



**Pennsylvania Health Care  
Cost Containment Council**

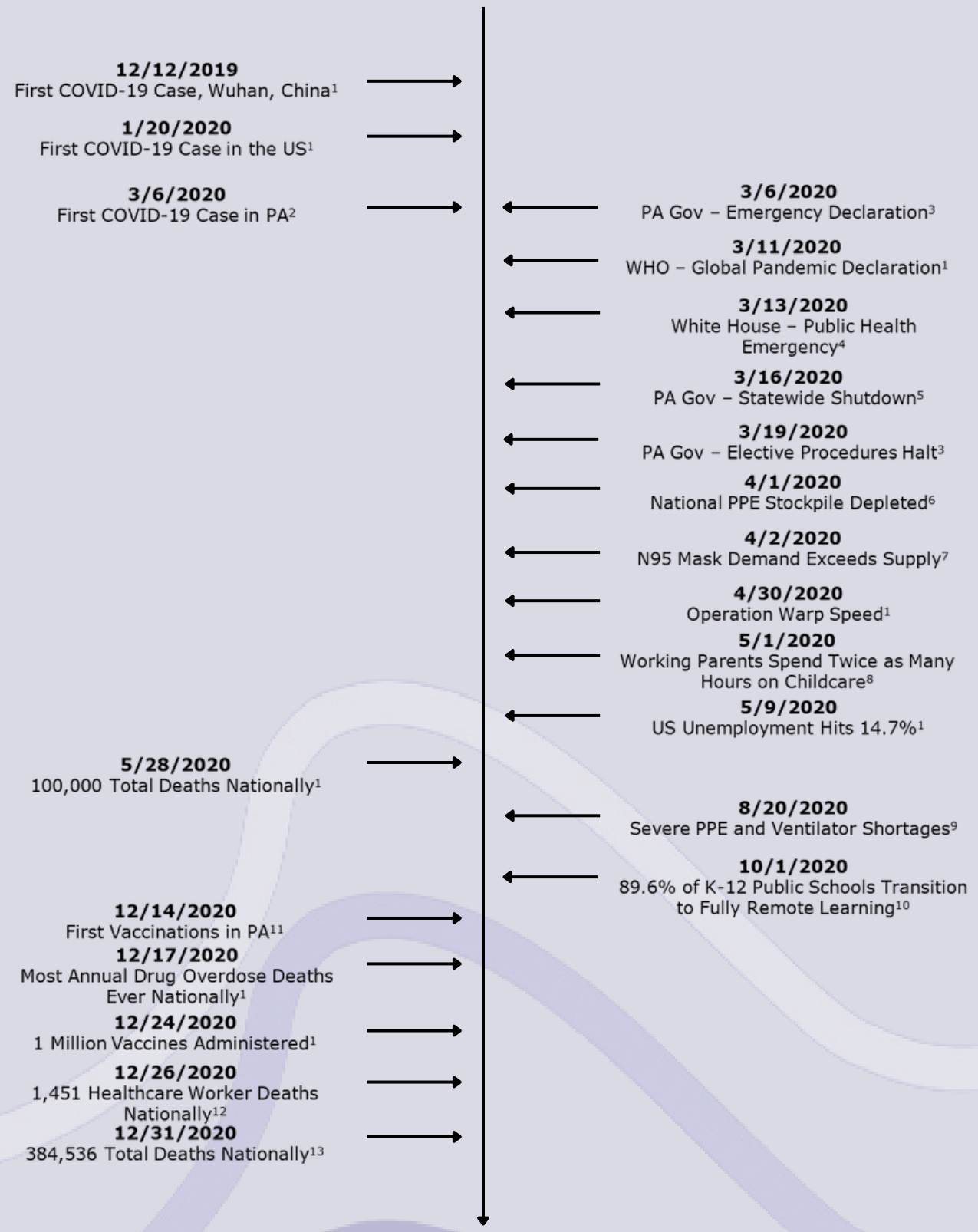


# **COVID-19**

## **The Impact on Health Care in Pennsylvania**

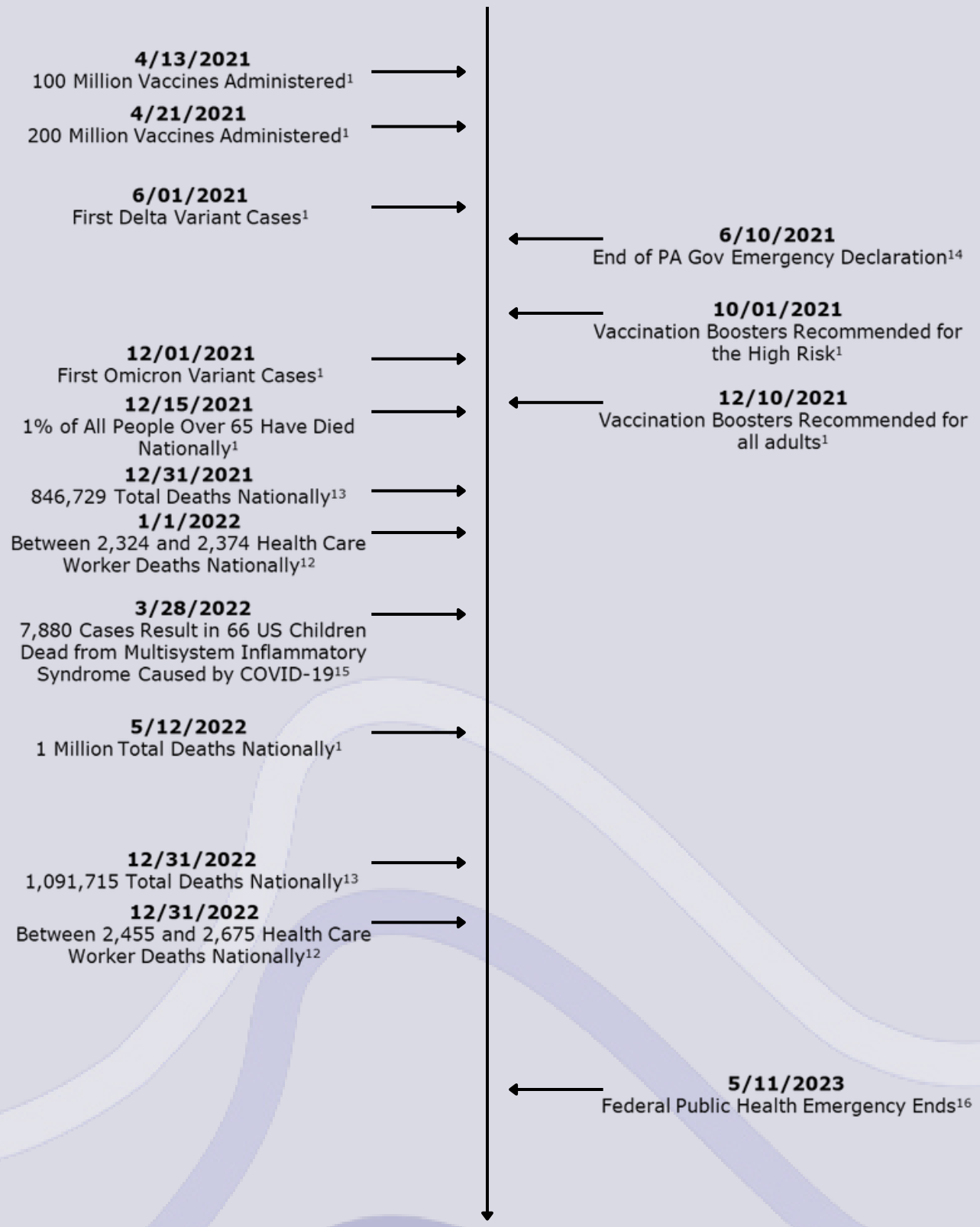


# COVID-19 Timeline



References for the COVID-19 Timeline can be found on page 34.

# COVID-19 Timeline Continued



References for the COVID-19 Timeline can be found on page 34.



"We know COVID-19 had seismic effects on our communities, and we are still grappling with understanding what those effects are. From schools to stores to sports clubs and movie theaters, many of the basic ways that Pennsylvanians lived changed. But nowhere was this more dramatic than on the health care system. Like other businesses, hospitals and health care providers had to manage risk, while simultaneously bearing responsibility for caring for our sick."

**Dan Frankel, Chairman of the Democratic Health Committee**

"Doctors couldn't stop the pandemic. It spread across the country in repeated waves, with deaths counted in mounting hundreds of thousands."

**David B. Nash, MD, MBA**

**Founding Dean Emeritus**

**Dr. Raymond C. & Doris N. Grandon Professor of Health Policy**

**Jefferson College of Population Health**



"Throughout the pandemic, Pennsylvania hospitals stepped up as leaders to care for and protect their communities. In its wake, hospitals continue to navigate persistent challenges, including a health care workforce shortage and threats to financial stability."

**Nicole Stallings, HAP President and CEO**

"PHC4 hopes this statistical representation of the COVID-19 pandemic found in this summary gives stakeholders the opportunity to learn from this experience."

**Barry D. Buckingham, PHC4 Executive Director**



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# PHC4 Clinical Research

# Key Findings

- There were 263,800 hospitalizations with COVID-19 from March 2020 through December 2022 in Pennsylvania acute care hospitals.
- During this period, there were 196.7 COVID-19 hospitalizations per 10,000 residents. Hospitalization rates were statistically higher for:
  - Older residents, especially ages 45 and older
  - Male residents
  - Black, non-Hispanic residents
  - Residents living in areas where 10% or more of the population lives in poverty
- The in-hospital mortality rate for these hospitalizations was 11.0%. In-hospital mortality rates were statistically higher for:
  - Older patients, especially ages 65 and older
  - Male patients
  - White, non-Hispanic patients
  - Patients living in areas where 10% to less than 25% of the population lives in poverty
- On average, patients with COVID-19 spent 8.3 days in the hospital, accounting for a total of 2,195,047 days in the hospital. The average hospital stay was statistically higher for:
  - Patients ages 45 to 84
  - Male patients
  - Black, non-Hispanic patients
  - Patients living in areas where 25% or more of the population lives in poverty
- Mechanical ventilation was used in 9.1% of patients with COVID-19. Rates of mechanical ventilator use were statistically higher for:
  - Patients ages 45 to 84
  - Male patients
  - Black, non-Hispanic patients
  - Patients living in areas where 10% to less than 25% of the population lives in poverty

# Clinical Impact

## I. Trends in COVID-19 Hospitalizations, March 2020 – December 2022

\*Note: For Figures 1-7, Quarter 2 (Q2) 2020 data includes four months, Mar 2020-Jun 2020.

### Figure 1. Number of COVID-19 Hospitalizations, by Month

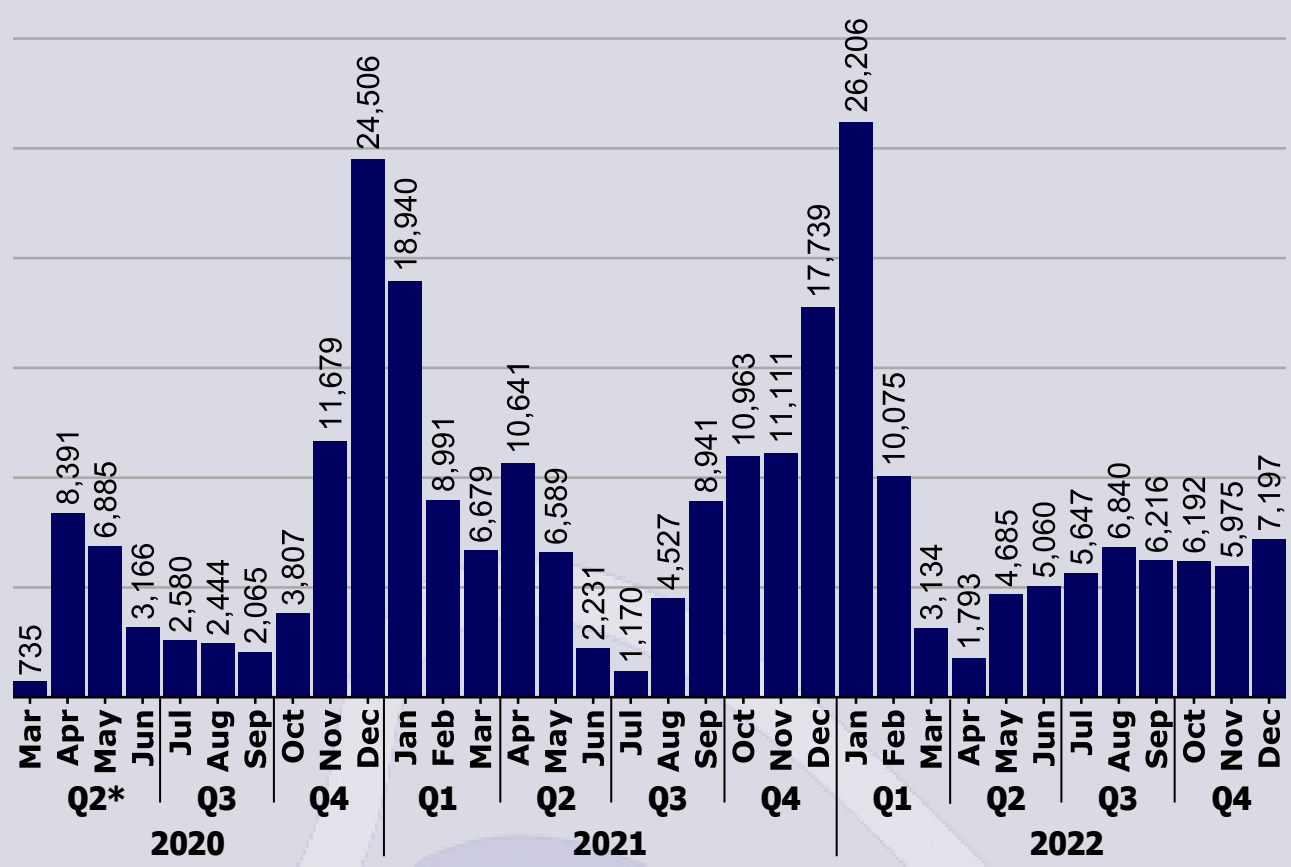


Fig. 1. Since the onset of COVID-19, there were two prominent spikes in the number of monthly COVID-19 hospitalizations in Pennsylvania. The first spike occurred in December 2020 at 24,506 hospitalizations. The volume was highest in the second spike, which occurred in January 2022, at 26,206 hospitalizations.



## Figure 2. Proportion of All Hospitalizations that had a Diagnosis of COVID-19 by Month

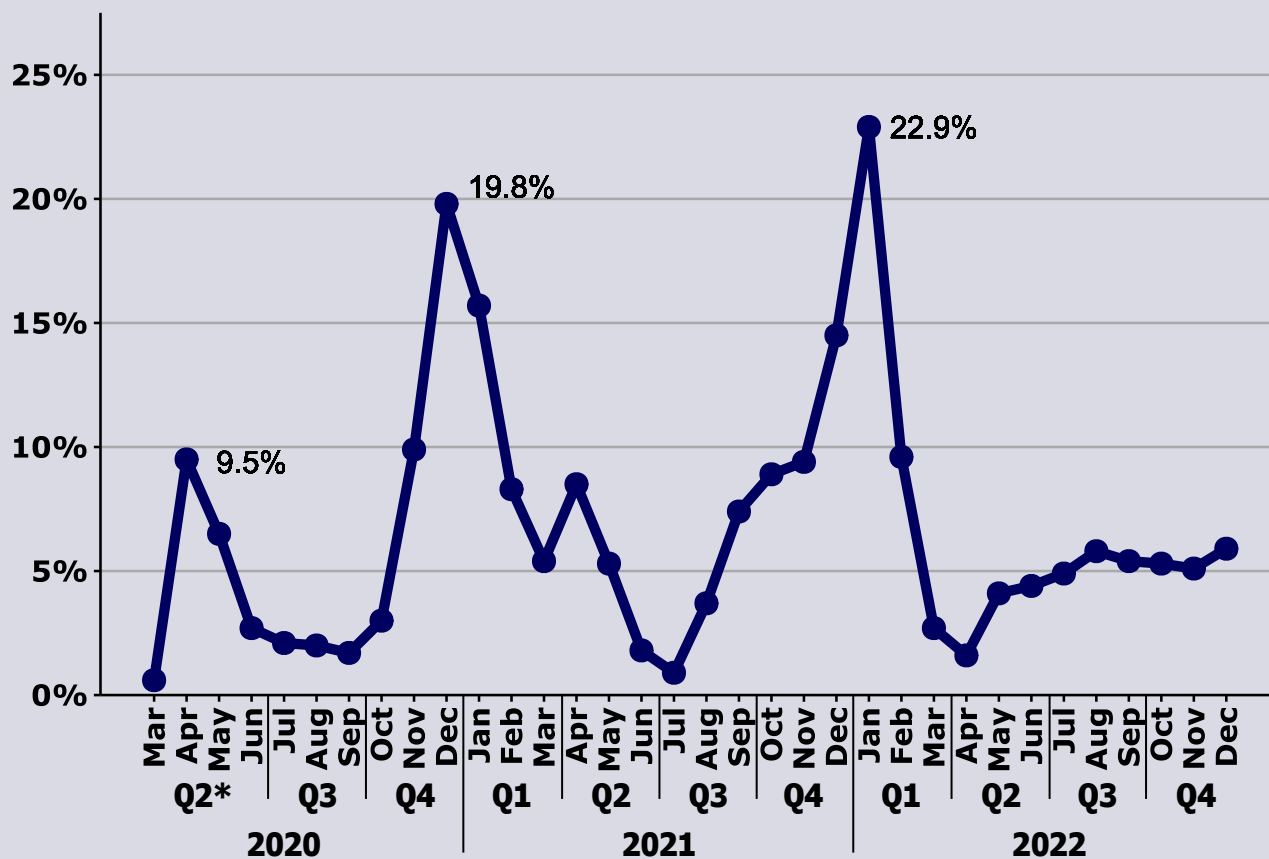


Fig. 2. Large fluctuations in the proportion of hospital stays with COVID-19 were observed from March 2020 through December 2022. These variations resembled the changes seen in the number of COVID-19 hospitalizations (Fig. 1). Two large spikes occurred in December 2020 (19.8%) and January 2022 (22.9%). A smaller spike occurred in April 2020 (9.5%) and was likely the result of an increase in COVID-19 hospitalizations as well as a decrease in other hospital stays from the cancellation of elective procedures at the beginning of the pandemic. As the needs for acute hospital care increased, hospitals had to address several challenges, including clinical staff shortages and sourcing critical supplies— such as hospital beds, personal protective equipment, and medicines.

# Figures 3A-E. Rate of COVID-19 Hospitalizations per 10,000 Residents by Quarter

## Figure 3A. Rate of COVID-19 Hospitalizations



Fig. 3A. The quarterly COVID-19 hospitalization rate for Pennsylvania followed a pattern similar to the number of hospitalizations by month (Fig. 1), with an initial peak in Q4, 2020, followed by a second peak in Q4, 2021.

### Figure 3B. Rate of COVID-19 Hospitalizations, by Age (Years)

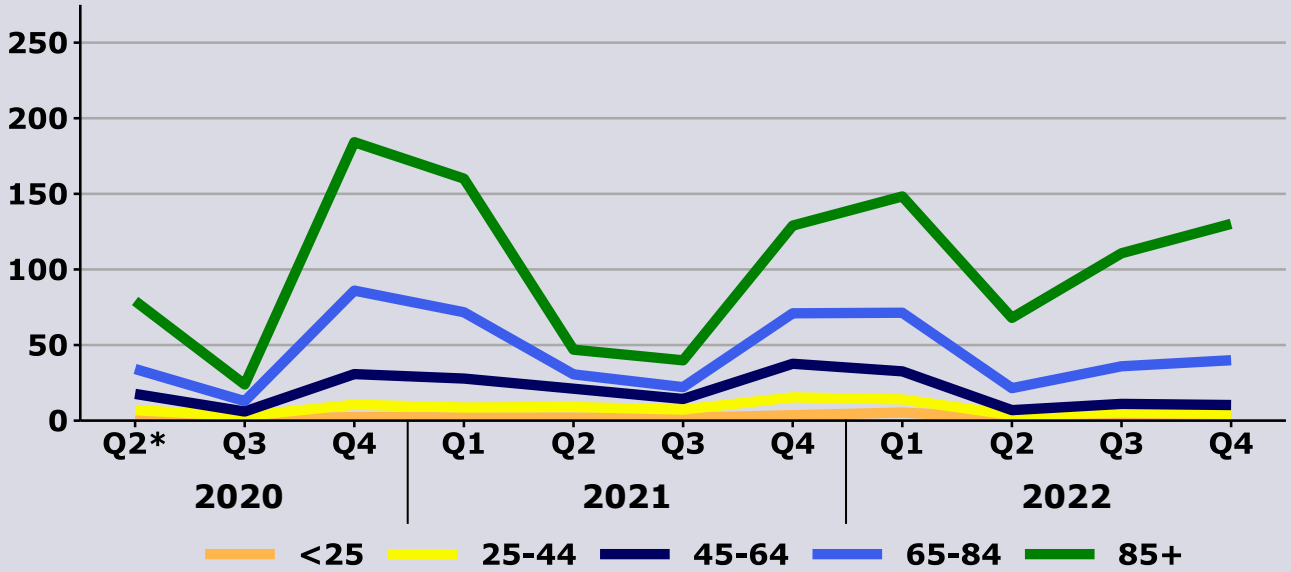


Fig. 3B. COVID-19 hospitalization rates varied by age during this time period. Older residents consistently had higher hospitalization rates.

