U.S. Department of Health and Human Services
Office of Inspector General
Data Snapshot
June 2021, OEI-02-20-00490

COVID-19 Had a Devastating Impact on Medicare Beneficiaries in Nursing Homes During 2020

Key Takeaways

- 2 in 5 Medicare beneficiaries in nursing homes were diagnosed with either COVID-19 or likely COVID-19 in 2020.
- Almost 1,000 more beneficiaries died per day in April 2020 than in April 2019.
- Overall mortality in nursing homes increased to 22 percent in 2020 from 17 percent in 2019.
- About half of Black, Hispanic, and Asian beneficiaries in nursing homes had or likely had COVID-19, and 41 percent of White beneficiaries did.
- Understanding the pandemic's effects on nursing home residents is necessary if tragedies like this are to be averted.

Why These Data Are Important

The COVID-19 pandemic has presented extraordinary challenges for the Nation's health care system. Nursing home residents have been particularly affected by the disease, as they are predominately elderly, tend to have underlying conditions, and live in close quarters.

The media have chronicled the fear, loneliness, and isolation residents have endured, as well as the grief they have felt watching so many peers die. However, data on the number of nursing home residents who were diagnosed with COVID-19 or likely COVID-19 have not been readily available, particularly for early in the pandemic. Nursing homes are not required to report cases and deaths that occurred before May 8, 2020. It is important that we understand the extent of the outbreaks in nursing homes, including increases in deaths, to not only acknowledge the pandemic's toll, but to improve efforts to mitigate the damage of the continuing pandemic, and better prepare for future public health emergencies.

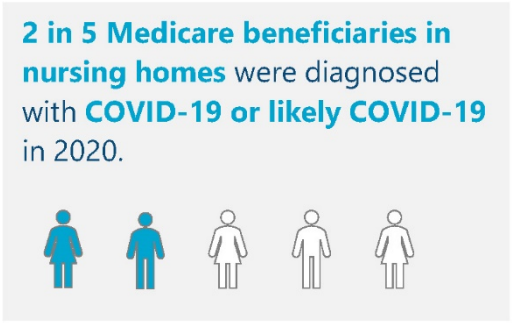
This data snapshot provides objective, standardized data based on Medicare claims for all Medicare beneficiaries in nursing homes throughout the country.[a] This snapshot is part of an Office of Inspector General (OIG) initiative focusing on COVID-19 and nursing homes.[1] Recent work examined infection control and complaint surveys conducted during the early months of the pandemic.[2] Upcoming work will focus on strategies nursing homes have used to combat the pandemic.[3] The goal of this body of work is to help protect the health and safety of the vulnerable nursing home population.

Understanding how many beneficiaries in nursing homes were affected, who they were, and what characteristics may have put some at greater risk can help prevent future tragedies. This data snapshot aims to inform public health and contribute to the body of knowledge needed to combat this pandemic and protect vulnerable seniors as well as the general population. As this pandemic has shown, hardships faced in nursing homes can quickly spread across the rest of the Nation.

[a] This data snapshot provides new information and is not equivalent to other previously reported data on nursing home COVID-19 cases and deaths. Our analysis is based on Medicare claims data and does not include nursing home residents who are not Medicare beneficiaries. Further, our findings include Medicare residents diagnosed with "likely COVID" and describe trends in overall mortality of Medicare nursing home residents, not just those with COVID-19.

Diagnoses and Overall Deaths

2 in 5 Medicare beneficiaries in nursing homes were diagnosed with COVID-19 or likely COVID-19 in 2020. About 3.1 million Medicare beneficiaries resided in nursing homes in 2020. Forty-two percent of them—1.3 million beneficiaries—had or likely had COVID-19, according to diagnoses on their Medicare claims. For context, about 6 percent of the Nation's population were reported to have been infected by the end of December.[4] Of the 1.3 million Medicare beneficiaries residing in nursing homes who had or likely had COVID-19, 762,594 were confirmed to have COVID-19 and 532,901 were diagnosed as likely having it, meaning COVID-19 was suspected but not confirmed by a positive test result.

