EBOLA: Facts and Fiction

Symptoms of Ebola

- Fever
- Severe headache
- Muscle pain
- Weakness
- Diarrhea
- Vomiting
- Abdominal pain
- Bleeding or bruising

According to the Médecins Sans Frontières (MSF), in the early days of infection, symptoms are non-specific which makes Ebola difficult to diagnose. In the early stages, the disease is characterized by sudden fever, weakness, muscle pain, headaches and a sore throat. As time progresses, vomiting, diarrhea, rash, liver and kidney problems and internal and external bleeding often occur. Other less common symptoms which may occur in the later stages are red eyes, hiccups, chest pain and difficulty breathing and swallowing.

History and Current Ebolavirus disease (EVD)

The Ebola Virus Disease (EVD) is an acute, severe and potentially fatal disease characterized by haemorrhagic fever. The virus was discovered in 1976 in Zaire (now the Democratic Republic of the Congo [DRC]) and has since had relatively few outbreaks. In the past, EVD was largely confined to rural areas which was thought to limit transmission. However, in December 2013, the largest and first regional outbreak of EVD reached West Africa, with the first outbreak reported in southern Guinea in December 2013.

Since then, there have been confirmed cases in the following countries: Guinea, Liberia, Senegal, Sierra Leone, the Democratic Republic of the Congo (DRC), Mali, Spain and the U.S. The outbreak was not recognized until March 2014 (three months after the outbreak in southern Guinea) when it infiltrated the borders of Nigeria when an individual travelled on a commercial plane on July 20th from Liberia. Shortly after, on August 8th, the World Health Organization (WHO) declared EVD an epidemic, yet some studies suggest the outbreak could have been circulating in the Western region for almost a decade.

As of October 22, 2014, the Center for Disease Control (CDC) reported the disease has claimed 4877 lives out of 9935 total cases. Of these cases, 433 health workers have been infected, of whom 244 have died, according to the World Health Organization on October 25th.

2Dr. Jennifer Gardy, “The Open Source Outbreak,” Health Achieve Conference, 3 Nov. 2014.
On October 24th, the first case of Ebola was declared in Mali, where the patient later died, according to the Medecins Sans Frontieres (MSF). By December 6th, the virus had killed 6128 people of 17290 cases. While the toll is rising, since October 20th, 2014, Nigeria has declared that the disease is contained, with no new cases. Moreover, in the first week of November, there seemed to be a lull in Western African cases. The CDC’s definition of the end of an EVD outbreak is when 42 days have passed since the last patient in isolation tests negative.

There have been five confirmed patients with Ebola overall in the United States, two of whom were released from the hospital, one who remains in isolation and two of whom have died after being sent back from Western Africa to the U.S. Of these people, four have been healthcare professionals, including the two most recent cases who were doctors practicing medicine in Western Africa. Media reports claim the doctor diagnosed in New York, Dr. Craig Spencer, went through many screening procedures on October 17th at the Kennedy Airport but was allowed entry without being quarantined, despite his work with the MSF treating Ebola patients. As the doctor began to experiencing lethargy, diarrhea and a fever, he contacted medical services and was isolated at Bellevue Hospital in New York. Dr. Craig Spencer was released from the hospital Ebola-free on November 10th as his symptoms were recognized early. However, Dr. Martin Salia, who returned from Sierra Leone as a general surgeon, arrived at the Nebraska Hospital in the later stages of the illness, 13 days after he was diagnosed and sadly died soon after.

Additional Analysis

The Canadian-born organization called Médecins Sans Frontières (MSF), or, Doctors Without Borders, has been at the forefront of the Ebola crisis, as well as other international humanitarian disasters since 1971. As the primary supplier of aid, the organization has also been a central educational resource and is especially useful for SEIU Healthcare as their safety protocols for front line healthcare workers are paramount.

On October 30th, the MSF held a lecture titled, “Stopping Ebola: MSF’s experience on the front lines of a historic epidemic” which discussed the historical significance of Ebola and how to not only address, but stop the crisis. The Executive Director, Stephen Cornish, said that since the first documented case in 1976, Ebola has been a longstanding, neglected disease. Cornish said that there have been over a dozen outbreaks over the last several years and that the MSF has helped respond to them in partnership with the ministries of health in the concerned countries.

