

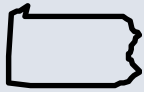


COVID-19 and The Commonwealth: County-Level Differences in Vaccination and Death Rates

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59.5%

of PA residents (18+)
 are fully vaccinated



52.4%

urban residents (12+)
 are fully vaccinated



43.6%

rural residents (12+)
 are fully vaccinated



Fulton, Bedford, Potter, & McKean

Counties have the lowest
 vaccination rates



Community & mobile health clinics

may be key to tackling
 health disparities
 for COVID-19 & beyond



Introduction

As of June 25, 2021, 59.5% of Pennsylvanians 18 years and older were fully vaccinated against COVID-19, with approximately 75% having received their first dose (Governor Wolf, 2021). However, counties across The Commonwealth vary widely in percent of residents fully vaccinated, ranging from Fulton County at 24% to Montour County at 67% (PA Department of Health, 2021).

There are several reasons why some adults in Pennsylvania have yet to receive the COVID-19 vaccination. Some residents may be hesitant to receive the vaccine; while others may encounter barriers to access, such as distance to vaccination sites and lack of transportation.

Understanding disparities in vaccination rates can ultimately inform more precise and targeted vaccination outreach.

This brief explores geographic differences in COVID-19 vaccination and death rates and considers the underlying healthcare disparities that will continue to need attention beyond the end of the COVID-19 outbreak.

County COVID-19 Vaccination Rates

Given that individuals 65 and older comprise a substantial portion of the PA population and are considered high risk of becoming severely ill due to the virus, ensuring access to vaccinations is imperative. Age was also a major component in the vaccination distribution plan, with younger individuals most recently gaining eligibility to receive the COVID-19 vaccines. For instance, the Pfizer vaccine was recently approved for children 12 years and younger, leading to increases in vaccine rates among those 19 and younger (Hamel et al., 2021).

Table 1 presents the three counties with the lowest vaccination rates for each focus age group: 19 and younger, 20-64, and 65 and older.

County-Level Differences in Vaccination and Death Rates

Table 1. Counties with the Lowest Vaccination Rates, by Age Groups, PA, 2021

Age Group	Counties
19 Years and Younger	1. Fulton 2. Bedford 3. Potter
20 – 64 Years Old	1. Fulton 2. Potter 3. Bedford
65 Years and Older	1. Potter 2. McKean 3. Fulton
Note: All vaccination rates were calculated per 100,000 residents. Data for Philadelphia County was collected from the Philadelphia County Department of Health. All vaccination rates were calculated as of June 29, 2021.	

The lowest vaccinated counties in the Commonwealth of Pennsylvania are Potter, Bedford, Fulton, and McKean Counties. These counties are all classified as rural counties and are located at the northern and southern edges of central PA (see Figures 1, 2, and 3). A lack of vaccination sites, combined with the potential need to travel for appointments, may contribute to relatively low vaccine rates in these counties. Potter County, for example, only has three vaccination sites for the county and Fulton County has no pharmacies participating in the state or federal vaccination distribution program.

The following maps give a visual representation of county vaccination rates by age group, where the counties with the lowest rates are shown in lighter colors and counties with higher rates are darker. The three counties with the lowest vaccination rates and the three counties with the highest vaccination rates are labeled.

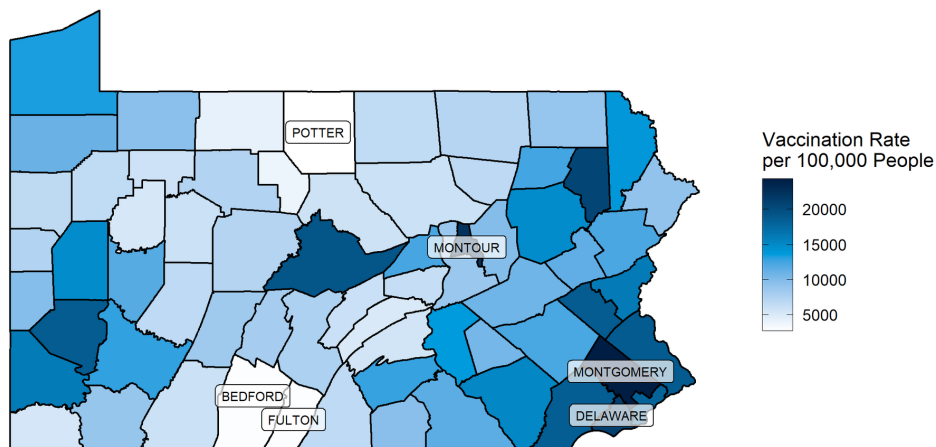


Figure 1. COVID-19 Vaccination Rates for Ages 19 and Younger, by County, PA, 2021

