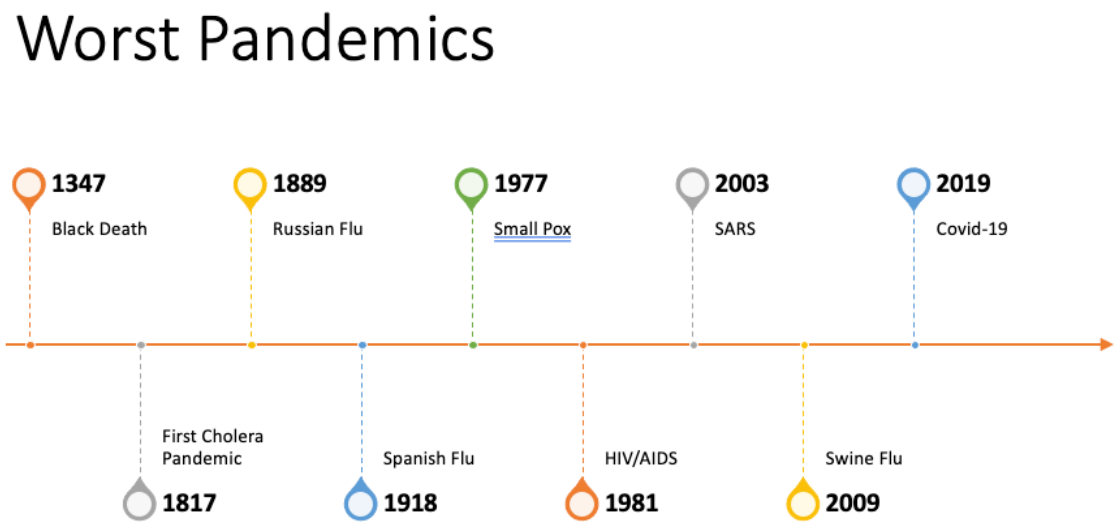
CHAPTER 8: PANDEMIC

INTRODUCTION

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.

Throughout history no other event has killed more human beings than infectious diseases. A review of the major pandemics illustrates the frequency, and now with the COVID-19 pandemic, nearly 3 million deaths have occurred worldwide at time this document is published. Figure 1 below gives a basic timeline of some of the deadliest pandemics recorded in human history.

Figure 1: Timeline of Worst Pandemics



The challenge with the transmission of disease is the variety of ways a person can become infected. A look at just a few major pandemics illustrates the different paths to infections and their sources:

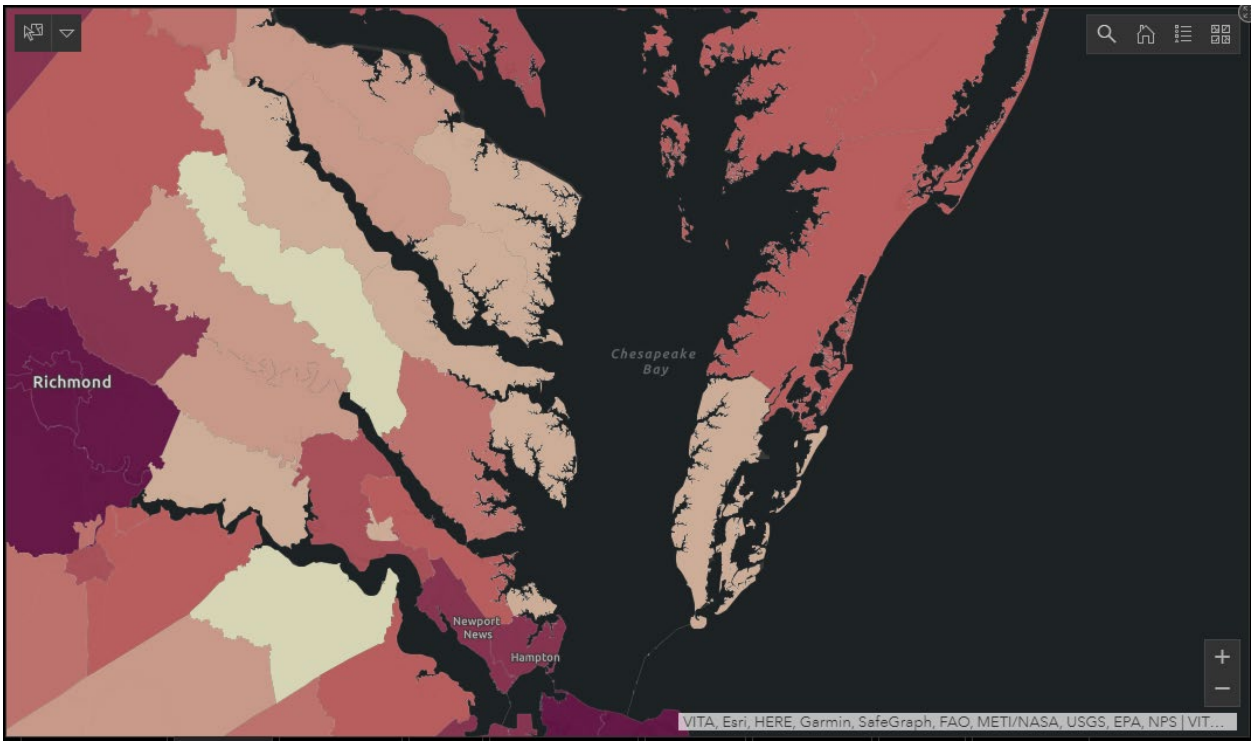
Table 1: Pandemics and Infection Paths

Pandemic	Path of Infection
1918 & 2009 Influenza (H1N1)	Respiratory droplets, infected surfaces Zoonotic influenza virus from swine
Avian Influenza A (H5N1 & H7N9)	Spread occurs by contact with infected living or dead poultry and birds Zoonotic influenza virus from birds and poultry
Bubonic Plague	Flea bites Zoonotic bacteria found in fleas and small mammals
Ebola	Contact with infected blood or body fluids Zoonotic Ebola virus from bats
COVID-19, MERS-CoV, SARS-CoV	Respiratory droplets Zoonotic coronavirus, possibly from bats

History has shown that the best-known types of pandemics are Influenza pandemics. Currently the world is being impacted by COVID-19 which is a new strain of coronavirus. COVID-19 causes an outbreak of respiratory illness that was first detected in Wuhan, Hubei province, China. Coronaviruses are a large family of viruses that are known to cause illness ranging from the common cold to more severe diseases such as severe acute respiratory syndrome (SARS) and Middle East Respiratory Syndrome (MERS).

COVID-19 has resulted in the estimated death of 3 million people worldwide at the time of writing this chapter. The true number is likely higher, but unknown. The United States has recorded the greatest number of deaths of any country, at just over 600,000 fatalities. Vaccine efforts are ongoing, with multiple options available to the public. These vaccines carry some side effects but have largely been proven to be safe and effective against the Coronavirus. The image below is a map produced by Johns Hopkins University displaying the number of confirmed cases of COVID-19 for Accomack County and Northampton County. The darker colors indicate a higher confirmed case count. As of August 3, 2021, Accomack County has 2,928 confirmed cases and Northampton County has 811.

Figure 2: Cases of COVID-19 by County. Source: Johns Hopkins University https://coronavirus.jhu.edu/us-map



During the COVID outbreak on The Eastern Shore, officials came together to support testing and vaccinations. Locally, the Virginia Department of Health's Eastern Shore Health District (ESHD) partnered with Eastern Shore Rural Health System, Inc. (ESRHS) and Riverside Medical Group (Riverside). Virginia's emergency declaration on March 12, 2020, also allowed the Virginia National Guard to be deployed across the state. In the town of Melfa, the Virginia National Guard assisted ESHD with running a testing site at the Eastern Shore Community College. As seen in Figure 3, below.