According to Jennifer Gardy of the B.C. Control Disease Centre, the science community

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is not collecting useful data to trigger infectious disease and epidemic alerts and that the alarm bells only ring when a crisis reaches the global level. Gardy provides the example of Ebola and notes that on March 14th, a “HealthMap” application found an Ebola case. HealthMap is an online disease mapping tool which collects and combines information from different sources, including social media, to map threats. By doing so, HealthMap identified a “mystery hemorrhagic fever” that killed eight people in southeastern Guinea. A week later, on March 22nd, 2014, the first Ebola case was reported as suspected on an internet reporting resource called The Program for Monitoring Emerging Diseases, or, “ProMed Mail.” According to the website, ProMed is an internet-based reporting system designed to disseminate information on outbreaks in a rapid manner to pre-empt and prevent outbreaks and epidemics. Despite the fact that the website reported an Ebola case in March, no action was taken by larger bodies such as the WHO. On June 23rd, MSF said that Ebola was out of control and according to Dr. Gardy, the WHO waited three days after this statement to report the first case (7 months after the ProMed alert). Moreover, she notes that only on August 8th did the WHO declare the epidemic a state of emergency. Given their sluggish response, Dr. Gardy suggests that citizens are the most powerful source of data, as she notes was proven by the first reported case on HealthMap and transcended physical borders.

While it is important not to cause unnecessary panic or alarm, it is even more essential to ensure proper reporting mechanisms are in place for proper procedure to be put in place. As reported by both the MSF and Dr. Gardy, the current surveillance and reporting system does not allow for this cautionary approach which is very problematic for front line healthcare workers; the first ones to arrive at the scene. This negligence is very disconcerting as more forewarning could have led to greater protection of front line healthcare workers, as well as the general public. Therefore, there needs to be a more standardized, unified and pre-emptive approach to infectious diseases which moves beyond borders and into broader channels. Likewise, there needs to be a swift response to provide pre-emptive resources and reactionary aid to more impoverished countries in such situations, as opposed to waiting until it has an impact on Western countries.

Screening and Quarantining: U.S and Canada

The diagnosis of healthcare workers, specifically the MSF doctor in New York, prompted discussion over the legalities and necessity of controversial mandatory quarantining for people returning from affected regions. While the Federal government backed away from widespread enforcement, certain states such as New York and New Jersey are imposing mandatory quarantine for health care workers travelling from Western Africa. However, there is still

10Gardy.
11“Health Map,” Harvard Medical School and Boston Children’s Hospital, 2014.
14Gardy.
15Ibid.
controversy over the legalities of mandatory 21-day quarantining, especially as the modern federal case law governing quarantine is not developed.\textsuperscript{16} Regardless, on October 29\textsuperscript{th}, Chuck Hagel, U.S. Secretary of State, ordered that all military personnel must undergo a 21-day quarantine if they are returning from West Africa.\textsuperscript{17}

In Canada, the quarantining approach is less forceful as the PHAC recommends healthcare professionals or other responders from Western Africa to monitor for symptoms for 21 days after arrival, according to Dr. Gregory Taylor, the Deputy Chief Public Health Officer.\textsuperscript{18} Yet, for those labelled “high risk travellers” – those who have been in Guinea, Sierra Leone or Liberia and have had direct contact with Ebola patients – will be directed to self-isolate at home or at a designated treatment centre for 21 days.\textsuperscript{19} It was not explicitly specified whether or not these travellers include HCWs.

However, in early November, the screening procedures introduced in Canada sparked large controversy and has since received criticism from the international community. On October 31\textsuperscript{st}, the Federal government announced it would not issue new travel visas for residents or citizens of countries with widespread Ebola transmission.\textsuperscript{20} Moreover, they are putting permanent residency visa processes on hold for people from Western Africa. Subsequently, the World Health Organization has asked Canada to justify this move since the International Health Regulations Treaty stipulates that infectious disease outbreaks should not render travel or trade sanctions against affected countries beyond what is recommended by WHO. Since WHO has urged countries not to impose sanctions from the region, the government of Canada and Australia must provide their rationale to the organization.

