**The complex humanitarian crisis can come in many forms. Some examples are war, extended pandemics, underdeveloped infrastructure with the nations, and political turmoil. All of which can cause extreme loss of life and degradation of regions in multiple ways. However, when two or more disasters strike simultaneously, the results are even more tragic and complicated. One country that experienced what might be considered an awful run of bad luck involving multiple emergencies at once is Haiti. This is because Haiti After experiencing a devastating earthquake on January 12th of 2010, was given an additional challenge of having to deal with the chlorella epidemic. When the chlorella epidemic struck, only 12% of patients were receiving pita and treated water. Only 17% overall had access to adequate sanitation, according to the World Health Organization, "The chlorella outbreak became fatal for many due to a lack of clean hydration to counteract the dehydration due to diarrhea." Because of its lack of preparedness, weakened infrastructure from the earthquake, and lack of stability in the country before the disasters struck, the countries fatality rates exceeded the global expectations of 1% or less. In response to this, the government and non-governmental organizations came together to create a surveillance system that studied the clinical cases through hospitalizations and deaths and assess the infrastructural failures of the country to provide adequate sanitation and clean drinking water.**

**As a result of the surveillance system, there was better tracking of patients and discoveries of the more affected regions. The program had many limitations, but more than anything, it began a meaningful conversation about the importance of health care tracking and surveillance. The chlorella outbreak was contained, and many important discoveries about Healthcare surveillance we realized.**

**Reference:**

**Barzilay, E. J., Schaad, N., Magloire, R., Mung, K. S., Boncy, J., Dahourou, G. A., ... &Tappero, J. W. (2013). Cholera surveillance during the Haiti epidemic—the first 2 years. New England Journal of Medicine, 368(7), 599-609.**

Surveillance systems implementation for public health is essential. These systems are used to prepare, execute, and assess public health intervention programs, relay information to decision-makers, and play an important part in the early detection of health issues (Varney &Hirshon, 2006). The Center for Disease Control and Prevention offers a list of current outbreaks in the United States as well as internationally. As of October 2019, there is an alert for the Polio outbreak in the Philippines, which means that the practice of enhanced precautions is recommended. This outbreak is caused by vaccine-derived poliovirus (VDPV), a sign of low oral polio vaccine coverage in the country (Center of Disease Control, 2019). The Philippines declared the outbreak on September 19, 2019, with two cases confirmed (World Health Organization, 2019).

Data collection is still on-going. The World Health Organization (2019) mentioned the following response actions from Public Health:

1. Acute flaccid paralysis (AFP) and environmental surveillance.
2. Field investigation to define the geographic scope.
3. Mass immunization campaigns – reinforced recommendation for all children.
4. WHO, the Global Polio Eradication Initiative (GPEI) and other organizations, are supporting the Department of Health and local health authorities to investigate and support the efforts to enhance surveillance, strengthen routine immunization, communicate risk to the public and implement outbreak response.

On May 14, 2019, the Emergency Committee agreed that the risk of international spread of poliovirus remains a Public Health Emergency of International Concern (PHEIC); countries affected are required to declare the emergency at a National level. As we can see with this outbreak, some of the rationales mentioned by Varney and Hirshon (2006) are covered. Improved communication and collaboration for early detection, as well as sharing of information, is critical locally and internationally to prevent the spread of the virus to those with no immunization, especially children. Also, alerting travelers of these outbreaks helps to take appropriate actions to reduce the risks of exposure when traveling from the place of the outbreak and vice-versa. This improves the public health response to what could become a rapidly developing public health emergency (Varney &Hirshon, 2006). Finally, the surveillance of this outbreak includes the environmental aspect due to the nature of the virus, improving their ability to correlate events (Varney &Hirshon, 2006).

References:

Center of Disease Control and Prevention. (2019). Polio in the Philippines. Retrieved from

<https://wwwnc.cdc.gov/travel/notices/alert/polio-philippines>.

Varney, S. M., Hirshon, J. M. (2006). Update on public health surveillance in emergency department.

*Emergency Medicine Clinics of North America, 24*(4), 1035-1052. Doi:10.1016/j.emc.2006.06.004

World Health Organization. (2019). Statement of the twenty-first IHR emergency committee regarding

the international spread of poliovirus.  Retrieved from <https://www.who.int/news-room/detail/29-05-2019-statement-of-the-twenty-first-ihr-emergency-committee>

**1. Varney and Hirshon list seven general rationales for providing ED-based public health surveillance. Surveillance is a critical form of communication for public health officials. Choose a real public health outbreak, disaster, or crisis. Provide one example of how any of the concepts described in this paper were actually used to improve public health. Describe the intervention for your classmates. Cite your reference.**

        Surveillance is a critical form of communication for public health officials during or after the occurrence of disaster outbreak. Also, it is a method of managing the outcome of an outbreak to prevent further effects to the community. The World Health Organization defines public health surveillance as the continuous, systematic collection, analysis and interpretation of health-related data needed for the planning, implementation, and evaluation of public health practice. Public health surveillance is a tool to estimate the health status and behavior of the populations served by ministries of health, ministries of finance, and donors. Because surveillance can directly measure what is going on in the population, it is useful both for measuring the need for interventions and for directly measuring the effects of interventions. The purpose of surveillance is to empower decision makers to lead and manage more effectively by providing timely, useful evidence.

        For example, Ebola outbreaks have fatality rate of 60–90%, and no specific drug or vaccine is available for people and/or animals hosts. As of 4 August 2014, the cumulative number of cases attributed to EVD in the four countries stands at 1711 including 932 deaths. The outbreak is expected to last longer if proper diagnostic tools and rigorous integrated active surveillance response systems are not rapidly established and instituted. Unfortunately, several countries in Africa, as well as governmental and research institutions, are inadequately equipped in diagnostics, tracking, active reporting, prompt health care delivery, and accessible and affordable treatment to combat the Ebola infection and other emerging infectious diseases.

         The development of new tools, strategies and approaches, such as improved diagnostics and novel therapies including vaccines, is needed to prevent, control and contain Ebola as well as SARS, bird flu, Lassa fever, dengue and MERS outbreaks. Hence, the urgent need to develop and implement early warning alert and active surveillance response systems for emerging infectious diseases as well as early warning and emergency systems, cannot be overemphasized.

**References:**

Thacker SB, Choi K, Brachman PS. The Surveillance of Infectious Diseases. *JAMA.* 1983;249(9):1181–1185. doi:10.1001/jama.1983.03330330059036

Hanlin, R. (2016). Health systems strengthening (1. edition ed.). Aalborg: Aalborg University Press. Retrieved from <http://www.econis.eu/PPNSET?PPN=888134487>