

Norovirus outbreaks in nursing homes associated with increase in hospitalizations, risk of death

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In a study that included more than 300 Medicare-certified nursing homes, rates of hospitalization and death were substantially increased during outbreaks of norovirus gastroenteritis vs. non-outbreak periods, according to a study appearing in the October 24/31 issue of *JAMA*. The study is being published early online to coincide with its presentation at the ID (infectious disease) Week meeting.

"In the United States, nursing homes annually provide care to approximately 3.3 million residents' and 22 percent of all deaths occur in these settings. Gastroenteritis outbreaks are common in nursing homes in high-income countries. Annually, more than 1,000 outbreaks of [acute gastroenteritis](#) are reported by nursing homes to U.S. public health agencies, and this likely represents only a fraction of the actual number due to underreporting. Although nearly half of all reported nursing home gastroenteritis outbreaks are never etiologically [the cause] confirmed because of challenges in performing diagnostic testing, norovirus is implicated in 86 percent of etiologically confirmed outbreaks," according to background information in the article. Because hospitalizations and deaths are common among the vulnerable, [elderly population](#) in nursing homes, it is difficult to ascertain if there is actually a greater number of these events during norovirus outbreaks.

Tarak K. Trivedi, B.S., a 4 th year medical student at the University of Chicago Pritzker School of Medicine, and colleagues conducted a study

to assess the association between norovirus outbreaks and excess all-cause hospitalization and mortality in nursing homes. The study included 308 Medicare-certified nursing homes in Oregon, Wisconsin, and Pennsylvania that reported at least 1 confirmed or suspected norovirus outbreak to the [Centers for Disease Control and Prevention's National Outbreak Reporting System](#) (NORS), January 2009 to December 2010. Deaths and hospitalizations occurring among residents of these nursing homes were identified through the Medicare Minimum Data Set (MDS). Rates of all-cause hospitalization and mortality during outbreak periods were compared with rates during non-outbreak periods, after adjusting for seasonality.

The nursing homes in the study reported a total of 407 norovirus outbreaks. The median (midpoint) duration of outbreaks was 13 days. Hospitalizations and deaths were reported in 119 (29 percent) and 30 (7 percent) outbreaks, respectively. A total of 67,730 hospitalizations and 26,055 deaths were reported in the nursing home cohort during follow-up. Nursing homes experienced 2,533 hospitalizations (124.0/home-year) and 1,097 deaths (53.7/ home-year) during outbreak periods compared with 65,197 hospitalizations (109.5/home-year) and 24,958 deaths (41.9/home-year) during non-outbreak periods. After adjusting for seasonality by month, the rates of hospitalization and death were significantly elevated during outbreak periods.

The increase in hospitalizations was concentrated in the initial week and the subsequent week, and the increased mortality rate was concentrated in the initial week, relative to outbreak onset. In subsequent weeks, the rates of hospitalizations and deaths returned to the levels observed in non-outbreak periods.

The researchers found that nursing homes with lower daily RN hours per resident had a significantly increased rate of mortality during norovirus outbreaks compared with baseline, while no increased risk was observed

in homes with higher daily RN hours per resident. The increase in hospitalization rates did not show a similar pattern.

"In conclusion, we detected a consistently increased risk of hospitalization and [death](#) from all causes during norovirus outbreaks among residents in [nursing homes](#) from 3 U.S. states. As a next step, research should be directed to determine if this increase is directly attributable to norovirus infection and subsequent disease resulting from gastroenteritis. Additionally, more detailed information is necessary to understand the specific contributory causes and comorbidities of norovirus-associated deaths. Given the lack of [diagnostic testing](#) in sporadic illness, outbreaks may provide the best opportunities for identifying such associations between norovirus disease and deaths," the authors write.

"At present, strategies for averting these severe outcomes include general treatment for dehydration and infection control to prevent and control [outbreaks](#). More targeted interventions would be welcome and in light of recent progress with a norovirus vaccine, these results highlight a setting and population that may benefit if efficacy and safety of immunization can be demonstrated."

More information: [doi:10.1001/jama.2012.14023](https://doi.org/10.1001/jama.2012.14023)

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