

Draft Global Vaccine Action Plan

In May 2011, the Sixty-fourth World Health Assembly (WHA) noted the Decade of Vaccines (DoV) vision and called for the development of a Global Vaccine Action Plan (GVAP). This plan builds on the success of the Global Immunization Vision and Strategy (GIVS), launched in 2005 as a first-ever ten-year strategic framework to realise the potential of immunization.

Developing the GVAP has brought together multiple stakeholders involved in immunization - including governments and elected officials, health professionals, academia, manufacturers, global agencies, development partners, civil society, media and the private sector - to define collectively what the immunization community wants to achieve over the next decade. In total, the global consultation process reached over 1,100 individuals representing more than 140 countries and 290 organizations, including two special sessions to brief representatives of the Permanent Missions of the United Nations Offices at New York and Geneva, respectively.

1. Introduction

Immunization is, and should be recognised as, a core component of the human right to health and an individual, community and governmental responsibility. Vaccination prevents an estimated 2.5 million deaths each year. Protected from the threat of vaccine-preventable diseases, immunized children have the opportunity to thrive and a better chance of realising their full potential. These advantages are further increased by vaccinations in adolescence and adulthood. As part of a comprehensive package of interventions for disease prevention and control, vaccines and immunization are an essential investment in a country's - indeed, the world's - future.

Now is the time to commit to achieving immunization's full potential. The collective recognition of this opportunity has led the global health community to call for a DoV. The vision for the DoV is a world in which all individuals and communities enjoy lives free from vaccine-preventable diseases. Its mission is to extend, by 2020 and beyond, the full benefits of immunization to all people, regardless of where they are born, who they are or where they live.

The GVAP reiterates existing goals and sets new goals for the decade, identifies actions to make change happen, provides an initial estimate of resource requirements, and defines indicators to monitor and evaluate progress. Beyond the GVAP, country, regional and global stakeholders need to take responsibility for specific actions, translate the GVAP into detailed operational plans, update the GVAP and the detailed operational plans as new information becomes available, complete the development of an accountability framework for the DoV and mobilise resources to ensure the DoV vision becomes a reality. Accomplishing this will require global and national institutions to innovate and to change the way they work.

The last century was in many respects the century of treatment, resulting in dramatic reductions in morbidity and mortality, with the discovery and use of antibiotics as one of the biggest game changers in health. This promises to be the century of vaccines with the potential to eradicate, eliminate or control a number of serious, life-threatening or debilitating infectious diseases and with immunization at the core of preventive strategies. Ensuring that the DoV vision becomes a reality is a powerful step in that direction.

2. The immunization landscape today

Significant progress has been made in the last decade

In the last ten years, great advances have been made in developing and introducing new vaccines and expanding the reach of immunization programmes. More people are being reached than ever before and access and use of vaccines by age groups other than infants is expanding. As a result of immunization combined with other healthcare and development interventions, including improved access to clean water and sanitation, better hygiene and education, the number of children under five years of age who die annually fell from an estimated 9.6 million in 2000 to 7.6 million in 2010, despite an increase in the number of children born each year.

Immunization has helped drive this reduction in child mortality through expanded coverage of vaccines that have been in use since the inception of the Expanded Programme on Immunization (EPI) as well as through the introduction of new vaccines. Hepatitis B and *Haemophilus influenzae* type b (Hib) vaccines have become part of national immunization schedules in 179 and 173 countries, respectively, polio is nearing eradication, and a large number of deaths due to measles are being averted every year. Deaths caused by traditional vaccine-preventable diseases (diphtheria, tetanus, pertussis, polio, measles) have fallen from an estimated 1.4 million in 2000 to 0.4 million in 2008.

New and increasingly sophisticated vaccines that have become available in the last decade, including the pneumococcal conjugate vaccine, the rotavirus vaccine and the human papillomavirus (HPV) vaccine, are currently being rolled out globally. Efforts are being made to shorten the time lag that has historically existed in the introduction of new vaccines between high- and low-income countries. For example, the 13-valent pneumococcal vaccine was introduced in a low-income country a little more than a year after it had been introduced in a high-income country.

