

COVID-19 Vaccinations, Cases, and Deaths by Race/Ethnicity

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I. Introduction

This paper provides a quick summary of the percentage of COVID-19 vaccinations and changes in COVID-19 cases and deaths. Considering the unstable behavior of COVID-19, the paper depicts a few graphical analyses of the long term and the most recent behavior in South Carolina and Horry County relative to the percentage of people receiving the COVID-19 vaccine.

Showing the rates of cases and deaths as 10K or 100K per capita this paper depicts the true weight of the situation and enables valid comparisons to other states and counties, between states and counties, between demographics, and so on. For example, South Carolina and Horry County show distinct differences in the weekly count of cases on August 14, 2021 (23,619 and 1,916); however, their rates of cases per 100K indicate the true and smaller difference with an approximate ratio (1:1) when reported in a per capita context instead of a ratio (12:1) without the per capita context. Unfortunately, when COVID-19 cases and deaths are not discussed in the context of per capita—it fostered unnecessary fear in the public mind. See Figure 1.1.

cont.

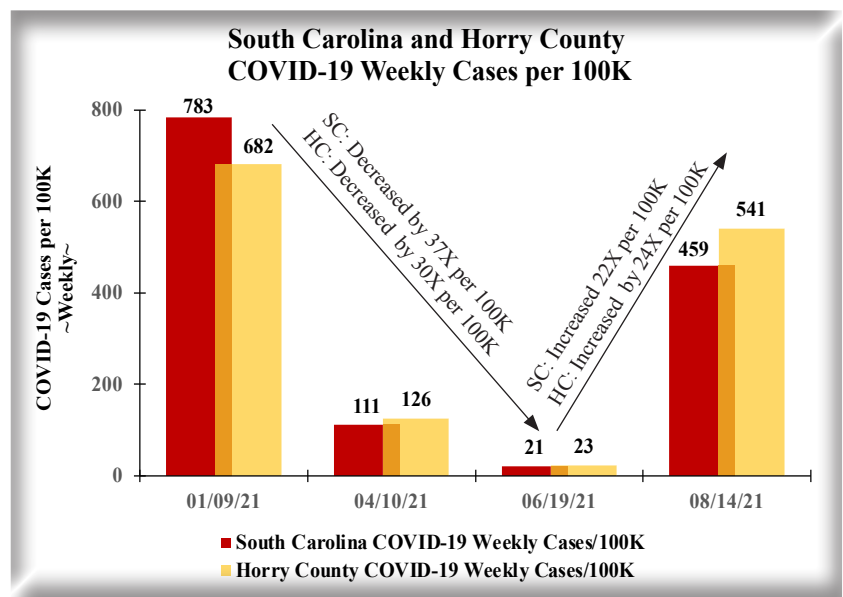


Figure 1.1 COVID-19 weekly cases per 100K

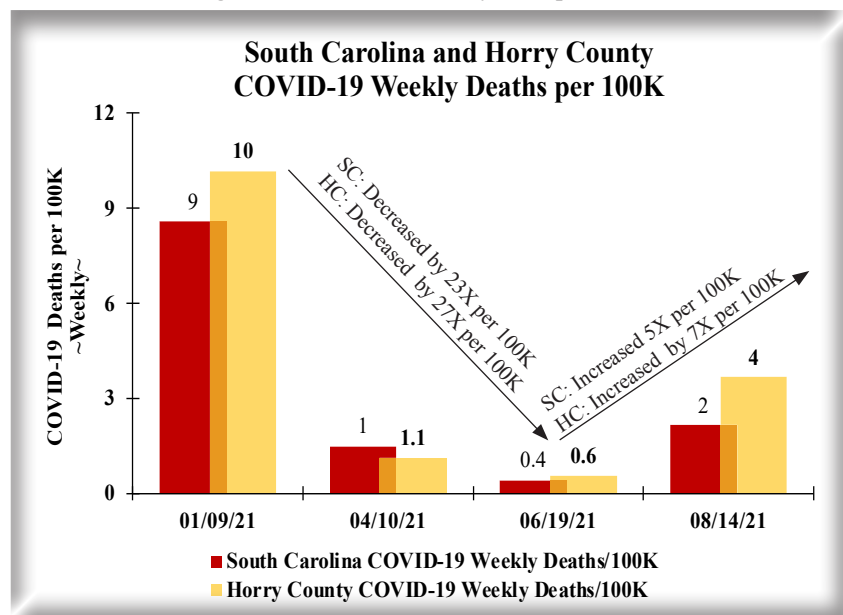


Figure 1.2 COVID-19 weekly deaths per 100K

I. Introduction, cont.

COVID-19 Highlights: South Carolina and Horry County as of August 14, 2021*

- Of 1,971,128 fully vaccinated people (South Carolina), 270 were hospitalized for COVID-19, which equates to 0.0138%. This means that there were only 13.8 COVID-19-related hospitalizations per 100,000 fully vaccinated people. Moreover, the probability of one person being hospitalized out of 50 fully vaccinated people is 0.00685.
- Of 1,971,128 fully vaccinated people (South Carolina), 45 died from COVID-19, which equates to 0.0023%. This means that there were 2.3 COVID-19 deaths per 100,000 fully vaccinated people. Moreover, the probability of one person dying out of 50 fully vaccinated people is 0.001138.
- Of the COVID-19-vaccine-eligible Black people in South Carolina (1,138,479) and Horry County (43,641), only 41.5% and 34.6% have received at least one dose of the vaccine, respectively.
- Of the COVID-19-vaccine-eligible White people in South Carolina (2,865,531) and Horry County (256,746), 49.2% and 55.2% have received at least one dose of the vaccine, respectively.
- Of the COVID-19-vaccine-eligible Hispanic or Latino people in South Carolina (249,177) and Horry County (20,050), 42.6% and 43.3% have received at least one dose of the vaccine, respectively.
- Of the COVID-19-vaccine-eligible White and Black residents age 65+, the vaccination rate for White residents exceeds that of Black residents by 47.1% in South Carolina and 97.7% in Horry County. Hence, this is the most vulnerable age group.
- Of the COVID-19-vaccine-eligible White and Black people age 12+, the vaccination rate for White residents exceeds that of Black people by 16.9% in South Carolina and 45.9% in Horry County.
- Of the COVID-19-vaccine-eligible male and female residents age 65+, the vaccination rate for females exceeds that of male residents by 26.2% in South Carolina and 19.0% in Horry County.
- Although the percentage of Horry County White residents receiving at least one vaccine COVID-19 dose exceeds that of Horry County Black residents, the cumulative deaths per capita for Black residents were 14 per 10K compared to White residents at 17 per 10K.
- The percentage of Horry County White residents receiving at least one vaccine COVID-19 dose exceeds that of Horry County Black residents, the cumulative deaths per capita for Black residents were 21 per 10K compared to White residents at 18 per 10K.

