CHAPTER 11: PANDEMIC & EMERGING INFECTIOUS DISEASE

During the 2021 Plan Update process the stakeholder group identified a new hazard to be included as a chapter in the hazard mitigation plan. The Chapter, **Pandemic and Emerging Infectious Diseases**, was added to the Plan with the most recently available data.

Updates to this chapter include the following new sections:

- How are Pandemics and Emerging Infectious Diseases a Threat to Wicomico County?
 - Overview of Epidemics and Pandemics
 - The difference between pandemic, epidemic, and emerging infectious disease
- Contributing factors to pandemic and emerging infectious disease risk
- History of notable pandemics and epidemics
- Vulnerability Assessment
 - COVID-19
 - Social Vulnerability
- Capability Assessment and Mitigation Strategies
- o 2021 Mitigation Goals and Action Items

WICOMICO COUNTY HAZARD MITIGATION AND RESILIENCE PLAN

11.1 HOW ARE PANDEMICS AND EMERGING INFECTIOUS DISEASES A THREAT TO WICOMICO COUNTY?

We live in an ever-connected world and the benefits seem limitless. At present, the average U.S. citizen can travel coast-to-coast in less than six hours. A round trip flight out of BWI airport to Los Angeles can be purchased for just about \$200. When we travel, however, there are additional costs than the ticket price – this has been made devastatingly clear in the face of a year-long global pandemic. As demonstrated by the COVID-19 pandemic, not only has human health been jeopardized, but also the social and economic well-being of the world.

EPIDEMIC

The amount of a particular disease that is usually present in a community is referred to as the baseline or endemic **Pandemic** refers to an epidemic that has spread over several countries or continents, usually affecting a large number of people. **Epidemics** occur when an agent and susceptible hosts are present in adequate numbers, and the agent can be effectively conveyed from a source to the susceptible hosts.

Source: Centers for Disease Control and Prevention CDC.gov

level of the disease. This term refers to the constant presence and/or usual prevalence of a disease or infectious agent in a population within a geographic area, such as Wicomico County.

Sometimes the amount of disease in a community rises above the expected level; this is known as an epidemic. Epidemics are characterized by an increase, often sudden, in the number of cases of a disease above what is normally expected in that population in that area. While some diseases are so rare in each population that a single case warrants an epidemiologic investigation (e.g., rabies, plague, polio), other diseases occur more commonly so that only deviations from the norm warrant investigation. Figure 11-1 provides a visual representation of the difference between endemic and epidemic.

According to the Center for Disease Control (CDC), epidemics may commonly result from:

- A recent increase in amount or virulence of the agent;
- The recent introduction of the agent into a setting where it has not been before;
- An enhanced mode of transmission so that more susceptible persons are exposed;



Source: Health.mo.gov

- A change in the susceptibility of the host response to the agent, and/or;
- Factors that increase host exposure or involve introduction through new portals of entry.

Epidemics may also take the form of large-scale incidents of food or water contamination, infestations of disease bearing insects or rodents, or extended periods without adequate water or sewer service. An epidemic may also be a secondary effect from other disasters such as flooding, tornadoes, hurricanes, or hazmat incidents.

PANDEMIC

The CDC defines a pandemic as "an epidemic that has spread over several countries or continents, usually affecting a large number of people." Similarly, according to the World Health Organization (WHO) a pandemic is defined as "the worldwide spread of a new disease." A pandemic occurs when a new strain of a virus appears for which people have little or no immunity. As a result, it spreads easily from person to person around the world, causing widespread illness and death. Individuals, families, caregivers, healthcare workers, and teachers can all take steps to prepare for a pandemic before it happens.

EMERGING INFECTIOUS DISEASES

According to the CDC, emerging infectious diseases are those whose incidence in humans has increased in the past two decades or threaten to increase in the near future. These diseases, which respect no national boundaries, can challenge efforts to protect workers as prevention and control recommendations may not be immediately available. These diseases include:

- New infections resulting from changes or evolution of existing organisms
- Known infections spreading to new geographic areas or populations
- Previously unrecognized infections appearing in areas undergoing ecologic transformation
- Old infections reemerging as a result of antimicrobial resistance in known agents or breakdowns in public health measures.