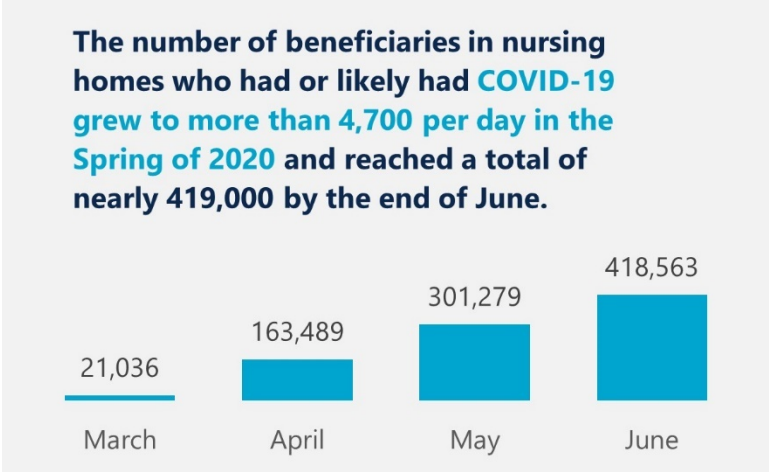


This analysis includes all beneficiaries who were enrolled in Medicare and resided in a nursing facility or skilled nursing facility— collectively referred to here as nursing homes—during 2020. It determines the number of beneficiaries who were diagnosed with COVID-19 or likely COVID-19 in a nursing home as well as those diagnosed in the hospital or other care settings after being transferred from the nursing home. It also provides the overall number of deaths; it does not attribute cause of death. See Methodology for more detailed information on nursing home residency and diagnosis codes.

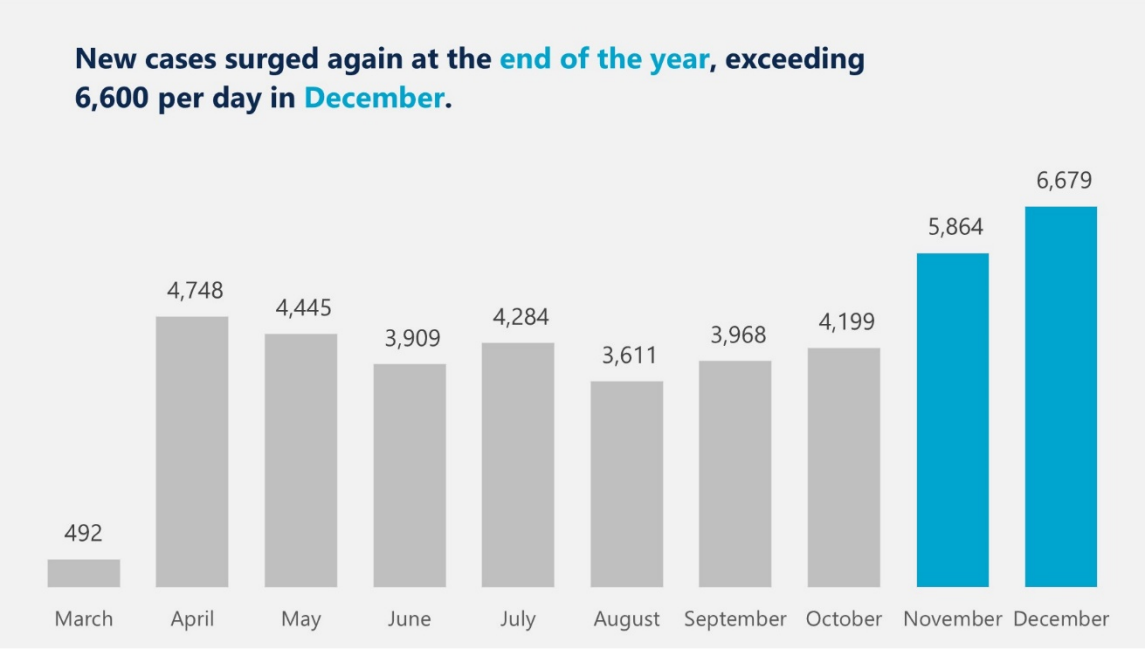
The number of infected beneficiaries in nursing homes grew exponentially in the spring of 2020. The country's first confirmed case of COVID-19 was in January 2020.[5] Over the course of a few weeks in the spring, the number of beneficiaries in nursing homes who had or likely had COVID-19 increased dramatically. In March, 492 Medicare beneficiaries in nursing homes per day were diagnosed as having or likely having COVID-19. That increased almost tenfold in April, which averaged more than 4,700 new cases per day.

In total, just over 21,000 Medicare beneficiaries were diagnosed as having or likely having COVID-19 from January through March 2020. By the end of June, there were almost 419,000 overall.

