

THE IMPACT OF COVID-19 ON MEDICARE BENEFICIARIES WITH DEMENTIA

People disproportionately affected by dementia—including the oldest older adults, people with multiple chronic conditions, Black and Hispanic individuals, and nursing home residents—have also been disproportionately impacted by COVID-19. This issue brief examines rates of COVID-19 infections and mortality among Medicare fee-for-service (FFS) beneficiaries to understand the impact of the pandemic on this population.

KEY POINTS

- Medicare FFS beneficiaries with dementia, whether living in the community or nursing homes, had among the highest rates of COVID-19 diagnosis and mortality of all of the Medicare FFS populations evaluated.
- Between February 28 and September 27, 2020, 166,485 beneficiaries with dementia (8.8%) were diagnosed with COVID-19, compared to 2.4% of all Medicare FFS beneficiaries.
- Almost one-third of beneficiaries with dementia who were infected with COVID-19 died, regardless of whether they lived in the community or in a nursing home, almost twice the 17.5% mortality rate among all Medicare FFS beneficiaries.
- After controlling for living arrangements, age, chronic conditions, and other characteristics, the likelihood of being diagnosed with COVID-19 was 1.5 times greater for persons with dementia and their risk of dying was 1.6 times higher.

BACKGROUND

The novel coronavirus, COVID-19, has had a significant impact on older adults in the United States, with increasing risk of mortality at older ages. Dementia is another condition whose prevalence increases with age and may increase the risk of severe illness or death from COVID. Dementia causes the “loss of cognitive functioning—thinking, remembering, and reasoning—and impacts behavioral abilities to such an extent that it interferes with a person’s daily life and activities.”¹ The most common and well-known cause of dementia is Alzheimer’s disease, but other dementias include Lewy body, frontotemporal, and vascular dementias. At first dementia causes minor symptoms, but for these progressive conditions, symptoms worsen over time, significantly impairing memory and thinking skills. Eventually, many people living with dementia need assistance with daily living tasks and are reliant on others for assistance. These daily tasks include bathing, dressing, eating, and toileting—activities that require close contact with the person providing the support. Family and friends provide much of this assistance,² but people with dementia often eventually need long-term services and supports such as home care, adult day services, or care in a residential facility such as assisted living or nursing home. In 2016, approximately half of the 1.2 million people living in nursing homes (long-stay residents) were diagnosed dementia.³

The risk of dementia increases with age: Among community-dwelling older adults, the prevalence increases from 2% among adults ages 65-69 to 33% among adults aged 90 and older.² People who are White and non-Hispanic are less likely to develop dementia than people who are Black or Hispanic.⁴ People with dementia are more likely to have other chronic conditions such as heart disease, hypertension, arthritis, osteoporosis, diabetes, lung disease, stroke, or cancer, and to have multiple chronic conditions.² Most types of dementia are fatal conditions. For example, Alzheimer's disease is the sixth leading cause of death overall and the fifth leading cause of death among people 65+ in the United States.⁵

According to the Centers for Disease Control and Prevention (CDC) age, multiple chronic conditions, and disability are risk factors for more severe illness or death from COVID-19.⁶ Some of the highest rates of infection and mortality have occurred among people living in congregate care facilities such as nursing homes where residents live in shared spaces and receive personal care from staff who support many residents. As of September 24, 2020, an estimated 80,193 people in long-term care facilities had died in 2020 due to COVID-19, accounting for at least 41% of all United States deaths.⁷

These risk factors put people with dementia at significant risk of high morbidity and mortality due to COVID-19. Recent research has demonstrated increased risk for COVID-19 infection, hospitalizations, and mortality, independent of demographic characteristics and other risk factors for people with dementia.⁸ There are also concerns about higher rates of mortality due to unintended impacts of the pandemic such as depression, loneliness, and social isolation.^{9,10} This issue brief examines the impacts of COVID-19 on Medicare beneficiaries with dementia both in the community and in nursing home settings by examining rates of infection and mortality, and comparing dementia to other demographic and clinical risk factors.

