

## FINAL REPORT

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# The Impact of COVID-19 on Seniors Housing

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## Findings at a Glance

- Seniors housing properties encompass a wide range of care settings serving America's older adults.
- Fifty-one percent of seniors housing properties studied experienced no COVID-19 deaths in 2020.
  - About two-thirds of independent living (67 percent); assisted living (64 percent); and memory care (61 percent) properties had no COVID-19-related deaths; and 39 percent of skilled nursing facilities experienced no deaths.
- COVID-19 mortality rates across seniors housing increased as the health and caregiving complexity of residents increased, with the highest percentages occurring in memory care settings and skilled nursing facilities.
  - Independent living properties' COVID-19 mortality rate was comparable to that of their respective counties. This suggests that residents who live in independent living properties were not at higher risk by virtue of their congregate care setting.
  - The mortality rates in memory care and skilled nursing were higher than in other levels of care, and were statistically equivalent to each other.
- Seniors housing properties continued to operate and care for their residents, while facing a range of evolving circumstances—including shortages of personal protective equipment (PPE) and testing—as well as rapidly changing regulatory environments across all levels of government.
- There were many challenges in conducting this research due to data availability, timeliness, complexities, and limitations. Specifically, there are identified inconsistencies between local, state, and federal data reporting systems.
- Future research is needed to better understand the role of health, age, and demographic characteristics on mortality rates by care setting.

## Executive Summary

The COVID-19 pandemic has ravaged older adults in the United States, killing hundreds of thousands of people ages 75 and older.<sup>1</sup> Skilled nursing facilities (SNF), also known as nursing homes and referred to in this report as skilled nursing facilities or skilled nursing, serve the frailest elderly and have been especially hard hit. However, seniors housing encompasses a wide range of care settings serving the different needs of older adults, and the impact of COVID-19 on seniors housing other than skilled nursing is less understood. This study seeks to estimate differences in the impact of COVID-19 on seniors housing, with a focus on estimating differences in COVID-19-related deaths across skilled nursing as compared to those experienced in the different levels of care in memory care properties (MC), assisted living properties (AL)

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<sup>1</sup> Centers for Disease Control and Prevention. (2021, May 12). *COVID-19 provisional counts - Weekly updates by select demographic and geographic characteristics*. [https://www.cdc.gov/nchs/nvss/vsrr/covid\\_weekly/index.htm](https://www.cdc.gov/nchs/nvss/vsrr/covid_weekly/index.htm).

and independent living properties (IL). In this study, properties are categorized by the level of care where the majority of residents reside.

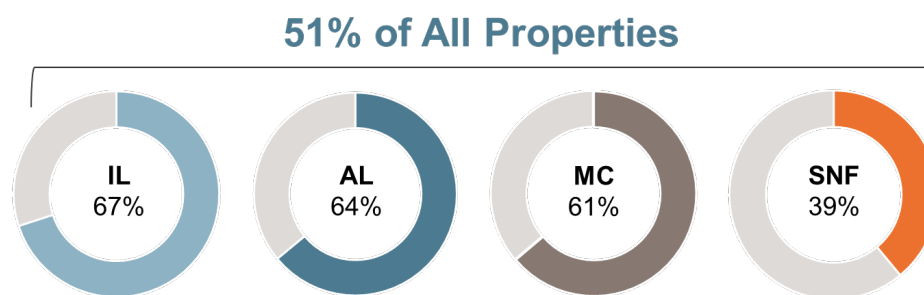
Researchers from NORC at the University of Chicago (NORC) examined state and federal public health data in five states (Colorado, Connecticut, Florida, Georgia, and Pennsylvania) to estimate 2020 COVID-19 mortality rates in seniors housing by level of care and compared these mortality rates to those experienced by adults ages 75 and older who lived in non-congregate settings (e.g. adults living in private homes or non-seniors housing settings) in the same counties. Researchers adjusted raw mortality rates to control for prevailing COVID-19 case rates in the area. The analysis includes data from 3,817 market-rate<sup>2</sup> seniors housing properties across 113 counties throughout the five states. Researchers also conducted interviews with 12 seniors housing operators and eight state affiliates of LeadingAge and Argentum, organizations that serve non-profit and for-profit aging services and seniors housing operators, to understand the context of the COVID-19 death data and challenges they faced during the pandemic.

This analysis primarily focuses on COVID-19-related deaths, rather than case rates. While deaths from COVID-19 are reasonably well documented, actual infections are estimated to be 3 to 20 times higher than confirmed COVID-19 cases due to incomplete testing.<sup>3</sup> As a result, higher rates of testing in specific geographies or levels of care (e.g., skilled nursing) will significantly impact confirmed case rates and may lead to inaccurate conclusions.

### **Fifty-one percent of seniors housing properties experienced no COVID-19 deaths in 2020.**

In the first half of 2020, as understanding grew about the scope of COVID-19's impact on seniors housing, many properties instituted infection control policies to protect residents and reduce the spread of the virus. Such policies included restricting visitors, halting communal dining and group activities, cohorting residents and staff, and reinventing physical spaces and workflow processes to include safely donning and doffing PPE. In total, throughout 2020, 51 percent of properties included in the analysis experienced no resident deaths from COVID-19. While 39 percent of skilled nursing facilities experienced no COVID-19-related deaths, about two-thirds of independent living (67 percent); assisted living (64 percent); and memory care (61 percent) properties had no COVID-19-related deaths.

**Portion of Seniors Housing Properties with No Reported COVID-19 Deaths in 2020**



<sup>2</sup> Market rate seniors housing does not include affordable housing options that may be subsidized or rate capped.

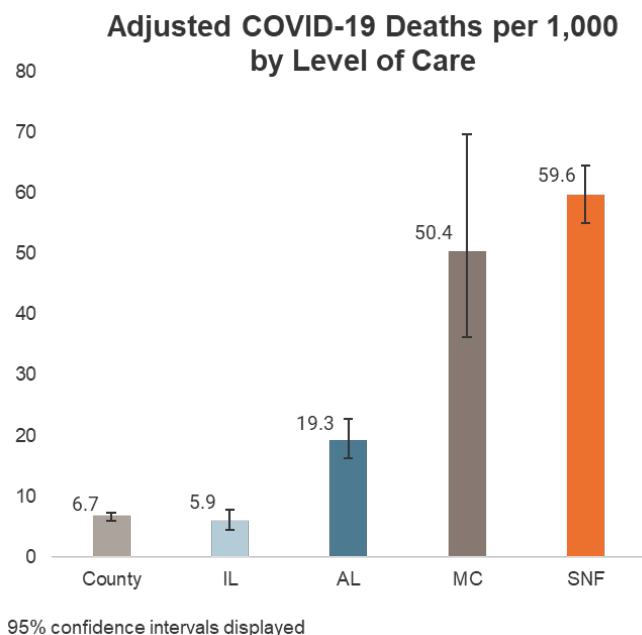
<sup>3</sup> Wu, S. L., Mertens, A. N., Crider, Y. S., Nguyen, A., Pokpongkiat, N. N., Djajadi, S., ... & Benjamin-Chung, J. (2020). Substantial underestimation of SARS-CoV-2 infection in the United States. *Nature communications*, 11(1), 1-10.

**COVID-19 deaths increased by level of care. The mortality rate in studied independent living properties was comparable to the county. The mortality rate in assisted living properties was one-third that of skilled nursing facilities.**

Deaths from COVID-19 follow a clear pattern based on the health status of residents, with skilled nursing facilities experiencing much higher mortality rates than assisted and independent living properties. Prior to COVID-19, almost one-third of all skilled nursing care residents died annually, with that particular setting of care often being the final long-term residence for seniors prior to their death.<sup>4</sup> While COVID-19 likely increased overall mortality rates across all seniors housing segments, its total impact on all-cause mortality in these settings is not yet known. In 2020, COVID-19 may have accelerated or replaced other common causes of death during this period.

