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THE JOHNS HOPKINS MODEL UNITED NATIONS CONFERENCE

World Health Organization

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WHO
World Health Organization

Topic A: *Global Strategy for the Diagnosis and Care of Patients with Arboviral Diseases (Zika, Dengue, and Chikungunya)*

Topic B: *Addressing High-Threat Pathogens in Active Conflict Zones*

Committee Overview

The World Health Organization is a specialized agency of the United Nations that focuses on and concerns itself with international public health. Assembled on April 7, 1948, the World Health Organization has explored, researched, and conquered a seemingly endless spectrum of diseases, viruses, and illnesses on the mass level.[1]

Before the World Health Organization that we know today, it was previously known as the Health Organization, which was an agency of the former League of Nations.[2] The organization's first list of prioritized tasks included monitoring the spread of malaria and sexually transmitted infections as well as improving child health, nutrition, and hygiene.

The World Health Organization's main objective, as stated by its constitution formed in 1948, is "the attainment of all people of the highest possible level of health".[3] Member states of the United Nations see the World Health Organization as an international leader on critical health matters, research initiatives, upholding health standards, setting regulation(s), providing support where sought, and both monitoring and controlling health outbreaks.

As much as the agency wishes to achieve its goal of the highest possible health standard on an international scale, it cannot do so alone. The World Health Organization appoints a delegation to the World Health Assembly[4], a superior decision-making body, that observes and works closely with other international health bodies and organizations including (but not limited to): the International Committee of the Red Cross, the International Federation of Red Cross and Red Crescent Societies.[5]

As of 2016, there are officially 194 member states that observe the international standards and regulations provided and enforced by the World Health Organization. There are currently six regional offices, each of which are responsible for both relaying information communicated by the World Health Organization's international headquarters in Geneva, Switzerland, in addition to monitoring all relevant health

1 Target Health Blog "History of the World Health Organization (WHO)"
2 Target Health Blog "History of the World Health Organization (WHO)"
3 Preamble to the Constitution of the World Health Organization as adopted by the International HealthConference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States
4 Target Health Blog "History of the World Health Organization (WHO)"
5 International Federation of Red Cross and Red Crescent "History"

matters in their respective region. The six regional headquarters are located in: Brazzaville, Republic of Congo (Africa); Manilla, Philippines (Western Pacific); Cairo, Egypt (Eastern Mediternanean); New Delhi, India (Southeast Asia); Copenhagen, Denmark (Europe); and Washington D.C., United States of America (Americas).[6]

[6] World Health Organization "WHO regional offices"

Topic A:

Global Strategy for the Diagnosis and Care of Patients with Arboviral Diseases (Zika, Dengue, and Chikungunya)

Introduction

Arboviral diseases are those diseases that are spread through the bite of infected arthropods (insects) such as mosquitoes or ticks.[7] More often than not, these diseases are much more prevalent during the warmer months, making nations with tropical climates much more vulnerable to outbreaks. Zika, Chikungunya, and Dengue are all viruses that are spread through infected mosquito bites; while they can infect and harm an individual of any age or stature, children and the elderly are at most risk of becoming infected with severe illness.

Despite the ongoing, continuous medical research dedicated towards finding remedies to either cure or prevent arboviral diseases, there are currently none of the sort. Symptoms of arboviral diseases can range from mild to severe; mild symptoms, generally seen in the beginning, include slight fever, headaches, skin rashes, and/or joint pain. Symptoms generally begin and can last anywhere between three and fourteen days depending on both the geographical location and on the bite itself. Severe symptoms range from a more severe headache to high fevers, seizures, paralysis, coma, and, at worst, death.[8] The only way to detect the infection of arboviral diseases is through bodily fluids, such as urine and/or blood tests.

Historical Background

One of the first, and most commonly known, arboviral diseases detected was yellow fever. Globalization and the African slave trade proved to have its detriments (other than the obvious) when variations of the *Aedes aegypti* spread throughout Africa and Asia, causing major outbreaks of not just yellow fever, but introducing civilization to the dengue virus as well. Documented epidemics occurred throughout the 18th and 19th centuries in Asia, Africa, and the Americas.[9]

While initially presumed to be passed through human contact, it was scientifically confirmed that *Aedes aegypti* transmitted both yellow fever and dengue virus via bites, making these two the first known arboviral diseases. As the years passed, the gap between discoveries of different arboviruses lessened. Global transportation increased the unfortunate connection of arboviral diseases, making a larger community much more susceptible and prone to falling ill with the viruses. According to the World Health Organization (WHO), before 1970 only nine countries documented having presence of arboviral diseases.[10] Today, the entire world is affected.

Arthropods that transmit these arboviral diseases thrive in extremely specific conditions; tropical climates are home to these mosquitoes. Humidity,

[7] New York State Department of Health Arboviral (Arthropod-borne Viral) Diseases"

[8] New York State Department of Health Arboviral (Arthropod-borne Viral) Diseases"

[9] Microbiology Society "The Emergence and History of Arboviruses" (January 28, 2019)

[10] World Health Organization SEARO "Dengue"

rainfall, and an excess of vegetation proves optimal in allowing these mosquitoes to grow. Those who are infected and carry arboviral diseases have the potential to bring the disease(s) out of the tropical climate and into alternate cities that do not have tropical climates. Instances like these, however, are rare. While viruses can be transmitted through person-to-person contact, it must be through bodily fluid. The more common way of finding the presence of these viruses out of their usual climate is through the arthropods traveling on their own.

