/>

Table 1 | **Donations to Strategic Response plans 1-3 by donor (August 2018 to May 2019)**

Donor	Amount (US\$)
African Development Bank	1,000,000
China	2,000,000
ECHO	4,679,429
Gavi, the Vaccine Alliance	13,066,143
Norway	1,830,137
Republic Of Korea	500,000
UK Department for International Development	29,842,662
UN Central Emergency Relief Fund	1,701,255
USAID - Global Health	5,000,000
World Bank - CERC	23,760,934
Wellcome Trust and UK Department for International Development	4,160,200
World Bank - PEF	7,200,000
Bill and Melinda Gates Foundation	2,000,000
Total	96,669,000

Source: WHO

new vaccination strategies, made on an ad hoc, reactive basis.

The lack of a predefined, logical progression from one strategy to another based on pre-agreed indicators in West Africa ultimately led to the creation of UNMEER – an extra layer of top-heavy bureaucracy at a point in the response when strategic and tactical agility was most required. At present the decision-making algorithms that govern how and when different agencies become involved in an emergency health response, and when broader UN leadership is required, are opaque and seem to lack a consistent internal logic.

The exception to this pattern, interestingly, has

been the series of decisions by the International Health Regulations Emergency Committee not to declare the North Kivu and Ituri outbreak a public health emergency of international concern (PHEIC). Despite considerable political pressure, the transparent criteria that govern when a PHEIC should be called have been applied consistently throughout the outbreak.

The countries most at risk of an imported case of EVD are already making diligent preparations for such an eventuality, with the support of WHO and partners, whilst the DRC government has led the response and been transparent from the outset. The two primary benefits of the declaration of a PHEIC, to compel countries to notify WHO of the occurrence of a disease,

and to warn neighbouring countries to prepare for the possibility of international transmission, would therefore be of no material benefit in the case of the North Kivu and Ituri outbreak.

The outbreak had already spread hundreds of kilometres north and south before the detection of three imported cases tens of kilometres east of Butembo in a well-prepared Ugandan border district. The arrival of cases in Uganda was inevitable as the outbreak went on, and did not change the fundamental complexion of the situation. The potential harm that the declaration of a PHEIC would do to the already strained relations between the response and affected communities also needed to be taken into account.

In mid-July, the arrival of a case in the city of Goma, an international travel hub and major urban centre, did satisfy the Emergency Committee

that the outbreak constituted a PHEIC.* But by that point, an acute lack of funding to finance the continuation of the response was also a major factor that played into the decision. In the absence of any other objective mechanism through which the response could send a clear signal that it was changing strategy and changing gear, the PHEIC process became the primary focus of donors and national governments† keen for a clear political message that the response was moving to a new footing.

The political pressure brought to bear on the PHEIC deliberations is a sign of the clear appetite amongst donors and national governments for a clear and transparent process that governs how and when to trigger step changes in an outbreak response. The UN should consider how better to systematically monitor and assess the effectiveness of an outbreak response, with pre-planned thresholds beyond which

* See statement of the IHR Emergency Committee (pdf): <https://www.who.int/ihr/procdures/statement-emergency-committee-ebola-drc-july-2019.pdf>

† See Forbes report: <https://www.forbes.com/sites/judystone/2019/06/16/who-surprised-many-by-not-declaring-ebola-a-public-health-emergency-why/#13f931c867d0>

And

Guardian: <https://www.theguardian.com/world/2019/jul/07/declare-ebola-outbreak-in-drc-an-emergency-says-uk-s-roy-stewart>

Figure 11 | **How the Pandemic Emergency Financing Facility works**



Source: World Bank

a pre-planned shift in the coordination and leadership of the response would take place.

This forward planning is especially important when one considers that the current Ebola outbreak took 11 months to reach 2000 cases. In the case of a faster moving, more virulent respiratory disease, there will be no time to “build the ship as it sails”, and it is crucial that the criteria and mechanisms for activating and implementing a UN-wide response are objective, transparent, and stress-tested regularly as part of UN system-wide preparedness.

Financing

Patience stretched

To date, 13 donors have contributed over US\$ 100 million to the three iterations of the strategic response plan (table 1). Representatives from four of the largest donors – the European Civil Protection and Humanitarian Aid Operations (ECHO), UK Department for International Development, World Bank, and USAID – were already based in Goma when we arrived there in April. Without exception, their patience with the way the response was being conducted and coordinated, and the way that funds were being managed, was stretched.

There was mutual miscomprehension between WHO and donors on funding requirements. Donors made it clear they did not consider SRP3 to be a credible plan to fund against, leaving WHO with a rapidly diminishing pool of resources with which to fund a sprawling response.

After ten months of the outbreak, WHO was increasingly struggling to track and account for how funds had been spent, and there are clearly problems with the systems that WHO uses to track implementation. Donors also complained that it was unclear to them where in WHO responsibility lies for tracking expenditure: the country office, regional headquarters or Geneva. A recent reorganization of resource mobilization capacity within WHO as part of the organization's transformation is unlikely to have clarified the issue.

Triggers: part three

From the outset, WHO has acted as the principal funding platform for the response.

