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How Has Outbreak Management Fared over the Years in Uganda?
Recommendations to Improve Health System Resilience to Disease Outbreaks in Uganda

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Key Messages

- The effects of epidemics on good health and well-being are far-reaching, with huge short- and long-term implications beyond health.
- In Uganda, health system investments that are aimed at steady progress towards the achievement of UHC are constantly eroded by the frequent epidemics.
- Comprehensive management of epidemics is still a challenge. The predominant medical model focuses more on surveillance and managing cases than on comprehensive management that should invest in expanding actions for epidemic mitigation and preparedness. This needs to be corrected.
- A multi-sectoral approach is needed to mobilise actors and actions for comprehensive epidemic management. Epidemiological interventions and control only provide partial remedies if the social, environmental and economic determinants of epidemics persist.

- Legitimate mandates need to be revisited to ensure role assignment to legitimate duty-bearers. Financial resources and their allocation need to reinforce the legitimate mandates to optimise coordination and effective epidemic management processes across the expanding networks of actors at national and global levels.

Introduction: Outbreaks and Universal Health Coverage (UHC)

Disease outbreaks are one of the major hindrances to the attainment of UHC. The safety envisaged in UHC requires that outbreaks are not only reactively treated with medical technologies but proactive activities are undertaken to mitigate them. The broad goal of UHC is to ensure that all people have access to the needed promotive, preventive, curative, rehabilitative and palliative health services of sufficient quality while ensuring that people do not suffer financial hardship when using health services. In practice, however, the majority of LMICs tend to narrow the scope of UHC down to curative services (1-3). In their 2015 publication on whether public health, UHC and SDGs can coexist, Schmidt and colleagues identify five reasons why LMICs prioritise curative services at the expense of the comprehensive health services envisioned by UHC (1). These are: (1) UHC initially targets the richer, urban formal sector workers who demand clinical services, unlike the poor communities that would demand community services; (2) The clinicians who design health programmes tend to emphasise curative care than the provision of preventive and promotive care to the many who are poor; (3) More powerful constituencies campaign and advocate curative care with no constituency passionately demanding health promotion; (4) Lack of a critical mass of non-clinical health workers to work in the non-clinical health sector; and (5) The fact that all the other SDG 3 targets need population-level interventions, creating the misconception that UHC should now focus on clinical interventions.

Regarding how to prevent the increased attention given to curative services from undermining the delivery of a full range of public health measures, Schmidt and colleagues propose the following:

1. Engaging a multi-sectoral approach in planning for interventions for achieving UHC as opposed to an MoH-alone approach.

2. Advocating fixed and distinct budgets for curative and preventive/ promotive health services.

3. Developing and implementing health workforce interventions that do not only emphasise the development of only clinical health workers but also of a whole spectrum of public health workforce.

4. Devising means of assessing progress towards UHC that pay more attention to sector-wide achievements rather than only to clinical achievements in the health sector.

Over the last few years (2012-2018), Uganda has experienced epidemics of Ebola virus disease (EVD), Marburg, yellow fever, anthrax, Rift Valley fever, meningitis, avian influenza, Crimean-Congo haemorrhagic fever (CCHF) and cholera, among others. The majority of these have been recurrent. Between 2011 and 2015, for example, Uganda registered over 10,000 cases of cholera in 18 out of the 124 districts. On average, each cholera outbreak response in Uganda is estimated to cost over US$ 4.3 million in the form of development assistance and local finance diversions from other vital programmes. This is in addition to the revenue lost due to travel and trade restrictions. Such frequent outbreaks, therefore, have huge direct and indirect implications for the community, the health system and the economy at large (4).

Lessons from other countries have also shown that recurrent epidemics continuously erode the efforts of achieving UHC. When outbreaks occur, people get sick and others die, productivity is lost, the health system gets burdened (health care costs of outbreak response), resources get reallocated (say from maternal and child health to outbreak response), capabilities get stretched and other health problems are escalated or displaced. For example, in 2015, reports indicated that maternal and newborn deaths in Sierra Leone rose during the Ebola outbreak. This was attributed to the fear of contagion and mistrust of health workers. Pregnant women feared giving birth in health facilities, leading to an increase in maternal and newborn death (5). Furthermore, epidemics worsen indicators like access to education and access to local markets (which are social determinants of health) and affect the broader economy such as mining, tourism and human capital development. As an example, Sierra Leone's economy, which had grown by 20.1 per cent from 2012 to 2013, stalled during the period of the outbreak (6). Liberia also experienced violence as one of the destabilising effects of the Ebola epidemic, illustrating that epidemics not only affect health, but also a nation's ability to fully recover from existing shocks and stresses (6). In 2015 alone, the World Bank estimated that Sierra Leone, Guinea and Liberia lost a total of US$ 2.2

billion owing to the 2014-2015 West African EVD epidemic (7). In other words, disease epidemics have short- and long-term negative implications not only for the health of a country but generally for the whole economy. Often, the recovery of countries from such effects of epidemics takes long, sometimes in excess of tens of years (7-10).