Arboviruses appear in many forms; they can be either neuroinvasive or non-neuroinvasive. Clinical criteria for either form of the disease mainly depends on whether neurological effects take place in the patient or not.[11] While precautionary measures are encouraged to all those who live in affected areas, more often than not, they prove ineffective, as individuals continue to become infected. In addition to wearing repellent, it is highly recommended to keep living areas clean and hygienic in order to prevent congregation of mosquitoes and additional breeding. Unsanitary spaces combined with unhygienic water creates a perfect breeding ground for infectious mosquitoes; therefore, it is important to recognize unsanitary spaces and operate functionally to prevent common and overlooked spaces from becoming so.

For most arboviruses, just as with other infections, if detected and treated early upon infection, the fatality rate heavily reduces. However, for those with fragile immune systems, particularly young children and the elderly, the mortality rate increases; majority of deaths from arboviruses are composed of those deaths of infected young children and elderly individuals.[12] Therefore, it is imperative to formulate a global strategy to combat and control these viruses if not find ways to mitigate them altogether.

Contemporary Conditions

Zika

Zika is a virus transmitted by the *Aedes* mosquito; the disease was first identified in Uganda in 1947 in monkeys before being identified for the first time in humans in 1952 Uganda and the United Republic of Tanzania.[13] Zika outbreaks have been recorded across four continents: Africa, the Americas, Asia, and the Pacific. The first recorded outbreak of Zika virus was reported in 2007 from the Federated States of Micronesia.[14] However, Zika grabbed the global stage during its most recent outbreak in 2015 in Brazil. It was during this most recent outbreak that severe birth defects, like microcephaly, became associated with the virus.

As with most arboviruses, there are different stages throughout the infection. The first is an incubation period upon receiving the bite from an infected mosquito; the incubation period can last anywhere between 3-14 days depending on the severity of the infection.[15] The following stage is where symptoms begin to reveal themselves; most individuals do not even display any symptoms and, if they do, they are commonly misdiagnosed as a mild illness as symptoms include fever, muscle and joint pain, and headache. However, there is specific rash that appears in conjunction with these listed symptoms that make Zika much easier to diagnose.[16]

[11] Center for Disease Control and Prevention "Arboviral Diseases, Neuroinvasive and Non-neuroinvasive 2015 Case Definition"
[12] World Health Organization SEARO "Dengue"
[13] World Health Organization "Zika virus" (July 20, 2018)
[14] Ibid.
[15] World Health Organization "Zika virus" (July 20, 2018)
[16] World Health Organization "Zika virus" (July 20, 2018)

The infection is transmitted by an infected *Aedes* genus mosquitoes, mainly the *Aedes aegypti* - the same mosquito responsible for transmitting dengue virus, chikungunya, and yellow fever. However, Zika virus can also be transmitted through human contact such as sexual contact, blood transfusions (or other blood products), organ transplantation, and from mother to fetus during pregnancy.[17] Unfortunately approximately 10% of women who had confirmed Zika virus gave birth to babies with severe, Zika- associated birth defects.[18]

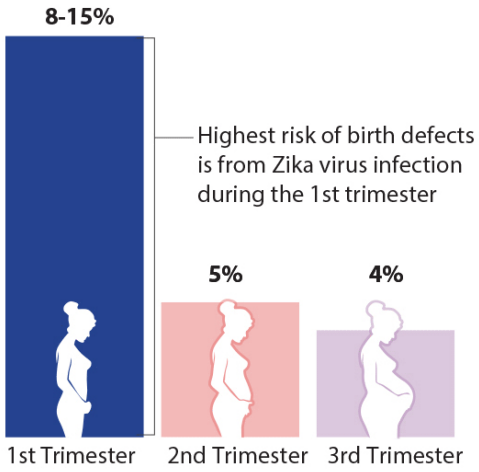


Chart of zika-associated birth defects trends[19]

Zika virus diagnosis, as with other arboviruses, relies on testing of bodily fluids such as blood or urine. There is currently no specific vaccination, treatment plan, or cure for Zika virus. The only prevention methods recommended are those that are for mosquito-bite prevention such as wearing longer clothing, using insect repellant, and reducing the breeding sites for these mosquitoes.

Dengue

Dengue virus is spread by two species of the *Aedes* mosquito: *Aedes aegypti* and *Ae. Albopictus*. At first, an infected individual might think they simply have the flu, as the virus initiates by causing flu-like symptoms to the contaminated. However, if not properly addressed in the first few stages, the symptoms can become severe and lead to hemorrhaging, shock, and ultimately, death.

Unfortunately, rates of dengue infection has rapidly increased, with the disease infecting more than 100 nations worldwide with a massive 50-100 million new infections per year.[20] To the world's dismay, at least 20,000 individuals who are infected with dengue virus pass away every year.

Those individuals with low immune systems are most susceptible to catching the virus; children and the elderly from Latin American and Southeast Asian nations make up the majority of the deaths during the year. However, if detected and treated early upon infection, the fatality rate is less than 1%.

As with most arboviruses, dengue affects tropical and sub-tropical areas; the mosquito thrives in humid, wet climates. Most nations infected include those in Latin America and Southeast Asia. Severe dengue was first documented in the early 1950s when outbreaks occurred in the Philippines and Thailand, causing many children and adults to lose their lives to the disease.[21] Four different variations of the dengue virus, known as DEN-1, DEN-2, DEN-3, and DEN-4 have the potential to transmit the disease and cause infection.[22]

[17]World Health Organization "Zika virus" (July 20, 2018)
[18]Center for Disease Control and Prevention "Data & Statistics on Zika and Pregnancy"
[19]Center for Disease Control and Prevention "Data & Statistics on Zika and Pregnancy"

[20]World Health Organization SEARO "Dengue"
[21]World Health Organization SEARO "Dengue"
[22] World Health Organization SEARO "Dengue"

Dengue virus is transmitted solely through the *Aedes aegypti* species from the bite of an infected female mosquito. The danger does not rest in solely the infected mosquito, but once a human is infected, he or she becomes a carrier of the disease which creates the potential to infect uninfected mosquitoes once they bite the carrier. It is extremely important to note that the peak biting time for the *Aedes aegypti* mosquito is in the early morning and in the evening before sunset. The mosquito's eggs are always laid in water, generally in open, plastic containers in unsanitary conditions, making those individuals who live in such areas more prone to contracting the disease.