This worked well initially with the relatively small amounts of rapid funding released through the pre-defined process of WHO's [Contingency Fund for Emergencies](#) (CFE).

The situation changed from SRP2 onwards, as large influxes of funds arrived from donors at a time when the response was increasing in scale and complexity, outstripping WHO's capacity to disburse and track the large volumes of money required by an ever increasing number of organizations involved in the response.

This brings us back, again, to the issue of triggers, and knowing when the mechanisms used to finance a response need to change as the scale of the response increases. In this outbreak, as in over 90 previous health emergencies since it was established in 2015, the WHO Contingency Fund for Emergencies proved itself to be an invaluable tool for financing the earliest stages of a response. In many outbreaks, the CFE has been the only platform required due to the success of the initial response. In cases such as North Kivu and Ituri, where an outbreak continues to grow in scale and complexity, there is an urgent need for a predictable, scalable platform that WHO can call on once the size and resource needs of a response cross a predetermined threshold. For the North Kivu and Ituri outbreak, a response envelope within the OCHA-managed country-based pooled fund would provide a quick fix: a well-established funding mechanism that has the confidence of NGOs and donors, while also providing WHO with visibility on where funds are going, to whom, and for what. For future health emergencies, there is a strong case for WHO, OCHA, major donors, implementing partners, and ministers of health to be brought together to agree on a shared platform and way of working that is predictable, transparent, engenders trust, and that empowers incident managers at the same time as relieving them of the burden of financial bureaucracy.

Agreeing on when such a platform should be triggered, and how it should be financed, will be key considerations, and lessons must be learnt from the drawbacks of current emergency financing mechanisms. At present there are two major financing facilities that national governments, the WHO, and other responding agencies can request funding from in health emergencies: the UN Central Emergency Response Fund (CERF) and the World Bank's Pandemic Emergency Financing Facility (PEF);

figure 11). Both have very different criteria for funding that have, so far, limited their use in health emergencies.

The CERF was established as a humanitarian tool designed to contribute funds to large-scale humanitarian emergencies in which large-scale loss of life has already occurred. But, again, unlike most humanitarian crises, infectious disease outbreaks usually start small, meaning that CERF funding remains locked behind the life-saving criteria until an outbreak has resulted in a high number of potentially avoidable deaths.

The PEF, by contrast, is a facility specifically designed for outbreaks of a small number of pathogens with pandemic potential: pandemic strains of influenza, coronaviruses such as SARS and MERS, and filoviruses including Ebola and Marburg. The facility has two pools of funds (figure 11): a cash window with funds provided by national governments and other donors, and which can disburse funds in response to independent expert advice; and a larger insurance window, with over US\$400 million funds underwritten by financial market investors, but accessible only once stringent criteria covering pathogen, number of cases, number of deaths, rate of growth, and geographic spread are satisfied.

In the North Kivu and Ituri outbreak, funds have been applied for by WHO and released via the PEF's cash window: approximately US\$7 million to date (July 2019). However, despite Ebola being a pathogen eligible under the insurance window, DRC being an eligible country, the outbreak being the second biggest of its type in history in terms of both case numbers and its geographic distribution, and despite the outbreak having crossed an international border into Uganda, the outbreak falls short of meeting the insurance window criteria due to the fact that, as yet, there have been fewer than 20 confirmed deaths from Ebola in Uganda. Despite this, the World Bank has provided over US\$25 million funding for SRP1 and SRP2 from the Contingent Emergency Response Component (CERC) of the World Bank's overall health system investments.

At the time of writing, the North Kivu and Ituri

outbreak is in the paradoxical position of being big enough, and lethal enough, to satisfy CERF funding criteria originally intended for humanitarian disasters, but falling short of PEF criteria designed specifically to "fill the financing gap that occurs after the initial outbreak and before large-scale humanitarian relief assistance can be mobilized". On the evidence of the North Kivu and Ituri outbreak, this gap remains to be filled in a coherent and predictable way.

Innovation

The adversity of West Africa gave rise to many innovations, many of which have come to maturity in North Kivu and Ituri.

Patients with suspected Ebola can now receive a confirmatory diagnosis in hours rather than days, using rapid diagnostic tests. And cutting-edge, experimental therapeutics have been made available for only the second time during an EVD outbreak through the Monitored Emergency Use of Unregistered and Investigational Interventions (MEURI) protocol.

MEURI is part of a number of measures that have been brought from concept to reality since West Africa through the work of WHO's Research and Development Blueprint for Action to Prevent Epidemics. The Blueprint is a global strategy and preparedness plan with its secretariat in WHO, but that is effectively owned by a broad global coalition of experts from medical, scientific and regulatory backgrounds. It aims to replicate and refine the coordinated efforts that brought the VSV-EBOV vaccine to trial in Guinea during the West African outbreak, whilst avoiding some of the shortfalls in coordination and prioritization that led to the unsatisfactory conduct and conclusion of a number of trials of novel therapeutics during the same outbreak.