Uganda is a global role model in effective response to viral haemorrhagic fever (VHF) outbreaks (11). Uganda was recently credited for its major deployment of epidemiologists to strengthen the response to the 2014-2015 EVD outbreak in West Africa. Despite this recognition, Uganda continues to face frequent disease outbreaks every year. Following repeated responses to the frequent disease outbreaks, the expected gains in infrastructure, knowledge, experience and response memory should gradually build a national health system that is more resilient to disease outbreaks. Uganda should, therefore, be experiencing less frequent disease outbreaks with lower attack rates, lower fatality rates and less time required to successfully contain the outbreaks when they occur. Unfortunately, responses to the frequent outbreaks in Uganda seem not to build health system outbreak resilience. With the new agenda of accelerating the achievement of UHC, all health system investments should translate into UHC gains. This calls for analysis of Uganda's current outbreak management framework as part of the efforts to accelerate the achievement of UHC (3).

Structure and Framework for Outbreak Management in Uganda

The structures responsible for outbreak management in Uganda are the Epidemiology and Surveillance Division (ESD), the Public Health Emergency Operations Centre (PHEOC) and the Resource Centre (RC). The ESD is the national focal point (NFP) for the coordination of outbreak management activities and is meant to mobilise resources, develop policy, provide oversight and build and maintain the capacity for outbreak management at both national and district levels. The PHEOC is the physical space and centre for information coordination during outbreak response. The RC is the centre for the collation and analysis of disease surveillance data. The functions of these three units are meant to be complementary.

Since 2010, Uganda's strategy for outbreak management has been the Integrated Disease Surveillance and Response (IDSR) strategy. It is the same strategy through which Uganda aspires to achieve the goals of International Health Regulations (IHR, 2005), the Global Health Security Agenda (GHSA)

and One Health. The IDSR/IHR committee and the National Task Force on Epidemics (NTF) at national level and the Emergency Preparedness and Response Committee (EPRC) and the District Task Force (DTF) at district level are the structures responsible for IDSR implementation in Uganda.

The IDSR/IHR committee and the district EPRC

The IDSR/IHR committee is composed of MoH and other relevant ministries, departments and agencies (MDAs). The MoH programmes on the committee include: the Epidemiology and Surveillance Division (ESD), which is the IDSR/IHR national focal point; the RC; Uganda National Expanded Programme on Immunisation (UNEPI); Health Promotion and Education; the Clinical Services Department; the Central Public Health Laboratories (CPHL); Uganda Virus Research Institute (UVRI); the Malaria Control Programme; the AIDS Control Programme; the Vector Control Division/NTDs; the Guinea Worm Eradication Programme; the Division of Veterinary Public Health; the National TB and Leprosy Programme; Child Health; the Pharmacy Division; the Environmental Health Division; the Nutrition Division; and the Human Resource Division.

Other government sectors on the IDSR/IHR committee will include: the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF); the Ministry of Energy and Mineral Development (MEMD); the National Environment Management Authority (NEMA); Uganda National Bureau of Standards; the National Pharmacovigilance Centre in National Drugs Authority (NDA); Uganda Wildlife Authority (UWA); the Ministry of Gender, Labour and Social Development (MGLSD); the Catholic, Protestant and Muslim Medical Bureaus; Uganda People's Defence Forces; the Department of Meteorology; and academia (Makerere University School of Public Health and Faculty of Veterinary Medicine).

Partners on the IDSR/IHR committee include the World Health Organisation (WHO), Centres for Disease Control and Prevention (CDC), African Field Epidemiology Network (AFENET) and other health development partners.

In times of no outbreak, the IDSR/IHR committee is meant to oversee the implementation of the IDSR strategic plan. Each MDA on the IDSR/IHR committee is meant to implement specific roles and responsibilities related to the outbreak management capacity in Uganda as stipulated by the

2011 IDSR strategic plan. The EPRC is meant to be the exact mirror image of the NTF in composition and functioning but at district level (18).

The National Task Force on Epidemics (NTF) and the District Task Force on Epidemics (DTF)

In Uganda, the Office of the Prime Minister (OPM) has delegated the coordination of public health disaster actors and actions to the National Task Force on Epidemics (NTF). Chaired by the Director General of Health Services (DGHS) and co-chaired by the WHO country representative, the NTF to a great extent has the same composition as the IDSR/IHR committee. The NTF conducts its work through six technical sub-committees (Coordination, Case Management, Surveillance and Laboratory, Social Mobilisation, Psychosocial Support and Logistics). These sub-committees are responsible for implementing the technical aspects of outbreak responses at national level. In times of no outbreak, the NTF is meant to sit quarterly to coordinate outbreak preparedness activities. During outbreaks, the NTF is meant to sit daily or as deemed necessary by the chair to coordinate outbreak response activities. During the post-outbreak periods, the NTF is meant to coordinate the implementation of recovery interventions. The DTF is meant to be the exact mirror image of the NTF in composition and functioning but at district level (19).

The structures responsible for outbreak management in Uganda have huge overlaps in membership and responsibility. The IDSR strategic plan of 2011 has some guidance on the stakeholders (actors) and their roles (actions) in outbreak management. The weaknesses in coordination have led to ambiguity in the specific roles and responsibilities of each of the stakeholders. This creates poor alignment between the little available resources with the stakeholders and the required outbreak management actions. This poor alignment sometimes results in conflict among stakeholders, over-mobilisation of resources for specific actions and lack of resources for other equally important outbreak management actions.