Chikungunya

Chikungunya is a virus that is transmitted to humans through infected mosquito bites; the disease was first documented in 1952. The RNA virus is mainly characterized through a severe fever and joint pain.[23] Symptoms similar to those of Zika and dengue virus make characterizing and proper diagnosis a challenge; these (and other) symptoms include headache, fatigue, muscle pain, and rash. The joint pain experienced can be excruciating and can last anywhere from a few days to several weeks depending on the severity of the virus. The joint pain creates a distinct stooped appearance known as arthralgia in those who are affected.[24]

While most patients completely recover from the virus, those with weak immune system as susceptible to enduring more extreme symptoms and pain. In the elderly community, even if they do not currently exhibit the virus, if they did so previously, the virus has potential to contribute to a cause of death. Joint pain caused by chikungunya can occur for several months, or even years, upon recovery from the disease.

The *Aedes aegypti* and *Aedes albopictus* mosquitoes are responsible for the transmission of the chikungunya virus; it can only be transmitted through the mosquito bite of an infected female *Aedes*. Due to these mosquitos being responsible for other arboviruses such as dengue and Zika, diagnosing chikungunya is difficult. The timings during which individuals are most susceptible to contracting the virus through mosquito bites is in the early hours of the morning or in the late afternoon.[25]

Just as with other arboviruses, there are several stages of infection. Upon being bitten by an infected mosquito, the incubation period will commence. Once symptoms begin to reveal themselves, the infected individual will experience the listed symptoms typically between four to eight days, however, symptoms have the potential to range from two to twelve days. There is no proper treatment method for chikungunya yet other than simply addressing the symptoms individually. While research continues, there is no current vaccination or specific cure for the disease.

Prevention and control of the disease relies heavily upon mitigating breeding sites for the infected mosquitos. Reducing the number of natural and artificial water-filled container habitats, no matter how big or small, will immediately reduce the number of breeding sites available.[26] Most prevention methods are, once again, those used against everyday mosquitoes; wearing longer clothing, using insect repellant, and sleeping under mosquito nets are all ways in which becoming infected is less likely.

[23] World Health Organization "Chikungunya" (April 12, 2017)
[24] World Health Organization "Chikungunya" (April 12, 2017)
[25] World Health Organization "Chikungunya" (April 12, 2017)
[26] World Health Organization "Chikungunya" (April 12, 2017)

Past United Nations and International Actions

Zika

The World Health Organization supports countries to control the Zika virus; it does so through its Zika Strategic Response Framework. Currently, with USD $122.1 million invested in the plan, it focuses on four main objects: detection, prevention, care and support, and research.[27] The plan's focus is combating the Zika virus head-on and reducing socio-economic burdens for those who are affected. The World Health Organization has aimed to achieve three main goals: advancing research, increasing surveillance, and supporting the affected.[28] Regional laboratories are focused on learning more and furthering the progress of creating vaccinations and finding cures for the zika virus. In addition, the World Health Organization has emphasized surveillance of the disease; surveillance will help in monitoring the *Aedes* population and controlling it. Finally, the World Health Organization recognizes that the families and those who are affected by the virus need as much support as they can get and aim to strengthen that care.

Dengue

The World Health Organization supports countries on the regional level through education on how to address an outbreak. Training for physicians in clinical management from the moment of diagnosing the patient onwards is provided at each affected nation's regional office. Hardware is produced through tool development, such as insecticides, and publications on dengue prevention that can be physically handed out to communities. World Health Organization South-East Regional Office (WHO SEARO) is continuously working in regional laboratories to contribute sufficiently to ongoing international medical research.[29]

Chikungunya

The World Health Organization encourages forming evidence-based outbreak management plans and supporting nations to improve their reporting systems. It is imperative that all cases of arboviruses are documented properly and officially; it proves detrimental to the international research being conducted due to lack of information. In addition to research, plans, and reports, the World Health Organization provides technical support to affected nations on how to effectively manage individual cases as well as how to advance should an outbreak occur. Clinical training management is also provided regionally to physicians, emphasizing the necessity of experienced physicians.[30] Finally, the World Health Organization has published guidelines and handbooks, such as the "Preparedness and Response for Chikungunya Virus Introduction in the Americas," which is published in accordance with the U.S. Centers for Disease Control and Prevention (CDC), and the Pan American Health Organization (PAHO)[31], which are distributed internationally to educate about the virus and how to prevent becoming infected.

[27] World Health Organization "Zika virus outbreak global response" (July 15, 2016)
[28] World Health Organization "Zika virus" (July 20, 2018)
[29] World Health Organization "World Health Organization in South-East Asia"
[30] World Health Organization "Chikungunya" (April 12, 2017)
[31] Pan American Health Organization/World Health Organization "Factsheet Chikungunya"

Questions a Resolution Must Address

1. How can we make experienced physicians more accessible to patients who do not have the financial ability to get treatment at high-end hospitals?

Majority of individuals who contract these diseases do not have the finances to support themselves through treatment. Breeding sites are found most prominently in underprivileged areas and accessibility is one of the most important aspects of healthcare.

