MMR, Wakefield and *The Lancet*: what can we learn?

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Vaccine scares are inevitable and we need to plan accordingly

Twelve years after *The Lancet* published the study by Wakefield and colleagues[1] that suggested a link between measles–mumps–rubella (MMR) vaccination, inflammatory bowel disease and autism, the journal has fully retracted the article. The retraction followed the findings of the Fitness to Practise Panel of the UK General Medical Council, released 28 January 2010, that certain statements in the article were false — namely, that children were "consecutively referred" and that investigations were "approved" by the local ethics committee.[2]

Wakefield's theory had a significant impact on MMR vaccination rates in the United Kingdom. Looking at why Australia was relatively unaffected provides insights into how to better manage vaccine scares in the future.

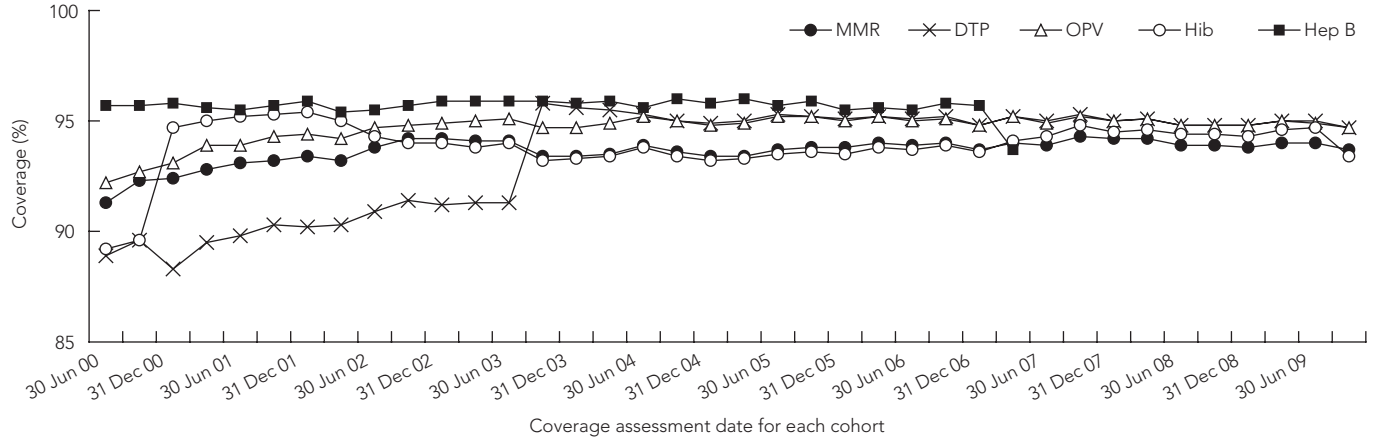
After publication of the article, many readers had written without delay to *The Lancet* regarding methodological deficiencies of the original research.[3] Subsequent studies overwhelmingly supported the safety of MMR vaccination, but the accumulation of this evidence took years to achieve, with considerable opportunity costs, including time and resources spent on investigations which could have been better directed elsewhere.[4]

In the UK, the MMR vaccination rate fell from 91% in 1997–98 to 80% in 2003–04.[5] Notably, there has been no decline in coverage for other vaccines for children in the UK. Despite a recovery in the MMR vaccination rate to 85% by 2008–09,[5] there was a large upsurge in measles occurrences in the UK, beginning in 2002.[6] In 2009, 1144 laboratory-confirmed measles cases were reported in England and Wales.[6] The impact was also felt in the United States, where Wakefield's theory augmented unsubstantiated fears about thiomersal (a mercury-based preservative) in some vaccines leading to autism. A recent survey found that one in four US parents believed that some vaccines cause autism in healthy children.[7]

Vaccine scares are typically depicted as conflicts between science and dogma; between the informed and the misinformed.[8] The publication of Wakefield et al's article in *The Lancet* breached the boundary between the two: here was a well credentialled specialist at a highly regarded teaching hospital whose findings were published in a renowned journal. These signifiers of prestige may have overshadowed the relatively poor quality of the science in the original article.

