

My name is Tolbert Nyenswah, Senior Research Associate in the Department of International Health at the Johns Hopkins Bloomberg School of Public Health in the United States of America.

Before joining Johns Hopkins University, I was the incident manager responsible for the incident management system for the 2014–2016 Ebola outbreak in West Africa, specifically in Liberia.

Teaching this course, I will focus on the module having to do with crowdsourcing surveillance and incident management systems and crisis intelligence.

It's a privilege to introduce this course and the importance of crowdsourcing.

Surveillance is one of the core elements of running a public of crisis. If you have a public health crisis, getting the intelligence the cluster of cases systemic collections, analysis, collation of data, monitoring of cases, tracing their contacts, testing them and reporting is what the surveillance system will look like.

That's the core of any crisis management in a public health system. You have to get the surveillance right, the data collection right, then you can trace the cases. That's the basic component of surveillance.

I know everybody knows what Ebola is: one of the latent diseases transmitted from person to person. Liberia was engulfed and struck in 2014 – the early part of 2014 – with an unprecedented Ebola outbreak and the reason it's unprecedented, it was in three capital cities across borders with thousands of cases that were reported.

Before the outbreak was declared over, there were Africa alone and other areas. It's impacted the healthcare system and economy. Ebola was really devastating. We had to organize an incident management system.

The challenges were organizing the IMS system, getting a coordination team together. Laboratory testing was challenging. We had to transport samples, managing the dead bodies, community engagement and information sharing were the major challenges.

These things collapsed the healthcare system of the three countries: Guinea, Liberia, and Sierra Leone.

There's a difference between the incident management command and incident management system. Incident management system encompasses not only health response, but brings together logistics management, information management, data management, and providing the equipment to do the work.

So the incident management system that I headed in Liberia in West Africa was comprised of the epidemiology system that you have to put together to collect the data, and this is why crowdsourcing is important in a surveillance system.

Contact tracing team has to be there as part of a pillar. You have to

put a laboratory team that collect the specimen from the patient. Social mobilization is very, very key and cases management in isolation unit because in Ebola you have to put the cases in isolation in an Ebola treatment unit and making sure that you have the specialized staff in the ambulance system, treatment management, psychosocial support, buriers of the dead bodies, internal control system, information collection and all or of that, and logistics. All of these are important in an incident management system. Patient isolation, case management, and monitoring the epidemiological trend and the weekly reporting, information sharing with the community makes incident management system an important public health tool with crisis management and outbreaks.

Data collection was at every level of the incident management system. You have to get data from the Ebola treatment units to know the number of cases – the case count. You have to make sure that a laboratory information system was up-to-date to get testing that was done in a lab and the data has to be accurate.

The contact tracers have to go into every cluster of the outbreak in the communities to get people who are contacts, and if the contacts develop symptoms, you have to make sure you get the specimen and put it in a lab and then you have to make sure that the epidemic care is monitored to know when the curve is flattening, and which communities are reporting disease.

That's where the information collection and sharing is important. It drives how the incident management system runs and how you can get ahead of the curve of the disease and make sure the outbreak gets under control.

That's why surveillance system and data collection is very, very important. These are the sources of data that you have to get a monitoring process to make accurate decision for the outbreak.

First the surveillance system have to have trained people, and this is where field epidemiologist play a very, very crucial role. What we did in West Africa – every district and community are cases of Ebola in a community, so we had to use the field epidemiologists that are trained to collect the data.

That information is important. Once you know where the cases are, then you can isolate them. So the role of surveillance system is core to everything in the outbreak. That's how you get decisions for contact tracing, that's how you make the decisions of who to isolate in a treatment unit, that's how you make the decision of what kind of logistics and PPE's (Personal Protective Equipment) are needed in an Ebola treatment unit.

That's how we helped the ministry to curtail the disease in 2014–2016.

I know there were cases in some of the communities that were resistant, and we divided the country into counties and zones reporting. We got to know that there were less cases, or the cases were declining, in some of the counties that we were dealing with, and the capital city of Monrovia was reporting more cases based on the

surveillance information that we were having.

It makes me as the incident manager based on the clusters, to focus more attention on logistics management, on the number of people we needed to deploy, on the number of PPE's we needed to procure and put into action, and you've divided the response, separated to respond with strong community mobilization and community engagement in Monrovia where the disease was concentrated and providing their diseases and other infection to other counties that were Ebola free. And I'm seeing similarities in COVID-19 today.

The situation is similar because we dealing with infection that's spreading from human to human. That's one similarity - it is spreading from one area to another area.

This one is a pandemic. That makes it a little bit different. Ebola was not a pandemic; it was a cluster in West Africa, but there were a few cases that were transported to the United States, Europe, and other areas.