County-Level Differences in Vaccination and Death Rates

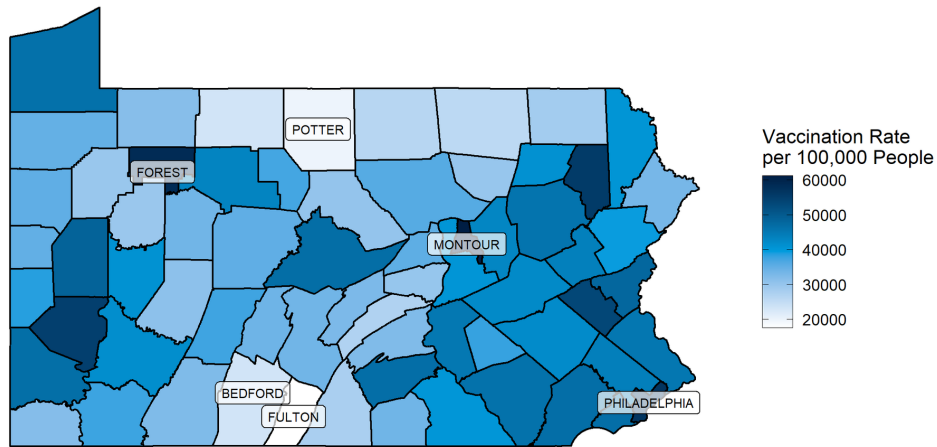


Figure 2. COVID-19 Vaccination Rates for Ages 20 to 64, by County, PA, 2021

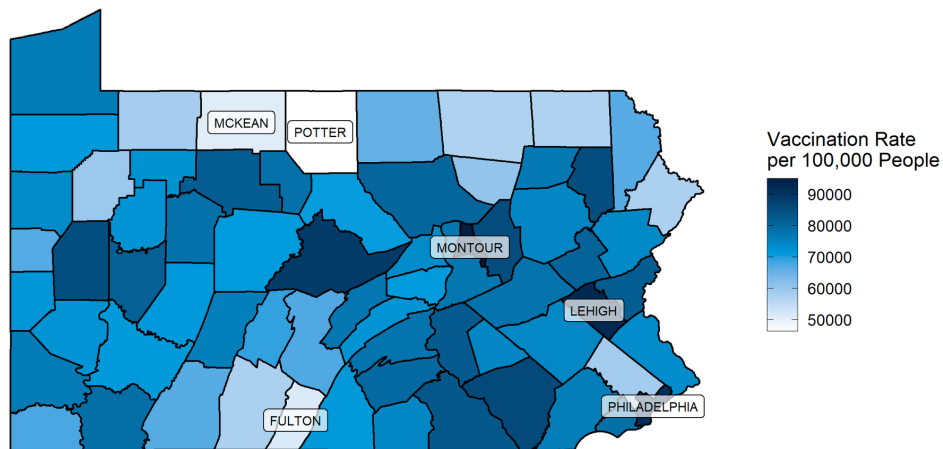


Figure 3. COVID-19 Vaccination Rates for Ages 65 and Older, by County, PA, 2021

Another potential explanation of variation in vaccine uptake is hesitancy. The Kaiser Family Foundation notes a significant difference in vaccination interest among rural and urban residents (Kirzinger, Muñana, & Brodie, 2021). Currently in Pennsylvania, 43.6% of rural residents and 52.4% of urban residents are fully vaccinated. While these rates seem comparable, the total number of fully vaccinated urban residents (4,359,654) far exceeds the total number of fully vaccinated rural residents (1,329,440). For reference, Figure 4 demonstrates the large number of Commonwealth counties classified as rural according to the Center for Rural Pennsylvania (2014).

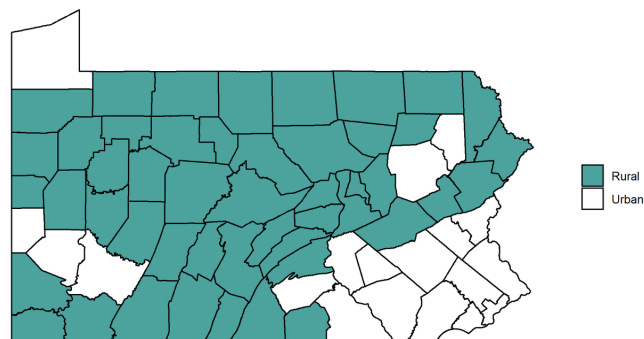


Figure 4. County Rural/Urban Status in The Commonwealth

County-Level Differences in Vaccination and Death Rates

Table 2 presents the three counties with the highest vaccination rates for each focus age group: 19 and younger, 20-64, and 65 and older.

