

# The Inevitable Pandemic: What is the Plan?

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January 17, 2020

Introduction:

“A plague on both your houses!” is the Shakespearean quote from *Romeo and Juliet* that Dr. Peter Moore starts his book, *The Little Book of Pandemics*. Dr. Moore is a well-regarded professional that designed an incredible guide to “50 of the world’s most virulent plagues and infectious diseases” (Moore, 2007). The Plague or Black Death referenced by Shakespeare is one of the most well-known pandemics in human history that killed up to 200 million people in Eurasia starting in the fourteenth century (Wikipedia, 2020). If you get a chance, this compelling book breaks down the origins of these diseases, available medical treatments, chances of death, and also the probability of use as a bio-weapon in a very easy to read format. The back cover reads, “The three greatest killers in human history have not been war, famine, or natural disasters. They have been influenza, Black Death, and AIDS” (Moore, 2007). The book title is a little misleading as all 50 diseases have not reach “pandemic” status, but many of these infectious diseases have the potential to be a true global health threat.

How does an infectious disease reach the status of causing a “pandemic”? There are thousands and thousands of diseases in our global community. Some are harmless to you and me because some are genetic diseases and disorders that are inherited. Some diseases are in the animals around you, but these diseases have not found a pathway to jump from animal to human. However, diseases such as chicken pox and SARS have made this jump because of close interactions between livestock and people, especially when people and livestock are living together in one structure. One of the greatest vectors for the spread of disease is water and there are a number of waterborne illnesses that can be contracted such cholera and hepatitis A (WHO, 2020). Cholera has caused discomfort and death throughout the world and evidence of this disease can be found in Ancient Sanskrit from 400 B.C.E (Moore, 2007). Today, there are

epidemics of cholera in Somalia, Yemen, and Sudan (WHO, 2020). Epidemics are more common in communities with poor sanitation and personal hygiene and without proper healthcare facilities (Shoals, 2019). So what is new that is lurking out there today? Just ten days ago, the Centers for Disease Control and Prevention, or the CDC, issued a travel notice for Wuhan Province in China due to a mystery illness that scientists are now describing as an unknown pneumonia that was first seen in mid-December (CDC, 2020).

So if there are diseases around us every day, how does one become an epidemic or grow into a pandemic? Let's start with what epidemic means. According to the World Health Organization (WHO), an epidemic is "the outbreak of a disease that spreads quickly and affects many people" because the population does not have "either an acquired or an inherent immunity to the disease" (Shoals, 2019). An epidemic becomes a pandemic once the "infectious disease spreads across its geographical boundaries and begins to affect nearby regions" (Shoals, 2019). Pandemic is derived from a Greek word *pandemos* meaning, "pertaining to all people" (Shoals, 2019). Today, epidemics across the world can quickly spread to a pandemic if authorities are not paying attention to the movement within our complex trade and travel matrix.

Do you recall the 2014-2016 outbreak of infectious Ebola Virus Disease, also known as simply Ebola, and the questions surrounding whether this would become the next pandemic? This health scare started in December 2013 with 18-month child that contracted an illness from bats. This disease quickly spread from this identified index patient to family and the surrounding communities in Guinea, Africa. By January 24 a medical alert was sent out and by March 23 the World Health Organization declared an outbreak of Ebola with 49 confirmed cases and 29 deaths. Ebola had for the first time left rural communities and was now detected in Guinea's capital city Conakry. By July, this disease quickly spread to neighboring countries and their

capital cities and in August the “World Health Organization declared a “Public Health Emergency of International Concern (PHEIC), which is designated only for events with a risk of potential international spread or that require a coordinated international response” (WHO, 2020). For the first time, Ebola found its way into the United States when a Liberian citizen contracted the illness just before visiting family in the US (Wikipedia, 2020). Within two weeks, this healthy man became the first fatality of Ebola in the US. Healthcare workers that tended to this patient and people near these healthcare workers during travel were put into quarantine with some contracting the disease. With the assistance of US military and medical aid to West Africa to set up better facilities to combat this disease, the outbreak was declared over in June 2016 after 28,600 cases and 11,325 deaths (WHO, 2020). That is an astounding 40% death rate. I believe the global response helped to quell this potential devastating global health threat.