In November 2018, enrollment began in a number of Ebola treatment centres for a trial comparing the efficacy of the four experimental treatments that were made available under the MEURI protocol*: the antiviral Remdesivir, and the antibodies ZMapp, REGN 3470-3471-3479, and mAB 114, developed by DRC's National Institute of Biomedical Research and the US National Institutes of Health. In stark contrast to West Africa, the trial in DRC got underway

* See WHO: <https://www.who.int/news-room/detail/26-11-2018-democratic-republic-of-the-congo-begins-first-ever-multi-drug-ebola-trial>

And <https://www.who.int/ebola/drc-2018/treatments-approved-for-compassionate-use-update/en/>

just several months after the onset of the outbreak, and was designed and coordinated by a consortium of researchers led by WHO. The results could have far reaching consequences for patients in future outbreaks.

The North Kivu and Ituri outbreak is the second outbreak in quick succession for which the VSV-EBOV vaccine has been available from the outset of the response, and with over 150 000 people vaccinated it has undoubtedly saved many lives.

The collaborative efforts in the DRC to address the research, regulatory, ethics and logistical requirements (including cold chain maintenance) in a timely manner is commendable. However, the IOAC found that lack of mobile laboratories and delays in getting laboratory results was challenging for the implementation of a vaccine strategy that depended on rapid case identification and contact tracing. Poor understanding of the ring vaccination strategy, ie why some people were offered the vaccine and others in the same community were excluded, engendered significant mistrust.

As with all the tools at the disposal of the response, the vaccine can only work with the trust and acceptance of affected communities. Rapid diagnostic tests, cutting edge therapeutics, and high standards of supportive care are at their most effective when patients seek health at Ebola treatment facilities early in the course of their disease.

In future outbreaks, it will be as important to test and refine innovative methods of engaging with communities as it will be to test biomedical interventions. Social media provide new ways for authorities to disseminate information, but work by SSHAP is also showing how a systematic analysis of social media messaging can provide key insights into community perceptions of response interventions. Embedding these methods into outbreak response would pay dividends not only in North Kivu and Ituri. Recent research by UNICEF has shown that the proliferation of vaccine-related misinformation on digital and social platforms is one of the key factors that has stalled vaccine uptake in many high-income countries. Technology is changing the concept of what an “authoritative” source

of information is in the 21st Century. In a pandemic scenario, the ability to identify and counteract misinformation will be a crucial determinant of the effectiveness of any available countermeasures.

In addition, the variable speeds at which surrounding countries have been able to approve the compassionate use of the VSV-EBOV vaccine to vaccinate health and frontline workers as part of preparedness efforts, points to a continued need to prioritise support for research, regulatory, ethics and operational capacities in the most vulnerable countries.

Preparedness

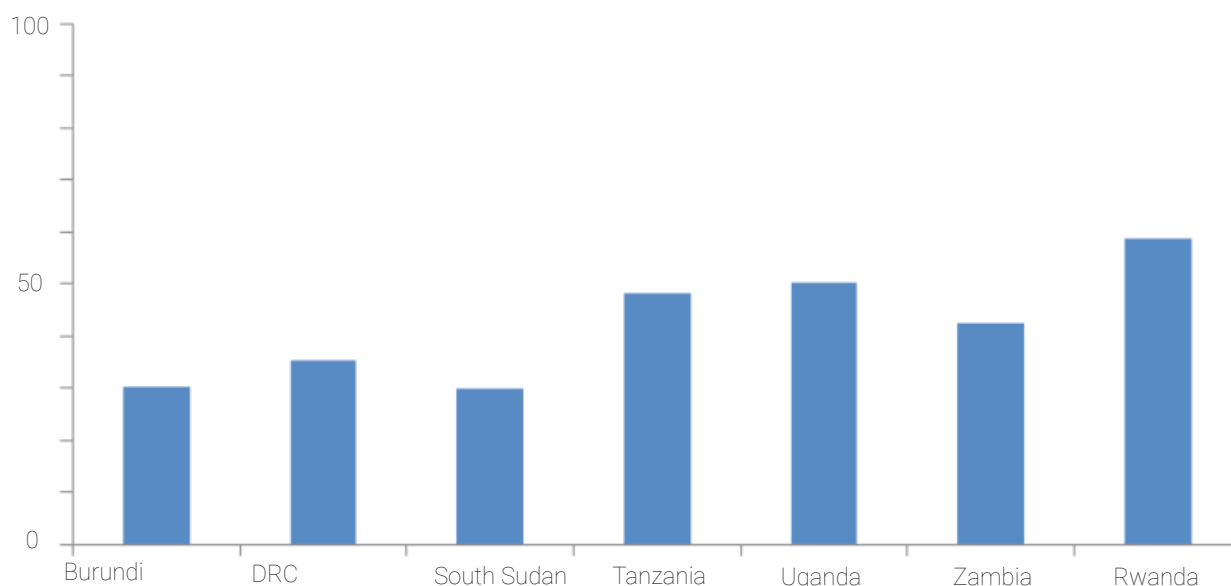
When we talk about preparedness in relation to the North Kivu and Ituri outbreak, we are talking about two different things. The first is the preparedness of the health system in DRC to prevent, detect and respond to an infectious disease outbreak – its IHR core capacities. The second is, in light of the outbreak in North Kivu and Ituri, how prepared are surrounding unaffected provinces and countries to deal with imported cases of Ebola? We look at each in turn.

