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Contact: Michele Baum

[BaumMD@upmc.edu](mailto:BaumMD@upmc.edu)

412-647-3555

[University of Pittsburgh Schools of the Health Sciences](#)

## **Men at increased risk of death from pneumonia compared to women**

*Men come to emergency departments sicker, more likely to die over the next year, University of Pittsburgh School of Medicine study finds*

TORONTO, May 18 ·Men who come to the hospital with pneumonia generally are sicker than women and have a higher risk of dying over the next year, despite aggressive medical care, according to a study being presented Tuesday, May 20, at the 104th International Conference of the American Thoracic Society. Scientific sessions are scheduled May 16 to 21 in Toronto.

It is well known that women live longer than men. We have always assumed that these differences occur because men engage in riskier behaviors and have a greater burden of chronic diseases, ·said Sachin Yende, M.D., study co-author and assistant professor in the Department of Critical Care Medicine, University of Pittsburgh School of Medicine. Our study showed that men were more likely to die up to a year after pneumonia, despite adjusting for health behaviors and chronic conditions. Further, our findings indicate this may be linked to differences in immune response.

The University of Pittsburgh researchers evaluated data from 1,136 men and 1,047 women with symptoms of pneumonia who were treated at 28 hospital emergency departments in the United States.

On average, men arrived at the emergency departments with poorer vital signs, were more likely to be smokers and had a greater variety of complicating health conditions. After hospitalization, men received timely antibiotic treatments more often than women and were twice as likely to be admitted immediately to intensive-care units.

The gender disparity on aggressiveness of hospital care is appropriate, given that men tended to be significantly sicker than women, ·said Michael Reade, D.Phil., first author, former fellow in Pitt's Department of Critical Care Medicine, and assistant professor at the University of

Melbourne, Australia. Investigators adjusted results for age, race, tobacco use, other demographic characteristics, chronic health conditions, health behaviors and levels of treatment. Even so, men had a 30 percent higher risk of death, and the social factors we examined were not sufficient to explain the differences we observed.

Using the patient data, Drs. Reade, Yende and their colleagues next examined a series of molecules important to the body's immune response to infection, finding significant differences between men and women in levels of tumor necrosis factor, interleukin-6, interleukin-10, antithrombin III, Factor IX, plasminogen activator inhibitor-1 and D-dimer. By comparison between the genders, some concentrations were lower, while others were higher.

No one had shown this before, said Dr. Yende. So these differences in immune response could explain at least some of the differences in survival.

Gender differences in immune response to infection are an area of intensive research, with investigations into the role of X chromosomes, which encode genes for several important immune system mediators. Some investigators have suggested that the immune response may differ because women have two copies of the X chromosome," said Dr. Yende. Sex hormones are another area of inquiry. It is tempting to speculate that in the future, medical treatment of pneumonia may be different for men and women.

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In addition to Drs. Yende and Reade, other authors are Gina D'Amico, Ph.D., Eric Milbrandt, M.D., John Kellum, M.D., Amber Barnato, M.D., Florian Mayr, M.D., Lisa Weissfeld, Ph.D., and principal study investigator Derek Angus, M.D., all of the University of Pittsburgh School of Medicine. The study was funded by the National Institute of General Medical Sciences at the National Institutes of Health.

Editor's note: Presentation scheduled for session C96; Abstract No. 4377. A press conference on this study will be held at 11:15 a.m. ET, Sunday, May 18, in Room 101, North Building, Metro Toronto Convention Centre.

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