Throughout 2020, average adjusted mortality rates from COVID-19 in skilled nursing facilities were 59.6 per 1,000, likely driven by the advanced age, frailty, and comorbidities of the residents. In contrast, assisted living mortality rates were two-thirds lower at 19.3 deaths per 1,000 residents. Resident deaths in independent living settings were statistically comparable to the rates of death for older adults living in non-congregate settings in the same geographic area. Independent living had average adjusted mortality rates of 5.9 per 1,000 compared to 6.7 per 1,000 found for adults 75 and older living in the same counties. Based on properties

included in this analysis, COVID-19 mortality rate in independent living properties was comparable to that of older adults living in their counties. This suggests that healthier seniors who lived in independent living properties were not at higher risk by virtue of their congregate care setting.



**Of the memory care properties with COVID-19 resident deaths, the mortality rate was high and is consistent with other research documenting the risks of COVID-19 for dementia patients.**

Adjusted mortality rates in memory care units were 50.4 per 1,000 residents, which is statistically comparable (within the margin of error) to skilled nursing facilities. Memory care settings faced particular challenges with infection control, since seniors who have cognitive impairments are more likely to require additional care and support with activities of daily living. Seniors housing operators have described the challenges of enforcing infection control protocols in memory care units. Because most memory care residents require close physical caregiving, it was difficult to implement social distancing. Operators also found that many residents with dementia were unable to comply with mask mandates and were afraid of and disoriented by staff wearing masks. The loss of access to trusted caregivers due to visitor restrictions and staffing changes was described as particularly problematic for the memory care population. While

<sup>4</sup> Vossius, C., Selbæk, G., Šaltytė Benth, J., & Bergh, S. (2018). Mortality in nursing home residents: A longitudinal study over three years. *PLoS ONE*, 13(9), e0203480. <https://doi.org/10.1371/journal.pone.0203480>.

virtual programming was implemented for residents in other levels of care, virtual programming did not effectively replace activities for residents with cognitive impairment.

### **Seniors housing operators faced a rapidly changing regulatory environment, while contending with shortages of PPE and testing.**

As the pandemic unfolded in early 2020, seniors housing continued to operate and care for its residents, while facing a range of challenges. Early in the pandemic, operators prioritized protecting residents and controlling infections, despite having limited information about transmission risks. Physical building layouts, described by many operators as communal and social environments, required swift adaptation to implement infection control protocols as the pandemic unfolded.

Local, state, and federal governments issued many new regulations, guidance, and requirements for skilled nursing and other seniors housing operators. Operators quickly began to track and implement new rules, which often varied across property types, levels of care, and different geographies. Many reported data to local public health agencies, states, and the Centers for Disease Control and Prevention (CDC).

Operators at all levels of care reported shortages in both staffing and supplies. Operators worked to secure scarce PPE and testing supplies and to contract with labs to process those tests. Other operators increased pay and introduced other incentives to motivate and retain staff. These market dynamics placed a strain on the industry both financially and operationally.

### **Conclusions**

This research demonstrates large differences of the mortality impact of COVID-19 across seniors housing levels of care. Mortality rates in assisted living were much lower than those in skilled nursing. Mortality in independent living was statistically indistinguishable from mortality rates experienced by adults living in non-congregate settings in the same geographic area. In these data, mortality rates followed a pattern of increasing mortality outcomes corresponding to increasing levels of resident social support, health, and caregiving needs. Although additional research into understanding the causes of these differences is required, this pattern suggests that differences in health status and frailty levels of residents living in seniors housing may have been a primary driver of seniors housing mortality during the COVID-19 pandemic. These findings demonstrate the important distinctions between the levels of care within seniors housing and may inform future public health and public policy responses to ensure a more effective future pandemic response that protects vulnerable populations.

We encountered many data challenges in conducting this analysis, including data availability, quality, timeliness, variation in reporting across states, and inconsistencies between state and federal government sources. These limitations make it more difficult for health officials, policymakers, industry operators, researchers, and the public to understand how the COVID-19 pandemic is impacting various locations and settings of care. Ongoing improvements in our data infrastructure would enable better understanding of this pandemic and preparation for future health crises.

Future research will attempt to compare mortality rates across levels of care while risk-adjusting for age and health status, and to understand the impact of COVID-19 on all-cause mortality by setting of care. Such research could leverage Medicare fee-for-service (FFS) claims data to produce risk-adjusted mortality rates for individuals living in seniors housing properties, and compare them to individuals living in non-congregate settings. This risk-adjustment will account for baseline demographics such as age, race, and gender, as well as health status at the individual level. Doing so would allow for a rigorous assessment of differences in COVID-19-related and all-cause mortality across seniors with comparable health statuses living within the same geographic areas.

This study could not reliably assess the relationship between testing, confirmed case rates, and mortality among those with confirmed infections. Finally, additional analysis that further explores residents' experiences in memory care is warranted to identify opportunities to improve their protection from infectious disease while continuing to preserve their mental and emotional well-being.

# Introduction

Beginning in early 2020, the COVID-19 pandemic began to fundamentally impact all aspects of life in the United States and around the world. Nowhere in the United States has this impact been more strongly felt than among older Americans living in congregate housing settings (seniors housing).

Seniors housing includes a diverse range of properties caring for different types of residents at different stages of their lives, ranging from independent living (IL) to assisted living (AL) and memory care (MC) to skilled nursing facilities (SNF), often referred to as nursing homes. Seniors housing residents are older individuals who are at the greatest risk of severe COVID-19 outcomes because they live in congregate settings that increase opportunities for person-to-person contact and viral transmission. In general, residents of seniors housing, particularly residents of skilled nursing facilities, have high rates of chronic illness and are nearing the end of their lives, resulting in high annual mortality rates during non-pandemic times and making these residents especially susceptible to serious complications from COVID-19.<sup>5</sup> Because residents in seniors housing are older and sicker, they are dependent on the care of others, greatly complicating the ability for residents to socially isolate to prevent infection.<sup>6</sup>

Data from state and federal governments have demonstrated that older adults living in seniors housing were particularly vulnerable to severe disease and death. While less than 1 percent of the nation's overall population lives in seniors housing properties, one-third of the nation's confirmed and probable COVID-19 deaths were residents of skilled nursing and seniors housing.<sup>7</sup> Almost 60 percent of U.S. COVID-19 deaths have been in the 75-and-over age group,<sup>8</sup> a cohort that is at increased risk for severe illness due to age and underlying chronic conditions.<sup>9,10</sup>

The public's imagination has been filled with shocking news stories of the horrendous COVID-19 impacts on some skilled nursing properties, especially early in the pandemic.<sup>11</sup> In this study, we found substantial evidence of wide variation in COVID-19 mortality across seniors housing levels of care, as well as variation of outcomes within the same level of care. While some properties did, in fact, experience catastrophic COVID-19 outcomes, the majority of seniors housing properties that we studied experienced no deaths from COVID-19 at all.

In this report, we present data to assess the impact of COVID-19 on mortality in seniors housing, accounting for differences in level of care. We further present information obtained through interviews with seniors housing property operators to help place the quantitative results in context and help readers understand some of the challenges of managing COVID-19 in these settings.

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<sup>5</sup> Vossius, C., Selbæk, G., Šaltytė Benth, J., & Bergh, S. (2018). Mortality in nursing home residents: A longitudinal study over three years. *PLoS ONE*, 13(9), e0203480. <https://doi.org/10.1371/journal.pone.0203480>.