### Influenza Pandemics

One of the most well-known and destructive virus for humans is influenza. First records of this ailment dates back to Hippocrates in 412 B.C.E. (Arnold, 2018). The word “influenza” first appears around the 1500s in Italy because of possible “influence of the stars” or “influence of the cold” (Arnold, 2018). There are four different types of influenza: A, B, C, and D. Influenza A and B are the types that cause seasonal influenza epidemics. While influenza C causes mild symptoms and D affects cattle. Influenza A is currently the only known type of influenza that can cause a pandemic. Influenza A is broken down into sub-types that are based on the number of proteins the strain has on the surface of hemagglutinin (H) and neuraminidase (N). If there is only one protein from each, then the strain would be described as “A(H1N1)” which stands for influenza A with one protein of hemagglutinin and one protein of neuraminidase on the surface of the virus. This particular strain spread quickly in 2009 and caused the last

influenza pandemic (CDC, 2020) with the US estimating 60.8 million cases, 274,304 hospitalizations, and 12,469 deaths in the US (Shrestha et. al, 2011).

Why is influenza so dangerous? First, the influenza virus can evolve rapidly and form new strains that are not the seasonal influenza that we receive vaccinations for every year. Second, humans have not developed immunity to these newly formed strains so chances of possible pandemics are very high. Third, developing a vaccine for the new strain takes months (Moore, 2007). Fourth, influenza is so easy to transfer between people because the virus can survive on hard surfaces for up to 48 hours (CDC, 2020). Fifth, influenza and many other microorganisms can quickly disperse globally because of the scale of global trade and transportation. Finally, while seasonal influenza typically has a greater effect on children, people older than 65 or with immune deficiencies, pandemic influenza will cause fatalities of those around us that are healthy, strong, and in the prime of their lives (Arnold, 2018),

Influenza epidemics come every 20 to 30 years with some episodes developing into a world-wide health emergency. The United States was not heavily affected by the influenza pandemics in 1810 and 1847, but Americas were affected by the 1890 pandemic. The most devastating influenza pandemic that has affected the United States was the 1918-1919 influenza outbreak that left 675,000 America dead here on America soil and abroad in Europe during World War I. This sickness had many names, but one that I found that was used most often in my research is the “Spanish Lady.” This pandemic left 50 to 100 million people dead world-wide. Poor sanitary conditions in the trenches and camps in Europe due to the war efforts along with increased movement of troops and goods accelerated its rapid spread globally (Arnold, 2018).

## Fort Wayne Response to 1918-1919 Spanish Lady Pandemic

How did our community handle this pandemic in 1918? Luckily I have some information because fellow Questor, Todd Pelfrey of the History Center, shared a copy of the Old Fort New from 1997 that has an article by author Maureen Gaff. Gaff (1997) scoured dozens of Journal Gazette articles from the period of October 1918 to January 1919 to tell a story about federal orders, curfews, quarantines and citizen volunteers. Remembering that doctors at this time could not yet see or detect viruses, it is remarkable that measures that Fort Wayne took at that time helped prevent serious loss of life by this pandemic in our community.

The Spanish Lady came in three waves in the United States. The first wave in August of 1918 our community only reported a few dozen cases of influenza in the Fort Wayne. However, by October 8, 1918 Fort Wayne received an order from the Indiana State Board of Health from the federal government to “ban all public meetings and to close schools, churches, and places of amusement” to stop the spread. On October 9, Boy Scouts helped this effort by walking door to door passing out important information about influenza. Since Fort Wayne was not experiencing significant cases of influenza, it petitioned and had this order lifted two days later. However, local officials reinstated this ban on public meetings by October 12 when reports from Whitley County having 400 cases and Garrett having 300 cases. On October 14, the City Board of Health put its emergency plan in affect that included a strict no-spitting ordinance, people with influenza were to remain home and not visit hospitals, doctors were to wear masks, and the Fort Wayne Health Commissioner was given authority to “commandeer any suitable building” to establish an emergency hospital (Gaff, 1997).

