Not All Vaccines are Cost-beneficial in Developing Countries

Sir,

We commend Babu and Murthy for their letter about the dilemmas faced by developing countries in introducing new vaccines.[1] They have rightly emphasized the importance of surveillance systems, to estimate locally, the true burden of disease before introducing a vaccine. In the absence of such evidence, they write that governments are forced to decide, based on the lobbying of private manufacturers or of international organizations and self-proclaimed experts.

In this excellent letter there are, however, some points the authors make which need further discussion. They cite as a case study, the debate on the introduction of Hib vaccine in the Universal Immunization Program in India, and say the decisions of the government of India were based on the relatively high cost of the vaccine. The debate was about cost-utility and not just about cost. The utility of the vaccine in Asia (with low incidence of Hib disease) has been questioned in an editorial in the World Health Organization (WHO) bulletin.[2]

The authors quote ‘global estimates’ to suggest that 72,000 children under the age of five die in India of Hib disease every year, and that the country ranks among the top ten countries with the greatest number of deaths on this account without reference to the total population size.[3] Such estimates without reference to the population size give a misleading picture. India is second only to China in population size. One-fifth of the world’s population of children-under-five lives in India. All other factors being equal, India must rank second with the greatest number of deaths due to Hib (not just in the first 10) and one-fifth of all Hib deaths must belong to India. We acknowledge that the authors have stated that the articles quoted in the paper are for purposes of illustration and other examples not cited here can be quoted to discuss the same concept.

Many of the attempts to estimate the incidence of the disease in India have been cataloged previously.[4] The argument that Hib disease is being underestimated in India (because of lack of adequate laboratory infrastructure and delays in transport), was addressed in the IBIS study where the IBIS group did the cultures. In six of the largest hospitals, working over four years, they could only find 125 cases.[5]

Babu and Murthy quote the incidence of Hib under-five as 7.1/100,000. Even if we assume that three doses of pentavalent vaccine would completely eliminate the disease (100% efficacy), and if costs of the vaccine and that of administering the three injections comes to just Rs 300/child (US$ 6), (much lower than the cost quoted by the authors of Rs 300 per dose of vaccine) the expenditure for preventing seven cases of Hib comes to Rs 30 million (US $600,000). If we assume 10% mortality from Hib disease, the cost per life saved is Rs 43 million (US$ 800,000 per life saved). This must be compared against India’s per capita gross national income of $1340 (2010 estimate of the World Bank),[6] and the per capita earning in a lifetime of 50 years of US$ 67,000. It is obvious that at the cost of US $800,000 per life saved, prevention of Hib disease in India with vaccines is not such a good idea.

In the absence of local data on disease burden Babu and Murthy recommend that the WHO must utilize evidence from other countries. The probe studies in Asia (done to overcome difficulties in culturing Hib) in Indonesia and in Bangladesh have shown that three doses of the vaccine do not significantly reduce the incidence of meningitis or pneumonia in Asia.[7] If the WHO were to use evidence from neighboring countries in Asia, there is even less justification to recommend the vaccine.

There is an opportunity cost for all interventions. As an illustration, if we assume a hypothetical situation where there are two programs competing for scarce healthcare resources, one saving 1 life per 20,000 spent and the second saving 1 life per 5000—then three lives will be lost for every 20,000 spent on the first program, if it is selected in preference to the second. This is why governments are well advised to be careful when evaluating the self-serving advice from ‘manufacturers, international agencies and self-proclaimed experts’ as pointed out by Babu and colleague.

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