

## Infectious Diseases 2015 :The threat of zoonotic diseases and ebola virus disease specifically -Stef Stienstra - Royal Dutch Navy

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Public health systems are not always prepared for huge outbreaks of infectious diseases. Although in the past several public health institutes were prominent surveyors of infectious diseases and very active in the mitigation of infectious diseases both in- and outside their country of origin, like the French Institute Pasteur, Dutch Tropeninstituut and many others Institutes, the investments in worldwide public health was in the last decennia far less compared to curative healthcare. With the recent Ebola Virus Disease outbreak in West Africa we see now a new wave of growing interest in Worldwide Public Health. Zoonotic diseases are the most dangerous for outbreaks as the population does not have natural nor artificial (from vaccination) immune response to new emerging diseases. The Ebola Virus Disease outbreak in West Africa is such an example. As the new strain of the Ebola Virus in West Africa has a longer incubation time and is only slightly less lethal compared other Ebola Virus strains, the threat of spreading among the population is far bigger. Especially when the epidemic enters denser populated areas. The mitigation of a highly infectious and deadly disease outbreak has several aspects for which most public health systems in the world are not trained well enough. NGOs helping to fight the outbreak are often also better trained in curative treatments and have less experience with biological (bioweapon) threats for which the military are trained for. The UNMEER mission is unique in this. It is a setting in which military and civilian actors cooperate in fighting a biological threat. Protection is essential for health workers and smart systems have to be developed to prevent further spreading of the disease. But it is unfortunately not only the biosafety, which has to be considered, but also the biosecurity, as misuse of extremely dangerous strains of microorganisms cannot be excluded. Several zoonotic infectious diseases, like anthrax, small pox and also the haemorrhagic fevers like Ebola Virus Disease are listed as potential bioweapons. With this extra threat in mind both biosafety and biosecurity has to be implemented in all measures to fight outbreaks of highly infectious diseases, as we are now doing in West Africa. Animals provide many benefits to people. Many of us interact with animals in their daily lives, both reception and far away from home. This sort of disease passes from an animal or insect to a person's. Some don't make the animal sick but will sicken a person's. Zoonotic diseases range from minor short-term illness to a serious life-changing illness. Certain ones can even cause death. Ebola virus was first discovered in 1976 near the Ebola River in what's now the Democratic Republic of Congo. Since then, the virus has been infecting people from time to time, resulting in outbreaks in several African countries. In fact, the epidemic killed five times quite all other known Ebola outbreaks combined. Quite 21 months on from the primary confirmed case recorded on 23 March 2014, 11,315 people are reported as having died from the disease

in six countries; Liberia, Guinea, Sierra Leone, Nigeria, the US and Mali. There's no cure or specific treatment for the Ebola virus disease that's currently approved for market, although various experimental treatments are being developed. For past and current Ebola epidemics, treatment has been primarily supportive in nature. On 30 April, the US pack up a special Ebola treatment unit in Liberia. The last known case of Ebola died on 27 March, and therefore the country was officially declared Ebola-free on 9 May 2015, after 42 days with none further cases being recorded. The Ebola virus causes an acute, serious illness which is usually fatal if untreated. EVD first appeared in 1976 in 2 simultaneous outbreaks, one in what's now Nzara, South Sudan, and therefore the other in Yambuku, DRC. The latter occurred during a village near the Ebola River, from which the disease takes its name. The 2014–2016 outbreak in West Africa was the most important Ebola outbreak since the virus was first discovered in 1976. The outbreak started in Guinea then moved across land borders to Sierra Leone and Liberia. the present 2018-2019 outbreak in eastern DRC is very complex, with insecurity adversely affecting public health response activities. The virus family Filoviridae includes three genera: Cuevavirus, Marburgvirus, and Ebolavirus. Within the genus Ebolavirus, six species are identified: Zaire, Bundibugyo, Sudan, Tai Forest, Reston and Bombali. The virus causing the present outbreak in DRC and therefore the 2014–2016 West African outbreak belongs to the Zaire ebolavirus species. The virus spreads through direct contact with body fluids, like blood from infected humans or other animals. Spread can also occur from contact with items recently contaminated with bodily fluids. Spread of the disease through the air between primates, including humans, has not been documented in either laboratory or natural conditions. Semen or breast milk of an individual after recovery from EVD may carry the virus for several weeks to months. Fruit bats are believed to be the traditional carrier in nature, ready to spread the virus without being suffering from it. Other diseases like malaria, cholera, typhoid, meningitis and other viral haemorrhagic fevers may resemble EVD. Blood samples are tested for viral RNA, viral antibodies or for the virus itself to verify the diagnosis. Control of outbreaks requires coordinated medical services and community engagement. This includes rapid detection, contact tracing of these who are exposed, quick access to laboratory services, look after those infected, and proper disposal of the dead through cremation or burial. Samples of body fluids and tissues from people with the disease should be handled with special caution. Prevention includes limiting the spread of disease from infected animals to humans by handling potentially infected bushmeat only while wearing protective clothing, and by thoroughly cooking bushmeat before eating it. It also includes wearing proper protective clothing and washing hands when

around an individual with the disease.

### **Biography**

Stef Stienstra is a Strategic and creative consultant in biomedical science, with a parallel career as a Commander of the reserve of the Royal Dutch Navy. For the Dutch Armed Forces he has responsibility for the counter measures in CBRNe threats and (medical) consequence management both in a military and a civilian (terrorism) setting. He is strategic functional specialist for "Health & Environment" of the 1-Civil-Military-Interaction Command (1-CMI) of the Dutch Armed Forces and for 2015 also in the NATO Response Force (NRF), which is in 2015 the responsibility of the 1-German-Netherlands-Corps (1-GNC). He was the director of the 2014 World Congress of CBRNe Science & Consequence Management in Tbilisi, Georgia. In his civil career he works internationally as consultant or as scientific supervisory board

member for several medical and biotech companies, merely involved in biodefense. He is also visiting professor for Punjab University in Pakistan and Rhein-Waal University in Germany. He has finished his studies in Medicine and in Biochemistry at the University of Groningen in The Netherlands and has extensive practical experience in cell biology, immuno-haematology and biodefense and transfusion medicine. His natural business acumen and negotiation competence helps to initiate new successful businesses, often created out of unexpected combinations of technologies. His good understanding of abstract science combined with excellent skills in the communication of scientific matters to non-specialists, helps him with strategic consulting at top level management.

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