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What factors are causing antimicrobial resistance?

Following a recent study by health economists at the University of Manchester and the University of Southern Denmark, the tremendous pressure GPs are currently working under has been linked to increasing broad-spectrum antibiotic prescribing in England. Because excess antibiotic prescribing has been closely linked to antibiotic resistance, there are concerns that these higher prescribing levels may be contributing to antimicrobial resistance.

What is antimicrobial resistance?

Health economist Dr Thomas Allen (who led the [Medical Decision Making study](#) along with Dr Anne Sophie Oxholm from the University of Southern Denmark) explains how antimicrobial resistance can occur in the population.

GPs sometimes choose to prescribe broad-spectrum antibiotics more often compared to narrow-spectrum antibiotics.

Dr Allen adds: "One of the issues is trying to target specific bacteria with the correct antibiotic. There are different antibiotics that treat different bacteria, so getting the right one is important. However, determining which is the right one can take time, and this can lead to patients suffering for longer. This is why sometimes clinicians make the choice to prescribe a broad-spectrum antibiotic.

"We treat a lot of bacterial infections with [antibiotics](#) and over time, as part of a natural process, the bacteria are becoming resistant to that treatment."

While using broad-spectrum antibiotics attacks a lot of bacteria, the opportunities to use these in the future are diminished because more bacteria have a chance to become resistant to them.

Dr Allen says there's also a relatively small number of these broad-spectrum attack-all-bacteria types of antibiotics. This is why a lot of clinical guidelines will focus on promoting the use of narrow-spectrum antibiotics, which target a specific bacterial infection.

Why is this concerning?

It should be stressed that overall, prescribing of broad-spectrum antibiotics in England is low compared to other countries. Nonetheless, increasing pressure from patients may still leave GPs choosing to prescribe a larger share of broad-spectrum antibiotics, Dr Allen and Dr Oxholm argue.

Dr Allen says their findings that pressure on GPs may contribute to antimicrobial resistance are worrying.

"The increase in antimicrobial resistance is troubling because once these bacteria become resistant to what we use to treat them, it becomes really expensive for the health service and can be costly for the patient," says Dr Allen.

He adds that this is not something that can be easily undone.

"Once the bacteria are resistant to an antibiotic, there's not a lot we can do. That would then require healthcare professionals to think about other forms of treatment for that infection."

The World Health Organization (WHO) concurs that when resistant bacteria infect humans and animals, the infections they cause are harder to treat than those caused by non-resistant bacteria. Along with [vaccine hesitancy and air pollution](#), it classifies antimicrobial resistance as one of the [top 10 global public health threats](#) facing humanity.

The WHO says antibiotic resistance leads to:

- Higher medical costs.
- Prolonged hospital stays.

- Increased mortality.

It stresses that the world urgently needs to change the way it prescribes and uses antibiotics. If large swathes of bacteria become antibiotic-resistant, we may effectively return to the pre-antibiotic era, where pneumonia is almost always deadly and a minor scratch could lead to life-threatening complications. The pipeline of new antibiotics is almost dry, which means we would be left without options if we do not preserve the effectiveness of the antibiotics we have.

"Even if new medicines are developed, antibiotic resistance will remain a major threat in the absence of behaviour change."

Behaviour changes must also include actions to reduce the spread of infections through:

- Vaccination.
- Hand washing.
- Practising safer sex.
- Good food hygiene.

What types of bacteria might become antibiotic-resistant?

Dr Allen gives the example of [gonorrhoea](#) as one type of bacteria that has become widely antibiotic-resistant.

Gonorrhoea is a sexually transmitted infection ([STI](#)) that [the WHO says](#) remains a major public health concern. WHO estimates that in 2020, there are 82.4 million new cases infected among adolescents and adults aged 15-49 years worldwide.

"The bacterial infection that causes gonorrhoea is treated by a particular type of antibiotic. However, over time, the treatment recommendations for treating gonorrhoea have changed as its bacteria has become antibiotic-resistant to different antibiotics," says Dr Allen.

The WHO has conducted research into this. The findings echo how antimicrobial resistance in gonorrhoea has increased rapidly in recent years and has reduced the options for treatment.

The [WHO says](#) this antimicrobial resistance is caused by a number of factors, including:

- Unrestricted access to antimicrobials.
- Inappropriate selection of antibiotics.
- [Overuse of antibiotics](#).
- Poor-quality antibiotics.

How has GP pressure contributed to antibiotic resistance?

It has long been recognised that GPs work under enormous pressure: an ageing patient population has more complex care needs which has increased the demand for healthcare.

It is widely agreed that GPs are having difficulties retaining and recruiting colleagues. Between 2015–2017, the proportion of GPs reporting their practice was actively recruiting GPs increased from 41% to 46%.

Perhaps the greatest cause of stress, however, is linked to demand from patients, which was associated with a 14% rise in the percentage of broad-spectrum antibiotics prescribed.

"Until this study, evidence was scarce on the consequences of pressure on physicians' decision-making," shares Dr Allen.

His team's National GP Worklife Survey investigated sources of pressure on English GPs, and it used statistical modelling to find that the percentage of broad-spectrum antibiotics prescribed rises by 6.4% as pressure increases.

What types of pressures are GPs under?

Dr Allen acquires his information on pressure from a survey sent out to English general practitioners, which includes a wide range of questions about their working life.

The survey asks GPs about their job satisfaction and the hours and sessions that they work. For example, GPs may be asked what level of pressure they have from various aspects of their job.

These include:

- Demands from patients.
- Insufficient time.
- Insufficient resources.
- Working long hours.
- Paperwork.

"They're also asked if they are actively recruiting GPs at their surgeries. The training, recruitment and retention of GPs is a large issue. At the moment there are too many GPs leaving the workforce and not enough entering it," says Dr Allen.

"Obviously it takes a long time to train a GP, so it's not something that can be solved overnight. In our study, for example, we studied the period from 2010 to 2017, and over that period the proportion of GPs who reported high or considerable pressure from demands from patients increased from 65% to 84%."

Has the pandemic impacted this?

While Dr Allen's study was sent out to GPs in 2010, 2012, 2015, and 2017, he has no doubt that the pandemic has put additional strain on general practitioners.

"More GPs may have left the workforce as a result of the pandemic and many are now required to undertake additional tasks, such as the [vaccination programmes](#)."

What can be done to reduce pressure on GPs?

Dr Allen highlights the importance of policies to reduce pressure on GPs. He believes that tackling this pressure will allow GPs the appropriate time and resources when prescribing antibiotics.

He adds that this can then have a knock-on effect on antimicrobial resistance, allowing patients to receive suitable treatment and courses of medication that work for their ailments.

Do I need antibiotics?

If you have a minor health concern, you can visit your local pharmacy for advice on the appropriate treatment method, as this may include an over-the-counter remedy. Pharmacists are qualified healthcare professionals who can assist you with a range of minor illnesses, or direct you to your GP if they suspect a more serious condition. You do not need an appointment to access your pharmacy, and many are open late at night and over weekends. Most also have private consultation rooms where you can discuss sensitive, personal issues.

Your pharmacist can advise on whether antibiotics are likely to help. If they aren't, they can offer a range of options to relieve your symptoms, many of which are the same as you would get from your GP.

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