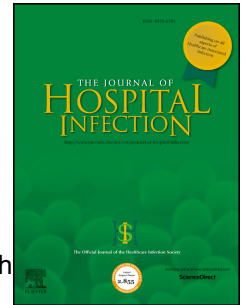


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Estimating the incidence and 30-day all-cause mortality rate of *Escherichia coli* bacteraemia in England by 2020/21

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Key words: *E. coli*, forecast, England, bacteraemia, 30-day all-cause mortality, case-fatality rate, incidence

Summary

Escherichia coli bacteraemia rates have been increasing in England. Using the national mandatory surveillance data for *E. coli* bacteraemia from 2012/13 to 2016/17, we aimed to estimate the incidence of *E. coli* bacteraemia and 30-day all-cause case fatality rate (CFR) by 2020/21 in the absence of new interventions to reduce infection rates. After controlling for age, sex, and hospital versus community-onset of infection, it is estimated that the incidence of *E. coli* bacteraemia will be 90.5 (95% PI: 89.8–91.3) per 100 000 population (n=50 663), with an associated CFR of 11.5 (95% PI: 11.2–11.8) per 100 000 population (n=6554) by 2020/21.

Introduction

Escherichia coli is the leading cause of bacteraemia in England; in 2016, 27% of all bacteraemia episodes and 54% of Gram-negative bacteraemia episodes were due to *E. coli*.¹ The incidence of *E. coli* bacteraemia has increased steadily in England in recent years, with a 22% increase from 60.4 per 100 000 population (n=32 309) in 2012/13 to 73.9 per 100 000 population (n=40 580) in 2016/17.² However, during the same time period, 30-day all-cause case-fatality rates (CFRs) decreased from 16.8% to 14.7%. The risk of patient mortality is not uniform with higher CFRs seen in hospital-onset or healthcare-associated infections compared to those with a community-onset that are not healthcare-associated.^{3, 4}

To address the increasing burden of Gram-negative bloodstream infections in England, the UK government aims to reduce healthcare-associated Gram-negative bacteraemias by 50% by financial year 2020/21, with a focus on bacteraemias caused by *E. coli*, *Pseudomonas aeruginosa* and *Klebsiella* species;⁵ collectively these organisms accounted for 72% of all Gram-negative bacteraemias in 2016.¹ As *E. coli* is the dominant cause of Gram-negative bacteraemia and robust data are available from the mandatory national surveillance scheme implemented in 2011, the aim of this paper is to estimate, in the absence of new interventions, the national incidence, mortality and 30-day all-cause CFR of *E. coli*

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