<sup>6</sup> ATI Advisory. (2020, May). *2020 Seniors housing data book*. [https://atiadvisory.com/wp-content/uploads/2020/05/ATI-Advisory-Seniors-Housing-Data-Book\\_May-2020.pdf](https://atiadvisory.com/wp-content/uploads/2020/05/ATI-Advisory-Seniors-Housing-Data-Book_May-2020.pdf).

<sup>7</sup> The COVID Tracking Project. (2021, March). <https://covidtracking.com/nursing-homes-long-term-care-facilities>.

<sup>8</sup> COVID-19 Mortality Overview. Provisional Death Counts for Coronavirus Disease 2019 (COVID-19). (2021, April). <https://www.cdc.gov/nchs/covid19/mortality-overview.htm>.

<sup>9</sup> Centers for Disease Control and Prevention. (2021, May). *Certain medical conditions and risk for severe COVID-19 illness*. <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html>.

<sup>10</sup> ATI Advisory. (2020, May). *2020 Seniors housing data book*. [https://atiadvisory.com/wp-content/uploads/2020/05/ATI-Advisory-Seniors-Housing-Data-Book\\_May-2020.pdf](https://atiadvisory.com/wp-content/uploads/2020/05/ATI-Advisory-Seniors-Housing-Data-Book_May-2020.pdf).

<sup>11</sup> Harris, A. J., Leland, J., & Tully, T. (2020, April 11). Nearly 2,000 dead as coronavirus ravages nursing homes in N.Y. region. *The New York Times*. <https://www.nytimes.com/2020/04/11/nyregion/nursing-homes-deaths-coronavirus.html>.



# Study Overview

Skilled nursing facilities care for the frailest elderly and have been especially devastated by the pandemic. However, seniors housing encompasses a wide range of care settings that serve the different needs of older adults, and the impact of COVID-19 on seniors housing other than skilled nursing is less understood. This study seeks to estimate differences in the impact of COVID-19 on seniors housing, with a focus on estimating differences in COVID-19-related deaths across different levels of care—including skilled nursing facilities, memory care properties, assisted living properties and independent living properties. Specifically, the report examines COVID-19 deaths that occurred in 2020 in seniors housing settings within five states: Colorado, Connecticut, Florida, Georgia, and Pennsylvania. Researchers at NORC relied on public datasets of COVID-19 deaths at the property level and the respective counties where seniors housing properties are located.

This analysis primarily focuses on COVID-19-related deaths, rather than case rates. While deaths from COVID-19 are reasonably well documented, actual infections are estimated to be 3 to 20 times higher than confirmed COVID-19 cases due to incomplete testing.<sup>12</sup> Since August 2020, the Centers for Medicare & Medicaid Services (CMS) has required skilled nursing operators to conduct regular testing of residents and staff based on confirmed cases in the facility and prevailing positivity rates in the county.<sup>13</sup> These testing requirements mean that confirmed cases in nursing care are likely to be driven, in part, by more frequent testing, in addition to any differences in actual infection rates. As a result, higher rates of testing in specific geographies or levels of care (e.g., skilled nursing) may significantly impact counts of confirmed case rates and lead to inaccurate conclusions.

The report also provides an overview of federal, state, and local policymaking efforts to keep COVID-19 from infiltrating seniors housing properties to prevent and contain the spread of the virus. It also describes many of the operational changes that seniors housing operators implemented over the course of 2020 in response to the pandemic, based on qualitative interviews with seniors housing and care organizations.

## Methods and Data Sources

This study's objective was to estimate the average number of deaths per 1,000 residents by seniors housing level of care, and then to compare those rates to the rates observed among the non-congregate population aged 75 and over living in surrounding counties. To achieve this, we needed to identify data for inclusion, assemble information from multiple data sources, and analyze the data.

NORC selected states for inclusion in the analysis based on the public availability of state-reported data on the number of deaths that occurred in seniors housing settings (i.e., independent living, assisted living, memory care). These properties do not report deaths to the federal government unless those deaths occurred in their CMS-certified skilled nursing subunits, meaning that state-reported data were the only available source for this information. We also gave preference to states where deaths that occurred in each county were reported in a manner that would allow an estimate of mortality rates among adults living in the same community in non-congregate settings by age group. In addition, we prioritized states with sufficiently large COVID-19 outbreaks to support evaluation of variation across properties. Finally, we selected states with geographic variability; political diversity (as measured by the political party of the state's governor and makeup of state legislatures); and sufficient penetration of NIC MAP® data regions (to

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<sup>12</sup> Wu, S. L., Mertens, A. N., Crider, Y. S., Nguyen, A., Pokpongkiat, N. N., Djajadi, S., ... & Benjamin-Chung, J. (2020). Substantial underestimation of SARS-CoV-2 infection in the United States. *Nature Communications*, 11(1), 1-10.

<sup>13</sup> Centers for Medicare & Medicaid Services. (2020, September 17). *Nursing home visitation - COVID-19 (REVISED)*. <https://www.cms.gov/files/document/qso-20-39-nh-revised.pdf>.

enable, at minimum, linking public datasets to NIC MAP property data). The NIC MAP data cover more than 15,000 adult congregate living properties in 140 U.S. metropolitan areas. For more detailed information about NIC MAP data and how they were used as part of this analysis, please refer to the technical report. Based on these criteria, the following states were selected for inclusion: Colorado, Connecticut, Florida, Georgia, and Pennsylvania. Connecticut was selected based on the quality and comprehensiveness of property-level data, although state reports do not provide adequate information to determine the number of deaths that occurred among people aged 75 and older in each county.

For each state, sufficient information was required in order to assign the name and location of each unique seniors housing property, the predominant care level of the property, the number of residents living in each property as of the first quarter of 2020, and the cumulative number of deaths that occurred in the property that were attributed to COVID-19 between the start of the pandemic and the data collection date. State and cross-state data files were developed using the following sources:

- The CMS COVID-19 Nursing Home Dataset
- The NIC MAP® data, powered by NIC MAP Vision, an affiliate of the National Investment Center for Seniors Housing & Care (NIC)
- Publicly available state reports of deaths in adult congregate living settings
- Publicly available state reports of all deaths by county and age group
- American Community Survey data on population
- New York Times-reported information on COVID-19 cases

The analysis includes only properties located in counties covered by the NIC MAP data, which were listed in either the NIC MAP data or the CMS COVID-19 data. It is limited to market-rate properties with 25 or more residents in major seniors housing markets, thus excluding state-operated or state-subsidized properties and properties in most rural areas.

The NIC MAP data were used to determine property-level attributes, including property type and occupancy information. We categorized properties by the level of care where the majority of residents resided, using the NIC MAP data. Memory care is not a designated property type in the NIC MAP data, so we assigned properties to the memory care designation if 50 percent or more of its estimated residents resided in MC units. In the primary analysis, we categorized continuing care retirement communities (CCRCs) by the level of care where the majority of residents resided. For the secondary analysis, we relied on NIC MAP data that designated properties as CCRCs.

We conducted fuzzy matching by name and addresses between publicly reported data and NIC MAP data to assign cases and deaths by individual property contained in state and CMS reports to the NIC MAP data. In instances where deaths for a given property were reported in both state and CMS datasets, we assigned the property the highest number of deaths from either source. Results are reported in aggregate for all of calendar year 2020.

We used a mixed binomial regression model to estimate the mortality rate and 95 percent confidence intervals by property type, assuming the same COVID-19 case rates in all geographies. The model controls for geographic differences, including variation in the severity of the COVID-19 pandemic, distribution of property types across states and geographies, and clustering of outcomes within a county. Results in this report are shown as adjusted death rates based on the model results, which vary only slightly from raw death rates. We performed multiple sensitivity analyses, which are detailed in the Technical Report, and found no changes in the rank order of results by property type that would impact the overall findings.

For additional information regarding the methods, data sources, and limitations of this analysis, please see the corresponding Technical Report.