METHODS

We analyzed unadjudicated claims and mortality data on 28 million FFS Medicare beneficiaries in all eligibility categories enrolled in Medicare Parts A and B with at least one claim in the past 14 months, approximately 45% of all Medicare beneficiaries, from February 28 to September 27, 2020. The outcome variables were COVID-19 diagnosis, all-cause mortality, and mortality following COVID-19 diagnosis. Dementia and other comorbid conditions were determined using claims data for the 14 months prior to February 28, 2020. Nursing home residence was determined based on the Minimum Data Set (MDS). "Excess mortality" was a comparison of monthly deaths in 2020 (COVID-19 and non-COVID-19) to 2019 (all-cause). In order to examine the unique contribution of dementia on the risk for COVID-19 infection and mortality, we conducted two discrete multivariate logistics regressions. All of the variables in Table 1 were included in the model. Unless otherwise noted, throughout this brief Medicare FFS beneficiaries with dementia are compared to the overall Medicare FFS population.

FINDINGS

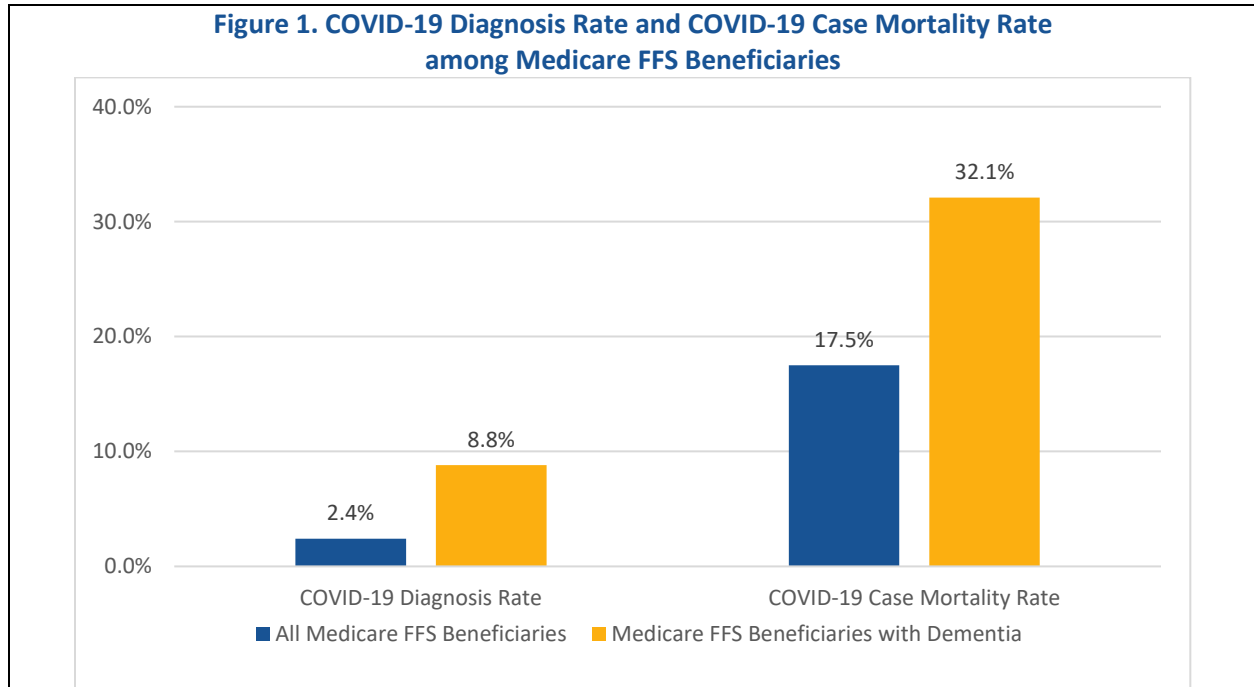
Among the total of 28.2 million Medicare FFS beneficiaries in the study, more than 1.89 million had a claim indicating dementia in the 15 months prior to the start of the study period. Similar to previous research, our study population of beneficiaries with dementia were more likely to be older, female, Black or Hispanic, be dually eligible for Medicare and Medicaid, and have more chronic conditions than the overall Medicare FFS population. They were also more likely to reside in nursing homes (see Table 1).

