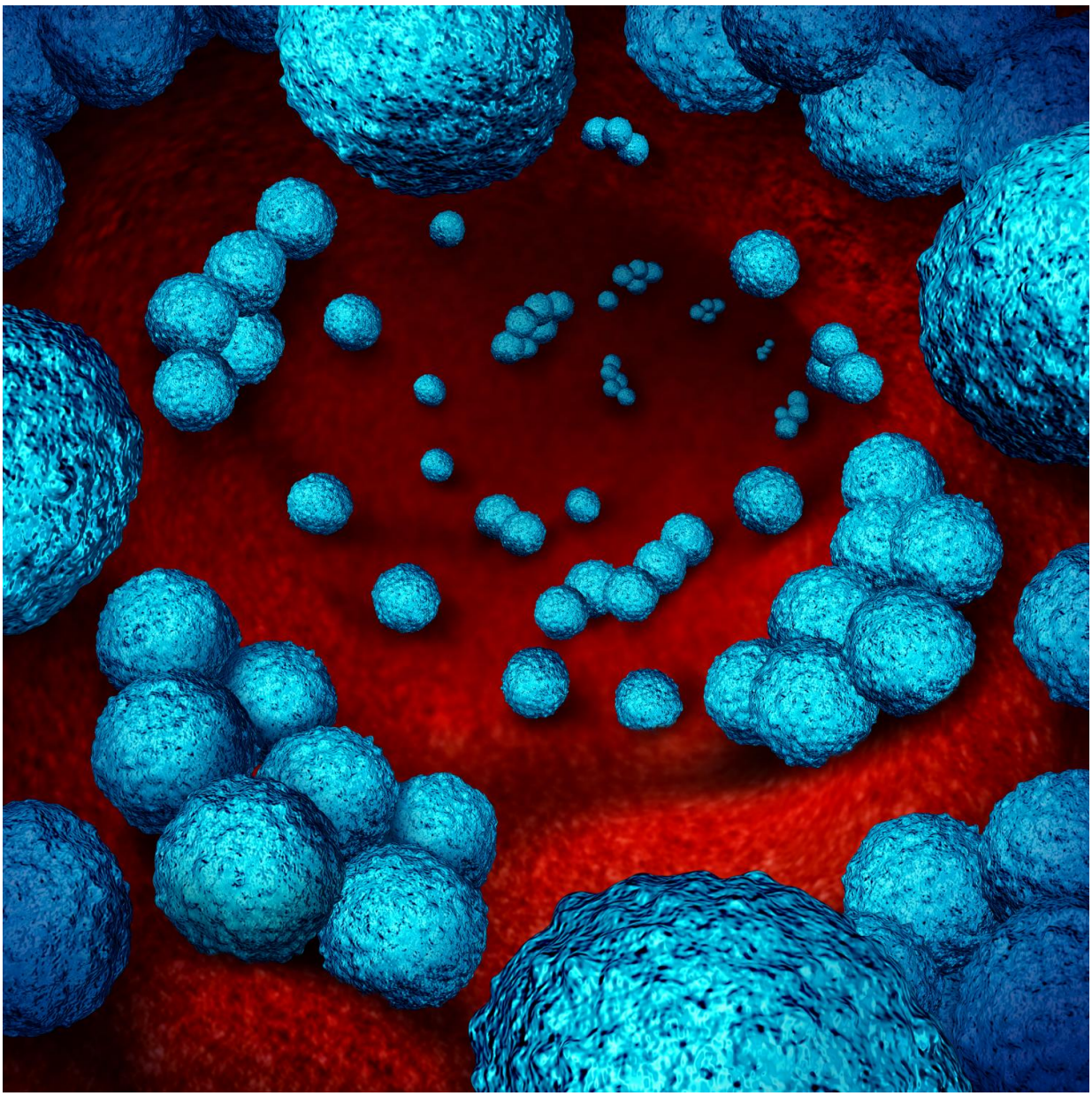
Medical Xpress

Large integrated health outcomes study reveals shifting epidemiology in drug-resistant organisms

October 27 2016



A first-of-its-kind study of 900,000 hospital admissions from an integrated health system has yielded insights into shifts in the epidemiology of multi-drug resistant organisms (MDROs) in the community. Credit: Intermountain Medical Center

A first-of-its-kind study of 900,000 hospital admissions from an integrated health system has yielded insights into shifts in the epidemiology of multi-drug resistant organisms (MDROs) in the community.

