

Global effort is needed to keep antibiotics working

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Antibiotic resistance in nature, such as that identified in polar bears in the remote archipelago of Svalbard, is likely to be related to nearby human settlements. Credit: Hannes Grobe, Alfred Wegener Institute for Polar and Marine Research

A global approach is needed to address the unfolding burden of antibiotic resistance, say the authors of a new report, published this week in *Lancet Infectious Diseases*. The report coincides with the European Antibiotic Awareness Day and the U.S. Centers for Disease Control and Prevention (CDC) "Get Smart About Antibiotics Week."

The report, compiled by an international group of 26 leading experts in

the field, presents a comprehensive look at the growing problem of antibiotic resistance, its major causes and consequences, and identifies key areas in which action is urgently needed.

One area of particular concern is with the connection to the environment.

"The environment is key in the spread of resistance," said the report's lead author, Ramanan Laxminarayan, research scholar at the Princeton Environmental Institute and lecturer in the Department of Economics at Princeton University.

Antibiotic resistance arises when bacteria evolve mechanisms to withstand the drugs which are used to fight infection. Recent decades have seen vast increases in the use of [antibiotics](#) across medicine and agriculture, and in the absence of adequate regulatory controls, treatment guidelines, and patient awareness, this has led to a huge global surge in [antibiotic resistance](#).

"Many drivers of antibiotic consumption are grounded in human medicine. However, antibiotic use in veterinary medicine and for growth promotion and disease prevention in agriculture, aquaculture, and horticulture is also a major contributing variable," said Laxminarayan. "Antibiotic resistance is very low in polar bears on the isolated Arctic archipelago of Svalbard, supporting our theory that ecological resistance close to human settlements is rooted in the anthropogenic use of antibiotics."

The authors call for a bolder intervention outside hospitals and toward an ecological antibiotic stewardship—recommending the development of strategies focused on the control of non-human sources of antibiotics, resistant bacteria, and [resistance genes](#), such as in agriculture and waste water from the pharmaceutical industry.

"For example, waste water treatment facilities can be a hotspot. The chlorination of drinking water can, in fact, concentrate some antibiotic resistant genes," said Laxminarayan. "One of our key recommendations is for increased research on how to reduce and neutralize manmade antibiotic pressure and how to control the resistance gene pool in hotspot environments."

More information: "Antibiotic Resistance—The Need for Global Solutions." Ramanan Laxminarayan, Adriano Duse, Chand Wattal, Anita K.M. Zaidi, Heiman F.L. Wertheim, Nithima Sumpradit, Ericka Vlieghe, Gabriel Levy Hara, Ian M. Gould, Herman Goossens, Christina Greko, Anthony D. So, Maryam Bigdeli, Goran Tomson, Will Woodhouse, Eva Ombaka, Arturo Quizhpe Peralta, Fara Naz Qamar, Fatima Mir, Sam Kariuki, Zulfigar Bhutta, Anthony Coates, Richard Bergstrom, Gerard Wright, Eric D. Brown, Otto Cars, 2013. *The Lancet Infectious Diseases*.

Provided by Princeton University

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