*From February 27 through September 27, 2020, **53,490 beneficiaries with dementia died** of COVID-19, accounting for **44.6% of deaths** among the Medicare FFS beneficiaries.*

During the study period, 166,485 (8.8%) beneficiaries with dementia were diagnosed with COVID-19--a rate 3.7 times higher than the overall Medicare FFS population (684,141; 2.4%; see Table 2). People with dementia

accounted for 24.3% of the 684,141 cases among Medicare beneficiaries, despite being only 6.7% of the Medicare FFS population.

Over 53,490 beneficiaries with dementia died from COVID-19, accounting for 44.6% of the deaths among the Medicare FFS population (119,879). Among beneficiaries with dementia diagnosed with COVID-19, 32.1% died compared to 17.5% of all Medicare FFS beneficiaries without dementia.



Beneficiaries with dementia have among the highest rates of COVID-19 diagnosis and mortality of all of the populations evaluated. Table 1 displays the rates of diagnosis and mortality among all of the population characteristics examined. The highest rates of diagnosis were among beneficiaries with dementia (8.8%) and long-stay nursing home residents (22.5%).^a Beneficiaries over age 85, short-stay nursing home residents, and those with dementia had the highest mortality rates—about one-third of these beneficiaries died after COVID-19 diagnosis.

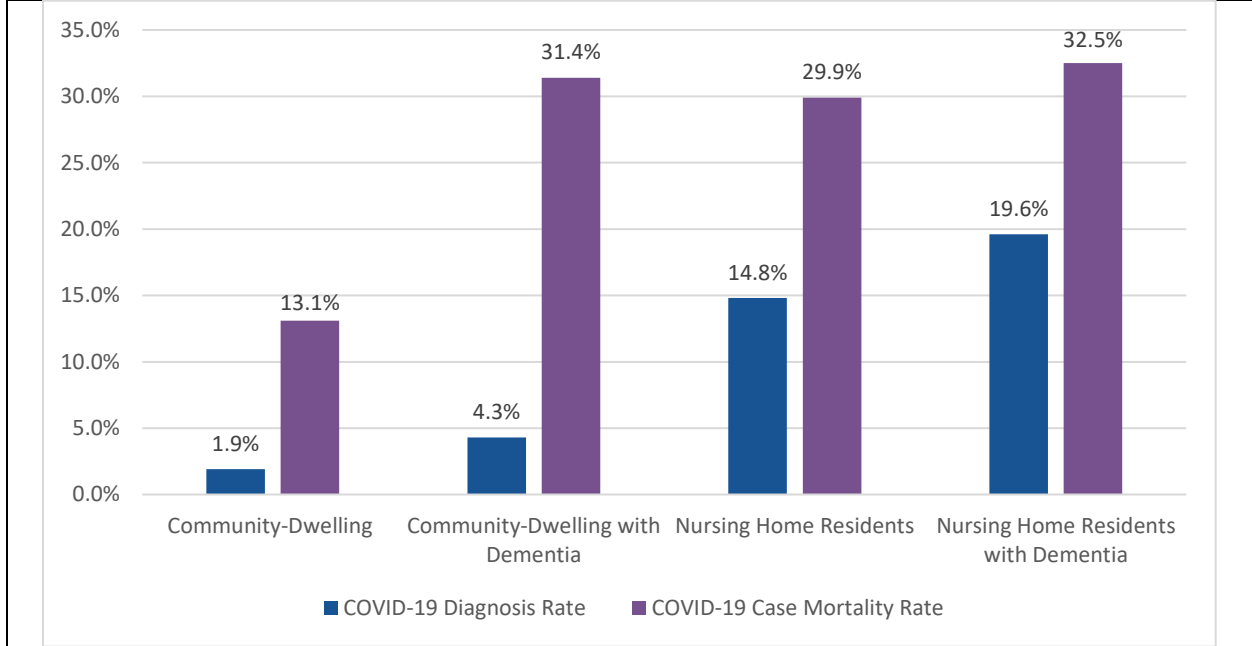
Among the 14 chronic conditions examined, the highest diagnosis and mortality rates were among people with dementia.

