

**PIERCE COUNTY
HAZARD IDENTIFICATION & RISK ASSESSMENT**

EPIDEMIC/PANDEMIC HAZARD¹

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Identification Description

Definition

An epidemic is a disease that spreads rapidly throughout a region's or country's population. Pandemic refers to an epidemic that has spread throughout a larger geographic area impacting multiple countries or continents.²

Types

The best-known types of pandemics are influenza pandemics. These have been some of the deadliest plagues in history. It is estimated that, worldwide, the 1918 flu pandemic killed over 50,000,000 people. The latest example of this is the H1N1 "Swine Flu". This flu strain is a recombination of swine, human and bird flu genes. Initial cases appeared in Veracruz, Mexico in the spring of 2009. Spreading through the population, it next moved to the United States and then eventually worldwide. Symptoms were mild for a large percentage of the population; however, those with a compromised immune system, pregnant women, or very young children had a more intense reaction to diseases than many others in the general population.

Seasonal flu epidemics are a recurring phenomenon that migrates around the world. The flu virus tends to mutate allowing it to continuously re-infect the population. In the United States, annual flu respiratory infections range from 5 to 15 percent yearly.

Other diseases with pandemic pedigrees are cholera, AIDS, and now emerging, tuberculosis. Each of these has been around for many years, and for cholera, tuberculosis and Ebola may break out into a rapidly moving pandemic again. AIDS while currently in a pandemic stage is unlikely to recede into the background anytime soon.

Profile

Location and Extent

Epidemics and pandemics have in the past covered the entire County. They will continue to do so in the future. To what extent they infect the public depends on their ease of transmittal. How serious the disease is to the individual depends on a number of factors including age, general health, lifestyle, occupation, etc. If they follow the pattern of the annual flu infecting 5 to 15 percent of the population, that would mean anywhere from 44,415 to 133,245 people in Pierce County could become infected.

Occurrences

Pandemics and epidemics have plagued humans for thousands of years. As human populations began to congregate in cities, the potential for large scale epidemics grew. As this process continued and trade between the various population centers increased and so did the potential for the disease to spread. This eventually led to the potential for pandemics. Today with our mobile population, individuals can be in North America one day, in Europe the next and in Asia the

next. This increases the ability for opportunistic diseases to migrate through the world's population.

Recent Epidemics have included:

- 1976-2014 Ebola outbreaks

Recent Pandemics³ have included:

- 1918-1919: "Spanish Flu" Worldwide
- 1957: "Asian influenza"
- 1961-1970s: "7th Cholera pandemic"⁴
- 1968: "Hong Kong influenza"
- 1981-Current: AIDS (Although pandemic in scale)
- 2009-2010: "Swine Flu"
- 2020 Coronavirus-19 (COVID-19)-Current

In recent years, citizens have been the victims of a number of different diseases some of which are on the verge of being, or are already, epidemics or pandemics. These have had an impact on the effect on the population's health in the County. A few of these include:

- Acquired immune deficiency syndrome (AIDS) was only discovered nationally in 1981 and is currently considered an epidemic in the United States.
- Measles has been a major childhood disease ever since settlers with European heritage moved into Washington during the 1800s. Much of it has been controlled by vaccinations. However, in the 1990s, Washington experienced the largest measles epidemic since 1979.
- Hepatitis B, a serious, highly contagious liver disease is frequent in Washington, including outbreaks in Pierce County.
- Tuberculosis (TB) is another one of those diseases which has been around for many years. The belief, a few years ago, that it would soon be brought under control is no longer considered realistic. The development of strains that resist treatment, combined with lifestyles that allow the disease to be transferred easily, has allowed its resurgence during the past few years. Many people, once they become symptomatic, will continue to infect others until they themselves are located and given treatment. When left to themselves, many of those who initially resist treatment will also fail to complete treatment once the symptoms begin to disappear. This could lead to a later resurgence and contribute to the development of resistant strains. This is especially true in the denser urban cores. To counter this, the Tacoma/Pierce County Health Department has initiated a program of aggressive follow up to make sure that individuals complete a full course of their treatment. Without these preventative measures, the future could see a dramatic increase in the disease rate. It is estimated that between two and three new cases are diagnosed in the County each month. This may not seem like many but considering that nationally only a few years ago we appeared to be on the verge of eliminating the disease, the numbers appear depressing.

- The standard fall/winter flu season creates its own epidemic on a yearly basis with some strains causing greater damage than others. In cases like this, the elderly are hit the hardest, resulting in several deaths attributable to flu each year.
- The highly publicized e-Coli epidemic in January of 1993, caused by tainted hamburger at fast food restaurants was an excellent example of how an epidemic we are not familiar with can suddenly enter our environment. In this case it infected a number of people, and caused a great deal of suffering before anyone even realized it was happening. Pierce County's toll in that epidemic was 73 infected individuals. In 1998, another e-Coli outbreak occurred in the County from an unknown source at the Puyallup Fair.
- Another disease that has come to the foreground in Washington is Lyme Disease. While the first reported case in Washington was in 1987, cases have increased from year to year with the large number of people recreating in our wilderness areas, there is potential for the number of cases to expand rapidly.
- Hantavirus Pulmonary Syndrome (HPS) is another one of those emerging diseases. HPS was first reported in the United States in the spring of 1993. As of November 2001, 288 cases had been reported in the U.S. and about 38 percent of the people died as a result of the infection. There have been a few cases reported within Washington State, none contacted in Pierce County. Deer and mice shed the virus in their urine, saliva, and droppings. Exposure comes through breathing dust after cleaning rodent droppings or disturbing nests, or by living or working in rodent-infested settings. Testing shows that approximately 10% of the deer and mice tested are carriers of the disease.

