Factors Associated with Nursing Home Infections and Fatalities in New York State During the COVID-19 Global Health Crisis

New York State Department of Health
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Executive Summary

In an effort to learn for the future from the data now available from the earliest days of the first in a century pandemic that swept across the globe and into the United States, the New York State Department of Health (NYSDOH) conducted an in-depth analysis of self-reported nursing home data that finds that COVID-19 fatalities in nursing homes were related to infected nursing home staff. The NYSDOH analysis found:

- The timing of staff infections correlates with the timing of peak nursing home resident mortality across the state;
- Nursing home employee infections were related to the most impacted regions in the state;
- Peak nursing home admissions occurred a week after peak nursing home mortality, therefore illustrating that nursing home admissions from hospitals were not a driver of nursing home infections or fatalities;
- Most patients admitted to nursing homes from hospitals were no longer contagious when admitted and therefore were not a source of infection; and,
- Nursing home quality was not a factor in nursing home fatalities.

According to data submitted by nursing homes, in many cases under the penalty of perjury, approximately 37,500 nursing home staff members—one in four of the state's approximately 158,000 nursing home workers—were infected with COVID-19 between March and early June 2020. Of the 37,500 nursing home staff infected, nearly 7,000 of them were working in facilities in the month of March; during the same period, more than a third of the state's nursing home facilities had residents ill with the virus. Roughly 20,000 infected nursing home workers were known to be COVID-positive by the end of the month of April. These workforce infections are reflective of the larger geographic impact of the virus's presence across the state.

NYSDOH further analyzed the timing of the COVID-positive staff infections and the timing of nursing home deaths. Based on published data, the average length of time between COVID-19 infections to death is between 18-25 days.[1] Therefore, the link between the timing of staff infection and nursing home mortality is supported by the fact that the peak number of nursing home staff reported COVID-19 symptoms on March 16, 2020—23 days prior to the date of the peak nursing home fatalities, which occurred on April 8, 2020. It is likely that thousands of employees who were infected in mid-March transmitted the virus unknowingly—through no fault of their own—while working, which then led to resident infection.

NYSDOH also examined the potential impact of the NYSDOH's March 25, 2020 admission policy. A survey conducted by NYSDOH shows that approximately 6,326 COVID-positive residents were admitted to facilities between March 25, 2020 and May 8, 2020; this finding is supported by an independent analysis done by the *Associated Press* on May 22, 2020.[2] However, an analysis of the timing of admissions versus fatalities shows that it could not be the driver of nursing home infections or fatalities. An individual nursing home-by-nursing home analysis of admissions versus fatalities further supports this finding.

A causal link between the admission policy and infections/fatalities would be supported through a direct link in timing between the two, meaning that if admission of patients into nursing homes caused infection—and by extension mortality— the time interval between the admission and mortality curves would be consistent with the expected interval between infection and death. However, the peak date COVID-positive residents entered nursing homes occurred

[1]Verity R, Okell LC, Dorigatti I, et al. Estimates of the severity of coronavirus disease 2019: a model-based estimate. *Lancet Infect Dis* 2020;20: 669–77. *See also* Flaxman S, Mishra S, Gandy A, et al. Report 13: Estimating the number of infections and the impact of non-pharmaceutical interventions on COVID-19 in 11 European countries. Imperial College London (30-03-2020).

[2] Condon, Bernard, Jennifer Peltz, and Jim Mustain, Over 4,500 virus patients sent to NY nursing homes, *Associated Press* (May 22, 2020) located at https://apnews.com/5ebc0ad45b73a899efa81f098330204c.

on April 14, 2020, a week *after* peak mortality in New York's nursing homes occurred on April 8, 2020. If admissions were driving fatalities, the order of the peak fatalities and peak admissions would have been reversed.

NYSDOH further analyzed the period of time patients stayed in hospitals prior to admission to nursing home facilities. Preliminary data show that residents were admitted to nursing homes a median of 9 days after hospital admission. Health experts believe that individuals infected with the virus are most infectious 2 days before symptoms appear and that they are likely no longer infectious 9 days after symptom onset – thus, by the time these patients were admitted to a nursing home after their hospital stay, they were no longer contagious.[3]

NYSDOH also considered the impact of visitation into nursing homes as a cause of infections. A review shows that prior to nursing home visitation being suspended completely on March 13, 2020, there was no tracking or testing of family and friends who were present in the facility, and any asymptomatic or symptomatic visitor could have been granted access. Given what we now know about how widespread the virus was in New York prior to testing availability in February and early March, there is a high likelihood that COVID-positive visitors entered nursing homes, although there is no specific data to support this assumption, and so ultimately this is inconclusive.

[3] Centers for Disease Control and Prevention, Symptom-Based Strategy to Discontinue Isolation for Persons with COVID-19, (Updated May 3, 2020) located at https://www.cdc.gov/coronavirus/2019-ncov/community/strategy-discontinue-isolation.html.

Background[4]

Nations all across the globe have been significantly impacted by COVID-19. The situation rapidly and dramatically altered everyday life—requiring social distancing, closing of schools and businesses, and restricting access to hospitals and other congregate facilities.

New York State was one of the earliest states affected by COVID-19 resulting from inbound travel from Europe.[5] On March 1, 2020, NYS identified its first case of COVID-19 in an international traveler. On March 3, 2020, the first COVID-19 case with no travel-related risk factors was identified in Westchester, NY; contact tracing revealed additional infected contacts.

Congregate settings, like nursing homes, are particularly vulnerable to infectious diseases like COVID-19,[6] and many states and nations around the world have had to grapple with this difficult situation. The first known positive COVID-19 nursing home case in the United States was discovered when a Kirkland, Washington resident was transferred to a hospital on February 24, 2020 and later tested positive. In New York, the first introduction of COVID-19 into a nursing home known at the time occurred on March 5, 2020 when a nursing home staff member tested positive; the first confirmed case of COVID-19 in a nursing home resident known at the time occurred on March 11, 2020.

New York State has approximately 100,000 nursing home residents housed in 613 nursing home facilities statewide. Although an analysis conducted by the Kaiser Family Foundation in 2017 found that New York State has more nursing home residents than any state in the nation, despite being the fourth most populous state (Appendix A), New York's nursing

[4] The New York State Department of Health staff was supported by McKinsey & Company.

[5] Gonzalez-Reiche AS, Hernandez MM, Sullivan M, et al, Introduction and Early Spread of SARS-CoV-2 in New York City, *Science* (May 29, 2020) doi: 10.1126/science.abc1917. Online ahead of print.

[6] Centers for Disease Control and Prevention, Nursing Homes and Assisted Living (Long Term Care Facilities [LTCFs]), (June 26, 2020) retrieved from https://www.cdc.gov/longtermcare/index.html.

homes fatalities are not anomalous or disproportionate to the rest of the country. Data demonstrates that COVID-19 has been a challenge for nursing home facilities nationwide.