### Figure 3C. Rate of COVID-19 Hospitalizations, by Sex

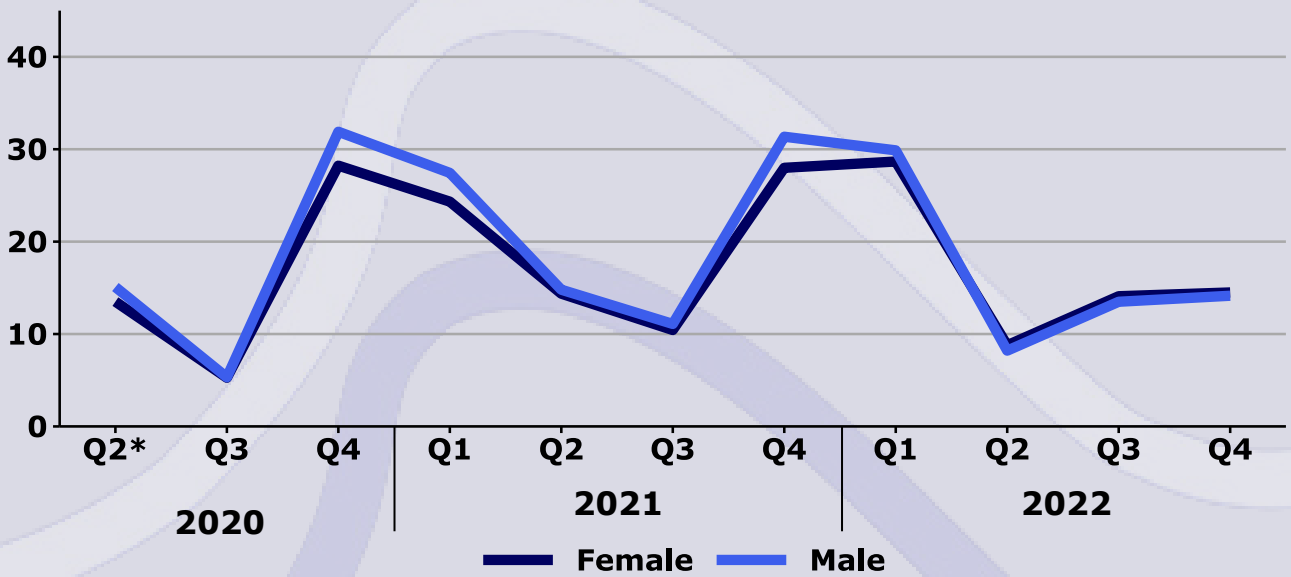


Fig. 3C. There was minimal variation in COVID-19 hospitalization rates by sex over time, although males tended to have slightly higher rates from Q4, 2020 through Q1, 2022.

### Figure 3D. Rate of COVID-19 Hospitalizations, by Race and Ethnicity

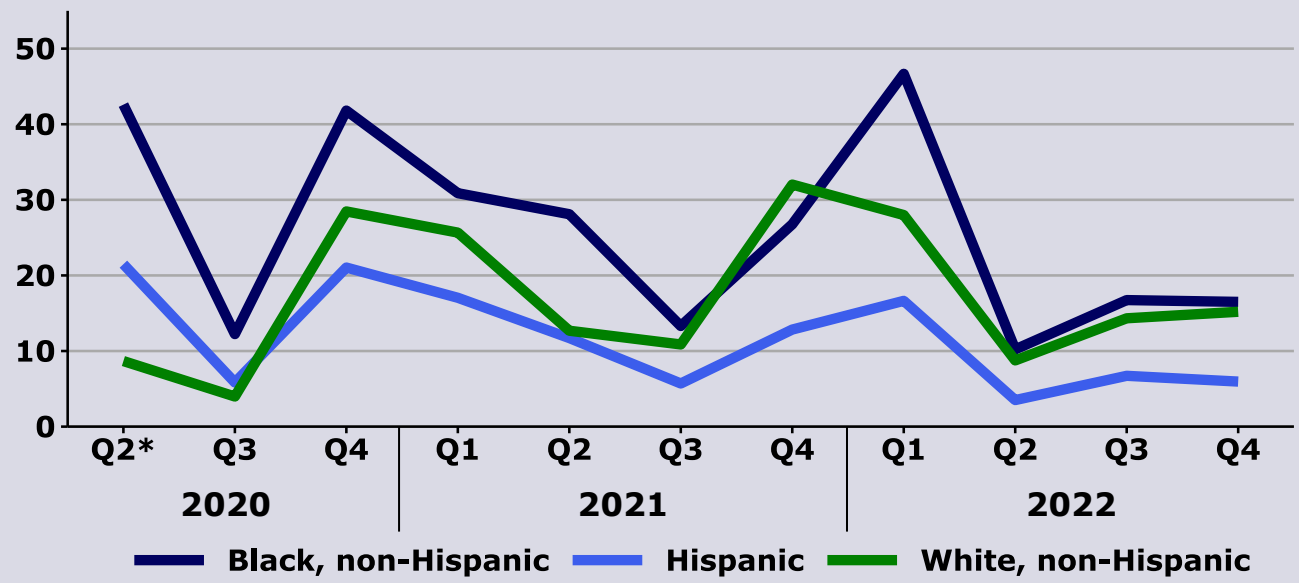


Fig. 3D. With the exception of Q4, 2021, COVID-19 hospitalization rates were highest for Black, non-Hispanic residents.

### Figure 3E. Rate of COVID-19 Hospitalizations, by Poverty Rate

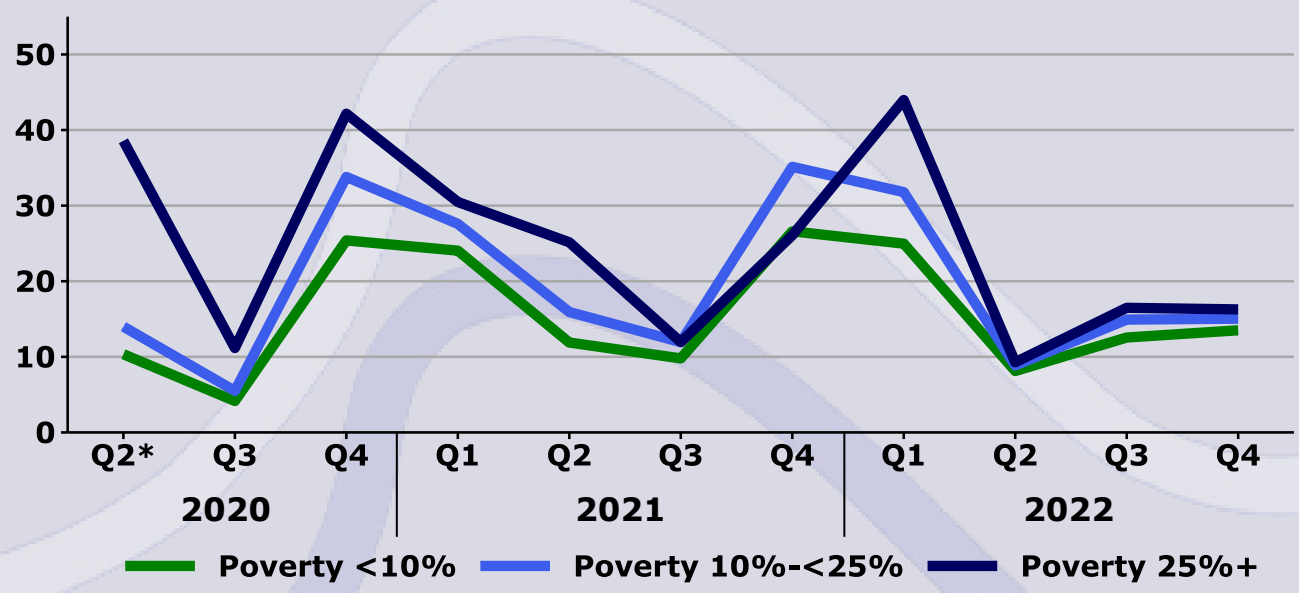


Fig. 3E. With the exception of Q4, 2021, COVID-19 hospitalization rates were highest for residents living in high poverty areas (zip codes where more than 25% of the population lives in poverty).

# Figures 4A-E. In-Hospital Mortality Rate for COVID-19 Hospitalizations by Quarter

## Figure 4A. In-Hospital Mortality Rate for COVID-19 Hospitalizations

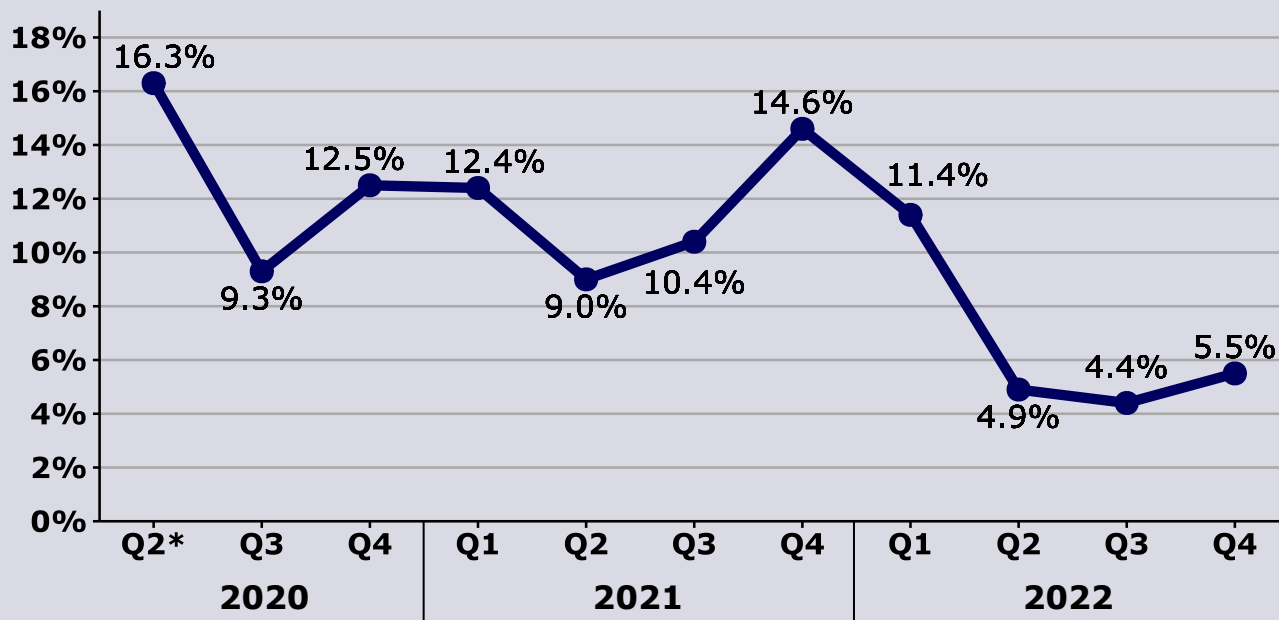


Fig. 4A. The statewide quarterly in-hospital mortality rate was highest at the beginning of the COVID-19 pandemic, specifically Q2, 2020. The second highest quarterly rate occurred in Q4, 2021.

### Figure 4B. In-Hospital Mortality Rate for COVID-19 Hospitalizations, by Age (Years)

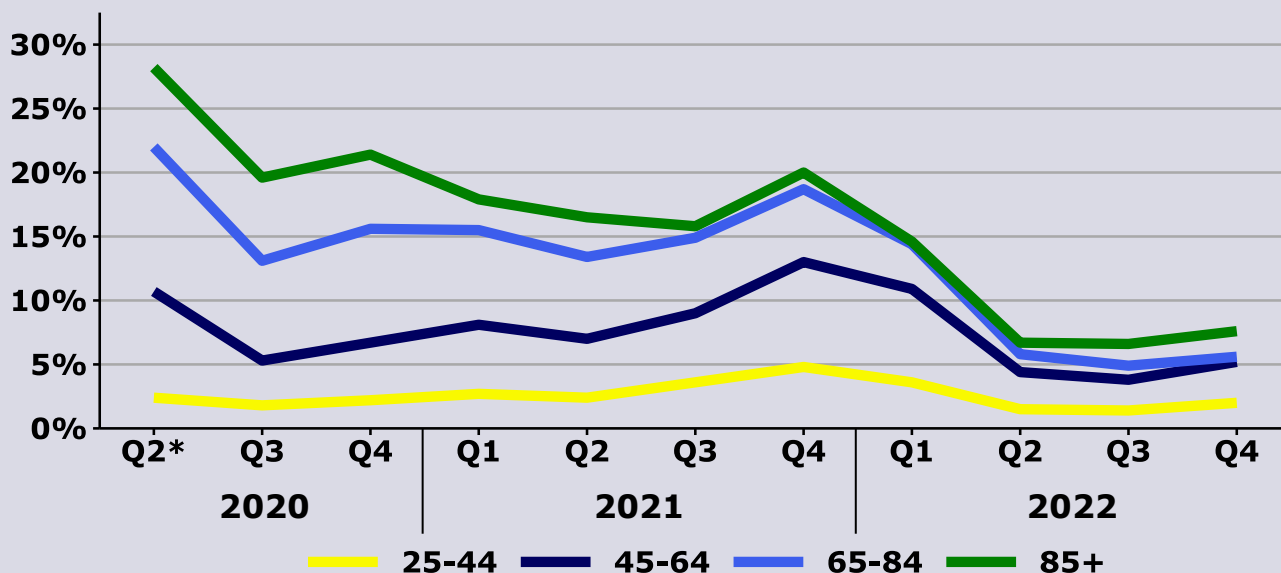


Fig. 4B. In-hospital mortality rates varied by age category. Rates were consistently highest among the oldest patients—ages 85 and older. Due to low volume, quarterly rates were not displayed for age less than 25.

### Figure 4C. In-Hospital Mortality Rate for COVID-19 Hospitalizations, by Sex

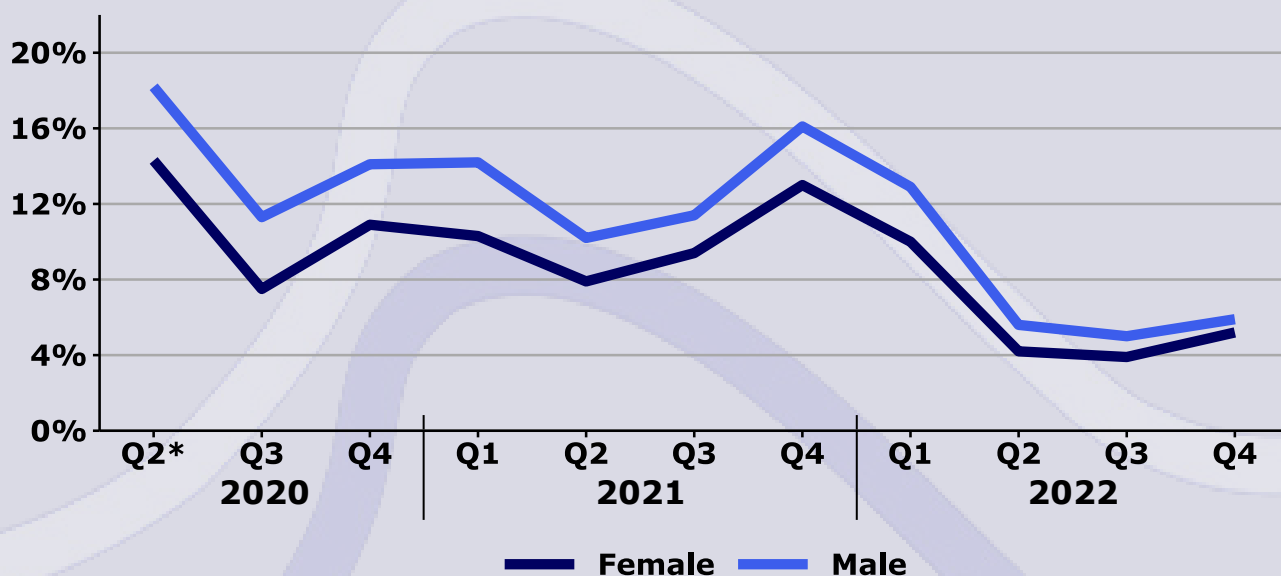


Fig. 4C. In-hospital mortality rates were consistently higher for male patients.

### Figure 4D. In-Hospital Mortality Rate for COVID-19 Hospitalizations, by Race and Ethnicity

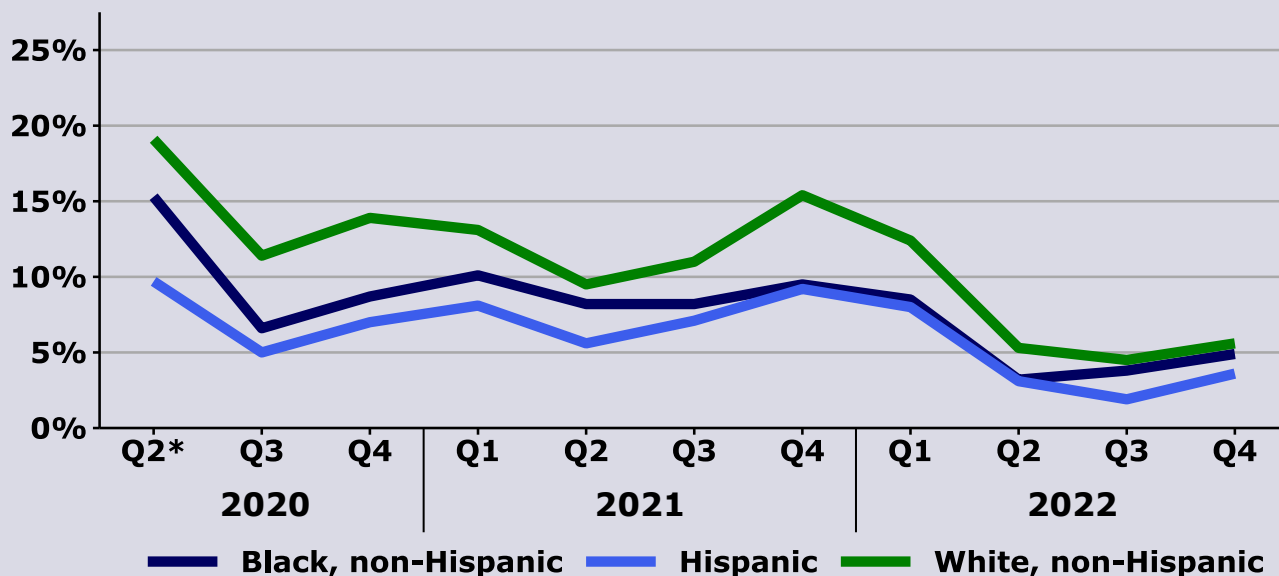


Fig. 4D. In-hospital mortality rates varied by race and ethnicity. Rates were consistently highest among White, non-Hispanic patients.