11.2 CONTRIBUTING FACTORS TO PANDEMIC AND EMERGING INFECTIOUS DISEASE RISK

Evidence suggests that the likelihood of pandemics has increased over the past century because of increased global travel and integration, urbanization, changes in land use, and greater exploitation of the natural environment. These trends likely will continue and will intensify. Significant policy attention has focused on the need to identify and limit emerging outbreaks that might lead to pandemics and to expand and sustain investment to build preparedness and health capacity.

The most common risk factors related to pandemics and infectious diseases include the following:

- Pandemics have occurred throughout history and appear to be increasing in frequency, particularly because of the increasing emergence of viral disease from animals.
- Pandemic risk is driven by the combined effects of spark risk (where a pandemic is likely to arise) and spread risk (how likely it is to diffuse broadly through human populations).
- Some geographic regions with high spark risk, including Central and West Africa, lag behind the rest of the globe in pandemic preparedness.
- Probabilistic modeling and analytical tools such as exceedance probability (EP) curves are valuable for assessing pandemic risk and estimating the potential burden of pandemics.
- Influenza is the most likely pathogen to cause a severe pandemic. EP analysis indicates that in any given year, a 1 percent probability exists of an influenza pandemic that causes nearly 6 million pneumonia and influenza deaths or more globally.

11.3 HISTORY OF PANDEMIC AND EMERGING INFECTIOUS DISEASES

The following section provides historical context and narrative for some of the worst epidemics, disease outbreaks, and pandemics to ever occur within the United States. This section discusses the following: COVID-19 pandemic, smallpox pandemic, yellow fever epidemic, cholera pandemic, scarlet fever epidemic, typhoid fever epidemic, H1N1 pandemic, and diphtheria epidemic. Note: this is not an all-inclusive historical account of pandemics, epidemics, and emerging infectious diseases that have occurred in the United States.

Novel COVID-19: 2019 – Present

The Novel COVID-19 pandemic has exploded since cases were first reported in Wuhan, Hubei Province, China in December 2019. As of January 15, 2021, the CDC estimates that 83.1 million total infections occurred between February and December of 2020. Of those cases, 70.4 million are estimated to have been symptomatic, and an estimated 4.1 million led to hospitalizations.

Individuals of all ages are at risk for infection and severe disease. However, the probability of fatal disease is highest in people aged over 65 years and those living in a nursing home or long-term care facility. Others at highest risk for COVID-19 are people of any age with certain underlying conditions, especially when not well-controlled. In addition, COVID-19 can spread between people who are in close contact with one another (within about 6 feet), via respiratory droplets produced when an infected person coughs, sneezes or talks, and by persons who are asymptomatic. Symptoms, or a combination of symptoms, can appear 2-14 days after exposure. Note: COVID-19 is an evolving pandemic. As such, symptoms and best practices to manage the spread of the virus are still being updated and adjusted by health professionals.

Smallpox: 1633-1634

Smallpox came to North America in the 1600s. Symptoms included high fever, chills, severe back pain, and rashes. It began in the Northeast and the Native American population was ravaged by it as it spread westward.

In 1721, more than 6,000 cases were reported out of a Boston population of 11,000. Around 850 people died from the disease.

In 1770, Edward Jenner developed a vaccine from cow pox. It helps the body become immune to smallpox without causing the disease.

Yellow Fever: 1793

During the humid summer of 1793, refugees fleeing a yellow fever epidemic in the Caribbean Islands sailed into Philadelphia, carrying the virus with them.

Yellow fever causes yellowing of the skin, fever, and bloody vomiting. During the 1793 outbreak, it is estimated that the 10 percent of the Philadelphia's population died and many others fled the city to avoid the illness.

A vaccine was developed and then licensed in 1953. One vaccine is enough for life and is mostly recommended for those nine months and older, particularly if one lives or travels to high-risk areas.

The Centers for Disease Control and Prevention (CDC) provides a list of countries where the vaccine is recommended for travel on their website.

Present: Mosquitoes are the key to how this disease spreads, particularly in areas such as Central America, South America, and Africa. Eliminating mosquitoes has been successful in controlling yellow fever. While yellow fever has no cure, someone who does recover from the illness becomes immune for the rest of their life.

Cholera (three waves): 1832-1866

The United States had three (3) serious waves of cholera, which is an infection of the intestines, between 1832 and 1866. The pandemic began in India and swiftly spread across the globe through trade routes.

