

# Why people overuse antibiotics

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The overuse of antibiotics occurs due to the mistaken widespread belief that they are beneficial for a broad array of conditions and because many physicians are willing to prescribe antibiotics if patients ask for the medication, according to a Rutgers study.

The study, published in the journal *BioEssays*, reviewed more than 200

peer-reviewed studies to examine the causes behind [antibiotic overuse](#), which can lead harmful bacteria to become drug-resistant and cause harmful effects on the microbiome, the collection of beneficial germs that live in and on our bodies.

Martin Blaser, director of the Center for Advanced Biotechnology and Medicine at Rutgers and lead author, said the global use of [antibiotics](#) between 2000 and 2015 increased 39 percent, with a 77 percent increase in low- and middle-income countries. He discusses the study's findings.

## **What health concerns result from the disruption of the microbiome by antibiotics?**

In children, improper antibiotic use can alter the microbiome while their immunological, metabolic and neural systems are developing.

Epidemiological studies associate antibiotic exposure with an increased risk of disease of allergic, metabolic and cognitive disorders that have grown more common in children during the antibiotic era.

In adults, there is increasing evidence that antibiotics may enhance risk for metabolic and neoplastic diseases, including diabetes, kidney stones and growths in the colon and rectum that can lead to cancer.

## **What are the trends you found in antibiotic use?**

Studies in the United States, United Kingdom and China found numerous online pharmacies selling antibiotics without a prescription. This problem also is large in low- to middle-income countries, where 60 percent of antibiotics are sold without prescriptions, often by untrained medical practitioners.

Perhaps of special concern during the COVID-19 pandemic is the

finding that telemedicine services are another potential source of questionable antibiotic sales in the United States. A recent analysis found that patients with acute respiratory infections were more often prescribed broad-spectrum antibiotics if they had a tele-health doctor visit, compared to an in-person visit.

Worldwide, antibiotic use is highest in young children, especially in low-income areas. This is often in response to the fact that young children are prone to have four to six upper respiratory tract infections each year. Although most of these infections are treated by antibiotics, 80 percent are not caused by bacteria and would therefore derive no benefit from antibiotics.

## **Are some practitioners more likely to prescribe antibiotics?**

Our findings are consistent with the hypothesis that older physicians are more likely than their younger colleagues to prescribe antibiotics. For example, one study found that physicians over 30 were several times more likely to prescribe antibiotics for common respiratory conditions that do not necessarily require them. Another study found that physicians with over 25 years in practice were disproportionately likely to issue prescriptions of more than eight days.

## **What misinformation did you find among the public?**

Many people believe that antibiotics are effective against bacterial and viral illnesses, lumping all types of pathogens together and adopting a "germs are germs" attitude. Others believe that taking antibiotics can't hurt. Across Europe, for example, 57 percent of people surveyed were unaware that antibiotics were ineffective against viruses, and 44 percent did not know that antibiotics have no effect against colds or influenza.

## What other reasons did you find for inappropriate prescription of antibiotics?

Antibiotics are commonly used across the world to self-treat health problems for which they were never intended, such as in Nigeria, where women are increasingly using antibiotics to reduce menstrual cramps. In low- to middle-income countries, antibiotics are often seen as strong, magical medicines, capable of both curing and preventing a range of illness. In many countries people also take them to return to work or school when ill. One of the studies found that 63 percent of Chinese university students kept a personal antibiotic stock at home.

Parents may appeal for an antibiotic for their children so that they can go to work or for the children to return to school or daycare. A U.S. study found that 43 percent of parents of a child with cold symptoms believed that antibiotics were necessary.

In addition, some doctors are inclined to prescribe an antibiotic to maintain a good relationship with patients who expect to receive medication. Patients may not demand antibiotics outright, but rather infer their need for them by how they describe the severity of their illness or note that they worked in the past for a similar issue. People have become less willing to wait and let an illness run its course. The perception that there is a pill for ills of all kinds leads the public to demand immediate relief for symptoms from practitioners and to self-medicate.

Every time an antibiotic is given, money changes hands. This is especially a problem in low- and [middle-income countries](#), where pharmacists are happy to dispense without a prescription to their customers. The rural health practitioners in China are paid every time they dispense an antibiotic as well. Such monetary incentives favor the

wide use of antibiotics.

## How can antibiotic overuse be addressed?

Clinicians need to be better educated about the long-term effects on the microbiome and learn about better ways to speak with their patients about antibiotic risks and benefits. They also need to improve their communication about the consequences of antibiotic treatments and identify antibiotic alternatives.

**More information:** Martin J. Blaser et al, Accounting for variation in and overuse of antibiotics among humans, *BioEssays* (2021). [DOI: 10.1002/bies.202000163](https://doi.org/10.1002/bies.202000163)

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