A call to action for the new decade of vaccines

No medical intervention has such an unambiguous track record of preventing morbidity and mortality from infectious diseases than that of vaccines. The type of vaccine-preventable diseases ranges from the acute (eg, measles or meningitis) to the chronic (eg, liver and cervical cancers). Further reduction of deaths and disability from infections remains a major challenge. Few would deny that there is a moral imperative to make vaccines widely available on an equitable basis, but governments are frustratingly slow to grasp a different and compelling argument: vaccines create wealth.

This tenet is especially true for the poorest countries, where infectious diseases account for almost half of all deaths. About 90% of these deaths are caused by six infection-related diseases: diarrhoeal and respiratory diseases of children, AIDS, tuberculosis, malaria, and measles. But encouraging progress has been made; the availability of rotavirus vaccines against one of the major causes of childhood diarrhoea has great potential. Pneumonia is the leading cause of child death, and glycoconjugate vaccines against pneumococcal pneumonia—the cause of more than a third of all pneumonia deaths in infants—are now reaching children in the poorest countries. A highly effective vaccine has substantially affected the burden from measles, although it does not provide protection among infants aged 4–9 months; however, research efforts towards an inhalable measles vaccine might provide protection for this vulnerable group. It is also hoped that a malaria vaccine will be licensed within the next 3 years or so.

One powerful and encouraging mechanism to realise the transformative contributions of immunisation to global health and strengthened economic development is through efficient global partnerships. The effectiveness of global partnerships has encouraging precedents. For example, an estimated 2·7 million deaths per year were attributable to smallpox in 1967, but this disease has now been eradicated. Although many challenges remain, the future eradication of poliomyelitis will contribute substantially to human wellbeing and productivity, and would free up resources to be devoted to other vaccine-preventable diseases. A notably successful partnership is that of the GAVI Alliance, which has provided sufficient vaccine to save an estimated 5 million lives in developing countries.

This is the good news, but GAVI is compromised by a shortfall of funds to distribute vaccines for which it has made a commitment, let alone those that it has earmarked for the future. Although resources have been allocated (most recently US$100 million) to roll out a glycoconjugate vaccine against meningococcus A (MenAfriVac), at a cost of less than $0·50 per dose, this is still far less than the $370 million costed to implement the vaccine in all areas where it could be effective. Clearly, to deliver improved and new vaccines, there is a funding shortfall of many billions of dollars. But there is also a need not only for alternative mechanisms of funding that are more sustainable, but perhaps also for countries to become more self-reliant so that GAVI’s funds can go further. Further, clinical trials of much needed improved vaccines, such as those for tuberculosis, are not moving ahead as rapidly as they should. One reason is that although improved technology has resulted in more efficient and safer vaccines, they are more complex to investigate in the field. Science has made the advances necessary for these and other important future vaccines—eg, against infections caused by Leishmania spp, respiratory syncytial virus, dengue, shigella, and Salmonella enterica serovar Typhi—to enter clinical trials, but only if substantial funding can be made available. This call to action (panel) comes at a crucial time. In some communities, recent declines in vaccine uptake provide a stark reminder that public confidence and trust in immunisations is fragile and requires attention.

Our call to action for the new decade of vaccines embraces four key elements. First, we need to find the requisite funds for the research and development of about 20 improved or novel vaccines in the next decade and beyond. Most important are vaccines for tuberculosis, AIDS, and malaria, but several tropical diseases are inexcusably neglected, including leprosy, trachoma,
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onchocerciasis, lymphatic filariasis, leishmaniasis, and common helminthic infections such as hookworm. We must also consider vaccines beyond classic infections, such as insulin-dependent diabetes, cancers, and degenerative diseases. The world is at last taking the issue of immunisation in the poorest countries more seriously, but research is needed to adapt existing vaccines for developing-country use and to create technologies that would allow needle-free immunisation, or to provide greater thermostability to licensed vaccines for rotavirus and other childhood infections. We need research that will facilitate vaccine distribution through appropriate low-cost combinations and newer adjuvants—eg, those that are dose sparing or able to reduce the number of immunisation visits. A strong argument can be made too for research aimed at adaptation of regulatory frameworks to allow vaccines to be more rapidly and widely introduced without compromise to safety. Such research should particularly take into account that licensing procedures in wealthy countries are based on principles that are appropriate for populations who have low risks of serious infection and no tolerance of adverse events, but that might be inappropriate in other epidemiological settings. Research is also needed to identify biomarkers and surrogate endpoints to facilitate earlier approval of products, complemented by phase 4 post-implementation trials, to verify the links between chosen endpoints and clinical effect. For example, the US Food and Drug Administration has a programme for accelerated vaccine approval based on surrogate endpoints. But careful attention should be paid to ensure that regulatory processes do not create unnecessary, costly obstacles to vaccine development.

