

### 4.5 Epidemic/Pandemic

#### 4.5.1 Description

The Centers for Disease Control and Prevention (CDC) defines an epidemic as “an increase, often sudden, in the number of cases of a disease above what is normally expected in that population in that area.” Moreover, the World Health Organization (WHO) defines a pandemic as “an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and 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. More specifically, an epidemic may result from any of the following:

- 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;
- 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.

While epidemics usually refer to infectious agents, the Centers for Disease Control and Prevention notes that non-infectious diseases such as diabetes and obesity exist in epidemic proportion in the United States. For the purposes of this report, only epidemics referring to infectious agents will be discussed. These types of infectious agents can include bacteria, viruses, fungi, and parasites.

Disease and epidemic can also impact animals. In particular, Clinton County is concerned with potential outbreaks of a virus that can impact swine and other livestock. In particular, swine are commonly infected with Influenza A Viruses.

#### 4.5.2 Location

Epidemics can develop with little or no warning and quickly erode the capacity of local medical care providers. A fast-developing epidemic can last several days and extend into weeks or even months in extreme cases. Epidemics can occur at any time of the year, but the warm summer months, when bacteria and microorganism growth are at their highest, present the greatest risk for epidemics to occur. An epidemic has the potential to affect the entire County but is more probable to occur in densely populated areas, especially at facilities with large numbers of occupants.

#### 4.5.3 Extent

According to the WHO, 70 percent of emerging human pathogens come from animals. As such, some of the most likely epidemics that could affect Clinton County include animal-sourced pathogens such as influenza and West Nile Virus. Such an event has the potential to cause serious injury or death to large numbers of people but would cause no damage to private property or structural damage to public facilities. The impact on individuals could also be economic at the individual level due to the inability of an infected person to go to work. In a worst-case scenario, cascading effects could lead to civil unrest, food and fuel shortages, or utility failure due to inability for people to provide services.

#### *Animal Disease and Epidemic*

It is important for the County to monitor Influenza A Viruses, as well as other swine-related disease, because of the potential for human interaction. Additionally, a widespread swine epidemic could have catastrophic economic impacts on the swine industry.

### 4.5.4 History

The Coronavirus (COVID-19) impacted the County, along with the rest of the United States, beginning in March of 2020. The pandemic is an ongoing national emergency, and a National Emergency Declaration went into effect on March 13, 2020. Governor Mike DeWine and Ohio Department of Health Director, Dr. Amy Acton, issued a stay-at-home order on March 23, 2020 with an expiration date of April 6, 2020. On April 2, 2020, Governor DeWine and Dr. Acton extended the stay-at-home order until May 1, 2020.

The stay-at-home order has the following components:

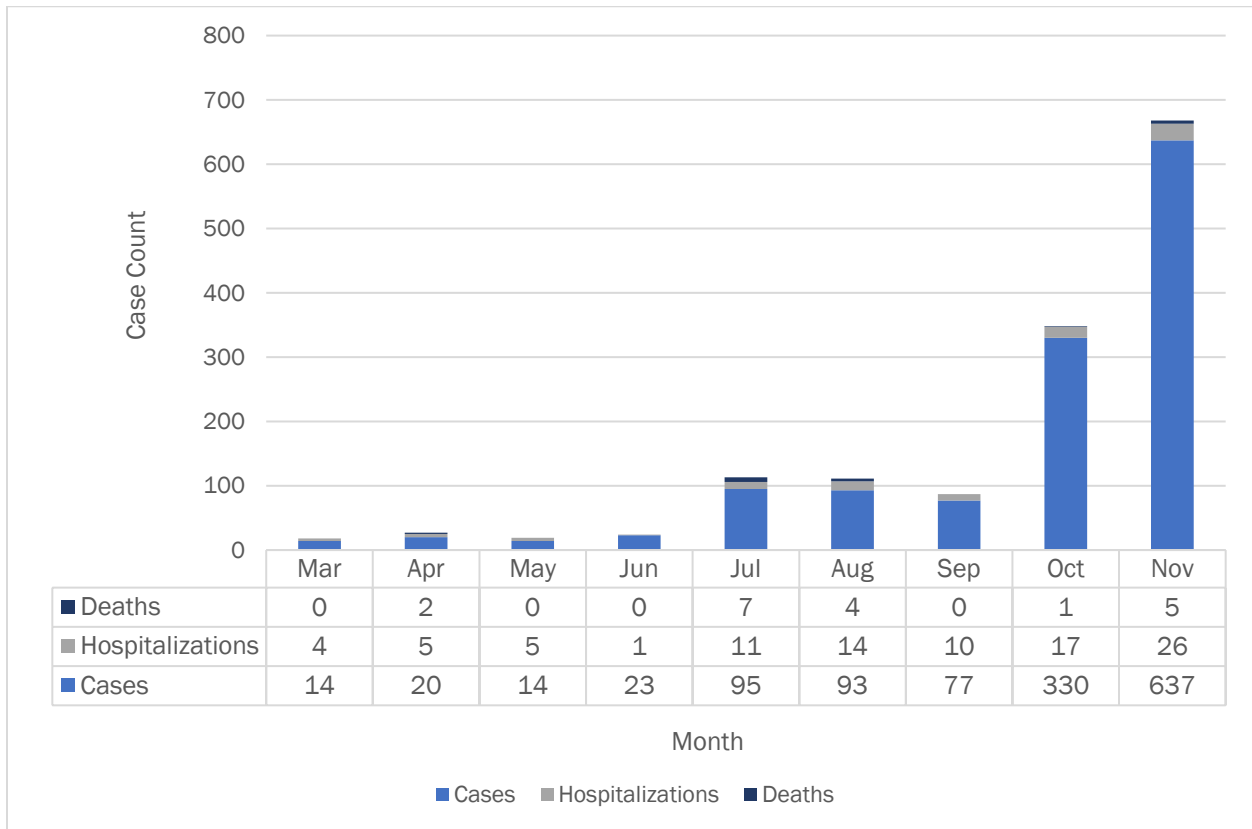
- Any person entering Ohio from out of state is asked to self-quarantine for 14 days.
- The number of people allowed to be inside essential establishments is restricted.
- A board has been established to assist local health departments identify essential businesses.
- Weddings are permitted, although receptions are expected to follow social distancing guidelines (at least six feet apart).
- Campgrounds are closed, except when a camper or recreational vehicle serves as a permanent residence.
- Ohio State Parks remain open, but the Parks Director can take action to enforce the orders that have been issued.

In early May 2020, businesses and other organizations in Ohio started the process of reopening; however, by mid-to-late June hospitals begin to see an uptick in the number of COVID-19 hospitalizations. In fall of 2020, as the school year began, local schools utilized a combination of in-person and virtual education. Additionally, by November 2020, communities across Ohio began to see a significant increase in COVID-19 cases.

As of December 7, 2020, Clinton County has 1,369 total confirmed cases, 94 hospitalizations, and 19 deaths attributed to COVID-19. Only three cases were confirmed within local school districts (Source: ODH). **Figure 4.5.1** displays total COVID-19 case count, as well as hospitalizations and deaths, in Clinton County by month. Please note that October only includes October 1-15, 2020.

