By Adam Dean, Atheendar Venkataramani, and Simeon Kimmel

Mortality Rates From COVID-19 Are Lower In Unionized Nursing Homes

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ABSTRACT More than 40 percent of all reported coronavirus disease 2019 (COVID-19) deaths in the United States have occurred in nursing homes. As a result, health care workers' access to personal protective equipment (PPE) and infection control policies in nursing homes have received increased attention. However, it is not known whether the presence of health care worker unions in nursing homes is associated with COVID-19 mortality rates. Therefore, we used cross-sectional regression analysis to examine the association between the presence of health care worker unions and COVID-19 mortality rates in 355 nursing homes in New York State. Health care worker unions were associated with a 1.29-percentage-point reduction in mortality, which represents a 30 percent relative decrease in the COVID-19 mortality rate compared with facilities without these unions. Unions were also associated with greater access to PPE, one mechanism that may link unions to lower COVID-19 mortality rates.

Adam Dean (adamdean@gwu.edu) is an assistant professor of political science at George Washington University, in Washington, D.C.

Atheendar Venkataramani is an assistant professor in the Division of Health Policy, Perelman School of Medicine, University of Pennsylvania, in Philadelphia, Pennsylvania.

Simeon Kimmel is an assistant professor in the School of Medicine, Boston University and Boston Medical Center, in Boston, Massachusetts.

Amid the coronavirus disease 2019 (COVID-19) global pandemic, as of September 23, 2020, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) had caused infections in almost seven million people and resulted in more than 200,000 deaths in the United States.[1] Nursing home residents have been disproportionately affected, accounting for more than 40 percent of documented deaths in the country.[2,3] New York State has suffered more than 6,600 COVID-19 deaths in nursing homes, which is more than any state other than New Jersey.[3]

Investigations into outbreaks in individual nursing homes have identified several factors leading to increased risk for infection and resulting death among nursing home residents.[4–7] First, nursing homes care for elderly people with medical comorbidities who have an increased risk for death from COVID-19. Second, nursing home residents live close together, and staff members have direct contact with residents and each other. These staff members provide direct care to multiple residents and may work in multiple facilities or provide home care to earn additional income.[8,9] These cumulative direct contacts may increase risk for SARS-CoV-2 infection and spread. Third, asymptomatic spread of SARS-CoV-2 eluded early infection control strategies, which focused on isolating only staff and residents with symptoms.

Centers for Medicare and Medicaid Services (CMS) guidelines now recommend personal protective equipment (PPE), including N95 respirators and eye shields, for staff, as well as universal testing in facilities with confirmed COVID-19 infections.[10] However, equipment and test shortages, as well as challenges with implementing infection control plans, have limited the adoption of these recommendations.[11] Under such circumstances, labor unions representing health care workers perform several functions that may reduce SARS-CoV-2 transmission. Unions generally demand high staff-to-patient ratios, paid sick leave, and higher wage and benefit levels that reduce staff turnover.[12–14] They educate workers about their health and safety rights, work to en-

sure that such rights are enforced, demand that employers mitigate known hazards, and give workers a collective voice that can improve communication with employers.[14–17] In the specific context of the COVID-19 pandemic in New York, labor unions advocated for access to PPE and new infection control policies.[18]

Health care worker unions have been shown to improve the occupational safety of health care workers and, in some cases, overall patient outcomes.[14,19] However, it is not known how the presence of unions has affected COVID-19 mortality rates among residents in nursing homes. We hypothesized that labor union representation among health care workers in nursing homes would be associated with reduced resident mortality rates. Although labor unions may influence COVID-19 mortality rates in numerous ways, we hypothesized that two important mechanisms were successful demands for PPE and reduced COVID-19 infection rates. By increasing access to PPE, labor unions may reduce the spread of COVID-19 between health care workers and nursing home residents, thus reducing COVID-19 mortality rates for residents.