There are several factors which contribute to an outbreak, and the result is often demonstrated by more cases than would be normally expected, often suddenly, of an infectious disease in a community or facility. These factors include:

- Time of the year
- Weather
- Environment
- Origin

Figure 3: U.S. National Guard. Photo by Cotton Puryear

In addition to the factors which influence an outbreak of a pandemic, epidemiologists are concerned with both the frequency and pattern of health events that might impact a population. Frequency is the number of health events and its relationship to the size of a population. One simple example is comparison of the impact of diabetes across different populations. Patterns refer to how often an event happens as it relates to time, place, and person. Because of patterns, geospatial data has been critical in capturing the impact of COVID-19. Geospatial data now informs patterns to help draw correlations between:

- Time: annual, seasonal, weekly, daily, hourly, weekday versus weekend
- Place: urban/rural differences, and location of work sites or schools
- Demographic: age, sex, marital status, and socioeconomic status

These data sets can demonstrate how serious a disease is to the individual and using the example of the annual flu, which usually impacts 5-15 percent of the population; the Eastern Shore may have between 2,200 to 6,600 people become sick.

IMPACTS

HEALTH AND SAFETY OF PERSONS IN THE AFFECTED AREA AT THE TIME OF THE INCIDENT

Healthcare and safety workers are affected by the spread of a pandemic. Transmission can be anticipated in the workplace not only from patients to workers, but also among co-workers and between members of the public and workers in other types of workplaces. The employer needs to proactively engage in clear communications and training, provide the appropriate personal protective equipment, and implement effective control measures. The following table indicates the estimated level of risk for various types of employment.

Table 2: Risk Type by Employment

Very High & High Exposure Risk	Medium Exposure Risk	Lower Exposure Risk (Caution)
Healthcare workers, particularly those working with known or suspected pandemic patients.	Workers with high-frequency interaction with the public (e.g., those working in schools, restaurants and retail establishments, travel and mass transit, or other crowded environments).	Workers who have minimal contact with the public and other coworkers (e.g., office workers).

CONTINUITY OF OPERATIONS AND DELIVERY OF SERVICES

According to FEMA, "Continuity of operations (COOP) during a pandemic requires using existing plans in more adaptive ways to address unique requirements, to include employee health, social distancing, and widespread absenteeism." (COVID-19 Best Practice Information: Continuity of Operations, n.d.).

FEMA recommends the following best practices for jurisdictions and communities:

- Review and/or assess your organization's essential functions and personnel
- Establish and practice your telework ability in advance. Employers should regularly check in with staff to see what is and is not working during teleworking to assess where new processes and procedures are needed to communicate with and support staff
- As organizations implement expanded telework to maintain business operations, companies should examine IT practices and procedures, and security risks that may arise from a remote workplace
- Identify essential workers needed to maintain the critical infrastructure services and functions that the community depend on daily
- Key critical infrastructure sectors should consider procuring supplies to include cots, sleeping bags, and food if essential workers need to shelter-in-place at work to ensure continued reliable service while avoiding exposure to the virus
- Local governments should aim to conduct business remotely while continuing to make time-sensitive decisions
- Use technology to expand virtual options to engage citizens in public meetings to maintain momentum on critical planning efforts

INFRASTRUCTURE AND ECONOMIC

Impacts to infrastructure are often limited except for increased demand on public health facility and care. Other areas of concern in a prolonged pandemic relate to the lack of maintenance or arability of resources because the supply chain is interrupted. One simple example is the loss of heat in the winter months in a school and resources are not available to place the systems back online.

ECONOMIC AND FINANCIAL CONDITION

The need to alter or prevent the normal social contacts, called "social distancing," or a lockdown will lead to a temporary decrease in the financial condition of the community. Recovery is often measured in the amount of time the economy is impacted by the pandemic.