The number of new COVID-19 and likely COVID-19 cases grew even higher at the end of the year. On average, more than 5,800 Medicare beneficiaries in nursing homes were being diagnosed each day in November. In December, the number topped 6,600 per day. By the end of December, the total number of cases (1.3 million) was about 62 times more than it had been at the end of March.



Source: OIG analysis of Medicare data, 2021.



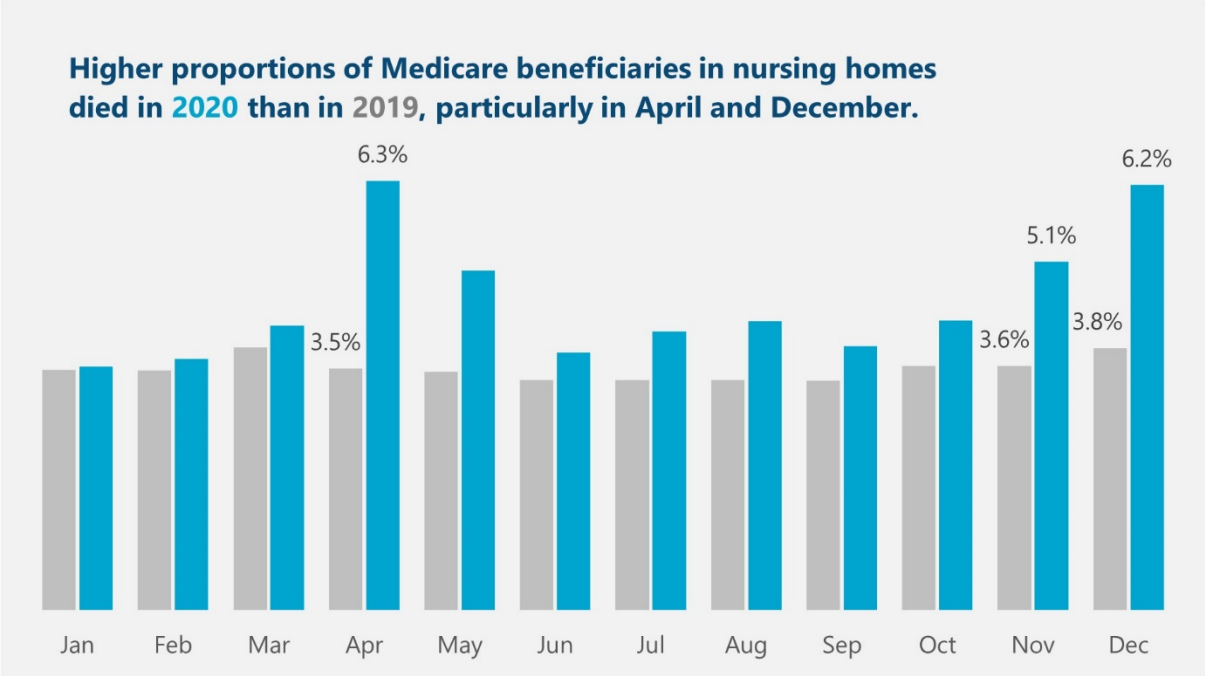
Source: OIG analysis of Medicare data, 2021.

Some States were impacted more than others. By the end of June, more than a quarter of the Medicare beneficiaries in nursing homes in each of 11 States had or likely had COVID-19. These States—Connecticut, Delaware, District of Columbia, Georgia, Illinois, Louisiana, Maryland, Massachusetts, New Jersey, New York, and Pennsylvania—were also some of the hardest hit in terms of percentage of their general population that contracted the disease during that time.[6] By the end of December, more than half the Medicare beneficiaries in nursing homes in each of four States—Connecticut, Illinois, Louisiana, and New Jersey—had or likely had COVID-19.

The overall mortality rate in nursing homes rose 32 percent in 2020. The pandemic had far-reaching implications for all nursing home beneficiaries, beyond those who had or likely had COVID-19. Among all Medicare beneficiaries in nursing homes, 22.5 percent died in 2020, which is an increase of one-third from 2019 when 17.0 percent of Medicare beneficiaries in nursing homes died. This 32-percent increase amounts to 169,291 more deaths in 2020 than if the mortality rate had remained the same as in 2019. Each month of 2020 had a higher mortality rate than the corresponding month a year earlier.