Study Data And Methods

STUDY DESIGN AND DATA SOURCES We conducted cross-sectional regression analyses to estimate the association between the presence of a health care worker union and COVID-19 mortality rates in nursing homes in New York State during the early months of the 2020 COVID-19 pandemic. We used publicly available data from the New York State Department of Health on COVID-19 mortality. We used proprietary data from 1199SEIU United Healthcare Workers East, the International Brotherhood of Teamsters, and the Communication Workers of America (CWA), as well as publicly available data from the New York State Nurses Association (NYSNA), to determine whether a labor union represented health care workers in each facility.

STUDY SAMPLE We included all New York State nursing homes for which the New York State Department of Health reported data on confirmed COVID-19 deaths. Nursing homes that reported zero deaths were included in the cohort, whereas facilities for which the department did not report data were excluded. Facilities for which there were missing data on key covariates were also excluded.

MAIN OUTCOME The main outcome was the percentage of nursing home residents who died from COVID-19. To calculate this percentage, we used nursing home–level data on confirmed COVID-19 deaths made available by the New York State Department of Health for the period March 1–May 31, 2020. These data include all COVID-19 deaths that occurred inside the facility, but not deaths that occurred after a resident was discharged to a hospital. The denominator was the total number of beds in each facility as a proxy for the number of residents in the facility.[20]

SECONDARY OUTCOMES The two secondary outcomes were nursing home access to PPE and nursing home COVID-19 infection rates. We obtained data from CMS on whether or not each facility reported having a one-week supply of N95 respirators, eye shields, surgical masks, gowns, gloves, and hand sanitizer on hand on May 24 and May 31, 2020 (the earliest two weeks of data available). Facilities were defined as having access to a given type of PPE if they reported having a one-week supply in both weeks. We also obtained nursing home–level data on confirmed COVID-19 infections per 1,000 residents from CMS from January 1 through May 31, 2020.

PRIMARY EXPLANATORY VARIABLE Facilities with NYSNA, 1199SEIU, Teamsters, or CWA unions representing health care workers were defined as having a union in our cohort. NYSNA only represents registered nurses, whereas the other unions represent workers throughout nursing homes, including nurse aides, dietitians, and maintenance workers. In every nursing home organized by 1199SEIU, the union represents certified nursing assistants, who provide direct care to residents (Mindy Berman, 1199SEIU regional communications director, personal communication, July 5, 2020). We gathered data on the union status of nursing homes through interviews with labor union representatives, conducted between May 6 and July 8, 2020. The union status of all nursing homes remained constant throughout our period of study.

COVARIATES To address potential confounders, we gathered data on nursing home– and area-level characteristics previously associated with poor outcomes from COVID-19. We obtained nursing home–level data on the average age of residents, percentage of residents who were obese, Resource Utilization Groups-III nursing case-mix index of resident acuity, total number of beds, number of occupied beds, occupancy rates, staff-hours-to-resident-days ratios (for registered nurses, certified nursing assistants, and licensed practical nurses), percentage of residents whose primary support came from Medicaid or Medicare, overall Five-Star Quality Rating System score, and chain and for-profit status.

We gathered data on total and occupied beds from the New York State Department of Health NYS Nursing Home Profiles, based on the most recent occupancy reports (85 percent reported their occupancy on March 25, 2020).[20] CMS pro-

Amid the COVID-19 pandemic, unions advocated for supplies and policies that protect staff and residents from SARS-CoV-2 infection.

vides data on the Five-Star Quality Rating System (updated April 1, 2020), and all other nursing home–level characteristics are available from Brown University's LTCfocus project, which includes data through 2017.[21] We also obtained county-level data on confirmed cases of COVID-19 and population from USAFacts (through May 31, 2020).[22]

STATISTICAL ANALYSES We first estimated descriptive statistics for the main outcome, primary explanatory variable, and all covariates for four groups: facilities for which the New York State Department of Health reported data, facilities for which the department did not report data, cohort facilities with unions, and cohort facilities without unions. Statistical differences by reporting and union status were ascertained using *t*-tests and *Z*-tests.

To examine the association between the proportion of residents who died from COVID-19 and the presence of health care worker unions, we then estimated cross-sectional ordinary least squares regression models both with and without adjustment for county- and facility-level variables.