In design, the IDSR framework for outbreak management is built on a medical model of disease management. The framework emphasises outbreak detection and response at the expense of the equally important prevention, preparedness and recovery. This results in more attention being paid to detection and response than to outbreak prevention/mitigation, preparedness and recovery (12-15,16).

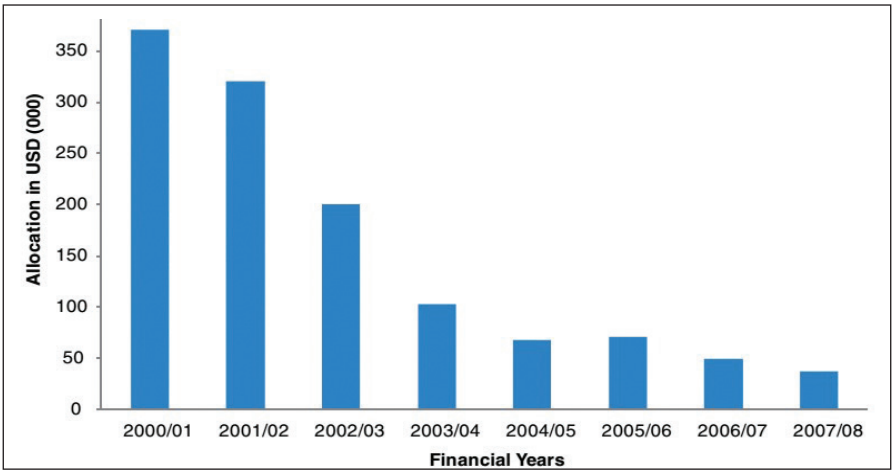
After the response to any disease outbreak, little or no resources are dedicated to recovery of health systems and affected communities. Equally, little or no resources are dedicated to prevent or reduce the impact of future outbreaks. Instead, the system just waits to detect and respond to the next outbreak, creating a vicious cycle of outbreak detection and response. This is one of Uganda's major challenges to effective outbreak management and to the overall goal of healthy lives and well-being as enshrined in Goal 3 in the Sustainable Development Goals.

Financing Outbreak Management in Uganda

Financing for outbreak management in Uganda largely comes from development partners. Tracking financing for outbreak management is practically challenging because outbreak prevention, preparedness, response and recovery do not occur in the MoH alone but in many MDAs. It can, therefore, be misleading if tracking of finances for outbreak management is restricted to the MoH alone. Irrespective of whether the direct investment to improve outbreak management lies in the mainstream MoH or not, the MoH is mandated to coordinate outbreak management. As such, change in the amount of finances dedicated to coordinating outbreak management is critical in the success of outbreak management in Uganda. From 2000 to 2009, direct financial support from the government to ESD for IDSR activities reduced tenfold. Increasingly, ESD cannot sustain its routine activities. Currently, monthly IDSR/IHR meetings, IDSR capacity-building training and IDSR support supervision occur rarely, if at all. These are activities that were previously financially supported by development partners such as WHO and CDC (24).

Reliance on development support for outbreak management is unsustainable. Amidst non-progressive government revenues, unpredictable development support from partners and increased demand for more budgetary allocations to other national programmes, the non-progressive trends of government allocations to outbreak management remain a challenge that needs to be addressed.

Figure 17.1: Change in the allocation of government finances to the Epidemiology and Surveillance Division (ESD) of MoH, Uganda from 2000 to 2008



Source: *Authors' analysis and Government archives*

Frameworks to Link Outbreak Management to UHC

As part of the efforts towards achieving UHC, this section assesses how Uganda can better manage the risks that the frequent and recurrent outbreaks pose to the realisation of UHC. The discussion is guided by the Emergency Management Cycle (EMC), sometimes referred to as the All Hazard model. This model categorises emergency management into four phases. As opposed to how these four phases are reflected diagrammatically, they are in practice non-linear, iterative and often overlapping. The phases include: **1) mitigation/prevention, 2) preparedness, 3) response** and **4) recovery**. The application of this model has been successful in the management of especially natural disasters like floods, cyclones, earthquakes and fires (17).

Based on the available evidence and expert knowledge, the authors give a synthesized opinion on how Uganda's epidemic management has performed in addressing infectious disease outbreaks in Uganda. Case studies of EVD and cholera are used as examples of a high attention-generating disease outbreak and a low attention-generating disease outbreak, respectively. From the identified gaps, outbreak management recommendations for accelerating the achievement of the UHC goal are proposed.

1. Outbreak Mitigation in Uganda

Mitigation refers to those actions that reduce the chance of outbreak occurrence or lessen the damaging effects of outbreaks when they occur. Over time, outbreaks have kept recurring. Some scholars have attributed this recurrence or increase in outbreak frequency to improved capacity to detect and confirm epidemics. As a matter of fact, Uganda's laboratory diagnostic capacity has improved over time. However, there are a number of countries with similar or even better outbreak diagnostic capacity, exposed to the same outbreak risks as Uganda but experiencing fewer outbreaks.

