

Failing to tackle drug-resistant superbugs will cause 10 million extra deaths a year and cost up to \$100 trillion

Drug-resistant infections will cost the world 10 million extra deaths a year and up to \$100 trillion by 2050, if the global increase is not stopped, according to a major new report launched by economist Jim O'Neill today.

Jim O'Neill leads the Review on Antimicrobial Resistance (AMR), another term for drug-resistant infections or superbugs. The Review was established by the UK Prime Minister David Cameron in July. It publishes its first paper today, *Antimicrobial Resistance: Tackling a Crisis for the Health and Wealth of Nations*. This outlines the sobering and escalating human impact of AMR between now and 2050, as well as its potentially enormous global financial cost.

Drug-resistant infections already kill hundreds of thousands of people globally every year, and the trend is growing. The importance of effective antimicrobial drugs cannot be overplayed. For example, *E. coli* is a widespread bacterial infection in rich and poor countries. It is a major cause of diarrhoea in children and can be lethal: it kills up to half of patients who get it as a bloodstream infection where antibiotics are not used. Today, doctors reserve a class of antibiotics called 'carbapenems' as a drug of last resort against *E. coli*, meaning they use it only in cases when the other antibiotics have become ineffective due to resistance. In an alarming development, doctors have had to use more and more carbapenems in the past years and now a strain of carbapenem resistant *E. coli* has emerged and spread around the world. For patients infected with that bacteria, there are now no effective drugs available for doctors to use.

The analysis, produced by RAND and KPMG, with input from experts in the scientific community, estimates that failing to tackle drug resistance will mean around 10 million people across the world will die every year by 2050. This is likely to be an underestimate, as it excludes the indirect

effects of AMR which could cast medicine back to the dark ages by making routine medical procedures far more dangerous through the higher risk of infection.

The reduction in population and the morbidity impact would also reduce the level of world GDP by between 2% and 3.5% by 2050, creating a cumulative hit to global wealth of \$60 - \$100 trillion. This is approximately the equivalent of losing the UK economy from global output every year.

Jim O'Neill, Chairman of the Review on AMR, said:

"Drug-resistant infections already kill hundreds of thousands a year globally, and by 2050 that figure could be more than 10 million. The economic cost will also be significant, with the world economy being hit by up to \$100 trillion by 2050 if we do not take action."

"We cannot allow these projections to materialise for any of us, especially our fellow citizens in the BRIC and MINT world, and our ambition is such that we will search for bold, clear and practical long term solutions."

However, the report makes the case that this crisis can be averted if global action is taken soon to address this huge problem and identifies that there is already cause for some optimism. This report provides the Review's first assessment of the economic challenge of AMR and over the coming year, Jim O'Neill and his team will be exploring what action can be taken at a global level to address:

1. The impact of antimicrobial resistance on the world's economy if the problem is not tackled.
2. How we can change our use of antimicrobial drugs to reduce the rise of resistance, including the game changing potential of advances in genetics, genomics and computer science.
3. How we can boost the development of new antimicrobial drugs.
4. The potential for alternative therapies to disrupt the rise in resistance and how these new ideas can be boosted.
5. The need for coherent international action that spans drugs regulation and drugs use across humans, animals and the environment.

The Review will publish further papers looking at these and other themes set out in today's report, culminating in its final report in the summer of 2016.

Quotes about the report

Nick Stern, President of the British Academy, IG Patel Professor of Economics and Government at the LSE and former Chief Economist of the World Bank, said:

"Wise policy looks ahead and tries to manage risks, particularly the big ones. There can be no doubt now that antimicrobial resistance is one of the biggest that we, all of us, face. The work of the group led by Jim O'Neill is of profound importance and this paper shows very convincingly the great scale of the risks, in terms of human lives and the economy, that are posed by this deeply worrying phenomenon."

Lawrence H. Summers, Charles W. Eliot University Professor and President Emeritus at Harvard University, said:

"This sobering analysis from Jim O'Neill's Review demonstrates why the world needs to get serious about tackling the rise in antibiotics resistance. We play with fire if we skimp on public health. Ignoring the tide of drug resistant infections risks rolling back the hard won medical advances of the last century at precisely the first moment in history when we can actually go the other way and close the global health gap."

