COVID-19 And Nursing Home Care In The US: Regional Differences Associated With Disparities In Race, Ethnicity And Community And Facility Characteristics (Presentation)

By: Dr. Sandi J. Lane, Dr. Adam Hege, Dr. Trent J. Spaulding, Dr. Lakshmi Iyer, and Dr. Maggie Sugg

Abstract
Purpose: To investigate U.S. nursing homes associated COVID-19 cases in relation to county-level and nursing home facility characteristics. Study Motivation: As of July 2020, there were approximately 1.3 million people residing in 15,483 nursing homes in the United States. Nursing homes account for approximately 40% of COVID-19 deaths in the United States, and many individuals residing in nursing homes have underlying respiratory conditions, making them especially susceptible to increased severity and harm from the virus. Infection control deficiencies are the most common deficiency nursing homes receive with almost 40% of the nation’s nursing homes having at least one infection control deficiency in 2017. Media reports indicate that nursing homes that have more staff shortages, and experience more survey deficiencies have a larger number of staff and residents who are positive for COVID-19.

COVID-19 and Nursing Home Care in the US: Regional Differences

Dr. Sandi J. Lane, Dr. Adam Hege, Dr. Trent J. Spaulding, Dr. Lakshmi Iyer, Dr. Maggie Sugg
Study Motivation

- As of July 2020, there were approximately 1.3 million people residing in 15,483 nursing homes in the U.S.
- Nursing homes account for approximately 40% of COVID-19 deaths in the U.S.
- Many individuals residing in nursing homes have underlying respiratory conditions, making them especially susceptible to increased severity and harm from the virus.
  - living in small rooms, with little to no space between resident beds,
  - residents have multiple comorbid conditions that weaken their immune systems, and
  - many require assistance with activities of daily living.
- Infection control deficiencies are the most common deficiency nursing homes receive with almost 40% of the nation's nursing homes having at least one infection control deficiency in 2017.
- Media reports indicate that nursing homes that have more staff shortages, and experience more survey deficiencies have a larger number of staff and residents who are positive for COVID-19

Sandi Lane
Purpose

To investigate U.S. nursing homes associated COVID-19 cases in relation to county-level and nursing home facility characteristics.
Research Questions

1. What organizational characteristics contribute to the spread of COVID-19 in nursing homes?

2. What quality metrics of nursing homes and their residents contribute to the spread of COVID-19?

3. What socio-economic variables contribute to the spread of COVID-19 in nursing homes?

4. Are there regional differences (e.g. urban/rural, coastal/mountainous, state) in the spread of COVID-19 in nursing homes?

Sandi Lane
Data Sources

- Centers for Medicaid and Medicare Services (CMS) nursing home data,
- County-level data from the 2010 Census and 5-year estimates from the American Community Survey, and
- County-level COVID-19 infections rates from USAFacts.org
Data Cleansing and final data set

- 15,403 facilities reported to CMS in 2020
- 14,886 facilities reported to CMS every year since 2016
- Some facilities missing staffing data for 2020
- Some facilities missing star-rating data for 2020
- 13,294 facilities reported to CMS COVID-19 data
- 86.3% of the full population of U.S. nursing homes included in the final analysis

Trent Spaulding
Methods

Zero-Inflated Poisson allows us to account for a large number of facilities with no infection. Further, the method models two processes.

1) How the virus gets into the facility
2) How the virus spreads in the facility
Results - Impacts on the Virus Getting into a Facility

- Higher county infection rates → more likely to have an infection
- Recently purchased facilities → less likely to have an infection
- Higher percentages of Blacks and Asians → more likely to have an infection
- Older populations → less likely to have an infection
Results - Impacts on the Spread of the Virus

- Most of the IVs were significant
- More nurses and nurse aids → lower infection spread
- More licensed practical nurses → higher infection spread
- Recently purchased facilities → lower infection spread
- NFP and local government → less spread than FP
- Higher percentage of Blacks, Asians, and Hispanics → higher infection spread

Trent Spaulding
Resident COVID-19 Cases (Normalized by Resident Population)

- ≤0.004075
- ≤0.02288
- ≤0.1096
- ≤0.5099
- ≤2.357
- No Data
Spatial Patterns

Significant spatial clustering of COVID-19 in the general populations and among nursing home residents.
Conclusions

Different factors affect how the virus gets in and how it spreads once in.

Findings suggest that racial and ethnic demographics of an U.S. county are a larger influence on nursing home associated COVID-19 cases than staffing and other nursing home characteristics.

Systemic racial and social inequities have been linked with COVID-19 associated health disparities and also helps to predict county-level nursing home outbreaks.
Public Health Implications

- COVID-19 is affecting the U.S. at much higher rates than other nations.
- Concurrently, the nation is dealing with hundreds of years of systemic racism and injustice.
- Communities housing nursing home facilities must address both while attempting to prevent and mitigate both the short and long-term effects of a global pandemic.
Project Outcomes and Next Steps


- Continue to collect updated data on COVID-19 cases - overall and we as in nursing homes in USA
- Cleanse data and further analyze to see if there are changes in trends
- Create a dashboard to inform stakeholders with appropriate information for decision/policy making
- Explore other funding opportunities
  - Qualitative interviews with Nursing Home Staff
  - Survey of Community Health Directors
Thanks to Appalachian State University’s Office of Research funding support for this project.

thank you!

Sandi Lane