

## USA sepsis incidence and trends measurement, clinical data best



On World Sepsis Day, 13 September, *JAMA* has published new research into the incidence of sepsis in the United States.

The challenges of tackling the sepsis burden include accurately measuring sepsis incidence and trends. Clinical diagnoses of sepsis may be subjective, and insurance claims data, a traditional method of surveillance, can be affected by changing diagnosis and coding practices over time.

A research team led by Chanu Rhee, MD, MPH, Brigham and Women's Hospital, analysed clinical data from the electronic health records (EHR) of nearly 3 million adult patients admitted to 409 USA academic, community and federal hospitals from 2009-2014, and compared it to claims-based estimates using the International Classification of Diseases, Ninth Revision, Clinical Modification codes for severe sepsis or septic shock. Their findings suggest that clinical surveillance using EHR data provides more objective estimates of sepsis incidence and outcomes.

Sepsis was identified if a patient had concurrent indicators of infection (blood culture draws and antibiotic prescribing) and organ dysfunction (initiation of vasopressors, mechanical ventilation, and/or changes in laboratory tests).

### Findings

The researchers found that sepsis was present in 6 percent of all hospitalisations and in more than 1 in 3 hospitalisations that ended in death. They estimated that there were approximately 1.7 million sepsis cases nationwide in 2014, of whom 270,000 died.

In contrast to prior claims-based estimates, they found no significant changes in adult sepsis incidence or in the combined outcome of hospital death or discharge to hospice between 2009 and 2014.

They suggest that the observed mortality rate, which exceeds the 10% mortality reported in the Sepsis-3 derivation and validation studies may reflect the more stringent definition of presumed infection (requiring blood cultures and  $\geq 4$  days of antibiotics rather than a single dose) and SOFA score adaptations.

Amongst the study limitations discussed, the researchers note that "neither Sepsis-3 criteria nor EHR-based clinical surveillance can solve the challenge that clinicians routinely face in deciding whether their patient is infected and whether organ dysfunction is due to infection." They suggest that EHR surveillance provides "a consistent gauge" to estimate sepsis incidence and outcomes using readily available, objective clinical data.

"Tracking sepsis using hospital claims data is problematic because sepsis tends to be under-recognised by clinicians, while coding can be influenced by reimbursement and policy incentives", said Dr. Rhee in a [media release](#). "Our research shows that wide-spread sepsis surveillance using clinical data is feasible and correlates well with expert physicians' diagnoses", he added.

In an accompanying editorial Kristina E. Rudd, MD, University of Washington, Seattle, Anthony Delaney, PhD, FCICM, Royal North Shore Hospital and University of Sydney, and Simon Finfer, MD, FCIC, The George Institute for Global Health, University of New South Wales highlight the informative data reported in the study for the disease burden in the USA while pointing out the lack of data on the global burden of sepsis. The Global Burden of Disease statistics do not include sepsis, so deaths due to sepsis are attributed to other causes. The ICD coding remains the most practical way to quantify sepsis cases, they suggest, given lack of electronic health records in low and middle-income countries. "New collaborations are needed to develop separate estimates for the global epidemiology of sepsis", they conclude.

Sources: *JAMA*; [Brigham and Women's Hospital](#)

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