Will the Decade of Vaccines mean business as usual?

In 2011, the story of immunisation coverage worldwide hovers between the glass half empty and the glass half full. Anticipated advances in vaccinology during this new Decade of Vaccines will only translate into reductions in global morbidity and mortality from targeted illnesses if fundamental restructuring means that the most marginalised countries (particularly in Africa and southeast Asia) gain access to new and established vaccines. Routine vaccine coverage and the introduction of new vaccines have increased enormously in the past 10 years, with 14.6 million more children receiving the routine diphtheria, tetanus, and pertussis vaccine in 2009 than in 2000. Yet 23 million children younger than 1 year are still missed, particularly those living in the poorest quintile of low-income countries who have not received the primary series of childhood vaccines.

At the World Economic Forum in Davos, Switzerland, in January, 2010, the Bill & Melinda Gates Foundation launched the Decade of Vaccines by pledging US$10 billion to support worldwide efforts to develop and deliver vaccines to the world’s poorest children in the next decade. Although this pledge could save the lives of more than 8 million children, this sum will still not reach the potential of vaccines to contribute to the achievement of Millennium Development Goal (MDG) 4—reduce the mortality rate in children younger than 5 years by two-thirds between 1990 and 2015. Partners in the Decade of Vaccines (WHO, UNICEF, the Gates Foundation, and the US National Institute of Allergy and Infectious Diseases) know that there are crucial gaps in policy, resources, advocacy, and research that will need to be addressed if the next 10 years is really to be business unusual for immunisation access.

Although many vaccine strategies target adolescents, adults, and elderly people, the main focus of coverage remains on children younger than 5 years. In 2008, of the nearly 8.8 million deaths in children younger than 5 years worldwide, 68% were caused by infectious diseases, 18% by pneumonia, 15% by diarrhoea, and 8% by malaria. Nearly half of these deaths were in five populous countries: India, Nigeria, Democratic Republic of the Congo, Pakistan, and China. Many of the deaths due to infectious disease can be prevented by the introduction of new and established vaccines, while others, including malaria, tuberculosis, HIV infection, and neglected parasitic diseases, still await the development of effective vaccines. The lag in introduction of life-saving vaccines in low-income countries with high disease burden has been most tragically shown by the Haemophilus influenzae type b conjugate vaccine (HibCV). Introduction of this vaccine in low-income countries, where most of the 371 000 yearly deaths from H influenzae type b occurred, was started only 12 years after its institution in developed countries. It took another decade before at least 60% of children in low-income countries gained access to the vaccine. This delay in HibCV implementation in low-income countries led to 6 million deaths since the vaccine became available to children in developed countries. Although lessons have been learnt from this experience, history could be repeated with other life-saving vaccines, including pneumococcal conjugate and rotavirus vaccines.

826 000 children younger than 5 years die from pneumococcal disease every year—almost three times the yearly deaths due to H influenzae type b. However, few low-income countries have successfully enabled access to pneumococcal conjugate vaccine for children a decade after its introduction in developed countries. Although uptake of pneumococcal conjugate vaccine immunisation in children from low-income countries is expected to match that in developed countries in the next 5 years, this is unlikely to materialise without the establishment of strong-willed partnerships between governments, developmental aid agencies, and drug companies. Similarly, introduction of vaccine against rotavirus, which is associated with 527 000 childhood deaths every year mainly in low-income countries, needs urgent introduction into low-income countries. The GAVI Alliance is committed to promoting early access to new vaccines in 56 of the world’s poorest countries. The GAVI Alliance estimates that the pattern of delay in introduction of new vaccines has meant that, for the 2008 birth cohort, many of the world’s poorest children remain unvaccinated, with rates for unvaccination of 34% for hepatitis B, 71% for H influenzae type b, 92% for rotavirus, and 93% for pneumococcal conjugate vaccines.