Second, advocacy is needed to mobilise political will for financing of vaccines. Vaccine advocacy has a distinguished record. From the leadership of UNICEF in the 1980s, to the creation of GAVI in 2000, vaccines have occupied a special position on health’s political agenda. Nevertheless, advocacy initiatives have been inconsistent, leading to a loss of momentum to take advantage of the many opportunities that vaccine science will present in the next decade.

The task for advocates is difficult. Sometimes advocacy can overreach itself, as might have been the case with HIV and malaria vaccines, leading to unfulfilled hopes that can create conditions for a loss of public confidence in scientific and public health institutions and messages. In the early years of research into HIV vaccines, for example, too many international AIDS vaccine initiatives claimed that a vaccine would be available in just a few years. But the fact that an effective vaccine against AIDS still remains an elusive goal now surely casts doubt on the wisdom of these advocacy messages, even though they were well intentioned. Advocates who made claims for simplistic technological solutions may have contributed to a lack of interest and research into programmes for AIDS prevention.

A way forward is for advocacy campaigns to draw on research evidence from related specialties to inform their strategies and messages. One specialty that might be worth comparison with vaccines is that of newborn health, in which investigation of neonatal survival has succeeded in becoming an issue commanding global interest and political commitment. Four factors were crucial: stakeholder power, ideas, issue characteristics, and political contexts.

Stakeholder power means coordinated networks of individuals and groups aligned behind the initiative in question, with a clear guiding institution to lead the advocacy. For vaccines, there are many such stakeholders. Whether across the UN, civil society, the private sector, academia, or philanthropy, these networks remain disconnected with no obvious guiding body. The time-bound Decade of Vaccines collaboration—an initiative involving WHO, UNICEF, the US National Institute of Allergy and Infectious Diseases, and the Bill & Melinda Gates Foundation—could provide short-term leadership. But, as yet, there is no sustainable mechanism to bring together stakeholders in vaccine science, public health, and advocacy.

Any successful movement in global health needs a defining idea around which to mobilise. For vaccines, the idea is simple: vaccines save lives, prevent suffering, and create wealth. For example, if the GAVI Alliance was fully funded (with an additional $3·7 billion), 4 million lives could be saved between now and 2015, through immunisation programmes that reach more than 240 million children worldwide. To achieve this funding, the issue must have two characteristics. First, it should represent a severe problem. Vaccine-preventable disease as a contributor to mortality in children younger than 5 years is certainly a severe public health burden. Second, that problem must be tractable: we must be able to do something about
it. Vaccines provide an almost perfect example of an intervention that we know will work to prevent unnecessary deaths and economic losses.

Finally, there must be the right political context, which means that other stakeholders need to make vaccines their priority, and there needs to be a policy window to create opportunities for action. For vaccines, political stakeholders are stepping forward—notably, the Norwegian and UK Governments, which are willing to lead nations in making substantial new commitments to vaccine supply. And a window now exists, with new possibilities for financing and advocacy (the GAVI Alliance pledging conference takes place on June 13, 2011, in London; and the Decade of Vaccines collaboration, established in December, 2010, will continue until mid-2012).

By balancing compelling but responsible advocacy for vaccines with a more strategic approach to transmitting and amplifying messages about those vaccines, the next 5 years offer prospects for unprecedented reinvigoration of public commitment to immunisation.

