



VIEWS AND REVIEWS

ACUTE PERSPECTIVE

David Oliver: What's behind the reported rise in sepsis deaths?

David Oliver *consultant in geriatrics and acute general medicine*

Berkshire

Recently, Brian Jarman, emeritus professor at Imperial College London and former director of its Doctor Foster Unit—which sends real time mortality rate alerts to hospitals—shared headline data with the BBC from an analysis of deaths from sepsis in the NHS. “Hospital sepsis deaths ‘jump by a third,’” was the BBC’s headline.¹ The story was widely reported by the broadcaster and was picked up in other media outlets.²

The reported finding was that absolute numbers of deaths clinically coded as being from sepsis as the primary cause, either in hospital or within 30 days of leaving, rose to 15 722 in the year to April 2017, up 38% since 2015.

I’ve since enjoyed very informative correspondence with Professor Jarman on his data analyses and write with his permission. To encompass sepsis, his team looked at coded care episodes with diagnoses including pneumonia, septicaemia, shock, aspiration pneumonitis, bacterial infection, hepatitis, viral infection, other infections (including parasitic), and sexually transmitted infections.

From 2013-14 to 2016-17 aggregated patient admissions with these codes increased from 44 321 to 77 996, rising in all of these code groups. Related deaths rose from 9143 to 15 851, while crude death rates were static at just over 20%. The age, acuity, and complexity of the hospital case mix is rising, but surely not enough to explain this increase. Jarman also clarified that his team’s regression analyses on potential explanatory variables behind all cause hospital mortality ratios had consistently identified doctor-patient ratios and bed occupancy, although not specific to sepsis. He discussed this on the BBC’s *Today* programme.²

Meanwhile, Bryan Williams, of University College London, a leading developer and advocate of National Early Warning Scores³ to recognise deteriorating patients and trigger earlier intervention, told the *Guardian*, “In reality [there] is an increased awareness and detection of sepsis and an actual reduction in mortality [rates] in hospital and in the first 30 days after discharge from sepsis.”² He confirmed to me in correspondence that NHS England data, based on hospital episode statistics, support this.

In the same article Ron Daniels, an intensive care consultant and chief executive of the Sepsis Trust,⁴ said that we can’t be certain how much of the apparent rise is due to coding differences, as coding is inconsistent and we have no national disease register.²

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Other columns remain to be written on the empirical evidence behind NICE guidelines and quality standards on sepsis; tools for early sepsis recognition and early intervention promoted by the Surviving Sepsis Campaign and Sepsis Alliance;⁵⁻⁷ variations in delivery of recommended best practice between hospitals;⁸ or potential consequences for antibiotic stewardship when serious infection, sometimes under-identified, is over-identified.⁹

The drive to identify patients at risk of sepsis, or those who may have it, has some potential downsides. For instance, data on antibiotic stewardship suggest that we often diagnose infection inaccurately, not least in older patients labelled with urinary tract infections. And sepsis screening tools may misidentify frail elderly patients with poor organ reserve and put them at risk of iatrogenic harm from antibiotic related infection.

On balance, I applaud the drive to recognise patients at risk of rapid deterioration, death, or life changing complications as early as possible and to increase public awareness of sepsis. In the past 3-4 years I’ve seen a far greater focus on documenting sepsis in notes and initiating early intensive treatment with fluids, oxygen, and antibiotics, using National Early Warning Scores.

Coding changes surely play a part in the story behind the headlines. And remember: sepsis is defined as “a life-threatening organ dysfunction caused by a dysregulated host response to infection.”¹⁰ I’m not sure that we reliably ascertain this from a range of clinical codes for infections, even in patients who have died. However, it would be great if NHS England could publish the more encouraging data on sepsis, which Professor Williams alluded to in his comments to the *Guardian*.

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- 2 Busby M. Hospital overcrowding blamed for rise in recorded sepsis deaths. *Guardian* 3 Aug 2018. <https://www.theguardian.com/society/2018/aug/03/sepsis-deaths-in-overcrowded-understaffed-hospitals-rise-by-a-third>.
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