2. What are some methods through which we can educate the global community on prevention measures?

Arboviruses are not as recognized on the global stage; educating those who live in tropical and sub-tropical areas, as those areas are much more prone to contracting disease, should be a top priority.

3. How can we improve the status of government-funded hospitals in their arboviral departments, treatment options, and education?

Government-funded hospitals do not always have the same resources as private hospitals. Think of ways to ensure that treatment options are still accessible and to the best standard they can be for patients who attend these hospitals.

4. What are some ways in which we can shed a light on the importance of learning about arboviral diseases?

Think about how to bring more attention and awareness to individuals who do not live in affected areas; those who should be educated regarding these diseases should not be limited to the affected areas.

5. How can we improve surrounding environments, particularly in tropical and sub-tropical climates, worldwide to prevent breeding sites?

Preventing breeding sites for these mosquitoes, while challenging, is not impossible. It will take a global effort to control environmental areas in which these mosquitoes thrive; the best way individuals can contribute is to be aware of unsanitary conditions and mitigate them.

6. What is the future in international medical research?

Medical research for arboviruses is mostly concentrated in affected areas. Think of ways to get the rest of the world involved. For example, non-affected states could provide physical or monetary resources to better support the research systems in affected countries. Furthermore, they could establish research systems of their own to perhaps outsource some of the work being done.

Bloc Positions

- *Africa*

Abbreviated as AFRO, the region consists of most African countries. However, some nations, including Sudan, Egypt, Djibouti, Tunisia, Libya, Somalia, and Morocco, are not included. These nations fall under EMRO (Eastern Mediterranean). Dr. Matshidiso Moeti from Botswana is the regional director.[32] Of the three, the primary arboviral disease that affects this region is chikungunya.

- *Western Pacific*

Abbreviated as WPRO, the region covers most Asian and Oceanic countries that are not part of SEARO and EMRO. Dr. Shin Young-soo of South Korea serves as the regional director.[33] Of the three, the primary arboviral disease that affects this region is dengue.

- *Eastern Mediterranean*

Abbreviated as EMRO, this region consists firstly of the countries in Africa that are not under AFRO as well as all Middle Eastern nations with the exception of Israel. It is also notable that Pakistan is served under EMRO. Dr. Ahmed Al-Mandhari of Oman serves as the regional director.[34] Of the three, the primary arboviral disease that affects this region is chikungunya.

- *Southeast Asia*

Abbreviated as SEARO, this region serves all Southeast Asian nations and North Korea. Dr. Poonam Khetrapal Singh of India serves as the regional director.[35] Of the three, the primary arboviral disease that affects this region is dengue.

- *Europe*

Abbreviated as EURO, this region consists of all European nations with the exception of Liechtenstein. In addition to these European nations, Israel and all member states that were formerly recognized as the USSR are served under this region. Dr. Zsuzsanna Jakab of Hungary serves as the regional director.[36] Of the three, the primary arboviral disease that affects this region is chikungunya.

- *Americas*

Abbreviated as AMRO, and also recognized as the Pan-American Health Organization (PAHO), serves all nations within the Americas (North America, Central America, and South America). Dr. Carissa F. Etienne of Dominica serves as the regional director.[37] Of the three, the primary arboviral disease that affects this region is Zika.

[32] World Health Organization. "WHO Regional Offices." Accessed December 1, 2019. http://origin.who.int/about/regions/en/
[33] Ibid.
[34] Ibid.
[35] Ibid.
[36] Ibid.
[37] Ibid.

Conclusion

The global burden of these arboviruses doesn't always get the emphasis needed to conduct prevention and treatment campaigns. Today, over 40% of the world's population, 2.5 billion people, is at risk from dengue, more than 2 billion people are at risk from Zika, and individuals from more than 100 nations across five continents are at risk from chikungunya[38,39,40]. With primarily four regions - the Americas, the Eastern Mediterranean, Southeast Asia, and the Western Pacific - affected by these viruses, cases with arboviruses have proven to be detected everywhere; new cases have been found recently in Europe for the first time and, unfortunately, it is not solely the number of individual cases we have to be worried about, but also an increase in the number of outbreaks that continue to occur.

After the preliminary bite has taken place, there is an incubation period between four to ten days during which symptoms arise. After the incubation period has ended, the symptoms can last anywhere between two to seven days depending on the severity of the infection. After the first symptoms reveal themselves, different warning signs depending on the infection deduce whether the patient is going to have a severe case or heal. If the individual has contracted the severe arboviral disease, the next two days following the seven days of infection (after the incubation period) will determine the outcome of the patient's life.[41] If not given the proper medical attention needed, the patient will lose their life.

Currently, there are no vaccinations or specific cures for any of the three arboviral diseases this committee will be focusing on. Treatment for patients relies solely on experienced doctors and nurses who have dealt with these infections and their progression. The difference between having a good physician and not having one is crucial in the treatment process. Mortality rates decreases from 20% to less than 1% when the presence of an experienced physician is evident.[42]

With the only method of both prevention and control being environmental control through discarding unsanitary breeding sites, the international community continues to search for both prevention and treatment answers. The medical research that has been invested towards arboviral diseases is primarily focused in nations suffering from continuous outbreaks. It is imperative that the international community comes together in finding solutions in a spectrum of areas from educating the public to providing access to treatment to environmental control and beyond.

