

from reading this volume edited by two of the world's most influential experts, Barry Bloom & Paul-Henri Lambert, is that the rate of progress in bringing new vaccines to the marketplace is frustratingly slow. Vaccines represent some of the most cost-effective interventions to improve human health on a global scale. Some of the most desperately needed vaccines such as those against human immunodeficiency virus (HIV), tuberculosis, and malaria seem yet distant hopes. Bloom & Lambert address this frustration directly in their closing chapter entitled "Future challenges for vaccines and immunization." They identify ten high priority challenges ranging from dealing with antigen diversity to public acceptance of vaccination. This book should be seen as a challenge to those concerned with public health, both in their own countries and worldwide, to increase the intensity of effort in vaccine research and development.

The recent new and greatly welcomed funding of vaccine research and development by the US National Institutes of Health, the Bill and Melinda Gates Foundation, and the European Union will help move the field forward more aggressively. But these new funds represent only a valuable down payment on the full investment that is required. For example, a proposal to establish an HIV vaccine enterprise with annual funding in the order of hundreds of millions of dollars is already on the table.

These are the kinds of funds that are both needed and justified by the opportunities described so well in *The vaccine book*. The book itself could serve as a potent tool to help justify substantial increases in funding for vaccine research and development. However, the vaccine community, itself, as pointed out in the chapters by Amie Batson, Sarah Glass & Erica Seiguer and by Kim Mulholland & Bjarn Bjorvatn, needs to effectively address a fundamental issue: the challenges to introducing a large number of additional vaccines to immunization programmes. The efforts of scientists and industrialists to bring vaccines through the research and development process and obtain licensure will require heroic efforts. However, the success of those efforts would represent only a portion of the monumental work that will be required. There will be the continuing

need to buy and distribute those vaccines in both developed in developing countries to those individuals who need them. Particularly with respect to developing countries, there is a need to invest substantial resources now to develop comprehensive plans for the introduction and sustainable procurement and use of vaccines, especially those needed by the poor. In addition, an urgent challenge is to ensure the continued support for the Global Fund for Children's Vaccines. By sustaining the Global Fund, the world will be meeting a wonderful opportunity to improve human health. On the other hand, failure in this effort could very well substantially delay long-term success in the vaccine enterprise resulting in unnecessary death and disease. We should all agree that failure is not an option. ■

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Immunization financing in developing countries and the international vaccine market: trends and issues

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Immunization is often cited as the exemplary public health good. Many immunizations are highly efficacious and relatively low cost. They are truly preventative of disease. Immunization is also associated with strong arguments for public action. There are often large associated externalities in benefits. In poor countries, where many potential beneficiaries may be too poor to use immunization sufficiently or lack sufficient appreciation of its benefits, governments have an important role to play in assuring coverage and use of vaccines.

Yet immunization is not a "pure public good" in the sense that economists' use the term. There is ample evidence of private demand for immunization and it is likely that this is increasing over time as incomes and awareness rise. Poverty and low knowl-

edge and awareness in many developing countries will, however, keep immunization levels below desired levels, over and above the effect of markets to fail to adequately capture externality-related benefits. Governments and the international community have a key role to play in supporting immunization. But precisely what role, to what extent, and for how long, are difficult questions to answer.

Immunizations are produced through a combination of labour and other inputs, including vaccines. While labour and other inputs are generally not tradable, vaccines certainly are. Many vaccines are sold in a global market in which ability to pay varies greatly. There are relatively few producers and those that can, do so on a large scale (lowering costs) and sell at whatever price the different markets will bear in order to make profits.

This useful book, produced by the Asian Development Bank, sheds light on a number of important issues from the perspective of an international organization financing immunization programmes and vaccine procurement for developing countries. As such, it gives more attention to some questions, less to others, and ignores yet others altogether.

As far as immunization financing is concerned, the book reports on the trends in the 1990s. This is described as a period of "declining donor funding" accompanied by the development of new public financing instruments and funding sources, such as the Bill and Melinda Gates Foundation support for the Global Alliance for Vaccines and Immunizations (GAVI). It is certainly disturbing that after the big "child survival" push of the 1980s and early 1990s, during which record high levels of immunization were achieved worldwide, donor and government attention shifted to other priorities resulting in significant lost ground.

One issue that the book does not deal with as clearly as it could have done is the net effect of the changing pattern of financing overall. Grant financing by some of the major donors has declined and shifted over time. New donors have also appeared on the scene. And what about government funding?