In adjusted models, we included county-level confirmed COVID-19 cases per capita to adjust for the prevalence of disease in the surrounding county, and population to account for the possibility that more populous counties may contain more unidentified cases. Because COVID-19 mortality rates are known to increase along with age and comorbidities, we included the average age of residents, the percentage of residents who were obese, average resident acuity, and the percentage of residents whose primary support came from Medicare (people receiving care after an acute inpatient hospitalization). As COVID-19 has disproportionately affected low-income people, we also adjusted for the percentage of residents whose primary source of insurance was Medicaid.

Because the quality of care may influence COVID-19 mortality rates, we adjusted for staff-hours-to-resident-days ratios for registered nurses, certified nursing assistants, and licensed practical nurses.[23] We also adjusted for overall Five-Star Quality Rating System score, which is based on health inspections, staffing, and fifteen different physical and clinical measures for nursing home residents, as previous research suggests that COVID-19 death rates may be lower in higher-rated facilities.[2,10] Similarly, we adjusted for chain and for-profit status, as previous research associates these ownership characteristics with the quality of care.[24,25] We also adjusted for each facility's occupancy rate, as empty beds may have facilitated the isolation of COVID-19-positive residents. Finally, we adjusted for the number of occupied beds, as unionization and COVID-19 infection may both be more likely in large facilities. Even with these adjustments, the available data and observational research strategy preclude strong causal interpretations because of bias from unmeasured confounders and selection into our study sample.

SECONDARY ANALYSES As secondary analyses, we used cross-sectional ordinary least squares regression analyses to explore two mechanisms that may link labor unions to lower COVID-19 mortality rates in nursing homes: access to PPE and reduced COVID-19 infection rates. First, we examined the association between facility union status and access to six types of PPE: N95 respirators, eye shields, surgical masks, gowns, gloves, and hand sanitizer. We adjusted for the same county- and facility-level variables as the main analysis, with the exception of resident obesity, which is unlikely to confound access to PPE. Second, we examined the association between union status and COVID-19 infection rates while adjusting for the same county- and facility-level variables as the main analysis.

We computed 95% confidence intervals derived from heteroscedasticity-robust standard errors for all regression models. All analyses were conducted using R, version 1.0.153, and Stata 15.0.

SENSITIVITY ANALYSES Prior research suggests that there may be COVID-19 deaths in nursing homes for which the New York State Department of Health did not report data, raising concerns about selection bias in our cohort.[2,26] To address these concerns, we conducted two robustness checks. First, we used an ordinary least squares model to assess for factors associated with reporting COVID-19 death data to the New York State Department of Health. Second, we used inverse probability weighting to adjust

for selection bias in the data from nursing homes that did report data on COVID-19 deaths. Specifically, we used estimates of the predicted probability of reporting to the New York State Department of Health from logistic regression models in constructing inverse probability weights in our main regression model.

We also considered the possibility that nonreporting facilities did not have any COVID-19 deaths by coding these facilities to have zero deaths. This is likely a conservative assumption, given that facilities were mandated to report to the state even if they had no deaths from COVID-19.

To account for the possibility that COVID-19 deaths were correlated across nursing homes in the same labor market, we calculated commuting zone–level wild cluster bootstrap robust standard errors.[27] To address concerns about regional variation in COVID-19 risk factors, as well as to account for the possibility that COVID-19 deaths were correlated across facilities within the same county, we included region-level fixed effects and calculated standard errors clustered at the county level. We also performed Oster's coefficient stability test to assess the robustness of our results to other unmeasured confounders.[28] Last, we estimated the models from our secondary analyses using only the nursing homes from our original cohort that reported data on PPE and COVID-19 infection rates. These sensitivity analyses are further described in the online appendix.[29]

LIMITATIONS Our study had several limitations that motivate future work. First, even with the inclusion of a rich set of covariates and sensitivity analyses, the observational study design precluded causal interpretations. Second, our study was conducted during an early phase of the COVID-19 pandemic, and the estimated associations may change over time. Similarly, our findings might not be generalizable to unions and other patient outcomes before or after the pandemic. Third, our study was limited by missing data on confirmed COVID-19 deaths in many nursing homes in New York State.[30] Data collection during the pandemic faces many obstacles, and it is not possible to know how many COVID-19 deaths occurred in facilities that were excluded from the New York State Department of Health data. Fourth, New York State Department of Health data only include confirmed COVID-19 deaths that occurred inside facilities. We were therefore unable to adjust for the possibility that unionized health care workers may transfer residents to hospitals earlier, and thereby reduce their facility's COVID-19 mortality rate.

