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Zika and Ebola: What we should learn from health crises

Daniela Braun

Key Points

- Health crises such as Ebola and Zika will be the rule rather than the exception. The international community should adapt to this reality and implement the far-reaching reforms developed after the Ebola crisis.
- It would be a mistake to orient reforms in global health policy too strictly on an Ebola-specific scenario. Zika has shown that every health crisis presents different challenges.
- Germany has assumed a leadership role in global health policy in recent years and can make a significant contribution with its partners to strengthen the international health architecture.

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Zika – a disease with two faces

No sooner was the Ebola crisis in West Africa under control than a new disease became the source of concern for health experts all over the world. Known since 1947 and mainly carried by mosquitoes, the Zika virus was suspected of causing severe brain malformations in newborns. Unlike Ebola, Zika is a creeping crisis, the fatal consequences of which only become visible at a later point in time. Every epidemic is different and presents the international community with distinct challenges. The delayed and inadequate response of the international community to Ebola created a storm of "lessons learned" reports and political momentum for far-reaching reforms. It would be a fatal error, however, to orient reforms solely on an Ebola-specific scenario. Zika has shown how surprisingly different the next health crisis can be.

On 1 February 2016 the World Health Organization (WHO) proclaimed a public health emergency due to the Zika virus. A coordinated international response was necessary to combat the epidemic, according to WHO General Director Margaret Chan. It was not the viral disease itself, which is usually very mild and only causes symptoms in one out of five cases, that worried experts. Rather, it was the dramatic consequences for unborn children that led the WHO to make this decision. Health experts had observed a sharp increase in the number of Zika cases in Brazil since May 2015, more than 4,000 babies being born with suspected microcephaly from October 2015 until January 2016. By way of comparison: In previous years, 163 microcephaly cases had been reported on average. What was initially only a strong suspicion at the start of 2016 was confirmed in April 2016. The U.S. Centers for Disease Control and Prevention (CDC) reported that a causal relation existed between infections and miscarriages, fetal death, microcephaly and other severe neurological damages.[1] In the meantime, the disease has also become associated in rare cases with Guillain-Barré Syndrome, a disease of the peripheral nerves in adults.

Zika can have drastic consequences for unborn children.

Rapid dissemination

The disease has spread rapidly worldwide. In October 2016, 67 countries had reported Zika cases with infections through vectors (i.e. disease carriers), while in February 2016 "only" 33 countries had done so. More than five million babies are born each year in the countries of the Western Hemisphere affected by Zika. The situation in Puerto Rico is particularly disturbing, where more than 10,000 Zika cases have been reported. One in 10 infected persons is a pregnant woman. As a result of these figures, the U.S. government proclaimed a health emergency in the insular areas, with CDC director Thomas Frieden warning on 25 October 2016 that the spread of the virus was out of control. In Germany, over 200 cases of Zika infections have been reported since October of last year (as of 4 November 2016).[2]

Over 200 cases of Zika infections in Germany

Zika still a danger

The CDC calls the fight against Zika the most difficult in its history. The large degree of ignorance about the virus, the differing effects and the delayed visibility of the consequences are reasons that led health authorities to make this dramatic declaration. Even though the WHO ended the global health emergency on 18 November 2016, health experts nevertheless stressed that Zika would remain a significant and prolonged threat and that the fight should not be neglected.

Health emergency as a wake-up call

Zika as the fourth "health emergency of international dimension"

The WHO had most recently proclaimed a public health emergency for the Ebola epidemic in West Africa. After the swine flu in 2009 and the spread of polio in 2014, Zika is the fourth "Public Health Emergency of International Concern" (PHEIC) since the reform of the International Health Regulations (IHR) in 2005. Whether a health crisis is to be declared a state of emergency is decided by a committee convened by the WHO. This IHR emergency committee is composed of international experts from the areas of virology, infectious diseases, vaccine development and disease control, who are appointed by the Director -General.