According to the Centers for Disease Control and Prevention (CDC)

- COVID-19 vaccines are effective.
- Vaccine breakthrough cases occur in only a small percentage of vaccinated people. To date, no unexpected patterns have been identified in the case demographics or vaccine characteristics among people with reported vaccine breakthrough infections.
- COVID-19 vaccines are effective. The CDC recommends that everyone 12 years of age and older get a COVID-19 vaccine as soon as they can.
- People who have been fully vaccinated can resume their pre-pandemic activities.

*As a reminder, the percentages are based on the subpopulations of each group.



I. Introduction, cont.

Table 1.1 Total populations and vaccine eligible populations

	South Carolina				Horry County			
	General Population	Population Eligible for COVID-19 Vaccine by Age			General Population	Population Eligible for COVID-19 Vaccine by Age		
Demographics	Total*	12–64	12+	65+	Total	12–64	12+	65+
All	5,149,000	3,359,083	4,296,149	937,118	354,081	203,572	292,546	88,874
White	3,196,421	2,255,960	2,865,531	581,749	256,746	165,789	238,132	64,443
Black	1,333,876	890,157	1,138,479	242,765	43,641	25,866	37,153	10,954
Hispanic	285,458	196,506	249,177	51,953	20,050	12,424	17,845	5,033

Source: South Carolina Department of Health and Environmental Control (SCDHEC)

Table 1.2 COVID-19 selected weekly cases and deaths

	Cases: COVID-19		Deaths: COVID-19	
	Weekly Count		Weekly Count	
Dates	South Carolina	Horry County	South Carolina	Horry County
01/09/21	40,307	2,415	442	36
04/10/21	5,696	445	76	4
06/19/21	1,069	83	21	2
08/14/21	23,619	1,916	111	13

Source: SCDHEC

*Based US Census Population Estimates and, American Community Survey, July 1, 2019.



II. Percentage Distribution of Residents Receiving at Least One COVID-19 Vaccine Dose *cont.*

Percentage of Residents Who Received at Least One Dose of COVID-19 Vaccine by Race/Ethnicity (Age 65+) as of 08/14/21

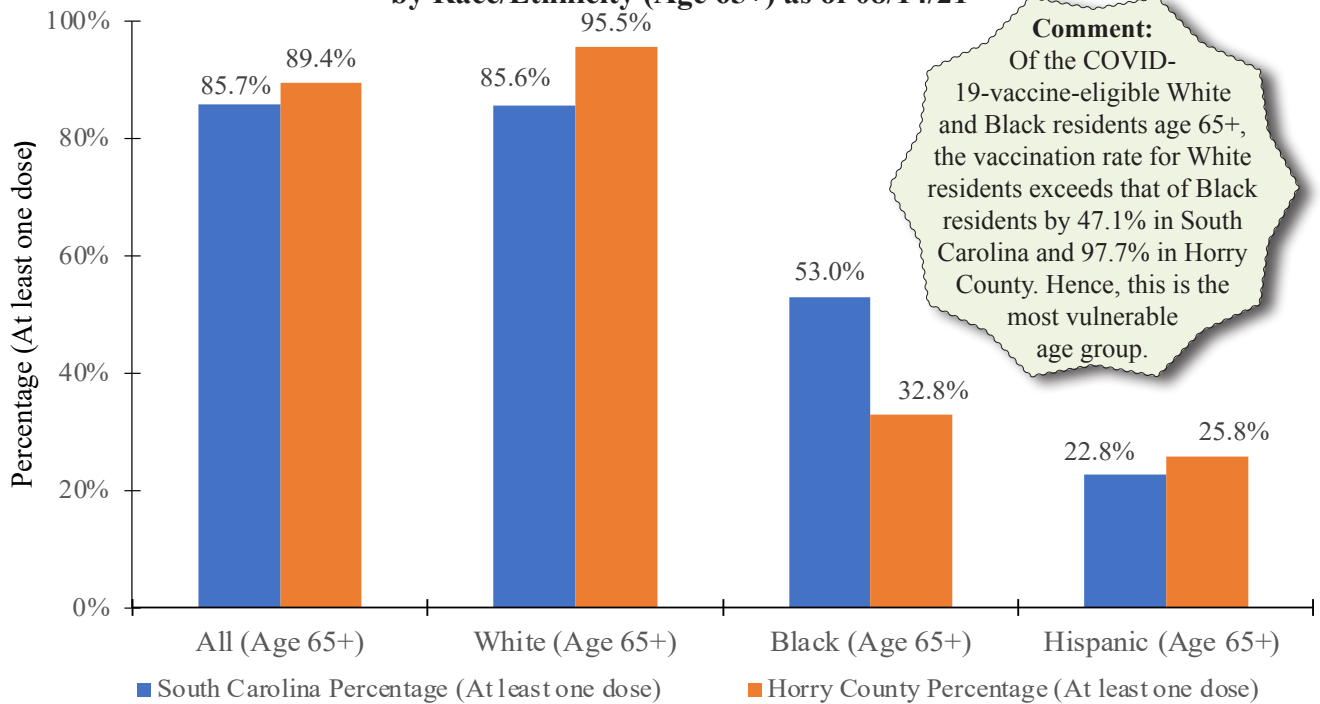


Figure 2.1 Percentage of people 65 and over who received at least one COVID-19 vaccine dose by race/ethnicity (08/14/21).