Fifth, although our data on unionized facilities cover the largest health care worker unions in New York, a small number of facilities may have been misclassified. Sixth, because of the lack of data on PPE early in the pandemic, we were unable to adjust our main results for access to PPE. Seventh, we were unable to gather data on the race and ethnicity of people who died from COVID-19 or for health care workers, thus limiting our ability to examine racial disparities.

Eighth, many of the nursing home–level covariates were last measured in 2017, which may introduce measurement error. Our main outcome also may suffer potential measurement error because of our reliance on total beds to proxy for nursing home residents. Measurement error in both cases may bias estimates of the association between unionization and COVID-19 death rates either downward or upward. Last, the findings of this study might not be generalizable outside of New York State.

Future surges of COVID-19 infections in regions with fewer unionized nursing homes are particularly worrisome.

Study Results

DESCRIPTIVE STATISTICS We identified 621 nursing homes in New York State, 385 of which are included in the New York State Department of Health's report on COVID-19 mortality. Thirty facilities were excluded because of missing data on covariates, resulting in a study cohort of 355 nursing homes.

Health care worker unions were present in 246 of 355 nursing homes in our sample (239 affiliated with 1199SEIU, 4 affiliated with NYSNA, 1 affiliated with the International Brotherhood of Teamsters, and 2 affiliated with both 1199SEIU and NYSNA). Facilities with health care worker unions had residents who were younger and less obese, who had higher acuity scores, and who were less likely to be white and more likely to be insured by Medicare or Medicaid (exhibit 1). Unionized facilities were also more likely to be for profit, were less likely to be associated with a chain, had lower licensed-practical-nurse-to-resident ratios, and were located in more popu-

EXHIBIT 1

Characteristics of nursing homes with and without reported data on COVID-19 deaths and cohort nursing homes with and without health care worker unions, New York State, 2020

	All nursing homes (N = 621)		Nursing homes in cohort (n = 355)	
Variables (mean)	COVID-19 deaths reported (n = 385)	COVID-19 deaths not reported (n = 236)	Unionized (n = 246)	Nonunionized (n = 109)
COUNTY				
Population	1,285,134	392,288**	1,446,815	863,978**
COVID-19 cases per capita	0.02	0.01**	0.03	0.02**
FACILITY				
Average age of residents (years)	79.59	80.96**	78.35	81.59**
Residents who were obese (%)	23.89	29.73**	23.53	25.08**
Resident acuity	1.23	1.20**	1.24	1.20**
White residents (%)	65.12	90.79**	58.39	77.58**
Primary payer for residents (%)				
Medicaid	60.88	56.94**	63.82	57.19**
Medicare	14.39	10.96**	15.07	11.72**
Ratio of staff to residents				
RNs	0.48	0.57	0.47	0.47
LPNs	0.79	0.95**	0.74	0.90**
CNAs	2.30	2.41**	2.26	2.33
Five-Star Quality Rating System score	3.33	3.15	3.35	3.21
Occupancy rate	0.91	0.85**	0.92	0.90
No. of occupied beds	203.47	112.76**	215.31	199.45
For profit[a]	0.69	0.49**	0.78	0.51**
Chain[a]	0.11	0.24**	0.08	0.18**

SOURCE Authors' analysis of data on confirmed COVID-19 deaths in nursing homes from the New York State Department of Health; union representation from 1199SEIU United Healthcare Workers East, New York State Nurses Association, the International Brotherhood of Teamsters, and Communication Workers of America; and covariates from the Centers for Medicare and Medicaid Services, Brown University's LTCfocus project, and USAFacts. **NOTES** All variables are for nursing homes except where county is indicated. *T*-tests calculated to compare the means across union and nonunion facilities for all other continuous measures. Noncohort nursing homes have missing data for the nursing home–level variables; therefore, the means and standards deviations for "Reported" and "Not reported" nursing homes are calculated using fewer than 385 and 236 observations, respectively. Resident acuity is a numeric score corresponding to the Resource Utilization Group-III nursing case-mix index. Higher numbers indicate residents who require greater resources. RN is registered nurse. LPN is licensed practical nurse. CNA is certified nursing assistant. [a]*Z*-tests calculated for the binary measures of "For profit" and "Chain." **$p < 0.05$

lous counties with higher per capita rates of confirmed COVID-19 cases. At the county level, the percentage of nursing homes that were unionized ranged from 0 to 100 (exhibit 2).