## Data Limitations

*Sample Limitations.* This study represents a convenience sample of properties from which data were available. When this study began in September 2020, the following five U.S. states provided data necessary to support the analysis: Colorado, Connecticut, Florida, Georgia, and Pennsylvania. While the states provide some level of variation in their respective geographic regions, demographics, timing of pandemic introduction, and political leadership, they are not fully representative of the United States as a whole. The sample was further limited by the exclusion of areas and properties that are not included in the NIC MAP data property inventory. This results in a sample that tends to be less rural, excludes properties with fewer than 25 residents, and focuses on market-rate seniors housing. The sample was further limited by varying state reporting requirements for different levels of care. While some states reported deaths that occurred at independent living properties, it was not a requirement for every state. Since the sample used for this analysis reported properties by the level of care used by the majority of its residents, many of the IL-related deaths were captured through this determination.

*Data Quality.* This analysis relies on the integrity and accuracy of data reported of COVID-19 deaths by CMS and state public health agencies. Many analysts have documented inconsistent reporting between state and federally reported data.<sup>14,15</sup> CMS identifies some causes for these variances,<sup>16</sup> including different definitions and requirements for reporting cases and deaths between states, and differing requirements for data collected at the federal level. Over time, some states' data have been updated without explanation. We used the most current data available at the time of analysis. States included in this analysis are those with more robust data reporting systems, though we cannot validate the accuracy of the information. This analysis relies on the most up-to-date state and federal information between the start of the pandemic and the closest date measured to December 31, 2020.

*All-Cause Mortality.* One challenge in estimating the impact of COVID-19 on elderly populations is understanding the extent to which COVID-19 has replaced other likely causes of death. For instance, terminally ill or hospice patients may be attributed as COVID-19 deaths, but likely passed away from other causes in the absence of the pandemic. Before 2020, about 32 percent of skilled nursing residents passed away each year.<sup>17</sup> While COVID-19 likely increased overall mortality rates in seniors housing, its total impact on all-cause mortality across the seniors housing segments is not yet known and not addressed in this study. Future analysis will seek to further understand COVID-19's impact on all-cause mortality.

## COVID-19 Regulatory and Policy Context

As the full scope of the COVID-19 threat became apparent in early 2020, federal, state, and local policymakers acted to mitigate the spread of the virus in the community and within congregate living settings. Although federal and state governments jointly regulate nursing care provided in skilled nursing facilities, assisted living is state-regulated and independent living is, in most states, not regulated. As a

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<sup>14</sup> Teegardin, C. (2021, April 5). Warnock, Johnson seek investigation of Georgia's nursing home death data. *The Atlanta Journal-Constitution*. <https://www.ajc.com/news/investigations/warnock-johnson-seek-investigation-of-georgias-nursing-home-death-data/C6AYC3DFGJENZE6LTA3T4OCVEE/>.

<sup>15</sup> Jones, T. (2020, June 12). Major Discrepancies between Federal and State Data on COVID-19 Infections, Deaths in Nursing Homes. *NBC 7 San Diego*. <https://www.nbcsandiego.com/news/local/major-discrepancies-between-federal-and-state-data-on-covid-19-infections-deaths-in-nursing-homes/2345456/>.

<sup>16</sup> Centers for Medicare & Medicaid Services. (2020, June 18). *Nursing home COVID-19 data quality – Frequently asked questions*. <https://data.cms.gov/download/b62a-ieuз/application%2Fpdf>.

<sup>17</sup> Vossius, C., Selbæk, G., Šaltytė Benth, J., & Bergh, S. (2018). Mortality in nursing home residents: A longitudinal study over three years. *PLoS ONE*, 13(9), e0203480. <https://doi.org/10.1371/journal.pone.0203480>.

result, operators faced myriad restrictions from seniors housing care segment to care segment, property to property, state to state, and county to county.

President Trump declared a federal state of emergency related to COVID-19 on March 13, 2020, and most states followed suit over the coming weeks with their own declarations, which paved the way for stay-at-home orders, social distancing requirements, quarantine restrictions for travelers, non-essential business closures, large gathering bans, and mask mandates.<sup>18</sup> Governments issued guidance quickly and made frequent and rapid changes, with requirements for seniors housing properties varying widely by state and county.<sup>19</sup> The volume of guidance was described as highly daunting to operators and staff, who were implementing the compliance and operational changes day to day.

Though the federal state of emergency related to COVID-19 was issued in March, CMS and the CDC began communicating about COVID-19 to health care facilities—including skilled nursing—in early February. CMS and CDC began issuing formal guidance in early March 2020 on testing, restricting visitation, and mandating specific PPE usage, as well as sanitation, ventilation, and room cleaning requirements. CMS guidance released March 13, 2020, restricted access for all visitors and nonessential health care personnel, while simultaneously announcing that skilled nursing facilities should accept residents from hospitals despite their suspected or confirmed positive COVID-19 status, so long as the property was able to comply with CDC guidance for transmission-based precautions.<sup>20</sup> On April 2, 2020, CMS released guidance recommending universal use of facemasks and other PPE in nursing properties.<sup>21</sup> On May 8, 2020, CMS required skilled nursing facilities to report COVID-19 cases and deaths to the CDC.<sup>22</sup> CMS did not release official guidance regarding skilled nursing testing requirements for staff and residents until August 25, 2020, though testing supplies were notoriously hard to procure and long wait times for results plagued many geographies.<sup>23</sup>

Importantly, CMS guidance applied to skilled nursing facilities, not assisted living or independent living properties. Yet, some assisted living and independent living properties followed CMS guidance, either as a means of corporate policy or because particular states adopted CMS requirements at pace with their federal release, which were then adopted by assisted living and independent living properties. In Georgia and Colorado, state policy mirrored federal testing requirements for staff and residents, which were implemented in August 2020, the same month CMS released guidance. Some states formed a taskforce or working group to tackle COVID-19 in seniors housing properties head on, while simultaneously interpreting and implementing rapidly evolving guidance from the federal level. For example, in April 2020, Colorado formed the Residential Care Strike Team, which worked to mitigate the spread of COVID-19 in congregate settings serving seniors through monitoring and testing, infection control enforcement and education, and providing PPE, among other things.<sup>24</sup> In July 2020, the Pennsylvania state government launched the Regional Response Health Collaborative Program to aid with infection control and manage outbreaks in

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<sup>18</sup> Kaiser Family Foundation. (2021, May 18). *State COVID-19 data and policy actions*. Kaiser Family Foundation. <https://www.kff.org/report-section/state-covid-19-data-and-policy-actions-policy-actions/#note-4-26>.

<sup>19</sup> The National Academy for State Health Policy. (2021). *2020 COVID-19 state restrictions, re-openings, and mask requirements*. <https://www.nashp.org/2020-state-reopening-chart/>.

<sup>20</sup> Centers for Medicare & Medicaid Services. (2020, March 13). *Guidance for infection control and prevention of coronavirus disease 2019 (COVID-19) in nursing homes (REVISED)*. <https://www.cms.gov/files/document/qso-20-14-nh-revised.pdf>.

<sup>21</sup> Centers for Medicare & Medicaid Services, Centers for Disease Control and Prevention. (2020, April 2). *COVID-19 long-term care facility guidance*. <https://www.cms.gov/files/document/4220-covid-19-long-term-care-facility-guidance.pdf>.

<sup>22</sup> Centers for Medicare & Medicaid Services. (2020, May). *Centers for Medicare and Medicaid (CMS) COVID-19 NHSN reporting requirements for nursing homes*. <https://www.cdc.gov/nhsn/pdfs/covid19/lcf/cms-covid19-req-508.pdf>.