According to an analysis done by the *New York Times* on June 26, 2020, "at least 54,000 residents and workers have died from the coronavirus at these facilities for older adults in the United States, and as of June 26th, the virus has infected more than 282,000 people at some 12,000 facilities." The same *New York Times* analysis found that in terms of the percentage of total deaths in nursing homes, New York State ranked 46th in the nation—meaning 45 states had a greater percentage of fatalities (Appendix B).[7] Further, an examination of fatalities in our neighboring states—despite having populations much smaller than New York's—illustrates fatalities at these facilities were not a New York-specific phenomenon: Connecticut reports 3,124 deaths in these facilities, New Jersey reports 6,617, and Massachusetts reports 5,115, to New York's 6,432 fatalities. Looking at this on a per capita basis of nursing home deaths versus total population, Connecticut had 86 nursing home/long term care resident deaths for every 100,000 people, New Jersey 75 for every 100,000, Massachusetts 74 for every 100,000 people, Pennsylvania 35 for every 100,000 people, while New York had 33 for every 100,000 (Appendix C).

The New York State Department of Health (NYSDOH) undertook aggressive steps to prepare healthcare facilities for COVID-19 to prevent and control the spread of COVID-19 in the state's 613 nursing homes, issuing orders, directives and guidance to nursing homes on a variety of topics. For example, knowing personal protective equipment (PPE) would be critical and that there could be shortages because of global demand, on February 6, 2020 NYSDOH issued a

[7] 43% of U.S. Coronavirus Deaths Are Linked to Nursing Homes, *New York Times* (June 27, 2020) located at https://www.nytimes.com/interactive/2020/us/coronavirus-nursing-homes.html?action=click&module=Spotlight&pgtype=Homepage. The *New York Times* uses nusing homes and long term care facilities in their analysis.

letter to all nursing homes stating, "The Department asks all facilities to compare their existing inventories of PPE, such as face shields, gowns, gloves, masks, N95 respirators, against the expected rate of use of these items under a surge situation, to determine the quantities needed to be on hand" and then to coordinate with existing vendors and local offices of emergency management to procure additional PPE.[8] Over the course of the crisis, New York State provided nursing homes with an unprecedented 8,510,729 pieces of PPE for their workers and others.

In addition to PPE, NYSDOH issued guidance: on infection control in healthcare facilities (February 25, 2020), specific nursing home infection control, and health and safety guidance (March 6, March 11, & March 13, 2020). On March 13, 2020 NYSDOH mandated staff temperature checks at the beginning of each shift, mandated use of face masks by all staff, and cancelled congregate activities within nursing homes. The same day, Governor Cuomo issued an executive order banning all nursing home visitation statewide, expanding an order issued days earlier in New York's first known 'hot spot' New Rochelle on March 7, 2020. Moreover, the state created strict penalties for non-compliance, including the potential for a nursing home to lose its operating license.

On May 10, 2020, New York State mandated twice-weekly testing of staff for nursing homes in regions of the state operating in phases I and II of reopening, and once-weekly testing for all nursing homes in phase III and beyond. NYSDOH surveyors and epidemiologists conducted over 2,000 calls, video assessments, and in-person assessments to support nursing homes and assess compliance with infection control and prevention practices and bring corrective action for any deficiencies through April 2020.

[8] Letter from NYSDOH Commissioner Howard A. Zucker to all nursing home operators (February 6, 2020).

Analysis of COVID-19 Nursing Home Fatalities

Below is an analysis of possible factors correlating to infection rates or mortality rates in nursing homes. We compared and analyzed the following nationwide data and factors—many of which have been suggested as potential causes of nursing home infections—to determine correlation, including:

I. COVID-19 staff illness in the nursing home as a possible source of exposure;

II. Potential transmission from residents with COVID-19 who were admitted to the nursing homes;

III. Nursing home quality of care ratings contributing to COVID-19 resident exposures; and,

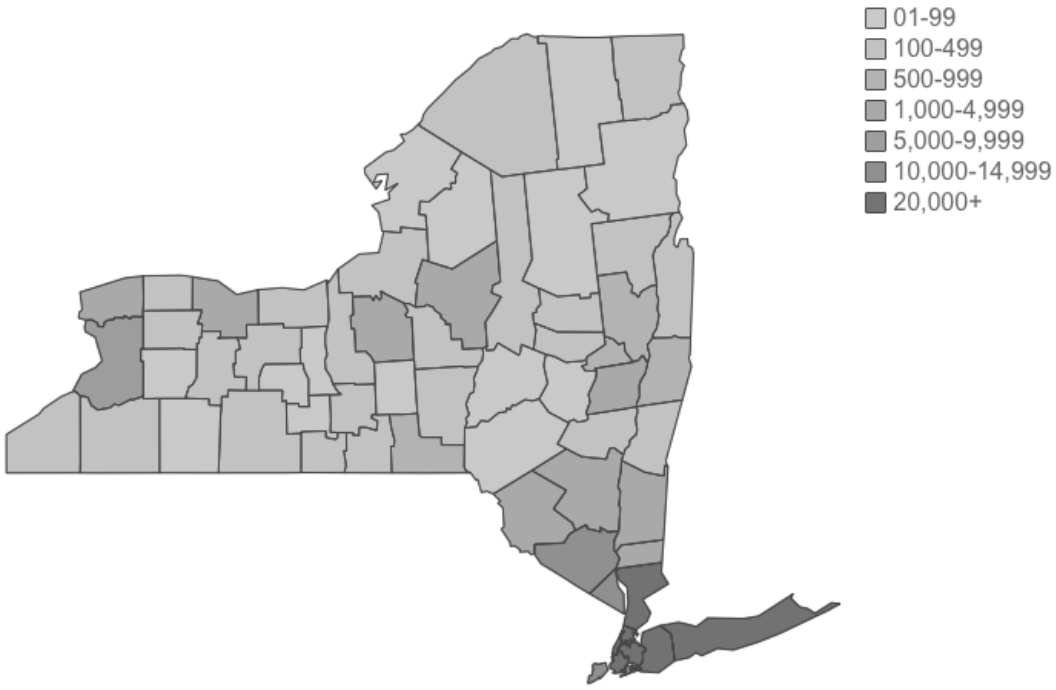
IV. The age of the nursing home residents as a factor for mortality.

I. COVID-19 Staff Illness Contributed to Infections of Nursing Home Residents

Since New York State's first confirmed COVID-19 case on March 1, 2020, until July 5, 2020, New York State has tested 4,233,803 people with 397,131 testing positive.[9] Within New York State, there has been significant geographic variation in overall positive tests by region (Figure 1) and within nursing home cases and fatalities. The most impacted regions in New York State were in the downstate region (Mid-Hudson Valley, New York City, and Long Island) —those regions had the highest nursing home fatality rates.

[9] See New York State Department of Health COVID Tracker at https://covid19tracker.health.ny.gov/views/NYS-COVID19-Tracker/NYSDOHCOVID-19Tracker-Map?%3Aembed=yes&%3Atoolbar=no&%3Atabs=n.