New York City was the first U.S. city to feel the impact. Between 5 and 10 percent of the total population died in large cities. It is unclear what ended the pandemic, but it may have been the change in climate or the use of quarantine measures. By the early 1900s, cholera outbreaks had ended.

Present: Cholera is responsible for nearly 95,000 deaths a year worldwide, according to the CDC. Modern sewage and water treatment have helped eradicate cholera in some countries, but the virus is still present elsewhere.

Vaccinations for cholera are available for those planning to travel to high-risk areas. The best way to prevent cholera is to wash your hands regularly with soap and water and avoid drinking contaminated water.

Scarlet Fever: 1858

Scarlet fever is a bacterial infection that can occur after strep throat. Like cholera, scarlet fever epidemics came in waves. Scarlet fever most commonly affects children ages 5 to 15; it is rare in children under 3. Adults who are in contact with sick children have an increased risk. Studies once indicated that scarlet fever declined due to improved nutrition, but new research suggests that improvements in public health were more likely the cause.

Present: There is no vaccine to prevent strep throat or scarlet fever. It is important for those with strep throat symptoms to seek treatment quickly. Your doctor will typically treat scarlet fever with antibiotics.

"Typhoid Mary": 1906-1907

One of the biggest typhoid fever epidemics of all time broke out between 1906 and 1907 in New York City. Mary Mallon, often referred to as "Typhoid Mary," spread the virus to about 122 New Yorkers during her time as a cook on an estate and in a hospital unit.

About 5 of the 122 New Yorkers who contracted the virus by Mary Mallon died. The CDC cites a total of 13,160 deaths in 1906 and 12,670 deaths in 1907. Typhoid fever can cause sickness and red spots to form on the chest and abdomen.

A vaccine was developed in 1911, and an antibiotic treatment for typhoid fever became available in 1948.

Present: It is rare to contract typhoid fever today, but it can spread through direct contact with people who have the virus, as well as consumption of contaminated food or water.

H1N1 Flu: 1918

H1N1 is a strain of flu that still circulates the globe annually. In 1918, it was the type of flu behind the influenza pandemic, sometimes called the Spanish flu (though it did not actually come from Spain).

After World War I, cases of the flu slowly declined. None of the suggestions provided at the time (wearing masks, drinking coal oil) were effective cures. Today's treatments include bed rest, fluids, and antiviral medications.

Present: Influenza strains mutate every year, making last it is important to receive an annual vaccination to decrease the personal risk for the flu.

Diphtheria Epidemic: 1921-1925

Diphtheria peaked in 1921, with 206,000 cases. It causes swelling of the mucous membranes, including in your throat, which can obstruct breathing and swallowing. Sometimes a bacterial toxin can enter the bloodstream and cause fatal heart and nerve damage.

A vaccine was produced by researchers in the mid-1920's, which led to a sharp decline in infection rates in the United States.

Present: Today more than 80 percent of children in the United States are vaccinated, according to the CDC. Those who contract the disease are treated with antibiotics.

11.4 VULNERABILITY ASSESSMENT

COVID-19 PANDEMIC VULNERABILITY ASSESSMENT

The National Institute for Environmental Health Services (NIEHS) provides a COVID-19 Pandemic Vulnerability Index (PVI) to be utilized in assessing vulnerability at the county-level for the entire country. According to the source, the dashboard creates risk profiles, called PVI scorecards, for every county in the United States. It is continuously updated with the latest data. The PVI summarizes and visualizes overall risk in a special version of a pie chart, called a radar chart, where different data sources make up pieces of the pie. Infection rates, depicted in red slices, are labeled 1 and 2. Intervention rates, noted in blue slices 5 and 6, are highly variable and are updated daily. Population concentration and density are fixed values describing general demographic information, and these are shown in green slices 3 and 4. Health and Environmental variables are shown in the purple slices 7-12.



Source: https://covid19pvi.niehs.nih.gov/

SOCIAL VULNERABILITY ASSESSMENT

In the sphere of social science and public health science, policy, and practice, the terms *vulnerable, at risk,* and *special* are used in different contexts to describe overlapping segments of the U.S. population. In social science literature, vulnerability has been defined as "the potential for loss"; county-level socioeconomic and demographic data can be used to construct an index of social vulnerability to environmental hazards to guide research and interventions. Other researchers have published comprehensive models of vulnerability that are based on likely inequities in health and health care for use in health services research and public health practice.

