

Antibiotic reduction campaigns do not necessarily reduce resistance

July 29 2013

Antibiotic use—and misuse—is the main driver for selection of antibiotic resistant bacteria. This has led many countries to implement interventions designed to reduce overall antibiotic consumption. Now, using methicillin resistant *Staphylococcus aureus* (MRSA) as an example, Laura Temime of the Conservatoire National des Arts et Metiers, Paris, and collaborators warn that simply reducing antibiotics consumption does not necessarily reduce resistance. The research is published online ahead of print in *Antimicrobial Agents and Chemotherapy*.

The success of antibiotic reduction programs depends on which antibiotics are reduced, because some select more strongly for resistance than others. For instance, in the case of *S. aureus*, reducing use of [clindamycin](#) and methicillin lead to decreased resistance, while reducing use of penicillins does not, since most *S. aureus*, including MRSA, are already resistant to penicillin, explains Temime.

Additionally, efforts to reduce antibiotic use must be coordinated between hospitals and the community, since either can feed resistant bacteria into the other, undermining reduction efforts, says Temime.

In 2002-2003, a national program reduced antibiotic use in France by 10 percent. However, it fell short of the full potential for reducing resistance because it failed to target those antibiotics that generate the most resistance, says Temime. She and her collaborators developed a [mathematical model](#) of MRSA circulation, which correctly simulated that reduction, post-facto. They then performed a number of simulations

of reductions in antibiotic use, which demonstrated the complexities of reduction efforts.

"We found that the reduction in MRSA hospital rates could have been much larger than it actually was following the 2002 antibiotic reduction campaign," says Temime. "Our results also suggest that changes in the distribution of antibiotics prescribed for non-hospitalized patients actually limited the impact of the antibiotic reduction campaign in French hospitals."

Their research shows that class-specific changes in antibiotic use, rather than overall reductions, need to be considered in order to achieve the greatest benefit from antibiotic reduction campaigns, says Temime. "This underlines the importance of generating surveillance data on both antibiotic class-specific changes in [antibiotic use](#) and antibiotic resistance in the years following an antibiotic reduction campaign. We believe that this research may help health policy makers and physicians in the design of more efficient antibiotic reduction campaigns."

More information: [www.asm.org/images/Communicati ...
3/0713antibiotic.pdf](http://www.asm.org/images/Communications/3/0713antibiotic.pdf)

Provided by American Society for Microbiology

Citation: Antibiotic reduction campaigns do not necessarily reduce resistance (2013, July 29)
retrieved 2 May 2024 from
<https://medicalxpress.com/news/2013-07-antibiotic-reduction-campaigns-necessarily-resistance.html>

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