There were 3,298 confirmed COVID-19 fatalities in nursing homes in New York State through May 31, 2020. The facility with the highest number of confirmed COVID-19 deaths had 82 deaths, and the highest proportion of deaths among residents was 62 of 160, or 38.8 percent. Eleven nursing homes in our sample reported zero confirmed COVID-19 deaths (data not shown). At the county level, average COVID-19 mortality rates in nursing homes varied from a low of 0.0 percent to a high of 12.9 percent (exhibit 3). In the 246 unionized nursing homes, 3.72 percent of residents died from COVID-19, whereas in the 109 nonunionized facilities, 5.53 percent of residents died from the disease (data not shown).

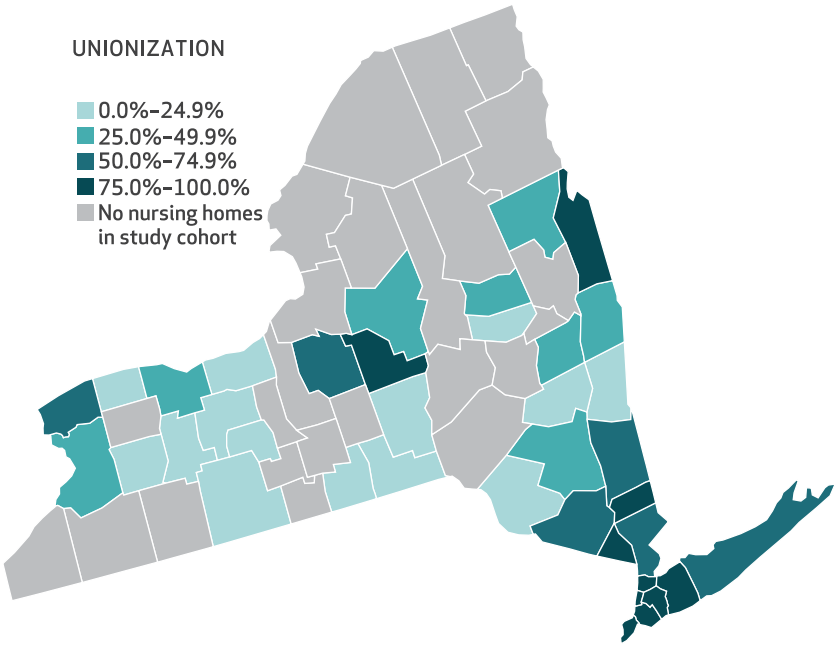
MAIN REGRESSION RESULTS In regression analyses, we found that the presence of a labor union representing health care workers was associated with a 1.29-percentage-point reduction (95% CI: −2.405, −0.172; $p = 0.024$) in the proportion of facility residents who died from COVID-19. Estimated coefficients were similar in models with and without covariates (exhibit 4), and the statistical significance of our findings was substantively unchanged regardless of how confidence intervals were calculated. Because the mean proportion of facility residents who died from COVID-19 during our study period was 4.279 percent, the covariate-adjusted estimates suggest that the presence of a labor union was associated with a 30 percent relative decrease in the COVID-19 mortality rate compared with facilities without health care worker unions.