Residential Setting. Because COVID-19 had such a significant impact on nursing homes, and people with dementia are more likely to live in these settings than people without dementia, we analyzed rates of diagnosis and mortality across residential settings. Figure 2 shows the rates of COVID diagnosis across four populations: community-dwelling beneficiaries, community-dwelling beneficiaries with dementia, nursing home resident beneficiaries, and nursing home resident beneficiaries with dementia. Consistent with other research, the rates of COVID-19 diagnosis and mortality were much higher among nursing home residents than among beneficiaries living in the community. In both the community and the nursing home settings, beneficiaries with dementia had higher rates of diagnosis and mortality than the overall population. The mortality rate was essentially the same among beneficiaries with dementia living in the community (31.4%) and those living in nursing homes (32.5%).

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^a Medicare FFS beneficiaries who had been in the nursing home for more than 90 days were categorized as long-stay residents while those with stays shorter than 90 days were categorized as short-stay residents.

Figure 2. COVID-19 Diagnosis Rate and COVID-19 Case Mortality Rate among Medicare FFS Beneficiaries, by Residential Setting



Multivariate Regression. The results of two logistic regression analyses showed that some, but not all, of the increased risk for COVID diagnosis and mortality among people with dementia is attributable to other characteristics. The raw risk for diagnosis among beneficiaries with dementia was 4.8 times higher than beneficiaries without dementia. After controlling for demographic characteristics, nursing home residence, health conditions, and number of health conditions, people with dementia were 1.5 times more likely than beneficiaries without dementia to be diagnosed with COVID-19. Similarly, the raw risk of death from COVID-19 was 3.2 times higher for beneficiaries with dementia than those without. After the above characteristics were statistically controlled, people with dementia were still 1.6 times more likely to die from COVID-19.

*After statistically controlling for other risk factors, beneficiaries with dementia were **1.5 times more likely to be diagnosed with COVID-19 and 1.6 times more likely to die from it.***

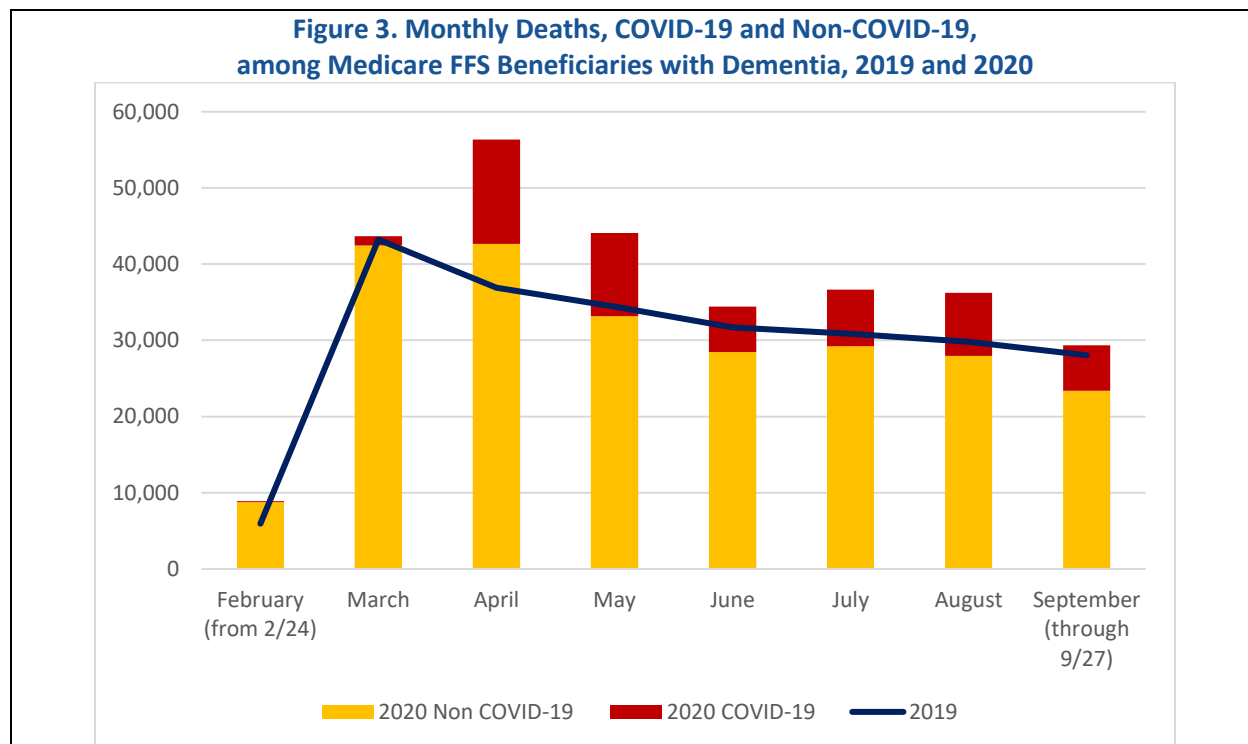
Excess Deaths. During the study period in 2020, a total of 274,910 beneficiaries with dementia died from all causes, compared to 232,449 deaths among this same population in 2019, or approximately 42,000 excess deaths.^{b,c} Adjusting for the size of the population, this translates to a mortality rate of 12.0% in 2019 and 14.2% in 2020 over the 31 weeks of this study, an 18% increase.