Figure 1. Persons Testing Positive for COVID-19 by County, July 5, 2020



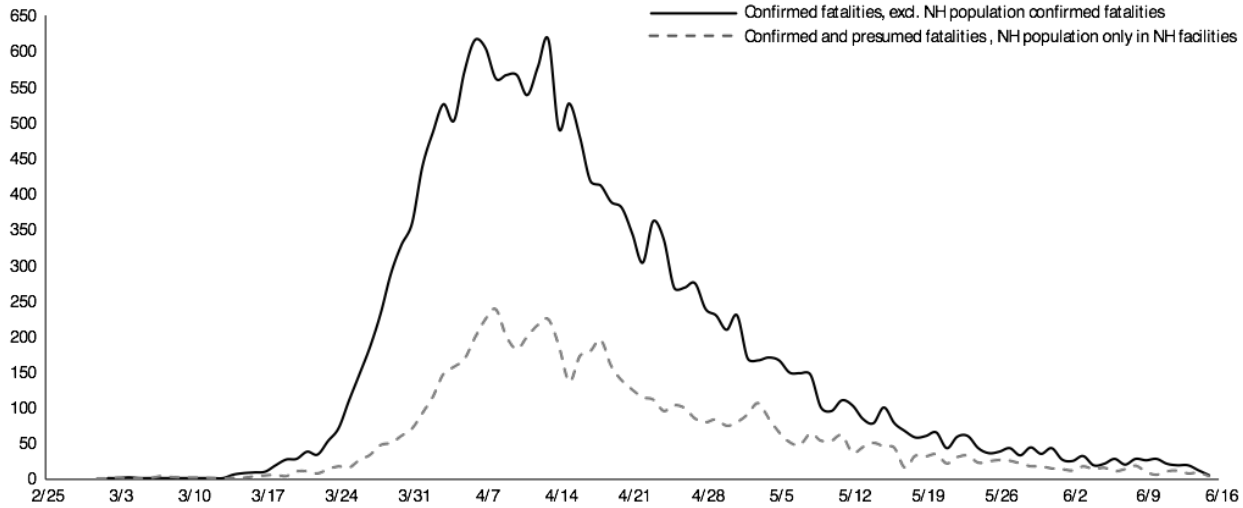
SOURCE: New York State COVID Tracker, located at https://covid19tracker.health.ny.gov/views/NYS-COVID19-Tracker/NYSDOHCOVID-19Tracker-Map?%3Aembed=yes&%3Atoolbar=no&*%3Atabs=n,* Accessed June 28, 2020.

As Figure 2 demonstrates[10], the mortality curve for nursing home residents closely follows the mortality curve for non-nursing home residents, with the peaks occurring at similar dates. As Figure 2 also illustrates, the peak was in early April suggesting the virus was spreading in many instances much earlier than first thought. An independent antibody study found that early infections—virtually undetected—were happening much earlier than initially thought in February of 2020.[11] This suggests a correlation between infections in geographical broader public infections and infections in nursing homes. Many of the nursing home residents were in those areas most impacted in New York State, including in the outer boroughs of New York

[10] This trend with a similar 3 city survey found in a recent article in the Journal of the American Medical Association. *See:* Michael L. Barnett, Hu, Lissy, et al, Mortality, Admissions, and Patient Census at SNFs in 3 US Cities During the COVID-19 Pandemic, JAMA. Published online (June 24, 2020), doi:10.1001/jama.2020.11642.
[11] Mandavilli, Apoorva, In Early February, the Coronavirus Was Moving Through New York, *New York Times* (June 30, 2020) located at https://www.nytimes.com/2020/06/30/health/coronavirus-ny.html.

City, Long Island, and the Mid-Hudson Valley. For example, 80% of all infected nursing home staff were from the most impacted areas of the state: New York City (48%), Long Island (17%), and the Mid-Hudson Valley (15%) with only 20% coming from the rest of the state. Not only was the number of nursing home staff significant, they were found in the most impacted regions, correlating to the overall infections in the most impacted regions.

Figure 2: **Comparison of Non-Nursing Home and Nursing Homes COVID-19 Fatalities Over Time**

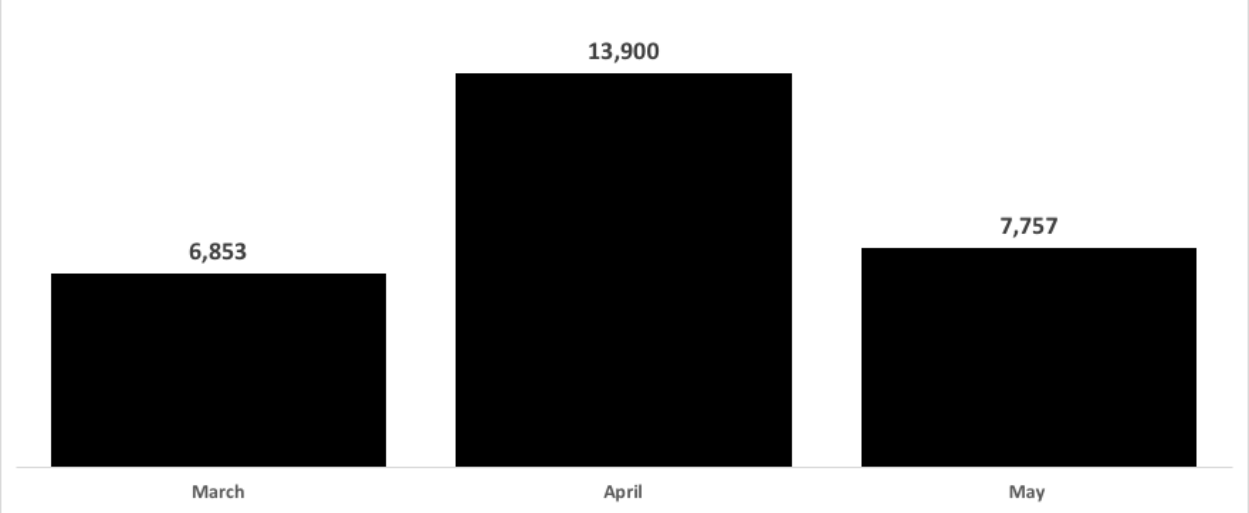


SOURCE: NYSDOH Daily Health Emergency Response Data System (HERDS) as of June 16, 2020.

Evidence suggests that nursing home residents were infected with COVID-19 as a result of transmission by the workforce. Based on a NYSDOH nursing home supplemental survey conducted on June 9, 2020 for the months of March, April, and May, 28,510 nursing home staff were confirmed or suspected COVID-positive cases across New York State.

Between May 20, 2020 and June 16, 2020, following Governor Cuomo's Executive Order mandating twice-weekly staff testing resulted in approximately 9,000 staff tested positive. That means that out of approximately 158,000 nursing home employees in the state, approximately 37,500 nursing home staff were presumed or confirmed positive for COVID-19—or one out of every four workers were infected.

Figure 3. Number of Nursing Home Employees Confirmed or Suspected To Be COVID-Positive, March 2020-May 2020



SOURCE: NYSDOH Nursing Home Staff Testing Survey, June 8, 2020, data reported by NYS nursing homes to NYSDOH.

Additional studies support this finding and suggest the number of staff infections could have been even higher. A May 2020 serological study conducted by the lab BioReference of roughly 3,500 nursing home employees in New York State found that 29% of the nursing home staff tested positive for having the COVID-19 antibodies.[12] Extrapolating that number, up to 45,820 nursing home staff were infected by May—or nearly one in three workers.