\textit{Additional Analysis}

In regards to quarantining time, the CDC, WHO and MSF state that symptoms can appear anywhere from 2-21 days after exposure to the disease but that the average is 8-10 days. However, there have been some conflicting views on the range, where some scientists argue Ebola is contagious even after the 21 days.

On October 14\textsuperscript{th}, \textit{PLOS Currents} published a journal article which challenges the common conception of a 21-day quarantine period.\textsuperscript{21} According to their website, \textit{PLOS Currents, Outbreaks} is a publication channel that seeks to minimize the time between the generation and publication of new research, without threatening its integrity in relation to peer-reviewing, citations, and other legitimizing processes. Charles N. Haas, the author of the article


\textsuperscript{18} Canada, Public Health Agency of Canada, \textit{Statement from Dr. Gregory Taylor, the Deputy Chief Public Health Officer, on the Ebola Outbreak in Africa}, Ottawa, 08 Nov. 2014.

\textsuperscript{19} Ibid.


on Ebola quarantining, argues that the 21-day limitation is correct when looking at interpretation of early outbreak data but that a reconsideration is needed as 21 days may not sufficiently protect public health.\(^{22}\) Haas’ findings were complemented by University of Texas Medical Branch (UTMB) virologist, Dr. C.J. Peters, who estimates that approximately 5 per cent of people can transmit the virus after more than a 3 week incubation period.\(^{23}\) One variability considered in the incubation time period is whether the appearance of symptoms is related to the type of bodily fluid one encounters; an element that has not yet been confirmed. Another unknown factor is at what exact temperature the patient start shedding the virus, according to Dr. Michael Hodgson, chief medical officer of the Occupational Safety and Health Administration.\(^{24}\)

The science concerning incubation must be developed not only to protect public health, as Haas suggests, but more importantly, to protect front line healthcare workers who are at the highest risk of contracting the disease.

In the U.S., SEIU International’s Health and Safety Director, Mark Catlin, notes that there are a myriad of issues when it comes to incubation considerations. Catlin poignantly notes that in his 30 years of experience in OHS issues, Ebola is the fastest-moving occupational disease and that what has to be done is so complex that “any one issue ripples into ten other questions about how to we do it here.”\(^{25}\) Currently, in relation to quarantining alone, Catlin notes the many questions raised, such as: If one hospital provides full pay, benefits and job security, during the 21 days after a health team is in contact with a suspected Ebola patient, what happens to those who have another job which does not provide the same security during that time? What happens to those employees that are coming home from visiting family in Western Africa, who are ordered by their employer to stay home without compensation? And how do you deal with the stigmatism and racism associated with the disease?\(^{26}\) In relation to racist attitudes, Catlin states that some of the older nurses are reporting that the situation feels similar to the discriminatory attitude that emerged in the early 1990s with HIV.\(^{27}\) All of these questions will be addressed in the full SEIU Healthcare position paper on Ebola, specifically in relation to current OHS legislation and regulation and essential developments that need to be made, as outlined by Catlin and other important stakeholders.

Interestingly enough, the MSF notes that the UN Security Council declared Ebola a threat to international peace and security; a designation that is only paralleled by HIV/AIDS in the 1990s as it was the first time a disease was characterized as a security threat.\(^{28}\) Yet, the MSF posits that the only way to end the epidemic is for more healthcare workers to provide assistance to the afflicted areas in Western Africa in order to fight the epidemic both there and worldwide. In the same vein, on November 21\(^{rd}\), United Nations Secretary-General, Ban Ki-moon, urged countries to continue their support in hopes of bringing the disease under control by mid-

\(^{22}\) Ibid.

\(^{23}\) Sharon Begley, “U.S. scientists say uncertainties loom about Ebola's transmission, other key facts,” Reuters, 3 Nov. 2014.