Source: South Carolina Department of Health and Environmental Control (SCDHEC)

Percentage of Residents Who Received at Least One COVID-19 Vaccine Dose by Race/Ethnicity (Age 12–64) as of 08/14/21

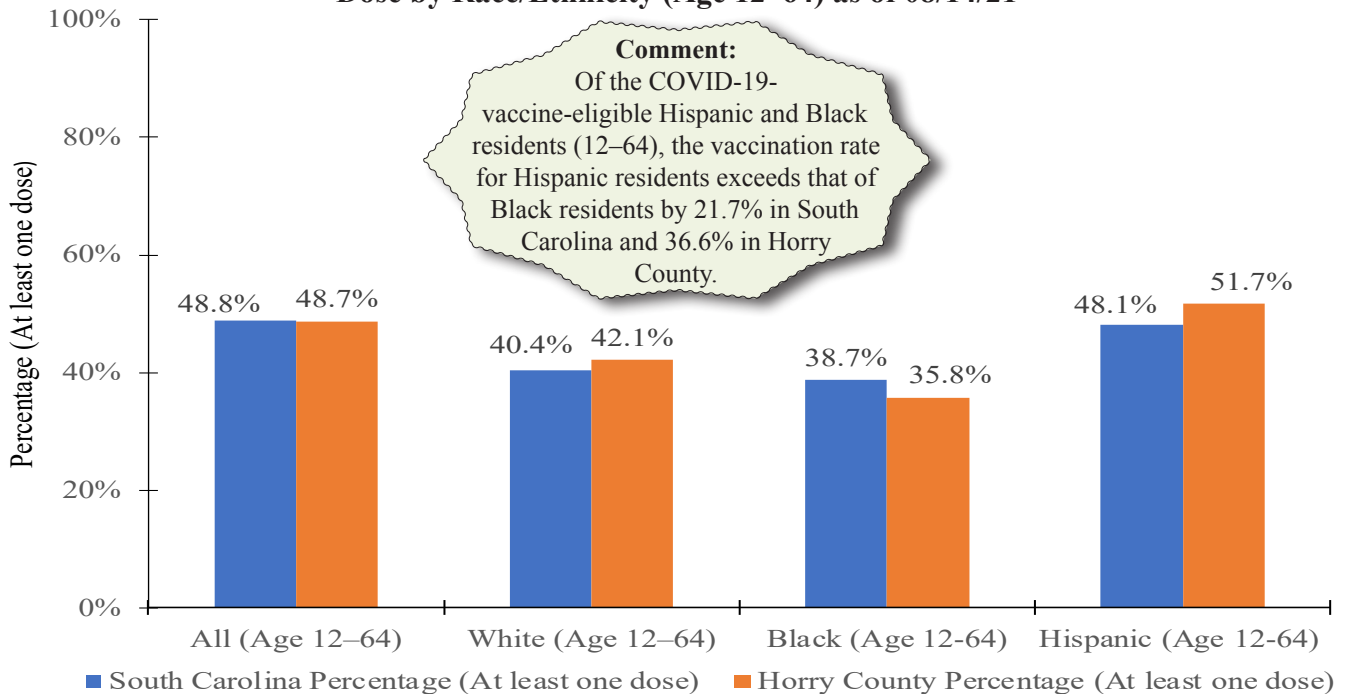


Figure 2.2 Percentage of residents from 12 to 64 years old who received at least one COVID-19 vaccine dose by race/ethnicity

Source: SCDHEC



II. Percentage of Residents Receiving at Least One COVID-19 Vaccine Injection, *cont.*

Percentage of Residents Who Received at Least One COVID-19 Vaccine Dose by Race/Ethnicity (Age 12+) as of 08/14/21

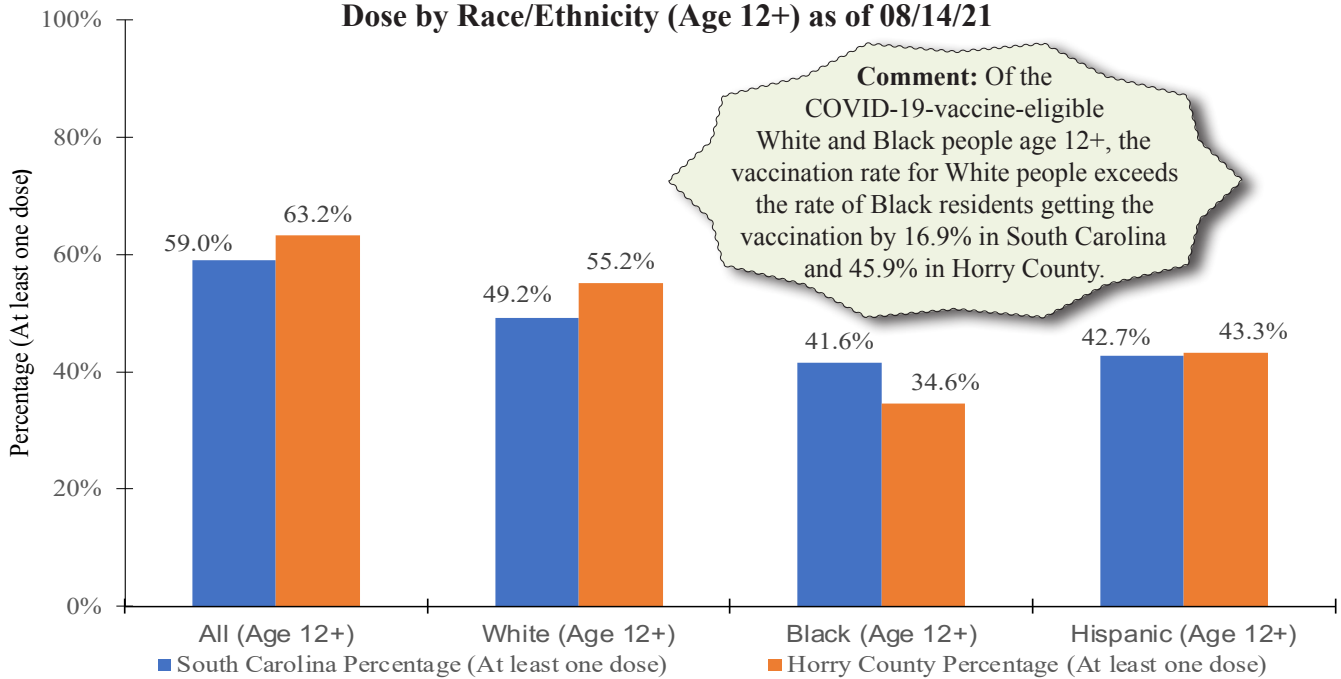


Figure 2.3 Percentage of residents age 12+ years old who received at least one COVID-19 dose by race/ethnicity.