Why were infected nursing home staff able to likely infect residents in the nursing homes? In March, the federal government's Centers for Disease Control and Prevention (CDC) did not suspect that asymptomatic people were likely to spread the infection. First, there was no CDC recommendation for testing nursing home staff until recently, and the CDC guidance issued during February, March, and April varied in its recommendations, or lack of recommendations,

[12] BioReference Laboratories, Inc, Health's BioReference Laboratories Reports Results of COVID-19 Testing for Almost One Quarter of a Million Nursing Home and Live-in Facility Employees, (July 1, 2020) located at https://www.prnewswire.com/news-releases/opko-healths-bioreference-laboratories-reports-results-of-covid-19-testing-for-almost-one-quarter-of-a-million-nursing-home-and-live-in-facility-employees-301086786.html.

for when asymptomatic recovering or exposed healthcare workers could work, a reflection of the evolving understanding of the risk these people posed.

Moreover, CDC also issued guidance on March 7, 2020 that stated certain asymptomatic healthcare personnel exposed to others with the virus were "not restricted from work."[13] This early, and ultimately erroneous, understanding of viral spread allowed many nursing home COVID-positive employees to continue working. It was not until much later, as the true number of asymptomatic cases became clear, that evidence based upon contact tracing established definitively that asymptomatic people were in fact capable of spreading the virus.

To compound the situation, on March 16th the CDC issued guidance that nursing home employees who were symptomatic, but not tested, should wait only three days after the symptoms had passed to return to work and only seven days after the COVID-19-like symptoms first appeared.[14] As more was learned about COVID-19, CDC issued updated guidance on April 13th for asymptomatic workers and April 30th for symptomatic workers by increasing isolation to 10 days.[15] However, by that point, as data show, the disease was already at its peak in the

[13] Centers for Disease Control and Prevention, Interim U.S. Guidance for Risk Assessment and Public Health Management of Healthcare Personnel with Potential Exposure in a Healthcare Setting to Patients with Coronavirus Disease (COVID-19), (March 7, 2020). CDC did not recommend changing the beginning of the exposure period from the onset of symptoms to "48 hours before symptom onset" until April 2020.

[14] Centers for Disease Control and Prevention. Criteria for Return to Work for Healthcare Personnel with Confirmed or Suspected COVID-19 (Interim Guidance), (March 16, 2020) retrieved from https://web.archive.org/web/20200404023742/https://www.cdc.gov/coronavirus/2019-ncov/hcp/return-to-work.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fhealthcare-facilities%2Fhcp-return-work.html.CDC issued guidance regarding return to work for health care personnel but did not address asymptomatic COVID-19 positive healthcare personnel. Therefore, on March 31st, NYSDOH guidance issued to address this by applying the non-test based strategy to these individuals to exclude them for at least 7 days after the positive test result. *See* Updated Protocols for Personnel in Healthcare and Other Direct Care Settings to Return to Work Following COVID-19 Exposure or Infection (March 31st, 2020). This directive has since been superseded.

[15] Centers for Disease Control and Prevention, Return to Work for Healthcare Personnel with Confirmed or Suspected COVID-19, (April 13, 2020) retrieved from https://web.archive.org/web/20200417211515/https:/www.cdc.gov/coronavirus/2019-ncov/hcp/return-to-work.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fhealthcare-facilities%2Fhcp-return-work.html; CDC, Criteria for Return to Work for Healthcare Personnel with Suspected or Confirmed COVID-19 (Interim Guidance) (April 30, 2020) located at https://www.cdc.gov/coronavirus/2019-ncov/hcp/return-to-work.html.

nursing homes (Figure 2). It is likely that a significant percentage of both mildly symptomatic and asymptomatic employees were advised to continue working during March and April and thus unknowingly spread the disease within the facility. The entire situation was further compounded by the lack of testing nationwide capacity in March, making it impossible to have an accurate assessment of which nursing home staff were COVID positive.

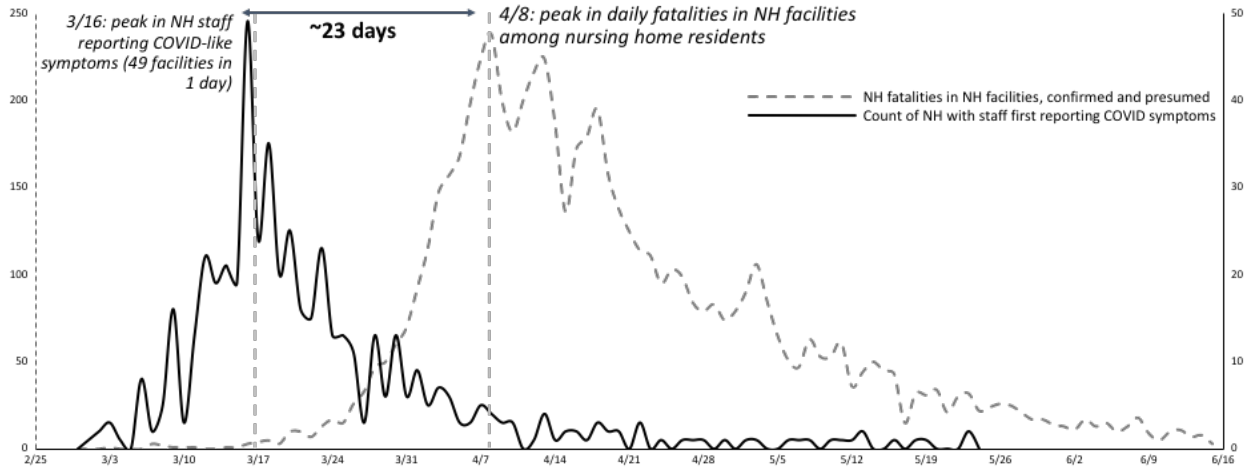
As Figure 4 illustrates below, the peak of nursing home fatalities was in early April. In order to address possible correlation, you must consider COVID-19's incubation period. According to the CDC,[16] the incubation period for COVID-19 is as follows:

- Infection to symptoms: Avg. 5 days (range 2-14)
- Symptoms to hospital: Avg. 8 – 12 days
- Infection to hospital: Avg. 13 – 17 days
- Symptoms to death: Avg. 13 – 20 days
- Infection to death: Avg. 18 – 25 days

Given this incubation period, it is likely that thousands of employees infected in mid-March could have unknowingly—through no fault of their own— transmitted the virus while working, which then led to resident infection, something that Figure 4 demonstrates. The average length of time between infections to death is between 18-25 days. Therefore, an analysis of the timing between known nursing home staff infections and nursing home fatalities indicates that they are correlated due to the fact that the peak number of nursing home staff reporting COVID-19 symptoms occurred 23 days prior to the date of the peak nursing home fatalities.

[16] Centers for Disease Control and Prevention, Interim Clinical Guidance for Management of Patients with Confirmed Coronavirus Disease (COVID-19), (Updated May 29, 2020) located at https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html.

Figure 4. Number of Nursing Homes Reporting First Symptomatic Staff and Nursing Home Resident Fatalities Timeline



SOURCES: NYSDOH Nursing Home Staff Testing Survey, June 8, 2020, data reported by NYS nursing homes to NYSDOH and NYSDOH Daily Health Emergency Response Data System (HERDS) survey.