Figure 3 compares the number of deaths, by month, during the study period in 2019 and 2020. Despite the population being slightly larger in 2019, essentially the same number of people with dementia died in February and March 2020 as in February and March 2019. Deaths peaked in April 2020 when over 56,000 beneficiaries with dementia died--almost 20,000 more than died in April 2019.

^b The population beneficiaries with dementia at the start of 2019 was 1,936,378; at the start of 2020 it was 1,891,333.

^c This is consistent with a CDC estimate of 30,248 more dementia-related deaths from February 1 to October 9, 2020, than the average from 2015-2019. Available at: https://www.cdc.gov/nchs/nvss/vsrr/covid19/excess_deaths.htm.

In order to understand how many of these excess deaths are attributable to COVID-19, Figure 3 shows deaths by month in 2019 and 2020 (COVID-19 and non-COVID-19). Without COVID, the number of deaths (non-COVID-19) in 2020 would essentially be the same as the number of deaths in 2019. There is a significant number of excess deaths in almost every month in 2020, and most of these excess deaths are due to COVID-19. The exception to this pattern is April, when 2020 non-COVID-19 deaths exceeded 2019 deaths.



DISCUSSION

People with dementia in this study population had significantly higher COVID-19 diagnosis and mortality rates than the overall Medicare FFS population, rates that exceeded populations with most other demographic and chronic health condition risk factors. Our findings are consistent with other research that has demonstrated high rates of COVID-19 infections and mortality among people of all ages with dementia.⁸ In addition, there was a significant amount of excess mortality among beneficiaries with dementia in 2020 compared to 2019.

Much of the risk of COVID diagnosis and mortality was explained by risk factors such as age, chronic conditions, and nursing home residence. However, the multivariate analyses show that beneficiaries with dementia are still 1.5 times more likely to get COVID-19 and 1.6 times more likely to die from it than beneficiaries without it. This underscores the vulnerability of this population over and above older adults or other beneficiaries with multiple chronic conditions in the Medicare FFS population.

The monthly mortality comparisons show that most of the excess deaths among Medicare FFS beneficiaries with dementia in 2020 can be attributed to COVID-19. The exception to this pattern is April, when non-COVID mortality rates exceeded 2019 mortality rates. The non-COVID-19 excess mortality may be due to unidentified COVID-19 as well as higher mortality associated with the tremendous disruption to the emergency response and health care system early in the pandemic.