Third, developing countries and local communities need to increase their ownership of immunisation programmes. In view of the rich array of vaccines that have recently been licensed or are in development, donor funds alone are unlikely to meet the total cost of deploying them all. The GAVI Alliance favours copayments from affected countries, although at times these have been only small amounts. Most developing countries accord too low a priority to health in their budgets. They must be persuaded to take more of the burden themselves on behalf of their poorer citizens. Ultimately, expansion and sustainment of access to the benefits of immunisation requires ownership of the programme by developing-country governments and the communities that they serve.

Too often, immunisation programmes are driven by external forces, and national input to key decisions is either limited to a few voices or comes too late in the process. Improvement in country autonomy in decision making for vaccines requires strengthening of country institutions and their capacities, and alignment of incentives to promote autonomy in the long term, even when it might be inconsistent with achieving short-term goals. The increasing number of countries that are establishing their own vaccine policy committees (known as national immunisation technical advisory groups) is an important step in building institutional capacity for local decision making, and one that will permit them to better assess and adapt or reject evidence-based policy recommendations from other national and international sources.

Increasing recognition of global health as a human right strengthens the need for increasing country ownership of their programmes. Immunisation, with its proven cost-effectiveness, would be an excellent place to begin. Many low-income countries might not be able to finance their entire immunisation programme fully in the short term from domestic sources. However, many of these countries can finance more than they now do and take steps to make their small domestic financing commitments more stable. For example, addition of a line item for immunisations to the national budget is a policy action that would make immunisation funding more predictable and stable than it is at present.

Equally importantly, many low-income countries are now becoming lower-middle-income countries with more national budget available to them. In these transitions, health budgets must increase to reasonable amounts, with a commensurate increase in domestic financing for their immunisation programmes. Through the building of institutional capacities for decision making, a concerted effort to turn political will into supportive legislation, and economic growth, developing countries are poised to take an increasing ownership of their immunisation programmes over the next 10 years.

Fourth, the benefits of vaccines must be measured and communicated. Establishment of effective communication that bolsters advocacy and sets up a solid platform for trust and confidence in vaccines is a challenge. The global scenario of immunisation in the next decade is changing and dynamic, as a result of the interplay of several factors. Among these factors, we can identify that the underpinning science and technology have resulted in much safer vaccines and more effective protective immunity. But improved safety and effectiveness also mean higher production costs and more complex vaccines. Further, improved delivery of vaccines has been achieved through combination of antigens that can be delivered in one, not several, injections, but which are complex formulations. Immunisation programmes are already, and will be increasingly, tailored to reflect differences
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development, and supporting clinical investigation will make unprecedented demands on our scientific ingenuity and a greater imperative to communicate these sophisticated concepts to governments, health professionals, and the public.

The challenge is that between development of a vaccine and its public consumption there is a so-called black box within which a multiplicity and heterogeneity of human factors must be negotiated to realise the public health gains of immunisation. If trust and confidence in vaccines is not secure, our efforts to advocate increased resources to make possible the necessary research, development, and supporting clinical investigation will be a bridge too far. Clearly we do not have answers to many basic questions. What is needed? What motivates people to be immunised? What deters them? Undoubtedly, fundamental questions such as these need to be given more prominence. We need to listen more. However, we have the knowledge base, expertise, and methodology with which to investigate what needs to be done to increase public trust and confidence in immunisation. We must not hesitate to use the skills and innovations of those who have a track record of success in communication—eg, in marketing consumer products or boosting television audiences. As with these examples, when sales and viewing rates measure success or failure, there is a tractable arbiter with which to test whether or not new communication strategies work because we have excellent measurements of immunisation uptake. There is a way forward and we need to grasp the opportunity.

*E Richard Moxon, Pamela Das, Brian Greenwood, David L Heymann, Richard Horton, Orin S Levine, Stanley Plotkin, Gus Nossal

University of Oxford Department of Paediatrics, John Radcliffe Hospital, Oxford OX3 9DU, UK (ERM); The Lancet, London, UK (PD, RH); London School of Hygiene and Tropical Medicine, London, UK (BG, DLH); Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA (OSL); University of Pennsylvania, Philadelphia, PA, USA (SP); and Department of Pathology, University of Melbourne, Australia (GN)

richard.moxon@paediatrics.ox.ac.uk

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