

## Antibiotic Effectiveness: Managing a Common Resource

**A**ntibiotic-resistant infections are becoming increasingly deadly. According to reports from the Centers for Disease Control and Prevention, the percentage of U.S. patients with staph infections who failed to respond to a common antibiotic, methicillin, went from 2 percent to more than 50 percent between 1974 and 2004.

The consequences are very real: when these familiar and affordable antibiotics fail, doctors must adopt more extreme measures to treat patients, from the use of much more expensive drugs to surgery. Antibiotic resistance claims more than 63,000 American lives every year, more than the U.S. death toll from traffic accidents or AIDS.

In a new report, *Extending the Cure: Policy Responses to the Growing Threat of Antibiotic Resistance*, RFF Senior Fellow Ramanan Laxminarayan and his co-authors examine the problem of antibiotic resistance from a natural resources perspective.

“Antibiotic effectiveness is a valuable shared resource, much like clean water, forests, fisheries, and oil production,” said Laxminarayan. “Success in protecting this shared resource will require incentives for all stakeholders to change their current approach to antibiotics.”

All antibiotic use, appropriate or not, “uses up” some of the effective-

ness of that antibiotic, diminishing our ability to use it in the future. Hastening the spread of resistance by overuse of antibiotics, then, is like other shared resource problems, such as global warming and overfishing. The federal government has required sustainable management of resources like forests and fisheries, and more recently, genetically engineered pest-resistant crops. Similar approaches can help government craft policies for the sustainable use of antibiotics.

For many shared resources, including antibiotic effectiveness, the key to successful management is in aligning stakeholder incentives. The root causes of antibiotic resistance lie in insufficient incentives for patients, physicians, hospitals, and pharmaceutical companies to act in ways that would conserve the effectiveness of antibiotics.

Effective solutions to declining antibiotic effectiveness, the report finds, must include financial inducements, such as lower reimbursement for hospital-acquired infections, coupled with some measure of regulatory sanctions for health care providers, hospital administrators, health insurers, and drug manufacturers. The authors’ recommendations include educating patients and physicians about the risks of

greater antibiotic use and using vaccinations in community settings and infection control in health care facilities to lower the burden of infections.

Even if we were to make the best use of existing drugs, resistance would arise. However, in recent decades the development of new antibiotics has not kept pace with resistance. Investment in antibiotics appears to be declining. Just as importantly, pharmaceutical companies do not have a strong incentive to care about the development of resistance to their products. Policies to encourage the timely development of new drugs would take two forms: encouraging research and development into new antibiotics, and reducing incentives for pharmaceutical manufacturers to oversell their antibiotics.

“Practical economic incentives are a time-tested and powerful way to change behaviors,” said Laxminarayan. “Without providing positive rewards for those who use and produce antibiotics to change their practices, we will continue to see our arsenal of disease-fighting drugs shrink.”

*Extending the Cure* was developed by a team of researchers from RFF, the University of Chicago, the



National Institutes of Health, and Emory University. The researchers were advised by a distinguished panel of academics, including Nobel Prize-winning economist Kenneth Arrow, and Donald Kennedy, former U.S. Food and Drug Administration Commissioner and current editor-in-chief of *Science*. The report is available at [www.extendingthecure.org](http://www.extendingthecure.org). ■