However, other factors that cannot be ruled out include spread from family and visitors. As Figure 4 illustrates, nursing home fatalities were increasing in mid-March. New York State acted early in its outbreak to ban any non-medical visitation, including family and friends, on March 13, 2020. The nursing home fatality peak was April 8, 2020. Given this timing, and given the COVID-19 incubation period, it is possible that with visitation by family and friends prior to March 13th, the potential for positive COVID-19 cases being among those visitors and spreading it within the facility was a contributing factor. There is no data on the infection rate of nursing home visitors, so this is inconclusive. All of this activity well pre-dated the March 25 admission policy for COVID-positive residents (*Infra*).

II. Potential Transmission from Residents with COVID-19 Who Were Admitted to the Nursing Homes

One of the factors that has been suggested by some observers to contribute to nursing home infections and subsequent fatalities is that the admission of COVID-positive residents introduced COVID into nursing homes. However, data does not support this assertion.

If the March 25th NYSDOH policy on admissions uniquely impacted nursing home fatalities, New York's—and the roughly 12 other states with similar policies—nursing home fatalities would be disproportionate to the rest of the country. Not only has a recent report by the *New York Times,* found that New York's nursing home fatalities were not disproportionate to the rest of the nation (*See,* Background, *Infra.*), neighboring states—despite having populations much lower than New York's—illustrates that on a per capita basis, New York has one of the lowest fatality rates in nursing homes of any of its neighboring states (Appendix C).

New York State followed the federal government's Centers for Medicare & Medicaid Services (CMS) guidance which stated that nursing homes should accept residents with COVID-19 as long as they can use transmission-based precautions.[17] The federal guidance specifically states, "Nursing homes should admit any individuals that they would normally admit to their facility, including individuals from hospitals where a case of COVID-19 was/is present."[18]

NYSDOH's March 25, 2020 admission guidance stated, "No resident shall be denied re-admission or admission to the NH *solely* based on a confirmed or suspected diagnosis of

[17] U.S. Centers for Medicare and Medicaid Services, Guidance for Infection Control and Prevention of Coronavirus Disease 2019 (COVID-19) in Nursing Homes (Revised) (Report Ref: QSO-20-14-NH), (March 13, 2020), Baltimore MD: US Centers for Medicare and Medicaid Services.
[18] Id at page 5.

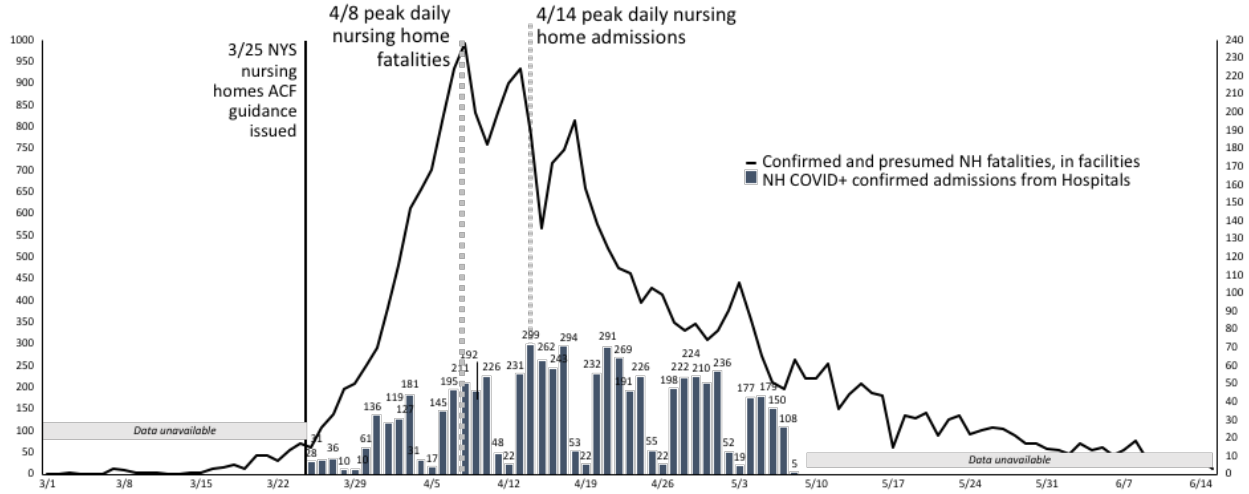
COVID-19" (*emphasis added)*.[19] However, contrary to some press reports, neither CMS guidance nor the state ever *directed* that a nursing home must accept a COVID-positive person. In fact, the opposite is true. By state law, a nursing home could *not* accept a COVID-positive person unless the nursing home could provide adequate care. Title 10 of New York State Codes, Rules and Regulations clearly states a nursing home, "shall accept and retain only those nursing home residents for whom it can provide adequate care."[20] It was in the nursing homes' sole discretion to determine if they would accept the COVID-positive person and if they could provide adequate care. Thus, it would be against the law for any nursing home operating in New York State to accept a patient it could not care for—in this instance that specifically meant a nursing home's ability to properly isolate patients and follow protective procedures.

Admission of COVID-19 Patients

A statewide nursing home survey conducted by NYSDOH for admission data from March 25, 2020- May 8, 2020 show that approximately 6,326 COVID-19 patients were admitted from a hospital to a total of 310 unique nursing homes. Of the 310 nursing homes that admitted COVID-19 patients, 252 of them already had a suspected or confirmed COVID-positive resident, COVID-related confirmed or presumed fatality, or worker infected prior to admission of a single COVID-positive patient—meaning the admission of a COVID patient *did not* introduce COVID into the nursing home as it was already present. Furthermore, 222 of the state's nursing homes already had residents with confirmed or suspected COVID-19 prior to the March 25, 2020 NYSDOH guidance.

[19] NYSDOH, Advisory: Hospital Discharges and Admissions to Nursing Homes (March 25, 2020).
[20] See Title 10 of the New York State Code of Rules and Regulations, section 415.26, (ii).

Figure 5. **Nursing Home Fatality Curve and Admissions Over Time**

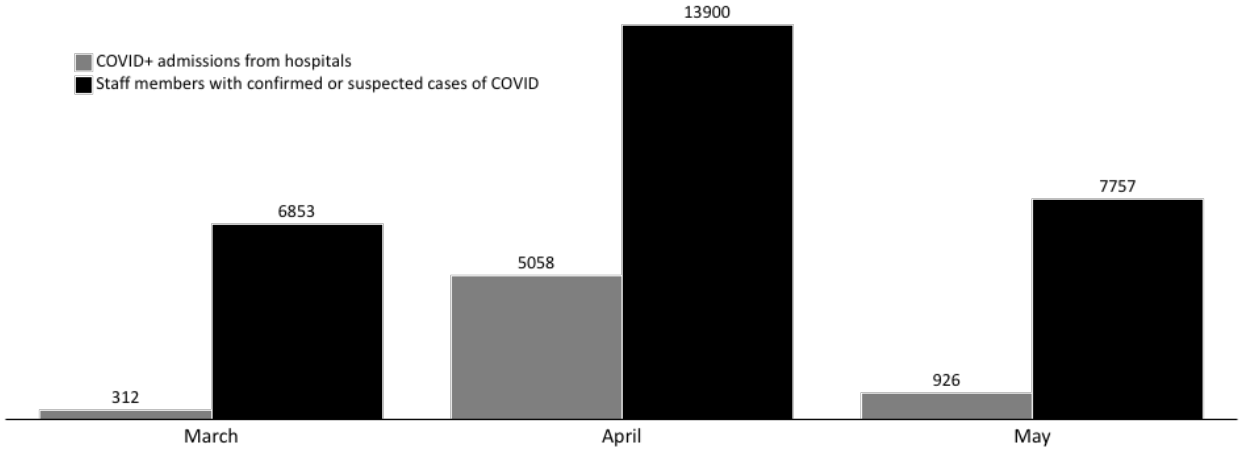


SOURCE: NYSDOH Facility Survey as of May 27, 2020 for COVID Positive Admissions from March 1, 2020 - May 8, 2020.