Table 2. Counties with the Highest Vaccination Rates, by Age Groups, PA, 2021

Age Group	Counties
19 Years and Younger	1. Montgomery 2. Montour 3. Delaware
20 – 64 Years Old	1. Montour 2. Forest 3. Lackawanna
65 Years and Older	1. Montour 2. Lehigh 3. Philadelphia
Note: All vaccination rates were calculated per 100,000 residents. Data for Philadelphia County was collected from the Philadelphia County Department of Health. All vaccination rates were calculated as of June 29, 2021.	

Of the seven counties with the highest vaccination rates by age, five are urban. One possible explanation for such high vaccination rates is the large and established healthcare infrastructure in each of these counties, comprised of hospital systems and/or many residents employed in healthcare. Healthcare workers were the first eligible for vaccinations, which may explain the high rates in these counties. For example, Montour County is the location of Geisinger Medical Center; the health system's largest hospital and employs roughly 24,000 individuals (Geisinger Health, 2018).

County COVID-19 Death Rates

The emphasis on vaccination uptake is to slow the spread of COVID-19, with the goal of reducing deaths from the virus. Table 3 presents the three counties with the lowest and highest death rates from COVID-19 in the Commonwealth.

Table 3. Highest and Lowest COVID-19 Death Rates, by County, PA, 2021

	Counties
Lowest Death Rate	1. Centre 2. Pike 3. Forest
Highest Death Rate	1. Sullivan 2. Warren 3. Jefferson
Note: All death rates were calculated per 100,000 residents. Data for Philadelphia County was collected from the Philadelphia County Department of Health. All death rates were calculated as of June 29, 2021.	

County-Level Differences in Vaccination and Death Rates

The county-level death rates in PA follow a different geographical distribution than vaccination rates, as evidenced in Figure 5. Interestingly, there is little overlap in county death and county vaccination rates, aside from Forest County. Forest County has both a high vaccination rate and a low death rate, which could be influenced by the vaccination rates among the residents at the State Correctional Institution (SCI) in Forest county. The Pennsylvania Department of Corrections (PaDOC), has prioritized vaccinating both inmates and staff at correctional facilities around the Commonwealth. Out of the 2,212 inmates currently residing at SCI Forest, 83.5% (1,872) are fully vaccinated (PaDOC, 2021). Among the 666 staff members, 27.2% (190) are fully vaccinated. While there is a small percentage of fully vaccinated staff members, the combination of fully vaccinated staff and inmates could be a possible explanation for the low death rate and high vaccine rate among 20 to 64-year-olds.

Counties with lower death rates are shown in lighter colors while darker colors represent counties with higher death rates. The counties with the lowest and highest death rates are labeled.

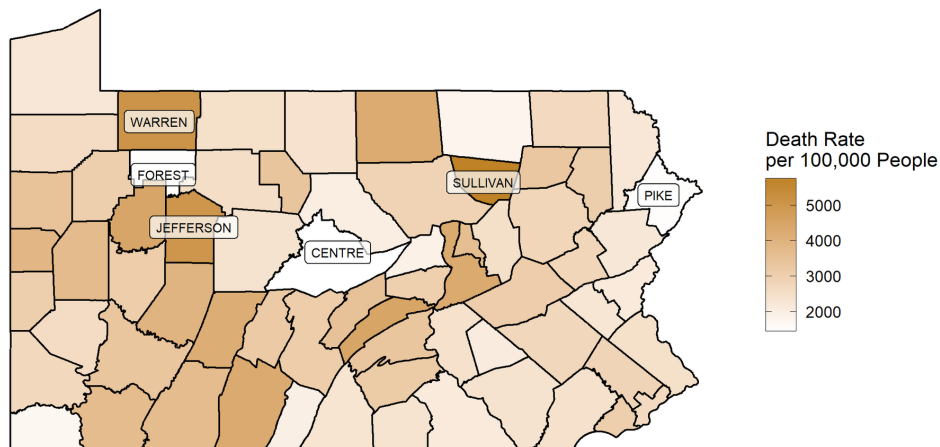


Figure 5. COVID-19 Death Rates, by County, PA, 2021

As noted above, understanding the number of individuals 65 and older that are vaccinated is important because they have the highest risk of dying from COVID-19. According to a report released by the Pennsylvania Department of Health, there have been 23,883 COVID-19 deaths over the age of 65 as of June 25, 2021. While there have not been as many deaths for the younger age groups (see Figure 6), it is still important for younger age groups to get vaccinated to stop the spread the of the virus to their surrounding communities and those who are more vulnerable.