New research, funded by OpGen and conducted by Intermountain Healthcare and Enterprise Analysis Corporation (EAC), found that Methicillin Resistant *Staphylococcus aureus* (MRSA), *Clostridium difficile* (*C. difficile*) and ESBL harboring Gram-negative rods were the most common organisms treated by the Intermountain Healthcare system over an eight-year period between January 1, 2008 and December 31, 2015.

The study examined data from Intermountain Healthcare over an eight-year period to characterize the trends occurring in *C. difficile* and MDROs. The abstracted electronic data was pulled from patients seen at Intermountain's 22 hospitals and affiliated clinics who had clinical cultures positive for antibiotic resistant Gram-positive or Gram-negative bacteria and/or laboratory tests positive for toxigenic *C. difficile*.

The researchers discovered that resistant organisms were found in 1.4 percent of the 900,000 hospital admissions during the study period with most originating from the ambulatory setting.

Researchers found that a 222% increase was observed in the prevalence of *C. difficile* as well as a 322% increase in ESBL positive organisms. The good news is that the prevalence of MRSA decreased by 32%. The study measured both the prevalence of infections, as well as impacts on patient care. Economic data are still being analyzed and will be revealed in a future presentation.

Results from the study were presented on Thursday, Oct. 27, at 1:30 p.m., EDT, in the Poster Hall at IDWeek in New Orleans by Bert Lopansri, M.D., lead author of the study at Intermountain Medical Center, the flagship hospital of Intermountain Healthcare.

Highlights of the study:

- Of the 900,000 hospital admissions during the study period, 12,905 (1.4%) were from patients positive for an MDRO and/or *C. difficile*.
- While MRSA continues to be the most common MDRO, rates have declined.
- MRSA, ESBL and CRE forms of E. coli were less frequently acquired in the hospital while VRE, multi-drug resistant Pseudomonas, and other CRE's were more frequently encountered in a healthcare setting.
- 70% of all MDROs and *C. difficile* cases originated from an ambulatory setting.
- While all-cause, in hospital mortality was relatively low (7%), significantly more patients with MDRO require continued medical care in some capacity.

"For the last 10 to 15 years, the number of antibiotic-resistant bacteria continues to increase. We wanted to turn on the lights and look at all the different types of antibiotic-resistant bacteria that have been highlighted as serious and urgent threats by the Centers for Disease Control to see

what the landscape looks like in our system," said Dr. Lopansri, Chief of the Infectious Diseases Division at Intermountain Medical Center. "Although MRSA still poses the greatest challenge, the rise in ESBLs is a major concern and mirrors findings reported at other centers in the U.S. One concern with ESBLs is that the most common antibiotic used to treat them are carbapenems, known as 'last-resort' antibiotics."

"Our support for a study of this magnitude provides a benchmark to hospitals and health systems on what could be lurking in their facilities as we seek to validate the health and economic impact of our rapid MDRO products and services to improve infection control," said Evan Jones, Chairman and CEO of OpGen. "The next step in this collaboration will revolve around leveraging our technologies to guide rapid clinical decisions with a goal of reducing the spread of these infections and improving health outcomes."

In addition to presenting these study results, Dr. Lopansri will be hosting a discussion of the study and its results at the Learning Lounge. The discussion is titled, "Antibiotic resistant bacteria in our Integrated Healthcare Network: are new diagnostic tests needed?" and will take place on Saturday, October 29, 2016.

Provided by Intermountain Medical Center

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https://medicalxpress.com/news/2016-10-large-health-outcomes-reveals-shifting.html