

Study highlights pneumonia hospitalizations among US adults

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Viruses, not bacteria, are the most commonly detected respiratory pathogens in U.S. adults hospitalized with pneumonia, according to a *New England Journal of Medicine* study released today and conducted by researchers at Centers for Disease Control and Prevention (CDC) and hospitals in Chicago and Nashville, including Vanderbilt University Medical Center.

The findings highlight a need for more sensitive rapid diagnostic tests to identify pneumonia pathogens and target appropriate treatments when considering that neither viruses nor bacteria were detected in 62 percent of hospitalized adults during the two-and-a-half year study, researchers said.

"Pneumonia is a leading cause of hospitalization and death among adults in the United States and in 2011 the medical costs exceeded \$10 billion," said CDC Director Tom Frieden, M.D., M.P.H. "Most of the time doctors are unable to pinpoint a specific cause of pneumonia. We urgently need more sensitive, rapid tests to identify causes of pneumonia and to promote better treatment."

Known as the CDC Etiology of Pneumonia in the Community (EPIC) study, it is one of the largest U.S. population-based pneumonia studies ever conducted.

The EPIC study team enrolled 2,488 eligible adults, of which 2,320 (93 percent) had pneumonia that was confirmed through chest x-rays and extensive diagnostic methods.

"We studied about 2,400 patients hospitalized with community-acquired pneumonia at five hospitals to understand if pneumonia continues to be a significant public health burden and to investigate what pathogens are causing pneumonia in our communities," said Vanderbilt lead author Wesley Self, M.D., MPH, assistant professor of Emergency Medicine at Vanderbilt University Medical Center.

"We found that, indeed, community-acquired pneumonia remains a very common reason for hospital admission in the US. We also found that viruses were more commonly associated with pneumonia than bacteria in our study. This highlights the urgent need to develop better diagnostic tests and treatment options for respiratory viral infections," he said.

Vanderbilt senior author Kathryn Edwards, M.D., Sarah H. Sell and Cornelius Vanderbilt Chair in Pediatrics and director of the Vanderbilt Vaccine Research Program, said she is pleased with the results of the study, a combined effort between investigators at Vanderbilt and at St. Thomas Hospital Midtown.

"These data will be used by practitioners throughout the country to diagnose and manage pneumonia. It also shows the impact of vaccines on pneumonia rates," Edwards said.

Viruses were detected in 27 percent of patients and bacteria in 14 percent of patients.

Human rhinovirus (HRV) was the most commonly detected virus among [pneumonia patients](#); influenza was the second most common pathogen detected, with twice as many pneumonia hospitalizations due to influenza than any other pathogen (except HRV) in adults 80 years or older.

Streptococcus pneumoniae, the most commonly detected bacterium, caused an estimated five times more pneumonia hospitalizations in adults 65 years and older than in younger adults.

"The frequency in which respiratory viruses were detected in adults hospitalized with pneumonia was higher than previously documented. This may be due to improved molecular diagnostics for viruses and also to the benefits of bacterial vaccines," said Seema Jain, M.D., lead author of the paper and medical epidemiologist in CDC's Influenza Division.

"However, what's most remarkable is that despite how hard we looked for pathogens, no discernible pathogen was detected in 62 percent of adults hospitalized with pneumonia in the EPIC study. This illustrates the need for more sensitive diagnostic methods that can both help guide treatment at the individual level as well as inform public health policy for adult [pneumonia](#) at a population level."

Provided by Vanderbilt University Medical Center

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