A prescription for drug delivery

Improvements in basic infrastructure are the key to saving millions of lives each year, say **Julian Lob-Levyt** and his colleagues.

One-quarter of all child deaths result from diseases that could be prevented by vaccination. But the introduction of new and underused vaccines into the world's poorest countries is hampered by inadequate infrastructure and a lack of guaranteed finance.

In wealthy countries, it is taken for granted that research and development of new vaccines and other medicines is the first step towards the manufacture of effective products and their distribution through carefully regulated channels. But this process breaks down in the poorest countries. There is a lack of investment in research and development in these regions because the pharmaceutical industry perceives that the market for new drugs is limited or non-existent. Also, the basic infrastructure required for distribution — from human resources to diagnostic tools — is badly in need of strengthening.

> "The health gains made in Europe in the past 150 years could be achieved in Africa within the next 10 to 20 years."

If a country is to capitalize on the benefits of new advances in the fight against infectious disease, then it needs to deliver basic services to all those in need, including those living in hard-to-reach areas. The ability to do this depends on tight budgets and the relative affordability of products and services: tough choices must be made in the allocation of scarce resources.

Ethiopia, one of Africa's poorest nations, is an example of a country where the weak infrastructure for health-care delivery is a major impediment to providing basic medical services. As Ethiopia's health minister, Tedros Ghebreyesus, has said, "Our vehicle has not been strong enough to carry all the programmes we have loaded on it. Now we are working to strengthen the vehicle so that it can carry our programmes, the vaccines and the other health-care interventions, to every corner of this vast country."

To address the challenges posed by weak infrastructure and to accelerate access to new and underused vaccines in about 70 of the world's poorest countries, including Ethiopia, the GAVI Alliance was launched in 2000. GAVI brings together the main public- and private-sector stakeholders in vaccination, including national governments, philanthropic organizations, the vaccine industry and international bodies.

The alliance provides financial support for vaccination against hepatitis B and *Haemophilus influenzae* type b (Hib) to countries that show more than 50% coverage with the vaccine DTP3 (used worldwide to protect against diphtheria, tetanus and whooping cough). Countries falling short of this threshold are not eligible for funding to roll out these additional vaccines but are instead eligible to apply for support to strengthen their current vaccination schemes. GAVI's financial support is tied to indicators of performance, and success is rewarded.

Unlike the traditional approach to financing health systems, in which priorities are set externally and/or tied to the purchase of specified products and services, GAVI provides support that is not earmarked. This allows countries to assign their own priorities to funds. In general, countries supported by this scheme focus on training, management and improving infrastructure.

This type of funding has resulted in swift changes. Fifteen million additional children have been vaccinated in the seven years since GAVI's launch. In eligible countries, the overall coverage of vaccination with DTP3 increased from 63% in 1999 to 71% in 2005 (see graphic, right). The figures are particularly impressive in the African region — DTP3 coverage increased from 44% in 1999 to 65% in 2005.

Much of this increase in DTP3 coverage can be attributed to the immunization services support provided by GAVI to improve vaccine delivery (C. Lu *et al. Lancet* **68,** 1088–1095; 2006).

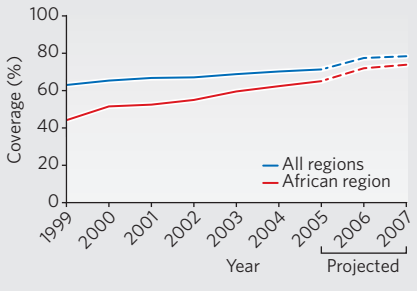
The African-led success story defies common misperceptions of poor performance in Africa. Marked increases in the uptake of vaccines against hepatitis B and, more recently, Hib have also occurred (see graphic, opposite).