When discussing vulnerability in terms of public health, vulnerability may be defined as "increased exposure to infection; increased susceptibility to severe disease, including complications, hospitalizations, and death; and lack of access to health care." With these definitions in mind, Wicomico County should consider the following four questions – developed by the CDC – when addressing the needs of vulnerable populations during a pandemic, epidemic, or disease outbreak:

- 1. Why is the population considered vulnerable?
- 2. What are the unique issues, concerns, and needs of each vulnerable population?
- 3. What strategies can protect these populations?
- 4. What specific approaches are needed for vulnerable populations, their families, and their health care and service providers to ensure their protection?

As in the previous hazard chapters, the CDC Social Vulnerability Index (SVI) was reviewed and utilized to measure social vulnerability as it relates to Wicomico County. The social vulnerability index developed by the CDC and the Agency for Toxic Substances and Disease Registry (ATSDR) addresses the first question by identifying vulnerable populations at a census tract level for all counties in the United States. Understanding where populations have an increased vulnerability and exposure to hazards, including epidemics, while not predictive, can help emergency managers and public health officials take actions to reduce the impacts to these

communities before an event or distribute needed recovery dollars after an event. All populations have value and should have the option to contribute to emergency management and hazard mitigation. Continued collaboration with the Lower Shore Vulnerable Population Workgroup will serve to further engage the community early and often, allowing residents to grow into partners in response, and emergency managers and public health officials to grow into community allies.

Lower Shore Vulnerable Populations Workgroup During the plan development process the Lower Shore Vulnerable Populations Workgroup reviewed the project website public survey. In addition, the language workgroup added hazard mitigation as an agenda item for several meetings including:

- March 2, 2021; and,
- March 24, 2021.

Additional integration of social equity is needed, therefore adding social vulnerability to the 2021 Plan is a step in this direction.

Refer to *Planning for an Emergency: Strategies for Identifying and Engaging At-Risk Groups* published by CDC as a resource about characteristics that influence vulnerability and FEMA's *Guide to Expanding Mitigation: Making the Connection to Equity.*



The SVI has been conducted for Wicomico County at the census tract level and is mapped on the follow page. The SVI utilizes ACS 5-year estimates. The darker census tracts indicate areas of higher social vulnerability while the lightest tracts indicate relatively low social vulnerability.



Map 11.1: Wicomico County Social Vulnerability Index

11.5 CAPABILITY ASSESSMENT

Amidst the rising number of cases in early 2020, local governments had to quickly provide information to as many residents as possible in an effective and safe (i.e., socially distanced) manner. Having a robust website and online technical capabilities is a key element in dispersing information and creating a safe and informed population. Wicomico County currently has the following services available to the public:

- Vaccine Information
- Testing Appointments
- Latest COVID-19 Stats
- Information on Executive Orders
- Links to Resources (e.g., CDC website, MD Dept. of Health website, covidLINK, and information for businesses)

Wicomico's Health Department website includes relevant information about the vaccine(s), statistics, how the vaccine is allocated, priority groups, and vaccine registration. There are instructions for testing and receiving a vaccination.



Source: https://www.wicomicohealth.org/

Hotel Mass Sheltering Guidelines

In the event of a mass-casualty incident in Wicomico County that involves significant health hazards (e.g., pandemic), the following guidelines developed by the Wicomico Department of Emergency Services would go into effect:

- Practice social distancing. Stay at least 6 feet (about 2 arms' length) from other people outside of your household.
- Please stay in your assigned room. Your meals/water and any other items needed will be delivered to your room.
- Follow CDC COVID-19 preventive actions—wash your hands often, cover coughs and sneezes, and follow shelter policies for wearing face coverings. Avoid sharing food and drink with anyone if possible.
- Avoid touching your eyes, nose, and mouth.
- Avoid touching high-touch surfaces, such as handrails, as much as possible. If not possible, wash hands or use hand sanitizers immediately after you touch these surfaces.
- Keep your living area clean and disinfect frequently-touched items such as toys, cellphones, and other electronics.
- Place used tissues in the trash.
- If you feel sick when you arrive at the hotel or start to feel sick while sheltering, tell staff immediately.