Global health emergency as wake-up call

According to the IHR, a PHEIC occurs when a disease represents an "extraordinary event," constituting a "public health risk" to other states and requires a "coordinated international response." In addition to the temporary recommendations the emergency committee can make (e.g. travel advisories), a health emergency sends a strong political signal. As a wake-up call, the international community is called to action, drawing the attention of specialists and financial backers to the health crisis.

Five observations from the experience with Ebola and Zika

Ebola crisis a warning shot

After the Ebola crisis, the international community, and especially the WHO, was criticized for the far too late and inadequate response. Presumably for this reason, the World Health Organization reacted faster in the case of Zika, declaring an emergency in February 2016. The Ebola crisis was seen by experts as a warning shot for the international community to reform its crisis management capabilities. The lessons learned from the crisis in West Africa, which claimed more than 11,300 lives, have been discussed in countless reports, lectures and conferences.

The following five observations can be drawn from the analysis of the Ebola and Zika health crises. They show that it would be a mistake to orient reforms too closely on an Ebola-specific scenario. The observations are also intended to serve as additional suggestions and considerations for current reform efforts in global health policy.

I. The new normal – health crises are more the norm than the exception

Health crises are more the norm than the exception.

Ebola in West Africa, Zika in Latin America, the USA and Southeast Asia, yellow fever in Angola and the Congo, avian flu in China—the accumulation of serious outbreaks of diseases in recent years suggests that health crises will be the norm rather than the exception. This is due mainly to the rapid increase in the volume of travel and commerce, the increase in the world's population, as well as urbanization and environmental degradation. All these developments will continue in the future, thus further increasing the likelihood and speed of disease outbreaks.

Strengthen prevention, early detection and crisis management

This should not be a reason to panic. It should rather be an urgent call to develop strategies and build capacities at three levels: prevention, early detection and crisis management, in order to decisively counter the rise in health crises.

The Ebola outbreak in West Africa caught the international community by surprise and overwhelmed it. In light of the fact that the pathogen is not unknown and has appeared irregularly in Africa since the 1970s, the delayed and, for a long time, inadequate response of the international community was particularly unsettling. Nor did anyone foresee the potential danger and rapid spread of the Zika virus, which

Prepare for a broad spectrum of different scenarios

has been known since 1947. The fact that it is nearly impossible to predict what pathogen will trigger the next crisis makes it imperative to prepare for the widest possible range of scenarios. Nevertheless, it is advisable to identify particularly dangerous pathogen hotspots and to monitor them closely. Analyses such as the Infectious Disease Vulnerability Index of the RAND Corporation can offer valuable guidance.[3]

II. Zika – a creeping crisis

"The more we know, the more serious appears the situation."[4] Margaret Chan

The impact of viruses on people can vary in many ways.

Every epidemic is different. The effects of viruses on people can vary in many ways. Though this may sound banal, it must be emphasized in order to illustrate just how complex the management of health crises can be. The nature and mode of transmission, the reproduction rate, the symptoms, the degree of lethality and other potential damage are only some of the factors that determine the "face" of an epidemic. We cannot neglect the critical battle against Zika simply because this outbreak does not resemble the preceding one.

The consequences of Zika are only visible later.

Zika is a creeping crisis, whose potential drastic harm only becomes visible at a later time. While Ebola immediately causes severe symptoms and can in many cases lead to death, Zika only triggers mild symptoms in few cases. Death occurs very rarely. The delayed visibility of its consequences allows the fight against the virus to have low priority among decision makers. In the United States, where parts of Florida and Puerto Rico are heavily affected by Zika, a bill to finance the fight against the virus failed twice in Congress before finally passing at the end of September 2016.

Severe neurological damage through Zika

Zika has been proven to cause grave neurological damage, a fact that must be taken very seriously, despite its delayed appearance. A virus that attacks the human brain in such a severe way, causing serious neurological damage in a large number of unborn babies and, in rare cases, adults, cannot be ignored. And the potential consequences known to date might only be the start. The more we learn about Zika, the more frightening is the picture of the disease. Apart from the human suffering, the heavy long-term economic costs caused by having to care for thousands of handicapped children, a decline in tourism and diminished economic productivity make decisive action against Zika imperative. In the countries of the Western Hemisphere affected by Zika, over five million babies are born each year.