\(^{24}\) Michael Hodgson, The Institute of Medicine and National Research Council Panel, 4 Nov. 2014.


\(^{26}\) Ibid.

\(^{27}\) Ibid.

\(^{28}\) “Stopping Ebola: MSF’s experience on the front lines of a historic epidemic.”
MSF’s Stephen Cornish notes that, “If healthcare personnel in our own countries end up with a level of fear that will prevent them from lending a hand and going overseas...It worries me greatly that if we don’t educate people, that it could take over and that West Africa won’t get the help it deserves and that will be the worst outcome possible.” Cornish goes on to quote Dr. Peter Piot, who diagnosed Ebola in 1976, and said that the biggest fear is that the disease will get into Nairobi or Delhi and “should that happen, we can’t even tell you what kind of situation that will be.”

Cornish notes:

We have a collective moral responsibility, we have a humanitarian responsibility, absolutely. But we also have an awful lot of self-interest in ensuring that this global world that we live in does not have to face the plague that we’ve left West Africa wallowing in, unnecessarily, lethally, for far too long. So we have to respond together, we have to be courageous, we are learning and we’re learning together. And there is no zero risk; we have to take some risk.

To remedy the fear of Ebola and reduce the risk of infection, the MSF notes that they provide three simple steps: case management, contact tracing and public education. More of their skillful tactics will be explored in the transmission section below.

Transmission

The disease is transmitted through close contact with bodily fluids (e.g. blood, vomit, secretions) and can be carried by both humans and animals. While Ebola is a very dangerous disease, the MSF and other sources report that it is very hard to catch and that it cannot be transmitted until symptoms are present. There appears to be a lower risk of contracting the disease compared to other disease such as SARS which was airborne. To put it in perspective, in epidemiology, infectious diseases are rated using a basic reproduction number to designate its rate of infection (denoted $R_0$). The $R_0$ reproduction rate for Ebola is 1.5-2.5 (through bodily fluids), whereas the SARS rate is 2-5 (airborne droplet) and measles is 12-18 (airborne). The mortality rate is relatively high for Ebola, with the WHO estimating the average fatality at 50%, where rates have varied from 25% to 90% in the past.

Additional analysis

It is suspected that Ebola was transferred to humans though a process called zoonosis, where animals, most often bats, produce “spillover” (bodily waste) and infect humans. Dr. Gardy of the B.C. CDC claims that since 1940s, 60 per cent of 336 emerging diseases have been from this...
process and that in the current Ebola case, the point of infection can be traced back to hunters that ate buckwheat.  

Fast forwarding to the current epidemic, the MSF explains that Guinea was the epicentre of the current disease. Since the closest case of Ebola was 5000 kms. away and since there had never been an outbreak in that region, the symptoms were not connected to Ebola but rather, malaria. Luckily, the MSF had a malaria clinic available and soon realized the disease was unique. However, since the zone traverses three countries and the Kissi people, native to the region, travel throughout the area, the outbreak easily spread to other bordering countries. Moreover, the Kissi people have specific traditions associated with death, where the bodies are brought back to their hometown and where the people have close contact with the body. Since the hemorrhagic and most transmissible stage of Ebola is in the last few days of life and the first few days of death, that is the most transmissible stage which led to the quick spread. Adding insult to injury was the fact that for the region, which was as large as Guelph, there was only one doctor who worked for MSF and later died of infection. Cornish notes, “There were 225 doctors in Sierra Leone and Liberia for 10 million workers and because they were on the front lines trying to fight this disease, because they weren’t protected, because they didn’t have the tools they needed, at this stage, one third of those doctors have died from this disease.”

