

Researchers see hospitalization records as additional tool

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Comparing hospitalization records with data reported to local boards of health presents a more accurate way to monitor how well communities track disease outbreaks, according to a paper published April 16 in the journal *PLOS ONE* by a research team led by Elena Naumova, Ph.D., professor of civil and environmental engineering and associate dean at Tufts University School of Engineering.

In a paper titled "Hospitalization Records as a Tool for Evaluating Performance of Food and Water-Borne Disease Surveillance Systems: A Massachusetts Case Study," Naumova and the team examined healthcare statistics for Massachusetts residents 65 and older who were diagnosed with three different foodborne and waterborne illnesses—salmonella, campylobacteriosis, and giardiasis—from January 1991 to December 2004.

Statistics for diseases transmitted via food and water are monitored by the Massachusetts Department of Public Health and local boards of health through reports by [health care providers](#), hospitals and laboratories. Hospital data came from information reported by these institutions to the federal Centers for Medicare and Medicaid Services.

The researchers analyzed and compared the number of cases of salmonella, campylobacteriosis, and giardiasis reported through [public health](#) surveillance with the number of hospital admissions for the same infection recorded by the federal Centers for Medicare and Medicaid Services to establish each infection's surveillance to hospitalization ratio

(SHR) for cities and towns across the state.

In their data analysis for salmonella, for example, the team was able to calculate an average statewide SHR of one hospitalization for every 1.7 cases of the infection reported through the surveillance system.

"Some municipalities had SHRs below the state average and this means fewer cases were being reported to those boards of health than the number of patients infected," says Naumova.

The paper describes several reasons for the deviations. For one, patients with mild symptoms sometimes do not seek medical care. Some who do seek clinical care do not have laboratory tests to determine specific causes. Third, not every case gets reported to the local boards of health.

Also, some municipalities have less than adequate resources to collect complete information to confirm cases, says co-author Alfred DeMaria, Jr., medical director of the Bureau of Infectious Disease in the Massachusetts Department of Public Health. "This is not a matter of lack of diligence," says DeMaria "A big component of this is shortage of resources on the local level to get all the information needed to determine that every possible case is actually a case. Communities need to set priorities to focus on the cases that appear to present the most risk to the public."

Moving forward, Naumova says that "using the SHR framework allows us to pinpoint potentially underreporting towns and potentially provide more support for these municipalities. SHR can be an effective and complementary tool to better design the strategies for evaluating and improving [surveillance systems](#). Better surveillance systems allow public health authorities to detect diseases and identify potential areas for targeted interventions."

First author of the study, Siobhan Mor, a faculty member of the Veterinary Science/Marie Bashir Institute for Infectious Diseases and Biosecurity at The University of Sydney in Australia and Tufts University School of Medicine, who developed the methodologies for the SHR framework, agrees. "These methodologies have applications beyond this study—from Sudbury to Sydney—and in contexts beyond these three infections," she says. "We're hopeful that these methodologies could be used to improve [public health surveillance](#) systems worldwide."

More information: Mor SM, DeMaria A Jr, Naumova EN (2014) Hospitalization Records as a Tool for Evaluating Performance of Food- and Water-Borne Disease Surveillance Systems: A Massachusetts Case Study. *PLoS ONE* 9(4): e93744. [DOI: 10.1371/journal.pone.0093744](https://doi.org/10.1371/journal.pone.0093744)

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