[38]World Health Organization SEARO "Dengue"
[39]Independent "Zika: More than two billion people at risk of catching virus around the world, study shows" (September 2, 2016)
[40]Center for Disease Control and Prevention "Geographic Distribution, Chikungunya Virus"
[41] Center for Disease Control and Prevention "Geographic Distribution, Chikungunya Virus"
[42]World Health Organization SEARO "Dengue"

Topic B:

Addressing High-Threat Pathogens in Active Conflict Zones

Introduction

There are more than 1.6 billion people worldwide who live in active conflict areas without any access to basic care.[43] High-threat pathogens exploit the harsh conditions created by war, affecting not only the soldiers who fight in them but also civilians. Conflict gives way to mass population displacement and overcrowding, a lack of access to clean water and adequate shelter and poor sanitation which all leave a civilian population more vulnerable to infectious disease. In addition to these factors, the collapse of public health infrastructure and other impediments to treatment leave typical control programs such as vaccination efforts underfunded and, in many cases, dangerous to carry out.[44]

Beyond the direct body count of battlefield casualties, the conditions created by civil war and other armed conflict provides the ideal environment for the outbreak and spread of infectious diseases. While the political boundaries of a conflict can usually be defined easily, the impact that conflict can have on healthcare infrastructure is often much more difficult to accurately estimate.[45] The World Health Organization will continue to work in countries with active conflict zones to strengthen healthcare infrastructure so that they can more easily respond to outbreaks of high-threat pathogens.

Historical Background

Over the course of history, war and disease have behaved as "deadly comrades" which have together accounted for a major proportion of human suffering and loss.[46]

A Time magazine article published in 1940 recognized this, reporting that "in the Thirty Years' War, an estimated 8,000,000 Germans were wiped out by flea-borne bubonic plague and louse-borne typhus fever. On Napoleon's retreat from Moscow, typhus, dysentery and pneumonia killed 450,000 of the Grand Army's 500,000 men. World War I was the first war in history in which guns were more deadly than germs. Battlefield deaths totaled 8,000,000; deaths from disease, 3,000,000."[47] Another example of the deadly toll that disease has when paired with conflict is the American civil war. During this conflict, two-thirds of the estimated battlefield casualties were caused by pneumonia, typhoid, and dysentery- the same diseases that devastated Napoleon's army.[48] These high-threat pathogens became known as the "third army."

These numbers show the devastation that disease has had in the past during periods of conflict. The historical statistics are truly astounding, especially considering that they don't account for the impact on civilian populations.

[43] World Health Organization "Ten threats to global health in 2019"

[44] Connolly, Máire A, and David L Heymann. "Deadly Comrades: War and Infectious Diseases." (*The Lancet* 2002)

[45] Sharara, Sima L., and Souha S. Kanj. "War and Infectious Diseases: Challenges of the Syrian Civil War."(October 2014)

[46] Connolly, Máire A, and David L Heymann. "Deadly Comrades: War and Infectious Diseases." (*The Lancet* 2002)

[47] "Medicine: War and Pestilence." *Time*, 29 Apr. 1940.

[48] Jeffrey S. Sartin. "Infectious Diseases during the Civil War: The Triumph of the "Third Army"." (1993)

Contemporary Conditions

Ebola Crisis in the Democratic Republic of the Congo

There aren't many diseases today that can elicit the same degree of panic as Ebola. That's why health specialists and observers worldwide felt a massive wave of relief when the Ebola outbreak in the Democratic Republic of Congo (DRC) in July 2002 was declared over. However, this victory was short-lived as one week later there was a new outbreak in the Eastern part of the DRC. This second outbreak proved much more difficult to contain due to the presence of one hundred armed groups and one million displaced persons.[49]

Angry residents take to the streets over recent violence, including deadly shelling hours earlier, in Goma, DRC, on Aug. 24, 2013.[50]

Movement of refugees and internally displaced persons (IDPs) complicates the emergency response. Past outbreaks have shown that once Ebola reaches densely populated areas, it is much more difficult to control than in remote villages.[51] According to the most recent data from the United Nations High Commissioner for Refugees, there are almost 800,000 refugees from the DRC.[52] When these refugees are displaced from their remote villages they move through more urban areas on their way to neighboring countries in their search for security. This exacerbates deteriorating health conditions and makes adequate response extremely difficult.

History has shown that Ebola outbreaks have higher mortality rates and spread faster when they occur in active conflict zones that are inaccessible to healthcare providers. The development of new vaccines should have lowered the death toll of outbreaks, however in reality this has not been observed. Medical innovations cannot have the desired effect due to the challenges faced in their administration. In active conflict zones, health workers need armed escorts to deliver vaccines.[53] The issue of security of healthcare providers is urgent.

In the current 2019 Ebola outbreak in the DRC, the threats posed by active conflict have impeded the response of international healthcare providers.[54] Healthcare workers from WHO have been attacked by rebel groups in the past, leading to temporary evacuations in November 2019, which disrupted efforts at vaccination and disease monitoring.[55] Healthcare providers from the international community want to help in the DRC, but often cannot due to fears over exposure and personal security concerns.

In April 2019 insurgents murdered a WHO epidemiologist and set fires at multiple Ebola Treatment Units.[56] If negotiations with local militias to allow healthcare experts into active conflict zones are unsuccessful, then it might be impossible

[49] Campbell, John. "Ebola enters Active Conflict Zones in DRC" (CFR, 2018)
[50] Warner, Gregory. "In Eastern Congo, Complex Conflicts and High-Stakes Diplomacy." (NPR, 2014)
[51] Campbell, John.
[52] UNHCR "DR Congo emergency"
[53] Grady, Denise. "Ebola Outbreak in Congo Is Declared a Global Health Emergency." (NY Times, 2019)
[54] Wolfe, Mitch. "Confronting Ebola: Addressing a 21st Century Global Health Crisis." (CDC, 2019)
[55] Cohen, Jon. "DRC Expands Ebola Vaccine Campaign as Cases Mount Rapidly." (*Science*, 2019)
[56] Wolfe, Mitch.

to completely suppress the current outbreak.[57] Any future action to address this crisis must take into consideration the health and security threats that healthcare providers face in conflict areas.