Almost 1,000 more beneficiaries died per day in April 2020 than in the previous year. In April 2020 alone, a total of 81,484 Medicare beneficiaries in nursing homes died. This is almost 30,000 more deaths—an average of about 1,000 per day—compared to the previous year. This increase in number occurred even though the nursing home population was smaller in April 2020. Overall, Medicare beneficiaries in nursing homes were almost twice as likely to die in April 2020 than in April 2019. In April 2020, 6.3 percent of all Medicare beneficiaries in nursing homes died, whereas 3.5 percent died in April 2019.

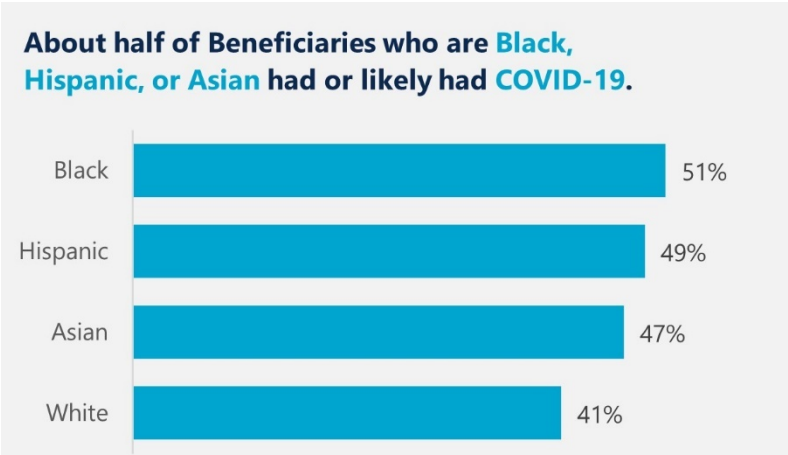
The mortality rates also rose at the end of 2020. In November, 5.1 percent of all Medicare beneficiaries in nursing homes died, and in December that increased to 6.2 percent. Again, these rates are markedly higher than the previous year. In November 2019, 3.6 percent of all Medicare beneficiaries in nursing homes died, and, in December 2019, 3.8 percent did.



Source: OIG analysis of Medicare data, 2021.

Medicare Beneficiary Characteristics

About half of Black, Hispanic, and Asian beneficiaries in nursing homes had or likely had COVID-19 in 2020. About half of Black beneficiaries, Hispanic[7] beneficiaries, and Asian beneficiaries in nursing homes had or likely had COVID-19 in 2020. Other research has similarly found that Black individuals and Hispanic individuals experience higher rates of COVID-19.[8]



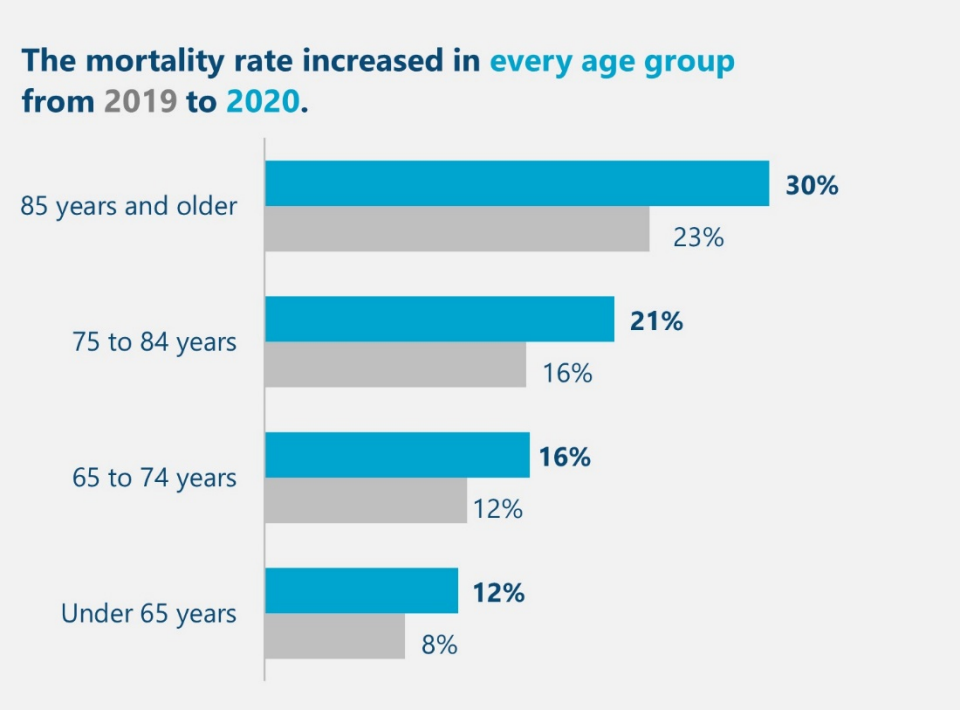
Each of these groups was more likely than White beneficiaries to have or likely have COVID-19. Forty-one percent of White beneficiaries in nursing homes had or likely had COVID-19 in