Heavy long-term consequences

The call of numerous health authorities to postpone pregnancies illustrates the heavy long-term consequences the epidemic might also have on population growth.

III. Fighting mosquitoes

While Ebola is transmitted from person to person through bodily fluids, the Zika virsus is predominantly spread by vectors, more precisely by the sting of an Aedes aegypti mosquito, and presumably also by other mosquitoes. Once the disease began to be more intensively researched in February 2016, it also became evident that Zika is sexually transmissible.

Effective control of mosquitoes long overdue

Mosquito control must play a critical role in any decisive reaction to Zika. Successfully combatting vectors is not easy, especially because the Aedes aegypti is proving to be extremely resistant and adaptable. But an effective strategy for combating mosquitoes that spread not only Zika but other diseases such as dengue and chikungunya is long overdue. The affected countries have currently taken various measures to declare war on mosquitoes. The United States sprayed entire regions

with insecticide by plane for the first time in 14 years. Brazil opted to release genetically modified aedes aegypti that are unable to disseminate the pathogen in order to sharply reduce the natural population. Both methods are controversial, and their success is by no means guaranteed. More certain but almost impossible would be – as the CDC recommends – to dry out or seal off as many breeding sites as possible, because mosquitoes breed in small amounts of water, even in rainwater canisters and puddles in flower boxes.

Neglected fight against vectors comes at a price

Though mosquito control was already well advanced in South America by the 1960s and 70s, it became increasingly neglected once the immediate danger seemed to have subsided. Because mosquitoes recover very quickly, neglecting the fight against vectors has now returned to exact its revenge.

Mosquito control first line of defense

Effective epidemic control must also entail long-term and sustainable measures, including resolute mosquito control. Zika and other dangerous diseases, such as dengue fever, malaria and yellow fever, can be eradicated in this way. Vector control should be used as the first line of defense and an integral component of epidemic control.

IV. Boost in mobility alters risk assessment

Before Ebola and Zika set off health crises in 2014 and 2016, they were not candidates for vaccine development, because their risk potential was assessed to be low. In the case of Ebola, it was known that the disease resulted in a high mortality rate. Yet due to the distribution of reservoir hosts (animals in which pathogens multiply and can be a starting point for transmission to human beings) and the relatively low infection rate (the virus is not transmitted in air) and the fact that infected patients can be easily recognized and can hardly travel due to the severity of their symptoms, it was assumed that Ebola outbreaks could not reach particularly severe proportions. Initially isolated in a monkey in the Zika Forest, Uganda in 1947, the Zika virus was not considered for vaccine development due to the mild course of the disease and the lack of any information about the possible serious subsequent neurological damage.

Ebola and Zika were underestimated.

While it was possible in the case of Ebola to fall back on findings from military vaccine research, in the case of Zika experts had to start from scratch. This fact was depicted visually by Thomas Frieden, who published a photo displaying a small stack of papers representing all the research on Zika. The caption read, "Entire world literature on Zika. 50 years of neglect."[5] Research on vaccines is particularly time-consuming and can last a decade or more. In the case of Zika, experts are optimistic that a vaccine will be available by the start of 2018, which would be enormously fast. The great amount of attention paid to Zika as a result of the declaration of the PHEIC has led an unprecedented number of enterprises and institutions to work on the vaccine research.

Vaccine research on Zika started from scratch.

Why have these two improbable epidemic candidates developed into dramatic health crises? How can it be explained that diseases known for a long time could suddenly develop such destructive power? The reason is the extraordinarily high degree of mobility in today's societies. We travel fast, often and far. Civil aviation alone is increasing by five percent a year. This increase in mobility can decisively alter the risk potential of diseases.