Syrian Civil War

Syria's ongoing eight-year civil war has displaced 6.7 million Syrians, left hundreds of thousands wounded or killed by violence, and created a vacuum in basic healthcare infrastructures that will reverberate throughout the entire region for years to come.[58] Beyond the direct devastation to the population from weapons of war, epidemics have also been introduced and spread through Syria and neighboring countries.[59]

The rapid spread of diseases through vulnerable populations within Syria and in refugee camps beyond their borders have created a global health crisis that will be very expensive to address appropriately. The shattered medical infrastructure, exodus of healthcare workers and deterioration of vaccination programs have created a dangerous vacuum in the provision of basic healthcare services.[60]

The military forces of the Syrian regime and anti-government armed groups that oppose it have both attacked and taken over medical facilities as a strategic act of war. According to a study conducted by NPR, "at least 160 doctors have been killed and hundreds jailed, leading to the emigration of an estimated 80,000 doctors."[61]

Before the Syrian civil war erupted in 2011, the Syrian health care system consisted of government-run programs that provided mostly basic primary care services.[62] National health indicators such as falling infant mortality rate and increased child immunization rates have shown the improvement of the Syrian health system. However, the outbreak of the civil war has led to complete and total devastation of Syrian health infrastructure. War has led to the destruction of health facilities, a shortage in health care personnel and supplies, and a lack of secure transportation routes for what little supplies remain.[63] Each of these factors has created a gaping hole in the government's ability to protect its most vulnerable populations.

The Syrian civil war has caused one of the largest refugee crises since World War II with displaced people pouring into Syria's neighboring countries of Lebanon, Jordan, and Turkey. This has caused a significant strain on local health care systems in Syria's neighboring nations.[64] International humanitarian organizations such as the United Nations High Commissioner for Human Rights (UNHCR) and others have had their budgets slashed, reducing the amount that refugee medical services can be subsidized, causing many refugees in need to forgo crucial treatment.[65]

The devastation that the Syrian health care infrastructure has suffered as a result of the civil war has had many far-reaching impacts. Arguably the most outstanding of which is the hindering of immunization programs which has left millions of citizens vulnerable to vaccine-preventable diseases. Necessary vaccine administration in Syria is estimated to have dropped from 91% in 2010

[57] Campbell, John.
[58] The Editors of Encyclopaedia Britannica. "Syrian Civil War." (Encyclopædia Britannica, inc., 2019)
[59] Sharara, Sima L., and Souha S. Kanj. "War and Infectious Diseases: Challenges of the Syrian Civil War."(October 2014)
[60] Ibid
[61] Cole, Diane. "In Syria, Reports Of 19 Medical Facilities Bombed Since April 28." (NPR, 2019)
[62] Ibid
[63] Ibid
[64] Sharara, Sima L., and Souha S. Kanj.
[65] Karasapan, Omer. "The Challenges in Providing Health Care to Syrain Refugees." (Brookings, 2018)

to as low as 45% in some regions after just three years.[66] This apparent collapse of health care services within Syria shows how far-reaching and deadly the impacts of war, and civil war in particular, can really be.

Yemeni Civil War: Cholera and Diphtheria

Yemen underwent a power switch during the 2011 Arab Spring, and the nation has been in a struggle for political stability ever since. [67]The Shia-minority Houthi movement seized control of Sanaa in 2014 and forced the Saudi-backed President Hadi out of power.[68] Then, in 2015, the Saudi government began an offensive against the Houthis to reinstate Haiti's government, bombing Yemen and preventing supplies from entering the country. This political and religious conflict has created a stalemate that has devastated the nation, creating one of the worst humanitarian crises: at least 8.4 million people are at risk of starvation and 75 percent of the population is in need of humanitarian assistance.[69] The UN estimates that three million people have been forced to flee Yemen.

Further amidst this crisis, Yemen's healthcare system has collapsed, and outbreaks of cholera and diphtheria have exacerbated mortality.[70] In 2017, Yemen had the largest cholera outbreak in the world, with 1.1 million people suffering from the bacterial disease.[71] Cholera, often caused by contaminated water sources, is characterized by intense "rice water stool" diarrhea and can lead to severe dehydration and death.[72] Diphtheria is a dangerous bacterial disease caused by *Corynebacterium diphtheria,* which is spread through respiratory contact.[73] Rohingya, Bangladesh and India are just a few nations, like Yemen, that have several outbreaks of diphtheria. Both diseases, which are relatively preventable in developed, intact nations, pose a serious threat to Yemen, especially in the context of the civil unrest.