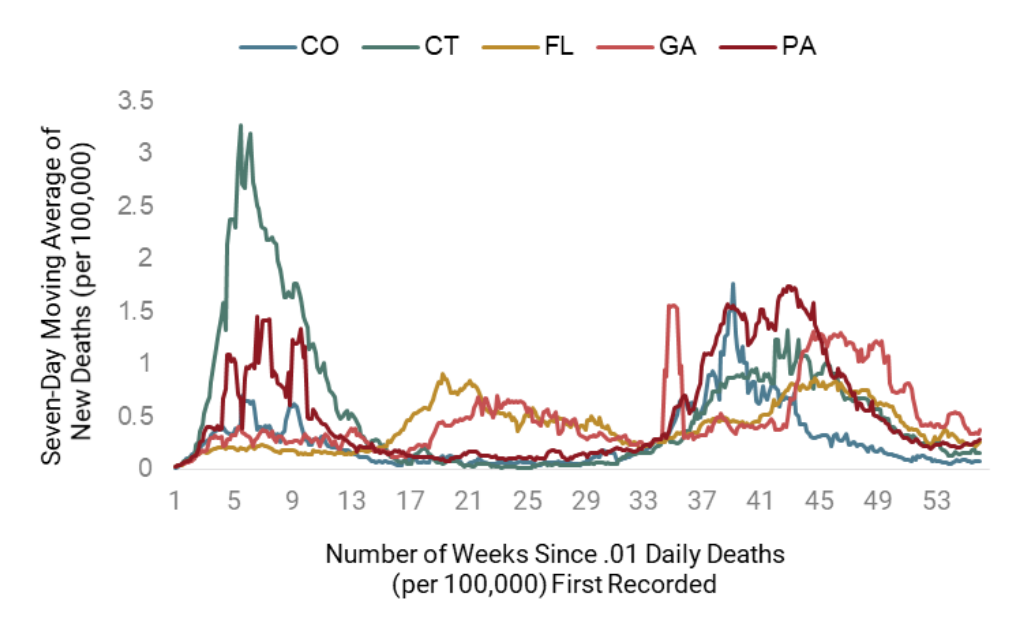
<sup>23</sup> Centers for Medicare & Medicaid Services. (2020, August 25). *Interim final rule (IFC), CMS-3401-IFC, additional policy and regulatory revisions in response to the COVID-19 public health emergency related to long-term care (LTC) facility testing requirements and revised COVID-19 focused survey tool*. <https://www.cms.gov/files/document/qso-20-38-nh.pdf>.

<sup>24</sup> Colorado Department of Public Health & Environment. (2020, April). *Residential care strike team*. <https://cdphe.colorado.gov/health-facility-covid-19-response/residential-care-strike-team>.

seniors housing properties, which may not have had necessary clinical infrastructure to respond to the pandemic.<sup>25</sup>

Particularly early in the pandemic, COVID-19 case and mortality rates varied widely depending on geography as infections spread through communities. As a result, the COVID-19 experience for seniors housing operators and other care settings was heavily influenced by prevailing case rates in their area. Exhibit 1 below presents mortality rates for the overall population by state throughout 2020, which shows how Connecticut and Pennsylvania experienced more COVID-19 deaths impact during the first three months of the pandemic than other states in this analysis.

Exhibit 1: COVID-19 Mortality Rates by State



Source: [https://covid.cdc.gov/covid-data-tracker/#compare-trends\\_newcasesper100k](https://covid.cdc.gov/covid-data-tracker/#compare-trends_newcasesper100k).

As reported above and in further detail in the *Technical Report*, skilled nursing, assisted living, and independent living case and death reporting requirements varied significantly across states and federal agencies. Data quality and data consistency with death and case counts across these different reporting requirements in the states and to the federal government have been documented, reported and discussed.<sup>26</sup> Some states (not included in this study) have suppressed death figures at the property level entirely, while others have suppressed the death data below a certain threshold (e.g., between 1 and 4, less than 11). While reporting variation exists across states, one thing that remains consistent is the significant impact the COVID-19 pandemic has had on vulnerable populations, particularly those that are older, within each state.

<sup>25</sup> Pennsylvania Department of Human Services. (2020, June). *Regional response health collaborative (RRHC) program*. <https://www.dhs.pa.gov/coronavirus/Pages/RRHCP.aspx>.

<sup>26</sup> Teegardin, C. (2021, April 5). Warnock, Johnson seek investigation of Georgia's nursing home death data. *The Atlanta Journal-Constitution*. <https://www.ajc.com/news/investigations/warnock-johnson-see-investigation-of-georgias-nursing-home-death-data/C6AYC3DFGJENZE6LTA3T4OCVEE/>.

# Results and Findings

## Reported COVID-19 Deaths in Seniors Housing

Our five-state data include information from the 3,817 seniors housing properties in 113 counties that were included in the analysis. While other properties within these counties also reported deaths, we were not able to include them because we could not match them to properties in the NIC MAP data or CMS data. The properties included in our analysis served an estimated 503,000 residents in 2020. Detailed information on the total reported residents and deaths in these properties is shown in Exhibit 2. Skilled nursing accounted for the majority of reported seniors housing deaths (14,574 out of 17,776 total) among the properties in this analysis.

Exhibit 2: Count of Counties, Properties, Residents, and Deaths Included in Analysis

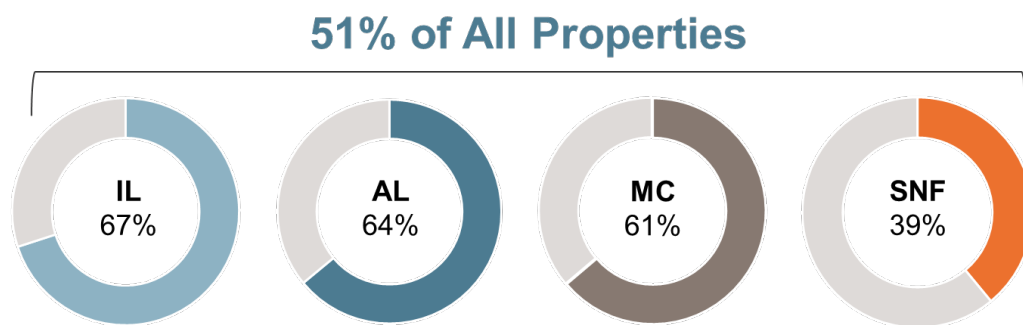
	Number Included	Estimated Residents	Total Deaths
County	113	2,053,582	13,360
All Seniors Housing	3,817	503,252	17,776
Independent Living	482	164,921	935
Assisted Living	1,126	87,755	1,751
Memory Care	180	8,391	516
Skilled Nursing	2,029	242,185	14,574

## Seniors Housing Properties with No COVID-19 Deaths

***Fifty-one percent of seniors housing properties experienced no COVID-19 deaths in 2020.***

Many seniors housing properties took significant measures to limit COVID-19 exposure and infection risk in their properties, as described later in this report. For many properties, these measures seem to have been effective, as 51 percent of all properties in our data experienced no COVID-19 deaths in 2020. Exhibit 3 shows that 64 percent of assisted living and 67 percent of independent living properties studied experienced no COVID-19 deaths at all.

Exhibit 3: Portion of Seniors Housing Properties with No Reported COVID-19 Deaths in 2020



### Adjusted COVID-19 Deaths by Level of Care and Within Surrounding Counties

Over the past four decades, the market for seniors housing—including assisted living and independent living—has greatly expanded to accommodate people with more complex needs.<sup>27</sup> As shown in Exhibit 4, seniors housing properties are caring for residents who are much older on average than those living in traditional non-congregate private housing (85.3 years old in assisted living compared to 74.0 in private housing). In addition to advanced age, seniors housing residents are much more likely to require help with activities of daily living (ADLs) and to have cognitive impairment. Taken together, these higher-need individuals are at higher risk for contracting COVID, due to both their age and underlying health status and the fact that they require more hands-on caregiving.