Ramanan Laxminarayan Director at the Center for Disease Dynamics, Economics & Policy in Washington & New Delhi, said:

"The timing of the release of this important Review coincides with the re-entry of one of the world's largest pharmaceutical companies back into the antibiotics business. The Review emphasizes that we need to be smarter and can't afford to repeat our earlier approach to antibiotics which has failed to taken into account the fact that these are medications like no other and are central to modern medicine. The consequences of not doing so are likely to be staggering."

Jin-Yong Cai, CEO of International Finance Corporation part of the World Bank Group and the largest global development institution focused on private sector development said:

"This report raises in stark terms the economic and human toll that AMR is taking on global health, and the consequences of inaction. As a financial development institution, we are

concerned that AMR may constrain economic progress in the world's poorest countries. The report sensibly calls for ideas and action on multiple fronts to avert a global crisis, and support progress the world has made in fighting infectious diseases and alleviating poverty."

Dr Jeremy Farrar, Director of the Wellcome Trust, said:

"The medical community has long been aware that drug resistant infections are one of the biggest emerging threats to global health, with the potential to trigger new epidemics and to undermine the foundations of much modern healthcare. By highlighting the vast financial and human costs that unchecked drug resistance will have, this important research underlines that this is not just a medical problem, but an economic and social one too."

Professor Dame Sally Davies, Chief Medical Officer for England, said:

We all know that antimicrobial resistance (AMR) is important. This is a compelling piece of work, which takes us a step forward in understanding the true gravity of the threat. It demonstrates that the world simply cannot afford not to take action to tackle the alarming rise in resistance to antibiotics and other antimicrobial drugs we are witnessing at the moment. I look forward to the ideas that Jim will recommend in due course for how we can begin to turn this tide globally.

"The studies also demonstrate that there are simply far too many gaps in the monitoring and surveillance of bacterial infections across all parts of the world. Keeping track in real time of the emergence and spread of new resistant strains is essential if we are to act effectively at a global level to halt the rise of resistance."

Allan Coukell, Senior Director, Health Programs, The Pew Charitable Trusts, said:

"This report is a stark warning of the global human and economic costs if antimicrobial resistance is allowed to rise unchecked. However, this dire scenario can be averted if governments, industry, healthcare leaders and non-governmental organizations work together to develop new drugs and diagnostics and reduce overuse of antibiotics in healthcare and in agriculture."

Notes for Editors

1. AMR is the term used to describe drug-resistant infections, sometimes referred to as 'superbugs'. Antimicrobials include antibiotics, antivirals, antiparasitics and antifungals.
2. The Report, *Antimicrobial Resistance: Tackling a Crisis for the Health and Wealth of Nations* will be published on the Review's website at www.amr-review.org on Thursday, December 11. The paper is based on analysis produced by two sets of researchers, RAND and KPMG, in which they estimate the future impact of AMR under different scenarios for six common infections (three bacterial infections, malaria, HIV and TB), and the speed at which resistance to standard treatments of these increases. The studies undertaken by KPMG and RAND Europe will also be available for download on this site.
3. To reach these figures researchers estimated the impact that an increase in resistance would have on the labour force through mortality and morbidity, and then looked at how this would affect GDP. Their studies examined only a limited number of infections where drug resistance is of the greatest concern. They also did not attempt to quantify other impacts such as increased social and healthcare costs. As a result the true total cost of AMR is likely to be even higher than their results suggest.
4. The UK Prime Minister commissioned the Review on Antimicrobial Resistance in July of this year to address the growing global problem of drug-resistant infections. It is Chaired by Jim O'Neill and backed by the Wellcome Trust and the UK Government.
5. Jim O'Neill is an internationally published economist, and until 2013 was Chairman of Goldman Sachs Asset Management, having previously been the organisation's Head of Economic Research. He is particularly well known for his work in relation to developing and middle-income economies having coined the BRIC and MINT acronyms – meaning that he is especially well-placed to understand the broad range of international interests at play with this topic.
6. The Wellcome Trust is a global charitable foundation that spends more than £700 million a year on advancing human and animal health. It is the second highest-spending charitable foundation in the world, after the Bill & Melinda Gates Foundation, investing principally in biomedical science, the medical humanities and public engagement. The Trust is providing part-funding for the work of the Review, and hosting the team at its London headquarters.
7. The press release for the formation of the Review is available here: <https://www.gov.uk/government/news/prime-minister-warns-of-global-threat-of-antibiotic-resistance>

This Press Release is also available on www.amr-review.org.

Media enquiries should be addressed to the AMR team on: info@amr-review.org and 020 7611 5729.