

Examining Factors and Disparities Associated with COVID Cases and Deaths in California Skilled Nursing Facilities: A Literature Review

Background:

Cal Hospital Compare (CHC) conducted a scan of relevant academic literature on organizational factors (staffing levels, infection control, quality performance etc.) and patient population characteristics (race, ethnicity, gender etc.) associated with quality in long term care facilities. This report summarizes key findings to support the Long-Term Care Advisory Committee in identifying variables and/or characteristics to identify long term care facilities at higher risk of COVID-19 infections. Recognition of risk factors will serve as an improvement lever to reduce COVID-19 related deaths in this vulnerable population.

Skilled Nursing Facilities (SNFs) have borne the brunt of COVID cases and deaths. As of August 5, 2020, California Department of Public Health (CDPH) reports 19,913 COVID positive SNF residents and 3,415 COVID-related deaths. Data reported by Centers for Medicare & Medicaid Services (CMS) through the recently established Centers for Disease Control and Prevention (CDC) National Healthcare Safety Network (NHSN) mechanism reported 164,055 resident cases and 43,231 deaths as of July 26, 2020. Patterns vary, but approximately 40% of COVID related deaths nationwide arise in SNF settings. The impact of COVID is likely to drive fundamental changes in the SNF sector.

There have been rapidly evolving analytics and research related to racial disparities in COVID cases/ deaths conducted by journalists, researchers and others including Polis Center at Indiana University – Purdue University Indianapolis, Sutter Health, and the New York Times / Brown University. Several factors may contribute to these disparities; it is critical to understand these factors and their relative contribution.

At a population-level, CDPH data indicates that African Americans aged 65-79 constitute ~5.5% of the California population but ~9.3% of COVID-related deaths (as of Aug. 10 2020). At a hospital-level, the Sutter Health study from May 21, 2020, found that “compared with non-Hispanic white patients, African Americans had 2.7 times the odds of hospitalization, after adjusting for age, sex, comorbidities, and income”.

At a SNF-level, the New York Times analysis found “more than 60 percent of SNFs where at least a quarter of the residents are black or Latino have reported at least one coronavirus case,” which is “double the rate of homes where black and Latino people make up less than 5 percent of the population.” Overall, compared to whites, racial/ethnic minorities tend to be cared for in facilities with limited clinical and financial resources, low nurse staffing levels, and a relatively high number of care deficiency citations.²

The recent social unrest that has erupted because of systemic racial and ethnic disparities within law enforcement has created a new sense of urgency to understand and address the systemic racism that mars many sectors of society, including health care.

Key findings (see Appendix 1 for details):

1. Long term care quality has been steadily improving year over year, although significant opportunities for improvement remain
 - a. Previous studies have indicated that nursing home care in certain areas might have improved, possibly as a result of stronger government enforcement after the 1987 Omnibus Budget Reconciliation Act, market-based quality improvement efforts such as public reporting, and increased Medicaid payments, among other factors.²
2. Higher nurse staffing levels improve resident outcomes

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- a. Previous studies have demonstrated that higher levels of RN staffing are associated with fewer deficiency citations and reduced severity of cited deficiencies, as well as with improved resident outcomes such as reduced rates of pressure ulcers, urinary tract infections, and mortality.¹
3. For profit ownership is associated with poor resident outcomes and quality
 - a. In general, for-profit facilities provide poorer care than nonprofit nursing homes as evaluated by overall rating, staffing rating, facility rating, staffing levels, staff turnover, deficiencies, citations, and complaints.³
 - b. In 2015 there were 1,226 nursing homes in California, the majority were for-profit facilities (82%, n=1006) and part of a multi-facility organization (i.e., chains; 75%).³
4. Medi-Cal coverage, particularly for dual-eligibles, is associated with longer length of stay and poor resident outcomes
 - a. Medi-Cal is the primary payer for 63% of nursing home residents.³
 - b. The payment rate for SNF care is effectively lower for dual-eligibles than for Medicare-only patients.⁴
 - c. Dual-eligible beneficiaries were more likely to be discharged to lower nurse staffing SNFs that treat patients for a longer time. They were also more likely to become long-stay residents in any SNF.⁴
5. The number of citations and deficiencies is directly correlated with poor resident outcomes
 - a. CMS Nursing Home Compare considers the deficiencies issued to nursing homes to be the best measure of quality because these are based on actual observations of care in nursing homes by trained state survey and certification teams on an annual basis or when there is a complaint investigation.³
 - b. It is important to note that deficiencies for low or inadequate staffing levels are rarely issued by state inspectors, and CMS does not have guidelines for penalties for staffing violations.⁷
6. Racial/ethnic minority residents tend to receive care in lower performing facilities.
 - a. Racial/ethnic minority residents tend to receive care in facilities with limited financial and clinical resources and high numbers of care deficiencies. In a landmark study conducted more than a decade ago, Vincent Mor and co-authors reported that across the US 40 percent of black residents, but only 9 percent of whites, resided in these lower tier facilities.⁹
 - b. Nursing homes with higher minority concentrations tended to be larger, for-profit, and located in more competitive markets. They also tended to have more Medicaid-funded residents and less appropriate nurse staffing patterns.²
 - c. This suggests that less skilled (and therefore less expensive) LPNs are more likely to be used instead of more skilled RNs in this group of nursing homes than in low-concentration nursing homes.¹