Source: SCDHEC

Percentage of Residents Who Received at Least One COVID-19 Vaccine Dose by Race/Ethnicity (Age 65+) as of 08/14/21

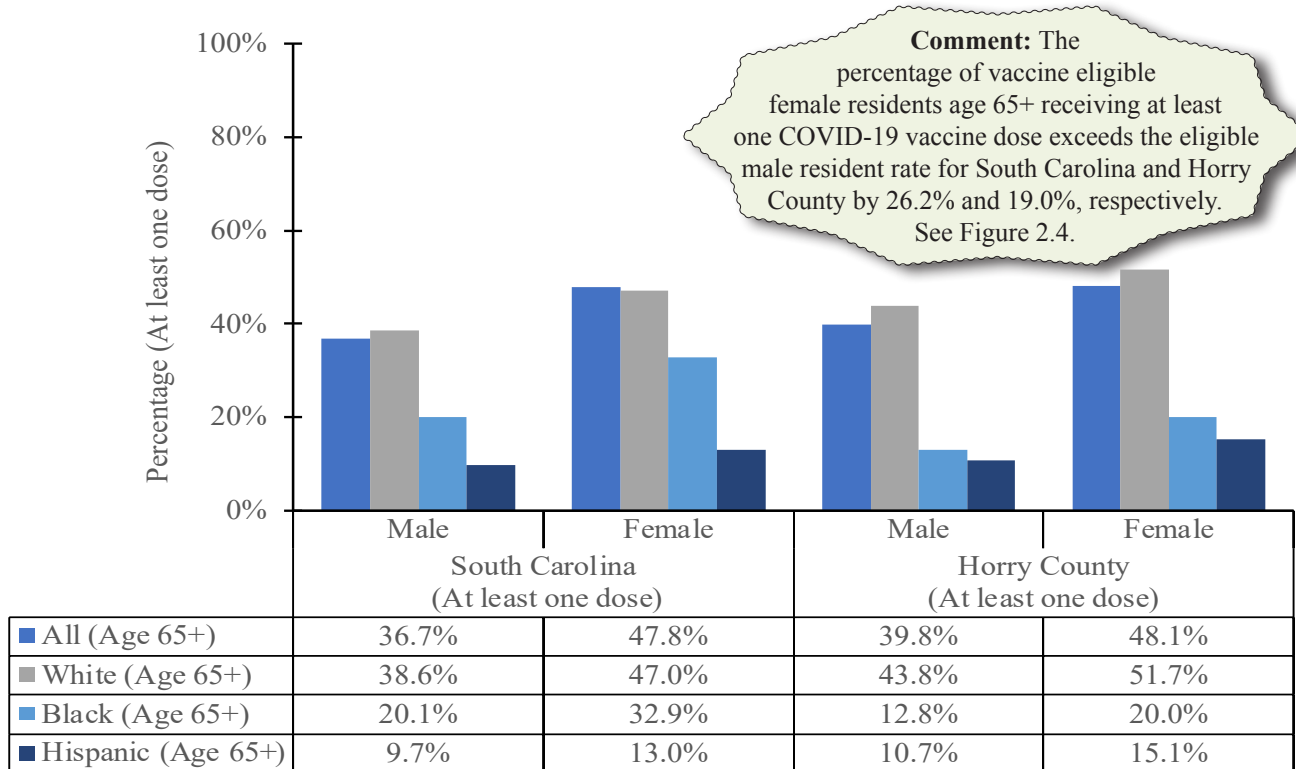


Figure 2.4 Percentage of people from age 65+ who received at least one COVID-19 dose by gender and race/ethnicity.

Source: SCDHEC



II. Percentage of Residents Receiving at Least One COVID-19 Vaccine Injection, cont.

The chart in Figure 2.5 is an extraction from the chart in Figure 2.4 to highlight the low percentage of Black residents who are 65 or older and have not received at least one vaccination. Empirical data has shown that those residents who are 65 and

over are vulnerable to contracting the COVID-19 virus and requiring hospitalization. Therefore, the excerpt (Figure 2.5) is to emphasize these low numbers with the hopes that loved ones will help facilitate seniors getting vaccinated.

Percentage of Black Residents Who Received at Least One COVID-19 Vaccine Dose by Gender (Age 65+) as of 08/14/21

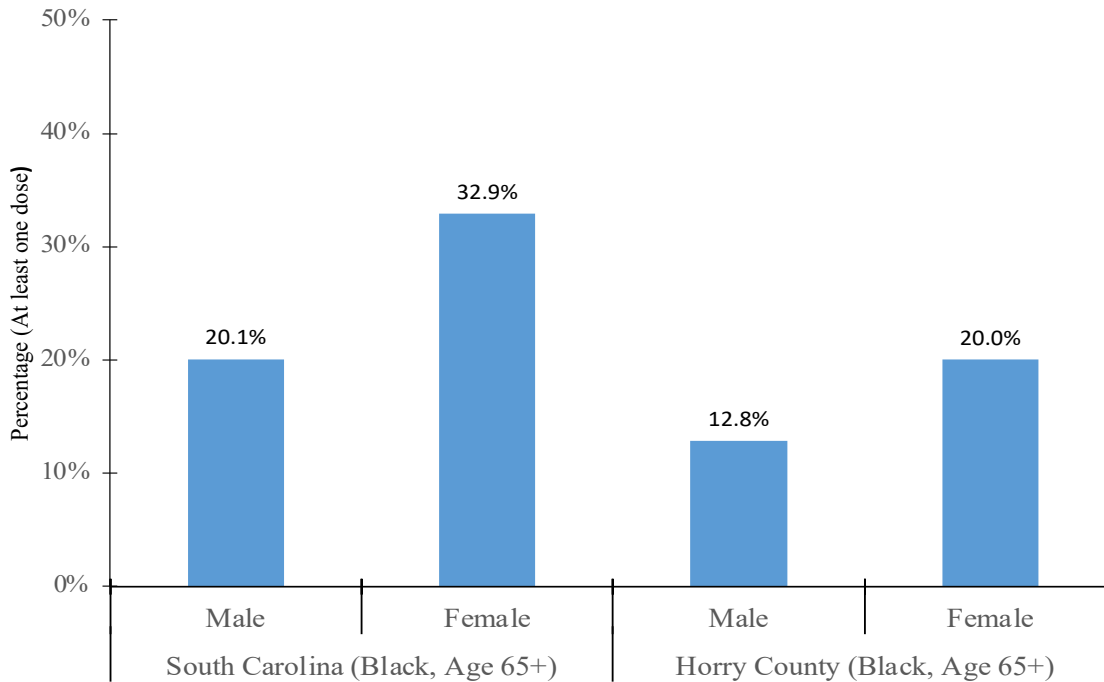


Figure 2.5 Percentage of people from who received at least one COVID-19 vaccine injection

Source: SCDHEC

Summary of Figure 2.5

- Of the COVID-19-vaccine-eligible Black residents age 65+, the vaccination rate for female residents exceeds that of Black male residents by 48.3% in South Carolina and 43.9% in Horry County. Hence, this is the most vulnerable age group.
- Of the COVID-19-vaccine-eligible Black residents age 65+, the vaccination rate for South Carolina female residents exceeds that of Horry County female residents by 48.8%.
- Of the COVID-19-vaccine-eligible Black residents age 65+, the vaccination rate for South Carolina male residents exceeds that of Horry County male residents by 43.8%.
- Although the vaccination rate for Black residents is low (less than 50%), the Black male vaccination rate is even lower at about 46% than the vaccine-eligible Black female in South Carolina and Horry County. Judging from Figure 2.5 and subsequent analysis, there is a significant gap between the vaccine-eligible Black male and female in the 65+ group.