C. NESBITT/GAVI

Weaknesses in the vehicle

With results such as these, the potential impact of strengthening infrastructure on a much larger scale is evident. Under similar circumstances, the poorest countries could probably effect similar changes in other medical areas — making the health-related Millennium Development Goals, set by the United Nations, potentially achievable. But, despite an increase in financial commitments as donors recognize the large sums required, the

DTP3 VACCINE COVERAGE IN COUNTRIES ELIGIBLE FOR GAVI SUPPORT



GAVI ALLIANCE PROGRESS REPORT 2006

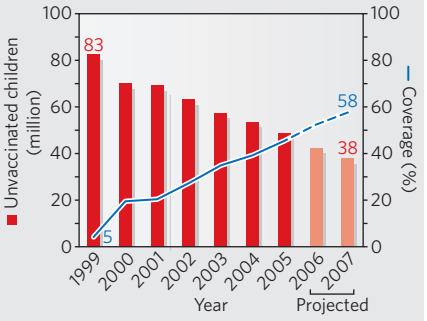
Better coverage: Nigerian women receive free bednets when their children have been fully vaccinated.

disbursement of funds to the poorest countries still needs to be scaled up, and there is a tendency among donors to focus on disease-specific issues at the expense of broader reinforcement of health systems. This means that long-term planning by health ministers in the poorest countries to 'strengthen the vehicle' remains a major challenge.

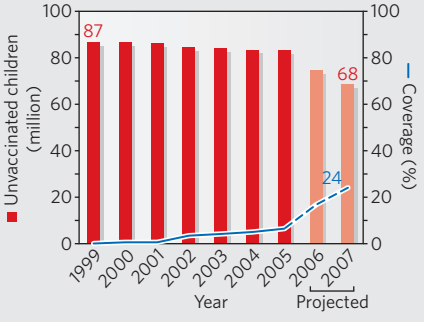
Although increasing funds are flowing through partnerships such as GAVI and the Global Fund to Fight AIDS, Tuberculosis and Malaria, these organizations still face crucial constraints. An important issue is the acute shortage of staff, particularly in sub-Saharan Africa. Even where staff are available, they can lack appropriate skills, or their skills are in demand elsewhere. So recruitment, training and retention pose a challenge.

There are also shortages of drugs and vaccines where they are needed. Infrastructure, logistics and management systems are inadequate to meet the scale of need and might not even extend to the communities they are meant to serve. Because of cultural or financial reasons or poor quality, the services might not meet demand or indeed be accessible or accountable to the poor and marginalized (see page 160). Governments often rely too much on delivery by the public sector.

HEPATITIS B VACCINE COVERAGE IN GAVI-ELIGIBLE COUNTRIES



HIB VACCINE COVERAGE IN GAVI-ELIGIBLE COUNTRIES



Such constraints are not new. But the considerable increase in funding through global health partnerships, the high profile of these partnerships and their need to be accountable in terms of results means that these constraints must be confronted anew and that more radical solutions must be considered. The international community has been successful in mobilizing financial and political support for HIV/AIDS prevention and treatment, and for vaccines for children. It has been less effective, however, at uniting around a vision and strategy to tackle the more fundamental challenge — the building of an integrated delivery platform across the public, private and civil-society sectors in the poorest parts of the world.

A mother cannot afford to go six times in a week, often to different places, to access separate services to immunize her child, treat her son's asthma, ensure she has antiretroviral drugs for her husband, collect an insecticide-treated bednet, receive family-planning advice and discuss whether her daughter should receive a vaccine against cervical cancer. Yet this scenario will remain the reality for millions of women in the absence of rational and functional health-care provision.

Financing the vehicle

GAVI has responded by creating a stream of finance so that health systems can overcome such practical difficulties. Alone, this finance is not enough. But if it is used in conjunction with other donations, and if countries form partnerships around a joint, agreed strategy, then financial donors might change their behaviour. Frankly, it is not complicated. Capacity building and additional funds will be required. Above all, political leadership — both nationally and globally — and agreement on a coordinated and sustained effort are vital. The goal is to deliver better health to women, children and other vulnerable groups.