### Figure 4E. In-Hospital Mortality Rate for COVID-19 Hospitalizations, by Poverty Rate

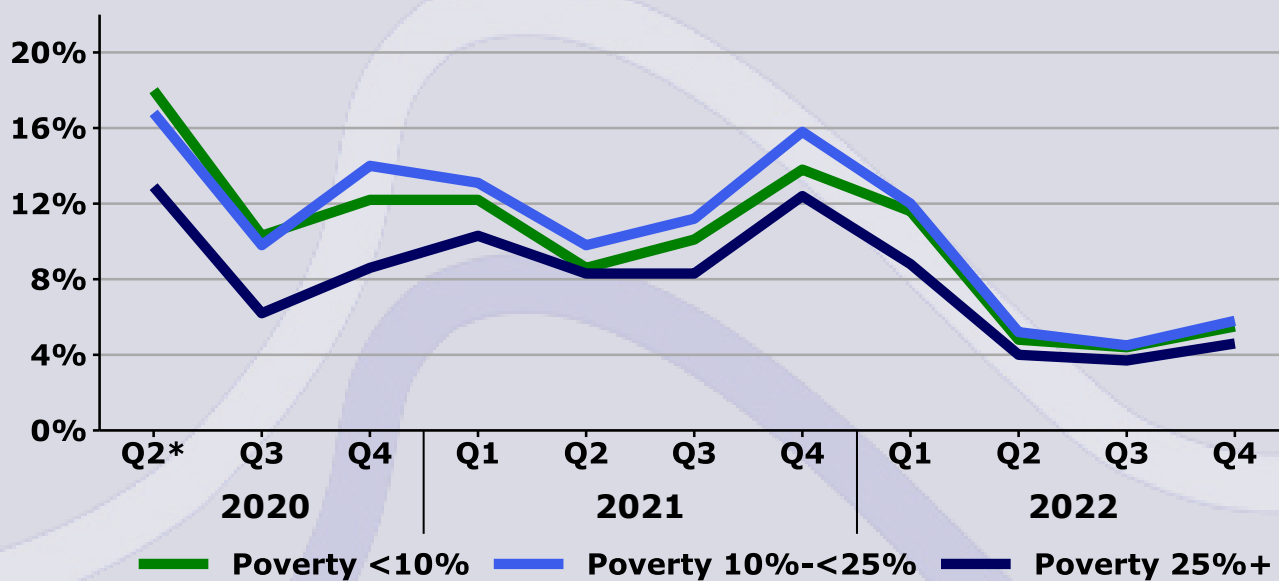


Fig. 4E. With the exception of Q2, 2020 through Q3, 2020, in-hospital mortality rates were highest for patients living in areas where 10% to less than 25% of the population lives in poverty.

# Figures 5A-E. Average Length of Stay (Days) for COVID-19 Hospitalizations by Quarter

## Figure 5A. Average Length of Stay for COVID-19 Hospitalizations



Fig. 5A. The statewide quarterly average length of hospital stay varied across the study period. The average stay was lowest in Q4, 2020 at 7.1 days and highest in Q1, 2022 at 9.5 days.



### Figure 5B. Average Length of Stay for COVID-19 Hospitalizations, by Age (Years)

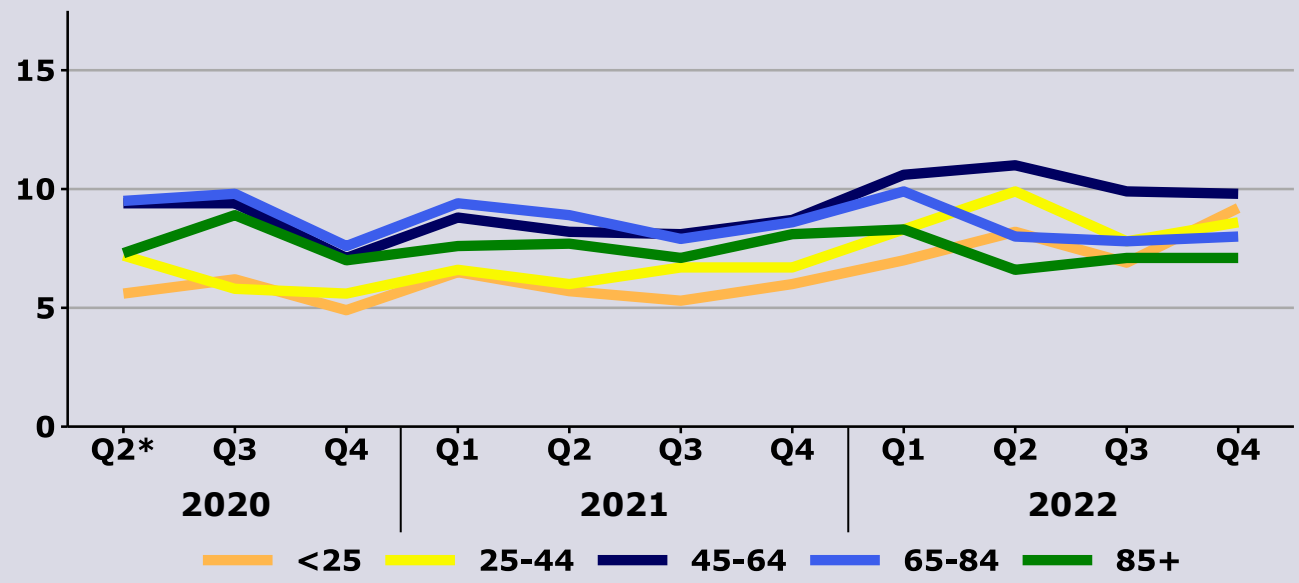


Fig. 5B. The average hospital stay varied by age category, and these differences changed over time.

### Figure 5C. Average Length of Stay for COVID-19 Hospitalizations, by Sex

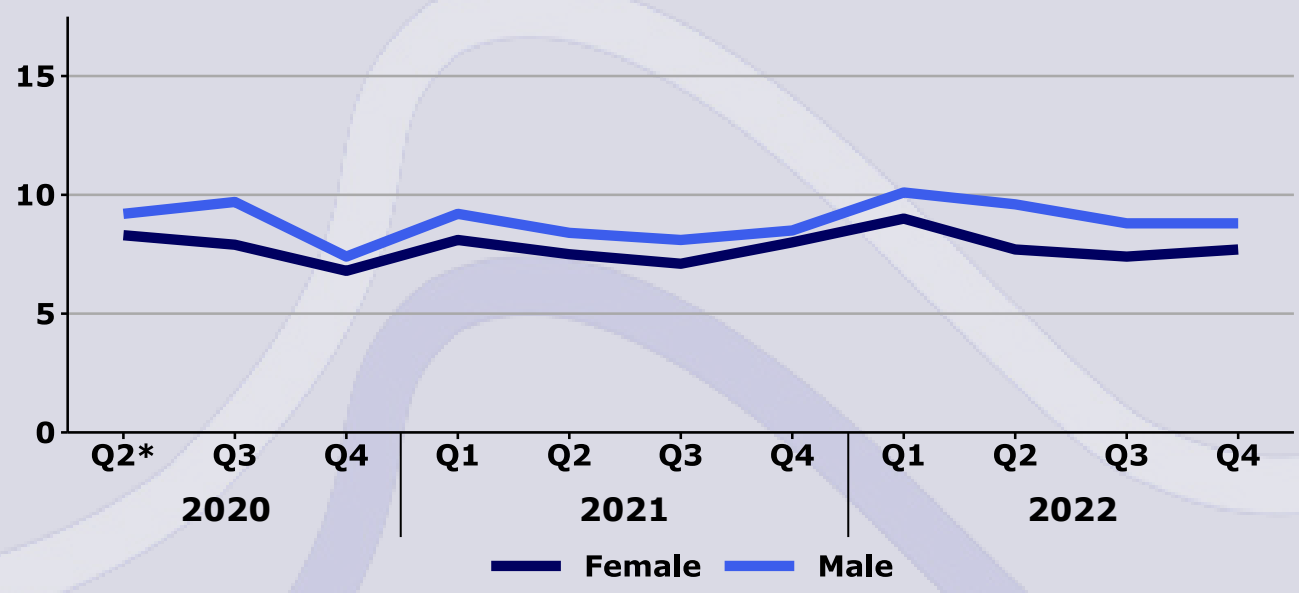


Fig. 5C. The average hospital stay was consistently higher for male patients.

### Figure 5D. Average Length of Stay for COVID-19 Hospitalizations, by Race and Ethnicity

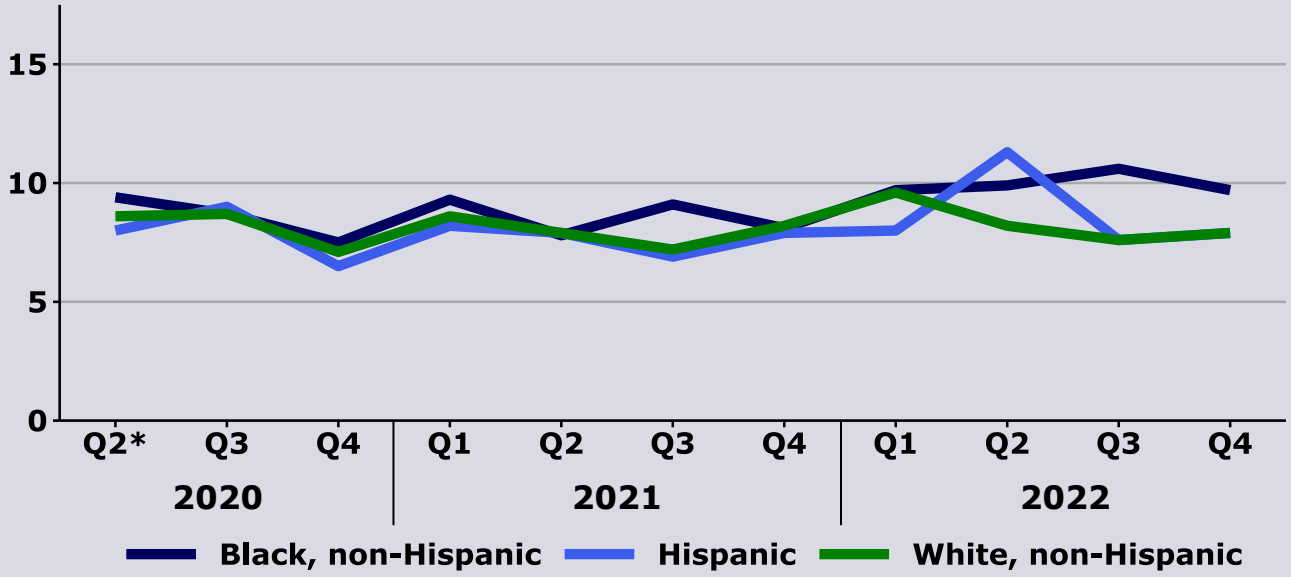


Fig. 5D. The average hospital stay varied by race and ethnicity, and these differences changed over time.

### Figure 5E. Average Length of Stay for COVID-19 Hospitalizations, by Poverty Rate

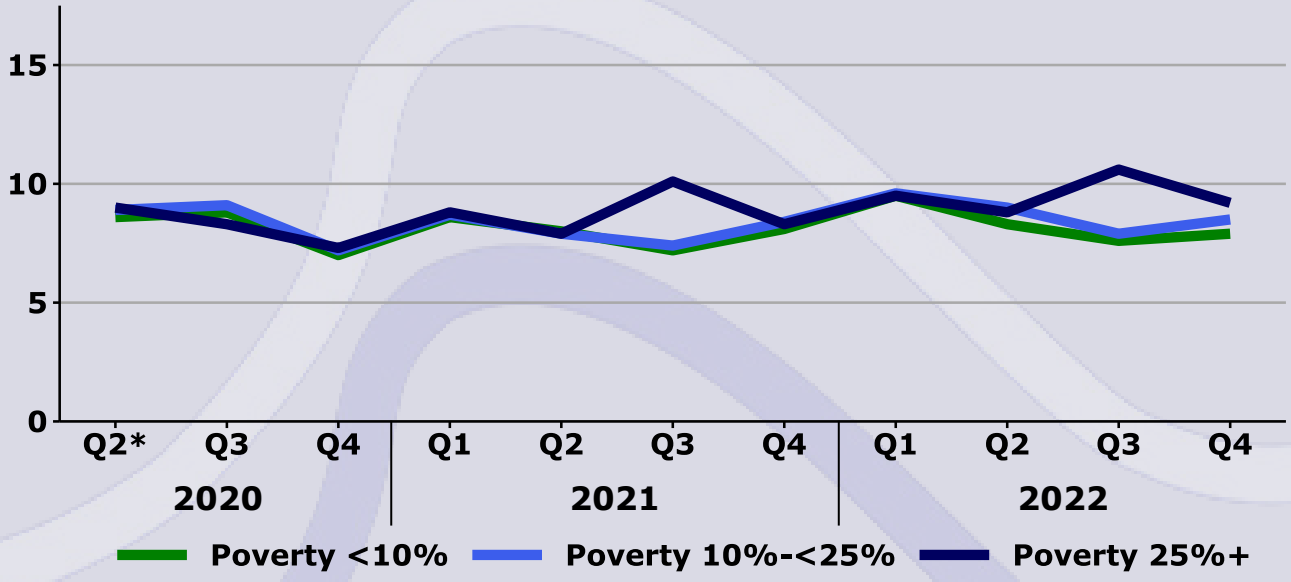


Fig. 5E. The average hospital stay varied by poverty rate, and these differences changed over time.

# Figures 6A-E. Mechanical Ventilation Rate for COVID-19 Hospitalizations by Quarter

## Figure 6A. Mechanical Ventilation Rate for COVID-19 Hospitalizations

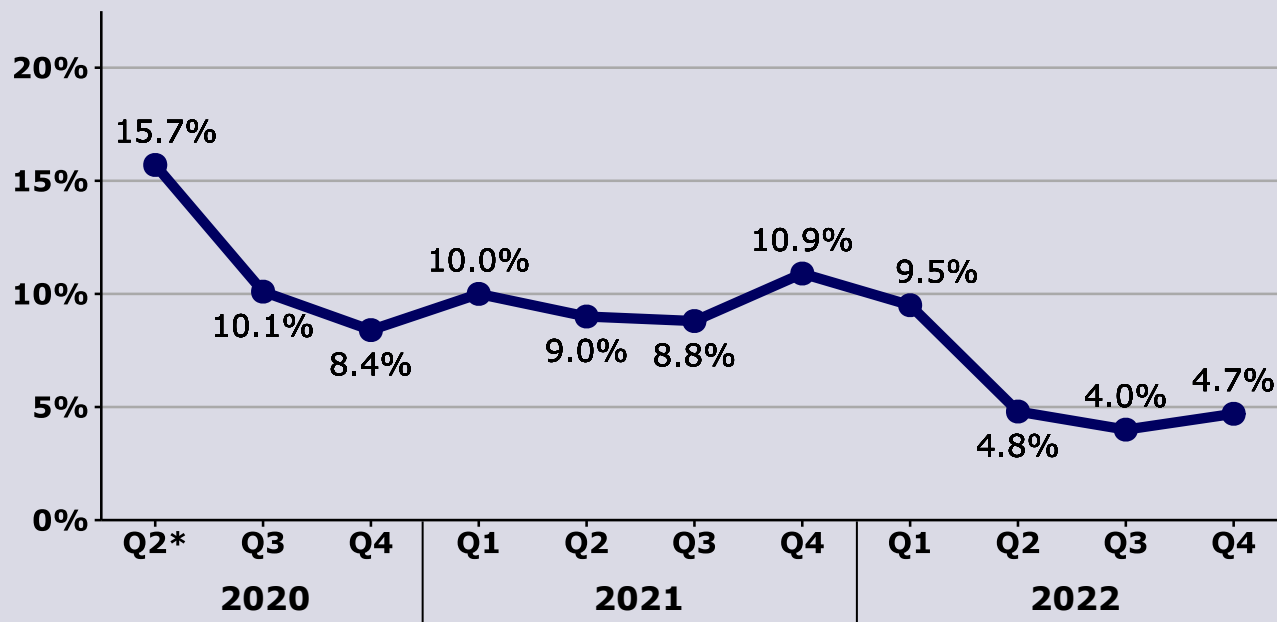


Fig. 6A. The statewide quarterly mechanical ventilation rate for COVID-19 hospitalizations was highest in Q2, 2020 at the onset of the COVID-19 pandemic.

### Figure 6B. Mechanical Ventilation Rate for COVID-19 Hospitalizations, by Age (Years)

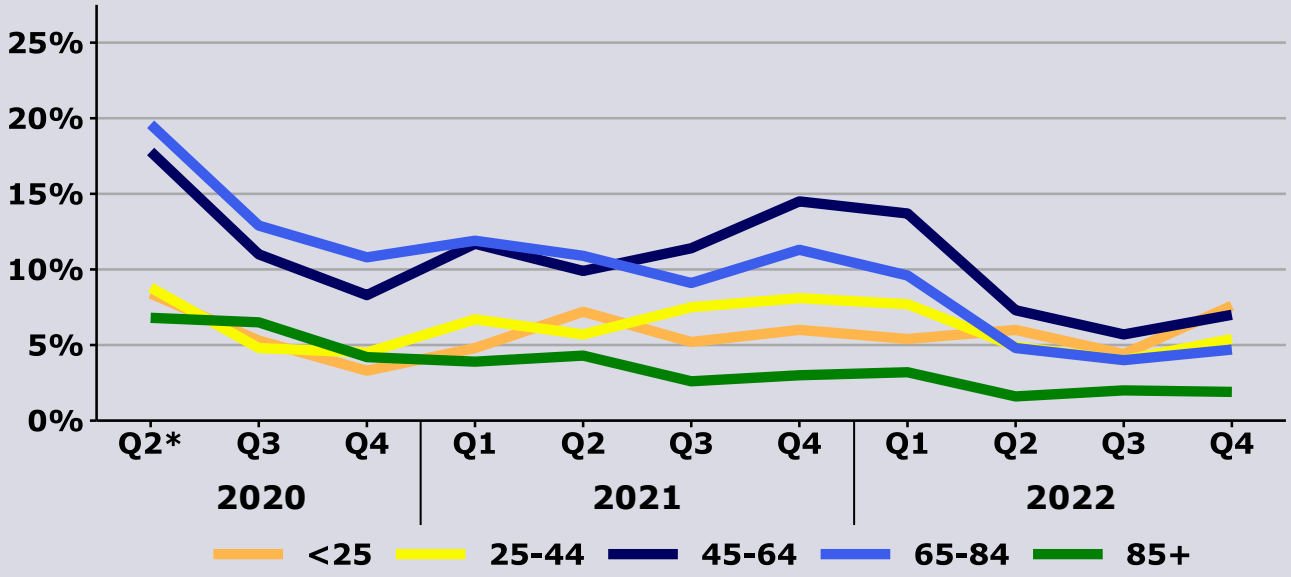


Fig. 6B. The mechanical ventilation rate varied by age category, and these differences changed over time.

### Figure 6C. Mechanical Ventilation Rate for COVID-19 Hospitalizations, by Sex

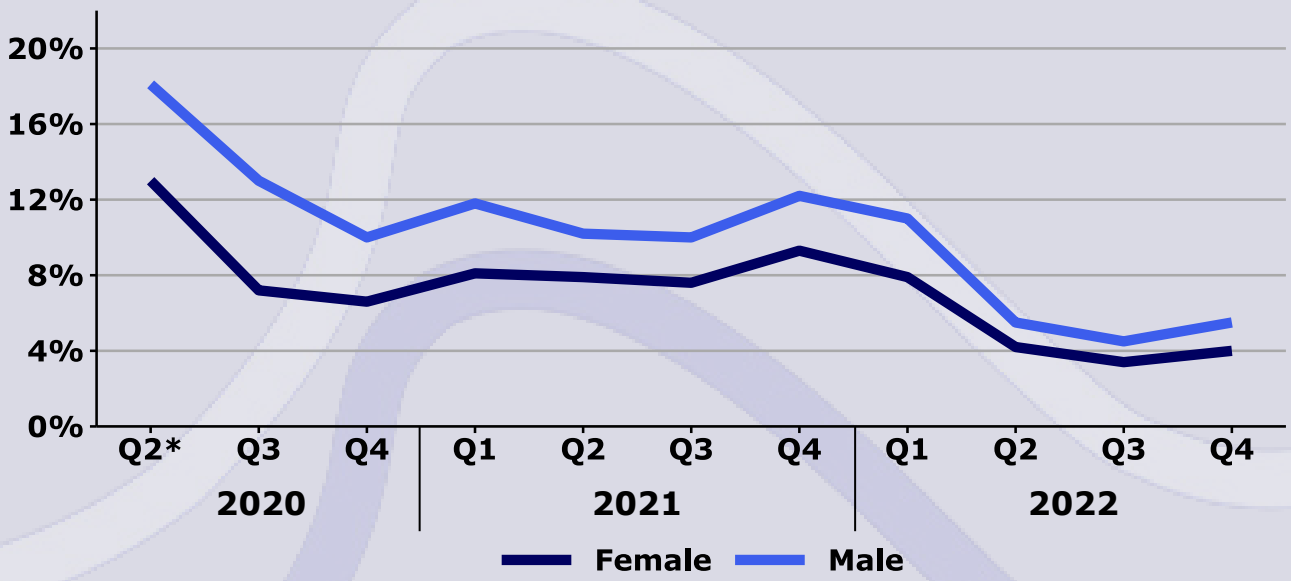


Fig. 6C. The mechanical ventilation rate was consistently higher for male patients.