Within days, citizens volunteered to become deputy health officials to help enforce the new rules with badges that were provided by General Electric. The Red Cross began to mobilize to assist with organizing nurses and supplies once an outbreak hit the community. The Board of Health provided important information about influenza in a full page newspaper notice. By November, residents were becoming restless as there had only be 109 reported cases in Fort Wayne and even school children's excitement of not going to school had worn off. The worse of it was thought to be behind the City. The excitement of Armistice Day on November 11, 1918 brought crowds to the street to celebrate and by November 15 all bans were lifted (Gaff, 1997).

However on December 4, 137 cases of influenza were reported within 24 hours. Fort Wayne closed schools again and enacted a mandatory mask ordinance for any gathering of three or more people. There were bans on public funerals and a curfew for youth. Ten days later, a whopping 5,000 cases were reported and 1,300 homes were marked for quarantine. The Boys Scouts continued to assist with information distribution and recruiting nurses for the Red Cross effort. The Women's Motor Corp transported nurses to homes, military officials to funerals, and patients to emergency care. The week of Christmas was "eerily" quiet and staggering numbers of new cases were reported. Then, there was a decline in cases and by 6pm on New Year's Eve – all bans were lifted and the City could start the road to recovery after the war effort not only in Europe, but also the war on influenza in Fort Wayne (Gaff, 1997).In the end, the Allen County Board of Health has listed that about 365 residents that died during this pandemic (ACGSI). However, Gaff (1997) does caution that this number may be very low due to lack of time for doctors to accurate report cause of death during the crisis. I think that taking time to look at these efforts from a hundred years ago helps because a number of these efforts still are used in modern emergency planning.

## Pandemic Planning

So – what is the plan? This was the most fascinating part of this entire paper. What as a citizen can I expect and what is expected of me when, not if, the next pandemic strikes? Whether the culprit will be influenza or Ebola, there is significant information about how to prepare our workplaces, schools, homes, and our medical facilities for the next pandemic. Leading authorities include the World Health Organization and the US Centers for Disease Control and Prevention (CDC). There is a broad effort from proper home hygiene to sustaining a network of professionals that monitor and assess emerging epidemics. For example, you can conduct an internet search using “cholera update” and it will lead you to a page that is actively updated with weekly monitoring reports from countries, such as Somalia, that are experiencing outbreaks. Also, if you search “Ebola outbreaks” you will discover that currently the Democratic Republic of Congo is experiencing the second largest outbreak of this disease ever recorded with a staggering 65% fatality rate (WHO, 2020).

Global pandemic planning with a focus on influenza is spearheaded by the World Health Organization. This organization has developed volumes of guidance materials such as Pandemic Influenza Preparedness Framework and the Tool for Influenza Pandemic Risk Assessment. These tools are designed for global entities to continually assess threats using the Global Influenza Surveillance and Response System and collaborators such as global experts from agriculture and animal health. Monitoring emerging epidemics and influenza mutating into new strains is essential for planning for the next pandemic (WHO, 2020).

In the United States, the CDC is the leading entity for studying infectious diseases and distributing information on preparedness for a pandemic emergency. There are guidance

documents for homes, schools, and the work place. I initially found some of these articles to be lacking in information because many of the guidelines are simple – stay home if you are sick, have ample food and water stored for emergencies, have ample supply of prescriptions at home, wash your hands, cover your mouth, etc....(CDC, 2020). These guidelines are known as Non-Pharmaceutical Interventions (NPIs). Then I realized that social norms of proper personal hygiene are something that I woefully take for granted in the United States. Poor hygiene and sanitation are major factors to why countries can be hit so hard by these infectious diseases. When Ebola came to the United States, it was taken care of immediately with very little spread because of planning, social norms, infrastructure, and communication.

Where I was not disappointed was when I discovered the 2009 Indiana State Department of Health's Pandemic Influenza Operations Plan (Monroe, 2009). Through this plan, I discovered that in 2006, the United State passed the Pandemic and All Hazards Preparedness Act with the specific focus of preparing for a number of human or natural caused health threats (HHS, 2020). Under this Act, it established a new position in the Department of Health and Human Services (HHS) of the Assistant Secretary for Preparedness and Response (Assistant Secretary). This Assistant Secretary holds the power to administer what vaccines and antiviral medications each state receives from the Strategic National Stockpile and when to quarantine and isolate victims (HHS, 2020).

