

## Confidence in vaccines in developing countries: social, cultural, economic and political influences

As a public health measure, vaccination is unique in its extraordinary capacity to control and eliminate diseases. Yet, to achieve this, it is necessary to administer, usually by injection, a potentially harmful substance to healthy children. It is not surprising then that vaccination has provoked heated debates and arguments ever since vaccines were first used.<sup>1</sup> Families in developing countries, where the burden of disease is still dominated by infectious diseases, many of them vaccine preventable, are often more enthusiastic about immunisation than those in industrialised countries, where non-communicable diseases have become the dominant burden of disease. Important diseases such as measles and polio are well remembered by the older generation in developing countries, while in industrialised countries these diseases are slipping out of living memory. As this happens, safety issues raised by anti-vaccine groups come to dominate the discussion.<sup>2</sup>

Confidence in vaccines can be seen as having two dimensions—confidence in the safety of vaccines, and confidence in their effectiveness. In both respects, public confidence is linked to public confidence in the health system. This varies considerably between industrialised countries, from those countries with a high degree of public confidence, such as Finland, to countries with more sceptical populations such as New Zealand. In industrialised countries, discussion about vaccines is dominated by safety, and anti-vaccine groups have been very active spreading doubts about vaccine safety. It is now accepted that the correct response to this is for the scientific and public health communities to thoroughly investigate legitimate safety concerns, while educating the general public with sound, factual information on vaccine safety and effectiveness.<sup>3</sup>

In the developing world, the situation is more confused. Confidence in the health system is extraordinarily variable between and within countries.<sup>4</sup> In many parts of the developing world, modern medicine is linked to Western colonisation, and interventions like immunisation are easily linked to the West. This has been most strongly felt with the global campaigns for the elimination of small pox and polio. The latter stages of the small pox campaign in India were marred by aggressive vaccination strategies led by foreigners.<sup>5</sup> More recently, polio campaigns in Africa and Asia have been seen to be led by outsiders, with little benefit for the countries concerned. The linkage of anti-Western and anti-vaccine messages can be extremely powerful, as was seen in the early 1990s when rumours claiming that maternal tetanus immunisation campaigns were actually a strategy to test a new form of contraception spread in Asia, Africa and Central America.<sup>6</sup> In 2003, political and religious leaders in northern Nigeria managed to virtually stop polio immunisation in three northern states with unsubstantiated allegations that the vaccine was contaminated with anti-fertility agents, HIV, and cancer-causing agents.<sup>7</sup> How could such an outrageous message catch on so quickly? It has been suggested that this was in part due to rising anti-Western suspicion among Muslim

communities in the wake of the 11 September tragedy in the USA, and possibly also the publicity surrounding the investigation into Pfizer's questionable trial of trovafloxacin in Nigeria in 1996.<sup>8</sup> Suspicions may be accentuated by the lack of a clear threshold of acceptable vaccine safety in developing countries, where postlicensure vaccine safety surveillance is often either weak or absent.

Faced with allegations such as these, WHO and the international community were often caught "on the back foot" as they tried to make reasoned arguments that there was no truth in the allegations. During the 1990s, WHO had come to adopt a zero tolerance attitude towards allegations about vaccine safety, essentially promoting the view that all vaccines are always safe. However, within the organisation, the Chief of Vaccine Research and Development, Dr P-H Lambert, argued for a more reasoned and scientific approach to vaccine safety. In 1999, he succeeded with the establishment of the Global Advisory Committee on Vaccine Safety.<sup>9 10</sup> The establishment of this committee was a major step forward, which has seen WHO move from a position of "stamping out" any allegations about vaccine safety towards one of reasoned scientific investigation and open communication.

In the developing world, there is also controversy about the potential health impact of vaccines, especially expensive new vaccines. These may cost hundreds of dollars per immunised child, a price out of all proportion to the annual health spending in many poor countries, which is often less than 30 dollars per capita. Thus, there is a reasonable concern that such spending on new vaccines may displace funds that would otherwise be available for other public health strategies. To address these concerns, one might have expected the international public health community to follow a path of reasoned scientific investigation and open communication, and to some extent this has happened. However, in recent years, there has been a trend away from support for scientific investigations to measure effectiveness, cost effectiveness and vaccine impact in developing country settings, and towards the aggressive promotion of new vaccine introduction, often supported by modelled data. If the impact and effectiveness of the vaccines were universal and beyond doubt, then this might be a reasonable strategy, although one might argue that it would likely face the same problems as have been seen in the vaccine safety field. If there are serious doubts either about the vaccine-preventable disease burden, vaccine effectiveness or cost effectiveness of new vaccines in developing country settings, then this is a strategy that risks wasting vast sums of international development aid money. This in turn could lead to serious long-term damage to the international vaccination movement.

As the level of funding required to purchase expensive new vaccines goes up, so do the potential profits for the vaccine manufacturers, and the amount of money that vaccine manufacturers are prepared to spend to influence opinion leaders, in particular clinicians and policy makers, by any means possible. With the new vaccines directed against diarrhoeal disease and pneumonia, epidemiological evidence of potential vaccine impact in developing countries is often indirect and weak. As the vaccines approach large-scale use in developing countries, and countries are searching for evidence on which to base a decision about vaccine introduction, there is a growing need for data on which to base such a decision and to monitor the epidemiological impact. This must involve demonstration of both safety and effectiveness. Some data are generated by