Exhibit 4: Age and Health Status of Seniors Housing Care Segments

	Traditional Private Housing	Independent Living	Assisted Living	Skilled Nursing
Average Age	74.0	82.2	85.3	83.5
Percent Requiring Help with 2+ ADLs	4%	8%	65%	92%
Percent with Cognitive Impairment	13%	21%	62%	76%

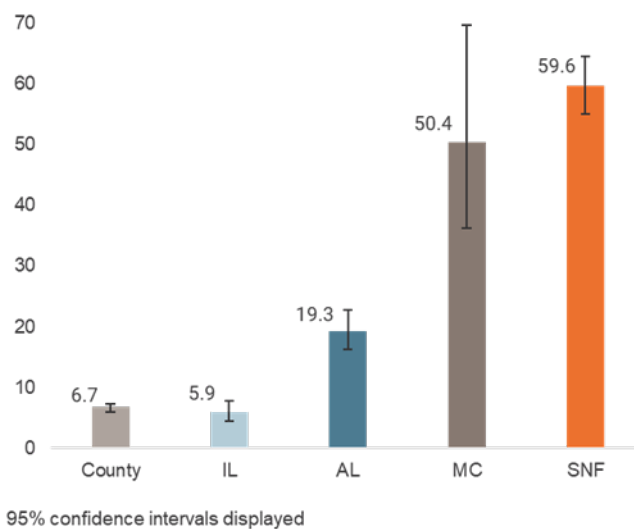
Source: 2020 Seniors Housing Data Book, ATI Advisory, May 2020.

#### COVID-19 deaths increased by level of care with the health needs of residents.

Differences in health needs were reflected in the mortality we observed across level of care. Exhibit 5 displays the expected rate of COVID-19 deaths per 1,000 residents in 2020 stratified by level of care and their associated 95 percent confidence intervals. We estimated these mortality rates using a statistical model that accounted for county-level differences in COVID-19 infection rates and state differences in reporting and mortality rates. They represent the average expected mortality rate for a property in our sample at each level of care, at the average rate of community COVID-19 infection seen across all included properties in the sample, equally weighting the differing impacts seen in each state.

As seen in Exhibit 5, risk of death increased with increases in the intensity of services and care. Mortality rates in independent living properties were statistically identical to older adults living in non-congregate settings (e.g., traditional private homes) in the same

Exhibit 5: Adjusted COVID-19 Deaths per 1,000 by Level of Care



<sup>27</sup> ATI Advisory. (2020, May). 2020 Seniors housing data book. [https://atiadvisory.com/wp-content/uploads/2020/05/ATI-Advisory-Seniors-Housing-Data-Book\\_May-2020.pdf](https://atiadvisory.com/wp-content/uploads/2020/05/ATI-Advisory-Seniors-Housing-Data-Book_May-2020.pdf).

county. Mortality rates in assisted living were higher than those for county or independent living, and lower than those in memory care and nursing care. Mortality rates in memory care and skilled nursing were higher than other levels of care, but were statistically equivalent to each other.

These differences in risk of COVID-19 death align with the increasing average age and declining health status of the residents in each care type, as residents of assisted living, memory care, and skilled nursing facilities were older and experienced more chronic health conditions that made them vulnerable to COVID-19 than people living in independent living or non-congregate settings. For instance, nationwide, people in assisted living and skilled nursing are 85.3 and 83.5 years old respectively, compared to 82.2 years old in independent living.<sup>28</sup> Skilled nursing residents also need more direct assistance from staff than residents in other levels of care, with 92 percent of skilled nursing residents requiring help with more than two activities of ADLs, compared to 65 percent of assisted living residents.<sup>29</sup> Persons living in memory care are experiencing Alzheimer's disease or related dementias that have been linked to an elevated risk of mortality from COVID-19.<sup>30,31,32</sup>

### ***COVID-19 impact in independent living was comparable to non-congregate settings in the community.***

Our mean estimate of COVID-19 mortality rates in independent living properties (5.9 per 1,000) was lower than those of people aged 75 and older old living in non-congregate settings in the same counties (6.7 per 1,000); however, this difference was not statistically significant and data from adults in non-congregate settings were limited in ways that might both accentuate and decrease this difference (see *Technical Report*). Our results show no statistical difference in mortality outcomes between persons in non-congregate settings and those in independent living. These findings suggest that the healthier seniors in independent living were not at higher risk by virtue of their congregate care setting. However, given data reporting limitations in both independent living properties and the surrounding counties, results should be interpreted with caution.

### ***Assisted living mortality rates were one-third of those in skilled nursing.***

Consistent with the health needs of residents, adjusted mortality rates were highest in skilled nursing, with an average of 59.6 deaths per 1,000 residents. Skilled nursing serves extremely old, frail, and high-risk residents who were most at risk of dying from COVID-19. By contrast, mortality rates in assisted living where residents were generally younger and healthier were two-thirds lower, at 19.3 per 1,000 residents.

### ***Mortality in memory care settings is high, consistent with other research documenting the risks of COVID-19 for dementia patients.***

Adjusted mortality rates in memory care were 50.4 per 1,000, which is statistically comparable (within the margin of error) to skilled nursing adjusted mortality. Memory care units also faced particular challenges in infection control, since seniors who have cognitive limitations are more likely to require additional care and

<sup>28</sup> ATI Advisory. (2020, May). *2020 Seniors housing data book*. [https://atiadvisory.com/wp-content/uploads/2020/05/ATI-Advisory-Seniors-Housing-Data-Book\\_May-2020.pdf](https://atiadvisory.com/wp-content/uploads/2020/05/ATI-Advisory-Seniors-Housing-Data-Book_May-2020.pdf).

<sup>29</sup> ATI Advisory. (2020, May). *2020 Seniors Housing Data Book*. [https://atiadvisory.com/wp-content/uploads/2020/05/ATI-Advisory-Seniors-Housing-Data-Book\\_May-2020.pdf](https://atiadvisory.com/wp-content/uploads/2020/05/ATI-Advisory-Seniors-Housing-Data-Book_May-2020.pdf).

<sup>30</sup> Wang, Q., Davis, P. B., Gurney, M. E., & Xu, R. (2021). COVID-19 and dementia: Analyses of risk, disparity, and outcomes from electronic health records in the US. *Alzheimer's & Dementia*. <https://doi.org/10.1002/alz.12296>.

<sup>31</sup> Saragih, I. D., Saragih, I. S., Batubara, S. O., & Lin, C. J. (2021). Dementia as a mortality predictor among older adults with COVID-19: A systematic review and meta-analysis of observational study. *Geriatric Nursing*.

<sup>32</sup> Vrillon, A., Mhanna, E., Aveneau, C., Lebozec, M., Grosset, L., Nankam, D., ... & Paquet, C. (2021). COVID-19 in adults with dementia: Clinical features and risk factors of mortality—A clinical cohort study on 125 patients. *Alzheimer's Research & Therapy*, 13(77), 1-8. <https://alzres.biomedcentral.com/articles/10.1186/s13195-021-00820-9>.



support with basic needs.<sup>33</sup> Researchers at Case Western Reserve University found evidence that patients with dementia had double the risk for contracting COVID-19 compared to patients without dementia.<sup>34</sup> The mortality risk for patients with dementia and COVID-19 (20.99 percent) was higher than for patients with COVID-19 but no dementia (4.81 percent) and for dementia patients without COVID-19 (7.64 percent).<sup>35</sup> Researchers suggest it could be due to preexisting damage to the brain that may permit greater virus entry into the brain and overall impact of COVID-19. The researchers also highlighted that memory impairment from dementia may interfere with residents' ability to comply with preventive measures for COVID-19. Despite these risks, 61 percent of memory care properties in our sample experienced no resident deaths, much higher than properties that were predominantly skilled nursing. This suggests that once COVID-19 entered a memory care property, it was extremely difficult to contain.