Fortunately, in the years since the article was published, Australia's MMR vaccine uptake has been relatively stable, as measured by the Australian Childhood Immunisation Register[9] (Box). However, there were other consequences of Wakefield et al's article,

MMR, DTP, OPV, Hib and hepatitis B vaccine coverage for Australian children at 24 months of age, 2000 to 2009*[10]



MMR = measles–mumps–rubella. DTP = diphtheria–tetanus–pertussis. OPV = oral polio vaccine. Hib = *Haemophilus influenzae* type b. Hep B = hepatitis B.
* Figure updated with 2008–2009 data (Brynley Hull, Epidemiologist, National Centre for Immunisation Research and Surveillance, personal communication). ◆

including the time and resources needed to address parents' concerns.[11] Some health professionals appeared to accept Wakefield's theory. A 2006 survey of doctor and nurse vaccination providers in regional New South Wales found that 12% believed there was an association between MMR and autism, with a further 29% being unsure.[11] Despite this, Australian MMR coverage remained essentially unaffected.

The fact that Australian MMR vaccination rates remained stable may be related to some key differences between Australia and the UK: (i) in Wakefield, the UK had a "home-grown champion" for the MMR–autism theory; (ii) the extensive and sustained coverage of this issue in the UK media continually exposed new cohorts of parents of MMR-eligible children to the theory, while Australian television only sporadically reported the story; (iii) there is bipartisan political support for immunisation in Australia, whereas there was grandstanding by a member of the UK Conservative opposition and a refusal by the nation's Labour Prime Minister to reveal whether his own son was immunised;[12] and (iv) a foundation of mistrust in UK government assurances was perpetuated by public perceptions of the management of the Creutzfeldt–Jakob disease issue.[13]

The child vaccination program is held in high regard by most Australians, and, for this reason, the media have traditionally sidelined our small but vocal antivaccination lobby. This high level of public confidence has been helped by the structural support originating from the first National Immunisation Strategy in 1993, followed in 1997 by the federal Immunise Australia: Seven Point Plan, including financial incentives for parents and providers to adhere to the national vaccination schedule.[14]

What can the world learn from the Wakefield experience? First, we should accept vaccine scares as inevitable and plan accordingly. There remains the potential for vaccine safety scares to lead to large-scale opting out of vaccination, exacerbated by dwindling familiarity with the severe effects of vaccine-preventable diseases, and a groundswell of dissent from the antivaccination movement.

Second, public communication about vaccine risk, particularly regarding responses to adverse events following vaccination in new vaccine programs, needs to be planned, and should involve multiple stakeholders, as new issues can arise with little warning. This occurred as recently as 23 April 2010, when Australia's Chief Medical Officer advised a temporary suspension of the 2010 trivalent seasonal influenza vaccine to children 5 years of age and under.[15] This suspension followed an increase in febrile convulsions among young child vaccine recipients reported in Western Australia.

Third, the current level of trust in vaccine programs that we enjoy in Australia is a precious resource and must be continually fostered with good communication. Such communication is more than a didactic one-way process — it requires an interactive engagement between professionals, the public and the media. Clearly, this will be important and challenging after the recent suspension of the trivalent influenza vaccine, because professional and public concern generated by this suspension could spread to concern about influenza vaccination for other age groups.[16]

Australian federal, state and territory governments are now developing a new national vaccination strategy. Essential considerations in this strategy will be how the postmarketing surveillance of adverse events following vaccination is to be conducted, and authoritative and timely communication about vaccine safety with professionals and the public.

Competing interests

Julie Leask is involved in an influenza vaccination study which receives support from Sanofi Pasteur. Peter McIntyre receives support from GlaxoSmithKline and Wyeth for National Health and Medical Research Council clinical trials. Robert Booy occasionally receives funding from CSL, Roche, sanofi-aventis, GlaxoSmithKline and Wyeth for clinical trials, and to attend and present at scientific meetings. Any funding he receives is directed to a research account at the Children's Hospital at Westmead and is not personally accepted by him.

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