As of March 23, 2020 dementia is characterized as a condition that “might be” a cause of increased risk for severe illness.¹¹ The growing body of research on the impact of COVID-19 on people with dementia will help CDC determine whether dementia should be added to the list of conditions with which adults *are* at an

increased risk of severe illness.¹² While people with dementia are likely to be identified as high-risk because of other characteristics such as age, chronic health conditions, or nursing home residence, dementia may exacerbate the risk to these individuals. Special attention should be given to this population in nursing homes and other congregate care settings, where evidence suggests that cognitive impairment such as dementia is associated with an increased risk of COVID mortality.¹³ However, infection control policies and practices such as restricting visitors need to be balanced with considerations about the quality of life for the person with dementia, as well as their families. Our results also showed that mortality is as high among beneficiaries with dementia in the community as in nursing home settings, despite the fact that beneficiaries in nursing home settings are likely to have higher levels of impairment and need for assistance. It is important for the public, including people living with dementia, family caregivers, and providers, to understand the heightened risk of mortality among this population. Lessons from the COVID-19 pandemic on the vulnerability of this population will inform the response to future pandemics as well as approaches to seasonal influenzas.

An important benefit to CDC's recommendation to prioritize vaccination of people living in nursing homes and over the age of 75 is that these two priority groups cover a large population of people with dementia. Over 75% of the Medicare beneficiaries with dementia in this study met at least one of these criteria. As of March 23, 2021, over 2.1 million people living in long-term care facilities (including nursing homes and assisted living facilities) had received at least one dose of a COVID-19 vaccine concurrent with declines in infections and deaths in these facilities, which have reached some of the lowest levels since the pandemic began.^{14,15} Among the roughly 22.6 million people over 75 in the United States, 15.1 million had received at least one dose of the COVID-19 vaccine.¹⁶

These analyses were limited by the population, which is only representative of Medicare FFS beneficiaries (Parts A and B) with a claim in the previous 14 months. Identification of COVID-19 infection was based on Medicare claims and therefore only reflects cases where the beneficiaries received medical care for a COVID diagnosis. The data are an undercount of beneficiaries with COVID because beneficiaries who may have had COVID-19 but did not seek medical care are not reflected in the COVID cases. Because testing capabilities and availability improved over the course of the pandemic, these results may more accurately reflect infections later in the study period. In addition, Medicare claims may not accurately capture the population of people with dementia.¹⁷

Advanced age, nursing home residence, multiple chronic conditions, and other demographic characteristics explain a great amount of the higher risk for COVID-19 diagnosis and mortality among Medicare beneficiaries with dementia. However, even after controlling for these and other characteristics, persons with dementia continued to have higher risk of diagnosis and death. This may be the result of COVID-19's damaging effects on pulmonary, cerebrovascular and renal systems, which may already be compromised by underlying diseases associated with dementia. A forthcoming paper will provide the full results of multivariate analyses of COVID-19 diagnosis and mortality rates among Medicare FFS beneficiaries. In addition, research is underway to examine the risk factors associated with higher infection and mortality within the population of people with dementia, such as race, among Medicare FFS beneficiaries.

SUPPLEMENTAL DESCRIPTIVE STATISTICS

Table 1: Characteristics of the Medicare FFS Population with Dementia and Overall Medicare FFS Population