***The pattern of mortality rates by level of care was largely consistent across states, though anomalies exist.***

While adjusted mortality rates reveal state to state variation, the overall pattern of mortality rates are relatively consistent (see Exhibit 6). COVID-19-related mortality was highest among skilled nursing and memory care, and much lower in assisted living. Mortality rates in independent living appear comparable to rates in non-congregate settings in the broader counties. Georgia reported significantly lower mortality rates in memory care than other states. In Georgia, mortality rates in memory care were comparable to assisted living and both exhibited lower rates than skilled nursing. Connecticut's rates in all categories were higher than in other states, although the relative pattern of mortality rates was the same. Higher mortality in Connecticut may have resulted from earlier pandemic onset and severity, as well as from a reporting change in July 2020 that may have double-counted some deaths. Raw mortality rates (i.e., unadjusted by the model) reflect the same pattern as the modelled results. In the raw results, the mean mortality rates in memory care were higher than in skilled nursing, but the two estimates were statistically equivalent.

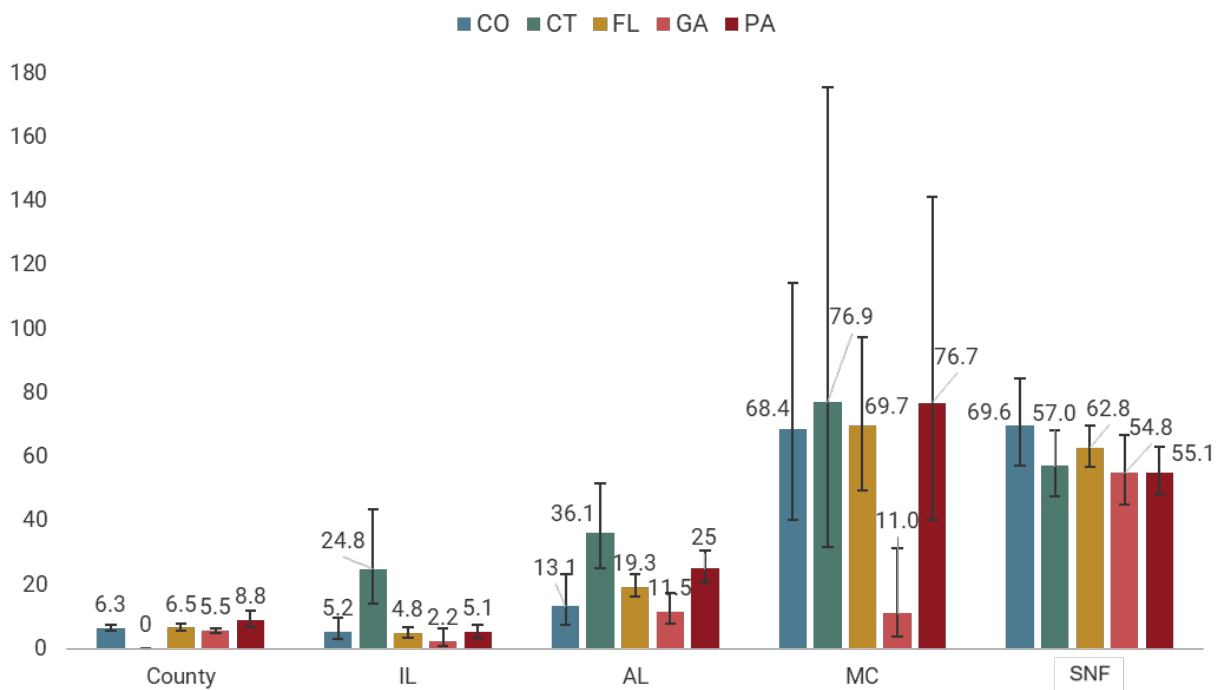
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<sup>33</sup> Pearson, C. F., Quinn, C. C., Loganathan, S., Datta, A. R., Mace, B. B., & Grabowski, D. C. (2019). The forgotten middle: Many middle-income seniors will have insufficient resources for housing and health care. *Health Affairs*, 38(5). <https://doi.org/10.1377/hlthaff.2018.05233>.

<sup>34</sup> Wang, Q., Davis, P. B., Gurney, M. E., & Xu, R. (2021). COVID-19 and dementia: Analyses of risk, disparity, and outcomes from electronic health records in the US. *Alzheimer's & Dementia*.

<sup>35</sup> Wang, Q., Davis, P. B., Gurney, M. E., & Xu, R. (2021). COVID-19 and dementia.

Exhibit 6: Adjusted COVID-19 Deaths per 1,000 Residents by Level of Care and State



\*Data note: IL refers to independent living, AL refers to assisted living, MC refers to memory care, SNF refers to nursing care. Note that non-congregate dwelling residents and deaths in Connecticut and in some counties in Colorado and Pennsylvania were not estimated and are not included in this total.

### The Impact on Continuing Care Retirement Communities

Continuing Care Retirement Communities (CCRCs), also known as life plan communities, offer a range of senior care services that can be modified as a resident ages in order to meet their evolving health care needs. These communities typically offer a range of levels of care— from independent living through skilled nursing services collocated within the same property or within separate buildings on a common campus. CCRCs may have experienced differences in their COVID-19 mortality outcomes compared to other seniors housing properties based on their mixed level of care, differences in health status of their residents, differences in the demographic make-up of their residents, or because their generally larger size and/or care-level segregated layout better equipped them to manage the pandemic.

In a secondary analysis that looked specifically at CCRC residents, we found that CCRCs were significantly associated with a lower expected mortality rate compared to non-CCRCs. The mean expected mortality rates for CCRCs across all care segments was 10.0 per 1,000 as compared to 19.9 in non-CCRCs. This impact was associated almost exclusively with better outcomes in CCRCs classified as majority skilled nursing in the NIC MAP data. We did not observe differences for other levels of care.

# Experience on the Ground: Seniors Housing Interview Themes

As part of this study, NORC interviewed eight aging services and seniors housing state affiliates of LeadingAge and Argentum and 12 seniors housing operators. The state affiliates we interviewed informed our understanding of the state policy landscape related to COVID-19 and seniors housing segments in their respective states and provided context to aid our interpretation of state COVID-19 mortality data. The operators we interviewed had a meaningful geographic footprint within the five states studied and represented a cross section of the industry (size, for-profit/nonprofit, care segments).

These interviews highlighted the experiences of seniors housing operators throughout the pandemic in 2020 and solutions they implemented to help protect residents and staff. Key themes from these interviews are summarized below.

## **Properties implemented staff workflow changes and visitor restrictions to reduce disease spread.**

The pandemic necessitated fundamental shifts in processes, workflow, and operational thinking to keep residents and staff safe. As stay-at-home orders were issued, operators had to adapt to keep their properties appropriately staffed to meet the social and medical needs of residents. Many operators took an “all hands on deck” approach to staffing—for example, transportation personnel became temperature checkers and physical therapists became resident window visitors. Operators also revised workflows to ensure safety and introduced new tasks such as properly donning and doffing of PPE. Operators also restricted visitation and halted communal dining and other group activities. Social activities, such as music and games that were previously held in group settings were adapted to limit contact. Building layouts, described by many operators as communal and social in nature, required swift adaptation to implement infection control protocols as the pandemic unfolded. Operators created COVID-19 isolation rooms, COVID-19 positive “communities,” and move-in quarantine wings, as well as staff cohorts to focus on different segments of the property to mitigate the close contact interactions between staff and residents.