Source: Wicomico County Department of Emergency Services, 2020

11.6 MITIGATION STRATEGIES

The CDC recommends the following "guiding principles" to consider when developing and implementing mitigation strategies:

- 1. Community mitigation efforts aim to reduce the rate at which someone infected comes in contact with someone not infected or reduce the probability of infection if there is contact. The more a person interacts with different people, and the longer and closer the interaction, the higher the risk of COVID-19 spread.
- 2. Each community is unique. Appropriate mitigation strategies should be based on the best available data. Decision making will vary based on the level of community transmission and local circumstances. Refer to Table 11-1.
- 3. The characteristics of the community and its population, health system and public health capacity, and the local capacity to implement strategies are important when determining community mitigation strategies.
- 4. As communities adjust mitigation strategies, they should ensure that the healthcare system capacity will not be exceeded. Precautions should be taken to protect health care professionals and other critical infrastructure workers. Communities need to assure healthcare systems have adequate staffing, a surplus of inpatient and ICU beds, and critical medical equipment and supplies such as PPE.
- 5. As communities adjust mitigation strategies, they should ensure public health capacity will not be exceeded. Public health system capacity relies on detecting, testing, contact tracing, and isolating those who are or might be sick, or have been exposed to known or suspected COVID-19 cases; it is important to stop broader community transmission and prevent communities from having to implement or strengthen further community mitigation efforts.
- 6. Attention should be given to people who are at higher risk for severe illness when determining and adjusting community mitigation strategies.
- 7. Certain settings and vulnerable populations in a community are at particularly high risk for transmission. This includes but is not limited to congregate settings such as nursing homes and other long-term care facilities, correctional facilities, and the homeless population.
- 8. Mitigation strategies can be scaled up or down, depending on the evolving local situation, and what is feasible, practical, and legal in a jurisdiction. Any signs of a cluster of new cases or a reemergence of broader community transmission should result in a re-evaluation of community mitigation strategies and a decision on whether and how mitigation might need to change.
- 9. Cross-cutting community mitigation strategies can be organized into the following categories: promoting behaviors that prevent spread; maintaining healthy environments; maintaining healthy operations; and preparing for when someone gets sick. Presuming a

community is not sheltering-in-place, cross-cutting strategies under each rubric are outlined below and should be implemented to the extent possible, and in accordance with the amount of ongoing community transmission. Refer to Table 11-1.

- 10. Community mitigation strategies should be layered upon one another and used at the same time—with several layers of safeguards to reduce the spread of disease and lower the risk of another spike in cases and deaths. No one strategy is sufficient.
- 11. There are range of implementation choices when setting or adjusting community mitigation plans. These choices offer different levels of protection from the risk of community transmission.
- 12. Communities need to decide the level of risk that is acceptable and make informed choices about implementing mitigation plans accordingly.
- Individuals make choices about following the behavioral practices that are recommended. Compliance to community mitigation decisions will also impact the spread of COVID-19.
- 14. CDC offers setting-specific strategies for a variety of sectors that include businesses, schools, institutes of higher education, parks and recreational facilities, and other places.
- 15. Travel patterns within and between jurisdictions will impact efforts to reduce community transmission. Coordination across state and local jurisdictions is critical especially between jurisdictions with different levels of community transmission.

Level of Community Transmission	Community Characteristics and Description	Level of Mitigation
Substantial, uncontrolled transmission	Large scale, uncontrolled community transmission, including communal settings (e.g., schools, workplaces)	Shelter in place
Substantial, controlled transmission	Large scale, controlled community transmission, including communal settings (e.g., schools, workplaces)	Significant mitigation
Minimal to moderate community transmission	Sustained transmission with high likelihood or confirmed exposure within communal settings and potential for rapid increase in cases	Moderate mitigation
No to minimal community transmission	Evidence of isolated cases or limited community transmission, case investigations underway; no evidence of exposure in large communal setting	Low mitigation

Table 11.1: Level of Mitigation Needed by Community Transmission and Community Characteristics

Source: https://www.cdc.gov/coronavirus/2019-ncov/community/community-mitigation.html

The following table includes mitigation strategies that Wicomico County could adopt in the future if they are not already in place. These strategies are divided into four (4) groups that: (1) promote behaviors that prevent spread, (2) maintain healthy environments, (3) maintain healthy operations, and (4) preparation for when someone gets sick. Not all strategies will be relevant for every community or setting within Wicomico County, but an important component of

mitigation is preparedness via foreknowledge of multiple strategies in the face of an uncertain future.