2020. See appendix for more detailed information for each group.

The mortality rates for each of these four groups increased in 2020, but to different extents. Asian beneficiaries in nursing homes had the greatest increase, with 27 percent dying in 2020 compared with 17 percent the previous year. The mortality rates for Hispanic beneficiaries in nursing homes and Black beneficiaries in nursing homes both reached 23 percent in 2020, up from 15 percent in 2019. The mortality rate of White beneficiaries grew less relatively, increasing to 24 percent in 2020 from 18 percent the previous year.

For beneficiaries in nursing homes, age does not appear to be a factor in rates of COVID-19 infections. All age groups of Medicare beneficiaries in nursing homes had similar infection rates in 2020. Just over 2 in 5 beneficiaries in each age group—under 65 years, 65 to 74 years, 75 to 84 years, and 85 years and older—had or likely had COVID-19. See appendix for more detailed information for each group.

Mortality rates were different across the age groups, but all increased during the pandemic. In 2020, the mortality rates ranged from 12 percent in the youngest group to 30 percent of the oldest. Before the pandemic, mortality ranged from 8 percent to 23 percent.



Source: OIG analysis of Medicare data, 2021.

Gender also does not appear to be a factor in rates of COVID-19 infections. Forty-three percent of female Medicare beneficiaries in nursing homes had or likely had COVID-19 in 2020. The rate was similar for male beneficiaries—41 percent.

Again, mortality rose for both females and males during the pandemic. In 2020, the mortality rate for female beneficiaries in nursing homes reached 21 percent, up from the pre-pandemic

rate in 2019 of 16 percent. The mortality rate for male beneficiaries increased to 24 percent from 19 percent.

Dually eligible beneficiaries—those enrolled in both Medicare and Medicaid—were much more likely than Medicare-only beneficiaries to contract COVID-19. Fifty-six percent of dually eligible beneficiaries in nursing homes had or likely had COVID-19 in 2020, compared to 29 percent of Medicare-only beneficiaries.

Although each group's mortality rate rose during the pandemic, the increase was greater for dually eligible beneficiaries. Specifically, 26 percent of dually eligible beneficiaries in nursing homes died in 2020, up from 19 percent the previous year. Meanwhile, the mortality rate for their Medicare-only counterparts grew to 19 percent from 16 percent. Previous research has shown that dually eligible beneficiaries are generally poorer and sicker—having low-incomes and multiple chronic conditions to manage—compared to other Medicare beneficiaries.[9]

Conclusion

The COVID-19 pandemic has been devastating for Medicare beneficiaries in nursing homes. Two in five Medicare beneficiaries in nursing homes either had or likely had the disease in 2020. From March through June, and again in November and December, the number of cases grew dramatically. Some Medicare beneficiaries in nursing homes seemed to be at greater risk than others. Specifically, Black beneficiaries, Hispanic beneficiaries, and Asian beneficiaries were more likely than White beneficiaries to have or likely have COVID-19. Further, dually eligible beneficiaries had significantly higher rates of COVID-19 infections than Medicare-only beneficiaries. In addition, overall mortality for Medicare beneficiaries in nursing homes increased by almost a third in 2020. Each month in 2020 had a higher mortality rate than the corresponding month in 2019.

The toll that the COVID pandemic has taken on Medicare beneficiaries in nursing homes demonstrates the need for increased action to mitigate the effects of the ongoing pandemic and to avert such tragedies from occurring in the future. OIG is committed to understanding and helping to protect nursing home residents from the impacts of COVID-19. We recognize that CMS is also committed to protecting nursing home residents.

Additional data analysis may help CMS in its efforts. The analyses in this report demonstrate the value of using Medicare data to understand the extent to which nursing home residents nationwide have been affected by the pandemic, who they were, and what characteristics are associated with greater risk. CMS currently relies on data from the CDC's National Healthcare Safety Network (NHSN) Long-Term Care Facility COVID-19 module, which are self-reported by nursing homes. Adding Medicare claims data could strengthen and broaden CMS's analyses. Unlike the NHSN, claims data cover the entire year and include demographic information about each beneficiary as well as information about the beneficiary's conditions and care needs. These data are important to understanding the effects of the pandemic and, moving forward, could play an integral part in understanding health disparities within the nursing home population and preparing for and dealing with future public health crises.