Population Characteristics	Medicare FFS Beneficiaries with Dementia	Medicare FFS Beneficiaries
All Medicare FFS (Total)	1,887,217 (6.69%)	28,215,887
Age		
Under 65	5.02%	13.23%
65-74	17.05%	45.87%
75-84	36.38%	28.69%
85+	41.55%	12.22%
Gender		
Male	36.93%	45.14%
Female	63.07%	54.86%
Race/Ethnicity		
White	83.54%	83.58%
Black	9.53%	8.23%
Hispanic	2.05%	1.95%
Other Non-White	4.88%	6.24%
Nursing Home Status		
Nursing Home status - Long-term	21.46%	2.23%
Nursing Home status - Short-term	8.12%	2.12%
Dual	33.03%	16.64%
Health Conditions		
Chronic Kidney Disease	1.46%	0.86%
End-Stage Renal Disease	1.91%	1.47%
Chronic Obstructive Pulmonary Disease	20.93%	12.77%
Other Respiratory Disease	5.69%	2.54%
Cardiac Disorder	34.50%	17.79%
Diabetes	34.27%	25.90%
Immune Deficiency	13.16%	5.53%
Severe Neurologic Condition	27.41%	8.45%
Cancer	7.00%	6.49%
Hypertension	57.87%	54.38%
Breast/Prostate Cancer	6.49%	6.70%
HIV/AIDS	0.25%	0.32%
Obesity	4.89%	6.94%
None of the above conditions	0.00%	23.40%
Any 1 of the above conditions	7.74%	29.96%
Any 2 of the above conditions	27.45%	25.12%
Any 3 of the above conditions	29.48%	13.17%
4 or more of the above conditions	35.33%	8.35%

Table 2: COVID-19 Infection and Mortality Rates by Demographic Characteristics and Health Conditions

Population Characteristic	COVID-19 Diagnosis Rate	COVID-19 Mortality Rate
All Medicare FFS (Total)	2.4%	17.5%
Age		
Under 65	2.8%	9.4%
65-74	1.9%	10.7%
75-84	2.4%	19.2%
85+	4.0%	33.3%
Gender		
Female	2.5%	15.9%
Male	2.3%	19.7%
Race/Ethnicity		
White	2.2%	16.9%
Black	4.1%	20.5%
Hispanic	4.6%	18.6%
Asian	2.2%	23.3%
Native American	3.5%	19.5%
Other	1.9%	15.1%
Nursing Home Status		
Nursing Home Resident (Long)	22.5%	28.4%
Nursing Home Resident (Short)	6.6%	35.1%
Original Reason for Medicare Entitlement		
Aged	2.2%	18.7%
Disabled	3.2%	14.4%
End-Stage Renal Disease	6.6%	21.8%
Dual Eligible	5.5%	22.2%
Health Conditions		
None of the following conditions	1.0%	7.3%
Chronic Kidney Disease	3.5%	28.9%
End-Stage Renal Disease	7.6%	27.3%
Chronic Obstructive Pulmonary Disease	4.5%	21.4%
Other Respiratory Disease	5.1%	24.2%
Cardiac Disorder	4.6%	24.2%
Diabetes	3.6%	20.7%
Immune Deficiency	6.0%	26.1%
Severe Neurologic Condition	5.3%	24.7%
Cancer	3.1%	24.3%
Hypertension	2.5%	15.8%
Dementia	8.8%	32.1%
Breast/Prostate Cancer	2.3%	15.4%

Population Characteristic	COVID-19 Diagnosis Rate	COVID-19 Mortality Rate
HIV/AIDS	4.4%	14.9%
Obesity	3.7%	15.7%
Any 1 of the above conditions	1.6%	9.7%
Any 2 of the above conditions	2.5%	15.9%
Any 3 of the above conditions	4.0%	20.8%
4 or more of the above conditions	6.8%	27.0%

ADDITIONAL METHODOLOGICAL INFORMATION

These analyses do not include nearly 25 million beneficiaries enrolled in the Medicare Advantage program or approximately 7 million FFS beneficiaries who were not enrolled in Part B or who did not have a claim in the 14 month prior to February. COVID diagnosis was indicated based on XX code in the Medicare FFS claims, a code that became available as of April 1, 2020. Prior to that date, we used five diagnoses to indicate probable COVID-19: Other viral pneumonia; Acute bronchitis due to other specified organisms; Unspecified acute lower respiratory infection; Other specified respiratory disorders; Acute respiratory distress syndrome. Indication of a beneficiary's death was taken from one of three sources: hospital inpatient claims, the MDS required for beneficiaries using nursing homes; or Medicare's Enrollment Data System, which receives mortality information from the Social Security Administration. Presence of dementia determined using codes HCC51: Dementia With Complications (HCC v21) HCC52: Dementia Without Complication (HCC v21).

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