SECONDARY ANALYSES

▶ **PERSONAL PROTECTIVE EQUIPMENT ACCESS:** In our secondary analysis of PPE access,

EXHIBIT 2

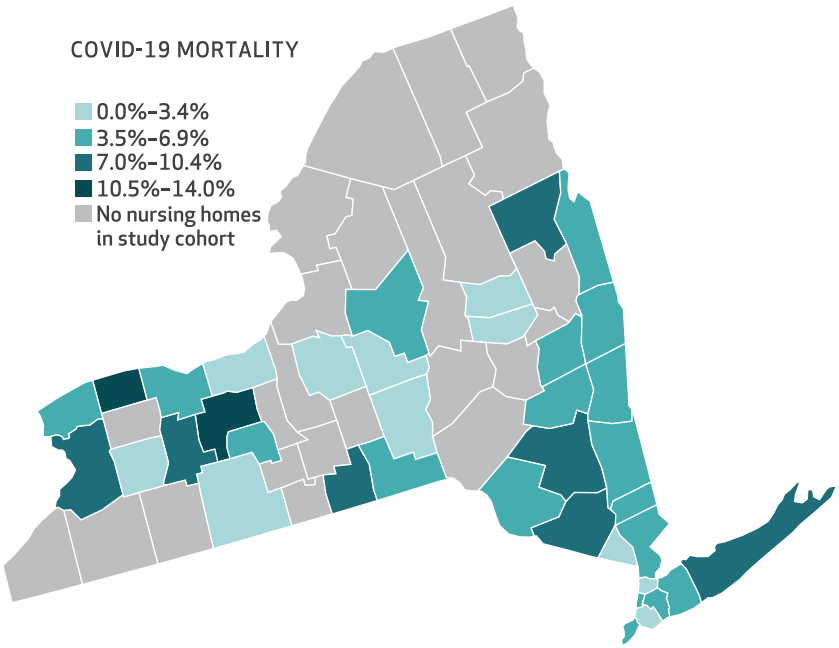
County-level unionization rates in New York State nursing homes, 2020



SOURCE 1199SEIU United Healthcare Workers East, New York State Nurses Association, and the International Brotherhood of Teamsters.

EXHIBIT 3

County-level COVID-19 mortality rates in New York State nursing homes, 2020



SOURCE New York State Department of Health.

we used data from a larger cohort of nursing homes. Of 418 facilities reporting data on PPE, nineteen were excluded as a result of missing data on covariates, resulting in a sample of 399 nursing homes (appendix exhibit A1).[29] In the resulting sample of facilities, 83 percent reported having N95 respirators, 92 percent eye shields, 96 percent surgical masks, 84 percent gowns, 96 percent gloves, and 95 percent hand sanitizer (data not shown).[29]

In regression analyses, we found that the presence of a labor union was associated with an 11.5-percentage-point increase (95% CI: 2.1, 20.9; $p = 0.017$) in the probability of a facility having access to N95 respirators and a 6.7-percentage-point increase (95% CI: 0.3, 13.0; $p = 0.039$) in the probability of having access to eye shields (exhibit 5). Unions were therefore associated with a 13.8 percent relative increase in access to N95 respirators and a 7.3 percent relative increase in access to eye shields. Labor union status was not a significant predictor of access to other types of PPE.

▶ **COVID-19 INFECTION RATES:** In our secondary analysis of COVID-19 infection rates, we used data from the 371 nursing homes in this cohort that reported data on COVID-19 infection rates. In the resulting sample, the average COVID-19 infection rate was 119.4 per 1,000 residents, and 148 of these nursing homes had infection rates of zero, thus minimizing concerns that CMS dropped facilities without COVID-19 infections.

In regression analyses, we found that the presence of a labor union was associated with a 50.1-point decrease in the number of COVID-19 infections per 1,000 residents (95% CI: −96.2, −3.9; $p = 0.034$) (exhibit 5). Because the mean COVID-19 infection rate during our study period was 119.4 per 1,000 residents, the covariate-adjusted estimates suggest that the presence of a labor union was associated with a 42 percent relative decrease in the COVID-19 infection rate.