Methodology

We based this study on an analysis of data from several sources including: (1) the Minimum Data Set (MDS); (2) the Medicare Enrollment Database; and (3) Medicare Parts A, B, and C claims. We obtained the data from CMS's Integrated Data Repository and focused our analysis on Medicare beneficiaries residing in nursing homes in 2020.

Identification of Medicare Beneficiaries Residing in Nursing Homes

We used the MDS to identify individuals who resided in nursing homes.[10] The MDS includes assessments completed by the nursing home for each individual residing in these facilities. Nursing homes must complete these assessments periodically for all residents—including beneficiaries receiving Medicare or Medicaid. Using each resident's unique identifier, we matched the data from the MDS to the Medicare Enrollment Database to identify the residents who were enrolled in Medicare.[11] Next, we identified the Parts A, B, and C claims for these Medicare beneficiaries.

We considered a beneficiary a nursing home resident starting from the date of the first MDS assessment at the facility until the date that the beneficiary leaves the facility to go home or dies. Therefore, a beneficiary who resided in a nursing home and entered a hospital for treatment is still considered a nursing home resident during the time spent in the hospital.[12]

Analysis of Beneficiaries Who Had or Likely Had COVID-19

We determined the extent to which Medicare beneficiaries residing in nursing homes were diagnosed as having or likely having COVID-19 in 2020.

We considered a beneficiary who had a diagnosis code of B97.29 or U07.1 on a claim to have a diagnosis of COVID-19. The CDC designated B97.29 as an interim code to identify confirmed cases of COVID-19 prior to April 1, 2020.[13] It later established U07.1 as the unique code to identify confirmed cases of the disease effective April 1. Further, we considered a beneficiary who had a diagnosis code of Z20.828 on a claim to likely have COVID-19. The CDC designated Z20.828 to report "suspected," "possible," or "probable" cases of COVID-19 prior to April and onward.[14]

We calculated the total number of Medicare beneficiaries in nursing homes who had or likely had COVID-19 in 2020. These counts include the beneficiaries who were diagnosed with COVID-19 or likely COVID-19 in a nursing home as well as those diagnosed in other care settings after being transferred from the nursing home. For each Medicare beneficiary in a nursing home, we determined if the beneficiary was diagnosed with COVID-19, likely COVID-19, or neither. If a beneficiary is diagnosed at one point with likely COVID-19 and later diagnosed with COVID-19, we considered that beneficiary to be diagnosed with COVID-19 as opposed to likely COVID-19.

We also calculated the total number of Medicare beneficiaries residing in nursing homes who died during this period. These counts include the beneficiaries who died in the nursing home as

well as those who died in the hospital or other health care settings, such as hospice, after being transferred from the nursing home. We calculated for each month the number of Medicare beneficiaries diagnosed as having or likely having COVID-19. We also calculated the number of Medicare beneficiaries residing in nursing homes who died. We used the date of death from the Social Security Administration, which is contained in the Medicare Enrollment Database, to identify those beneficiaries who died.

Next, we compared the number of *all* Medicare beneficiaries in nursing homes in 2019 and the number of *all* Medicare beneficiaries in nursing homes who died in 2019. We did the same for 2020. We also calculated similar statistics per month to identify any trends.

Analysis of Beneficiary Characteristics

We described the Medicare beneficiaries residing in nursing homes who had or likely had COVID-19 in 2020. To do so, we analyzed the information on age, gender, and Medicare eligibility (e.g., Medicare-only, dually eligible for Medicare and Medicaid) from the Medicare Enrollment Database. We analyzed race and ethnicity information from the MDS.[15]

For each characteristic, we determined the extent to which Medicare beneficiaries in nursing homes who had or likely had COVID-19 differed from other Medicare beneficiaries in nursing homes. In addition, for each characteristic, we compared the percentage of Medicare beneficiaries in nursing homes who died in 2020 to those who died in the 2019.

Limitations

This study determines the number of Medicare beneficiaries residing in nursing homes who had or likely had COVID-19 based on Medicare claims data; it does not include a review of medical records. It also determines the number of Medicare beneficiaries who died; it does not include a review of death certificates nor determinations about whether COVID-19 was the cause of death for these beneficiaries. The race and ethnicity categories used in this report are based on data from nursing home assessments, which combine race and ethnicity in one question. This information is intended to be self-reported, but a caregiver or staff may respond if the beneficiary cannot.