Figure 5 above shows the timeline of nursing home resident fatalities and COVID-19 admissions. Nursing home resident fatalities peaked on April 8, 2020. The peak of nursing home admissions from hospitals did not occur until April 14, 2020, a week *after* peak nursing home fatalities—suggesting the policy was not the cause.

Further, as Figure 5 shows, admissions of residents with COVID-19 were still increasing when the number of nursing home deaths was already *declining*. If the March 25, 2020 guidance was the major cause of exposures leading to nursing home deaths, the time interval between the admission and mortality curves would be consistent with the expected interval between infection and death. Figure 6 shows a comparison of the number of COVID positive admissions versus known COVID staff infections by month.

Figure 6. Comparison between Infected Nursing Home Employees and Resident Admissions



SOURCE: NYSDOH facility survey March 25, 2020 to May 8, 2020 Admissions and DOH Facility Staff Illness Survey.

In addition, the data suggests that people admitted from hospitals to nursing homes were most likely not contagious. Per CDC data, COVID-positive individuals are likely not capable of transmitting the virus after 9 days from the onset of the illness. The CDC stated, "The statistically estimated likelihood of recovering replication-competent virus approaches zero by 10 days."[21] This comports with the CDC policies related to return to work and removal from isolation precautions after a positive COVID test. CDC isolation period has been currently established to be 10 days. In April, the CDC suggested an even more reduced isolation period of 7 days after testing positive as long as 72 hours had been with symptoms reducing and no fever.[22] After this date, infected persons are unlikely to transmit the virus, although it may still

[21] Centers for Disease Control and Prevention, Symptom-Based Strategy to Discontinue Isolation for Persons with COVID-19, (Updated May 3, 2020) located at https://www.cdc.gov/coronavirus/2019-ncov/community/strategy-discontinue-isolation.html.

[22] Centers for Disease Control and Prevention, Return to Work for Healthcare Personnel with Confirmed or Suspected COVID-19, (Updated April 13, 2020) retrieved from https://web.archive.org/web/20200417211515/https:/www.cdc.gov/coronavirus/2019-ncov/hcp/return-to-work.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fhealthcare-facilities%2Fhcp-return-work.html.

result in a positive PCR test. Length of stay data shows that for nursing home admissions, the length of hospital stay was a median of 9 days. This is likely beyond the period of viral transmission. According to researchers and health experts, individuals with COVID-19 are most infectious 2 days before symptoms appear and likely no longer infectious 9 days after symptom onset.[23][24]

COVID Admissions

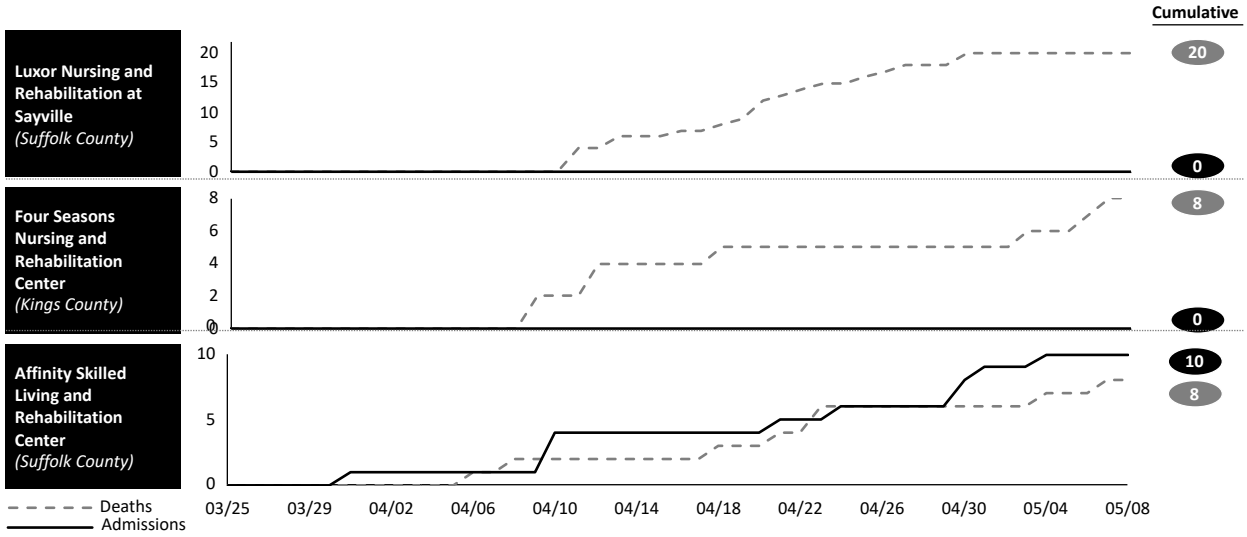
Admissions into nursing homes are patients who went to the hospital *from* a nursing home, were treated and returned back to their nursing home. By definition these patients could not have been responsible for introducing COVID into their nursing home, as they had COVID prior to going to the hospital for treatment and before being readmitted. These residents were pre-symptomatic or in the early stages of illness at the nursing home when they would have been infectious but before COVID-19 might have been recognized and the resident put on transmission-based precautions. Therefore, based on the most cautious current provisions, most patients readmitted to nursing homes were likely not infectious, for the time they were being readmitted would have far exceeded the CDC standard.

[23] Zou L, Ruan F, Huang M, et al. SARS-CoV-2 Viral Load in Upper Respiratory Specimens of Infected Patients. *N Engl J Med* 2020;382:1177-9.
[24] He, X., Lau, E.H.Y., Wu, P. et al. Temporal dynamics in viral shedding and transmissibility of COVID-19. *Nat Med* 26, 672–675 (2020).

Did Admissions Increase Mortality?

The data do not show a consistent relationship between admissions and increased mortality. As exemplified in Figure 7, there were cases where nursing homes did not admit any COVID-positive patients, yet still had a high number of COVID-related deaths. As the chart demonstrates, one facility with zero admissions or admissions still had 20 deaths and another had zero admissions, yet 8 deaths. In fact, 132 nursing homes that had zero admissions from hospitals nonetheless had one or more COVID-19 fatalities. A total of 97 facilities had their first COVID-19 fatality before or on the day of their first admission.