### Figure 6D. Mechanical Ventilation Rate for COVID-19 Hospitalizations, by Race and Ethnicity

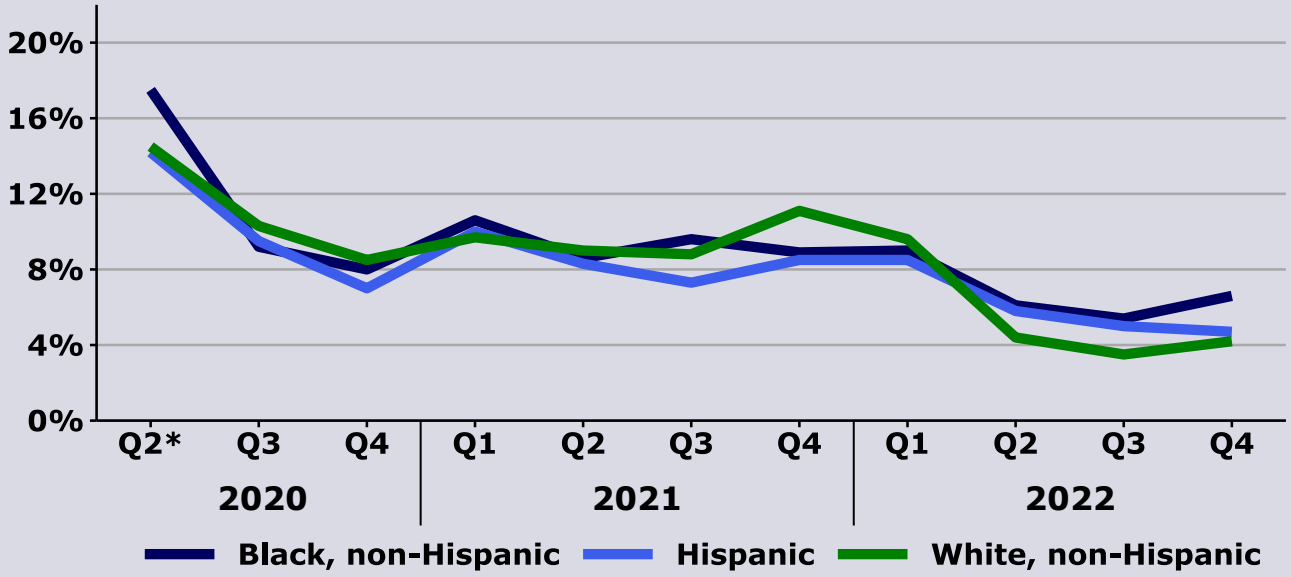


Fig. 6D. The mechanical ventilation rate varied by race and ethnicity, and these differences changed over time.

### Figure 6E. Mechanical Ventilation Rate for COVID-19 Hospitalizations, by Poverty Rate

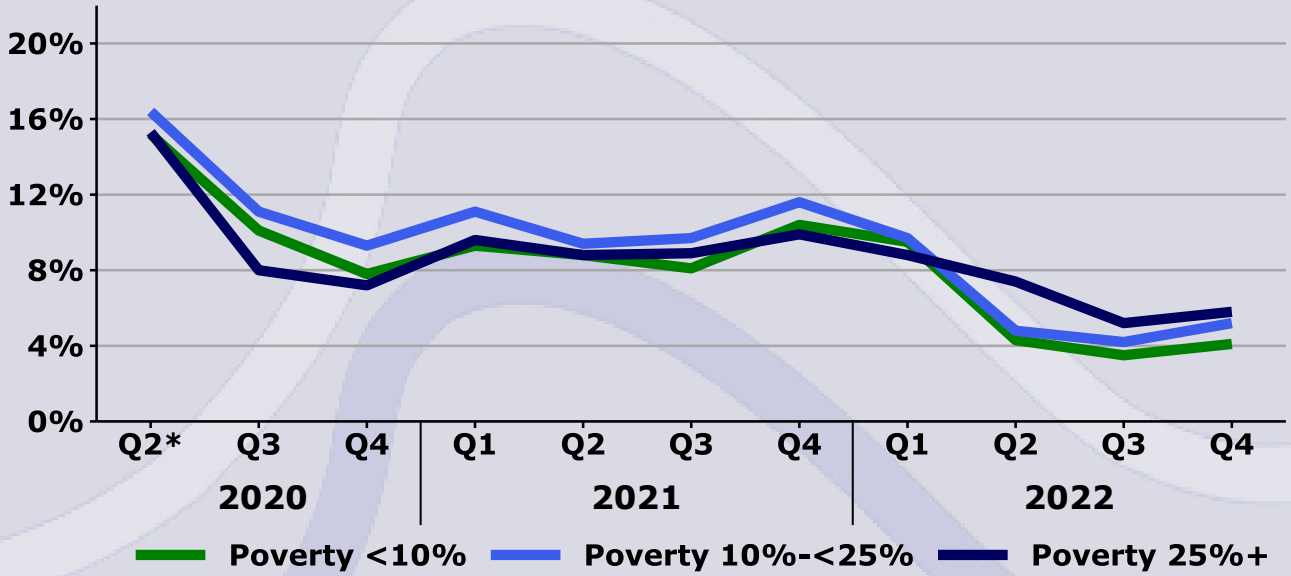


Fig. 6E. The mechanical ventilation rate varied by poverty rate, and these differences changed over time.

## II. COVID-19 Hospitalizations by Patient Characteristics

**Table 1. COVID-19 Hospitalizations and Outcomes by Patient Characteristics, March 2020 - December 2022**

Patient Characteristics		COVID-19 Hospitalizations and Outcomes by Patient Characteristics					
		Hospitalization Rate per 10,000 PA Residents†	Number of Hospitalizations	In-Hospital Mortality Rate	Average Length of Hospital Stay (in days)	Total Number of Hospital Days	Mechanical Ventilation Rate
<b>Statewide</b>		<b>196.7</b>	<b>263,800</b>	<b>11.0%</b>	<b>8.3</b>	<b>2,195,047</b>	<b>9.1%</b>
<b>Age</b>	Less than 25 years	25.5*	10,613	1.2%*	6.6*	69,580	5.6%*
	25-44 years	88.2*	30,276	3.0%*	7.1*	213,630	6.6%*
	45-64 years	220.3*	75,259	8.8%*	8.9*	673,272	11.6%*
	65-84 years	484.9*	111,580	14.0%*	8.7*	968,969	10.1%*
	85 years or more	1,136.6*	36,072	16.0%*	7.5*	269,596	3.4%*
<b>Sex</b>	Female	190.5*	128,992	9.6%*	7.8*	1,009,725	7.5%*
	Male	203.0*	134,798	12.5%*	8.8*	1,185,268	10.6%*
<b>Race and Ethnicity</b>	Black, non-Hispanic	286.7*	41,234	9.0%*	9.0*	369,321	9.8%*
	Hispanic	124.5*	14,346	7.2%*	7.8*	112,404	8.9%
	White, non-Hispanic	189.8*	189,623	11.8%*	8.2*	1,550,387	8.7%*
<b>Poverty Rate</b>	Less than 10%	171.4*	121,113	10.8%*	8.2*	987,282	8.5%*
	10% to less than 25%	214.5*	109,665	11.9%*	8.4	918,893	9.7%*
	25% or more	271.6*	33,022	9.0%*	8.7*	288,872	9.2%

†Hospitalization rates were based on Pennsylvania residents (255,148 hospital stays or 96.7% of all Pennsylvania COVID-19 hospitalizations) and 2022 US Census Bureau data, the most recent data available.

\*Statistically significant difference (at  $\alpha=0.05$ ) compared to the rest of the state.

## Findings

- There were 263,800 COVID-19 hospitalizations in Pennsylvania from March 2020 through December 2022.
- During this period, there were 196.7 COVID-19 hospitalizations per 10,000 residents. Hospitalization rates were statistically higher for older residents, especially ages 45 and older; male residents; Black, non-Hispanic residents; and residents living in areas where 10% or more of the population lives in poverty.
- 11.0% of the patients hospitalized with COVID-19 died during their hospitalization. In-hospital mortality rates were statistically higher for older patients, especially ages 65 and older; male patients; White, non-Hispanic patients; and patients living in areas where 10% to less than 25% of the population lives in poverty.
- Patients hospitalized with COVID-19 spent a total of 2,195,047 days in the hospital. The average hospital stay was 8.3 days. The average length of stay was statistically higher for patients ages 45 to 84; male patients; Black, non-Hispanic patients; and patients living in areas where 25% or more of the population lives in poverty.
- 9.1% of the patients hospitalized with COVID-19 required mechanical ventilation. Rates of mechanical ventilator use were statistically higher for patients ages 45 to 84; male patients; Black, non-Hispanic patients; and patients living in areas where 10% to less than 25% of the population lives in poverty.

### III. COVID-19 Hospitalizations: Percent of Infections Not Present on Admission

Not all COVID-19 hospitalizations reflect pre-existing infections. In some cases, a COVID-19 infection may not have been present at the time a patient was admitted to the hospital, meaning it developed during the hospitalization. The figure below shows the proportion of COVID-19 hospitalizations in which the COVID-19 infection was not present on admission (as documented in the patient’s medical record) and demonstrates how that rate changed over time. This information provides valuable insight into the changing challenges experienced by hospitals during the COVID-19 pandemic.

**Figure 7. Percent of Hospitalizations with COVID-19 in which the Infection was Not Present on Admission, by Quarter**

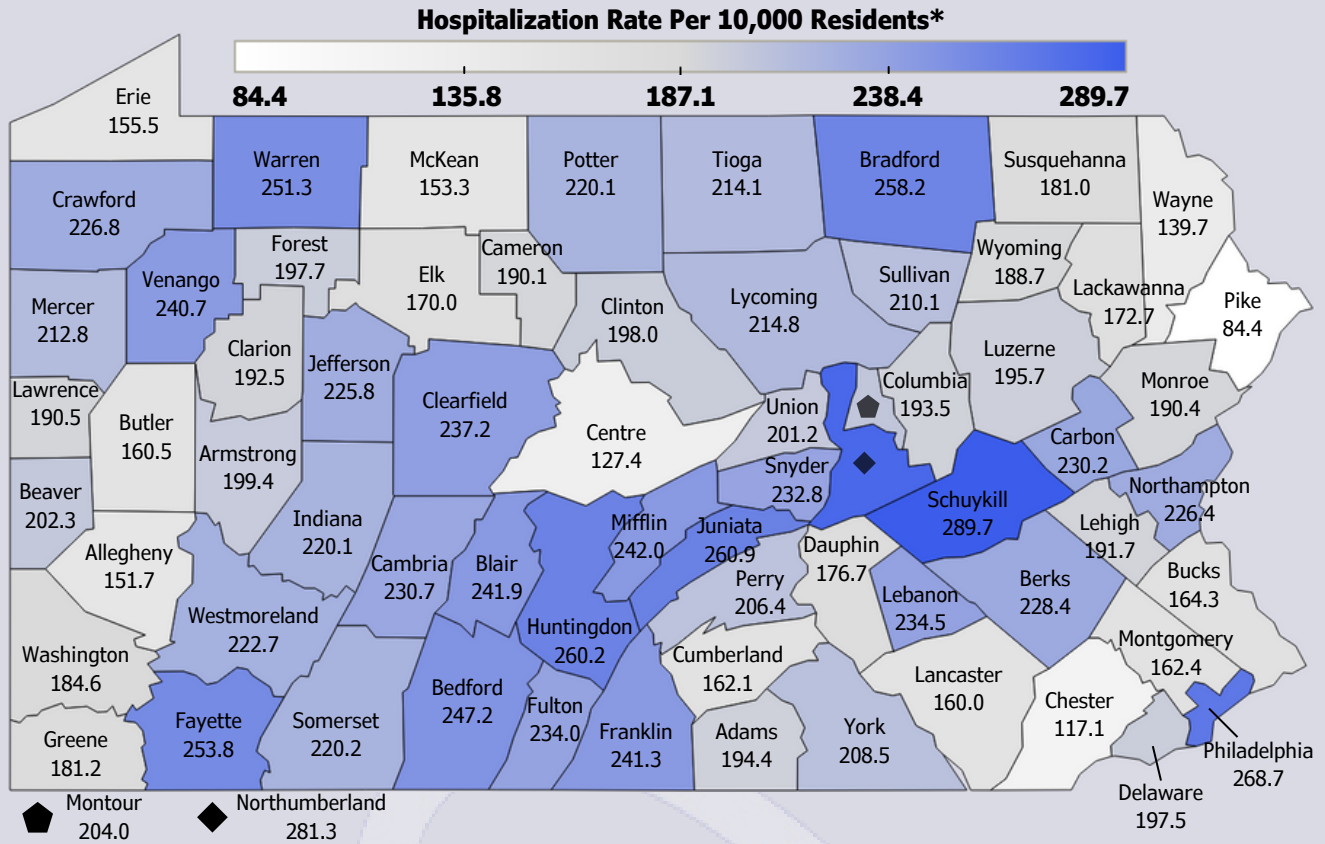


Fig. 7. Statewide, the percent of patients hospitalized with a diagnosis of COVID-19 that was determined not to be present on admission to the hospital increased 859%, from a rate of 1.1% in Q2, 2020 to a rate of 10.7% in Q4, 2022. Most of that change occurred between Q4, 2021 (rate of 3.0%) and Q3, 2022 (rate of 10.3%), accounting for an increase of 259%.



# IV. Geographic Differences in COVID-19 Hospitalizations

## Figure 8. COVID-19 Hospitalization Rate by County per 10,000 Residents, March 2020 – December 2022



\*Based on Pennsylvania residents and 2022 US Census Bureau county population figures, the most recent data available. Note that higher rates for some counties might reflect larger numbers of COVID-19 hospitalizations with certain at-risk characteristics (e.g., factors related to patient age, patient sex, patient race and ethnicity, and patient community poverty rates). County rates were not adjusted for these differences so that important effects of these patient characteristics were not masked by such adjustment.

- The COVID-19 hospitalization rate varied widely across Pennsylvania counties. The darker shaded areas indicate higher rates.
- The overall statewide rate was 196.7 per 10,000 residents.
- Schuylkill County had the highest overall rate at 289.7, while Pike County had the lowest overall rate at 84.4.
- Table 2 lists the number of COVID-19 cases and the hospitalization rate for each county.

## Table 2. COVID-19 Hospitalization Rate by County per 10,000 Residents, March 2020 – December 2022

County	COVID-19 Hospitalizations	
	Number	Rate per 10k Residents*
<b>All PA Residents</b>	<b>255,148</b>	<b>196.7</b>
Adams	2,061	194.4
Allegheny	18,708	151.7
Armstrong	1,291	199.4
Beaver	3,351	202.3
Bedford	1,172	247.2
Berks	9,833	228.4
Blair	2,928	241.9
Bradford	1,546	258.2
Bucks	10,601	164.3
Butler	3,166	160.5
Cambria	3,032	230.7
Cameron	84	190.1
Carbon	1,507	230.2
Centre	2,019	127.4
Chester	6,392	117.1
Clarion	719	192.5
Clearfield	1,848	237.2
Clinton	751	198.0
Columbia	1,256	193.5
Crawford	1,875	226.8
Cumberland	4,355	162.1
Dauphin	5,104	176.7
Delaware	11,357	197.5
Elk	518	170.0
Erie	4,162	155.5
Fayette	3,192	253.8
Forest	131	197.7
Franklin	3,786	241.3

County	COVID-19 Hospitalizations	
	Number	Rate per 10k Residents*
Fulton	340	234.0
Greene	628	181.2
Huntingdon	1,126	260.2
Indiana	1,826	220.1
Jefferson	989	225.8
Juniata	609	260.9
Lackawanna	3,724	172.7
Lancaster	8,905	160.0
Lawrence	1,616	190.5
Lebanon	3,377	234.5
Lehigh	7,215	191.7
Luzerne	6,388	195.7
Lycoming	2,429	214.8
McKean	611	153.3
Mercer	2,324	212.8
Mifflin	1,113	242.0
Monroe	3,184	190.4
Montgomery	14,039	162.4
Montour	369	204.0
Northampton	7,213	226.4
Northumberland	2,535	281.3
Perry	952	206.4
Philadelphia	42,107	268.7
Pike	511	84.4
Potter	357	220.1
Schuylkill	4,146	289.7
Snyder	923	232.8
Somerset	1,601	220.2
Sullivan	123	210.1

\*Based on Pennsylvania residents and 2022 US Census Bureau county population figures, the most recent data available.

## Table 2. Continued

County	COVID-19 Hospitalizations	
	Number	Rate per 10k Residents*
Susquehanna	689	181.0
Tioga	880	214.1
Union	860	201.2
Venango	1,198	240.7
Warren	950	251.3
Washington	3,884	184.6
Wayne	715	139.7
Westmoreland	7,842	222.7
Wyoming	491	188.7
York	9,614	208.5

\*Based on Pennsylvania residents and 2022 US Census Bureau county population figures, the most recent data available.

## V. Impact of COVID-19 on Hospitalizations for Select Health Conditions

Comparing patients who have a COVID-19 diagnosis to those who do not is valuable for understanding the impact a COVID-19 infection may have on an individual's health care outcome and highlights the additional burden hospitals experienced when treating patients with COVID-19. Such comparisons are shown below for several select health conditions (adults only). Overall, patients who had a COVID-19 diagnosis had higher rates of in-hospital mortality and longer hospital stays.

**Table 3. Hospitalizations for Select Health Conditions: Comparing Cases with and without COVID-19, March 2020 – December 2022**

Medical Condition†	Number of Cases			In-Hospital Mortality Rate		Length of Stay (Days)	
	Total	With COVID-19	Without COVID-19	With COVID-19	Without COVID-19	With COVID-19	Without COVID-19
Abnormal Heartbeat	83,193	1,883	81,310	2.9%*	1.1%	5.1*	3.3
Blood Clot in Lung	23,949	703	23,246	4.0%	2.9%	5.3*	4.0
Chronic Obstructive Pulmonary Disease	38,244	398	37,846	5.3%*	1.0%	6.1*	4.0
Diabetes – Medical Management	47,311	2,039	45,272	1.5%*	0.8%	5.2*	4.0
Heart Attack – Medical Management	20,409	538	19,871	11.3%*	8.1%	5.5*	3.7
Heart Failure	139,443	2,594	133,849	5.4%*	2.6%	7.9*	5.5
Intestinal Obstruction	24,435	423	24,012	3.3%*	1.3%	5.3*	3.9
Kidney and Urinary Tract Infections	44,074	1,480	42,594	1.6%*	0.6%	6.4*	4.1
Kidney Failure – Acute	57,048	2,415	54,633	3.8%*	2.8%	6.7*	4.7
Pneumonia – Aspiration	17,354	395	16,959	12.2%*	7.2%	8.8*	6.0
Pneumonia – Infectious	50,716	809	49,907	8.9%*	3.2%	7.2*	4.7
Respiratory Failure	37,768	516	37,252	19.8%*	9.9%	10.0*	5.7
Sepsis	204,942	36,813	168,129	23.4%*	10.9%	8.9*	6.6
Stroke	57,018	1,814	55,204	8.8%*	3.3%	8.1*	4.3

†Condition selection was based on a high frequency of hospitalizations (at large or small hospitals) and a high rate of in-hospital mortalities. These conditions are the focus of PHC4's annual *Hospital Performance Report*, a publication that examines hospital performance in terms of case volume, mortality rates, and other measures.

\*Statistically significant difference (at  $\alpha=0.05$ ) compared to cases without COVID-19.