Standards

We conducted this study in accordance with the *Quality Standards for Inspection and Evaluation* issued by the Council of the Inspectors General on Integrity and Efficiency.

Appendix A

Beneficiary Characteristics

Exhibit A-1: COVID-19 Rates by Race and Ethnicity of Nursing Home Beneficiaries

Race/Ethnicity	Number of Beneficiaries in Nursing Homes	Percentage Who Had or Likely Had COVID-19	Percentage Who Died*
Asian	48,691	47%	27%
Black	354,241	51%	23%
Hispanic	139,995	49%	23%
White	2,241,441	41%	24%

Source: OIG analysis of Medicare data, 2021.

* This refers to the percentage of Medicare beneficiaries in nursing homes who died from any cause.

These categories are based on data from nursing home assessments, which combine race and ethnicity in one question. This information is intended to be self-reported, but a caregiver or staff may respond if the beneficiary cannot.

Exhibit A-2: COVID-19 Rates by Age of Nursing Home Beneficiaries

Age	Number of Beneficiaries in Nursing Homes	Percentage Who Had or Likely Had COVID-19	Percentage Who Died*
Under 65 years	282,397	44%	12%
65 to 74 years	709,973	42%	16%
75 to 84 years	956,507	42%	21%
85 years and older	1,127,874	42%	30%

Source: OIG analysis of Medicare data, 2021.

* This refers to the percentage of Medicare beneficiaries in nursing homes who died from any cause.

Acknowledgements

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This report was prepared under the direction of Jodi Nudelman, Regional Inspector General for Evaluation and Inspections in the New York regional office, and Nancy Harrison and Meridith Seife, Deputy Regional Inspectors General.

Contact

To obtain additional information concerning this report, contact the Office of Public Affairs at Public.Affairs@oig.hhs.gov. OIG reports and other information can be found on the OIG website at oig.hhs.gov.

Office of Inspector General
U.S. Department of Health and Human Services
330 Independence Avenue, SW
Washington, DC 20201

Endnotes

[1] OIG, *COVID-19 Portal*. Accessed at https://oig.hhs.gov/coronavirus/index.asp. U.S. Department of Health and Human Services, Office of Inspector General, *Operation CARE: Caring, Awareness, & Resources for Our Elders*. Accessed at https://oig.hhs.gov/fraud/care/index.asp on March 11, 2021.

[2] OIG, *Onsite Surveys of Nursing Homes During the COVID-19 Pandemic: March 23–May 30, 2020*, OEI-01-20-00430, December 2020.

[3] OIG Work Plan, *Meeting the Challenges Presented by COVID-19: Nursing Homes*. Accessed at https://oig.hhs.gov/reports-and-publications/workplan/summary/wp-summary-0000474.asp on January 29, 2021.

[4] The COVID Tracking Project at The Atlantic, *National Data: Cases*. Accessed at https://covidtracking.com/data/national/cases on March 18, 2021. The total confirmed and probable cases for the total population as of December 31, 2020 is reported as 19,864,374. United States Census Bureau, *2020 Census Apportionment Results*, "Table 2. Resident Population for the 50 States, the District of Columbia, and Puerto Rico: 2020 Census." Accessed at https://www.census.gov/data/tables/2020/dec/2020-apportionment-data.html on May 6, 2021. The United States population, including Puerto Rico, in 2020 as determined by the U.S. Census was 334,735,155.

[5] Holshe, M.L., et al. (2020). First Case of 2019 Novel Coronavirus in the United States. *New England Journal of Medicine*, 382, 929-936.

[6] The COVID Tracking Project at The Atlantic, *The Data: Data by State*, "Cases: Historical Data." Accessed at https://covidtracking.com/data on March 11, 2021. United States Census Bureau, *2020 Census Apportionment Results*, "Table 2. Resident Population for the 50 States, the District of Columbia, and Puerto Rico: 2020 Census." Accessed at https://www.census.gov/data/tables/2020/dec/2020-apportionment-data.html on May 6, 2021. The percentage of each State's population that had contracted COVID-19 was calculated using confirmed and probable case totals as of June 30, 2020, and the state population results of the 2020 Census.

[7] Hispanic refers to beneficiaries identified as Hispanic or Latino.

