

Physicians can significantly reduce antibiotic use without compromising treatment

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Older GPs are more likely to prescribe antibiotics than their younger colleagues. A more cautious approach will not degrade treatment—and it can help fight antibiotic resistance that could soon kill millions of people

annually. The discovery was made in a new study from the Department of Economics at the University of Copenhagen.

Every year, more than 700,000 people worldwide die from antibiotic-resistant and antimicrobial infections. This figure surpasses the annual 627,000 deaths from malaria, 685,000 deaths from breast cancer and 500,000 deaths from drug abuse.

The continued spread of resistant bacteria makes even common infections and standard surgical procedures high-risk events.

"If we fail to contain resistance, 10 million people could die from [antibiotic-resistant infections](#) annually within the next three decades," says Hannes Ullrich, Associate Professor at the Department of Economics at the University of Copenhagen.

Change of physician provides crucial clues

Together with his research colleague Shan Huang, he has studied the varied use of antibiotics by medical doctors.

"Human antibiotic consumption is the most important factor in the fight against resistance. We also see major public health campaigns and costly policies aimed at targeting and restricting [antibiotic use](#) by health care professionals," explains Huang.

However, while physicians have been extensively studied in terms of prescribing addictive medications, referrals to specialists and health care costs in general, remarkably little is known about the impact of physician practices on antibiotic prescribing.

To shed some light on this area, the two economists investigated what a change of general practitioner can mean for the amount of antibiotics

prescribed to a patient—and how it affects treatment. The paper is [published](#) in the *Journal of Human Resources*.

"When GPs move or retire, their patients have to change doctors and may be exposed to a different approach to antibiotics. Using large amounts of administrative data from Denmark, we can see what these practice differences imply for patients," says Ullrich.

More prescriptions do not improve treatment

The study shows that, in particular, older doctors are more likely to prescribe antibiotics. On the other hand, doctors with more colleagues and better diagnostic capabilities pull in the other direction.

"This indicates that developments in professional education, diagnostic equipment and clinic organization are crucial for the appropriate use of antibiotics," emphasizes Huang.

At the same time, the economists see no evidence that greater antibiotic use ensures higher quality of care and better health outcomes for patients.

"Doctors who use antibiotics extensively require more follow-up treatments and do not send fewer patients to the hospital with preventable infections," says Huang.

Given the severity of the [antibiotic resistance](#) crisis, the researchers call for much more political action in this area.

"Our study shows that antibiotic overuse is highly associated with diverse practices. Harmonizing approaches to using antibiotics can reduce the overall consumption of antibiotics without compromising patient health. New diagnostic technologies, including data-driven solutions using

[artificial intelligence](#), can play an important role in promoting efficient use of antibiotics," concludes Hannes Ullrich.

About the study

In the study "Provider effects in antibiotic prescribing: Evidence from physician exits," economists Ullrich and Huang map the different approaches of GPs to antibiotic prescribing.

The study shows that different physician practice styles explain 49% of the differences in overall antibiotic use and 83% of the differences in the use of second-line antibiotics, which typically contribute more to the development of resistance.

The researchers find no evidence that high antibiotic prescribing is associated with better quality of care or fewer adverse health outcomes.

More information: Shan Huang et al, Provider effects in antibiotic prescribing, *Journal of Human Resources* (2024). [DOI: 10.3368/jhr.0523-12900R1](https://doi.org/10.3368/jhr.0523-12900R1)

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