# Definitions and Technical Notes - Clinical Research

Hospitalization discharge data, obtained from the UB-04 (Uniform Billing) form, was submitted electronically to the Pennsylvania Health Care Cost Containment Council (PHC4) by Pennsylvania hospitals. Federal hospitals were not included. The data included demographic information and diagnosis and procedure codes (ICD-10-CM/ICD-10-PCS). ICD-10-CM is the International Classification of Diseases, Tenth Revision, Clinical Modification. ICD-10-PCS is the International Classification of Diseases, Tenth Revision, Procedure Coding System.

Facilities submitted data to the Council on a quarterly basis (within 90 days from the last day of each quarter). Upon receipt of the data, verification was performed to ensure data were submitted in a readable format, and extensive quality assurance checks were completed. Error reports for UB-04 data were then generated and returned to each facility with an opportunity to correct any problems. Data accuracy and completeness were the ultimate responsibility of each individual hospital.

## Definitions

**COVID-19 Hospitalizations:** Included are all inpatient stays at general acute care (GAC) and specialty GAC hospitals in Pennsylvania with a principal or secondary diagnosis code for "COVID-19" (U07.1). Because the specific diagnosis code for COVID-19 was not introduced until April 1, 2020, hospitalizations with a principal or secondary diagnosis of "Other coronavirus as the cause of diseases classified elsewhere" (B97.29) are counted as COVID-19 hospitalizations for the month of March 2020 (March 1, 2020 – March 31, 2020).

**Rate of COVID-19 Hospitalizations per 10,000 Residents:** This rate is calculated by dividing the number of COVID-19 hospitalizations for Pennsylvania residents by the US Census Bureau population estimate. Hospitalizations for non-Pennsylvania residents are excluded. For annual rates, the corresponding US Census Bureau year estimates are used; for the cumulative March 2020 to December 2022 time period, the 2022 estimates are used.

**In-Hospital Mortality Rate for COVID-19 Hospitalizations:** The mortality rate is the percent of COVID-19 hospitalizations with a discharge status of "Expired." Patients who left against medical advice or were transferred to another hospital are excluded.

**Average Length of Stay for COVID-19 Hospitalizations:** The average length of stay is the arithmetic mean length of stay for COVID-19 hospitalizations. Length of hospital stay is calculated by subtracting the patient's date of discharge from the date of admission. Patients admitted and discharged on the same day are counted as a zero-day stay.

# Definitions and Technical Notes - Clinical Research

**Total Number of Hospital Days for COVID-19 Hospitalizations:** This includes the total number of days that patients stayed for COVID-19 hospitalizations. Length of hospital stay is calculated by subtracting the patient's date of discharge from the date of admission. Patients admitted and discharged on the same day are counted as a zero-day stay.

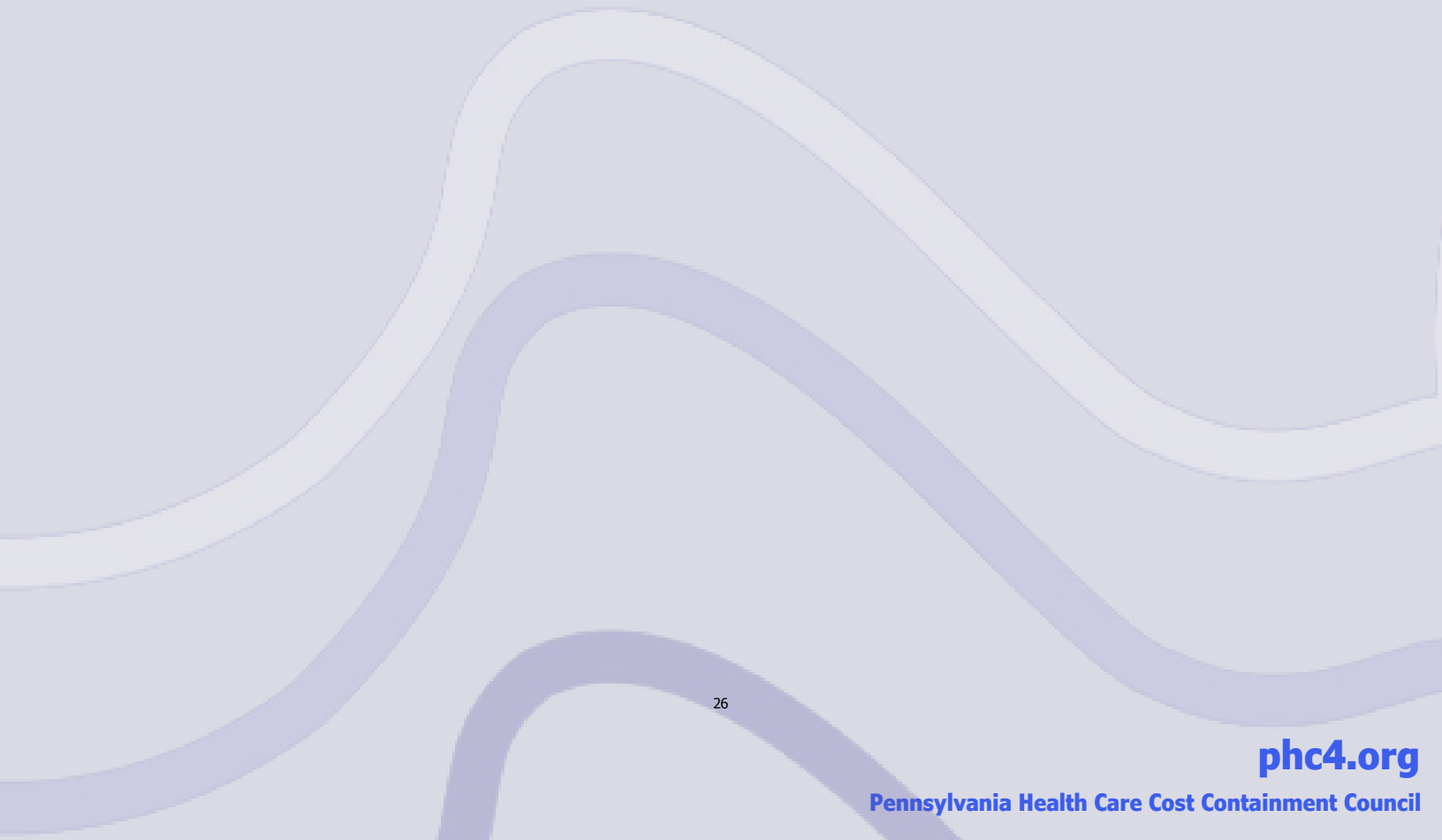
**Mechanical Ventilation Rate for COVID-19 Hospitalizations:** This is the percent of COVID-19 hospitalizations that included a procedure for mechanical ventilation.

**Patient Age, Sex, Race, and Ethnicity:** Each of these patient characteristics are provided by hospitals in the hospitalization data submitted to PHC4. Patient age is calculated as the number of full years between the patient's date of birth and the date of admission. Patient sex, race, and ethnicity are provided as independent data fields.

**Poverty Rate:** This reflects the percent of residents in the patient's zip code living in households with pretax incomes below the federal poverty threshold, according to the US Census Bureau's American Community Survey 2021 estimates.

**Select Health Conditions:** Several medical conditions are analyzed to determine the impact COVID-19 infections have on patients' mortality rates and lengths of hospital stay. The chosen conditions are the focus of PHC4's annual *Hospital Performance Report*, a publication that examines hospital performance in terms of case volume, mortality rates, and other measures. Condition selection is based on a high frequency of hospitalizations (at large or small hospitals) and a high rate of in-hospital mortalities. Detailed definitions (codes and exclusions) for the conditions may be accessed from the *Hospital Performance Report* Technical Notes (Table A) at <https://www.phc4.org/wp-content/uploads/HPR2022-Technical-Notes.pdf>.

# PHC4 Financial Research



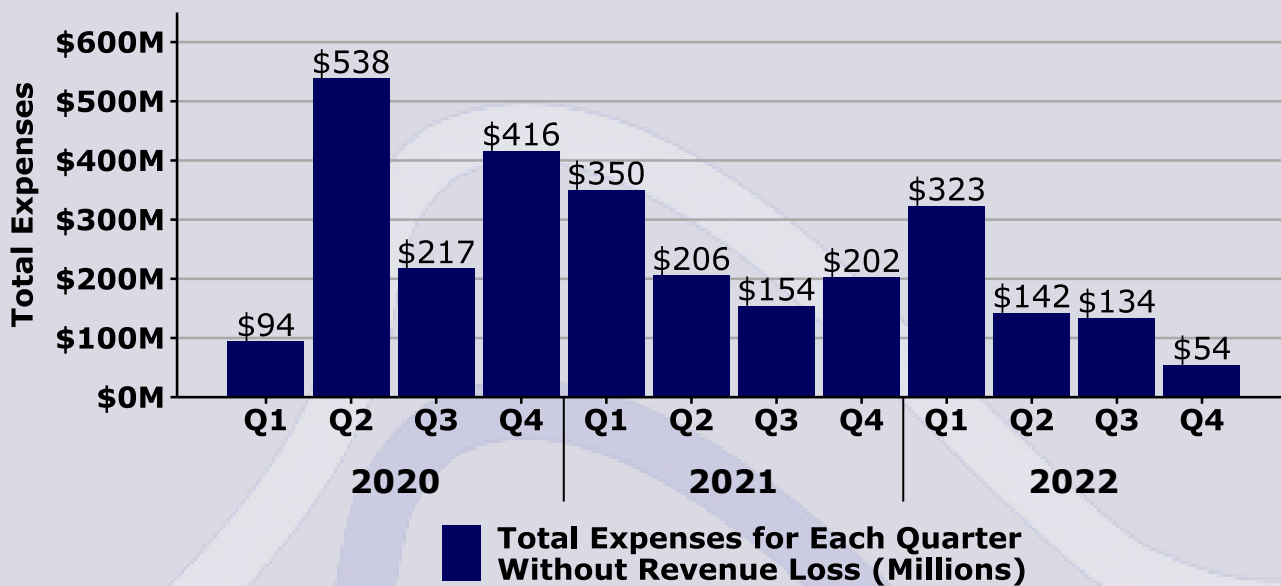
# Financial Research

## Key Findings

PHC4 aggregated data related to January 2020 through December 2022 COVID-19 expenses and lost revenue as reported by hospitals and health systems in the Commonwealth of Pennsylvania. Total COVID-19 related expenses and lost revenue reported by Pennsylvania hospitals and health systems through December 2022 (Jan 2020 – Dec 2022) were \$8.1 billion. These expenses and revenue losses were attributable to COVID-19 and used to prevent, prepare for, and respond to the coronavirus pandemic. Specific breakdowns for the period January 2020 through December 2022 include:

- Staffing Expenses: **\$1.3 billion**
- Testing Expenses: **\$374 million**
- Supplies & Equipment Expenses: **\$679 million**
- Construction Expenses: **\$28 million**
- Housing Care Expenses: **\$9 million**
- Other Expenses: **\$434 million**
- Revenue Loss: **\$5.3 billion**

**Figure 1: Total COVID-19 Expenses\***



\*COVID-19 expenses are dependent on the responsiveness of the hospitals and health systems. Expense categories based on Act 15 requirements. See technical notes for more details.



# Financial Impact

Total COVID-19 related expenses and lost revenue reported by Pennsylvania hospitals and health systems through December 2022 (Jan 2020-Dec 2022) were \$8.1 Billion.

Staffing expenses incurred \$1.3 billion – the largest expense reported.

Quarterly COVID-19 related costs, as reported by Pennsylvania hospitals and health systems varied widely. Fluctuations were most pronounced in other and staffing-related expenses and revenue losses. Some of the changes may have been influenced by variations in the percent of hospitals and health systems reporting survey results to the Pennsylvania Health Care Cost Containment Council across time.

Over 90% of Pennsylvania hospitals and health systems complied with COVID-19 reporting for 2020 data each quarter, compared to 37% reporting for the fourth quarter 2022 time period encompassed in this report.

## Figure 2: Trends for COVID-19 Disaster Emergency – Hospital Expenses & Revenue Loss

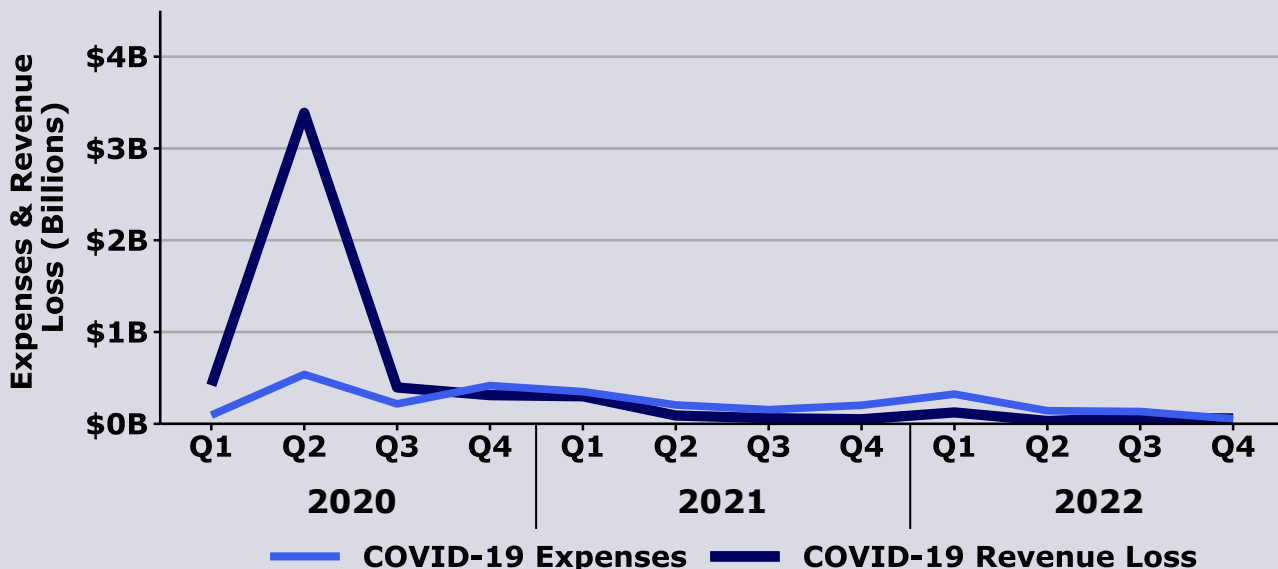


Fig. 2. Revenue loss was the highest during the second quarter of 2020 primarily due to the elimination of elective services.

## Figure 3: Trends for COVID-19 Disaster Emergency – Hospital Expenses

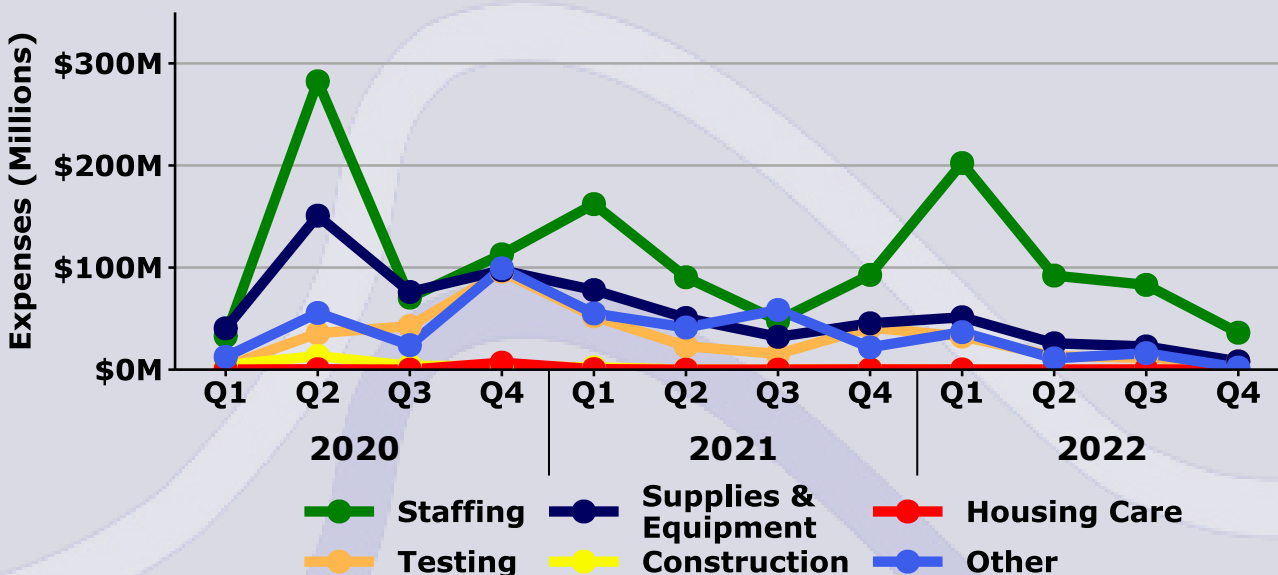


Fig. 3. Housing Care expenses were 0.31% of total expenses during this study period. Staffing expenses were 46.15%. The graph indicates staffing expenses and supplies and equipment expenses increased with the increase in COVID-19 cases (not visualized).

### Table 1: COVID-19 Quarterly Expenses & Revenue Loss Survey, 2020

Expenses & Revenue Loss	2020				Total
	Q1	Q2	Q3	Q4	
Staffing	\$33,077,000	\$282,451,895	\$70,528,527	\$112,931,170	\$498,988,592
Testing	\$3,127,414	\$35,660,806	\$42,642,924	\$95,956,759	\$177,387,903
Supplies & Equipment	\$40,479,371	\$150,810,228	\$76,055,474	\$97,370,185	\$364,715,258
Construction	\$4,457,579	\$13,354,673	\$3,702,951	\$3,642,363	\$25,157,566
Housing Care	\$127,775	\$400,924	\$14,893	\$6,854,430	\$7,398,022
Other	\$12,549,062	\$55,545,275	\$24,002,509	\$99,289,277	\$191,386,123
Revenue Loss	\$419,752,289	\$3,388,372,995	\$395,771,099	\$311,968,918	\$4,515,865,301
<b>Statewide</b>	<b>\$513,570,490</b>	<b>\$3,926,596,796</b>	<b>\$612,718,377</b>	<b>\$728,013,102</b>	<b>\$5,780,898,765</b>

### Table 2: COVID-19 Quarterly Expenses & Revenue Loss Survey, 2021

Expenses & Revenue Loss	2021				Total
	Q1	Q2	Q3	Q4	
Staffing	\$162,151,444	\$90,489,203	\$48,109,960	\$92,813,025	\$393,563,632
Testing	\$52,240,695	\$23,011,296	\$15,328,233	\$41,312,768	\$131,892,992
Supplies & Equipment	\$77,928,768	\$50,577,783	\$32,136,071	\$45,361,564	\$206,004,186
Construction	\$2,244,021	\$154,171	\$75,549	\$529,012	\$3,002,753
Housing Care	\$500,264	\$25,207	\$57,000	\$264,530	\$847,001
Other	\$55,043,880	\$41,251,373	\$58,423,737	\$21,846,591	\$176,565,581
Revenue Loss	\$299,817,012	\$90,174,074	\$61,256,866	\$49,755,360	\$501,003,312
<b>Statewide</b>	<b>\$649,926,084</b>	<b>\$295,683,107</b>	<b>\$215,387,416</b>	<b>\$251,882,850</b>	<b>\$1,412,879,457</b>

**Table 3: COVID-19 Quarterly Expenses & Revenue Loss Survey, 2022**

Expenses & Revenue Loss	2022				Total
	Q1	Q2	Q3	Q4	
Staffing	\$202,342,286	\$92,143,688	\$83,019,265	\$36,168,445	\$413,673,684
Testing	\$32,415,662	\$13,160,051	\$11,563,307	\$8,034,976	\$65,173,996
Supplies & Equipment	\$51,311,208	\$25,811,878	\$22,719,850	\$8,091,241	\$107,934,177
Construction	\$52,381	\$17,796	\$10,000	\$5,839	\$86,016
Housing Care	\$186,281	\$116,703	\$240,957	\$89,412	\$633,353
Other	\$36,737,314	\$11,020,558	\$16,155,131	\$1,996,043	\$65,909,046
Revenue Loss	\$123,858,574	\$30,871,775	\$65,100,110	\$58,535,044	\$278,365,503
<b>Statewide</b>	<b>\$446,903,706</b>	<b>\$173,142,449</b>	<b>\$198,808,620</b>	<b>\$112,921,000</b>	<b>\$931,775,775</b>

**Table 4: Three Year Grand Total COVID-19 Related Expenses & Revenue Loss**

Expenses & Revenue Loss	Total
Staffing	\$1,306,225,908
Testing	\$374,454,891
Supplies & Equipment	\$678,653,621
Construction	\$28,246,335
Housing Care	\$8,878,376
Other	\$433,860,750
Revenue Loss	\$5,295,234,116
<b>Statewide</b>	<b>\$8,125,553,997</b>

# Definitions and Technical Notes - Financial Research

## COVID-19 Report Data

This report reflects COVID-19 expenses and lost revenue as directed by Act 15 of 2020. This report does not reflect emergency funding provided under federal or state laws, including the Coronavirus Preparedness and Response Supplemental Appropriations Act, the Families First Coronavirus Response Act, the Coronavirus Aid, Relief, and Economic Security Act (CARES Act), or the Paycheck Protection Program and Health Care Enhancement Act.