Figure 7. Cumulative Mortality Versus Admissions, Select Facilities

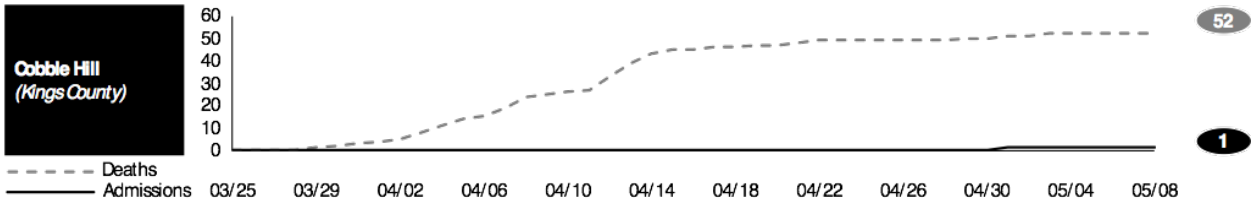


SOURCE: NYSDOH Facility Survey as of May 27, 2020 for Admissions from March 1, 2020 - May 8, 2020.

In addition, some nursing-home specific cases also demonstrate that admissions policies were not the determinative factor. For example, virtually all of the Cobble Hill Health Facility's fatalities happened by April 14, 2020 (43 of the 52); yet Cobble Hill Health Facility had only one COVID-positive admission and it did not occur until April 30, 2020. Thus, the admission of

COVID-positive patients was not a factor in the Cobble Hill Health Facility nursing home fatalities.

Figure 8. Cumulative Mortality Versus Admissions, Cobble Hill Health Center



SOURCE: NYSDOH Facility Survey as of May 27, 2020 for Admissions from March 1, 2020 - May 8, 2020.

Did Patients Coming from Hospitals Have Alternatives to Nursing Homes?

There was no need for nursing homes to accept COVID-positive patients if they could not provide adequate care in a safe environment, as required by state law, as there were alternatives available facilities for such patients. New York State had secured various alternative facilities, with a significant number of beds suitable for COVID-positive nursing home patients, had any nursing home declined to accept a COVID-positive patient. During the outbreak, the State even created COVID-positive exclusive facilities for nursing home residents across the state. In New York City, the State created the Brooklyn Center in Brooklyn with 281 beds run by Maimonides and South Beach in Staten Island with 259 beds operational. Upstate, Catholic Health's St. Joseph Post-Acute Center (operating under the license of Father Baker Manor Home) was made a COVID-only facility with 80 beds. In addition, surplus capacity was made available at SUNY Downstate Hospital in Brooklyn and SUNY Upstate Hospital in Syracuse. Therefore, there was no need for nursing homes to accept COVID-positive patients <u>if</u> they did not believe they could provide adequate care, as required by law, as the State had available alternatives. The State

Department of Health and Attorney General's office are doing an investigation to determine, among other things, if nursing homes violated this law.

Further, questions have been raised by the *New York Times* about the potential profit motivation by some nursing homes to evict certain low-income patients to be able to accept COVID-positive patients as the reimbursement for treatment is higher than that for traditional Medicaid patients.[25] The NYSDOH has begun to investigate these claims.

III. Nursing Home Quality Contributing to COVID-19 Resident Exposure

We analyzed whether nursing homes that had a lower quality rating over the past several years had a higher death rate than nursing homes with a record of higher star ratings. In fact, this hypothesis is not substantiated. Using the quality rating system developed by CMS, 5-Star Quality Rating System, nursing homes with higher CMS quality ratings were found to have higher mortality rates than those with lower quality ratings. The mortality rate was higher in 5-star rated facilities (i.e. better rated) than it was in the lowest-rated facilities (12% mortality rate in 5-star, versus 7% in the lowest rated).[26]

From the data, the apparent explanation for this phenomenon is that the geographic location of the nursing home facility, and its corresponding rate of community infection, had a greater connection than the performance of the nursing home facility. Data show the

[25] Jessica Silver-Greenberg and Amy Julia Harris, "'They Just Dumped Him Like Trash': Nursing Homes Evict Vulnerable Residents" *New York Times* (June 21, 2020) located at https://www.nytimes.com/2020/06/21/business/nursing-homes-evictions-discharges-coronavirus.html.

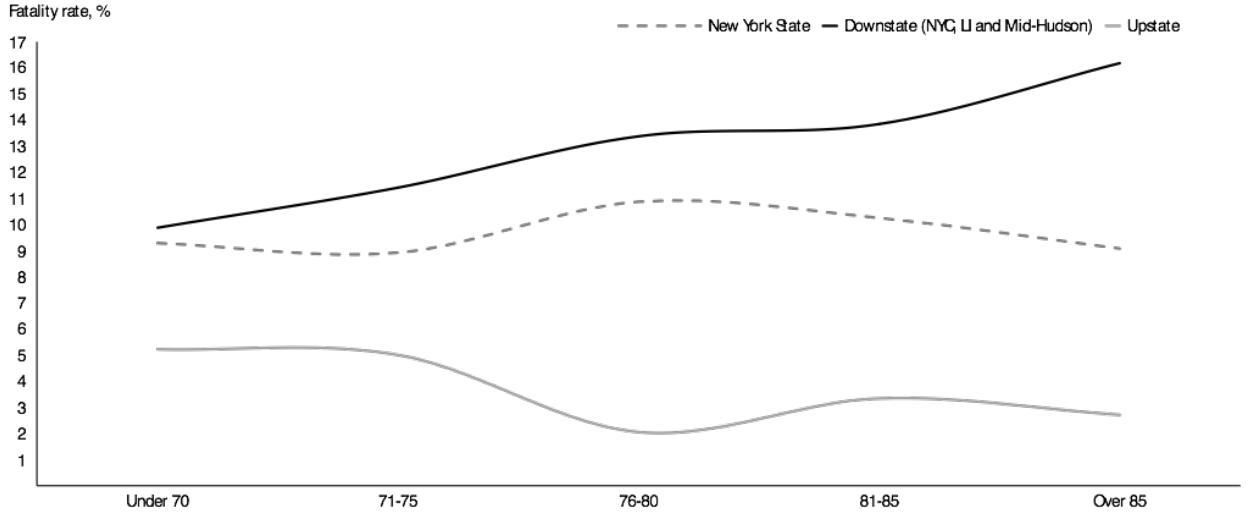
[26] NYSDOH Facility Survey as of May 27, 2020 for Admissions from March 1, 2020 - May 8, 2020, Nursing Homes detail as of May 26, 2020. Facility ratings come from https://data.medicare.gov/Nursing-Home-Compare/Provider-Info/4pq5-n9py.

predominance of nursing home deaths were in downstate New York and unrelated to the performance of the particular nursing home.

IV. Age of the Nursing Home Resident as a Factor for Mortality

Another factor was reviewed in relation to nursing home fatalities—age of the resident. As data show, older individuals are more susceptible to death from COVID-19 infection.[27] The analysis between resident age and mortality suggests a relationship between a higher median resident age and an increase in the mortality rate in downstate New York; this trend was not evident in the rest of New York where there were fewer nursing homes deaths.