IHR core capacities in DRC

Was DRC prepared to detect and respond to an outbreak of Ebola virus disease? It is a simple question, and on the basis of the outbreak in North Kivu and Ituri, one would expect it to be met with a simple answer: no. But the reality is a little more complex. If you had posed the same question on July 31, the day before the North Kivu outbreak was declared, you might have come to a different conclusion. The MoH, WHO, and partners had just successfully and rapidly put an end to an Ebola outbreak in Equateur province, in the north of the country, in under 3 months. The previous year, a smaller outbreak in Likati, in the Bas Uele province, was also detected and brought to an end with minimal fuss, although it is highly likely that surveillance only caught the very end of that outbreak. As previously mentioned, these were the eighth and ninth Ebola outbreaks the country had faced.

In March 2018, DRC hosted a voluntary Joint

Figure 12 | **IHR core capacity scores (%) after joint external evaluation in Ebola-affected and Ebola-adjacent countries**



Source: WHO

External Evaluation (JEE) Mission.* Undertaken primarily in Kinshasa, the JEE reported weaknesses in all of the 19 IHR technical areas of evaluation. However, it also highlighted national expertise in the management of viral haemorrhagic fevers including Ebola, the implementation of integrated disease surveillance, the national laboratory network, the national training programme in field epidemiology, and a recently set up national emergency operations centre. None of these strengths were immediately apparent in North Kivu and Ituri at the onset of the outbreak, the detection of which was most likely delayed by up to 3 months due to the collapse of the surveillance system in the affected provinces. This marked variation in the way different regions of the same country are able to respond to the same disease might contain a valuable lesson about how best to focus preparedness efforts, and assessments, in the future.

In any country the size of DRC, and, in fact, in many much smaller federalized countries, one would expect some degree of variation in the capacity of the country's health system to detect and respond to infectious disease outbreaks. In a country the size of DRC and with its recent history of conflict, political turmoil and the humanitarian crisis in the east of the country, we should expect enormous geographical disparities in IHR core capacities. With this in mind, there may be a case

for refining how countries with a high degree of internal variation in their health system capacity prepare for health emergencies, and how that preparedness is evaluated.

We have already spoken about fragile settings as incubators for outbreaks and refuges for pathogens. In order to accelerate IHR and health system capacity strengthening in these areas, it may be necessary to devise a stripped down, or re-emphasized version of the JEE that focuses on the most pressing IHR capacity needs, and that looks in greater depth at the essential dimensions of security and community engagement.

In May 2019, DRC finalized its national action plan for health security, although it has yet to be publicly released. It will be interesting to review the document in light of the North Kivu and Ituri outbreak. DRC joins a growing list of countries with national action plans for health security in place, but at the last count, none of these countries had allocated domestic funding for implementation of the plans.

We recommend that national governments, expert partners and WHO work together to identify criteria (conflict, disease epidemiology, patterns of land use, health system strength and resilience, humanitarian needs) to define the most fragile areas within countries at the highest risk of high-impact infectious disease

* See WHO: <https://www.who.int/ihr/publications/WHO-WHE-CPI-REP-2018.28/fr/>

outbreaks. Communities in these areas should be put at the centre of a coherent fragile-states preparedness action plan funded as a global public good.

WHO country office capacity

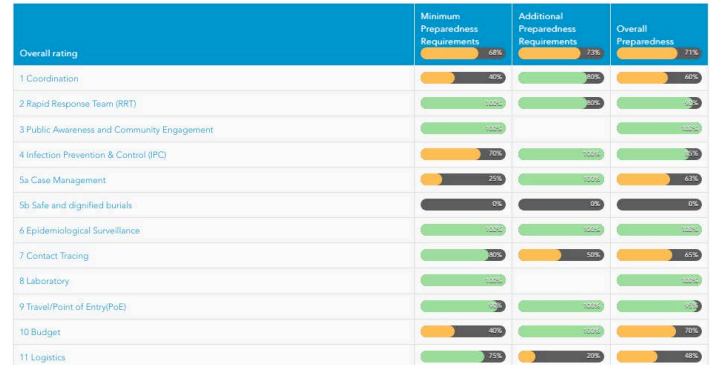
Related to the issue of national and subnational preparedness is the issue of WHO country office capacity in vulnerable countries. In 2015, the Report of the Interim Ebola panel recommended that WHO “adopt a new approach to staffing in country offices; the country circumstances must be taken more fully into account and the highest level of capacity must be ensured for the most vulnerable countries.” Progress in this area has clearly been patchy. In the WHO African region alone, the Democratic Republic of the Congo, Ethiopia, and Nigeria are all responding to or at high risk of multiple health and/or humanitarian emergencies, and yet each have had or still have WHO country offices operating under interim leadership for some time. In the Democratic Republic of the Congo, the country office is under staffed, with key posts including that of health cluster lead also filled on an interim basis. It is essential that WHO accelerates its efforts to strengthen capacity in priority countries as a prerequisite to cultivating strong in-country partnerships between WHO, other UN agencies, and international and national NGOs that can be leveraged to prevent, prepare for and respond to future outbreaks and other health emergencies.