Limitations:

If additional data were available on the number of tests performed, the extent that PPE were available, whether staff received emergency preparedness training to address disasters and pandemics, and better data on staff and resident infections and deaths, it would be easier to study variations and draw better conclusions.⁷ Moreover, it would be valuable to study the effect of nursing home working conditions, health and sick leave benefits, working in multiple facilities, hazard pay, and other factors on nurses and other health care workers and residents during the COVID-19 pandemic.⁷

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A Literature Scan

Appendix I: Literature Scan

Title	Authors	Year	Methods	Select Findings
Nurse Staffing Hours at Nursing Homes with High Concentrations of Minority Residents, 2001-11 ¹	Yue Li, Charlene Harrington, Dana B. Mukamel, et al	2015	Multivariate analysis, longitudinal study	<ul style="list-style-type: none"> - This study found persistently lower RN staffing hours during 2001–11, and lower CNA staffing hours in recent years, for nursing homes with high concentrations of racial/ethnic minority residents, compared to those with low concentrations of such residents. - However, the persistently lower RN staffing levels found in nursing homes serving high concentrations of racial/ethnic minority residents suggest that less skilled (and therefore less expensive) LPNs are more likely to be used instead of more skilled RNs in this group of nursing homes than in low-concentration nursing homes. - Increasing Medicaid nursing home payment rates was associated with improved staffing levels and reduced staffing disparities across the two groups of facilities, but the use of case-mix-adjusted payment was associated with worse staffing levels and disparities.
Deficiencies In Care At Nursing Homes And In Racial/Ethnic Disparities Across Homes Fell, 2006–11 ²	Yue Li, Charlene Harrington, Dana Helena Temkin-Greener, et al	2015	Bivariate, multivariate analysis	<ul style="list-style-type: none"> - Compared to nursing homes with lower minority concentrations, those with higher concentrations tended to be larger, for-profit, and located in more competitive markets. They also tended to have more Medicaid-funded residents and less appropriate nurse staffing patterns. - We found that during 2006–11 the average number of health care–related deficiencies and the severity of deficiencies (measured by having any deficiencies at levels G–L) decreased for freestanding nursing homes in all groups of racial/ ethnic minority concentrations. Meanwhile, disparities in health care–related deficiencies between facilities with higher and lower minority concentrations narrowed but did not disappear over time. The average number of life-safety deficiencies increased slightly, but across-facility disparities in these deficiencies narrowed. - Increased Medicaid nursing home per diem payment rates were associated with overall decreases in the number of health care–related deficiencies and slight reductions in across-site disparities. State use of the case-mix payment system was associated with increased health care–related deficiencies and slightly increased site-of-care disparities.

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California Nursing Home Chains By Ownership Type Facility and Resident Characteristics, Staffing, and Quality Outcomes in 2015 ³	Leslie Ross, Charlene Harrington	2016	Snapshot of the current state of California nursing homes using publicly available data	<ul style="list-style-type: none"> - California has had a steady growth in for-profit homes with 83.6 percent for-profit, 13.2 percent nonprofit, and 3.2 percent government in 2014, making California the 4th highest in the nation in for-profit homes. - There is a growing body of evidence shows that the profit incentive is directly related to poor quality of care - High total staffing levels, especially RN staff, have been associated with higher quality of care, such as improved functional ability, fewer pressure ulcers, less unplanned weight loss, and fewer facility deficiencies. - CMS Nursing Home Compare considers the deficiencies issued to nursing homes to be the best measure of quality because these are based on actual observations of care in nursing homes by trained state survey and certification teams on an annual basis or when there is a complaint investigation. - In 2015 there were 1,226 nursing homes in California, the majority were for-profit facilities (82%, n=1006) and part of a multi-facility organization (i.e., chains; 75%) - The overall average facility size was 97.2 beds, with chains having a larger capacity (102.3) than non-chain facilities (82.3). For-profit facilities maintain the highest rate of occupancy and for-profit chains have the highest occupancy rate. - MediCal is the primary payer for 63% of nursing home residents. - The available data between 2011-2015 indicates that overall ownership type has a greater impact than chain status on care provided by nursing facilities. In general, for-profit facilities provide poorer care than nonprofit nursing homes as evaluated by overall rating, staffing rating, facility rating, staffing levels, staff turnover, deficiencies, citations, and complaints. The complexity of how facility organizational structure can impact care indicators is highlighted when looking at staffing levels and direct care expenditures. Nonprofit chain facilities provide the most staffing and have the greatest expenditure for direct care services.
Dual Eligibility, Selection of Skilled Nursing Facility,	Momotazur Rahman, Pedro	2014	Descriptive analytics, bivariate analysis	<ul style="list-style-type: none"> - The payment rate for SNF care is effectively lower for dual-eligibles than for Medicare-only patients. SNFs located near high-poverty neighborhoods have a lower nurse patient ratio.

