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CPS Paper

The Effects of Vaccination Rates and Staff Shortages on Nursing Homes Residents' COVID-19 Mortality Rates in the United States

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Brief Description

Using a two-step statistical analysis on a large, longitudinal nursing home data set from the US Centre for Medicare and Medicaid Services, we underline the importance of considering health infrastructures beyond pharmacological responses, such as vaccine development to counter public health emergencies.

Abstract

Despite the universal and free distribution of the COVID-19 vaccines, disparities in mortality rates persisted among nursing homes in the United States. How did staff shortages contribute to those disparities, and how were they affected by county-level social deprivation? To address these questions, we applied a two-step statistical approach using an exploratory and inferential analysis on a large, longitudinal nursing home data set from the US Centre for Medicare and Medicaid Services. We performed a repeated cross-sectional multiple correspondence analysis to reveal the variable categories most contributing to the axes in a two-dimensional Euclidean space. We find that even after the initiation of vaccinations, staffing shortages of nurses, aides, and clinicians consistently remained the most influential variables for the second dimension. We further applied a time-series analysis to estimate 1) the overall effects of vaccination rates and staff shortages on nursing home mortality rates, and 2) the same effect moderated by relative deprivation on the county-level. Our study underlines the need to address social variables in the promotion of public health. It stresses the importance of considering health infrastructures beyond pharmacological responses, such as vaccine development to counter public health emergencies.