

Key messages: Health burden of antibiotic resistance

1. Each year, 33000 people die as a direct consequence of an infection due to bacteria resistant to antibiotics. This is comparable to the total number of passengers of more than 100 medium-sized airplanes.

2. The burden of infections with bacteria resistant to antibiotics on the European population is comparable to that of influenza, tuberculosis and HIV/AIDS combined.

3. Between 2007 and 2015, the burden of each of the 16 antibiotic-resistant bacteria under study has increased:

- The number of deaths attributable to infections with *Klebsiella pneumoniae* resistant to carbapenems – a group of last-line antibiotics – increased six fold. This is a worrisome trend because these bacteria can spread easily in healthcare settings if adequate infection prevention and control measures are not in place.
- The number of deaths attributable to infections with third-generation cephalosporin-resistant *Escherichia coli* increased four-fold.

4. 75% of the burden of bacteria resistant to antibiotics in Europe is due to healthcare-associated infections. This could be minimised through adequate infection prevention and control measures, as well as antibiotic stewardship in healthcare settings.

5. Infections with third-generation cephalosporin-resistant *E. coli* are responsible for the highest burden and more than half of these infections occur in the community. Antimicrobial stewardship targeting primary care prescribers as well as infection prevention and control interventions in primary care are therefore necessary to reduce the burden of these infections.

6. 39% of the burden is caused by infections with bacteria resistant to last-line antibiotics such as carbapenems and colistin.

7. This is an increase from 2007 and is worrying because these antibiotics are the last treatment option available. When they are no longer effective, it is extremely difficult or, in many cases, impossible to treat these infections.

The key messages are based on an article published in The Lancet Infectious Diseases on 5 November 2018, Attributable deaths and disability-adjusted life-years caused by infections with antibiotic-resistant bacteria in the EU and the European Economic Area in 2015: a population-level modelling analysis. The article estimates the burden of five types of infections caused by antibiotic-resistant bacteria, (8 bacteria species, 16 antibiotic resistance-bacterium combinations) of public health concern in European Union and European Economic Area (EU/EEA) countries in

2015, measured in number of cases, attributable deaths and disabilityadjusted life years (DALYs). One DALY can be thought of as one lost year of "healthy" life. The sum of these DALYs across the population, or the burden of disease, can be thought of as a measurement of the gap between current health status and an ideal health situation where the entire population lives to an advanced age, free of disease and disability.