Uganda should have a demonstrable improvement in safe water coverage (20) and public health safety programmes during activities that increase the proximity of humans to the habitats of wild virus (21). These are mitigation strategy examples for the two selected outbreaks of cholera and EVD, respectively. Over time, safe water coverage in Uganda has more or less remained stagnant. Currently, access to safe water and sanitation in rural areas stands at 67 per cent and 79 per cent, respectively. This is still below the national targets (22). With regard to EVD, population explosion, increased demand for land for agriculture and increase in economic activities like tourism and mining, increase the proximity of humans to the habitats of wild virus (21). In Uganda, such activities are largely not guided by public health safety procedures (23).

Uganda's efforts to mitigate outbreaks, at least for cholera and EVD, have not improved over time. Such outbreak mitigation interventions require a multi-sectoral approach from numerous MDAs. Part of the challenge lies in Uganda's outbreak management strategy which by design does not emphasise mitigation but instead emphasises outbreak detection and response. But even then, the other MDAs do not fully recognise the coordination mandate of the MoH and, as a result, there is divergence in the process of priority setting in the different MDAs. As an example, the MoH's priority for mitigating cholera is safe water access. However, this is often not the priority of the ministry responsible for water in the affected communities and, as a result, cholera continues to be a national problem. Measures to advance collaboration across MDAs in solving problems that require multi-sectoral action remain a major source of effective and comprehensive epidemic management. Goals such as UHC and many SDGs require a whole-of-government approach to policy and programme implementation.

2. Outbreak Preparedness in Uganda

Preparedness refers to those actions taken to reduce the impact of the outbreak before it occurs. There is always an element of residue outbreak likelihood. Therefore, there is always need to prepare to implement known outbreak-specific interventions when the outbreak in question inevitably happens.

These preparedness measures include specifying a response framework of actors and their required/mandated actions; having protocols and guidelines in place; training of frontline responders; stockpiling of vaccines, medicines and logistics for prevention and case management; and instituting surveillance measures to detect and confirm the occurrence of the outbreak early before its extensive spread. Preparedness is closely linked with how feasible and timely the response will be mounted and the effectiveness the response actions are to control the problem.

Development and testing of contingency plans

Uganda has prioritised a list of epidemic-prone diseases. These are epidemic-prone diseases for whose management the country is developing capacity. This list of priority diseases is meant to be reviewed every 3-5 years, in case new diseases become priority diseases or some diseases which were previously priority cease to be priority diseases. The list has, however, not been updated since 2011. The reason might be that no new diseases have become priority or that no priority diseases have ceased to be priority since 2011. In 2016, the country also developed a priority zoonotic disease list. In the same year, Uganda also developed a list of public health hazards through the multi-hazard response planning process. It is for these prioritised diseases and hazards that Uganda is gradually developing disease-specific or hazard-specific contingency plans. Despite the receipt of training from CDC and WHO, Uganda has been slow at developing contingency plans for all the prioritised diseases and hazards. The reasons for the slow development of disease-specific contingency plans include complacency in times of no outbreaks. This is true because Uganda has been observed to draft its disease-specific contingency/response plans immediately after outbreak confirmation (24). With support from WHO and CDC, the country has tested some of its available disease-specific contingency plans through table-top and functional simulation exercises (25). Testing contingency plans serves to update disease-specific contingency plans with new information. Owing to resource constraints, testing disease-specific contingency plans in Uganda is not a routine practice.

Human resource for outbreak response

Uganda has explicit policies and plans for building and maintaining human resources for epidemic management. These include both pre-service and in-service training for outbreak response.

> Uganda is recognised and has been rewarded for its immense support to different countries during outbreaks especially during Ebola outbreaks. Uganda built its rich experience from previous outbreaks of Ebola, Marburg, meningitis yellow fever and others that created a tested and committed cadre of health workers in all response pillars of an outbreak. These health workers have been deployed to different countries and have been very instrumental in containing outbreaks. (25)

Over the years, training institutions such as Makerere University School of Public Health (MakSPH) and other public health-related schools have trained more epidemic management specialists, such as epidemiologists and laboratory specialists. Institutions like WHO, CDC and African Field Epidemiology Network (AFENET) have continued to conduct in-service training for National and District Rapid Response Teams at the frontline of epidemic management. At national level, a number of specialists have been trained by WHO to constitute Uganda's National Rapid Response Team (NRRT). The challenge is that members of the NRRT come from different organisations and are sometimes not available when they are needed for deployment. WHO and CDC, through the field epidemiology training programmes (FETP), have trained District Rapid Response Teams (DRRTs) in almost all the districts in Uganda. The challenge is that the rate of attrition is high. This calls for repeat training, which is not economically sustainable. MakSPH and CDC are also implementing an FETP Fellowship called the MakSPH-CDC FETP Fellowship programme. This is a two-year graduate fellowship programme for field epidemiology training. Every year, the programme graduates about 10 field epidemiologists, who later get deployed in a number of outbreak response-critical positions in the country. The MakSPH-CDC Fellowship programme has also introduced new training tracks such as laboratory and leadership and management of outbreaks, contributing towards building a comprehensive spectrum of outbreak response specialists in the country. As is evident from the training, epidemiology and biomedical laboratory training provide emphasis for the medical model of prioritises surveillance and response phase of the hazed