Hospitals and health systems reported their COVID-19 related expenses and revenue losses that were attributable to COVID-19 and used to prevent, prepare for, and respond to COVID-19. Submissions included health care systems and independent hospitals that may include all system hospitals, ambulatory surgery centers, physicians' practices, etc. The accuracy of the data is the responsibility of each hospital or health system respondent.

**Figure 4: Hospitals and Health Systems  
COVID-19 Reporting**



Hospitals and Health systems were permitted to submit their data as a complete system including all system hospitals, ambulatory surgery centers, physicians' practices, etc. or as an independent hospital.

# Definitions and Technical Notes - Financial Research

## Definitions:

**Staffing Expenses:** COVID-19 related increased staffing and labor costs (salaries and benefits); expenses related to acquiring additional staff resources to expand or preserve care delivery and staffing emergency operation centers. Includes costs related to COVID-19 provider and staff training, (e.g., training on pandemic preparedness plans and the use of telemedicine), as well as temporary housing for staff.

**Testing Expenses:** Costs related to COVID-19 testing, including costs incurred from commercial lab services.

**Supplies & Equipment Expenses:** COVID-19 related costs associated with sourcing and purchasing additional supplies and equipment; such as, PPE and computer hardware or software related to preventing, preparing for, and responding to COVID-19, and may include temporary tents.

**Construction Expenses:** COVID-19 related costs associated with setting up emergency operation centers, including, but not limited to, construction and retrofitting facilities to provide separate screening and security areas.

**Housing Care Expenses:** COVID-19 related costs associated with providing housing and care for patients who do not require hospitalization but do not have housing in order to prevent the spread of COVID-19.

**Other Expenses:** Other COVID-19 related expenses required to be reported to the Federal or State government to receive COVID-19 assistance; may include e.g., consulting to comply with Federal Emergency Management Agency (FEMA) and other federal regulations, workers comp and other negative financial consequences to prevent, prepare and respond to COVID-19.

**Revenue Loss:** Loss of revenue amount due to suspension of elective services and decreases in non-elective/emergent services not related to COVID-19; such as fewer outpatient visits, canceled elective procedures or services, or increased uncompensated care. It does not need to be specific to providing care for possible or actual COVID-19 patients, but the lost revenue due to COVID-19.

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# HAP Research



# Introduction

Hospitals were on the front lines responding to the largest paradigm-shifting health crisis in more than a century. In its wake are a confluence of challenges that jeopardize our nation's entire health care system.

On March 11, 2020, when the World Health Organization (WHO) declared that COVID-19 was a global pandemic, there were 118,000 confirmed cases in 110 countries.<sup>1</sup> The first confirmed case in Pennsylvania was recorded on March 6 and the first COVID-19-related death occurred on March 18.<sup>2</sup> Since then, the Commonwealth has seen increasing cumulative case counts and deaths. On January 15, 2022, Pennsylvania saw a single-day record of 27,181 new cases (7-day average). By the first anniversary of the pandemic (March 6, 2021), Pennsylvania reported 948,861 cases and 24,425 deaths.<sup>3</sup> On May 11, the Centers for Disease Control and Prevention (CDC) announced that the Federal COVID-19 Public Health Emergency (PHE) had ended.<sup>4</sup> This marked the official end of the pandemic nationwide. By this time, there were 3,560,285 COVID-19 cases and 52,311 deaths in Pennsylvania.<sup>5</sup>

From the onset of the pandemic, Pennsylvania's hospitals and health systems stepped up to face the challenges of COVID-19, serving as a foundational piece of the public health response. To minimize the virus's spread and save lives, the Commonwealth's hospitals tested, treated, and vaccinated millions of Pennsylvanians. Hospitals erected testing tents, increased intensive care unit (ICU) capacity, and established COVID-19 units to treat and isolate infected patients while protecting the health of other patients and staff.<sup>6</sup>

During the pandemic, hospitals learned a great deal about how to coexist with COVID-19. They put in place protocols to treat existing COVID-19 patients, and also safely provide important routine and specialty care. Through reconfiguring space to accommodate for social distancing, creating special wings for COVID-19 patients, and doubling down on infection prevention and cleaning best practices, hospitals have been able to implement a model for safe care for all who need it.

These COVID-19 preparations and precautions came at a great financial cost to hospitals. Revenue shortfalls—due to state and federal government orders requiring hospitals to defer or cancel scheduled services and procedures to free up capacity for COVID-19 patients—intensified these burdens. Following disruptions to routine care early in the pandemic, hospital and health system teams began caring for more patients who presented with more advanced or greater acuity health needs while also responding to continued surges of COVID-19.

In the aftermath of the pandemic, staffing shortages, skyrocketing labor costs, continuing supply chain disruptions, inflation, rising interest rates, and volatile markets are pressuring both revenue and expenses. Many of these challenges are not merely transitory but likely represent a new normal.

Staffing shortages for nurses and clinical care support at hospitals, nursing homes, primary care offices, and other health care settings are leading to disruptions in care across Pennsylvania and greater strain on patient care teams. To address these shortages, hospitals are offering historic pay increases, bonuses, loan forgiveness, tuition support, and other incentives to recruit and retain staff. Hospitals are also partnering with educators and community organizations to grow the pipeline of health care professionals and are also piloting team-based care and innovations such as telehealth and virtual nursing to better support patients and their care teams.

These efforts—and the need for many hospitals to contract with temporary staffing agencies at inflated rates—have significantly increased labor costs, while overall inflation hit a 40-year high in June. These substantial increases in care delivery expenses have outpaced payment rates from Medicare, Medicaid, and commercial payers, placing considerable strain on the long-term sustainability of Pennsylvania hospitals' and health systems' mission to care for and enhance the health of their communities.

Despite these challenges, hospitals remain vital to their communities. During fiscal year (FY) 2022—the end of the pandemic—Pennsylvania's hospitals and health systems contributed directly and through ripple effects \$182 billion in spending that includes \$37 billion in salaries and supported more than 590,000 jobs.<sup>7</sup> At the same time, Pennsylvania hospitals reported nearly \$9 billion in community benefits. Hospitals will need long-term federal and state support to ensure they can remain economic and health care leaders for their communities.

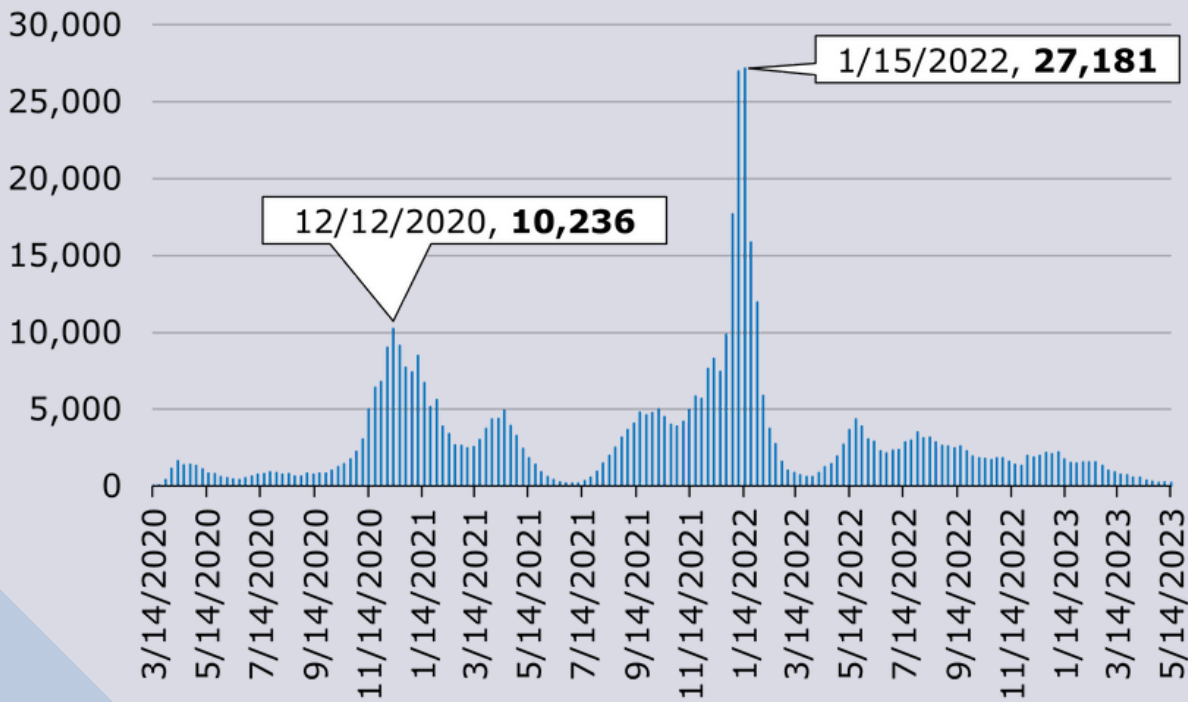
This section of the report aims to summarize how COVID-19 affected Pennsylvania, with specific attention to its hospitals and health systems.

# COVID-19 in Numbers

## Case History in Pennsylvania

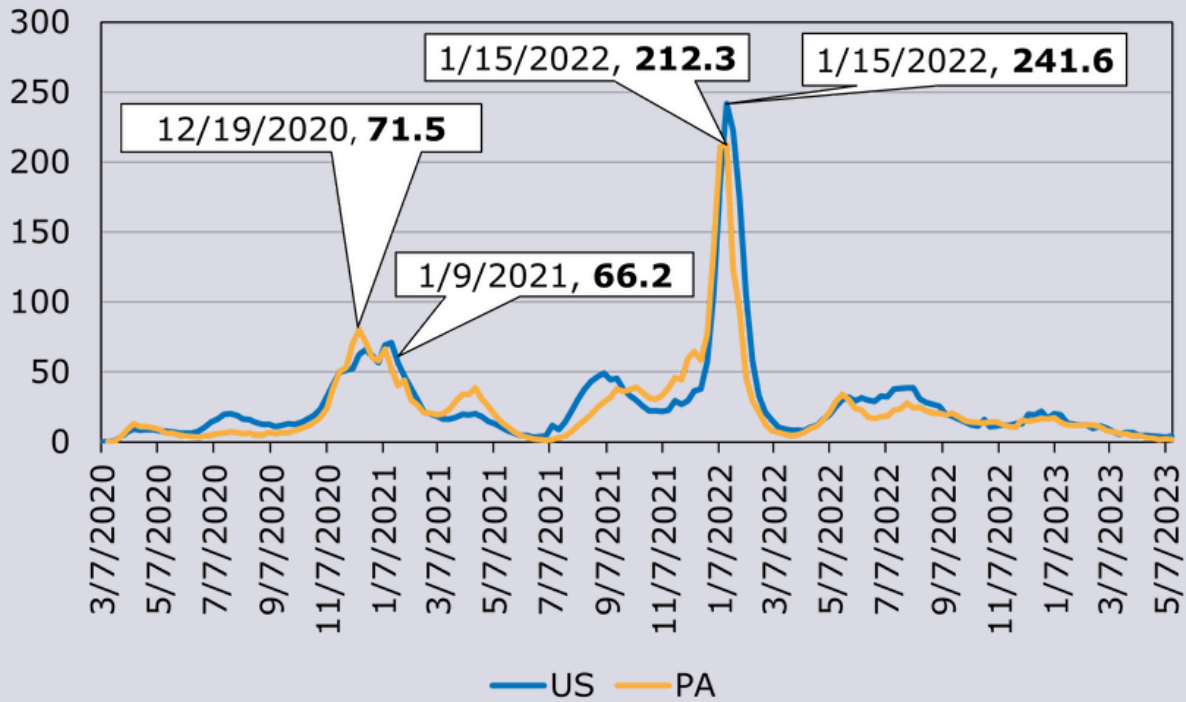
Pennsylvania recorded its first confirmed case of COVID-19 on March 6, 2020, and the total number of cases quickly rose as the testing increased and the virus spread. As the second wave of the pandemic hit Pennsylvania during the beginning of October 2020, the total number of cases started to increase even more dramatically, reaching a daily number of 10,236 on December 12, 2020. However, the nation experienced a quite larger wave nearly a year later, with a record of 27,181 daily cases on January 15, 2022. By the time the federal government announced the end of the pandemic on May 11, 2023, Pennsylvanians had experienced 3,560,285 total COVID-19 cases.<sup>8</sup>

**Figure 1. 7-day Average COVID-19 Cases in PA (March 6, 2020–May 14, 2023)**



Source: Commonwealth of Pennsylvania

**Figure 2. 7-day Average Case Rates, US vs PA (March 7, 2020–May 14, 2023)**



Source: Commonwealth of Pennsylvania and WHO

The 7-day average case rate per 100,000 residents for Pennsylvania was mostly on par with the national average throughout the pandemic (Figure 2) with slight variations. During the second biggest wave, the rate of cases peaked at 71.5 for Pennsylvania on December 19, 2020, while it was slightly lower nationwide with a peak of 66.2 on January 9, 2021. During the biggest wave that we saw at the beginning of 2022, the highest rate for Pennsylvania was 212.3 while it was 241.6 nationwide.

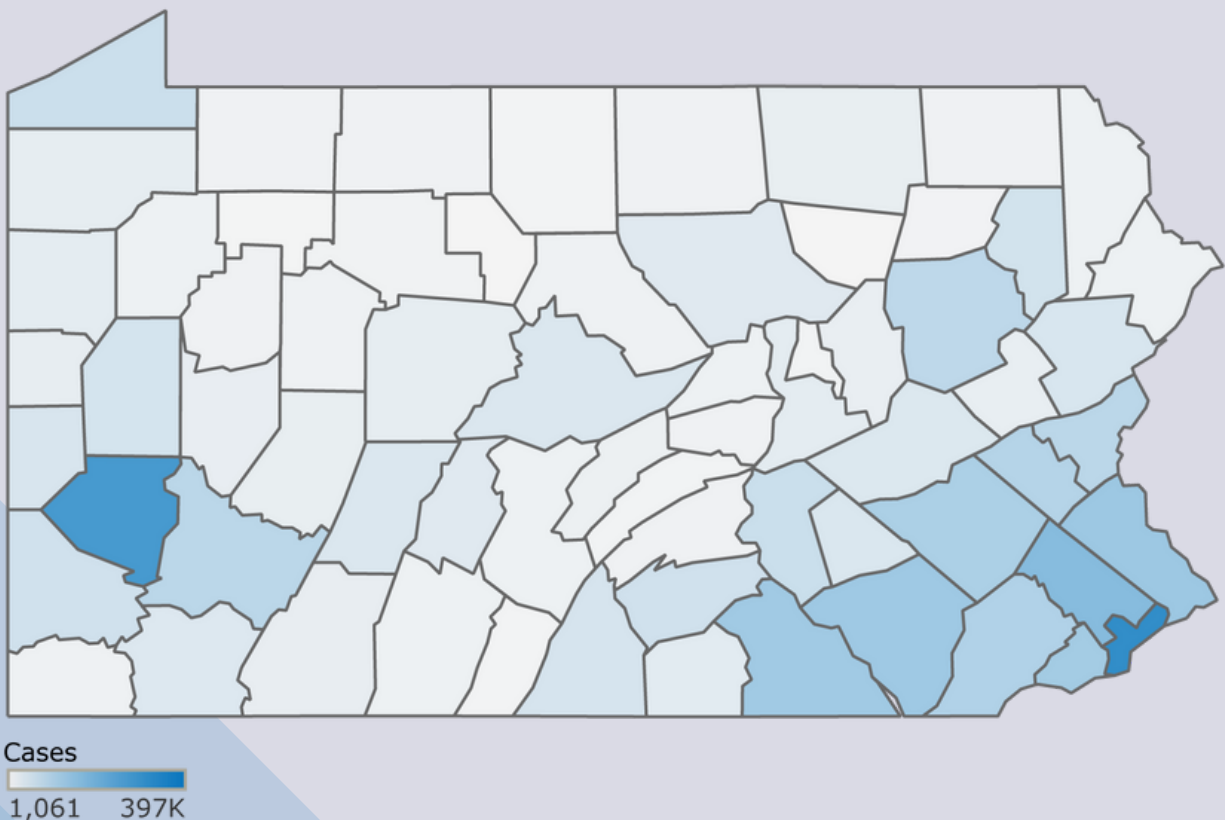
By the end of pandemic, the Commonwealth had a cumulative case rate of 28,517 per 100,000 residents, while the United States had 31,035 positive COVID-19 cases per 100,000 residents.<sup>9</sup>

## COVID-19 in Pennsylvania's Counties and Regions

The pandemic followed different trends throughout the Commonwealth. This section includes the results of county-based and regional analyses of the total number of COVID-19 cases and COVID-19 incidence rate per 100,000 population.