Preparedness and operational readiness: Ebola-adjacent Provinces and countries

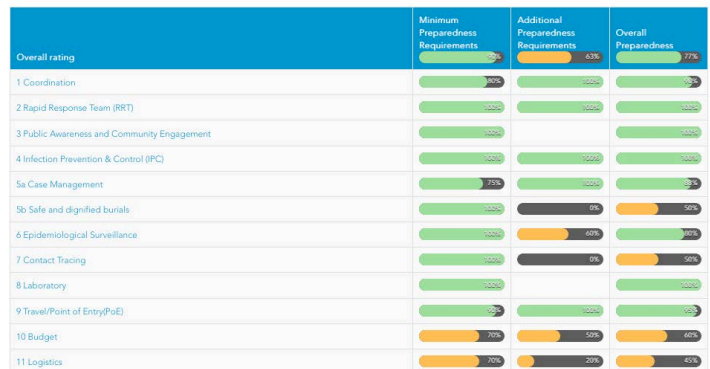
Nine countries share a border with the DRC – Angola, Burundi, Central African Republic, Republic of Congo, Rwanda, South Sudan, Tanzania, Uganda and Zambia – and all have been on alert for an imported case of Ebola since May 2018, when an outbreak was declared in DRC’s northern province of Equateur. In June 2018, WHO published the Regional Strategic EVD Readiness Preparedness plan, which used JEE scores (figure 12) or, in the cases of Republic of Congo and the Central African Republic, EVD preparedness checklist scores, to identify priority areas for targeted support. Since then, the outbreak in North Kivu has refocused efforts on the four countries closest to the outbreak – Burundi, Rwanda, South Sudan, and Uganda – and the unaffected health zones in DRC most at risk, with particular attention paid to the city of Goma.

Figure 13 | **Scores (%) against the WHO Ebola preparedness checklist in Ebola-adjacent countries (as of 15 July 2019)**

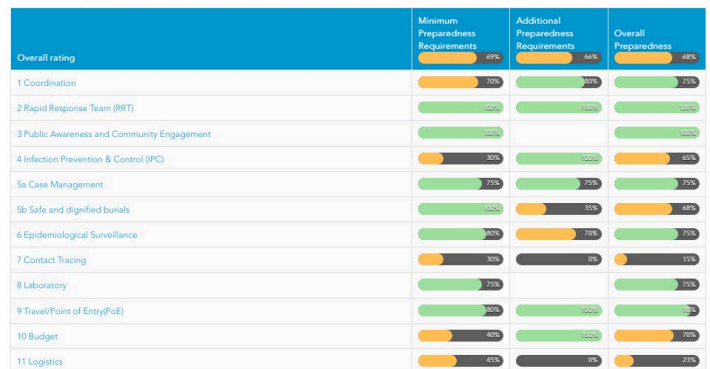
Burundi



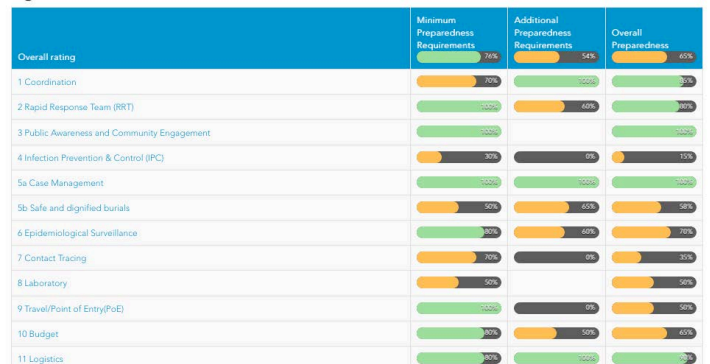
Rwanda



South Sudan



Uganda



The operation is a far cry from the fragmented and ad hoc nature of cross-border communication and preparedness efforts in West Africa. Dedicated multi-disciplinary and multi-partner preparedness strengthening teams have been deployed to deliver tailored technical assistance, conduct exercises and simulations to test response systems at the district level in areas modelled to be most likely to receive an imported case. At the national level, WHO is mapping partner activities, tracking the implementation of key tasks on a publicly available preparedness dashboard.

This all looks impressive, but the litmus test is how a country deals with an imported case. The early evidence is encouraging. Uganda, which shares a long and porous border with North Kivu and Ituri, is the country at greatest risk of imported cases from the current outbreak. Over 20 000 people pass back and forth through the busiest border markets each day, and many families and commercial interests straddle the border between the two countries. An IOAC assessment mission to Uganda in October 2018 noted that “Uganda has demonstrated the capacity to respond to emergencies and has previous experience in managing recurring disease outbreaks such as Crimean-Congo haemorrhagic fever, Ebola and Marburg virus disease”, and praised the country for doing “all the right things in terms of preparedness [for Ebola]”. All five of the highest-risk border districts had Ebola treatment centres up and running in late 2018, and thousands health workers have been vaccinated.

During the drafting of this report, three cases were reported in the Ugandan border town of Kasese, a short distance east of the border. All three cases crossed the border from DRC, and were quickly identified and isolated after Congolese authorities alerted their Ugandan counterparts.