Part III. Cumulative Distribution of COVID-19 Cases and Deaths (02/06/21–08/14/21)

The graphs in Figures 3.1 and 3.2 depict the cumulative increase in positive COVID-19 tests from February 6, 2021, to August 14, 2021. Although the number of cases could only increase because they are cumulative, the intent of the graphs is to demonstrate the magnitude and rate of increase from February 6, 2021, to August 14, 2021. The three largest racial/ethnic groups in South Carolina and Horry County were selected for this report. However, the

populations of all racial/ethnic groups are included in the measurements designated “all.” The start date was determined by when the COVID-19 vaccine was being administered to many residents in South Carolina and Horry County. In June 2021, the number of cases decreased to its lowest rate since March 4, 2020. However, there has been a robust uptick in cases in recent weeks (Figures 4.1 and 4.2).

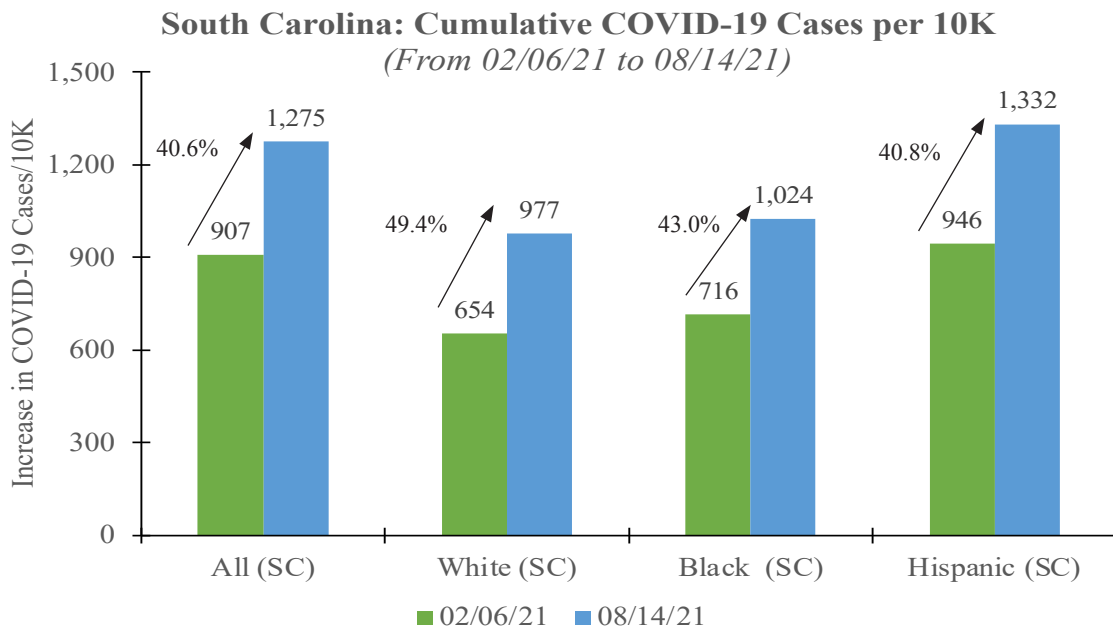


Figure 3.1 South Carolina: Cumulative distribution of residents with the COVID-19 cases per 10K
Source: SCDHEC

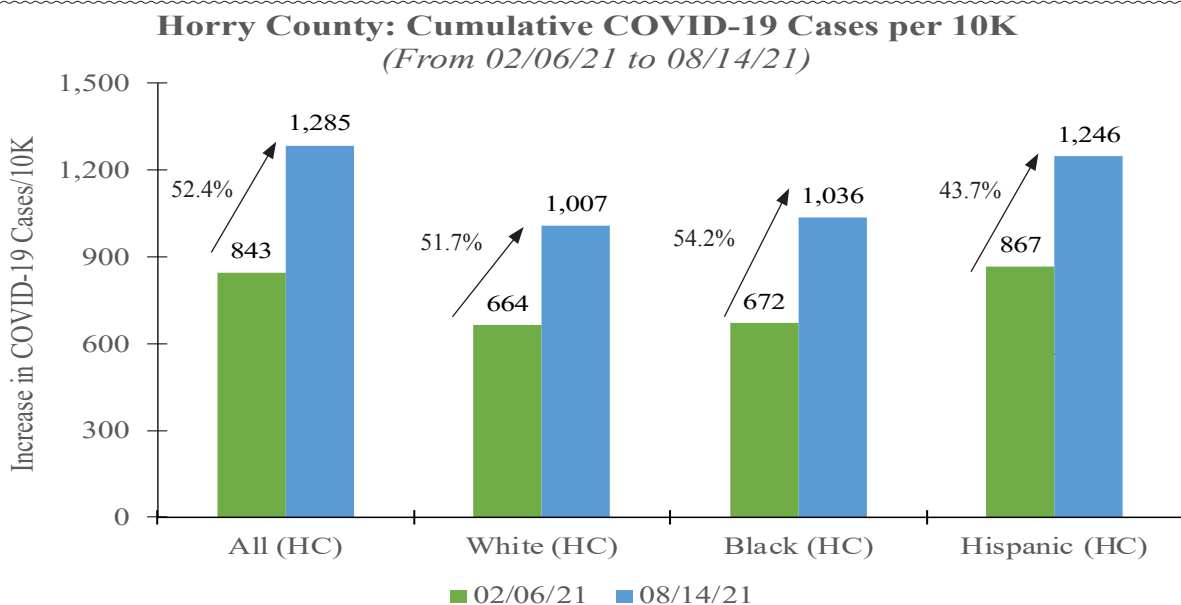


Figure 3.2 Horry County: Cumulative distribution of residents with the COVID-19 cases per 10K
Source: SCDHEC



Part III. Cumulative Distribution of COVID-19 Cases and Deaths (02/06/21–08/14/21)

The graphs in Figures 3.3 and 3.4 depict the cumulative increase in COVID-19 deaths from February 6, 2021, to August 14, 2021. Although the number of deaths could only increase because they are cumulative, the intent of the graphs is to demonstrate the magnitude and rate of increase from February 6, 2021, to August 14, 2021. The three largest racial/ethnic groups in South Carolina and Horry County were selected for this report. However, the populations of all racial/

ethnic groups are included in the measurements designated “all.” The start date was determined by when the COVID-19 vaccine was being administered to many residents in South Carolina and Horry County. In June 2021, the number of deaths decreased to its lowest rate since March 4, 2020. However, there has been slight uptick in deaths in recent weeks (Figure 4.3 and 4.4).