Figure 3 shows how the COVID-19 cases were distributed throughout the Commonwealth. The darker shaded areas indicate a higher number of total cases, which accumulated around urban areas (Philadelphia and Allegheny counties). Table 1 provides the exact number of total COVID-19 cases in the top 10 counties with the highest total COVID-19 cases in Pennsylvania between March 6, 2020, and May 14, 2023. During this time, Philadelphia County experienced the highest number of cases (397,290) followed by Allegheny County (343,845). Montgomery, Bucks, Lancaster, Delaware, York, Berks, Lehigh, and Chester were the other counties with the highest total number of COVID-19 cases.<sup>3</sup>

**Figure 3. Total COVID-19 Cases by Pennsylvania Counties (March 6, 2020–May 14, 2023)**



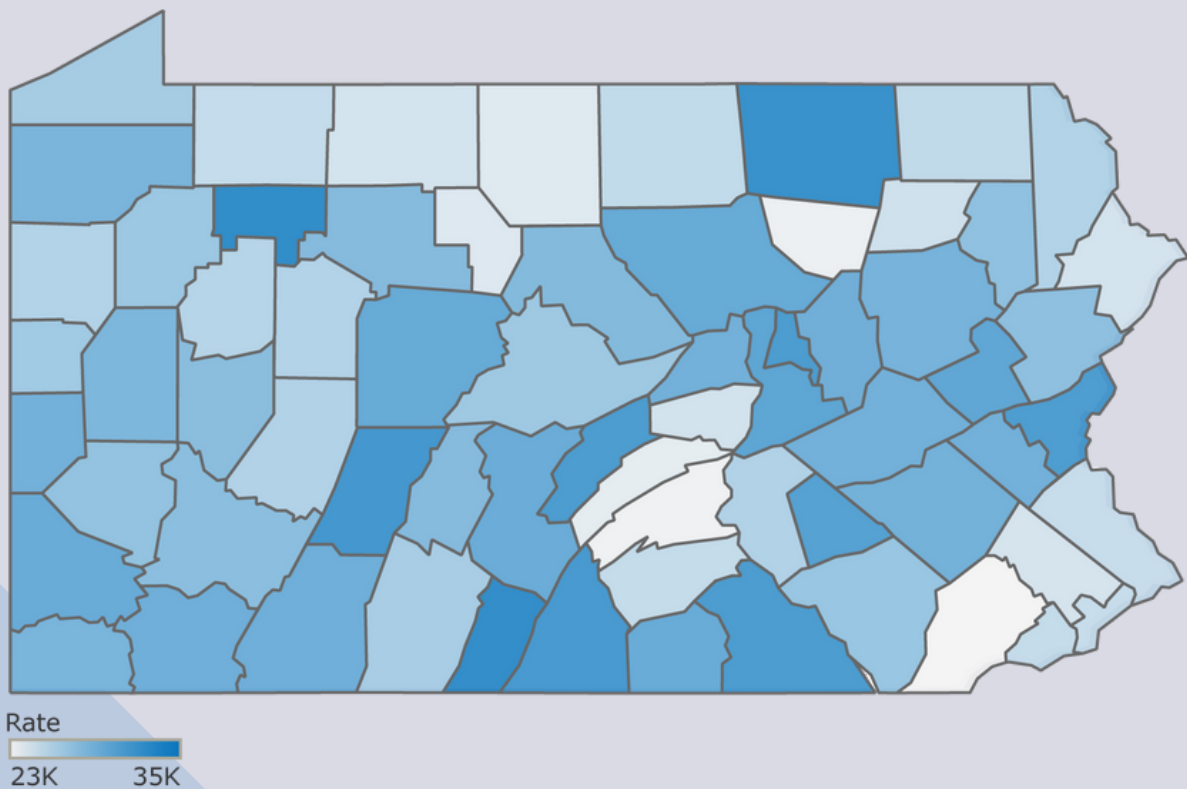
Source: Commonwealth of Pennsylvania

**Table 1. Top Ten Counties with Highest Total COVID-19 Cases (March 6, 2020–May 14, 2023)**

County	Total COVID-19 Cases
Philadelphia	397,290
Allegheny	343,845
Montgomery	201,818
Bucks	157,613
Lancaster	152,262
York	149,103
Delaware	142,976
Berks	127,766
Chester	118,812
Lehigh	112,395

Figure 4 demonstrates the rate of COVID-19 incidence in Pennsylvania counties. The darker shaded areas indicate higher rates. Contrary to the trend of the total number of cases by county, COVID-19 incidence rates were higher for rural counties. Table 2 lists the top 10 Pennsylvania counties with the highest COVID-19 case rate per 100,000 residents between March 6, 2020, and May 14, 2023. Eight of the top 10 counties with the highest incidence rates are rural counties (Lebanon and Northampton counties were the exceptions). This is in line with an overall higher rate of incidence in rural counties of Pennsylvania, compared to urban counties (Figure 7). Forest County observed the highest rate with 35,353 COVID-19 cases per 100,000 population.<sup>3</sup> This might be attributed to the outbreak that happened in a Forest County prison during the first year of the pandemic.<sup>10</sup>

**Figure 4. COVID-19 Case Rate per 100,000 Population by Pennsylvania Counties (March 6, 2020–May 14, 2023)**



Source: Commonwealth of Pennsylvania

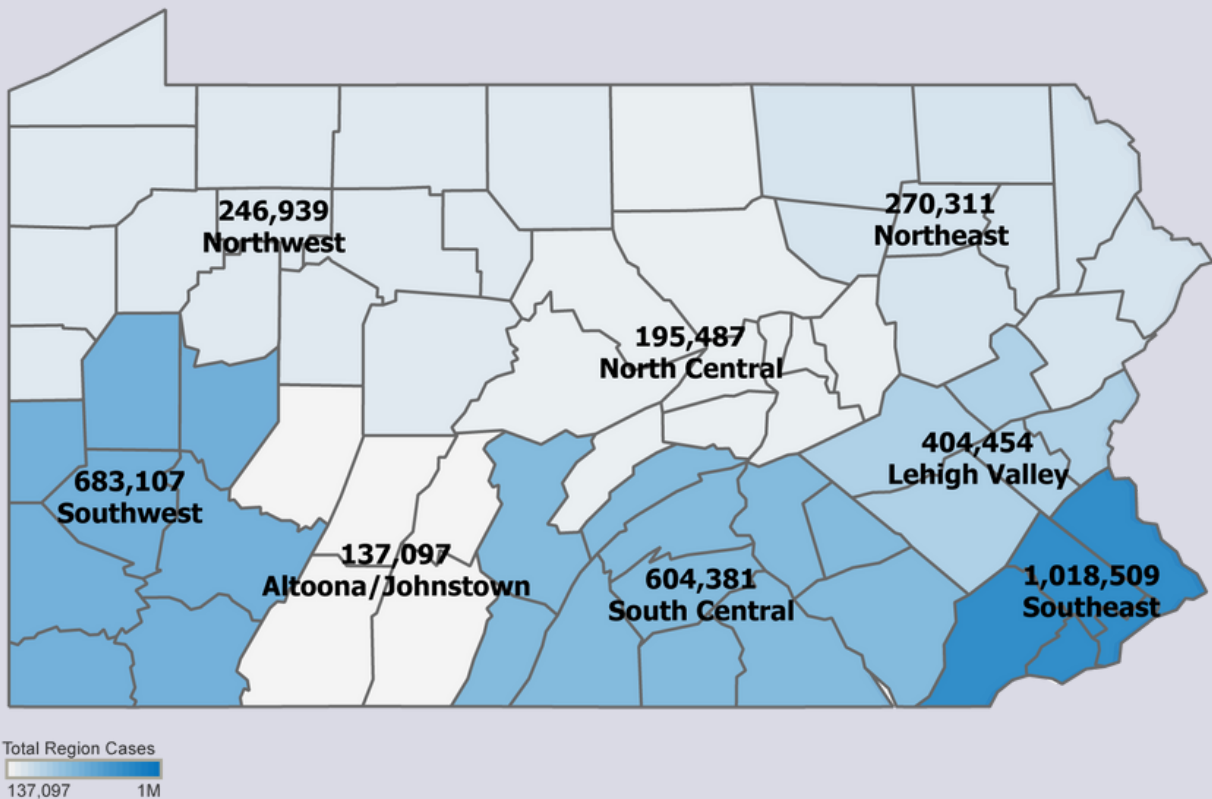
**Table 2. Top Ten Counties with Highest COVID-19 Case Rate per 100,000 Residents (March 6, 2020–May 14, 2023)**

<b>County</b>	<b>Rate</b>
Forest	35,353
Fulton	35,231
Bradford	34,809
Cambria	33,800
Franklin	33,551
York	33,204
Montour	33,193
Mifflin	33,192
Northampton	33,059
Lebanon	32,489



Figure 5 lays out the distribution of the cumulative COVID-19 cases in Pennsylvania by its eight regions. Of the total 3.5 million COVID-19 cases in Pennsylvania between March 6, 2020, and May 14, 2023, the Southeast region had the highest number of cases (darkest shaded area, with just more than 1 million cases). This was followed by the Southwest, South Central, Lehigh Valley, Northeast, Northwest, North Central, and Altoona/Johnstown regions, in the order of decreasing total case numbers.<sup>3\*</sup>

**Figure 5. Total Cases by Pennsylvania Regions (March 6, 2020–May 14, 2023)**

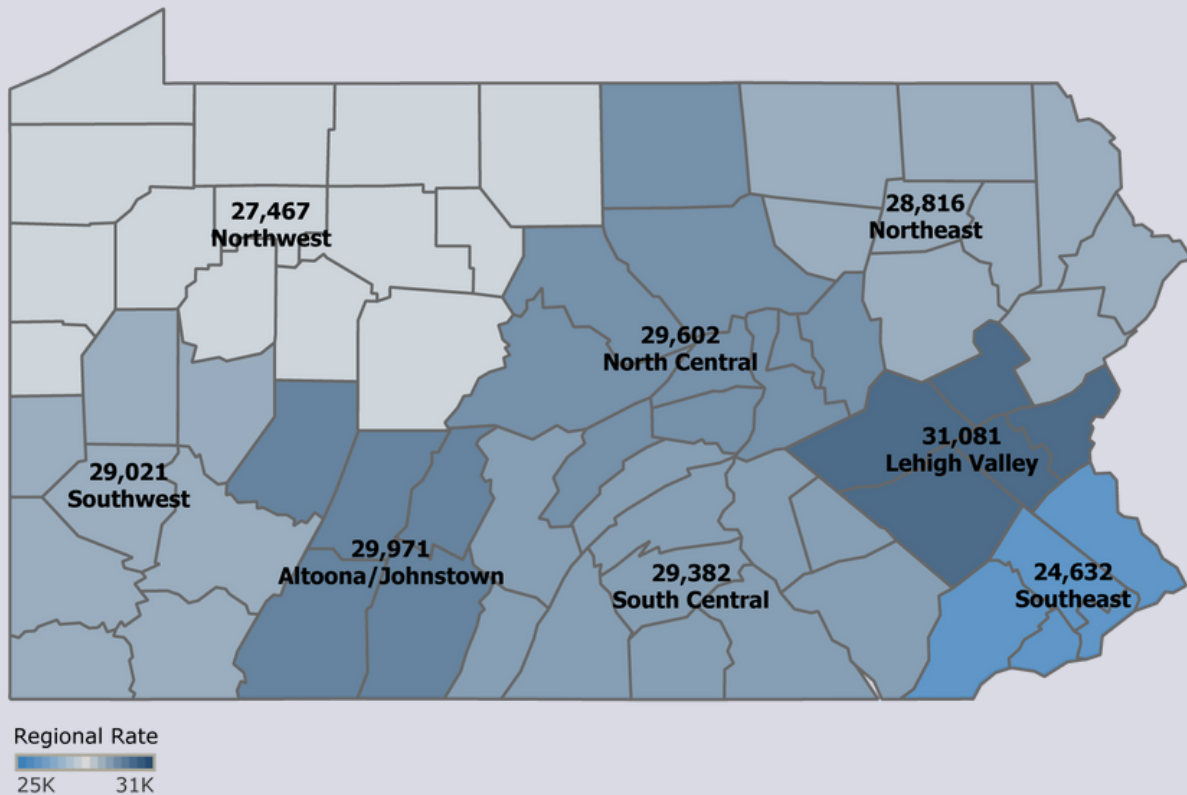


Source: Commonwealth of Pennsylvania

\*Altoona/Johnstown: Bedford, Blair, Cambria, Indiana, and Somerset counties. Lehigh Valley: Southeast region: Bucks, Chester, Delaware, Montgomery, and Philadelphia counties. North Central: Centre, Clinton, Columbia, Lycoming, Mifflin, Montour, Northumberland, Snyder, Tioga, Union counties. Northeast: Bradford, Lackawanna, Luzerne, Monroe, Pike, Sullivan, Susquehanna, Wayne, Wyoming, Cameron, Clarion, Clearfield, Crawford, Elk, Erie, Forest, Jefferson, Lawrence, McKean, Mercer, Potter, Venango, Warren counties. South Central: Adams, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lebanon, Perry, and York counties. Southwest: Allegheny, Armstrong, Beaver, Butler, Fayette, Greene, Washington, Westmoreland counties.

Figure 6 demonstrates the COVID-19 incidence rates of Pennsylvania’s eight regions. Lehigh Valley had the highest incidence rates with 31,081 cases/100,000 population, which is followed by Altoona/Johnstown, North Central, South Central, and Southwest, which all had incidence rates higher than 29,000 per 100,000 residents. Northeast and Northwest had lower rates, followed by Southeast with the lowest rate of 24,632 incidents per 100,000 residents.<sup>3</sup>

### Figure 6. COVID-19 Case Rate per 100,000 Residents for Pennsylvania Regions (March 6, 2020–March 14, 2023)



Source: Commonwealth of Pennsylvania

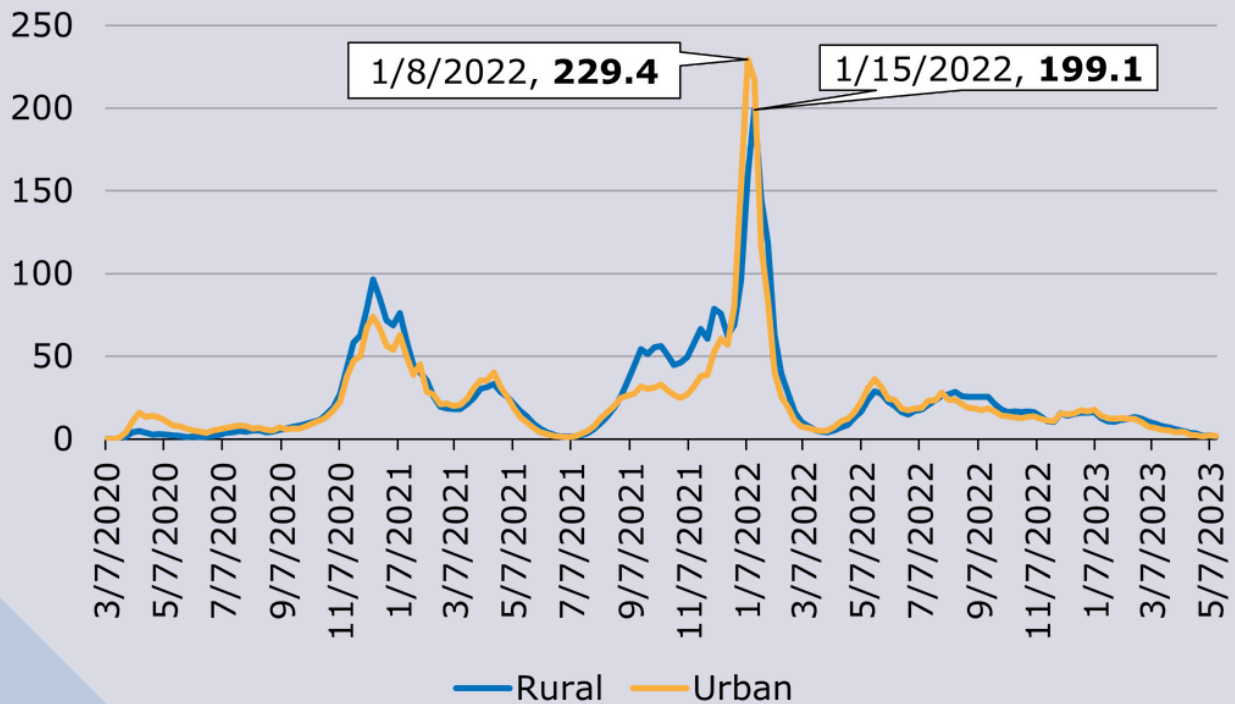
## COVID-19 Incidence in Rural and Urban Pennsylvania

According to the CDC’s analysis of COVID-19 incidence by urban-rural classification, nationally, large central and large fringe metropolitan areas had the highest COVID-19 incidence early in the pandemic (mid-March 2020 to mid-May 2020). However, starting in September 2020, COVID-19 started spreading into rural communities faster, resulting in the highest incidence in medium/small metropolitan areas and micropolitan/noncore areas until November 2020.<sup>11\*\*</sup>

Rural residents make up 26 percent of Pennsylvania’s total population, which makes the Commonwealth the state with the third-largest rural population.<sup>12, 13</sup>

\*\*Visit Center for Rural Pennsylvania for the list of rural and urban Pennsylvania counties.

### Figure 7. 7-day Average Case Rates, Rural vs Urban Counties (March 7, 2020–May 14, 2023)



Source: Commonwealth of Pennsylvania

Even though Pennsylvania’s urban counties overall had a higher 7-day average case rate at the very early stages of the pandemic and during the largest peak seen in early 2022, rural counties overall had higher 7-day average case rates during the second largest wave (early 2021) and at the end of 2021. When we look at the cumulative rates of rural and urban counties (Figure 8), we see that rural counties had an overall higher rate than urban counties and Pennsylvania in general.

### **Figure 8. Cumulative Case Rate: Urban vs. Rural Pennsylvania (March 6, 2020–March 6, 2021)**



Source: Commonwealth of Pennsylvania

## Death Rate Due to COVID-19 in Pennsylvania

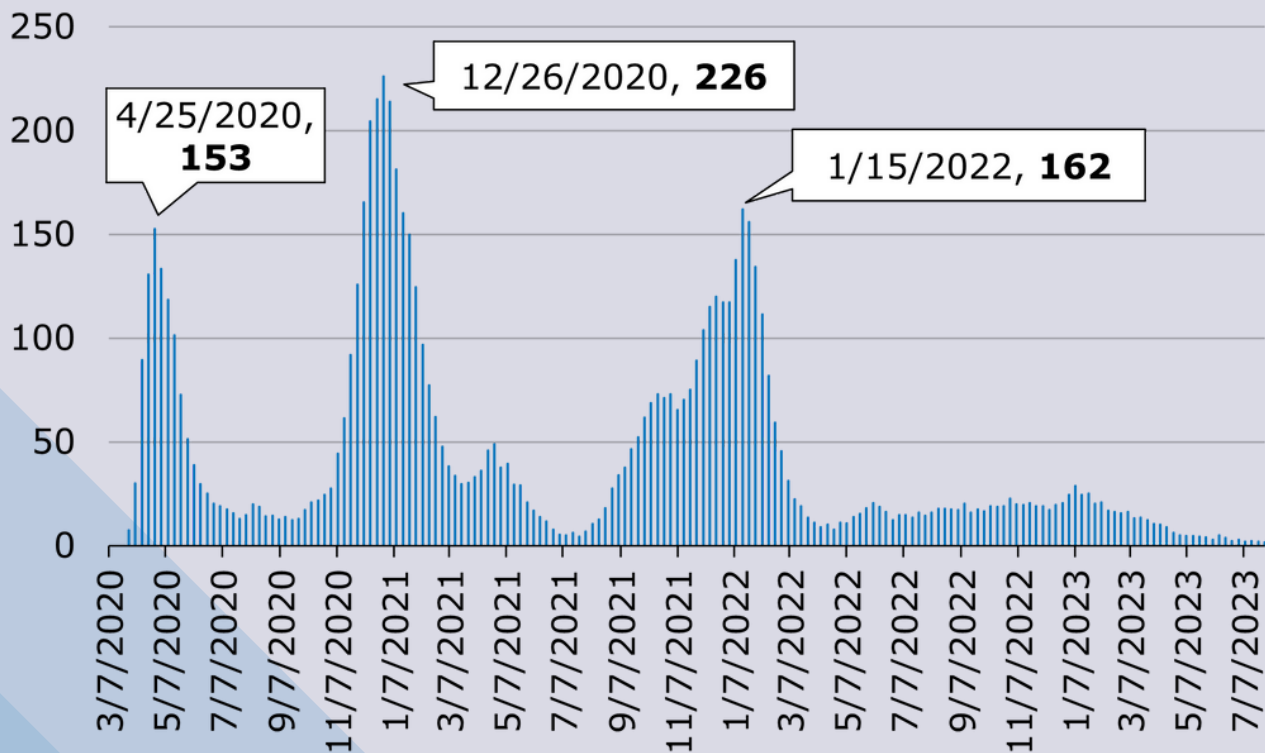
Figure 9 illustrates the trend of COVID-19-related deaths in Pennsylvania. The number of deaths due to COVID-19 increased as the number of cases and hospitalization were on the rise. However, just like hospitalizations, the first peak that is seen in the 7-day average of deaths (153 COVID-related deaths on April 25, 2020) is notably higher than that of cases.

The other two peaks were observed in line with case and hospitalization peaks. The highest number of deaths was observed on December 26, 2020, with a 7-day average of 226 deaths and the second highest peak was on January 15, 2022, with a 7-day average of 162 deaths.

By the end of pandemic on May 11, 2023, 51,131 people had died in Pennsylvania related to COVID-19.<sup>14\*\*\*</sup>

\*\*\*According to COVID Tracking Project, on April 23, 2020, Pennsylvania revised down its total deaths (confirmed and probable) from 1,622 to 1,421 to exclude some probable deaths that needed further confirmation to be linked to COVID-19.