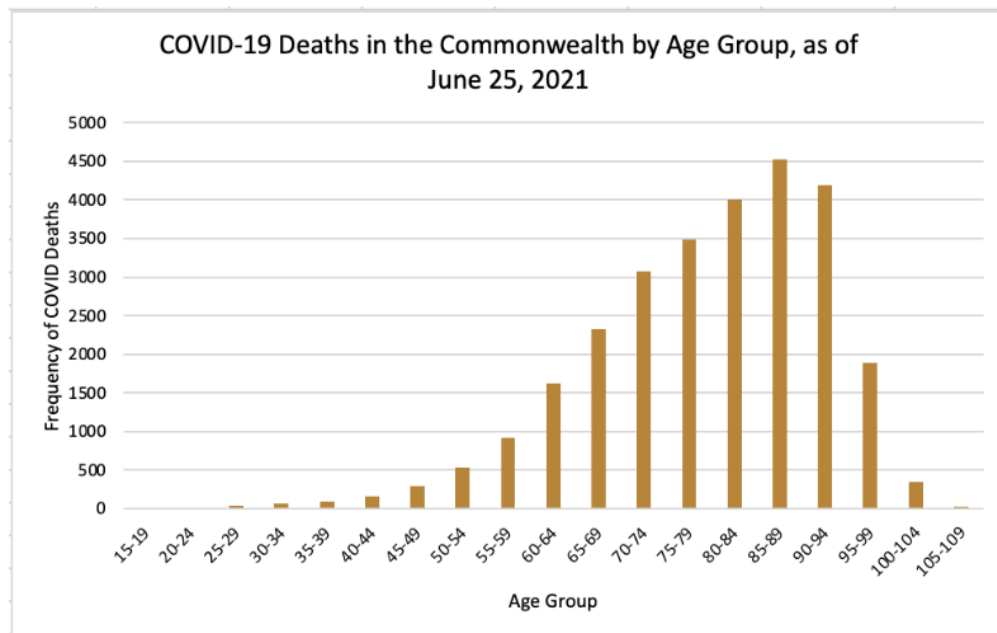


Figure 6. COVID-19 Deaths by Age, PA, 2021

Policy Implications

Both the vaccine and death rates discussed in this brief highlight the challenges faced by the Commonwealth of Pennsylvania in mobilizing vaccination efforts, especially in rural counties. Vaccine supply, hesitancy, and limited healthcare infrastructure exacerbate the process of inoculating Pennsylvanians. Lack of transportation and internet access may have also impeded rural populations in receiving vaccines. As discussed by the Pennsylvania Population Network (Chandler et al. 2020), households in rural counties are less likely to have an internet service subscription. Reliance on online portals for making vaccine appointments likely served as a brake on vaccinations in these areas making it more difficult to connect vulnerable citizens to vaccines during initial roll-out.

A distribution system that considers the geographic disparities that exist in PA, may have the potential to increase vaccination efforts and immunize a larger proportion of residents for a variety of illnesses, above and beyond COVID-19. Building stronger affiliations with local health centers and pharmacies in communities that are lacking in availability, may create an opportunity to dispense vaccines more equitably.

One promising sign is the emergence of community and mobile health clinics charged with tackling some of these distribution challenges. For instance, the Commonwealth has selected both Pike County and Sullivan County as the home to new community clinics, as both counties do not have adequate healthcare infrastructures in place (Martines, 2021). Mobile health clinics are an innovative model that can be utilized to increase healthcare accessibility and improve health outcomes, especially in rural communities and among hard-to-reach populations (Yu et al., 2017).

Similarly, developing transportation assistance programs to help both older residents and residents lacking means of transportation, may also prove to be effective in this situation. Lastly, the COVID-19 pandemic has revealed the importance of developing stronger, more equitable, long-term healthcare services, to not only manage unmet need in healthcare access in a variety of communities, but also to mitigate the risks of unforeseen health emergencies and hazards, such as the ongoing global pandemic.

Acknowledgements

The Pennsylvania Population Network and all associated research is made possible by a Penn State strategic initiative seed grant funded by the Office of the Executive Vice President and Provost.

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About the Network:
The Pennsylvania Population Network (PPN) is a visible program of demographic and health research, application, and outreach focusing on population characteristics and change in Pennsylvania, the United States and the world.

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