

# nature medicine

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## Evolving vaccines

Despite the need for an increasingly sophisticated approach to vaccine design and the rising costs incurred during the research, development and testing phases, vaccination is almost certainly the most economic and effective medical intervention available. But vaccines are not reaching those who need them most. To allow them to do so, a new strategy is needed.

Interest in vaccines is growing. There has been a major development in how the World Health Organization (WHO) manages its vaccine activities. Out goes the old *Global Programme for Vaccines and Immunization* and in comes the new (and somewhat awkwardly named) *Department of Vaccines and Other Biologicals*—a move aimed at expanding and strengthening vaccine activities within the organization. Vaccine activities have also received a boost in funding, not least from the unprecedented donation of hundreds of millions of dollars by Bill Gates. And better funding translates into more research—a

scan of the US Library of Medicine's Medline database reveals a steady increase in the number of "vaccine" papers published throughout the 1990s. (For the most recent research on cancer and influenza vaccines, see pages 1119, 1124, 1157 and 1171.)

This attention is welcome, as there is still so much to be done. Two related issues stand out as particularly urgent—developing countries and economics. A few numbers illustrate the problem: So far, HIV has taken the lives of 14 million people and is now killing in the order of 2.5 million a year; 95% of these are in poor countries. Measles is killing approximately 1 million people per year; 98% in poor countries. Malaria kills 1 million per year; 90% in Africa. And similar stories can be told for tuberculosis, meningococcal infection, rotavirus and others. Perhaps the most telling statistic (from the WHO) is that

worldwide, more than \$56 billion are spent on health research but only 10% of this is targeted at the diseases affecting 90% of the population.

This huge divide between the 'haves' and 'have nots' means that most of those who most need vaccines are denied them. Unfortunately there is little or no incentive for the vaccine industry to explore vaccines for the poorest countries, as these countries would not be able to afford them. With development costs for a typical vaccine running at hundreds of millions of dollars, and the risk

increase resources available for developing those vaccines most urgently needed by poorer countries.

Key to the success of this initiative will be the willingness of the public and private sector groups to cooperate very closely. Economists have produced convincing models of the sort of relationship and commitment that would make this cooperation effective. And logically there is every reason that it should work. As it stands, public sector agencies and industry are at the mercy of each other's policies. Without the investment from industry, no products will come to market and only with a commitment from the public sector to help poor countries pay for these new products can industry be confident that their investment will be recouped. Trust is key to the success of this relationship. Close cooperation will help build trust.

There is a risk that the Global Alliance for Vaccines and Immunization will be seen as just another bureaucratic structure that will produce fine words but little action. For now at least, this cynicism must be put aside in favor of a more optimistic view. The WHO understands the need for a partnership between public and private sectors and representatives of the countries most in need of help. It is reassuring to see that Gro Harlem Brundtland (the head of WHO) has agreed to head up the governing body of the alliance for the first two years.

Although for half a century vaccines have enjoyed tremendous success as affordable and effective medicines, it is now clear that they are failing those who stand to benefit most from their use. If vaccines are to realize their full potential in the next century, they must not only address the diverse and adventurous needs of a few rich countries, but also be positioned at the center of the medical strategies of poorer countries.

