A new report by the Australian Academy of Science has called for the Australian government to take immediate action to counter the growing resistance of bacteria to antibiotics, a problem known as antimicrobial resistance. The paper particularly highlights addressing shortfalls in research funding, food labelling and collaborations between sectors.

Antimicrobials are drugs that treat infections caused by microorganisms (bacteria, viruses and fungi). Antimicrobial resistance occurs when microorganisms evolve to survive exposure to antimicrobials. This could mean a course of antibiotics you take for a bacterial infection is ineffective.

Antimicrobial resistance is accelerated when antimicrobials are used unnecessarily, (such as when antibiotics are prescribed for a viral infection, or used as growth promoters in farming practices, and when their use is poorly managed.

What will happen as the drugs stop working?

In January of this year a woman died in the US from a bacterial infection following a hip break. She developed an infection that was resistant to all known antibiotics and was untreatable. This is just one example of what a world of unrestrained antimicrobial resistance might look like. Without action, the loss of effective antimicrobials is anticipated to claim ten million lives a year by 2050 and cost US$100 trillion (A$132tr).

Without antimicrobials we risk a return to death from infections previously thought defeated. We will likely also be unable to safely perform routine medical procedures such as hip replacements and Caesarean sections, or administer chemotherapy to cancer patients, as each often rely on accompanying antibiotics to prevent or treat infections.

What’s the solution?

Antimicrobial resistance is a complex problem involving different sectors. It is driven by, and affects, the human, animal and environmental health sectors.

Within human, animal and environmental health, groups of prescribers, users and regulators have influence over antimicrobial use and resistance. We often think of prescribers as GPs, but within this group are all doctors, dentists, pharmacists, vets and nurse practitioners working in the community, in hospitals and in residential aged care facilities.

Similarly, patients are not the only users of antimicrobials. Farmers and pet owners also fall into this category. Local and national governments typically play the role of regulating antimicrobials, but as antimicrobial resistance is a global problem, the actions of international governments and agencies are also significant.

Action to combat antimicrobial resistance requires prescribers, users and regulators of antimicrobials in human, animal and environmental health work together. This is because no single action in any single group is sufficient. This also makes it a very challenging solution to deliver.

Much has been written by governments and health organisations about how to respond to antimicrobial resistance. Common messages are that we need to reduce the use of current antimicrobials in order to preserve them. This includes preventing and reducing infections via vaccination, sanitation and good hygiene; developing new antimicrobials to replace ineffective ones; improving education about antimicrobial resistance; and expanding surveillance of resistant infections and antimicrobial usage so we understand the nature of the problem.

Report recommendations

The Australian government has outlined similar objectives in its First National Antimicrobial Resistance Strategy (2015-2019). The Australian Academy of Science Think Tank report sought concrete steps to accelerate one or more of these goals, and to consider important areas often overlooked. The report's recommendations include:

1. Fund interdisciplinary research in antimicrobial resistance

Current barriers to research among different disciplines, including the fact research collaborations between sectors are less likely to get funding grants , need to be removed.

2. Create a national agency to coordinate changes in antimicrobial use and demand

Programs to combat antimicrobial resistance must be consistent across states and territories. This requires unified oversight from a central body.

3. Clarify the role of human and animal waste in antimicrobial resistance

There is much uncertainty about how environmental pollution contributes to the emergence of resistant microorganisms, its effect on both food and water security, and the effectiveness of antimicrobials in the clinic.

4. Label antibiotic use in food production

Labelling how antimicrobials are used (for reasons other than animal health) educates consumers about the use of antimicrobials outside of medicine, and empowers consumers to make informed decisions.

Untreatable infections will continue to increase, affecting the most vulnerable first . These recommendations support the Australian government strategy and will help buy us vital time to identify and deliver solutions to antimicrobial resistance.

The full report An Interdisciplinary Approach to Living in a Risky World and a complete list of its authors can be found here .

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Read more http://theconversation.com/when-the-drugs-dont-work-how-we-can-turn-the-tide-of-antimicrobial-resistance-71711