

# One-in-ten antibiotic prescriptions 'fail'

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Over a 22-year period more than one in 10 of all antibiotic treatments in a primary care setting have failed. This rate has increased and continues to rise, according to a new study which analysed almost 11 million antibiotic prescriptions in the UK.

Much data has been gathered about antibiotic resistance in hospitals, but virtually nothing is known about the frequency and pattern of antibiotic failure in primary care.

Researchers from Cardiff University therefore set out to assess

antibiotic treatment failure rates in UK primary care with particular focus on four of the most common kinds of infection: [upper respiratory tract](#) infections (URTIs), lower [respiratory tract infections](#) (LRTIs), skin and [soft tissue infections](#) (SSTIs), and acute otitis media (AOM – middle-ear infection).

Findings revealed that between 1991 and 2012 — more than 20 years — overall antibiotic treatment failures had risen from 13.9% (1991) to 15.4% (2012), indicating an increase of 12%. Throughout this period, antibiotic treatment for LRTIs such as bronchitis and pneumonia was the least successfully treated of all infection classes, showing an increased failure rate of 35%.

Treatment failure rates for commonly prescribed antibiotics such as amoxicillin, penicillin and flucloxacillin remained below 20% throughout the studied period, while antibiotics not normally recommended for first line therapies showed concerning rates of effectiveness. Most notably, Trimethoprim, an antibiotic normally used in the treatment of URTIs and listed on the WHO's register of 'essential medicines', showed a failure rate rise of 40%.

"There is a strong link between the rise in antibiotic treatment failure and an increase in prescriptions," said Professor Craig Currie from the School of Medicine. "Between 2000 and 2012, the proportion of infections being treated with antibiotics rose from 60% to 65% which is the period in which we see the biggest increase in antibiotic failure rates. These episodes of failure were most striking when the antibiotic selected was not considered first choice for the condition treated.

"Given the lack of new antibiotics being developed, the growing ineffectiveness of antibiotics delivered through primary care is very worrying indeed. There is a mistaken perception that antibiotic resistance is only a danger hospitalised patients, but recent antibiotic use

in primary care is the single most important risk factor for an infection with a resistant organism. Furthermore, what happens in primary care impacts on hospital care and vice versa.

"Antibiotic resistance in primary care needs to be more closely monitored, which is actually quite difficult given that primary care clinicians seldom report treatment failures. The association between [antibiotic resistance](#) and antibiotic treatment failure also needs to be further explored. From the general level of feverish debate, it's not quite the "cliff" we would have imagined, but clearly this is worrying."

In Europe, hospital infections caused by antibiotic resistant bacteria result in 25,000 deaths every year, increased morbidity and EUR 1.5 billion in healthcare and societal costs. Microbial resistance to antibiotics has increased at an alarmingly rate in recent decades, to an extent that WHO has declared the issue a 'public health crisis'.

Professor Currie added: "We need to ensure that patients receive the appropriate medication for their condition and minimise any unnecessary or inappropriate treatment which could be fuelling microbial resistance to [antibiotics](#), prolonging illness and, potentially in a small number of cases, killing people."

Criteria used in the study to define antibiotic treatment failure included the prescription of a different drug within 30 days of first-line antibiotic; record of patient hospitalisation for an infection related diagnosis within first 30 days of the first-line prescription; GP referral to infection-related specialist within 30 days of treatment initiation; and patient death with an infection related diagnosis within 30 days of commencing [antibiotic treatment](#).

Provided by Cardiff University

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