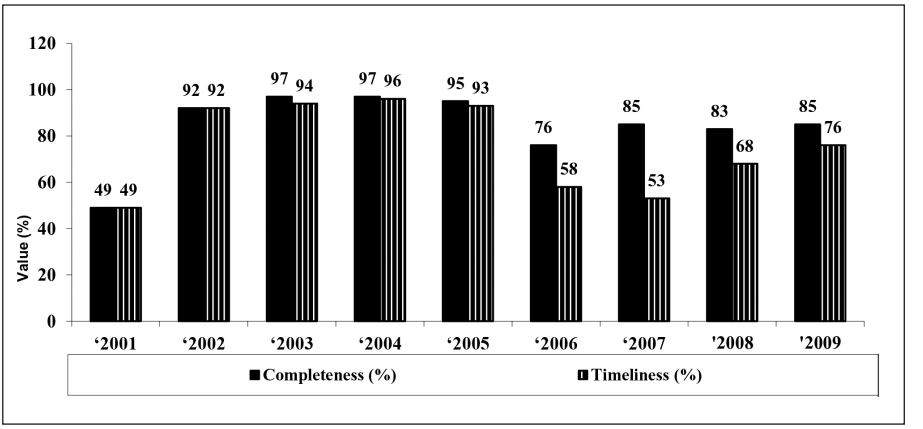
model. Other related expertise for the comprehensive management of epidemics needs to be mobilised to achieve the required complementarity and effective multi-sectoral actions.

Disease surveillance

The major form of disease surveillance in Uganda is facility-based. It is mandatory for all public health facilities to conduct disease surveillance on all priority diseases. The type of surveillance is syndromic surveillance. The country has guidelines (case definitions) on how to identify a case suspected of having a disease of interest. The country also has guidelines on how to report and investigate every suspected case of a priority disease in Uganda. Many training programmes have been carried out on how to identify, report and investigate suspected cases of priority diseases in Uganda. The main challenge, however, is the attrition of trained health workers and the dearth of resource support for these activities. The other challenge is that private health facilities are not obliged to participate in facility-based disease surveillance. Very few of them participate and there is no incentive or penalty for non-participation in surveillance. This is a challenge since the number of private health facilities is increasing, especially in urbanised communities where patients often prefer private facilities to the public ones. This preference for private health facilities, especially in urbanised settings, is likely to result in delayed detection of outbreaks.

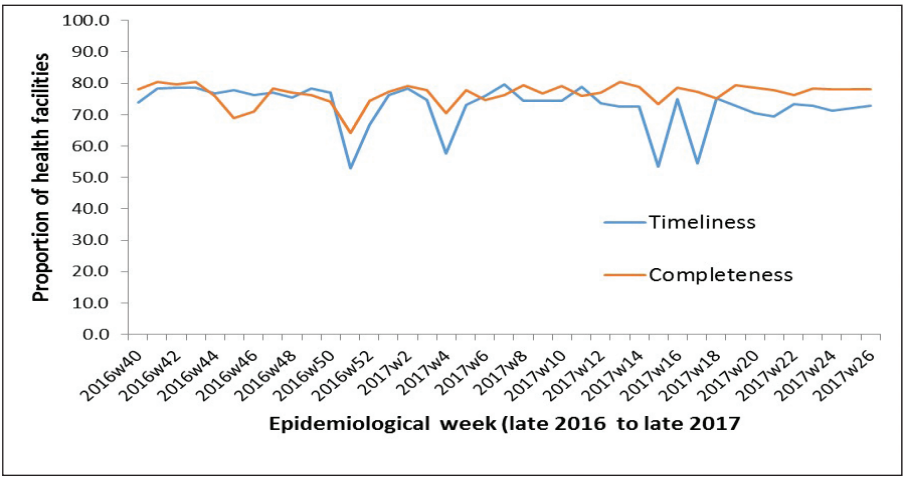
At national level, the quality of facility-based surveillance is measured using the two indicators of timeliness and completeness. As shown in Figure 17.2, there was no general trend of the direction of timeliness and completeness of surveillance data reporting between 2001 and 2009 in Uganda (18). Currently, as reflected in Figure 17.3, both timeliness and completeness average about 75 per cent. The national target is 80 per cent for both timeliness and completeness of surveillance data.

Figure 17.2: International Strategy for Disaster Reduction (IDSR) performance in Uganda from 2001 to 2009.



Source: *2011 IDSR Strategic Plan for Uganda (18)*

Figure 17.3: International Strategy for Disaster Reduction (IDSR) performance in Uganda 2016-2017.



Source: *Authors' own analysis of data from the Resource Centre, MoH*

Laboratory diagnostic capacity

Over the years, Uganda has gradually developed its laboratory diagnostic capacity. The Public Health Laboratory Network (PHLN) now has presence

in all the regions of the country. Laboratories at the eight regional referral hospitals now have the capacity to confirm all bacterial infection epidemics (29). Uganda Virus Research Institute (UVRI) has the capacity to confirm all viral infection epidemics. A national Public Health Laboratories Network (spoke-and-hub system) has been established to expedite laboratory sample transportation to country reference laboratories. Uganda does not have to ship laboratory samples outside the country anymore for confirmatory diagnosis. The excellent laboratory diagnostic capacity has been credited with the increase in the number of detected outbreaks in the country. Some scholars argue that, previously, the majority of disease outbreaks were going undetected because of poor laboratory capacity. The major challenge is laboratory systems sustainability. Currently, the majority of the laboratory systems, structure and human resource are donor-funded and get government support.