The Assistant Secretary also administers the “Emergency Support Function (ESF) #8: Public Health and Medical Response: Domestic Programs” (HHS, 2020). Under the Indiana Pandemic Influenza Plan, the Indiana State Department of Health is the key administer in Indiana for ESF#8 which includes providing the mechanism for coordinated Federal assistance for Indiana (Monroe, 2009).

To learn more about what is the plan for Indiana, I strongly encourage you to read the 2009 Indiana's Pandemic Influenza Operations Plan. This plan specifically states that using some of the mechanisms from the World Health Organization that I described before does not translate well when planning at the state level. So the United States developed the United States Government Response Stages (USG Stages) that can better guide response to individual state needs during a pandemic crisis. The CDC created the Pandemic Intervals within these USG Stages to account for the fact that pandemics do not spread uniformly (Monroe, 2009). Lastly, the US has developed its own Pandemic Severity Index (PSI) to help states trigger certain actions based on the impact of the pandemic on communities (Monroe, 2009).

Here are paraphrased the key facts listed in Indiana's plan for pandemic influenza:

1. Unlike most other disasters, pandemic influenza evolves slowly. Pandemics come in waves lasting weeks to months with periods of low activity.
2. Susceptibility to pandemic influenza virus infection will be universal and no one will have natural immunity.
3. A vaccine specific for the prevention of infection by the pandemic strain will not be available for several months.
4. It is not known if the pandemic strain may be susceptible or resistant to available antiviral medications.
5. The degree of public compliance with non-pharmaceutical countermeasures is unknown.
6. Some persons will become ill from pandemic influenza but may not develop clinically significant symptom. These persons may be able to transmit pandemic influenza to non-infected persons (Monroe, 2009).

Of the assumptions listed in this plan, it is expected that pandemic influenza will likely attack 20-40% of population. Also, worker absenteeism may be 30% or higher. Healthcare workers could report over 40% missing due to illness, helping ill family members or bereavement for a loved one lost. Another assumption would be that the fatality rate will be 2% of the population or approximately 133,840 Hoosiers (Monroe, 2009 and Wikipedia, 2020). Another fact to consider, is in a 2006 report it states there is only enough antiviral medicine to cover 10% of the state. Looking deeper, there are specific populations that are identified as “essential,” which includes government officials and healthcare workers (CAG, 2006). So in this room, how many of us would be considered “essential”? Also, assuming 100 people turned out to hear my paper, four of the tables of attendees would contract the pandemic influenza of which two individuals would not make it to the next Quest season.

The 2009 influenza pandemic was a horrible public health crisis, but important advancements have happened in the past ten years. First, the Next Generation Sequencing or Advanced Molecular Detection technology has exponentially improved our understand of all the particles of a specimen, including the ability to study how these specimens can mutate “inside a single patient to become more resistant to antiviral drugs” (CDC, 2019). Second, new kits now allow for specimens to be tested at site of the patient and use a sequence-first approach to identifying viruses. This has led to much quicker test results with incredible accuracy. Third, with the extensive data collected during the 2009 pandemic, the CDC and Association of Public Health Laboratories have creating the “right-size” approach to react to a known epidemic within a geographical area. Fourth, over 3,500 outpatient health care providers across states and territories collect data in the Outpatient Influenza-Like Illness Surveillance Network to track illnesses across the country. Lastly, the number of laboratories that now can test antiviral drug

resistance has jumped from four in 2009 to over twenty now with increased capacity for trainings and assistance from the CDC (CDC, 2019).

In conclusion, infectious disease pandemics are a real threat to public health globally and locally. There are plenty of diseases that have characteristics to become a pandemic, with influenza the most suitable for wide-spread impact. The Fort Wayne community has been directly impact by influenza pandemics in the past and it is inevitable that it will be again. There are better plans and technologies in place to protect the public with some of the same countermeasures used a hundred years ago such as masks and isolation. Finally, simple hygiene measures and reducing social interactions with those that are sick can help prevent transmission of infectious diseases to you.

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