## 4 | HAZARD RISK ASSESSMENT

**Figure 4.5.1: Clinton County COVID-19 Cases by Month**

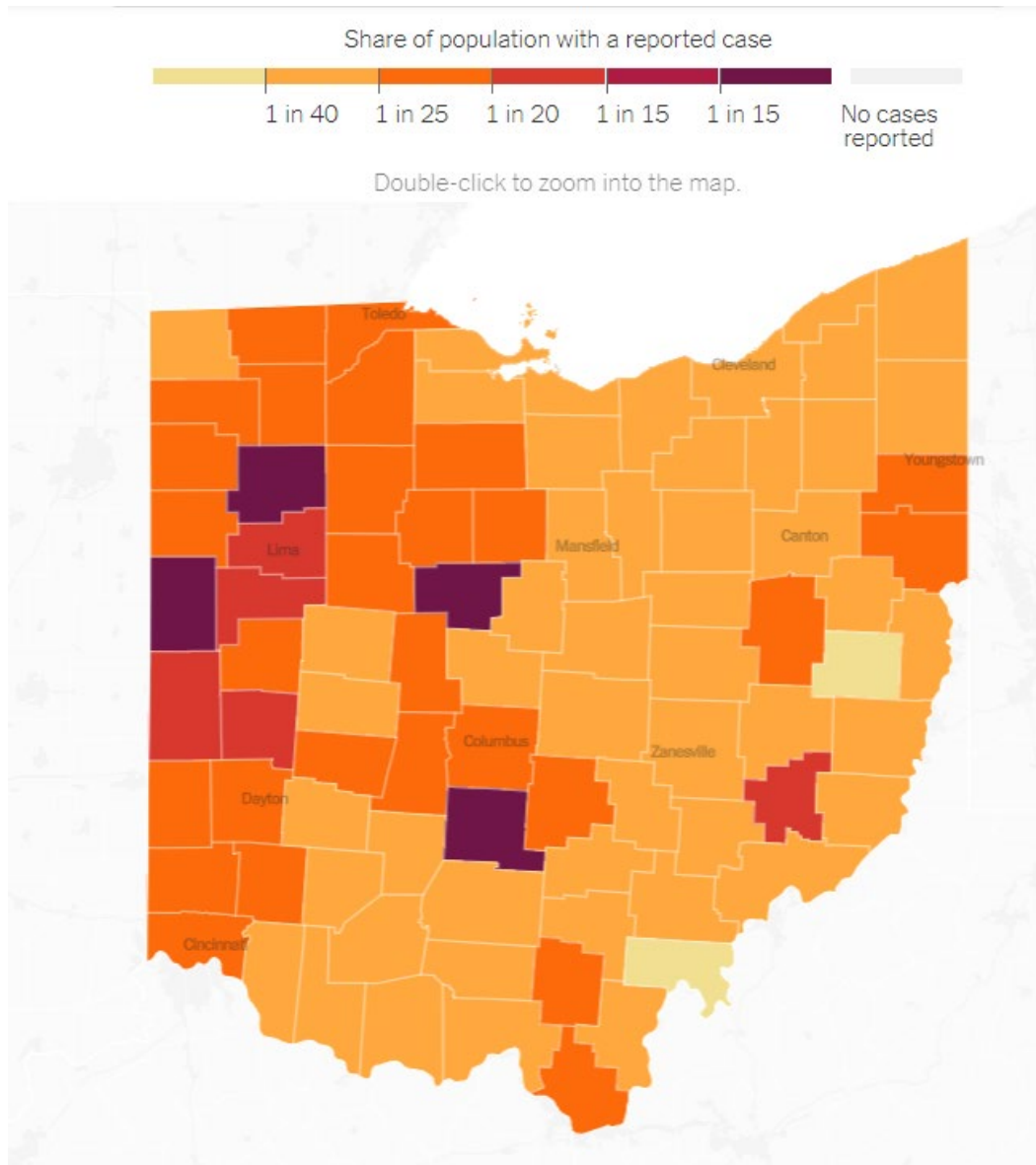


Source: ODH

**Figure 4.5.2** compares COVID-19 rates per capita in Ohio’s counties as of December 7, 2020. This figure, which was provided by The New York Times, was developed using data from state and local health agencies. According to this figure, Clinton County has a per capita COVID-19 rate of less than 1 in 40 residents. Counties in red on the figure have per capita COVID-19 rate of between 1 in 15 and 1 and 20 and counties in purple have the highest per capita rate of more than 1 in 15 residents.

## 4 | HAZARD RISK ASSESSMENT

Figure 4.5.2: COVID-19 Cases Per Capita by County as of December 7, 2020



Sources: State and local health agencies. Population and demographic data from Census Bureau.

The Ohio Department of Health (ODH) maintains a Public Health Advisory Alert System. This is “a color-coded system designed to supplement existing statewide orders through a data-driven framework to assess the degree of the virus’ spread and to engage and empower individuals, businesses, communities, local governments, and others in their response and actions” (Source: ODH). The system consists of four levels that provide Ohioans with guidance as to the severity of the problem in the counties in which they live. The levels are determined by seven data indicators that identify the risk level for each county and a corresponding color code to represent that risk level. These colors and risks are described in **Table 4.5.1**.