SENSITIVITY ANALYSES In ordinary least squares models examining whether or not the New York State Department of Health reported data on COVID-19 deaths for a given facility, the presence of a health care worker union was not found to be a statistically significant predictor (appendix exhibit A2).[29] Analyses using inverse probability weighting to address potential nonrandom selection into reporting COVID-19 deaths yielded similar estimates of the association between COVID-19 deaths and unionization (appendix exhibit A3).[29]

Our results remained statistically significant when we estimated commuting zone–level wild cluster bootstrap robust standard errors (appendix exhibit A4).[29] Findings were also robust when we adjusted for region-level fixed effects and

clustered standard errors at the county level (appendix exhibit A5).[29] Our results were similar even when we used the conservative assumption that all nonreported nursing homes experienced zero COVID-19 deaths (appendix exhibit A6).[29] Simulating the potential effect of additional unmeasured confounders did not reverse the substantive finding (appendix exhibit A7).[29] Last, the results of our secondary analyses were similar when we used only the nursing homes from our original cohort that also reported data on PPE and COVID-19 infection rates (appendix exhibits A8 and A9).[29]

Discussion

Among 355 nursing homes in New York State for which data on COVID-19 mortality rates were available, the presence of a health care worker union was associated with a 30 percent lower mortality rate from COVID-19 among nursing home residents. The findings were robust to adjustment for a range of covariates and specification checks for bias from missing data. We also found that nursing homes with labor unions had greater access to PPE and lower COVID-19 infection rates—two important mechanisms that may link unions to lower COVID-19 mortality rates.

Specifically, unions were associated with a 13.8 percent relative increase in access to N95 respirators and a 7.3 percent relative increase in access to eye shields. We also found that unions were associated with a 42 percent relative decrease in COVID-19 infection rates among nursing home residents. However, more research is needed to understand the numerous mechanisms through which unions may influence COVID-19 mortality rates, such as staff training, reducing use of part-time workers, implementing infection protocols, and giving workers a collective voice in the workplace.[9,14–17,31]

As more than 40 percent of all COVID-19 deaths have occurred in nursing homes,[2,3] there is an urgent need to understand the factors that protect residents and staff. Amid the COVID-19 pandemic, unions advocated for supplies and policies that protect staff and residents from SARS-CoV-2 infection. Although our study design precluded causal interpretations, our results suggest that unions may have reduced COVID-19 deaths among nursing home residents by successfully demanding PPE for health care workers. These are especially important contributions, given that early research on COVID-19 in nursing homes found that only facility size and location, rather than quality metrics, were associated with COVID-19 outbreaks.[2,11]

Our finding that unions are associated with reduced COVID-19 mortality rates in nursing homes is consistent with previous findings that unions improve safety and health standards for workers,[15,16,32] help coenforce those standards with employers,[33] and also reduce workplace injuries[34,35] and accidental deaths.[36] Health care worker unions, in particular, are also associated with improved patient outcomes.[14,19,37]

Our study identified additional facility-level factors associated with COVID-19 mortality rates in nursing homes. Certified nursing assistant staffing ratios were associated with lower COVID-19 mortality rates, while the average age of residents and the percentage of facility residents who were White were both associated

EXHIBIT 4

Association between the presence of health care worker unions and COVID-19 mortality rates in nursing homes in New York State, 2020

	Multivariate model
PRIMARY EXPLANATORY VARIABLE	
Union	−1.289**
COUNTY	
Population	0.503
COVID-19 cases per capita	41.960
FACILITY	
Average age of residents (years)	0.166****
Residents who were obese (%)	0.067
Resident acuity	1.301
White residents (%)	0.027***
Primary payer for residents (%)	
Medicaid	0.016
Medicare	0.050
Ratio of staff to residents	
RNs	0.411
LPNs	1.128
CNAs	−1.301***
Five-Star Quality Rating System score	
Two-star rating	−0.819
Three-star rating	−0.462
Four-star rating	−0.028
Five-star rating	0.671
Occupancy rate	2.135
No. of occupied beds	−0.001
For-profit	−0.462
Chain	2.429**
N	355
R^2	0.300
Adjusted R^2	0.284
Residual standard deviation	4.067