Although it is impossible to predict what course events may take in Uganda, the rapid detection and isolation of the cases, and the close cross-border cooperation between Congolese and Ugandan authorities, is cause for optimism that the outbreak can be geographically contained. That optimism, though, must be guarded. Although at the highest risk of an imported case, Uganda is also probably the best equipped of the four adjacent countries to detect and respond

to a pathogen it has already dealt with in the past. Rwanda and Burundi have done a huge amount of work to prepare, particularly in the building of laboratory capacity, and both now score highly on WHO’s composite measure of preparedness, although the lack of safe and dignified burial capacity in Burundi must be addressed (figure 13). It is South Sudan that is the greatest cause for concern. Many of the same factors that have militated against the response in DRC – conflict, extreme deprivation, a highly mobile population, and a threadbare health system – are also in abundance in the border regions of South Sudan. As in DRC, the effective engagement of at-risk communities will be the decisive factor in controlling any importation there.

In DRC itself, one of the main planks of SRP3 was the ramping up of operational readiness in previously unaffected health zones surrounding the current outbreak. The majority of effort has been focused on the city of Goma, the sprawling capital of North Kivu close to the border with Rwanda, and a regional and international travel hub for the surrounding provinces. During our visit to the city in April it was a hive of activity, with a new Ebola treatment centre about to be constructed and the opening of a new emergency operations centre to coordinate operational readiness activities, including surveillance. During the finalization of this report, the effectiveness of those efforts was put to the test, after a pastor tested positive for Ebola upon his arrival in Goma from Butembo. In these early stages it looks as though, as in Uganda, focused support from WHO and partners has paid off, with the rapid detection and isolation of the patient, and tracing of all those the patient travelled with from Butembo. Importantly, the improved security environment in Goma means that direct support for the MoH is also available through many of WHO’s traditional international partners in the field, including the US CDC.

The intensity of efforts to prepare surrounding countries and health zones for an imported case has already paid off once in Uganda, and in a sense offers some proof of the potential benefits of refocusing funding and attention for preparedness on the most fragile, high-risk areas across the globe.

Table 2 | **Lessons learned or lessons deferred? Progress since West Africa**

Recommendation*	Verdict in North Kivu and Ituri
Reaction time	
Establish a revolving fund to finance the initial stages of an emergency response	Lesson learned. The WHO contingency fund for emergencies was crucial for funding the early stages of the response, but has been overused since to top up short falls in funding through donor appeals
Create a dedicated, autonomous WHO programme or entity with the expertise and operational capacity to lead and coordinate a rapid emergency response	Major progress. The WHE programme was extremely effective in mobilizing resources and personnel rapidly in support of the DRC MoH. But question marks over WHO's capacity for planning and coordination of a large-scale, multi-partner response, remain unresolved.
Establish standby partnerships with humanitarian organizations	Lesson not learned. Coordination between humanitarian actors and WHO has been limited.
Preparedness	
Develop global strategy to invest in, monitor and sustain national IHR core capacities to prepare for, detect, and respond to health emergencies	Progress. The Joint External Evaluation (JEE) initiative has been an effective tool, providing a baseline measurement of national core IHR capacities. WHO has played an important role in supporting Member States draft National Action Plans for Health Security based on JEE findings. However, as yet, implementation of these plans by national governments has been too slow, and few plans are adequately funded.
Innovation	
WHO to take a leadership role in facilitating and prioritising research and development	Lesson learned. Patients in North Kivu and Ituri have access to potentially life-saving new therapies, and contacts have access to an effective vaccine as a result of the work done by WHO and a consortium of partners to develop the protocols, standards, and collaborative relationships needed to drive research and development forward in countermeasures and diagnostics for a number of dangerous pathogens. However, more work is needed to ensure national governments are prepared to implement experimental protocols, and approve the compassionate use of investigational products in the event of an outbreak. More work is also required to improve capacity to coordinate and undertake non-biomedical, operational research.
Community engagement	
Ensure community engagement in outbreak response and health system strengthening	Lesson not learned. A major limitation of the response to the North Kivu and Ituri outbreak.

*Adapted from recommendations made in the Report of the Ebola Interim Assessment Panel; the Harvard Global Health Institute and London School of Hygiene and Tropical Medicine Independent Panel on the Response to Ebola; the US National Academy of Medicine Commission on a Global Health Risk Framework for the Future; the WHO Executive Board Special Session on the Ebola Emergency; and the UN Secretary General's High-Level Panel on the Global Response to Health Crises.

Conclusions

The Ebola outbreak in North Kivu and Ituri is, without doubt, one of the most complex outbreaks ever faced by the health community. It is the first Ebola outbreak to occur in a highly active conflict zone, and is taking place in the midst of one of the most protracted, severe, and neglected humanitarian crises the world has ever seen.

In more benign conditions it is certainly fair to say that the speed and the scale of the initial response would have put a rapid end to the outbreak, as it did in DRC's next most recent Ebola outbreak just 3 months earlier. But if the May outbreak in Equateur province painted a flattering picture of national and global capacities to prepare for, detect and respond to an outbreak of a lethal pathogen, the North Kivu and Ituri outbreak has provided a reality check about the profound difficulties posed by insecure and conflict settings.