Table 17.1: Change in EVD preparedness and response over time in Uganda

EVD outbreak attribute/ outbreak (district)	Gulu 2000	Bundibugyo 2007	Kibaale 2007	Luwero 2001	Luwero 2012
Days from onset of first Ebola signs in the index case to reporting to MoH	20	51	30	NA	24
Days from reporting of first case to picking of sample for EVD diagnosis	3	2	1	NA	1
Days from sample collection to confirmation	2	7	14	NA	4
Days from EVD confirmation to declaration of national action	1	1	1	NA	1
Time from confirmation to declaration of EVD response	1	1	1	N/A	1
Total confirmed cases	425	149	15	1	7
Total confirmed deaths	224	37	4	1	4
Case fatality ratio (%)	53	25	27	100	57
Duration of epidemic in days	117	101	63	NA	34

Source: *Okware Samuel (28)*

Uganda has prioritised outbreak-prone diseases for which outbreak preparedness capacity should be built. In terms of human resource, surveillance and laboratory capacity, Uganda has built significant levels of outbreak preparedness. There are a number of pre-service and in-service training programmes for outbreak preparedness human resources development. Scaling up facility-based disease surveillance to all the public health facilities in Uganda has greatly improved the sensitivity of the surveillance system. However, private health facilities, which are increasing in number, are not incentivised to participate in surveillance. Equally, facility-based disease surveillance is not sensitive enough when some communities are far away from health facilities or when certain communities are not incentivised to utilise facility-based health care. All the above notwithstanding, outbreak preparedness is mainly donor-funded. The sustainability of outbreak preparedness is not guaranteed and the country risks loss of the current good preparedness capacity in the event that development support is reduced.

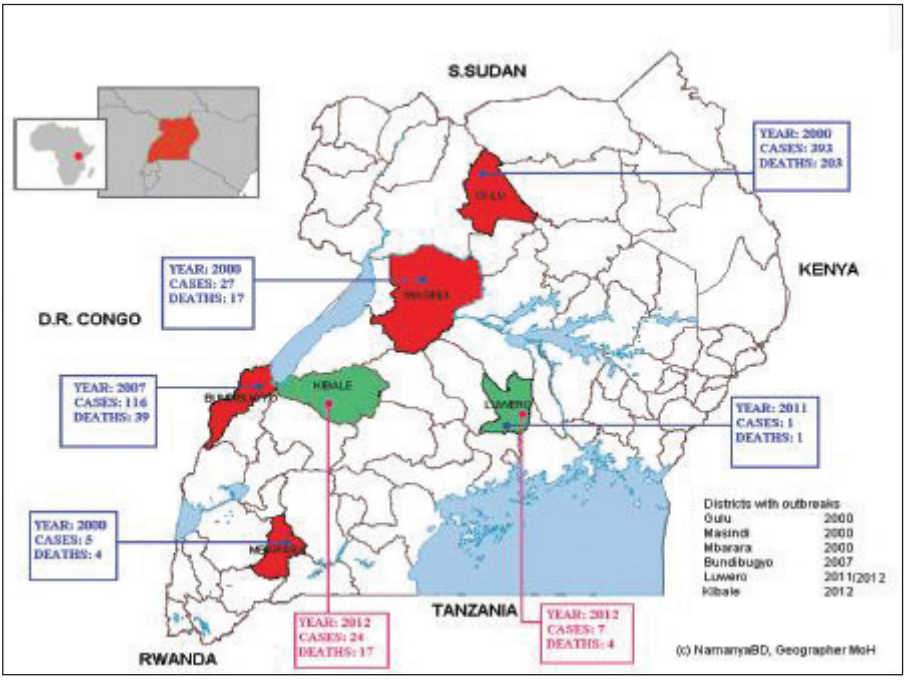
3. Outbreak Response in Uganda

Outbreak response refers to the actions taken during an outbreak to limit the burden of the outbreak in terms of total number of cases, total death and the duration within which the outbreak is controlled.

For a typical infectious disease outbreak, response activities include reactive risk communication, case management, active surveillance and laboratory, logistics, psychosocial support and coordination. We conceptualise the effectiveness of outbreak response in terms of the rate at which confirmed outbreaks spread in the affected community, the rate at which infected individuals die and the time taken to contain a confirmed outbreak. A reduction in these indicators is positively correlated with the effectiveness of outbreak response. For demonstration purposes only, we again take the case of EVD and cholera as a high-risk and a low-risk outbreak, respectively.

Since 2000, when Uganda recorded the first outbreak of EVD, the number of confirmed EVD cases, the number of confirmed EVD deaths, the EVD attack rate, the EVD case fatality rates and the duration taken to contain confirmed EVD outbreaks have all generally reduced over time. This is reflected in Table 17.1 and Figure 17.3 (29). EVD outbreak response has, therefore, improved over time in Uganda. However, the trend of cholera response is different from that of EVD response.