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and Length of Medicare Paid Post acute Stay ⁴	Gozalo, Denise Tyler			<ul style="list-style-type: none"> - Dual-eligible beneficiaries were more likely to be discharged to lower nurse staffing SNFs that treat patients for a longer time. They were also more likely to become long-stay residents in any SNF. In addition, the gap in likelihood of becoming a long-stay nursing home resident between dual-eligible patients and Medicare-only beneficiaries is much smaller in the top 20% SNFs in terms of nurse staffing than that in rest of the SNFs. - Dual-eligibles have the same or lower adjusted hospitalization rates than Medicare-only patients. This indicates that excess length of stay by dual-eligible patients is largely due to nonclinical reasons.
COVID-19 and long-term care facilities: Does ownership matter? ⁵	Margaret J. McGregor, Charlene Harrington	2020	Commentary	<ul style="list-style-type: none"> - Research has shown that for-profit ownership of LTC homes has been relevant to patterns of coronavirus disease 2019 (COVID-19) outbreaks and deaths in Ontario, Canada; this is related to building characteristics and chain status of owners. - For-profit ownership has been related to lower LTC staffing levels. - Recent research has shown an association between lower nurse staffing levels and worse COVID-19–related outcomes in LTC facilities.
COVID-19 Infections and Deaths among Connecticut Nursing Home Residents: Facility Correlates ⁶	Yue Li, Helena Temkin-Greener, Gao Shan, et al	2020	Clinical investigation, cross-sectional analysis	<ul style="list-style-type: none"> - Nursing homes with higher RN staffing and quality ratings have the potential to better control the spread of the novel coronavirus and reduce deaths. - Nursing homes caring predominantly for Medicaid or racial and ethnic minority residents tend to have more confirmed cases. - The average number of confirmed cases was eight per nursing home (zero in 107 facilities), and the average number of confirmed deaths was 1.7 per nursing home. - Among facilities with at least one confirmed case, every 20-minute increase in RN staffing (per resident day) was associated with 22% fewer confirmed cases. - Nursing homes with more confirmed cases or deaths were also more likely to be large for-profit facilities affiliated with a chain and having a higher resident census. - Nursing homes in better compliance with care standards perform better in resident-oriented quality measures and are more able to contain the spread of coronavirus among their residents, although their abilities to prevent COVID-19–related deaths were not found superior compared with other nursing homes.

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				<ul style="list-style-type: none"> - Nursing homes caring for more socio-demographically disadvantaged residents may be more likely than other facilities to experience severe shortages of staff, personal protective equipment (PPE), and medical equipment, as well as other issues such as poor testing capacity, delayed diagnosis, lack of access to medical treatment, and high risk of cross-infection among residents and staff.
Nurse Staffing and Coronavirus Infections in California Nursing Homes ⁷	Charlene Harrington, Leslie Ross, Susan Chapman, et al	2020	Bivariate, correlation, and logistic regression Analyses	<ul style="list-style-type: none"> - Results indicate that nursing homes with total RN staffing levels under the recommended minimum standard (0.75 hours per resident day) had a two times greater probability of having COVID-19 resident infections. - The study found that about 80% of California nursing homes did not meet the minimum RN standards (0.75 RN or higher hprd) and 55% did not meet the total nursing standards (4.1 hprd) that were first identified almost 20 years ago - The likelihood of having one or more cases of COVID-19 infections was found to be related to lower RN staffing levels, , having low star ratings on Medicare nursing home compare for overall quality, having a higher number of deficiencies, and a large number of beds.
The Need for Higher Minimum Staffing Standards in U.S. Nursing Homes ⁸	Charlene Harrington. John F. Schnelle, Margaret McGregor, et al	2016	Systematic review	<ul style="list-style-type: none"> - Low staffing levels and poor quality of care continue to be problems in a significant number of U.S. nursing homes, despite the overall staffing improvements in many homes. - The problems of low nursing home staffing have also been found in other countries such as the Canada and England.
Driven to tiers: Socioeconomic and Racial Disparities in the Quality of Nursing Home Care ⁹	Vincent Mor, Jacqueline Zinn, Joseph Angelelli, et al	2004	Statistical analysis	<ul style="list-style-type: none"> - In 2002 there a total of 14,130 nonhospital-based Medicare and Medicaid certified nursing facilities in the United States. - 13% of which were classified as lower tier - Proprietary facilities were significantly more likely to be lower tier - High concentrations of Medicaid residents were associated with more health-related deficiencies - African American nursing home residents are grossly overrepresented in these low revenues, understaffed, and poor-quality facilities - Lower tier facilities tend to be in the poorest counties, both urban and rural