Contrary to the predominately negative coverage of the response in North Kivu and Ituri, it is important to note that many fundamentals of an effective response were put in place within days of the declaration of the outbreak. The response in the first weeks of August was the fastest, best equipped, and best-funded in the history of Ebola outbreak response, in large part because of the myriad reforms that followed in the wake of West African Ebola outbreak (table 2). And yet the outbreak persisted and spread, crossing the international border to Uganda in June, and reaching Goma, the capital of North Kivu in July. The outbreak now stands, almost one year, 2500 cases, and 1700 deaths since its declaration, a complex manifestation of the national and global successes and failures in health emergency preparedness and response since West Africa.

Table 2 provides a summary of some of the key areas of progress, and in some cases inertia, since West Africa that we can infer from the North Kivu and Ituri outbreak. But in reality, the overarching message is even more simple. The easy stuff since West Africa has been done. There is still some ironing out to do when it comes to the global mechanisms for financing outbreak response, for example, or

how, at the global governance level, WHO and the UN humanitarian system work together. But the real issues are at the field level: who coordinates and leads what and when in the field, which partners are included when, how best to manage the flow of funds to the frontline, and how to put communities at the centre of the response. Many of these questions have been left unresolved since West Africa, but in an outbreak of the scale and complexity of North Kivu and Ituri, finding satisfactory answers cannot be further delayed.

In North Kivu and Ituri, crucial decisions on when to transition from a discrete health response to an integrated health and humanitarian response, when to activate various UN interagency mechanisms, when to appoint empowered whole-of-UN leadership, and even, to some extent, when to implement new vaccination strategies, have been made on an ad hoc, reactive basis lagging many months behind the curve of the epidemic. This is a pattern all too familiar from the West Africa outbreak.

The complex context of North Kivu and Ituri has brought all of the above issues into sharp relief, and they must urgently be addressed. But we must be careful now, as Sands cautioned us, not to become fixated on the "most visible actions". The driving force of this outbreak has been shattered health systems, conflict, and traumatized and deprived communities. Systemic deficits in the national public health systems of Guinea, Liberia, and Sierra Leone sowed the seeds of the West Africa outbreak. Over 5 years since the start of that outbreak, how far has the world collectively come in improving the capacities of the most vulnerable countries to deliver an effective and timely response to public health emergencies? The answer can be found in the Ebola outbreak in North Kivu and Ituri, the resurgence of yellow fever in Angola, poliomyelitis in North Eastern Nigeria, cholera in Yemen, and plague in Madagascar: not far enough.

Recommendations

In light of our findings, we have identified a number of recommendations for broad consideration.

Preparedness

- In 2015, the Commission on a Global Health Risk Framework for the Future challenged the world to “turn fine words into action” on health emergency preparedness.* The North Kivu and Ituri outbreak must bring about a new call to action. The success of the IHR Monitoring and Evaluation Framework, including the voluntary Joint external Evaluation initiative,† has given us an idea about how far we are from where we need to be. WHO has supported national governments to develop National Action Plans for Health Security,‡ but governments have been slow to fund and implement these plans. To kick start that progress, WHO, the World Bank, the UN, international and national NGOs and national governments should work to identify a priority list of the most fragile countries, and areas within countries, to receive core IHR capacity strengthening as part of a broader package of context-specific, community-centred health and development initiatives. This would directly benefit global health security, and should be funded as a global public good via an international pooled fund presided over by the World Bank and WHO. It is past time to put emergency preparedness on an equal footing, politically and financially, with emergency response.

- National governments should consider the possibility of separate health security action plans in subnational areas that have substantially different health system characteristics, security dynamics, and epidemiological risk factors compared with the rest of the country under evaluation. WHO should assist Member States to share best practices and approaches for subnational IHR capacity assessments and action plans, including plans for conflict areas.

- In 2015, the Report of the Ebola Interim Assessment Panel§ recommended that WHO

adopt a new approach to staffing in country offices, noting that “the country circumstances must be taken more fully into account, and the highest level of capacity must be ensured for the most vulnerable countries. At country level, the WHO Representative must have an independent voice and be assured of the full support of the Regional Director and the Director-General, if challenged by governments.” This remains an urgent priority, and is a prerequisite to building the institutional relationships between WHO and humanitarian partners at national level that can be called on during emergencies.

Leadership, partnership, and coordination

- In West Africa, the wider humanitarian system came to the response very late. In North Kivu and Ituri, the same is true despite the outbreak occurring in the midst of one of the world’s most protracted and complex humanitarian crises. There is clearly still a fundamental problem with the way the UN humanitarian system and WHO interact during health emergencies.