South Carolina: Cumulative COVID-19 Deaths per 10K
(From 02/06/21 to 08/14/21)

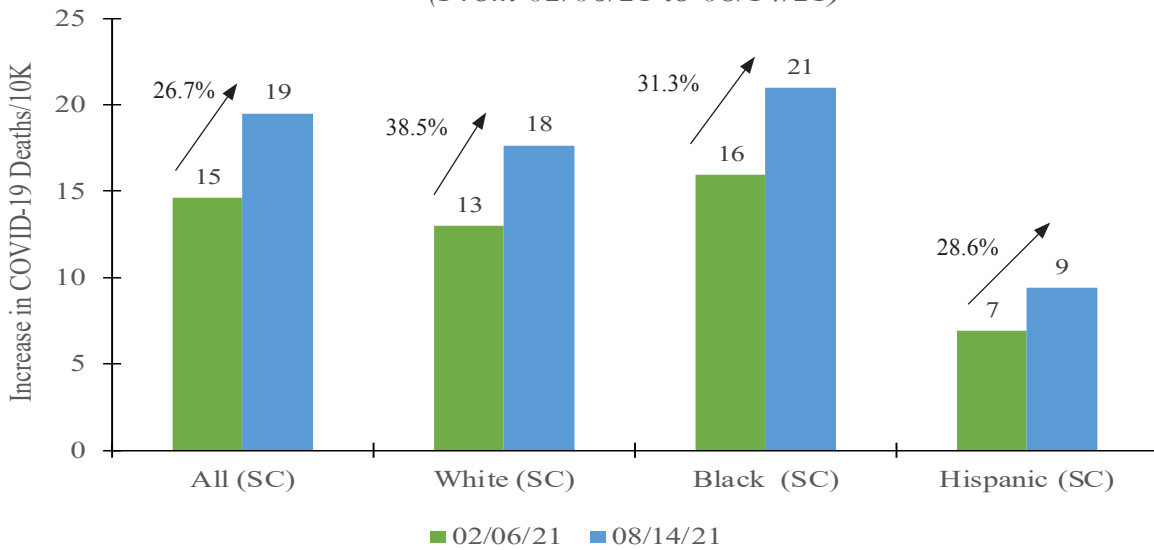


Figure 3.3 South Carolina: Cumulative distribution of residents with the COVID-19 deaths per 10K
Source: SCDHEC

Horry County: Cumulative COVID-19 Deaths per 10K
(From 02/06/21 to 08/14/21)

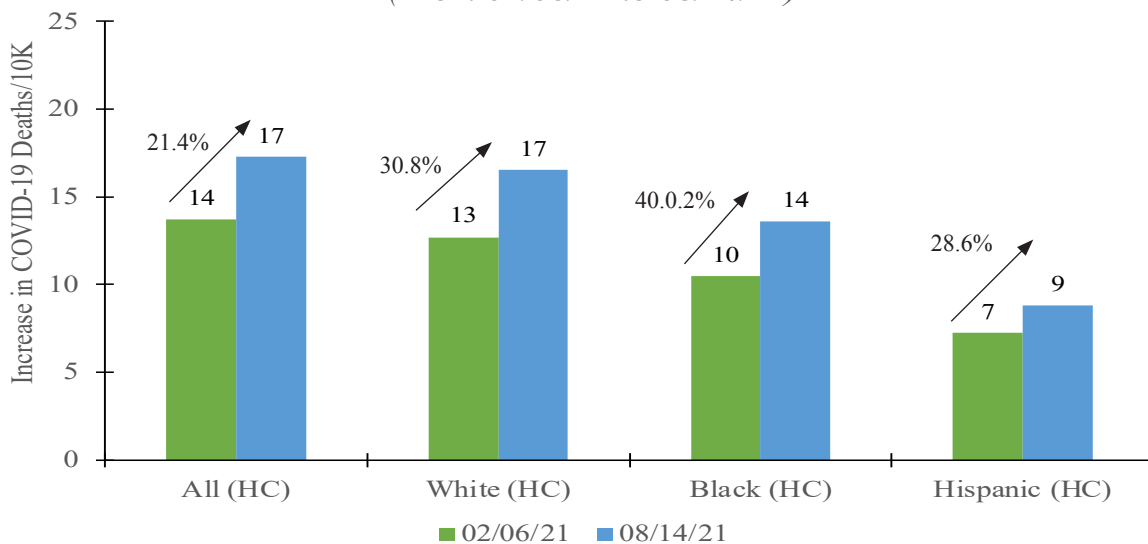


Figure 3.4 Horry County: Cumulative distribution of residents with the COVID-19 deaths per 10K
Source: SCDHEC



Part IV. Analysis of Pattern: COVID-19 Cases and Deaths, cont.

The graphs in Figures 4.1 and 4.2 depict the weekly trend of COVID-19 cases. The trend in Horry County mirrors the state trends, including the current uptick. As shown in Figures 4.1 and 4.2, cases have increased. From June 19, 2021, to August 14, 2021, the number of

cases per week increased sharply—state 22-times and county 23-times—despite a much larger percentage of the population receiving the vaccine and following the CDC guidelines. Perhaps getting vaccinated might be in the state’s and county’s best interests for now.