## **COVID-19 testing and PPE access varied and challenged operators financially.**

Testing staff and residents to mitigate the spread of COVID-19 was a high priority for all operators interviewed. It was also mandated by federal, state, and local governments. The early days of the pandemic challenged operators as testing supplies were scarce, the tests themselves were not always accurate, and diagnostic test results were frequently delayed due to long lab processing times. The operators described incurring high costs associated with meeting federal, state, and local testing requirements, including significant ancillary costs such as acquiring materials and establishing testing partnerships with labs. Financial support to offset the cost of testing varied from local, state, and federal government resources. Some states, including Colorado, Florida, Georgia, and Pennsylvania, provided monetary support to seniors housing properties for testing, while the federal government did not explicitly do so. The various federal government COVID-19 relief packages did ensure reimbursement for testing of Medicare beneficiaries (most residents of seniors housing and care are Medicare beneficiaries), though the legislation did not explicitly include funding to help offset employee and staff testing costs.<sup>36</sup> At the time these interviews

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<sup>36</sup>John A. Yarmuth. (2021, March 11). *Text - H.R.1319 - American rescue plan act of 2021*. Congress.gov. <https://www.congress.gov/bill/117th-congress/house-bill/1319/text>.

were conducted, operators were actively working to understand the provisions of the American Recovery Plan of 2021 to determine their eligibility to receive funding to offset non-reimbursable testing costs.

Accessing PPE has been a well-documented challenge for organizations across health care, including in seniors housing.<sup>37,38</sup> Some operators credit the federal government with bridging the critical supply gap, but others criticized federal PPE aid as not timely, low quality, and insufficient. Some states also established response teams to provide operators with PPE to manage outbreaks and mitigate COVID-19 infection, but similar criticism exists regarding the state-funded assistance.<sup>39</sup> Many operators were left to leverage their own vendor and industry connections to procure PPE, which proved particularly challenging for smaller operators without scale to leverage pre-existing vendor relationships or quickly access financial capital.

### **Social distancing and disrupted schedules posed particular challenges for memory care residents.**

Memory care units serve a particularly vulnerable population that thrives on routine and daily structure to keep patients calm and safe. Operators reported that memory care residents often did not adapt well to infection control and operational workflow changes. Patients with cognitive impairment were unable to understand the need for social distancing, masking, or why visitation was banned. Many were extremely fearful of staff wearing PPE and were not able to or were unwilling to themselves wear PPE. While social distancing measures were critical to reducing the spread of COVID-19, operators emphasized the particular challenge with memory care as residents typically require very close contact care (e.g., dressing, bathing, feeding).

## Conclusions

This research demonstrates large differences of the mortality impact of COVID-19 across seniors housing levels of care. Mortality rates in assisted living were much lower than those in skilled nursing. Mortality in independent living was statistically indistinguishable from mortality rates experienced by adults living in non-congregate settings in the same geographic area. In these data, mortality rates followed a pattern of increasing mortality outcomes corresponding to increasing levels of resident social support, health, and caregiving needs. Although additional research into understanding the causes of these differences is required, this pattern suggests that differences in health status and frailty levels of residents living in seniors housing may have been a primary driver of seniors housing mortality during the COVID-19 pandemic. These findings demonstrate the important distinctions between the levels of care within seniors housing and may inform future public health and public policy responses to ensure a more effective pandemic response that protects vulnerable populations.

There were many data challenges in conducting this analysis, including data availability, quality, timeliness, variation in reporting across states, and inconsistencies between state and federal government sources. These limitations make it more difficult for health officials, policymakers, industry operators, researchers, and the public to understand how the COVID-19 pandemic is impacting various locations and settings of care. Ongoing improvements in our data infrastructure would enable better understanding of this pandemic and preparation for future health crises.

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<sup>37</sup> Livingston, E., Desai, A., & Berkwits, M. (2020). Sourcing personal protective equipment during the COVID-19 pandemic. *JAMA*, 323(19), 1912-1914.

<sup>38</sup> Ranney, M. L., Griffeth, V., & Jha, A. K. (2020). Critical supply shortages—The need for ventilators and personal protective equipment during the Covid-19 pandemic. *New England Journal of Medicine*, 382(18), e41.

<sup>39</sup> Pennsylvania Department of Human Services. (2020, June). *Regional response health collaborative (RRHC) program*. <https://www.dhs.pa.gov/coronavirus/Pages/RRHCP.aspx>.

Future research will attempt to compare mortality rates across levels of care while risk-adjusting for age and health status, as well as understanding the impact of COVID-19 on all-cause mortality by setting of care. Such research could leverage Medicare FFS claims data to produce risk-adjusted mortality rates for individuals living in seniors housing, as compared to individuals living in non-congregate settings. This risk-adjustment will account for baseline demographics such as age, race, and gender, as well as health status at the individual level. Doing so would allow for a rigorous assessment of differences in COVID-19-related and all-cause mortality across seniors with comparable health statuses living within the same geographic areas.

This study could not reliably assess the relationship among testing, confirmed case rates, and mortality for those with confirmed infections. Finally, additional analysis that further explores the experiences in memory care is warranted to identify opportunities to improve protection of residents from infectious disease while continuing to preserve their mental and emotional well-being.

# Glossary

Activities of Daily Living (ADLs): Activities related to the care of and moving of the body, including: walking, bathing, dressing, toileting, transferring, and eating.

Assisted Living (AL): Properties where assisted living units comprise the largest share of inventory. Residents receive personal care services such as assistance with bathing, dressing, eating, walking, and toileting. Twenty-four-hour protective oversight is provided, but 24-hour medical care is not.

Congregate Living Settings: Residences that are seniors housing (independent living, assisted living, memory care, nursing care, or CCRC), where a group of people reside, meet, or gather in close proximity for an extended period of time.

Continuing Care Retirement Community (also referred to as CCRC or Life Plan Community): Age-restricted properties that offer at least independent living and nursing care, and may include a full continuum of care, including assisted living, memory care, and other supportive services to residents generally all on one campus.

Independent Living (IL): Properties where independent living units comprise the largest share of inventory. Independent living properties typically include services such as communal dining, housekeeping, transportation, emergency call, and social programming services in the monthly fee.

Long-Term Care: In this study, long-term care comprises the care settings for seniors of independent living, assisted living, memory care, and skilled nursing. It is often used generically and interchangeably with seniors housing. In this study, we use the term "seniors housing."

Market Rate: Market rate seniors housing does not include affordable housing options that may be subsidized or rate capped.

Memory Care (MC): Properties where memory care units comprise the largest share of inventory are considered a specialty type of assisted living, serving residents with Alzheimer's disease and other dementias, and can include standalone properties as well as properties with a minority of other care settings.

Non-Congregate Dwelling Adults: Adults living in residences (in the broader county) that are not seniors housing (independent living, assisted living, memory care, nursing care, or CCRC).

Non-Congregate Living Settings: Residences (in the broader county) that are not seniors housing (independent living, assisted living, memory care, nursing care, or CCRC). Examples include single-family homes, apartments, and condominiums.

Non-Continuing Care Retirement Community (Non-CCRC): Any combination of care settings that does not include both independent living and nursing care on the same campus.

Skilled Nursing Facility (SNF): For purposes of this analysis, properties where skilled nursing or nursing home beds comprise the largest share of inventory. A SNF is generally a licensed residential property that serves people who require 24-hour nursing and/or medical care and are often considered the frailest elderly. In this study, skilled nursing generally encompasses locations that provide post-hospital skilled nursing services to seniors. This term collectively includes skilled nursing properties, skilled nursing facilities, and nursing homes.

Seniors Housing: In this study, seniors housing includes properties with independent living, assisted living, memory care, and/or skilled nursing settings. Seniors housing encompasses a wide range of congregate care settings for seniors and includes nursing care, independent living, assisted living, and memory care.