Figure 9. Age Versus Nursing Home Fatality Rate by Region



SOURCE: MDS Q4 2019 - Analysis of age of the residents in the nursing homes

[27] CDC COVID-19 Response Team. Severe outcomes among patients with coronavirus disease 2019 (COVID-19)—United States, February 12–March 16, 2020. MMWR Morb Mortal Wkly Rep 2020;69:343–6.

Conclusion

When examining the data, several factors are clear from our analysis and research:

- Data suggest nursing home quality is not a factor in mortality from COVID.
- Admission policies were not a significant factor in nursing home fatalities.
- Employee infections were related to the larger community spread and employee transmission has the strongest correlation to nursing home fatalities.

Comparing nursing home policies and mortality rate timelines suggests COVID-19 transmission is strongly correlated to nursing home employees entering the facility. Early in the COVID-19 pandemic, the consensus among public health experts suggested asymptomatic people did not spread the disease and asymptomatic positive or presumed positive employees were allowed to continue to work. Later in the crisis, public health experts were forced to reverse this position as it became clear from the data that asymptomatic people could transmit the disease.

In addition, independent testing done by BioReference in May showed 29% of nursing home employees surveyed had COVID antibodies. Extrapolating the data means that approximately one in three nursing home workers were infected. Such a high percentage of employees having at one time been positive for COVID-19 suggests a strong correlation to contributing to the spread to patients.

Our analysis brings to the forefront the possibility of transmission from staff as an important mode of transmission. If states had accurate information about COVID transmission at an earlier time and had the testing capacity to detect asymptomatic but infected individuals, other procedures might have been taken. For example, all asymptomatic employees should have been barred from facilities as if they were symptomatic, which is the current policy (*See,* Directive April 29, 2020 to Nursing Home Administrators). If widespread testing was available

earlier, all employees could have been tested earlier (*See,* Executive Order 202.30, as amended). These are national issues that must be addressed (e.g. better training of staff, enhanced and rapid testing, and better coordination with other healthcare facilities) as nursing homes and other congregate settings will pose a continued risk for the Coronavirus or another public health threat in the future that attacks older adults.

Appendices

Appendix A. Nursing Home Facilities, by State

State	Number of Nursing Facilities	Number of Residents
Alabama	228	22,482
Alaska	18	608
Arizona	145	11,343
Arkansas	231	17,439
California	1,198	101,030
Colorado	221	16,078
Connecticut	223	22,653
Delaware	45	4,181
District of Columbia	18	2,380
Florida	690	72,741
Georgia	359	33,043
Hawaii	42	3,474
Idaho	71	3,319
Illinois	731	66,643
Indiana	552	38,682
Iowa	437	23,638
Kansas	276	14,657
Kentucky	285	22,760
Louisiana	277	26,169
Maine	100	5,947
Maryland	226	24,414
Massachusetts	399	38,673
Michigan	443	38,062
Minnesota	375	24,755

Mississippi	204	15,950
Missouri	518	37,874
Montana	72	4,153
Nebraska	214	11,394
Nevada	61	5,336
New Hampshire	74	6,442
New Jersey	364	44,033
New Mexico	74	5,693
New York	613	101,518
North Carolina	429	35,763
North Dakota	80	5,531
Ohio	966	73,826
Oklahoma	303	18,361
Oregon	136	7,317
Pennsylvania	693	76,652
Rhode Island	83	7,817
South Carolina	191	16,993
South Dakota	108	5,984
Tennessee	314	26,481
Texas	1,227	92,250
Utah	99	5,178
Vermont	36	2,440
Virginia	286	27,595
Washington	217	15,993
West Virginia	123	9,251

Wisconsin	374	24,239
Wyoming	38	2,428
TOTAL USA	15,483	1,321,663

SOURCE: KFF, Total Number of Residents in Certified Nursing Facilities (2017) located at https://www.kff.org/other/state-indicator/number-of-nursing-facility-residents/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D.

Appendix B. Cases and Deaths in Nursing Homes, by State

		Facilities	Cases	Deaths	Share of COVID Deaths
	United States	12,000	282,000	54,000	43%
1	New Hampshire	26	1,967	293	80%
2	Rhode Island	64	2,745	715	77%
3	Minnesota	853	5,777	1,107	77%
4	Connecticut	289	9,888	3,124	73%
5	Pennsylvania	678	20,689	4,518	68%
6	North Dakota	65	569	56	64%
7	Massachusetts	565	23,321	5,115	64%
8	Idaho	30	323	56	62%
9	Maryland	289	12,641	1,924	61%
10	Virginia	236	6,714	1,039	61%
11	Kentucky	172	2,626	350	61%
12	Washington	389	4,376	779	60%
13	Vermont	6	172	32	57%
14	Ohio	530	9,928	1,580	57%
15	North Carolina	170	5,445	746	57%
16	Maine	16	485	58	56%
17	Kansas	100	927	149	56%
18	Oregon	49	821	112	55%
19	Colorado	166	5,660	910	54%
20	Oklahoma	134	1,647	201	53%
21	Florida	1,011	11,472	1,748	52%
22	Delaware	31	687	263	52%
23	Illinois	593	21,390	3,649	52%
24	Iowa	54	2,030	360	51%
25	Mississippi	137	2,787	507	50%
26	West Virginia	37	394	45	49%
27	California	923	23,646	2,832	48%

28	South Carolina	171	2,541	317	46%
29	Georgia	533	9,939	1,237	45%
30	New Jersey	562	36,316	6,617	44%
31	Indiana	268	5,147	1,140	44%
32	Texas	863	6,641	1,031	44%
33	South Dakota	58	384	38	43%
34	Utah	191	906	70	42%
35	Louisiana	400	7,833	1,315	41%
36	New Mexico	55	250	180	37%
37	Arizona	289	3,902	541	—
38	Tennessee	85	1,513	195	34%
39	Nebraska	119	519	92	34%
40	Arkansas	113	978	83	33%
41	Michigan	240	10,630	2,031	33%
42	Montana	3	35	7	32%
43	District of Columbia	20	1,072	173	32%
44	Wyoming	4	54	6	30%
45	Nevada	75	1,289	135	27%
46	New York	509	7,177	6,432	21%
47	Alabama	131	3,746	112	—
48	Hawaii	15	89	1	—
49	Missouri	118	1,394	15	—
50	Alaska	10	93	0	—
51	Wisconsin	318	1,242	0	—

SOURCE: *New York Times;* States with insufficient data to calculate a share of Covid-19 deaths are shaded gray. The *New York Times* analysis included long term care facilities.

Appendix C. Nursing Home Fatalities as a Percentage of Nursing Home Residents and General Population

State	# of Deaths	Total Nursing Home Residents	Total Nursing Home Facilities	Deaths Per Capita to Total State Population (per 100k people)
CT	3,124	21,335	213	86
MA	5,115	41,000	476	74
NJ	6,617	61,000	615	75
PA	4,518	20,689	678	35
NY	6,432	101,518	613	33

SOURCE: NYSDOH Analysis of KFF data (Table 1) and *New York Times* (Table 2). The *New York Times* analysis included long term care facilities.