

# Study examines role of seasonal prescribing changes in antibiotic resistance

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A new study published in *Clinical Infectious Diseases* and available [online](#) shows how seasonal changes in outpatient antibiotic use – retail sales of antibiotics typically get a boost during the winter – can significantly alter seasonal patterns of drug resistance. The findings suggest that hospital campaigns to reduce inappropriate antibiotic use should be coordinated with efforts in the broader community if they are to be most effective.

In the study, Dr. Ramanan Laxminarayan, director of the Center for Disease Dynamics, Economics and Policy in Washington, D.C., and research scholar at Princeton University, and Eili Klein and Lova Sun at Princeton University show a link between changing rates of antibiotic consumption and resistance. They also suggest that restrictions imposed by hospitals may be undermined if usage at the community level is not addressed. "Considering that approximately 260 million antibiotic prescriptions are filled each year," they noted, "individual hospitals' efforts to restrict antibiotic usage are unlikely to have a large effect on certain pathogens unless complemented by and coordinated with campaigns at the community level."

Dr. Laxminarayan and his colleagues demonstrate that highly seasonal temporal relationships exist between some combinations of prescriptions among five classes of [antibiotics](#) (representing almost three-quarters of yearly antibiotic prescriptions) and resistance levels of two bacteria, *Escherichia coli* and methicillin-resistant *Staphylococcus aureus* (MRSA). Specifically, resistant *E. coli* and MRSA were significantly

correlated with lagged [antibiotic prescriptions](#) for drugs that were highly prescribed, but uncorrelated with antibiotics that were not used as often.

To analyze prescribing patterns, the researchers relied on data collected from U.S. retail pharmacies from 1999 to 2007. Information about resistance came from a repository of test results collected from more than 300 laboratories spread throughout the country. In nearly all cases analyzed, a one-month lag was found between high antibiotic prescription levels and the prevalence of resistant E. coli and S. aureus.

Because the sheer quantity of antibiotic consumption is still the main driver of resistance, Dr. Laxminarayan said, "decreasing inappropriate use through flu vaccinations and better education of both patients and physicians on when to use antibiotics will have an immediate impact." The United States still uses more antibiotics per capita than most comparable countries, and "there is room to lower prescribing without compromising on outcomes." The researchers plan future studies to examine other combinations of antibiotics and resistant bacteria, and to specify subpopulations of the U.S.

Provided by Infectious Diseases Society of America

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