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The book does not help the reader understand the net effect of these changes, which is really the critical question. This may reflect the lack of adequate information on national sources of financing for immunization programmes. Without this evidence, however, global planning takes place with only a partial view of the resources available.

Another lacuna in the book's coverage is the absence of a discussion of private financing of immunization. This includes both formal private organizations, also those that are non-profit, as well as household financing. It would have been helpful to have some discussion of non-government financing. Although this is likely to be small in lower income countries overall, it may be significant in some countries, or for some groups such as urban populations. What can we learn about medium-term trends in immunization financing in lower-middle and middle-income countries? What is the role for the state and for international donors in the future?

The second part of the book focuses on the mechanisms for vaccine procurement and financing, including the new initiatives sponsored by different international organizations. It is argued persuasively that such organizations can play a critical role in assuring dependable access to vaccines and commodities through well-managed and relatively inexpensive mechanisms. This intermediary role of the international community is certainly valuable and should be sustained.

Several initiatives that emerged in the 1990s to help maintain the funding and supply of vaccines and other inputs are described and compared. These include GAVI itself, a new type of public-private partnership that brings together governments in developing and industrialized countries, established and emerging vaccine manufacturers, non-governmental organizations (NGOs), research institutes, UNICEF, WHO, the Bill and Melinda Gates Foundation and the World Bank. The pros and cons of these different approaches are clearly laid out in useful comparative tables. Unfortunately, however, the reader is left with somewhat uncertain conclusions about the impact of these different initiatives. There is some evidence that

international support for vaccine supply can help sustain or even increase immunization levels, but other factors at the national level also matter a great deal.

There follows an analysis of the international vaccine market – one of few sellers and few large buyers, and a high degree of market segmentation and differential pricing. A valuable summary is provided of the issues from the perspective of both producers and organizational consumers. In addition to the specific insights about vaccines, there is also a useful case study of some of the issues that are getting attention in the wider international pharmaceutical market. In contrast to other sectors, however, a few large institutional buyers have managed to find some creative ways to achieve lower prices for poor countries without overly threatening the producers' concerns about their markets in wealthier countries. In many cases, vaccine prices have fallen or remained stable in real terms and some differential pricing strategies have been implemented, segmenting countries according to their ability to pay. The book provides an edifying comparison of two strategies: planned tiered pricing and bulk purchasing with uniform prices.

These approaches are also relevant to the longer-term question of how to assure markets for vaccines in the future, including vaccines that are not yet developed, and indeed, how to provide the incentives for that development. Unfortunately, this book does not address adequately these issues. The potential global market for possible new vaccines, for example for malaria

or HIV/AIDS, is immense in terms of people count. But how that will translate into future financial flows is a major question and a likely key determinant of investment in new vaccine development. Recent efforts to assure future vaccine demand (that is, financing) as a means to stimulate investment are not given coverage.

The final chapter of the book consists of a case study of the price of hepatitis B vaccines (plasma-derived and recombinant DNA) over time. The cost per dose of these vaccines declined from an initial level of over US\$ 30 in 1981 to US\$ 0.45-0.69 by 1999, with the decline being earlier and faster for the plasma-derived than for the recombinant DNA version. This difference is attributed to the plasma-derived vaccine's simpler, less costly production methods and much wider global market competition. It is concluded that this experience underlines the advantages of simpler production processes, more rapid technology transfer to producers outside the US and Europe, more effective international purchasing, and creative strategies to relax the monopolistic effects of intellectual property rights as strategies to pursue in future cases.

Overall, readers will find this book a useful guide to a number of complex technical issues that have increasing global relevance, not only for vaccines but for other health commodities. It is clearly presented and has a useful bibliography. All in all it is a worthwhile read in a key area of global health. ■

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Call for papers on Maternal and Child Health

The *Bulletin of the World Health Organization* is seeking Research and Policy and Practice papers dealing with maternal and child health for a projected issue on this topic to be published in the first half of 2005. We are particularly interested in papers that deal with the following areas: why it is important to invest in the health of women and children; how care for women and children has been affected by global policy change; assessment of the public health challenge; how to meet the needs for effective care of women and children; human resources aspects of maternal and child health; economic aspects of maternal and child health; and countries' responsibilities towards the health of mothers and children. We will also consider relevant submissions on this topic to the other sections of the *Bulletin*: Perspectives, Round Tables, and Public Health Reviews. Manuscripts should be submitted to <http://submit.bwho.org> by 1 November 2004, respecting the Guidelines for Contributors, and accompanied by a cover letter mentioning this call for papers.

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