SOURCE Authors' analysis of data on confirmed COVID-19 deaths in nursing homes from the New York State Department of Health; union representation from 1199SEIU United Healthcare Workers East, New York State Nurses Association, the International Brotherhood of Teamsters, and Communication Workers of America; and covariates from the Centers for Medicare and Medicaid Services, Brown University's LTCfocus project, and USAFacts. **NOTES** Results based on ordinary least squares regression. Univariate model (model 1) regressed COVID-19 mortality rates against union status. Key regression statistics for the univariate model: intercept, 5.529 (95% confidence interval: 4.436, 6.622), $p < 0.001$; coefficient on "union," −1.805 (95% CI: −2.988, −0.621), $p = 0.003$; $N = 355$; $R^2 = 0.033$; adjusted $R^2 = 0.030$; residual standard deviation = 4.733. The 95% confidence intervals for the model were calculated with robust standard errors. Resident acuity is defined in the notes to exhibit 1. RN is registered nurse. LPN is licensed practical nurse. CNA is certified nursing assistant. **$p < 0.05$ ***$p < 0.01$ ****$p < 0.001$.

EXHIBIT 5

Association between the presence of health care worker unions and facility access to personal protective equipment (PPE) and facility COVID-19 infection rates in nursing homes in New York State, 2020

	Access to PPE (n = 399)						COVID-19 infection rate (n = 371)
	N95 respirators	Eye shields	Surgical masks	Gowns	Gloves	Hand sanitizer	
Union	0.115**	0.067**	−0.010	0.030	−0.021	0.000	−50.089**
R^2	0.102	0.082	0.056	0.049	0.066	0.070	0.154
Adjusted R^2	0.057	0.036	0.009	0.001	0.019	0.023	0.106

SOURCE Authors' analysis of data on availability of PPE and COVID-19 infection rates from the Centers for Medicare and Medicaid Services (CMS); union representation from 1199SEIU United Healthcare Workers East, New York State Nurses Association, the International Brotherhood of Teamsters, and Communication Workers of America; and covariates from CMS, the New York State Department of Health, Brown University's LTCfocus project, and USAFacts. **NOTES** Results based on ordinary least squares regression. The 95% confidence intervals for the model were calculated with robust standard errors. **$p < 0.05$

with higher COVID-19 mortality rates. However, this finding regarding race was not statistically significant when we included region-level fixed effects (appendix exhibit A5).[29] This suggests that the result may have been driven by unmeasured confounders that varied across regions. Unfortunately, missing race and ethnicity data for people who died from COVID-19 limited our ability to further examine racial disparities. We also found that chain nursing homes were associated with higher COVID-19 mortality rates. Previous research similarly finds that nursing home chains are associated with lower-quality care.[16,17,38]

Our study had three main strengths that improve our understanding of the relationships among labor unions, access to PPE, and COVID-19 infection and mortality in nursing homes. First, we combined several data sources to identify unionized nursing homes in New York while also adjusting for facility and community covariates. Second, we performed important sensitivity analyses to address the New York State Department of Health's selective reporting of COVID-19 deaths in nursing homes. We found that the presence of a union was not associated with the reporting of data on COVID-19 deaths. Our results were also robust when we used inverse probability weighting to address potential nonrandom selection and accounted for potential unmeasured confounders. Third, to our knowledge, this study was the first to demonstrate that labor unions were associated with reduced COVID-19 infections and deaths in an essential industry. Lack of data on COVID-19 infections by occupation has thus far hindered research on whether unions can protect workers and the public.

Our results have significant implications for stakeholders concerned with COVID-19 mortality in nursing homes. Health care worker unions were associated with reduced mortality rates in the initial COVID-19 surge in the United States. Future surges of COVID-19 infections in regions with fewer unionized nursing homes are therefore particularly worrisome.

Conclusion

Residents in US nursing homes have been disproportionately affected by COVID-19. The presence of a health care worker labor union was associated with a 30 percent relative decrease in COVID-19 mortality rate compared with facilities without unions in New York State. Health care worker unionization may play an important role in ensuring access to appropriate PPE and implementing infection control policies that protect vulnerable nursing home residents. ■

Simeon Kimmel consulted for Abt Associates on a Massachusetts Department of Public Health–funded project to improve access to medications for opioid use disorder in skilled nursing facilities. An unedited version of this article was published online September 10, 2020, as a Fast Track Ahead Of Print article. That version is available in the online appendix.

NOTES

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