High degree of mobility changes the potential risks of pathogens

The Zika virus has appeared in numerous African countries for a long time. Yet neurological damage in newborns as a result of the disease in pregnant women is

hardly known there, because people in these regions are likely to contract the disease in childhood and develop immunity to the virus. Two years ago, the pathogen was presumably carried from Polynesia to Brazil, where the population had not yet come into contact with the virus and therefore had not developed any immunity to it.

Increased mobility and interconnectedness also played a major role in the surprisingly rapid dissemination of Ebola in West Africa as of December 2013. Outbreaks had previously occurred in remote regions in Central Africa, where the disease, which is very lethal and "only" transmissible via bodily fluids, burned itself out. However, in 2013 the first patient fell ill in the Gueckedou Province of Guinea, which is considered an important trading center in the region. Quickly, the disease was transmitted to the surrounding regions, until a critical mass of people became infected causing the disease to spread explosively.

Increasing global interconnectedness has given pathogens an enormous boost, decisively impacting the risk potential of diseases. The international community must find innovative ways to promote research, particularly vaccine research, even when there is no acute pressure of an imminent disease outbreak. The Coalition for Epidemic Preparedness Innovations (CEPI), which was introduced during this year's World Economic Forum in Davos, is an excellent example of this. CEPI provides 460 Million US-Dollar to research and develop vaccines against Mers, Nipah and Lassa fever. The German federal government is supporting this initiative, which was mainly founded by the Bill and Melinda Gates Foundation as well as the Welcome Foundation.

V. Avoid a loss of memory

Problems were analyzed and reform projects developed.

Since the Ebola epidemic—which has proven to be a real wake-up call for the international community—numerous organizations have placed the fight against epidemics high on their agenda. The many problems in coping with the crisis were analyzed intensively and far-reaching reforms developed.[6] The above observations and lessons should not be neglected in this reform process, however, because it would be a mistake to orient global health projects too closely on an Ebola-like scenario.

Will to reform could wane

Decisive now is to avoid "memory loss" and to take advantage of the political momentum. Particularly in times of foreign and security policy crises, the will to reform global health might decrease as attention on the topic wanes. The consequences could be dramatic. The next epidemic will come, and it is necessary to prepare now.

Summary

We will have to deal with more health crises in the future. This should not discourage us but should instead strengthen our resolve to make decisive progress in global health. Ebola and Zika have illustrated how different health crises can be. Even a disease that does not cause a lot of immediate damage can have very serious long-term consequences. Decision makers should be made aware of this fact so they can tackle the problems at an early stage. Consistent action against vectors should be an essential component of disease control. In light of the fact that the boost in mobility is changing the risk assessment of pathogens, the international community should find creative ways to promote vaccine research even without any immediate threat of an epidemic.

Germany has assumed a leadership role in global health policy.

Germany is playing an important role in the implementation of these reforms. Berlin has developed into a key player in the field of global health under Chancellor Angela Merkel.[7] Germany's new leadership role is illustrated by the fact that Berlin placed the issue high on the agenda during its G7 and G20 presidencies. The six-point plan to improve health crisis management presented by the Chancellor in January 2015 and her speech at the opening of the 2015 World Health Assembly demonstrate that Berlin ascribes great importance to the topic of global health. Germany should work with its partners in the UN and EU to ensure that the reforms developed in the field of global health will now be implemented. The observations presented should be integrated into this process in order to be better prepared for a wide range of health crises in the future. Unfortunately, implementing reforms is usually much more difficult than developing them. But there is hope that the past and current severe health crises have awakened the international community.

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Author

Daniela Braun is a Ph.D. candidate with the Freie University Berlin. Her main research interest is the intersection of health and security. She is a research assistant in the Team Political Dialogue and Analysis at the Konrad-Adenauer-Stiftung and a member of its Working Group of Young Foreign Policy Experts.

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Konrad-Adenauer-Stiftung e.V.

Contact:
Dr. Patrick Keller
Coordinator Foreign & Security Policy
Department of European and International Cooperation
Phone: +49(0)30/26996-3510
Email: patrick.keller@kas.de

Postal address: Konrad-Adenauer-Stiftung, 10907 Berlin

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