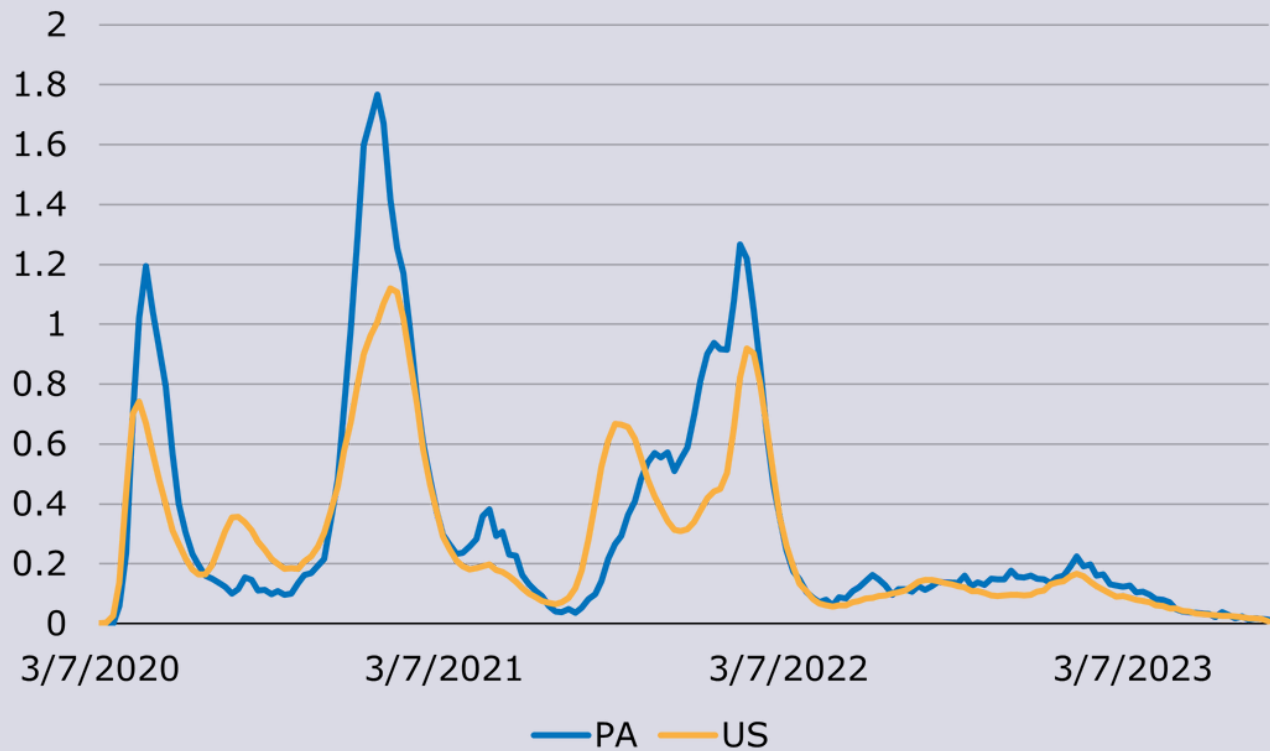
**Figure 9. 7-day Average COVID-19-Related Deaths in PA**



Source: Commonwealth of Pennsylvania

Figure 10 compares the rate of COVID-19-related deaths per 100,000 residents in the United States and Pennsylvania. Overall, the COVID-19-related death rate for the Commonwealth is higher than it is nationwide, which contradicts an overall lower rate of COVID-19 cases Pennsylvania experienced compared to the United States (Figure 3). This may be attributed to a higher rate of people who are 65 years or older in Pennsylvania, relative to the national population (19.6% in Pennsylvania, compared to 17.3% nationwide).<sup>8, 15</sup>

**Figure 10. Death Rate per 100,000 Residents in PA vs. US**



Source: CDC

# COVID-19

## Vaccinations in Pennsylvania

COVID-19 vaccines became available in December 2020 as the Food and Drug Administration (FDA) issued emergency use authorizations (EUA) for the use of Pfizer-BioNTech and Moderna vaccines. Another EUA was issued for Janssen in February 2021. Vaccine rollout initially started with vulnerable populations and essential workers, such as health care workers and teachers, but became available to all adult populations in April 2021. The first FDA vaccine approval happened in August 2021. During September 2021, the U.S. Department of Health and Human Services and the FDA started to allow booster doses.

Children ages 12–15 became eligible for Pfizer-BioNTech COVID-19 vaccine in May 2021 and children ages 5–11 were eligible after October 2021. Starting in December 2021, children ages 16–17 were directed to receive a booster dose. In January 2022, this directive included children ages 12–15. In June 2022, children down to 6 months of age were available for COVID-19 vaccinations and it was recommended they receive bivalent vaccines in December 2022.

Vaccine availability continued to expand, and vaccines continued to improve to provide immunity to the newly emerging COVID-19 variants. The latest vaccine policy recommendation was FDA's authorization of changes to simplify the use of bivalent mRNA COVID-19 vaccines.<sup>16</sup>

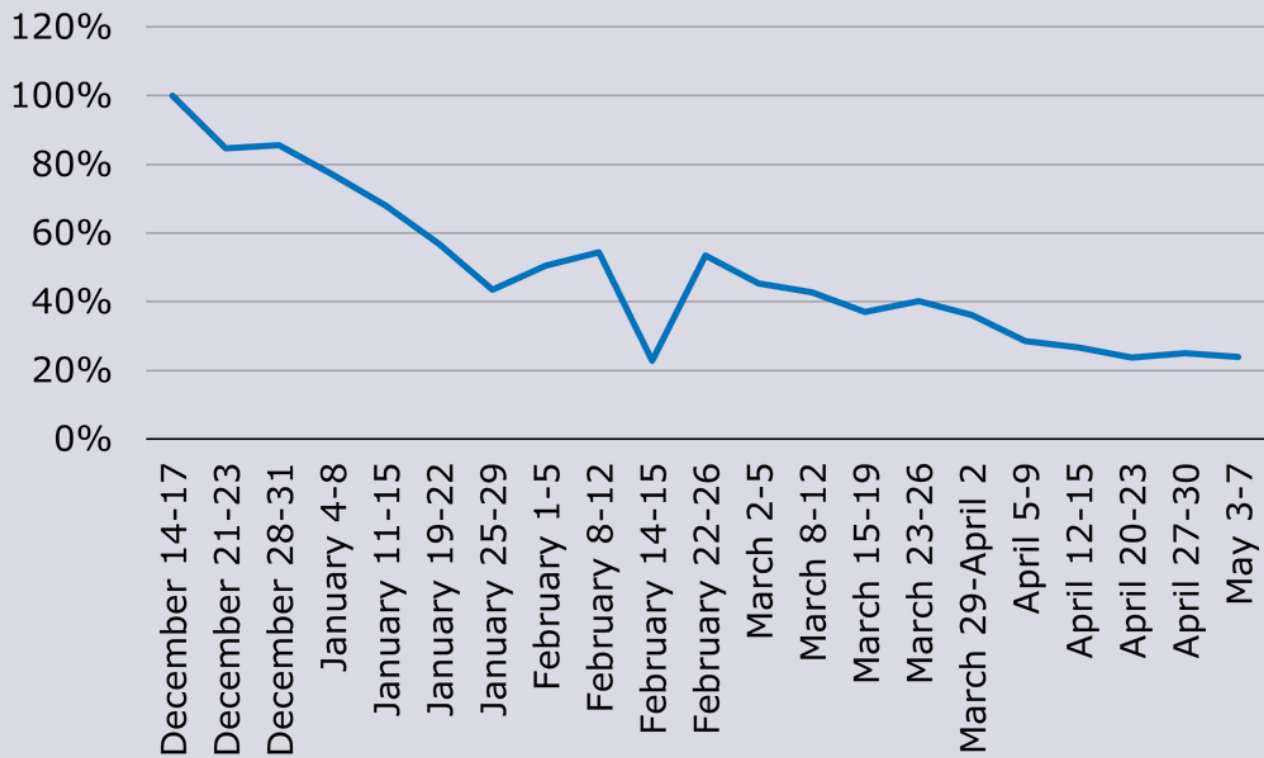
### Hospitals' Role in Vaccine Distribution

In lieu of a public hospital system, Pennsylvania's hospitals and health systems provide public health infrastructure; coordinate emergency preparation, management, and response; address community health needs; and serve as safety net health care providers. They exhibited a remarkable example of this role during the COVID-19 pandemic.

The COVID-19 vaccine rollout was a vast undertaking for Pennsylvania's hospitals and health systems as they worked to immunize the public based on state and federal guidelines. This included ensuring efficient appointment scheduling and keeping shots at the required refrigeration storage temperatures, which required the use of additional staffing and medical equipment.

Figure 11 represents how much of the initially available vaccine doses were distributed through hospitals. When vaccines first became available, hospitals provided 100 percent of the distribution. This rate decreased as other health care facilities joined in the efforts of COVID-19 vaccine distribution.<sup>17</sup>

### Figure 11. Percentage of Vaccines Distributed Through Hospitals (December 2020–May 2021)



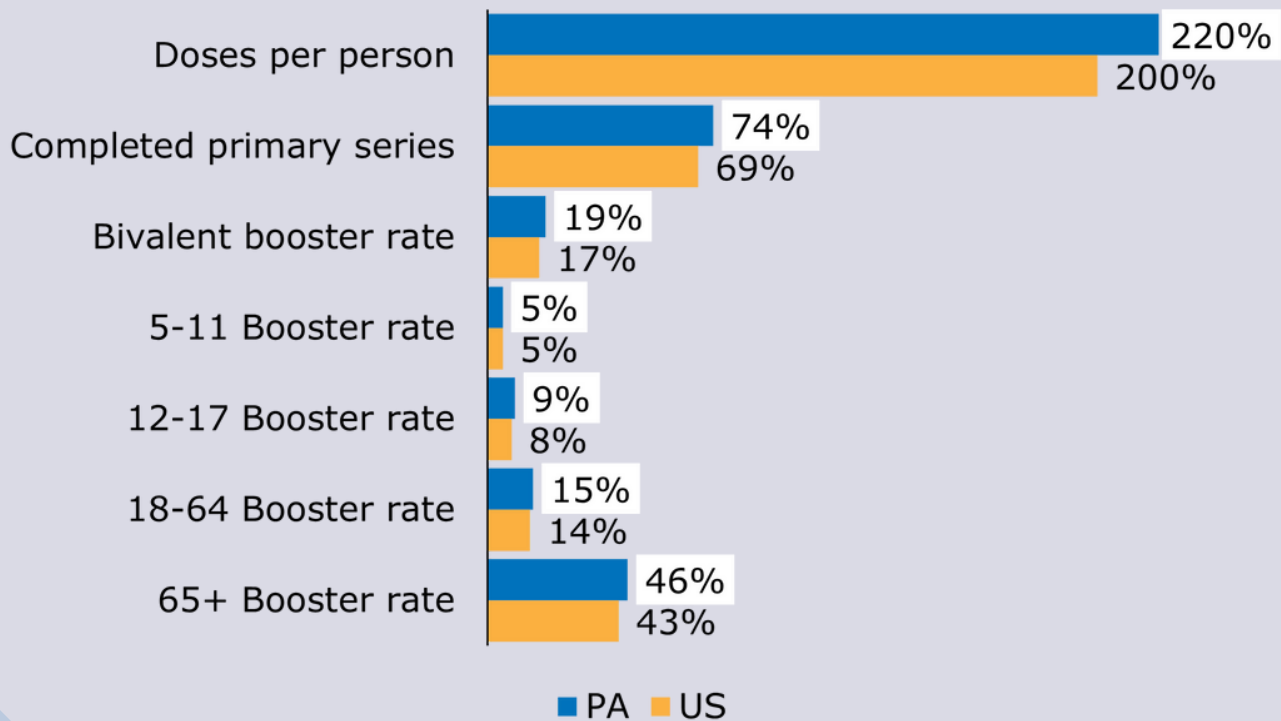
Source: Pennsylvania Department of Health



## Vaccination Rates in Pennsylvania

By September 12, 2023, the number of COVID-19 vaccinations administered per person was 2.2 in Pennsylvania while it was 2.0 nationwide (Figure 12). Pennsylvania ranks as the 24th state with the highest number of doses administered per person.<sup>18</sup> Pennsylvania is also above the national averages in terms of the rates of people who completed their primary series and the bivalent booster. The booster rate for each age group in Pennsylvania is also equal to or higher than the national average.

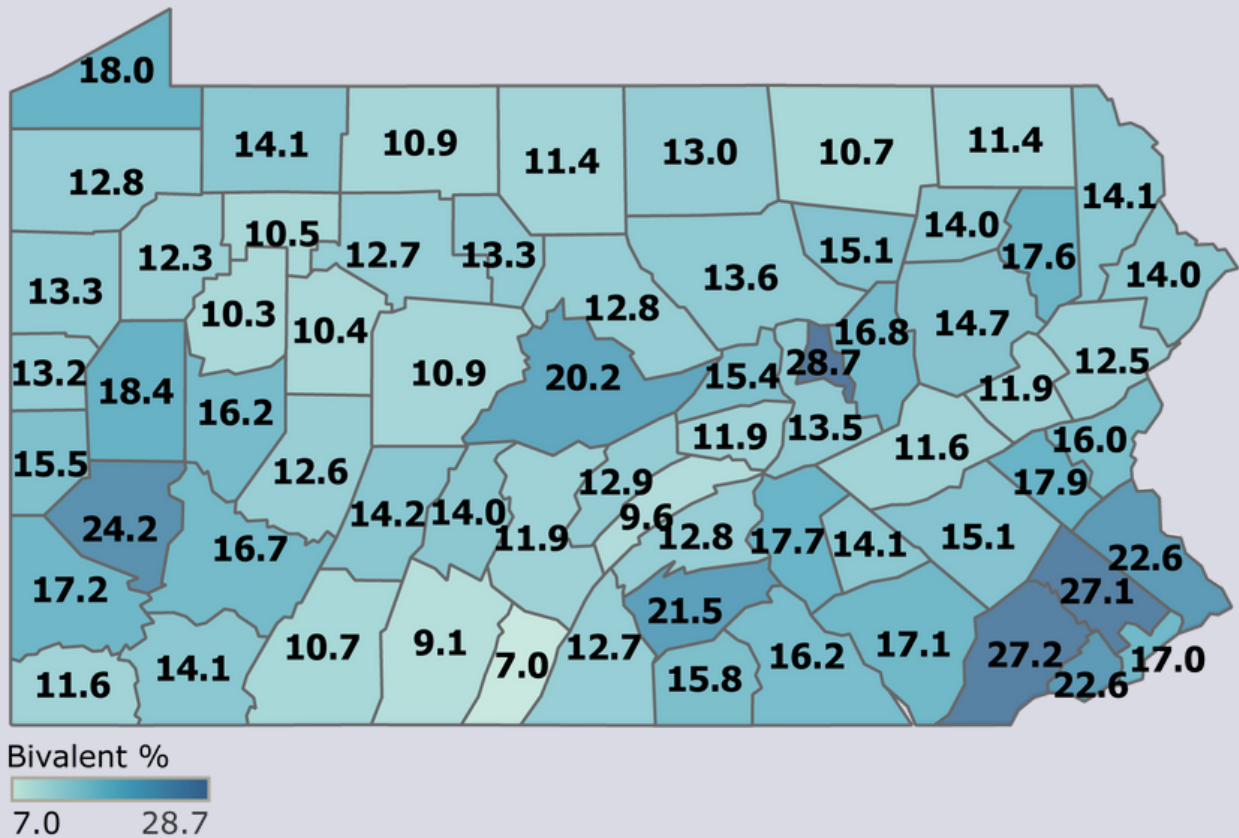
**Figure 12. Vaccination in PA and US by September 12, 2023**



Source: The New York Times

The percent of population with a bivalent (updated) booster dose varied in Pennsylvania counties. By May 11, 2023, Montour County had the highest rate (28.7)<sup>19</sup> while Fulton County had the lowest rate (7.0) of bivalent booster administration (Figure 13).

**Figure 13. Percent of Population with a Bivalent Booster Dose in Pennsylvania Counties**



Source: CDC

## Workforce Challenges

Health care workforce shortages across Pennsylvania and the nation were approaching a crisis even before the pandemic. An aging population means more health care professionals are retiring just as demand for care is increasing. There is not enough infrastructure in place to recruit, educate, and train the next generation of health care workers who will be needed to care for Pennsylvanians.

The COVID-19 pandemic intensified these challenges, increasing burnout among health care workers and accelerating retirements. Workforce shortages and rising violence and abuse targeting health care workers has further compounded the strain on hospital teams.

Workforce shortages throughout all health care settings during the pandemic put even greater pressure on care teams as they responded to COVID-19, contributed to strained hospital capacity during COVID-19 surges, and created bottlenecks throughout the continuum of care.

HAP's November 2021 and November 2022 survey of Pennsylvania hospitals found that:

- Vacancy rates for many hospital staff positions increased significantly from 2019.
- Vacancy rates averaged more than 30 percent by the end of 2022 for many key positions, including registered nurses, nursing support staff, and medical assistants.
- Hospitals are in need of physicians in areas such as primary care, neurology, radiology and critical care medicine.
- The top barrier that hospitals cited to employing staff was a shortage of qualified candidates.

# Community Impact of Pennsylvania Hospitals<sup>7</sup>

Despite the challenges of the pandemic, hospitals remained essential to the health and stability of their communities.

During FY 2022 - when the number of Pennsylvanians hospitalized for COVID-19 reached its highest peak - Pennsylvania hospitals' reported community benefits reached nearly \$9 billion. This includes enhancing community health, providing charity care to patients in need, training and educating the next generation of health care professionals, conducting lifesaving medical research, operating services at a loss to meet community needs, and absorbing costs associated with caring for millions of Pennsylvanians covered by Medicare and Medicaid.

During the pandemic, hospitals increased their impact on their communities' economies by maintaining and constructing new buildings; providing jobs; and purchasing medical supplies, pharmaceuticals, and medical equipment. They also continued to indirectly impact the economy through business interactions with organizations from other industries, such as employment and cleaning services, and induce economic activity outside of the hospital in such industries as real estate, financial investment firms, and restaurants. And they continued to attract federal research dollars to the state, enabling Pennsylvania to develop innovations that improve care for all Americans.

During FY 2022, Pennsylvania's hospitals provided the Commonwealth a total economic value of \$182 billion in spending, an increase of \$39 billion from before the pandemic in FY 2019.

This includes:

- \$83 billion in direct impact, representing the dollars hospitals pay out for employee salaries, wages, and benefits, as well as for the many goods and services needed to provide health care services and support hospitals and health system operations.
- \$99 billion in ripple impacts that represent the additional economic activity that results from the circulation of hospital dollars in local communities and across the state.

The total economic value includes more than \$37 billion in salaries, which support thousands of Pennsylvania families. On their own, Pennsylvania’s hospitals, directly and indirectly, supported more than 590,000 jobs during FY 2022, accounting for approximately one of every 10 jobs in the state. This includes:

- Directly employing more than 267,000 Pennsylvanians in a wide variety of jobs, providing nearly \$17.9 billion in wages, salaries, and benefits.
- Supporting more than 323,000 additional jobs—that pay another \$19.5 billion in salaries—through the direct purchase of goods and services and the subsequent circulation of hospital dollars in local economies.

Helping to pave the way for new evidence-based technology and cutting-edge care delivery, during FY 2022 alone, Pennsylvania’s hospitals and universities with hospital-affiliated medical schools attracted an estimated \$1.86 billion in federal funds. These investments are designed to improve health and health care delivery not just for Pennsylvanians, but for patients across the country and around the world.

## Conclusion

COVID-19 has taken a toll on Pennsylvania, and Commonwealth's hospitals and health systems were at the epicenter. In Pennsylvania, the case counts rose to more than 3.5 million by the end of the pandemic in May 2023. Tragically, the death toll totaled more than 52,000 during this time.<sup>3</sup>

Pennsylvania appears to have contained the virus more successfully when compared to the rest of the nation. The state has employed strong mitigation efforts throughout the pandemic and health care providers have worked hard to treat Pennsylvania patients.<sup>8, 16</sup> The pandemic followed different trends throughout the state. Philadelphia County had the highest number of total COVID-19 cases among all Pennsylvania counties, while Forest County had the highest incidence rate per 100,000 residents. The Southeast region had the highest number of total COVID-19 cases, while the Lehigh Valley had the highest incidence rate per 100,000 residents. The incidence rate also was higher in rural counties than in urban counties, based on the total number of cases between March 6, 2020, and May 14, 2023.<sup>3</sup>

Hospitals and their workforce acted as the first line of defense during the fight against the pandemic. This included immunization of Pennsylvania's population through the guidelines the state and federal governments provided. When the vaccines first became available, Pennsylvania hospitals provided 100 percent of the vaccines. This rate decreased as more vaccines became available and other health care organizations joined in the efforts of COVID-19 vaccine distribution.

The impacts of the pandemic, however, are long lasting. Significant and damaging impact to the health care workforce will require thoughtful intervention to build the necessary infrastructure required for building a successful pipeline for tomorrow's health care professionals.

The COVID-19 pandemic also threatened the financial stability of hospitals and the economic foundation that the Commonwealth's hospitals and health systems provide.

Through the pandemic, hospitals continued to support their communities and local economies. During FY 2022, Pennsylvania's hospitals and health systems provided nearly \$9 billion in community benefits and contributed \$182 billion to state and local economies, including \$37 billion in salaries that support thousands of Pennsylvania families. The hospital community also supported more than 590,000 jobs and attracted \$1.86 billion in federal research funds.

Efforts and resources could be more efficiently targeted to address the disparities and challenges identified during the COVID-19 pandemic. Moving forward, we encourage improvements in health information exchange to improve coordinated and timely care between different health care providers, public health, and other stakeholders.

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