[8] For example, CMS found that Black Medicare beneficiaries and Hispanic Medicare beneficiaries have experienced higher rates of COVID-19 compared to White beneficiaries. See CMS, *Preliminary Medicare COVID-19 Data Snapshot*. Accessed at https://www.cms.gov/research-statistics-data-systems/preliminary-medicare-covid-19-data-snapshot on May 13, 2021. Likewise, a recent review examining the association between COVID-19 infections, hospitalization, and mortality and race and ethnicity in the general population concluded that Black individuals and Hispanic individuals experienced disproportionately higher rates of COVID-19 compared to White individuals. See Mackey, K., et al (2021). Racial and Ethnic Disparities in COVID-19-Related Infections, Hospitalizations, and Deaths. *Annals of Internal Medicine,* 174(3), 362-373.

[9] CMS, *People Dually Eligible for Medicare and Medicaid*. Accessed at https://www.cms.gov/Medicare-Medicaid-Coordination/Medicare-and-Medicaid-Coordination/Medicare-Medicaid-Coordination-Office/Downloads/MMCO_Factsheet.pdf on December 17, 2020. CMS, *Medicare-Medicaid Coordination Office FY 2019 Report to Congress*. Accessed at https://www.cms.gov/files/document/mmco-report-congress.pdf on December 17, 2020. Medicare Payment Advisory Commission, *Data book: Beneficiaries dually eligible for Medicare and Medicaid—January 2018*, p. 3. Accessed at http://medpac.gov/docs/default-source/data-book/jan18_medpac_macpac_dualsdatabook_sec.pdf on December 17, 2020.

[10] We also used the Medicare Parts A and C Skilled Nursing Facility claims to identify additional beneficiaries residing in nursing homes, typically for beneficiaries in swing-bed hospital stays when MDS assessments were not readily accessible.

[11] We matched the unique identifier for each resident from the MDS along with the resident's name, sex, and date of birth to the Medicare Enrollment Database to confirm the identity of the nursing home resident and identify those who were enrolled in Medicare.

[12] For our analysis, if 150 days elapsed since the last MDS assessment and a discharge or date of death was not noted, a beneficiary is assumed to have been discharged home and is no longer considered a nursing home resident. CMS considers that, if a resident has not had a MDS transaction for 150 days, the resident is assumed to have been discharged. See CMS, *MDS 3.0 Frequency Report*. Accessed at https://www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/Minimum-Data-Set-3-0-Public-Reports/Minimum-Data-Set-3-0-Frequency-Report on April 21, 2021.

[13] CDC, *ICD-10-CM Official Coding Guidelines–Supplement Coding encounters related to COVID-19 Coronavirus Outbreak* (February 20, 2020–March 31, 2020). Accessed at https://www.cdc.gov/nchs/data/icd/interim-coding-advice-coronavirus-March-2020-final.pdf on July 20, 2020. See also, American Health Information Management Association (AHIMA), *AHIMA and AHA FAQ: ICD-10-CM/PCS Coding for COVID-19*. Accessed at https://journal.ahima.org/ahima-and-aha-faq-on-icd-10-cm-coding-for-covid-19/ on December 15, 2020. Since this code was not exclusive to the coronavirus responsible for COVID-19, providers were urged to limit the assignment of B97.29 to confirmed cases of COVID-19. See also CDC, *ICD-10-CM Official Coding and Reporting Guidelines* (April 1, 2020, through September 30, 2020). Accessed at https://www.cdc.gov/nchs/data/icd/COVID-19-guidelines-final.pdf on July 20, 2020.

[14] CDC, *ICD-10-CM Official Coding Guidelines–Supplement Coding encounters related to COVID-19 Coronavirus Outbreak* (February 20, 2020-March 31, 2020). Accessed at https://www.cdc.gov/nchs/data/icd/interim-coding-advice-coronavirus-March-2020-final.pdf on July 20, 2020. See also CDC, *ICD-10-CM Official Coding and Reporting Guidelines* (April 1, 2020, through September 30, 2020). Accessed at https://www.cdc.gov/nchs/data/icd/COVID-19-guidelines-final.pdf on July 20, 2020.

[15] During MDS assessment, nursing home residents (or their representative, if residents are unable to respond) select one or more categories from six race and ethnicity options—American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, White, and Hispanic or Latino. See Office of Management and Budget, *Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity*, Federal Register Vol. 62, No. 210, October 30, 1997. Accessed at https://www.govinfo.gov/content/pkg/FR-1997-10-30/pdf/97-28653.pdf on December 3, 2020.