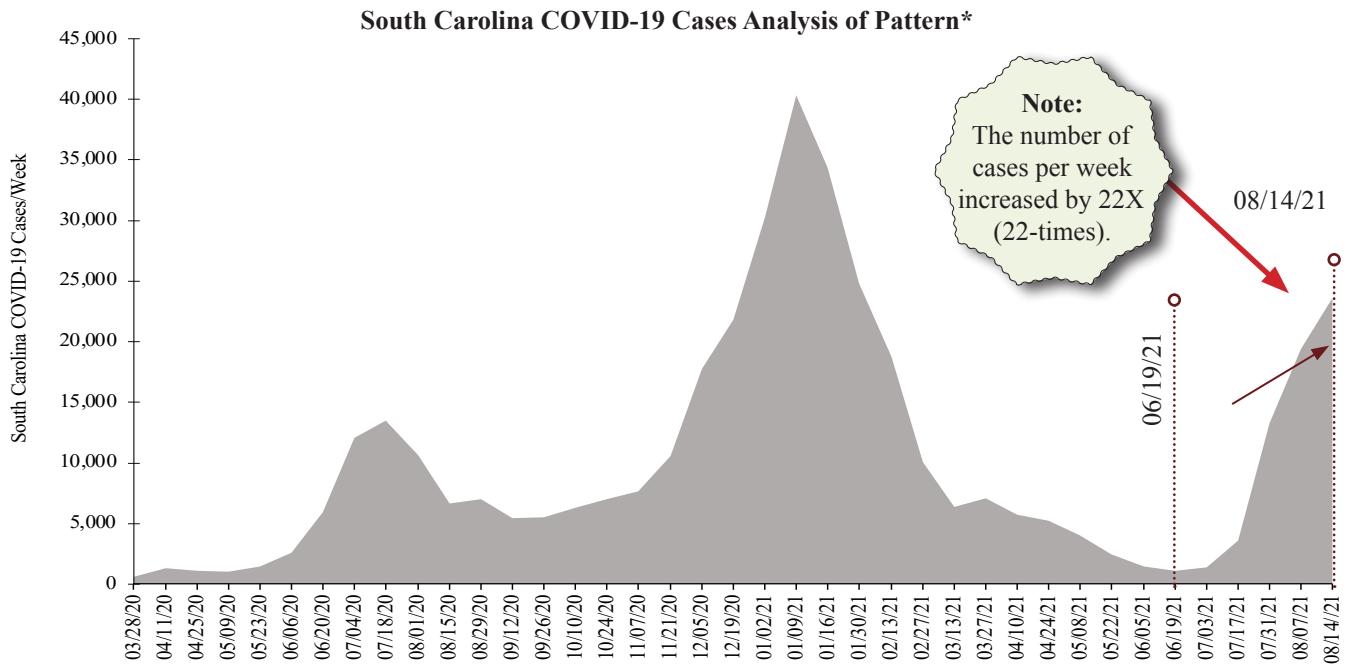


Figure 4.1. The pattern in COVID-19 weekly cases in South Carolina, 03/28/20–08/14/21.

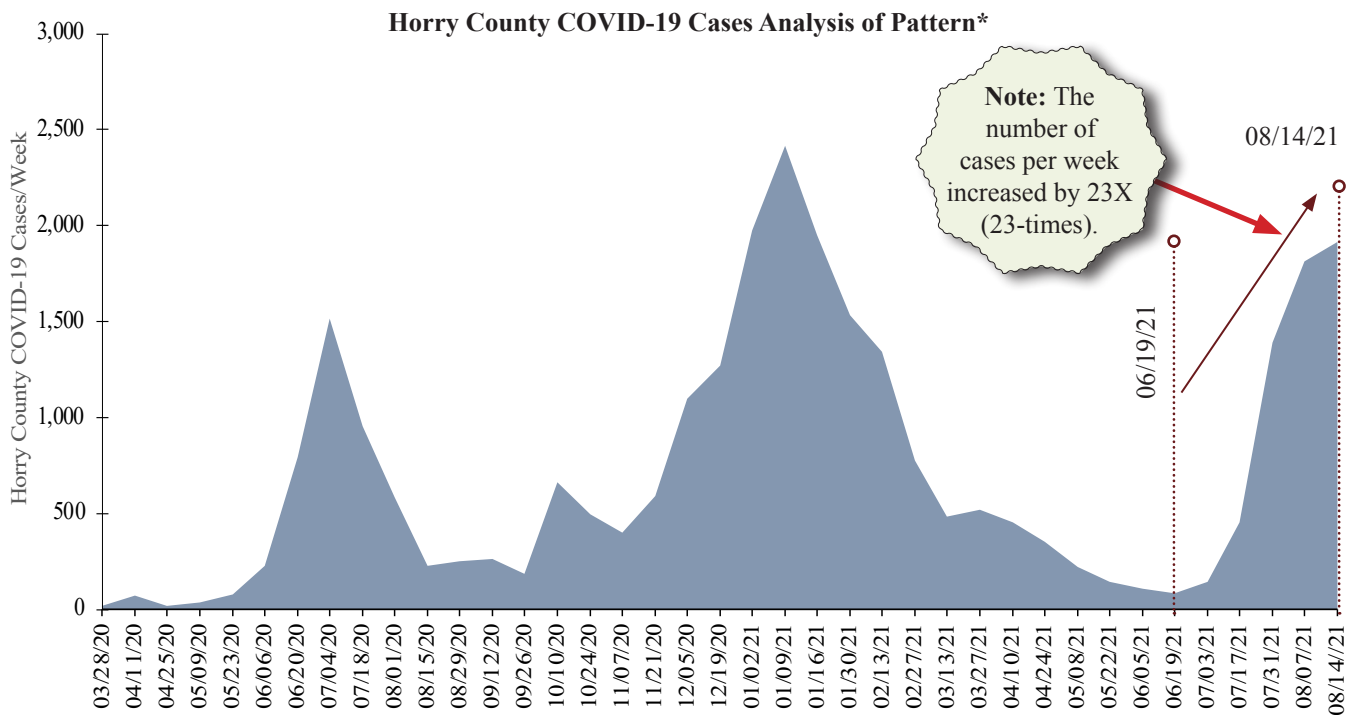


Figure 4.2. The pattern in COVID-19 weekly cases in Horry County, 03/28/20–08/14/21.

*Source: South Carolina Department of Health and Environmental Control



Part IV. Analysis of Pattern: COVID-19 Cases and Deaths

The graphs in Figures 4.3 and 4.4 depict the weekly trend of COVID-19 deaths. The trend in Horry County mirrors the state trends, including the current uptick. As shown in Figures 4.3 and 4.4, deaths have increased. From June 19, 2021, to August 14, 2021, the number of deaths per week increased sharply

by five-times and seven-times for South Carolina and Horry County, respectively. The larger question would the August deaths remained the same as June if more people was vaccinated? Perhaps getting vaccinated might be in the state's and county's best interests for now.