In Yemen, civil war heightens the crisis. Part of this healthcare issue stems from Yemen's failure to ensure immunization coverage and medicines to response to the diphtheria outbreak. Global health researchers recently published a study in BioMed Central which detailed the association of increasing diphtheria tied to conflicts in Yemen. [74]According to the study, less than 50 percent of Yemen's existing health facilities are fully functional. [75] The refugee movements across the Middle Eastern region have also had adverse effects on diphtheria and cholera cases. The same study showed that risk for outbreaks of disease, specifically diphtheria in Yemen's case, increases 11-fold during ongoing conflict while high immunization coverage in similar regions decreased risk by 0.98.[76]

Since diphtheria is preventable by vaccines, many global efforts to improve

[66] Sharara, Sima L., and Souha S. Kanj.
[67] "Yemen Conflict Explained in 400 Words." BBC News. BBC, June 13, 2018. https://www.bbc.com/news/world-middle-east-44466574.
[68] "Yemen Conflict." BBC News. BBC,
[69] Ibid.
[70] Dureab, Fekri, Johannes Krisam4, Olaf Müller1, and Albrecht Jahn1. "Diphtheria Outbreak in Yemen: the Impact of Conflict on a Fragile Health System." Conflict and Health. BioMed Central, May 22, 2019. https://conflictandhealth.biomedcentral.com/articles/10.1186/s13031-019-0204-2.
[71] "Yemen Refugee Crisis: Aid, Statistics and News: USA for UNHCR." Yemen Refugee Crisis: Aid, Statistics and News | USA for UNHCR. Accessed November 8, 2019. https://www.unrefugees.org/emergencies/yemen/.
[72] "Cholera." Mayo Clinic. Mayo Foundation for Medical Education and Research, March 9, 2017. https://www.mayoclinic.org/diseases-conditions/cholera/symptoms-causes/syc-20355287.
[73] "Cholera." Mayo Clinic.
[74] Dureab, Fekri, Johannes Krisam4, Olaf Müller1, and Albrecht Jahn1. "Diphtheria Outbreak in Yemen: the Impact of Conflict on a Fragile Health System." Conflict and Health. BioMed Central, May 22, 2019. https://conflictandhealth.biomedcentral.com/articles/10.1186/s13031-019-0204-2.
[75] Dureab, Fekri et al. "Diphtheria Outbreak in Yemen.."
[76] Ibid.

control of the disease in underdeveloped nations focused on improving vaccine access. One such program called the Expanded Program on Immunization (EPI) built up health care infrastructure in underdeveloped nations in the latter half of the twentieth century.[77] Yet, greater efforts are needed to address this issue. Thus, the Yemen-Saudi conflict has not only created a humanitarian and refugee crises but has also disabled Yemen's health care structures, creating a global health emergency.

Past United Nations and International Actions

DRC: Ebola

In the DRC, WHO has deployed 447 staff to support the healthcare response, which includes treatment centers and medications.[78] Six Ebola treatment centers are employed to care for 143 inpatients.[79] Additionally, the WHO has made use of the Monitored Emergency Use of Unregistered and Investigational Interventions (MEURI) protocols to evaluate the effectiveness of various trial drugs in mitigated this emergency.[80] MEURI is an ethical protocol developed by WHO for cases such as the Ebola outbreak. However, volatility in West and Central Africa, particularly in Butembo in the DRC poses as a serious obstacle to these efforts, and until stability is reached in the region, the health care emergency will be overshadowed by the political violence. [81]

Syria: Measles

Like in many war-torn nations, relief efforts have been hindered by violence and bureaucracy. WHO and the UN have attempted to raise awareness and provide relief efforts, and in 2014, Secretary- General Ban Ki-moon declared the UN's "fundamental objective," in addition to humanitarian aid, was to find "an end to the conflict."[82] Thus, present medical aid has been insufficient to meet the needs in Syria.

However, many independent nations and organizations have raised money for humanitarian needs in Syria. The EU member states are leading providers of international aid to those harmed by the Syrian Civil War. At a Brussels conference in March 2019, the EU pledged more than two billion euros in aid.[83] Half of this aid goes to life-saving humanitarian operations and medical treatment while the rest is used for sanitation, food and education.[84] The EU is just one group that has attempted to help in Syria, but many other independent nations and organizations are also involved in relief efforts.

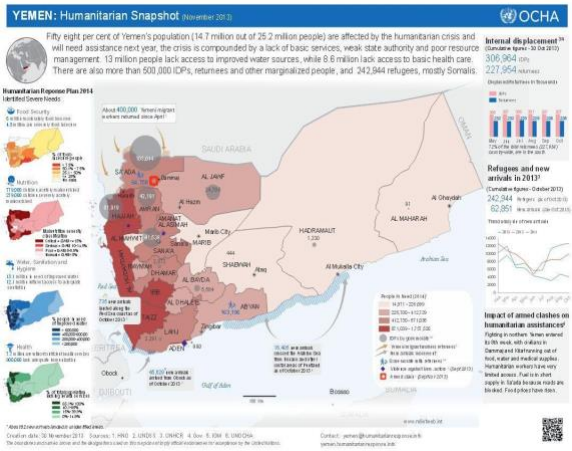
Yemen: Cholera and Diphtheria

The current Secretary-General of the UN, Antonio Guterres, has already voiced his solidarity with the Yemenis and declared "the United Nations and the wider international community are with you [the Yemenis] every step of the way."[85] Currently, the UN Office for the Coordination of Humanitarian Affairs (OCHA) has been heavily involved in

[77] "The Expanded Programme on Immunization." World Health Organization. World Health Organization, December 1, 2013. https://www.who.int/immunization/programmes_systems/supply_chain/benefits_of_immunization/en/.
[78] "DR Congo: Ebola Response Returns to Full Speed despite 'Risky Environment' | UN News." United Nations. United Nations. Accessed November 8, 2019. https://news.un.org/en/story/2019/01/1030052.
[79] "DR Congo: Ebola Response …" United Nations.
80 Ibid.
81 Ibid.