## 4 | HAZARD RISK ASSESSMENT

**Table 4.5.1: Public Health Advisory Alert System**

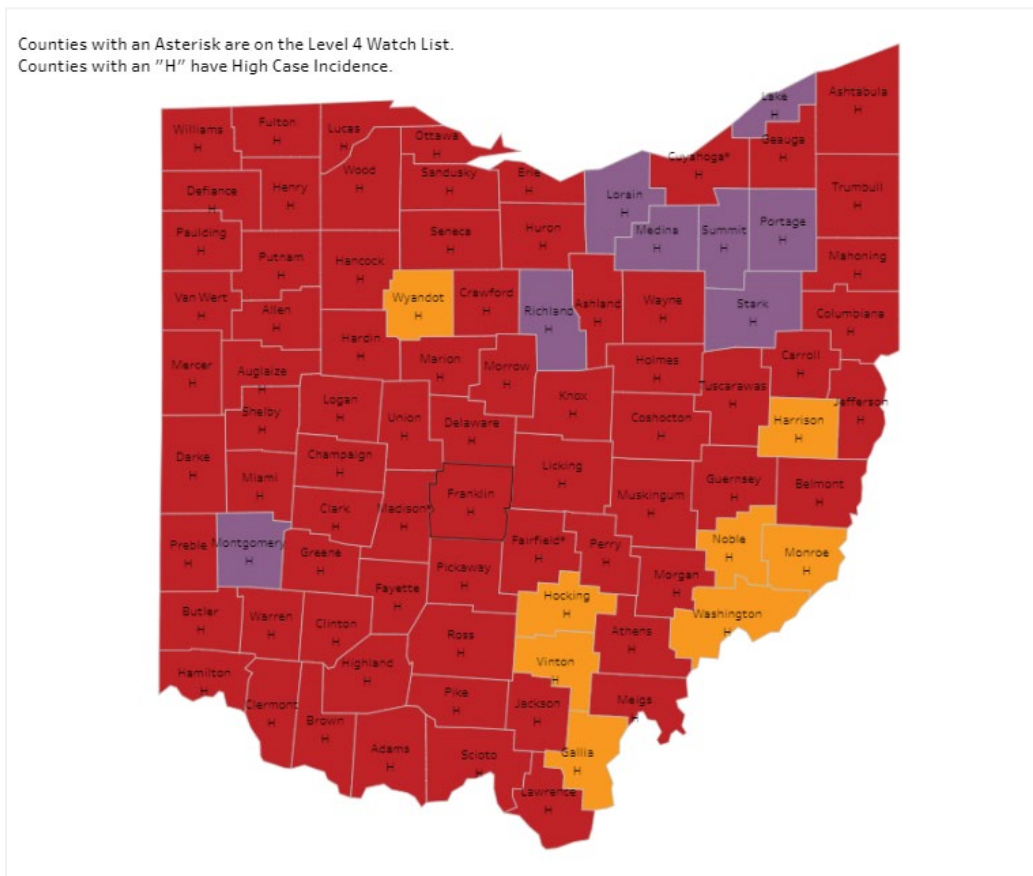
| Color  | Public Emergency Level   | Risk Information   |
|--------|--------------------------|--|
| Yellow | Level 1 Public Emergency | Active exposure and spread.  |
| Orange | Level 2 Public Emergency | Increased exposure and spread. Exercise high degree of caution.        |
| Red    | Level 3 Public Emergency | Very high exposure and spread. Limit activities as much as possible.   |
| Purple | Level 4 Public Emergency | Severe exposure and spread. Only leave home for supplies and services. |

Source: ODH

Figure 4.5.3 shows the Public Health Advisory System as of December 7, 2020. This image shows that Clinton County had a Level 3 Public Emergency (red) as of December 7, 2020.

The exact long-term impacts from COVID-19 are unknown at this point.

**Figure 4.5.3: Public Health Advisory System as of December 7, 2020**



Source: ODH

It is important to note that the situation with COVID-19 is constantly changing. At the time this report was written and submitted, the State of Ohio was experiencing a second wave of the virus. As of November 30, 2020, all Ohio counties were listed as High Incidence Spread.

### ***Livestock Disease & Epidemic Occurrence***

To monitor large-scale outbreaks of Influenza A Viruses (IAV) among swine in Clinton County, pigs at the County Fair are randomly checked each year. **Table 4.5.2** provides the incident rate for positive swine at the fair over the past five years.

**Table 4.5.2: Clinton County Ohio Fair Data Summary**

| Year | IAV Positive | Samples Collected | % IAV Pos | Subtypes Identified |
|------|--------------|-------------------|-----------|---------------------|
| 2016 | 2            | 20                | 10%       | H3N2                |
| 2017 | 14           | 20                | 70%       | H1N1, H3N2, Mixed   |
| 2018 | 4            | 20                | 20%       | H1N2                |
| 2019 | 0            | 20                | 0%        | NA                  |
| 2020 | 12           | 20                | 60%       | TBD                 |

Source: OSU Extension

### **4.5.5 Probability**

Epidemics do not occur at regular intervals and can begin without warning. The WHO indicates that most epidemic-prone diseases are rare, and outbreaks are generally contained quickly. Early detection of infected individuals can prevent a widespread epidemic.