Vaccines are now the largest cost-driver of immunisation programmes, and this expense is probably the greatest impediment for introduction of new vaccines in low-income and middle-income countries. The
increasingly complex research and technology needed for vaccine development means that new vaccines could cost substantially more to develop than the familiar US$0.50 of established vaccines. With this cost, and the increased costs incurred with expanded logistics of immunisation programmes, the biggest question for access to vaccines in poor settings is a financial one. Because more poor people live in low-income and middle-income countries than in countries eligible for support from the GAVI Alliance, how will overstretched national budgets cope with the costs of vaccine delivery without support from external donors? The GAVI Alliance has a $3.7 billion shortfall, so sustainable funding for global access to vaccines is one of the world’s biggest challenges. However, lessons can be learnt from existing procurement practices. First is the pooling of vaccine procurement for small and low-income and middle-income countries—a system that has already been effective in lowering vaccine costs in the Americas by the Pan American Health Organization. Second, at the start of new vaccine development and introduction, a tiered pricing arrangement should be negotiated in which vaccine costs are prorated dependent on the wealth of countries. This system will enable companies to recoup research and development investments and to be profitable, whilst simultaneously minimising suffering and death in the most vulnerable individuals worldwide. Negotiations of regimes for tiered pricing are usually done with an air of secrecy and often on a country by country basis, yet the question should be asked whether mystery and market forces should continue to drive this process? Or should global public health be more transparent to ensure vaccine access and affordable pricing. But history shows that, if a few manufacturers have a market monopoly, there might be little incentive to lower prices. With increases in technology transfer to emerging vaccine manufacturers in the developing world, the security of global vaccine supplies could be increased and prices reduced by the encouragement of several suppliers for each product. All these mechanisms rely on governments being committed to strengthening their immunisation programmes.

Global and grassroots advocacy premised on robust regional data for disease burden is needed to persuade politicians about the importance of vaccines as a public health tool, and to show this commitment with a budget line-item for immunisation services. Part of this advocacy should be the establishment of strong national immunisation technical advisory groups whose mandate is to advise about national policies for immunisation practices. For countries with limited human resources, constituting authoritative advisory groups has been difficult, and, in these settings, regional committees should offer immunisation advice to countries. Vaccination of children needs reductions in vaccine costs, but countries should also address why so many children remain inadequately vaccinated. Vaccine hesitancy as an indication of gaps in parental knowledge or refusal to allow immunisation is an increasing concern worldwide. A systematic review of children who are undervaccinated identified the reasons for undervaccination as insufficiencies in the immunisation system (44% of children), parental attitudes and knowledge (28%), family characteristics (21%), and communication and information (7%). The failure of the immunisation system was characterised by issues that are familiar to many struggling public health systems in the developing world, including distance to services, missed opportunities (ie, children not being vaccinated when they are seen at health centres), low knowledge among health workers, and unavailability of vaccines. Introduction of the best technology into failing health systems will have suboptimum impact.

Vaccine services have traditionally been run as vertical stand-alone programmes, and efforts for poliomyelitis eradication are encouraging these services to focus even more single-mindedly on eliminating one disease. Furthermore, there are demands for vaccination services to become closely integrated within comprehensive primary-care services, so that missed opportunities for vaccination are reduced, and immunisation services can be used as a springboard for other interventions. The bottom line for many poor countries is that public health services are struggling to deliver good-quality services across the board, and, to achieve the MDGs, the strengthening of health services probably needs the most attention.

The challenge of ensuring progress in those who stand to gain most from advances in vaccinology over the next decade needs a sea change in the way that vaccine advocacy is considered. If lessons are taken from HIV activism, it was international grassroots pressure that created the demand for global access to
antiretroviral drugs. Why then can a social movement not be created in support of vaccines? Admittedly, the appeal of vaccine-preventable diseases is different. In the developed world, because the diseases have largely been eliminated or greatly reduced, children are being immunised against an unseen threat. In the developing world, death from common childhood illnesses is commonplace and is regarded as part of the condition of poverty. Perhaps the voice of poor nations can be mobilised to demand vaccines as part of a broader call for global health equity. The 2009 experiences with the H1N1 influenza vaccine showed that, in a threatening pandemic, the developed world had access to vaccines but poor countries received too few vaccines that arrived too late to have made an impact should the pandemic have evolved. These experiences lead to the final question about who is responsible for global decision making for vaccine policy, strategy, and financing.

Although WHO is the main global health structure with international legitimacy, it has been criticised for a reluctance to influence crucial global health issues. The nature of vaccine-preventable diseases makes immunisation both an important global health issue and a matter of equity; therefore, immunisation must be a priority for action and financing by WHO. However, one agency alone cannot influence the complexities of immunisation. There must be dialogue with various stakeholders, including civil society, governments, the private sector, and donor agencies. Only with this dialogue could the partnership envisaged in the Decade of Vaccines become a powerful force seeking newer and bolder actions than before, in the knowledge that the value of a life is equal worldwide.

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