[82] "Crisis in Syria: Civil War, Global Threat Secretary-General." United Nations. United Nations. Accessed November 8, 2019. https://www.un.org/sg/en/content/sg/articles/2014-06-25/crisis-syria-civil-war-global-threat.
[83] Pat. "Syria." European Civil Protection and Humanitarian Aid Operations - European Commission, August 21, 2019. https://ec.europa.eu/echo/where/middle-east/syria_en.
[84] Pat. "Syria." European Civil Protection…"
[85] "Yemen | UN News." United Nations. United Nations. Accessed November 8, 2019. https://news.un.org/en/focus/yemen.

humanitarian efforts in Yemen.[86] OCHA has its staff deployed across five major hubs in Yemen: Al Hudaydah, Ibb, Sa'ada and Aden, and Sana'a.[87] Additionally, the WHO has been active in Yemen despite the ongoing conflict. In August of 2019, a six-day oral cholera vaccine campaign was provided by the WHO. This campaign reached almost 400,000 people, including 65,000 young children. Additionally, the WHO has supported several medical centers in Yemen, like the Al-Thawra Hospital in Sana'a, by installing new equipment and volunteering in the city.[88] While relief is increasing the availability of life-saving vaccines and medical care, much of the medical infrastructure in Yemen remains in shambles during the ongoing violence and requires massive reform.



UNOCHA Breakdown of the Humanitarian Needs of Yemen.[89]

[86] "About OCHA Yemen." OCHA, March 3, 2019. https://www.unocha.org/yemen/about-ocha-yemen.
[87] "About OCHA Yemen."
[88] World Health Organization. World Health Organization, October 24, 2019. https://www.who.int/emergencies/crises/yem/en/.
[89] OCHA, n.d. https://www.unocha.org/sites/default/files/OCHA_Category/Yemen_remittances_body.jpg .

Questions a Resolution Must Address

1. How can we transport volunteers and resources safely in hot zones?

Because our humanitarian issue of focus is localized to conflict areas, it is important to consider how best to use UN resources to ensure the safety of volunteers and transport of materials.

2. What is the best way the WHO can deal with the infectious disease crisis

Should we work to end the violence in nations like Ban Ki-Moon suggested, or instead focus on providing stronger humanitarian aid while the nation resolves its own conflict? This is essentially a question of how WHO and UN member nations can balance national sovereignty while furthering medical infrastructure.

3. What medical equipment should be prioritized in treating outbreaks in conflict zones?

Given limited funds, it is unfortunately not possible to provide the ideal response to each outbreak. Therefore, it would be most efficient for the committee to prioritize the funding, acquisition, and availability of resources that have proven to be effective. It is up to delegates to determine what types of equipment, if any, best mitigate outbreaks in hot zones.

4. How can the WHO coordinate efforts between NGOs in responding to infectious disease outbreaks?

There are several humanitarian groups and organizations, such as international coalitions, that are dedicated to relief efforts. We should ask ourselves how to best utilize these resources.

5. Which disease outbreak, if any, should the WHO prioritize?

Between the DRC, Syria, and Yemen alone, there are many types of infectious diseases that have devastated warring nations. Do any of these need more pressing solutions than others?

Bloc Positions

Map of regional divisions divided by the WHO[90]

- *South East Asia and the Pacific Islands*

While there may not be widespread civil wars like in the Middle East or Africa, many Southeast Asian nations, like Myanmar, do have some level of political instability. Disease groups that are most prevalent in these regions include dengue and malaria.

- *Middle East*

The Middle East stands as one of the more conflict-ridden regions of the world, and coupled with the refugee crisis, disease outbreaks here are extremely devastating. Some diseases prevalent in these regions include typhoid, cholera, diphtheria, and schistosomiasis.

- *Africa*

While we group Africa together as one bloc, it must be understood that there are a variety of civil conflicts and diseases within this large continent. Civil conflicts include those in the DRC and Sudan, and common diseases include Ebola, dengue, typhoid, and cholera.

- *South Asia*

Arboviral diseases are extremely prevalent in this region. Additionally, poor medical infrastructure causes outbreaks of dengue, typhoid, malaria, Crimean-Congo hemorrhagic fever, and chikungunya.

[90] World Health Organization. "WHO Regional Offices." Accessed December 1, 2019. http://origin.who.int/about/regions/en/

- *Europe*

While there are fewer infectious disease outbreaks here than compared to other regions, there was a 2017 outbreak of Chikungunya in Italy and France. Additionally, European nations should consider how to best use resources to help outbreaks abroad.

- *Americas*

South America, specifically, has had many cases of unrest in recent years in areas like Venezuela and Colombia. Diseases common in those Southern and Central American regions include malaria, dengue, yellow fever, and Chagas disease. The US and Canada have stronger medical infrastructure than many other American nations and should consider how they can best aid other nations in strengthening their medical programs.

Conclusion

The severity of high-threat pathogens is often worse in areas of conflict and unrest. Damaged healthcare infrastructure, sanitation, and poverty, along with other humanitarian problems, are characteristics shared by many war-torn nations. While many preventable pathogens, like diphtheria or measles, are often less serious is nations with greater access to vaccines, civil conflicts impede access to vaccines, creating outbreaks of such diseases. Some estimates state that approximately 22 percent of the global population live in active conflict zones and, as seen in the DRC, Syria, and Yemen, this has serious ramifications for global health. The WHO, along with other independent bodies like OCHA, the EU, and UNICEF, have led relief efforts in such nations by bringing medications and sanitation to conflict areas. However, instability and broken infrastructure impede such efforts.

In order to truly deal with the severity of diseases in war zones, it is important for member nations to discuss how to better allocate relief funds and efforts to humanitarian needs as well as how to deal with the major obstacle to humanitarian aid: conflict. It is the goal of the WHO to determine how best to handle these difficult crises to limit deadly outbreaks of diseases, while simultaneously instilling the need for stronger global health infrastructure.

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