Figure 7.4: Time, place and person analysis of EVD outbreaks in Uganda.



Source: *Okware Samuel (28)*

Table 17.2: Number of cholera cases/deaths and CFRs from 2007 to 2011 in Hoima district, Uganda

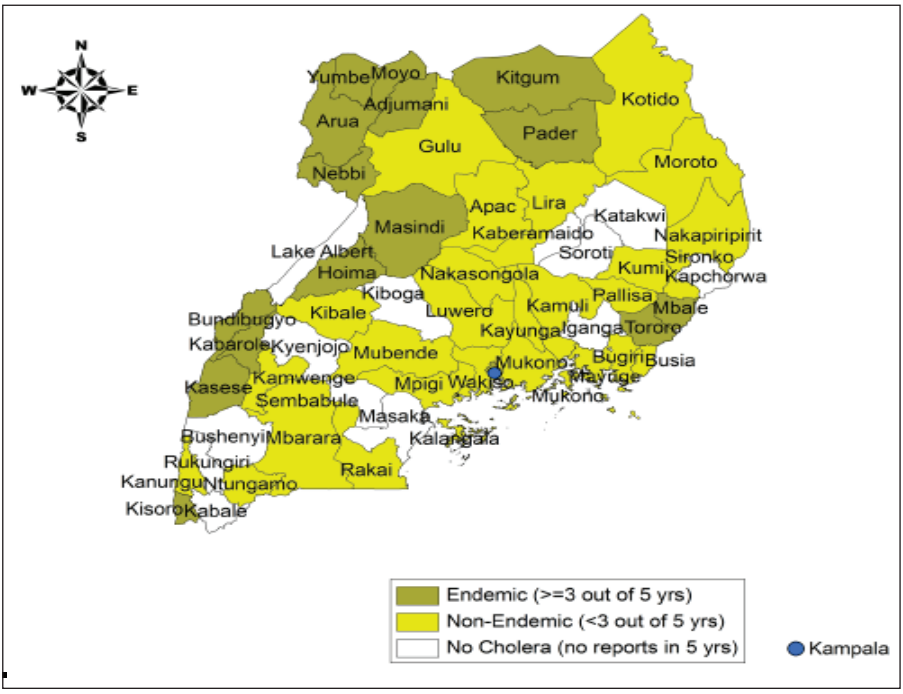
Year	No. of cases	No. of deaths	Case Fatality ratio (%)
2007	1,662	35	2.1
2008	2,630	54	2.1
2009	1,076	23	2.1
2010	2,017	64	3.2
2011	230	5	2.2
Total	**7,615**	**181**	**2.4**

Source: *Bwire et al., 2013 (30)*

Table 17.2 reflects the change in the effectiveness of response to cholera outbreaks in Hoima district in Uganda between 2007 and 2011. Since 2007, cholera ARs and CFRs during cholera outbreaks in Hoima district have generally increased. This is an indication that response to cholera outbreaks has stagnated or even worsened over time in Uganda (30)

As indicated in Figure 17.5 below, 12 districts did not experience any cholera outbreak between 2005 and 2010. In the same duration, 85 districts experienced cholera epidemics in 1 or 2 years while 15 districts experienced cholera in 3 or more years. To date, however, all the 12 districts that did not experience cholera between 2005 and 2010 have reported cholera outbreaks. The number of cholera-"endemic" districts in Uganda has since increased to more than 15.

Figure 17.5: Map of Uganda showing the number of cholera epidemics per district between 2005 and 2010



Source: *Bwire et al., 2013 (30)*

The picture of outbreak response trends in Uganda is mixed. Moreover, response capacity has been built for EVD but not for cholera. The build-up

of outbreak response capacity does not seem to be associated with response memory because Uganda has responded to more cholera outbreaks than EVD outbreaks. The build-up of response capacity seems more associated with the perceived risk and global attention to the outbreak in question. The global attention seems more associated with the likelihood of outbreak spread beyond Uganda. Internationally, EVD is a much higher-risk outbreak compared to cholera. Locally, cholera kills more people and consumes more national resources because of its high frequency compared to EVD.

4. Change in Epidemic Recovery over Time in Uganda

Recovery refers to those actions taken during and after the outbreak to return to normality. Recovery is key in dealing with the aftermath of an outbreak. For cholera, it may include re-opening of the trade in foods and drinks within the community and maintaining safe water supply from previously affected water points (4). For EVD, the WHO recovery toolkit aims at supporting countries to achieve health service resilience. Some recovery actions for EVD are included strengthening surveillance, civil society and community engagements and mental health, among others (26).

In Uganda, one of the recovery efforts that we cite here was the passing of legislation, such as the 1997 Kampala Declaration on Sanitation that came into effect after district authorities in Uganda realised that "poor sanitation was a major constraint (on) development in Uganda" (27). It is evident from this example that recovery efforts require multi-sectoral collaboration, with key strategies evolving around leadership commitment and full community mobilisation.

