

A 'nudge' reduces doctors' unnecessary antibiotic prescription, study finds

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Pills. Credit: Public Domain

Behavioral interventions that appealed to doctors' competitive spirits and desire to strengthen their reputations motivated them to significantly reduce unnecessary antibiotic prescriptions, a new study shows.

"Until now, most efforts to reduce antibiotic prescribing have involved education, reminders or giving financial incentives to physicians," said principal investigator and senior author Jason Doctor, director of health informatics for the USC Schaeffer Center for Health Policy and Economics. "We decided to test if socially motivated interventions, such as instilling pride in their performance or making physicians accountable for their decisions, would help address the problem. Our findings here suggest they may."

For the study published Feb. 9 in *The Journal of the American Medical Association*, a USC-led team of researchers employed a series of [behavioral interventions](#) known as "nudges" to curtail inappropriate antibiotic prescriptions for acute respiratory infections at 49 practices in Boston and Los Angeles. Nudges can change human behavior without the threat of punishment.

Over the 18 months of the study, two of the interventions studied collectively prevented on average 1 inappropriate prescription for every 8 patients seen.

Nationally, there are over 22 million inappropriate prescriptions for acute respiratory infections each year. This means many doctors are prescribing [antibiotics](#) to patients who have the common cold, even though antibiotics are ineffective against viruses.

"Antibiotics are overprescribed in the United States, which has made antibiotic-resistant infections a huge concern," said Jeffrey A. Linder, the lead study physician at General Medicine and Primary Care at Brigham and Women's Hospital who is also an assistant professor at Harvard Medical School. "There is an urgent need for interventions that safely decrease inappropriate prescribing."

Inappropriate prescriptions also can harm patient health, national health officials noted.

"[Recent clinical guidelines](#) note that increased use of antibiotics is highly correlated with antibiotic-resistant infections and that adverse reactions to antibiotics are implicated in an important subset of visits to emergency departments for adverse drug reactions," said Marie A. Bernard, deputy director of the National Institute on Aging, which funded in the study in part. "This is an area we all need to pay attention to when treating patients of all ages."

The study represents one of the latest efforts to slow [antibiotic overuse](#) and curb the emergence of treatment-resistant infections. It builds upon a [prior study](#) in which the USC researchers posted letters in clinics that discouraged inappropriate prescriptions. That study led to a 20 percent drop in prescriptions.

Doctor, an associate professor at the USC School of Pharmacy, warned that antibiotic overuse, if it continues, could lead to a "post-antibiotic future" in which treatments are ineffective for resistant infections.

It's unclear why over-prescription remains a problem. "There's not a lot of evidence that patients are really demanding antibiotics, but there may be a perception on behalf of physicians that patients won't be satisfied if they don't receive antibiotics," said Daniella Meeker, the study's lead author, an assistant professor of preventive medicine at the Keck School

of Medicine of USC and researcher at USC Schaeffer Center. "Also, some clinicians have gotten into the habit of prescribing antibiotics without necessarily ensuring that they may be warranted."

Three nudges

Researchers gathered data on prescription rates of 248 clinicians at 49 primary care practices for 18 months. They then tested the interventions over another 18-month period during which they focused on 16,959 cases of acute respiratory infection.

Some communities have used one intervention - "peer comparison" - to reduce residents' water and electricity usage by including charts in monthly bills that compare the resident's usage to the community's average or a neighbor's.

For the study on antibiotic prescriptions, clinicians received an email informing them of their ranking, from highest to lowest, for inappropriate prescriptions.

Clinicians with the lowest rates were told they were "top performers" and received a "congratulations" in their inbox. Anyone who was "not a top performer" received an email that included a count of their inappropriate antibiotic prescriptions.

Peer comparison prompted a 16 percentage point reduction in clinicians' antibiotic prescription rates, from 20 percent to nearly 4 percent.

The most successful intervention was "accountable justification." While entering information in a patient's electronic chart, a prompt would appear, asking the clinician to justify the antibiotic prescription. The written justification would be added to the chart, unless the clinician cancelled the prescription. This resulted in an 18 percentage point

reduction, from 23 percent to 5 percent, of antibiotic prescription rates for acute respiratory infections.

Meeker noted that the justifications in the patient charts could be seen by other clinicians, which may have upped the ante.

Another "nudge" that researchers tested was "suggested alternatives." In those cases, a pop-up box encouraging alternative treatments would appear on the computer screen whenever a clinician recorded an antibiotic prescription for [acute respiratory infection](#) in a patient's chart. But this approach "had no statistically significant effect," researchers wrote.

Limitations

The researchers acknowledged some study limitations:

- They did not assess potential harm from prescribing antibiotics unnecessarily.
- The number of clinicians in each testing cluster was small.
- Trial findings may not generalize to primary care practices that have different patient demographics.
- Results depended on electronic health record and billing data.
- Using more than one nudge could have attenuated the effects.

Provided by University of Southern California

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