As an outbreak evolves, there is a need to decouple decisions on when to transition from a health-focused response to a broader health–humanitarian response, and when to appoint empowered whole-of-UN leadership, from internal and external political pressures. This need is most acute in insecure settings, and when dealing with communities with a broad constellation of unmet humanitarian needs, where the consequences for delaying decisions can be most severe. At present, there seem to be no clear decision-making algorithms that govern how and when different UN agencies and partners become involved in an emergency health response, and when broader UN leadership is required to coordinate that response. We propose that, at the risk assessment stage, or at the strategic planning stage of an outbreak response, WHO, partners (including humanitarian partners), and national authorities agree thresholds for key indicators, beyond which a cascade of pre-agreed actions would be taken, including but not limited to the involvement of humanitarian partners, high-level political advocacy, and

* See: The US National Academy of Medicine Commission on a Global Health Risk Framework: <https://www.nap.edu/initiative/commission-on-a-global-health-risk-framework-for-the-future-for-the-future>

† See WHO: <https://extranet.who.int/sph/ihrmef>

And <https://www.who.int/ihr/procedures/joint-external-evaluations/en/>

See WHO: <https://www.who.int/ihr/procedures/health-security-national-action-plan/en/>

§ Report of the Ebola Interim Assessment Panel: <https://www.who.int/csr/resources/publications/ebola/ebola-panel-report/en/>

the appointment of UN-wide leadership from a roster of pre-qualified emergency coordinators.

Financing

- At the time of writing, the North Kivu outbreak is in the paradoxical position of being big enough, as the second largest of its type in history, and lethal enough, to satisfy UN [Central Emergency Response Fund](#) (CERF) funding criteria originally intended for large-scale humanitarian disasters, but falling short of the World Bank's [Pandemic Emergency Financing Facility](#) (PEF) criteria designed specifically to “fill the financing gap that occurs after the initial outbreak and before large-scale humanitarian relief assistance can be mobilized”. Clearly this gap remains to be filled in a coherent and predictable way. We urge WHO and World Bank to ensure that the second incarnation of the PEF is designed to do so.

Community engagement

- As late as February 2019, WHO and the DRC Ministry of Health acknowledged that the “poor monitoring of community feedback, the low utilization of knowledge, attitudes and practices (KAP) surveys, and other studies and surveys” was hampering the ability of the response to gauge and adapt to community attitudes and concerns.* The use of these tools, and the quantitative and qualitative expertise provided by partners such as the [Social Science in Humanitarian Action Platform](#), should be an integral part of the strategic planning process, with thresholds linked to community attitudes and sentiment beyond which pre-agreed course-correction procedures would be triggered. Surveillance of community attitudes and perceptions must be treated with as high a priority as epidemiological surveillance from the outset of an outbreak.

Community engagement must be a two-way process that both shapes community behaviour and shapes the response strategy. It must be integral to response structure, technical design and decision making, rather than a standalone tool used to persuade communities to adapt to the requirements of a response. Engagement of local health care providers is key, given their knowledge of their community's health-seeking behaviours, and the need to gain their support in implementing infection prevention and control measures that are fundamental to outbreak containment and workforce protection.

Security

- Insecurity and conflict pose a profound challenge for public health outbreak response and preparedness. In these contexts, humanitarian actors have traditionally been able to operate by adopting an acceptance model as the core part of their security management strategy.† Most commonly, this relies on negotiating consent from all parties, with a particular focus on groups that might seek to obstruct humanitarian actors. Success with this approach can take time, and is dependent on accurate and comprehensive analyses of context, conflict dynamics, and the perceptions of local populations.

Applying the acceptance model of security management to an outbreak response presents several challenges. The skills required in terms of political negotiation, conflict analysis, and social science are not currently part of outbreak emergency operational culture. The dependence of the acceptance model on starting with a small operational footprint, and building trust by cultivating a perception of political neutrality and independence, are also difficult to reconcile with the usual mode of public health outbreak response, which is government-led and seeks to rapidly scale to a size that matches the size of the outbreak.

The [Polio Eradication Initiative](#) provides an interesting model of how an infectious disease public health programme can be adapted, with variable success, to deal with some of the problems posed by insecurity and conflict. As part of preparedness for inevitable future outbreaks in conflict settings, it will take research, innovation, experimentation and collaboration between international NGOs, the UN's security system, humanitarian actors and WHO to identify the most appropriate models of security management for outbreak responses at different scales.

Innovation

- Given the opportunities afforded by biomedical innovations, all countries should be prepared to implement investigational diagnostic, vaccine and treatment protocols, and consider biomedical and social behavioural science research as an integral component of their public health emergency preparedness plans. There needs to be ongoing support for lower-income and middle-income countries to develop their

* See the Strategic Response plan for the Ebola Response February to July 2019: <https://www.who.int/emergencies/crises/cod/drc-ebola-srp-v20190225-en.pdf?ua=1>

† See A Closer Look at Acceptance, Humanitarian Practice Network: <https://odihpn.org/magazine/a-closer-look-at-acceptance/>

research, regulatory, ethics and operational capacities, learning from the experience of Guinea, Liberia, and Sierra Leone during the 2013–2016 outbreak, and DRC in 2018–2019.

The [WHO Blueprint for Research and Development](#) has enabled patients to access cutting edge therapeutics from the onset of the outbreak, and ensured that a coordinated trial of rationally prioritized therapeutics was able to enroll patients within 3 months of the onset of the outbreak. A similar approach is now required for non-biomedical interventions, to coordinate and prioritize operational and social science research.