As the MSF suggests, despite the seemingly high mortality rate of Ebola, the MSF and various other organizations argue that the mortality rate is largely determined by the quality of healthcare and level of infrastructure. MSF doctor, Tim Jagatic, claims the current, deadliest strain kills 90% of people infected but that when they provide the most basic level of care, the mortality rate is down to 50%. When they have behavioural changes in the community, Jagatic claims the mortality rate lessens another 20% which can be brought down even further with aggressive therapies related to IV fluids and electrolytes. This reality is the reason why the Executive Director argues that Western HCWs must provide help as well. Cornish states:

Infected AID workers are coming back, that is a reality. And the truth is, when more organizations are working, when more governments are truly on the ground, the numbers of infections are going to increase and there will be more infected people coming back to the Western world. The important, the thankful part and the thing we have to remind ourselves of is that our healthcare systems are capable of managing these cases; they have the know-how, we will not see a pandemic in the West; that is an absolute. And we can rely on and be confident in our healthcare systems. There is no such thing as zero risk but we have to fight Ebola on its facts. And we have to fight it at the epicentre in West Africa…

Although these points are compelling, we still must ensure that the Canadian healthcare system is providing the highest quality of care within the most stable infrastructure and with the least amount of impact on healthcare workers to allow for this aid to be provided outside our borders. And while this is expected out of the Canadian healthcare system, there are still significant gaps in the standardized protection of HCWs which must be instigated and which will be discussed in

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34 Gardy.
35 “Stopping Ebola: MSF’s experience on the front lines of a historic epidemic.”
36 Ibid.
37 Ibid.
the position paper to follow. As the MSF argues, one of the main approaches to Ebola must be public education and this is an element that is missing both in Western Africa as well as regions such as Canada and the U.S.

Another area of debate is the mode of transmission, where the debate centres around whether or not the disease can be carried via aerosols. In an article titled, “Health Workers Need Optimal Respiratory Protection for Ebola,” Dr. Lisa M. Brosseau and Rachael Jones of the Centre for Infectious Disease of Research and Policy (CIDRAP) states that there are two common conceptions regarding aerosols: that no-one located at a distance from the individual has contracted the disease and that respirators or other control measures for infectious aerosols cannot be recommended in developing countries because the perceived lack of resources, time and understanding.38 Brosseau and Jones’ response is that the first misconception “reflects an incorrect and outmoded understanding of infectious aerosols, which has been institutionalized in policies, language, culture, and approaches to infection control” and that virus-laden bodily fluids may be aerosolized and inhaled when close to an infected person. She also makes the important point workers everywhere deserve access to the best-types of protection, which in this case, are PAPRs and that “Every healthcare worker is a precious commodity whose well-being ensures everyone is protected.”39

Dr. Brosseau notes that early aerobiologists believed that only small particles (less than 5 micrometres) can be inhaled into the respiratory tract and that the current paradigm dictates this belief. However, Brosseau argues that “It’s time to abandon the old paradigm and consider one that looks at a full range of particle sizes both near and far from a source and the pathogen’s resistance to certain temperatures.”40 SEIU International’s Health and Safety Director, Mark Catlin, uses Brosseau’s research to argue that up to date science shows that there is a range of droplets from large to small and that there is a need to differentiate between them to know their effects on HCWs. Regardless, Catlin argues that real respirators (PAPRs) need to be used at any point to warn against aerosol spread, such as through particles floating in the air for hours after contact with patient and infecting the environment (e.g. linens).41


39 Ibid.

40 Ibid.

41“Stopping Ebola: MSF’s experience on the front lines of a historic epidemic.”
Works Cited


Begley, Sharon. “U.S. scientists say uncertainties loom about Ebola's transmission, other key facts.” Reuters. 3 Nov. 2014.


Gardy, Jennifer Dr. “The Open Source Outbreak.” Health Achieve Conference. 3 Nov. 2014.


“Guidance on Personal Protective Equipment To Be Used by Healthcare Workers During Management of Patients with Ebola Virus Disease in U.S. Hospitals, Including Procedures for Putting On (Donning) and Removing (Doffing).” Centers for Disease Control and Prevention (CDC). 20 Oct. 2014.


“Health Map.” Harvard Medical School and Boston Children’s Hospital. 2014.

Health Protection and Promotion Act, R.S.O. 1990, c. H.7, sec. (77).

Michael Hodgson. The Institute of Medicine and National Research Council Panel. 4 Nov. 2014.


Occupational Health and Safety Act R.S.O. 1990, c. O.1