South Carolina COVID-19 Weekly Deaths Analysis of Pattern

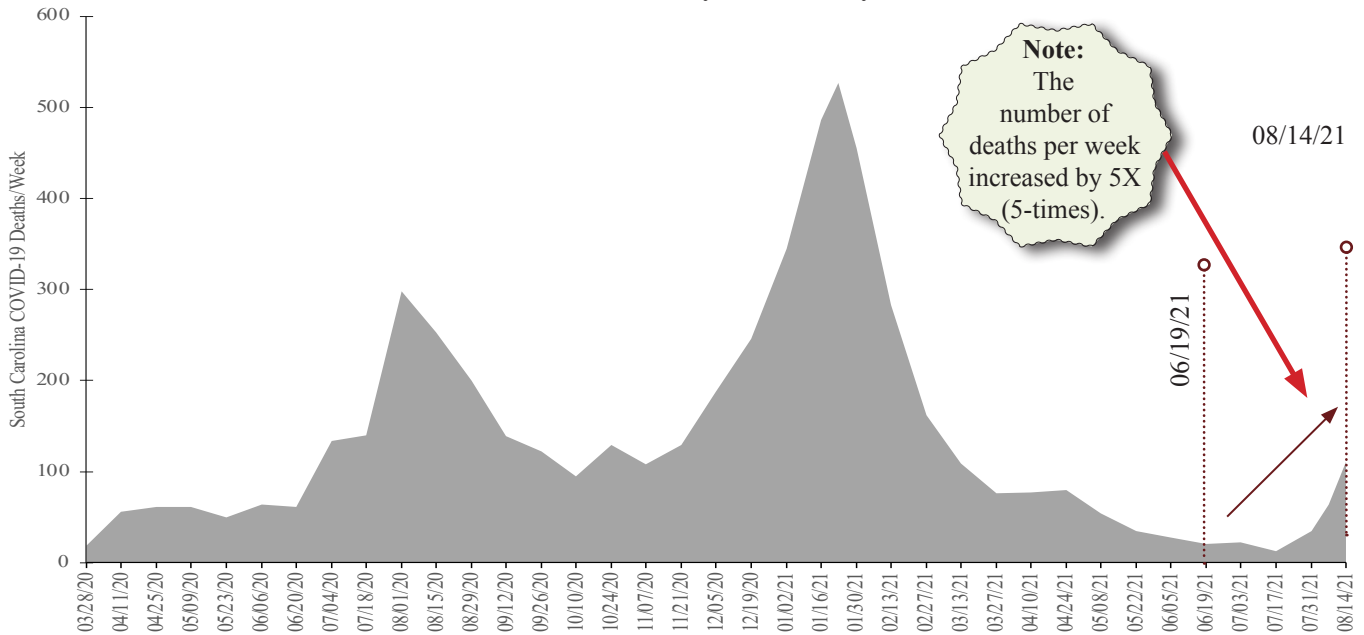


Figure 4.3 The pattern in COVID-19 weekly deaths in South Carolina, 03/28/20–08/14/21.

Source: SCDHEC

Horry County COVID-19 Weekly Deaths Analysis of Pattern

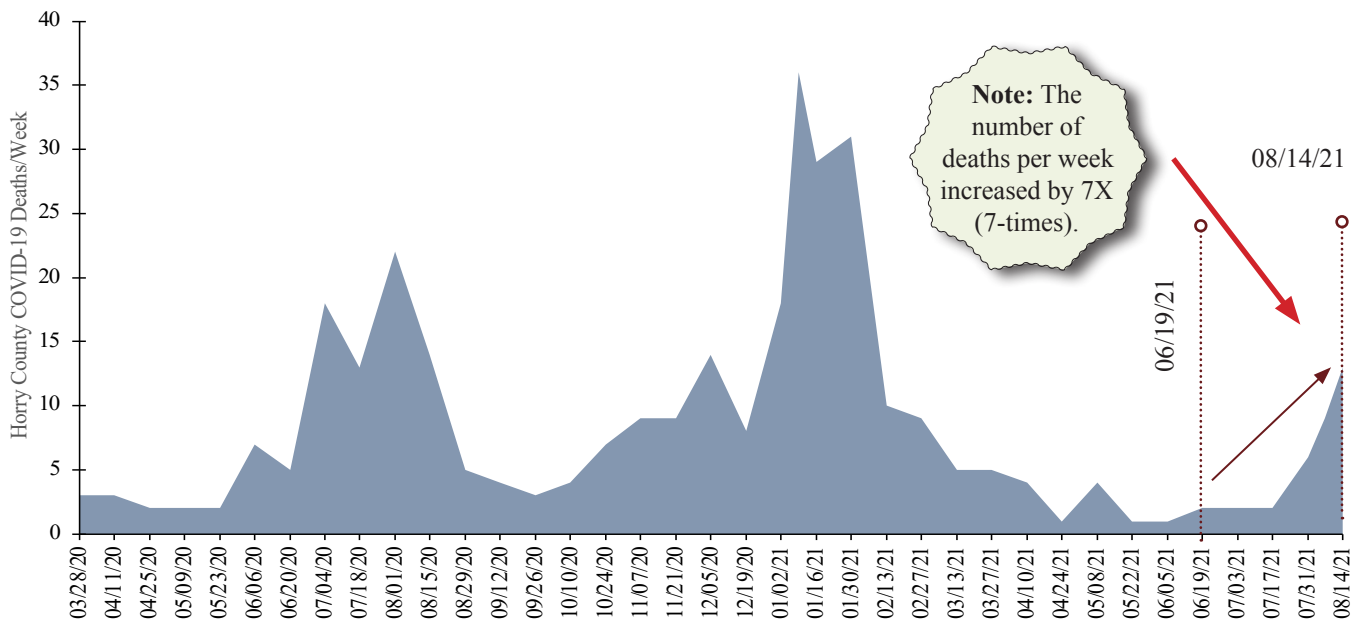


Figure 4.4. The pattern in COVID-19 weekly deaths in Horry County, 03/28/20–08/14/21.

Source: SCDHEC



The Author



David C. Wilson

David C. Wilson is an electrical engineer by training as well as an adjunct mathematics professor who is now retired after working for multinationals such as IBM and General Electric and teaching at schools such as Dutchess Community College, Quinnipiac University, and Horry Georgetown Technical College. He is a statistical consultant, family history researcher, author, and self-publisher. He earned his bachelor's degree from the **City College of New York** and a master's degree from **Manhattan College**. Dave resides in Conway, South Carolina, with his wife, Beverly. They have two adult sons and six grandchildren. He is a native of South Carolina (Horry County).



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It must be demonstrated . . .



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