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Authors' reply

We thank Christopher Exley for his interest in our work. For public-health decision-making what matters is evidence, in this case evidence of effectiveness balanced with evidence of harm observed from health outcomes, not surrogates such as antibody titres or metabolite concentrations.

We found no evidence of serious harm either in our systematic review of pertussis vaccines or in our systematic review of aluminium-containing DTP vaccines.^{1,2}

Adjuvanted pertussis and DTP vaccines have been in use since the 1940s and have been the objects of extensive studies and surveillance. While we would wish to see bigger and better reported studies of the effects of vaccines, we do not believe further public expenditure investigating the safety of aluminium used as adjuvant is justified.

Tom Jefferson, Melanie Rudin, and Carlo Di Pietrantonj

TJ and MR are at Cochrane Vaccines Field and Health Reviews Ltd, Rome,

Italy; and CDP is at Cochrane Vaccines Field, Alessandria, Italy

Correspondence: Dr Tom Jefferson, Cochrane Vaccines Field, Via Adige 28a, 00061 Anguillara Sabazia, Roma, Italy. Tel/fax +39 06 999 00 989; email tjefferson@cochrane.co.uk

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- 2 Jefferson T, Rudin M, Di Pietrantonj C. Adverse events after immunisation with aluminium-containing DTP vaccines: systematic review of the evidence. *Lancet Infect Dis* 2004; **4**: 84–90.

Giving identity to the faceless threat of antibiotic resistance

We have known that bacteria develop resistance to antibiotics since soon after the discovery of penicillin. While there was a steady supply of new antibiotics coming onto the market, antibiotic resistance was a problem that could be ignored. Yet the stream of new antibacterials has reduced to a trickle since the 1980s while levels of resistance among many common infectious bacteria have continued to rise. Despite these trends pointing to a future when some bacterial infections may be untreatable, politicians, the general public, and large sections of the medical profession seem unaware of the threat or are unwilling to take the actions necessary to ensure a sustainable future for antibiotics.

A seminar at the Dag Hammarskjöld Foundation, Uppsala, Sweden, May 5–7, looked at ways of kick-starting concerted action on antibiotic resistance. Unlike, for example, AIDS or severe acute respiratory syndrome, which are disease entities that pose evident and acute threats, antibiotic resistance cuts across many diseases and poses a chronic threat. Resistance can therefore be a slippery concept to grasp for the non-specialist. In this sense, antibiotic resistance is similar to an environmental threat such as acid

rain, depletion of the ozone layer, or global warming—there is evidence of current harm, but the real fear is what might happen in the future if the problem goes unchecked.

This notion prompted the suggestion at the seminar that to promote concerted action a campaigning “movement” was needed (eg, an antibiotic resistance Greenpeace). The movement would not be just another professional organisation; instead, it would seek involvement of the general public, politicians, and consumer groups—it would be the face of the so-called faceless threat of antibiotic resistance. Its mission would be to sustain antibiotics as an effective treatment for bacterial infections through raising awareness of the dangers of resistance, promoting access to effective antibiotics for all, rationalising antibiotic use to a necessary minimum, and exploring the need for new antibiotics and alternatives to antibiotics for treatment and prevention.

To generate action, the movement would need a simple, generic message, but it would also have to adapt its presentations of the message to different audiences and in different contexts. For example, politicians might respond to messages based on

burden of disease or the costs incurred in dealing with outbreaks of antibiotic-resistant bacteria; for the public messages based on the possibility of childhood middle-ear infections or pneumonia becoming untreatable might be necessary; whereas for the medical profession, it could be the possibility of transplant surgery becoming a thing of the past.

If this movement is to get off the ground, it must overcome some substantial obstacles, not least of which will be obtaining sustainable sources of funding. It will also have to decide how it is going to interact with organisations already active in this area such as the Alliance for the Prudent Use of Antibiotics and the International Forum on Antibiotic Resistance.

Nevertheless, it is time that antibiotic resistance became an issue of popular concern rather than the interest of a few experts. If a campaigning movement, even one that sometimes generate more heat than light, is the only way to ensure a future for one of the greatest scientific discoveries of the 20th century, then so be it.

John McConnell

Correspondence: John McConnell, The Lancet Infectious Diseases, 32 Jamestown Road, London NW1 7BY, UK