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## The global antibiotic crisis needs teamwork

### Three possible models for how the public sector and private companies can work together to develop agents against multi-resistant pathogens

*By Jim O'Neill*

When the health ministers of the G7 member nations meet in Berlin later this week, high on their agenda will be the question of how the world can be better-prepared to respond to health threats such as Ebola or [antimicrobial resistance](#) (AMR). An important part of this will be agreeing what the G7 can do to ensure that pharmaceutical research efforts are more focussed on products that we need to counter these threats.

Yet the core of these problems isn't the economically rational pursuit of profit but the frequent disconnect between how big pharma spends its money and the R&D investment that society needs most.

The problem of multi-resistant infections, or 'superbugs', illustrates this issue perfectly. There is not enough private investment to find new antibiotics, while we vastly overuse existing ones. The drugs we take for granted are losing ground against increasingly resistant microbes. Once antibiotics stop working, people can once again die from common infections, surgery becomes more dangerous, and cancer treatments and organ transplants are compromised. The results could be catastrophic for public health.

A year ago the British Prime Minister asked me to chair a review into the problem of drug resistance and recommend specific steps to tackle this crisis.

Stopping superbugs is a global public good: they threaten [trade and economic progress](#) and cannot be tackled by any country acting alone, even the biggest ones. Yet they can be beaten with political leadership, some global coordination, and without breaking the bank.

One root of the problem is personal behaviour. The more antibiotics we use without needing them, the quicker resistance to them emerges, and the more drug-resistant microbes spread with human and livestock travel.

We also need to ensure a supply of new drugs. Antibiotics are not profitable to invest in, because the newest ones are often held in reserve to preserve their effectiveness, so sales can remain low for many years. Consequently, today's new [antibiotics pipeline](#) is dangerously inadequate. To overcome this challenge, earlier this year I [recommended](#) a system of lump sum payments to organisations that develop useful drugs. This would cost the world just \$2bn a year to generate 15 good new drugs every decade. It would reward the innovators of novel drugs that meet our most urgent needs, while leaving the upfront investment and the risk of failure with the private sector and ensuring the drugs can be afforded by patients who need them.

“So who will pay for all this?” people have asked me.

The first thing to note is that the cost of tackling superbugs is insignificant compared to the costs imposed by the problem today - \$20 billion extra costs a year for the US healthcare system alone. Also, the funding could easily be found within current government budgets or even more easily within the tens of billions of dollars the pharma industry spends each year on [buying back its own shares](#) rather than investing to innovate. When short term threats such as SARS, Swine Flu and Ebola come along, governments spend large amounts, often in haste. The US just spent \$5.4bn countering Ebola; the UK spent \$1.9bn tackling Swine Flu and China over \$6.1bn in 2003 for SARS. Each of these would have covered that country’s entire contribution towards new antibiotics for more than a decade! The irony is that these crises were not possible to predict, whereas we know which superbugs are rising and [where](#), so we can actually do something about it before it’s too late.

As well as for new drugs, money is needed to invest in diagnostics, disease surveillance, infection control, and research into different approaches like vaccines. These costs too pale compared to paying for inaction.

There are many good ways to fund these interventions and each country should raise the money in a way that is appropriate for their economy, as long as it delivers investment in medical innovation society needs.

One approach is to give drug companies a transferable market exclusivity voucher that can be used or sold to extend another drug’s exclusive market access. This would mean that some patients would face higher prices for their drugs for longer, and the money generated would go towards supporting innovation. While this system has problems, it is far better than not funding vital new antibiotics at all. If implemented we believe the system should reward the best drugs most and not excessively hurt patients with unrelated conditions who could face increased medical bills.

A second option is for governments to raise funds from the pharmaceutical industry. In a field as crucial to healthcare as antibiotics, industry players who are not engaging in research themselves should support a fund that rewards scientists and innovators who are. This could take the form of an operating license on companies selling drugs or medical equipment that rely on antibiotics to work.

And a third approach would be to use existing health and science budgets and employ our multilateral institutions –from the old Bretton Woods financial institutions to the new BRICS Bank and AIIB – to back a new financing mechanism to tackle drug-resistant infections, making sure the money they have access to is used to target a global problem that will affect rich and poor countries alike, such as drug-resistant infections.

It is no use for countries, especially small ones, to act on their own: they need a coordinated response. But countries can fund this response in different ways: what matters is that we justly reward private and public-led innovation in this area, something that need not break the bank.