Table 11.2: Overview of Possible Mitigation Strategies to	Consider in Communities with Local COVID-19 Transmission
Across Settings and Sectors	

Guiding Principle	Community Mitigation Strategies	
	 Educate people to stay home when sick or when they have been in close contact with someone with COVID-19 Teach and reinforce practicing hand hygiene and respiratory etiquette 	
Promote Behaviors that Prevent Spread	 Teach and reinforce the use of cloth face coverings to protect others (if appropriate) Ensure you have accessible sinks and enough supplies that are easily available for people to clean their hands (e.g., soap, hand sanitizer with at least 60% alcohol, and a way to dry hands, such as paper towels or a hand dryer). Post signs or posters and promote messaging about behaviors that prevent spread 	
Maintain Healthy Environments	 Intensify <u>cleaning and disinfection</u> of frequently touched surfaces Ensure ventilation systems operate properly and increase circulation of outdoor air Ensure all water systems are safe to use Modify layouts to promote social distance of at least 6 feet between people – especially for persons who do not live together Install physical barriers and guides to support <u>social distancing</u> if appropriate Close communal spaces, or stagger use and <u>clean and disinfect</u> between use Limit sharing of objects, or <u>clean and disinfect</u> between use 	
Maintain Healthy Operations	 Protect people at higher risk for severe illness from COVID-19 To cope with stress, encourage people to take breaks from the news, take care of their bodies, take time to unwind and connect with others, particularly when they have concerns Maintain awareness of local or state regulations Stagger or rotate scheduling Create static groups or "cohorts" of individuals and avoid mixing between groups Pursue virtual events. Maintain social distancing at any in-person events, and limit group size as much as possible Limit non-essential visitors, volunteers, and activities involving external groups or organizations, especially with those who are not from the local area Encourage telework and virtual meetings if possible Consider options for non-essential travel in accordance with state and local regulations Designate a COVID-19 point of contact Implement flexible and non-punitive leave policies Monitor absenteeism and create a back-up staffing plan Train staff on all safety protocols 	

	• Consider conducting daily health checks such as temperature	
	screening or symptom checking	
	• Encourage those who share the facilities to also adhere to mitigation	
	strategies	
	• Put in place communication systems for:	
	Individuals to self-report COVID-19 symptoms, a positive test for	
	COVID-19, or exposure to someone with COVID-19	
	• Notifying local health authorities of COVID-19 cases	
	• Notifying individuals (employees, customers, students, etc.) of any	
	COVID-19 exposures while maintaining confidentiality in	
	accordance with privacy laws	
	• Notifying individuals (e.g., employees, customers, students) of any	
	facility closures	
	• Prepare to isolate and safely transport those who are sick to their	
	home or to a healthcare facility	
	• Encourage individuals who are sick to follow <u>CDC guidance for</u>	
	caring for oneself and others who are sick	
	• Notify local health officials of any case of COVID-19 while	
	maintaining confidentiality in accordance with the Americans with	
	Disabilities Act (ADA)external icon.	
Prepare for When	• Notify those who have had <u>close contact</u> with a person diagnosed	
Someone Gets Sick	with COVID-19 and advise them to stay home and self-monitor for	
	symptoms, and follow CDC guidance if symptoms develop	
	• Advise individuals who are sick when it would be safe for them to	
	return based on CDC's criteria to discontinue home isolation	
	• Close off areas used by someone who is sick. Wait >24 hours before	
	cleaning and disinfecting. Ensure safe and correct use and storage	
	of EPA-approved List N disinfectants, including storing products	
	securely away from children.	

11.7 CONCLUSION

On May 3, 2021, a meeting was held with the Public Health Group to review the new working draft Pandemic and Emerging Infectious Disease chapter content. During this meeting, the Public Health Group developed new goals, objectives, and mitigation actions for pandemic and emerging infectious disease hazard. As a result, these new goals, objectives, and mitigation actions have been incorporated into Chapter 14: Mitigation Strategies. The Public Health Group will meet periodically during the next five (5) year planning cycle to review the status of these mitigation action items.