Another similarity is you have to do the same traditional public health measures that you did in Ebola to contain COVID-19, meaning contact tracing is important, testing, testing, testing is important. Making sure that all probable and suspected cases are 100 percent tested.

That's what we did in Ebola. When we got ahead of the disease, it was testing, testing, and testing, and isolating the patients. These are the similarities I see in COVID-19 today.

The dissimilarity is that the case fatality rate is a bit different. For those of you who may not know what case fatality rate is, it's the number of infections below the number of person that will die from the infection.

With Ebola, it had a very high case fatality rate. Before WHO declared the disease over in it was 40 percent case fatality rate, as compared to COVID-19 that is still around 2 percent or 3 percent case fatality rate.

So, the number of people dying from COVID-19 is different from the number of people that were dying from Ebola. But, all of the measures that you are supposed to take are the same.

Get the sick people, test them, get their contact, trace the contact one hundred percent, isolate the contacts. That's how you respond to a disease that is spreading widely like the COVID-19 that we're looking at.

And PPE's are very, very much important. In West Africa we lost 192 healthcare works in Liberia alone. In the entire region, about 300 health workers lost their life. I'm seeing similar situation in COVID-19.

When healthcare workers are getting infected in the United States, in Europe, Italy, Spain, in and China, where the disease started from. So, protecting health care workers with the right PPEs its very, very, very critical.

When healthcare workers are infected, they will desert the health care system and you wouldn't want that. That's happening in West Africa.

You have to know where the disease is to respond. So getting the information in the crowdsourcing and making sure that you test the cases in the communities is very, very much – it's a panacea if I may say it – to getting an outbreak under control.

If you cannot do a surveillance system, you are in trouble. And this is why the curve for COVID-19 has not been flattened yet in places like Europe and the United States.

So getting a surveillance system from crowdsourcing, crisis management, crisis intelligence is important.

It should be a part of the incident management system. The incident management system brings together all of the pieces that I was telling you about: episurveillance, contact tracing, laboratory etc.

And crowdsourcing and getting the cases from the communities it's very, very much critical. It should be stood up from the very beginning of an outbreak, followed by testing.

You must have an isolation facility available to do crowdsourcing surveillance. The reason is, the cases that you are detecting through a surveillance system must go into isolation, and they should be treated.

And so, they go hand-in-hand. As you establish the treatment units, you also establish the crowdsourcing surveillance system.

Finding the cases is one thing – isolating them and treating them is another thing. You break transmission when you isolate the cases.

When the cases are still in a community, human to human transmission will continue. Number one is getting the testing right.

Laboratory system is a challenge. You should get those in place first. From our experience that's one of the major, crucial, challenges we had.

We had to take cases and specimens from Monrovia through the border in Guinea, which is about a thousand kilometers. And, you get the results taken to another laboratory elsewhere, so the testing capacity wasn't there to improve the surveillance system.

That was a major challenge. To alleviate that, you must have the laboratory test and make sure that the specimen is taken to the lab and the contacts are traced very, very fast to get ahead of the outbreak. What we see COVID-19 is the testing is delayed and when those kind of challenges happen you cannot get ahead of the curve.

The disease will flourish, and the exponential increase of the disease, you will see it in communities at the big cities. That's why we are containing right now.

So, my advice to countries, communities, and cities and states that are facing COVID-19 right now – make sure your testing capacity is there.

Get areas to isolate the cases, and then you have a very strong surveillance system and information sharing. One of the important things that we also need to know in a crowdsourcing and surveillance system is to do self-isolation and self-quarantining for people who are suspected having a disease.

I would give thermometers to households and communities with contacts

so we could do self-reporting of their temperatures. That's part of a surveillance system.

If somebody is getting symptomatic, they report their symptoms immediately. You get an ambulance to a healthcare facility and get the person into an isolation. And the rest of the people in the house, you make sure that everybody is self-isolated.

With that, we get ahead of the disease and the disease is not transmitted in the population.

So the challenges can be overcome when you have your testing capacity, your isolation facilities, your households are aware of the treatment of the disease and can report the cases on time.

So colleagues, thank you for listening. It is an important measure for this course. It's an important course. Crowdsourcing surveillance in crisis intelligence is very, very much important.

Tolbert Nyenswah, a Senior Research associate at the Johns Hopkins Bloomberg School of Public Health, someone who headed the Ebola crisis in West Africa – the conglomeration of international responders.

So this course is an important course. I would like to take you to a website: [www.cdc.gov](http://www.cdc.gov).

At [cdc.gov](http://cdc.gov), there is a paper that was published called "Ebola crisis management" and I can send you the website later on so that you get the core of that and you can know how the incident management and crisis management system is set up.