As global weather patterns shift and permafrost in areas of the world melts, there will be more opportunity for diseases that have been frozen within layers of permafrost to be released, exposing humans to new diseases. As such, there will be more potential for epidemics to arise from these diseases.

### **4.5.6 Vulnerability Assessment**

Given the lack of historic epidemic events in the County, it is difficult to estimate potential damages. Additionally, the long-term impacts of a widespread virus like COVID-19 are unknown. The following assessment was developed to provide a general vulnerability assessment for epidemics in Clinton County.

#### ***Infrastructure Impact***

There is likely to be little-to-no impact to infrastructure in the event of an epidemic.

#### ***Population Impact***

The population of Clinton County is likely to be significantly impacted should an epidemic occur. Day-to-day life can be significantly interrupted, and people may lose their jobs or need to work from home.

#### ***Property Damage***

Property damage is not likely to occur as a direct result of an epidemic event.

### Loss of Life

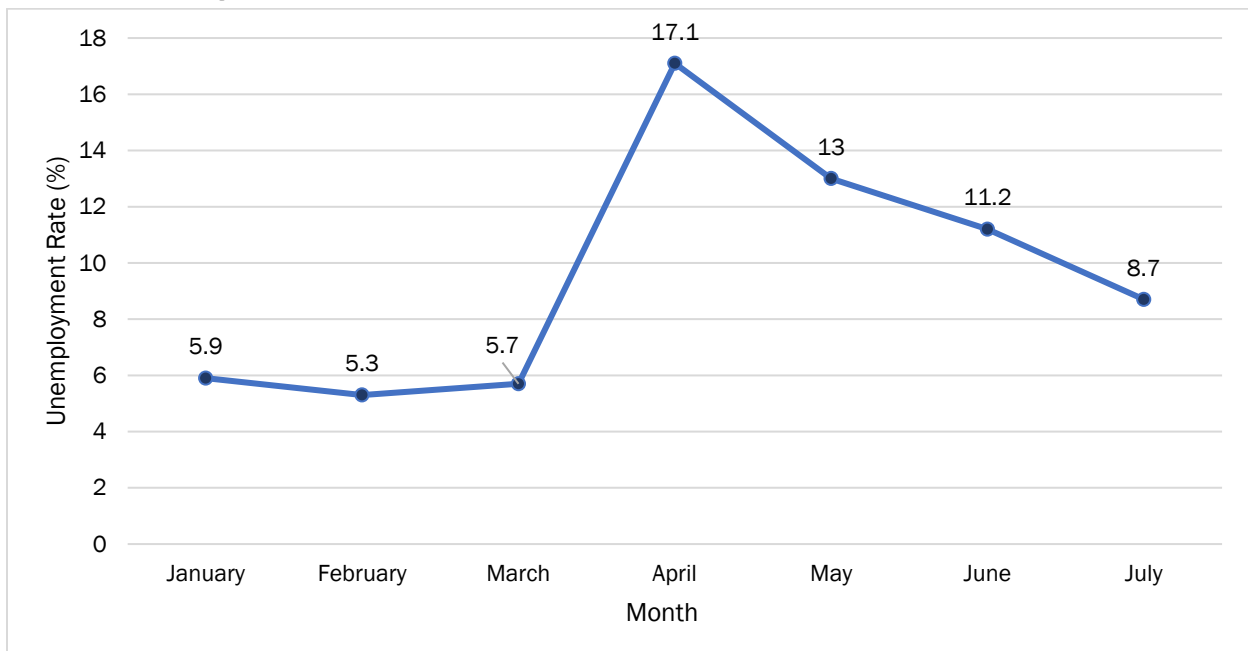
Loss of life is a potential outcome from any epidemic event. As of July 2020, COVID-19 has caused 6 deaths in Clinton County.

### Economic Losses

Economic losses would likely be observed through the inability for individuals to work. Large-scale epidemics then can have a significant impact on production and the supply chain. As such, these events can disrupt the flow of the economy. In the long run, the threat of epidemics is low, and there is little risk that economic losses will occur in the County due to an epidemic. With that being said, the COVID-19 pandemic has proven to be a multiple-month event resulting in ongoing losses. The full extent of this pandemic is still to be determined.

