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EDITOR'S CHOICE

# Antimicrobial resistance—an unfolding catastrophe

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At the end of the 1960s, the then US surgeon general William H Steward famously declared: "The war against infectious diseases has been won." His optimism might well have been justified at the time. The discovery of antibiotics and their widespread introduction had transformed both medical practice and life expectancy.

Antibiotics still transform lives, but—as with so many of the world's resources—we now know that they are not limitless, and that unless we are careful, their beneficial effects will run out. We have become so accustomed to the availability of antibiotics that a world without them is almost inconceivable. Yet this is the world that England's chief medical officer, Sally Davies, demands we contemplate in the second volume of her annual report (doi:10.1136/bmj.f1597). The causes of this unfolding catastrophe are many: overuse of existing antibiotics, increasing resistance to them, a "discovery void" regarding new drugs, and a change in the types of organisms presenting the greatest threat. "If we don't get this right we will find ourselves in a health system not dissimilar to the early 19th century," she says.

Is Davies being overdramatic? Sadly not. Her decision to focus on antimicrobial resistance has been broadly welcomed. And this week we publish a report from Richard Smith and Joanna Coast, long term analysts of the economics of resistance (doi:10.1136/bmj.f1493). They suggest that the picture she paints may even be too rosy. "Resistance is said to present a risk that we will fall back into the pre-antibiotic era," they say. "However, this is perhaps optimistic."

Their argument is that we have badly underestimated the cost of resistance. Studies that have tried to estimate the economic impact have looked at the extra cost of treating a resistant infection compared with a susceptible one. But this ignores the bigger picture. The whole of modern healthcare, including invasive surgery and immunosuppressive chemotherapy, is based on the assumption that infections can be prevented or treated. "Resistance is not just an infectious disease issue," they say. "It is a surgical issue, a cancer issue, a health system issue."

Their revised assessment of the economic burden of resistance encompasses the possibility of not having any effective antimicrobial drugs. Under these circumstances they estimate that infection rates after hip replacement would increase from about 1% to 40-50%, and that about a third of people with an infection would die. It seems likely that rates of hip replacement would fall, bringing an increased burden of morbidity from hip pain.

The CMO's 17 recommendations include better hygiene measures and surveillance, greater efforts to preserve the effectiveness of existing drugs, and encouragement to develop new ones. As Anthony Kessel and Mike Sharland point out, only one or two new antibiotics that target Gram negative organisms are likely to be marketed in the next decade (doi:10.1136/bmj.f1601). Recognising this as a global problem, the CMO's report also calls for antimicrobial resistance to be put on the national risk register and taken seriously by politicians internationally.

As for the cost of such action, Smith and Coast see it as an essential insurance policy against a catastrophe that we hope will never happen. And they share the CMO's urgency. "Waiting for the burden to become substantial before taking action may mean waiting until it is too late."

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