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Characteristics of US Nursing Homes with COVID-19 Cases. <i>JAGS</i> , 68:1658-1656.	H.R. Abrams, L. Loomer, A. Gandhi, and D. Grabowski	2020	Regression models	<ul style="list-style-type: none"> - Larger facility size, urban location, greater percentage of African American residents, non-chain status, and state were significantly related to the probability of having a COVID-19 case. - Five-star rating, prior infection violation, Medicaid dependency and ownership were not related - Outbreak size was related to facility size, for-profit status, and state.
Association of Nursing Home Ratings on Health Inspections, Quality of Care, and Nurse Staffing with COVID-19 Cases. <i>JAMA</i> , Aug 10	J.F. Figueroa, R.K. Wadhere, I. Papanicolas, K. Riley et al.	2020	8 states. Facility cases: 10 or less, 11-30, and 30 or more. Regression models	<ul style="list-style-type: none"> - High performing NHs on health inspections, quality measures and nurse staffing were less likely to have more than 30 COVID cases than low performing facilities. - High performing NHs had a lower number of beds. - After adjustment, high performing NHs on nurse staffing had fewer COVID-19 cases than low-performing NHs but there was no difference on health inspection and quality ratings.
Staffing Levels and COVID-19 Cases and Outbreaks in US Nursing Homes. Accepted at <i>JAGS</i> .	R.J. Gorges and R.T. Konetzka	2020	Logistic regression and negative binomial-2 regressions	<ul style="list-style-type: none"> - Higher RN hours are associate with a high probability of any cases. Among facilities with one case, high nurse aide and total nursing hours are associated with a lower probably of an outbreak and with fewer deaths. - The strongest predictor of cases and outbreaks is per capita cases in the county.
Is there a Link Between Nursing Home Reported Quality and COVID-19 Cases? Evidence from California Skilled Nursing Facilities. <i>JAMDA</i> accepted.	M. He, Y. Li, and F. Fang.	2020	Regression of no cases, 1-10 cases, and 11 or more cases.	<ul style="list-style-type: none"> - Higher nursing home star ratings had lower odds ratios of COVID-19 resident cases and deaths. - NHs with a greater percentage of racial and ethnic minority residents, for-profit, and higher occupancy rates were significantly associated with increased probability of having a COVID-19 resident cases and deaths.

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Racial and Ethnic Disparities in COVID-19 Infections and Deaths Across US Nursing Homes. <i>JAGS</i> , under review	Y. Li, X. Cen, X. CAI, H. Tempkin-Greener	2020	Regressions. Cases: 0, 1-10, 11-20, 20+ Deaths: 0, 1-5, 6+	<ul style="list-style-type: none"> - Controlling for nursing home, county and state covariates, NHs were more likely to have a least one new resident case as the proportion of racial/ ethnic minority residents increased. - Conditional on having at least one new COVID case, NH concentrations of racial/ethnic minorities residents were not significantly associated with the count of new cases.
For-Profit Long-Term Care Homes and The Risk Of COVID-19 Outbreaks and Resident Deaths. <i>CMAJ</i> . July 22.	N.M. Stall, A. Jones, K.A. Brown, P.A. Rochon, and A.P. Costa	2020	Regressions-cases per 1000 residents-Canada	<ul style="list-style-type: none"> - The odds of a COVID-19 outbreak were associated with the incidence in the region, the number of residents, the older design standards of the home, chain ownership, but not for-profit status. Higher staffing reduced the odds. - For-profit status, older design standards and chain ownership and COVID rates in the region were associated with the number of resident cases and deaths.
Variation in SARS-CoV-2 Prevalence in US Skilled Nursing Facilities	E.A. White, C.M. Kosar, R.A. Feifer, et al. and V. Mor	2020	Regressions of a sample of Genesis NHs in 25 states and non-Genesis NHs in 12 states with a least one case	<ul style="list-style-type: none"> - The county prevalence of cases in the population and facility size were related to an increase in the probability of an outbreak. - No consistent relationships were found between the facility ratings, past infection control deficiencies and the probability or severity of outbreak.