Figure 4.5.4 displays the unemployment rate for Clinton County from January 2020 through July 2020. This shows the significant increase in unemployment associated with COVID-19 and accompanying business closures mandated by the State of Ohio.

Figure 4.5.4: Unemployment Rates in Clinton County in 2020 by Month

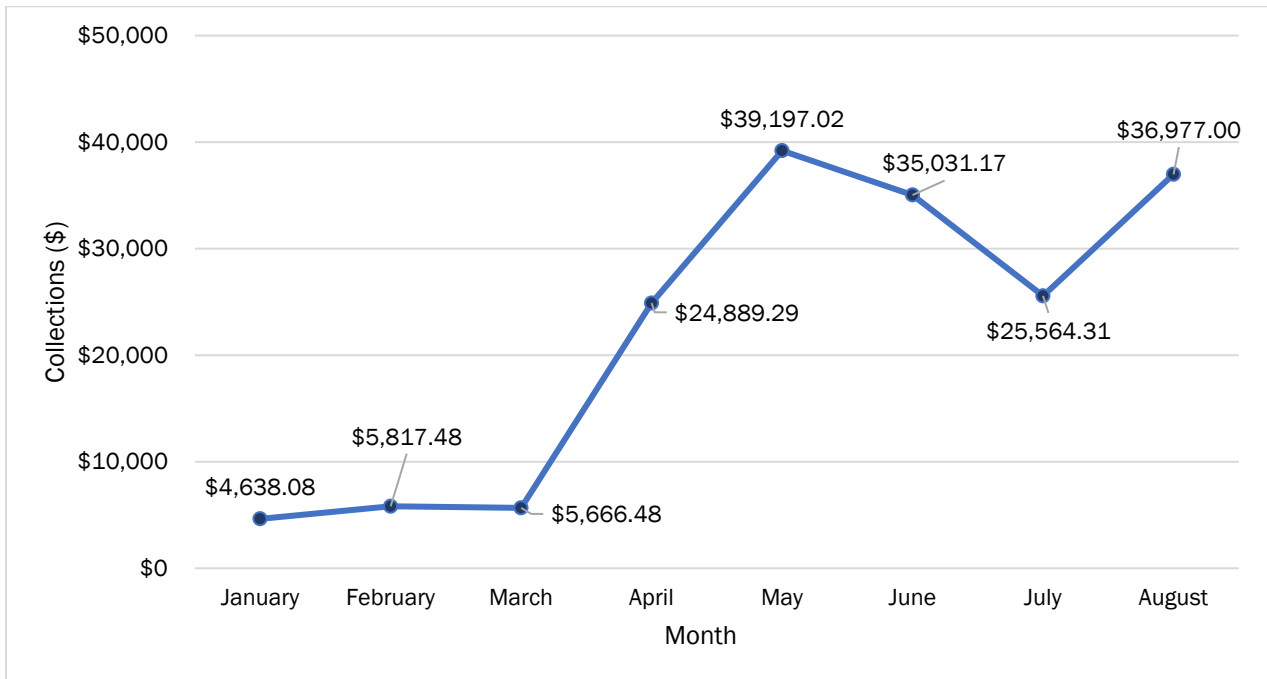


Source: Clinton County Job and Family Services

Clinton County also observed a surge in the number of SNAP, TANF, Medicaid, and PRC applications between March and April 2020 with 328 applications total in March to 700 in April. Between 200 and 300 applications were received each month from May through August. In addition to these observations, Clinton County also experienced a rise in the value of collections from Unemployment Claims for the payment of child support (Figure 4.5.5).

It is important to note that these figures are brief snapshots suggesting some of the impacts of COVID-19. A much more detailed economic analysis of the impacts of COVID-19 should be completed once more data has been collected. After 2020, more comprehensive statistical comparisons can be made related to taxes and other economic indicators.

Figure 4.5.5: Collections from Unemployment Claims for the Payment of Child Support



Source: Clinton County Job and Family Services

Economic impacts can also be observed should a swine influenza outbreak occur. Swine influenza costs pork producers approximately \$3.23 - \$10.31 per pig produced (national average).

#### 4.5.7 Land Use and Development Trends

Land use and development are not likely to be impacted by epidemics. Adequate health care facilities should be maintained in the event of an epidemic.