GAVI has developed other mechanisms to overcome some of the present limitations of direct bilateral aid. The International Finance Facility for Immunisation (IFFIm), launched

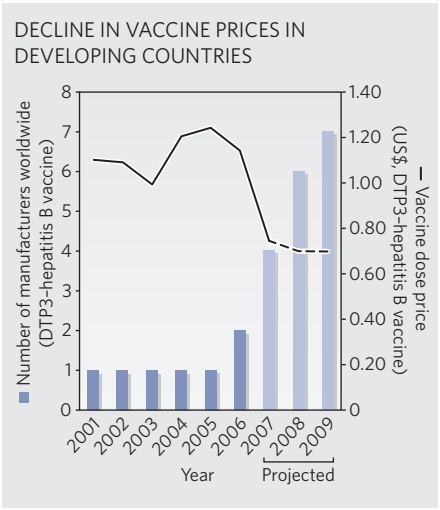
GAVI ALLIANCE PROGRESS REPORT 2006

E. PURNOMO/GAVI

If it weren't for infrastructure improvements in Indonesia, this baby might have missed out on a life-saving vaccine.

in 2006 by GAVI and supported by the governments of Brazil, France, Italy, Norway, South Africa, Spain, Sweden and the United Kingdom, has led the way in doing development business differently. IFFIm takes long-term (20-year), legally binding commitments from donors and borrows against them in the capital markets, producing upfront finance. This means that governments can make long-term plans for strengthening their health systems based on a predictable flow of funds. An anticipated IFFIm investment of US$4 billion is expected to prevent 5 million child deaths between 2006 and 2015, and more than 5 million adult deaths from liver disease associated with hepatitis B. The IFFIm is a win–win model — a financial instrument that saves lives while producing a high return on investment.

Other innovative financial measures are necessary to bridge the breakdown in the road from development to delivery. For example, vaccines that would prevent millions of deaths face long delays before they are developed, tested and produced for use in the poorest developing countries. Advance market commitments (AMCs) have recently been launched to tackle this market failure. These are financial commitments to subsidize the future purchase of a vaccine, up to a pre-agreed price, provided that an appropriate vaccine is developed and that there is still a demand when it is produced. By guaranteeing that the funds will be available to purchase vaccines once they are developed and produced, the AMC mimics a secure vaccine market and takes away the risk that countries might not be able to afford a high-priority vaccine (see page 176). In addition, vaccine prices decline as demand is generated and new manufacturers enter the market (see graphic, left).



GAVI ALLIANCE PROGRESS REPORT 2006

In the long term, the considerable size and growth of GAVI and the prices that it has negotiated, together with the introduction of specific market-shaping mechanisms such as AMCs, should partly address the market failure that keeps new health-related technology from the poor people who need it.

The next level

Today, the broader challenge is still to make vaccination programmes sustainable. Technologies such as vaccines and antiretroviral drugs have the potential to deliver a generational leap in achieving the Millennium Development Goals. The health gains made in Europe in the past 150 years could be achieved in Africa within the next 10 to 20 years. But without an accelerated and coordinated effort to tackle the fundamental constraint — weak infrastructure for the delivery of basic health care — the full potential of innovative strategies will not be realized.

> "Without an accelerated and coordinated effort to tackle weak infrastructure, the full potential of innovative strategies will not be realized."

In the next decade, vaccines against diseases such as pneumonia, malaria and tuberculosis, as well as infection with rotavirus or human papilloma virus, should be rolled out successfully. Ensuring that the new vaccines make it to remote villages in deprived areas must be at the centre of global health efforts. The alternative — millions more unnecessary deaths and millions more dollars lost — is unacceptable.

For the global health community, the challenge is therefore to work collectively to secure long-term political and financial support so that poor countries can develop integrated health-service delivery platforms, which are fundamental to productive nations. ■

Rebecca Affolder is head of the executive office of the GAVI Alliance, Geneva, Switzerland. Ivone Rizzo, Craig Burgess and Abdallah Bchir are senior programme officers at the GAVI Alliance. Julian Lob-Levyt is executive secretary of the GAVI Alliance, and chief executive officer and president of the GAVI fund.