Generally, outbreak management guidelines encourage After Action Reviews (AARs) after every specific outbreak is responded to. Often times, AARs are not funded because even the main response interventions such as case management rarely get the required funding. But with support from partners like CDC, Uganda sometimes conducts some AARs. The bigger challenge, however, is that when recommendations to reduce the likelihood and impact of the next outbreak are made from the few AARs done, follow-up to ensure that the recommendations are implemented is rarely done. Frequently, the mandate to implement the AAR recommendations lies outside the MoH. And as such, the MoH does not have the mandate to cause other ministries to implement activities which are sometimes not a priority of the ministry that has the mandate to implement them.

Uganda's outbreak management framework (IDSR) puts little emphasis on recovery. Often, the implementation of recommendations to reduce the likelihood and impact of the next outbreak falls within the remit of other MDAs, whose priorities are often different. Further more recommendations within the MoH's jurisdiction have to compete for resources with the other MoH priorities and are often left unimplemented.

Summary of Existing Gaps in Epidemic Management in Uganda

1. In design, the IDSR framework for outbreak management is built on a medical model of disease management that emphasises outbreak detection and response at the expense of the equally important prevention, preparedness and recovery. Resultantly, more stakeholders and resources are focused on detection and response than on outbreak prevention/mitigation, preparedness and recovery. This biomedical model of outbreak management does not build resilience to future disease outbreaks.
2. Operationally, the IDSR-TWG and the NTF at national level and the EPRC and DTF at district level are structures of the MoH. Although empowered by the OPM, MoH's mandate to coordinate other MDAs in outbreak management is not fully recognised. To this extent, other MDAs have not been forthcoming in the collaborative planning and implementation of especially mitigation and recovery interventions that lie outside the jurisdiction of the MoH.
3. Required actions and, therefore, actors across all the phases of outbreak management are often unclear. There has not been a deliberate effort to match the resources, competences and mandates of local, regional and international actors with the required actions across the four phases of outbreak management. This has sometimes led to unproductive conflict among actors and disproportionate allocation of outbreak management resources. This hinders the leverage of multiagency input to plug critical gaps across all the phases of outbreak management for the achievement of UHC.
4. Outbreak management financing in Uganda is heavily donor-dependent, with little direct financing out of government revenue. This type of financing is unprogressive and non-sustainable. It encourages the disproportionate development of outbreak management capacity

which is driven by the interests of the donor. Fir instance, the development of laboratory capacity to confirm any outbreak in record time is good but less important if the detected outbreak cannot be expeditiously responded to. Equally, the reactive financing of outbreak response by donors is often late and does not incentivise mitigation and preparedness against future outbreaks in Uganda.

Key Priorities to Improve Epidemic Management in Uganda

There is need to:

1. Develop and present to the economic bureaucrats of Uganda a business case for increased investment in outbreak management. Outbreaks can have a huge impact on the fiscal economy when they occur. Determining and communicating the amount of financial loss averted owing to increased investment in outbreak management is one of the feasible business cases that could compel economic bureaucrats to allocate more finances to outbreak management.
2. Devise country-owned sustainable mechanisms for financing outbreak management in Uganda as opposed to reliance on reactive financing from donors. Such mechanisms should ensure the availability of sufficient and rapidly deployable finances for outbreak response while incentivising mitigation and preparedness against future outbreaks. Outbreak insurance could be one such sustainable outbreak financing mechanism.
3. Adapt and implement an outbreak management framework modelled on the four phases of the Emergency Management Cycle (EMC) as opposed to the IDSR framework that prioritises detection and response at the expense of the equally important mitigation and recovery. As opposed to a medical model of outbreak management, this would gradually build outbreak resilience over time.
4. Identify all actions required in each of the four phases of outbreak management and assign specific mandates to specific stakeholders (actors). This rationalisation process would enable the proportionate allocation of available resources and the identification of gaps in outbreak management as well as enable the joint mobilisation and deployment of resources irrespective of which MDA faces the resource gap.

5. Build the capacity of line MDAs to collaborate in outbreak management. One of the options would be taking the mandate to coordinate the line MDAs back to the OPM. The other option would be shared leadership through, for example, the rotation of powers to chair joint meetings between the heads of the line MDAs. The most feasible option would, however, be a combination of shared leadership and deliberate development of inter-organisational collaboration capacity (ICC) among the line MDAs.

Conclusion

Frequent disease outbreaks constrain Uganda's realisation of the UHC agenda. Beyond the fatalities, suffering, productive days lost owing to deaths and caring for the sick and the health care resources required to effectively respond to the frequent disease outbreaks, the country foregoes a lot of revenue owing to interruptions to and restrictions in local and international travel and trade due to the frequent disease outbreaks.

The challenge of effective outbreak management in Uganda is complicated by the medical model of outbreak management that does not build outbreak resilience over time; poor coordination of outbreak management; non-progressive financing for outbreak management and the limited capacity for inter-organisational collaboration among the MDAs involved in outbreak management in Uganda.

The solutions we propose to the challenges of outbreak management in Uganda include the following: The need for increased investment in outbreak management; the development of country-owned sustainable mechanisms for financing outbreak management; adapting and implementing an outbreak management framework modelled on the EMC; rationalisation of available outbreak management resources; and improving coordination during outbreak management.

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