Recurrence Rate

There have been four flu pandemics in the past 100 years with three of them being in the last 60 years. This produces a recurrence rate for pandemic flu of 25 years or less.

Other pandemics like the cholera pandemic, the AIDS pandemic, the possibly evolving tuberculosis pandemic, and Coronavirus pandemic reveal that taking all types of pandemics together will bring the recurrence rate down to 20 years or less.

Impacts

Health and Safety of Persons in the Affected Area at the Time of the Incident

With epidemics and pandemics there is no area unaffected by the spread of the disease. The impact on citizens is acute illness and depending on which disease they catch there could be respiratory problems, vomiting, diarrhea, sore muscles, joint pain, weakness, spitting up blood, coma or death. For some diseases, and this includes the 1918 "Spanish Flu," many people develop long term physical complications, or due to brain damage, there may be long term, residual, mental impairment.

Health and Safety of Personnel Responding to the Incident

Responders will be mostly from the medial services in fire departments, ambulance attendants and hospital personnel. Those diseases that are transmitted through human-to-human contact will put the rescuer in danger of coming down with the same disease.

Figure E/P-1 Individuals Hoping to Avoid Contracting Disease



Continuity of Operations and Delivery of Services

Depending on the severity of the epidemic or pandemic there could be problems with continuity of operations and the delivery of services. As staff members stay home because they themselves are ill, they are caring for others or because they fear contracting the disease, the ability of the County, or the other jurisdictions within it, to maintain delivery of services to their constituents could be severely limited. As the incidence of disease increases, there could be a loss of operational continuity within individual departments.

Property, Facilities, and Infrastructure

There should be no direct impact to property, facilities or the physical infrastructure. Indirect impacts could develop due to lack of maintenance on equipment, property or facilities. However, with an epidemic or pandemic, if the symptoms of the disease are severe, with many people requiring skilled nursing or hospital care, it would overwhelm the medical infrastructure.

Environment

Epidemics and pandemics do not normally disrupt the environment. As a human disease they infect humans, and in some cases, certain animals. The avian flu H1N5 has attacked certain bird populations with a high rate of morbidity and mortality. This is also the case with West Nile Virus which is now moving through the bird population here in Washington State. It is possible that other diseases might make the jump between humans and animals, increasing animal illness and death.

Economic and Financial Condition

Seasonal flu by itself causes considerable economic hardship due to lost productivity⁵, high medical costs and lost wages. In the United States these costs range from \$71 to \$167 billion dollars a year.⁶ With a pandemic, if the symptoms of the disease are severe, including long periods of illness, or residual, debilitating effects, it could impact the economy of the County for years. The need to alter or prevent the normal social contacts, called “social distancing,” will lead to a further temporary decrease in the financial condition of the community.

Public Confidence in the Jurisdiction's Governance

An epidemic or pandemic can shake the confidence of the public across all social groups. As an ever-larger portion of the population becomes ill, demands for limited and controlled medical supplies could cause questions to arise concerning the methods of distribution. Inadequate response to the public's concerns about the supplies or the method of distribution could lead to not only lack of confidence, but outright hostility towards both those in power and those who hold the reins of distribution.

If there is a decision to isolate those who are ill, restrict travel, cancel public events, close schools and businesses or take other, possibly controversial, actions or positions, there could be strong public resistance. Any action would have to be partnered with a strong public relations campaign to convince the public that it may be necessary. If the actions are truly perceived by the public to be in their best interest, the confidence in government may survive.

Resource Directory

Regional

- **Pierce County Department of Emergency Management**
<http://www.co.pierce.wa.us/Index.aspx?NID=104>
- **Washington State Department of Health, Public Health Emergency Preparedness & Response**
www.doh.wa.gov/phepr/default.htm
- **Tacoma/Pierce County Health Department**
<http://www.tpchd.org/index.php>

National/International

- **Centers for Disease Control & Prevention**
www.cdc.gov
- **World Health Organization**
www.who.int/en

Endnotes

¹ This assessment was reviewed by the Tacoma Pierce County Health Department in January of 2020.

² Centers for Disease Control. (2012). Principle of Epidemiology in Public Health Practice (3rd. ed.). *Section 11: Epidemic Diseases Occurrence*. Retrieved March 16, 2015 from <http://www.cdc.gov/ophss/csels/dsepd/ss1978/lesson1/section11.html>

³ U.S. Department of Human and Health Services. Pandemic Flu History. Retrieved March 1, 2015 from <http://www.flu.gov/pandemic/history/>

⁴ Colwell, [Rita R.](#) (20 Dec. 1996). *Global Climate and Infectious Disease: The Cholera Paradigm*. *Science*. Vol 274 (2025-2031). Retrieved March 18, 2015 from <http://www.sciencemag.org/content/274/5295/2025.full.pdf>

⁵ *Influenza: Overview*, World Health Organization (WHO), <http://www.who.int/mediacentre/factsheets/2003/fs211/en/>

⁶ *Influenza: Overview*, World Health Organization (WHO), <http://www.who.int/mediacentre/factsheets/2003/fs211/en/>