Through an innovative international collaboration, an affordable conjugate vaccine against *Neisseria meningitidis* serogroup A was developed and is now in use in the meningitis belt of Africa. There are now licensed vaccines being used to prevent, or contribute to the prevention and control of 25 vaccine-preventable infections (Table 1).

Table 1: Vaccine-preventable infectious agents or diseases

<ul style="list-style-type: none">• Anthrax• Cholera• Diphtheria• Hepatitis A• Hepatitis B• Hepatitis E• <i>Haemophilus influenzae</i> type b• Human papillomavirus• Japanese encephalitis	<ul style="list-style-type: none">• Measles• Meningococcal disease• Mumps• Pertussis• Pneumococcal disease• Poliomyelitis• Rabies• Rotavirus gastroenteritis	<ul style="list-style-type: none">• Rubella• Influenza• Tetanus• Tuberculosis• Typhoid fever• Tick-borne encephalitis• Varicella and herpes zoster (shingles)• Yellow fever
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Rising immunization coverage rates have resulted from countries strengthening their programmes, with improved support by and coordination among local, national, regional and international stakeholders. Financing from domestic budgets allocated to immunization programmes has risen over the past decade, as has the flow of international resources dedicated to immunization. According to the 2010 World Health Organization (WHO) immunization programme data, 154 of the 193 WHO Member States report having a specific budget line item for immunization and 147 have developed multiyear national plans to sustain the gains achieved, further enhance performance to reach desired goals and introduce appropriate new vaccines.

Global and regional immunization initiatives have supported countries in building up their systems and introducing new vaccines. Global goals and milestones established through the GIVS, the United Nations (UN) Millennium Declaration, the UN World Summit and General Assembly Special Sessions on Children and more recently, the UN Global Strategy for Women's and Children's Health have stimulated expansion of national immunization programmes. In low- and middle-income countries these have been supported by initiatives such as the GAVI Alliance, the Polio Eradication Initiative, the Measles Initiative, the vaccine procurement services of UNICEF and the Pan American Health Organization (PAHO) Revolving Fund.

And yet, there are significant unmet needs

Despite this great progress, vaccine-preventable diseases remain a major cause of morbidity and mortality. Adoption of new vaccines by low- and middle-income countries (where disease burdens are often the highest) has been slower than in high-income countries. In 2010, for example, only 13% of the total high-income country birth cohort lived in countries that did not have pneumococcal conjugate vaccines in their immunization schedules. Of the total low-income country birth cohort, 98% lived in countries that did not have pneumococcal conjugate vaccines in their schedules.

Coverage gaps persist between countries, as well as within countries. The average coverage of the DTP-containing and measles vaccines in low-income countries was 16 and 15% below that of high-income countries in 2010, respectively. However, this represents a positive trend in comparison with the coverage gap of 30% for both DTP-containing and measles vaccines in the year 2000.

In some countries, coverage of measles vaccine in rural areas is 33% lower than in urban areas. Similarly, the measles vaccine coverage rate for the richest fifth of the population in some countries is up to 58% higher than for the poorest fifth. Coverage can also be very low in settlements of the urban poor, especially in cities with transitory migrant populations, and in indigenous communities.

Low coverage does not always correlate with geographic distance from health centres; inequities are also associated other socio-economic determinants, such as income levels and educational status of the mother. A special geographic focus is needed on lower-middle-income countries with large populations, where the majority of the unvaccinated live. Reaching underserved populations will be especially challenging, but inequities need to be addressed because these populations often carry a heavier disease burden, may lack access to medical care and basic services and have severe disease-related impact on their fragile economies.

This decade will bring new opportunities and challenges

Individuals and communities, governments and health professionals have the primary responsibility to exploit the opportunities and confront the challenges that this decade will bring. New and improved vaccines are expected to become available during this decade, based on the robust pipeline that includes several vaccines for diseases that are not currently preventable through vaccination. The introduction of new vaccines targeted against several important causes of major killer diseases such as pneumonia, diarrhoea and cervical cancer can be used as a catalyst to scale up complementary interventions. Beyond the mortality gains, these new vaccines will prevent morbidity with resulting economic returns even in countries that have already succeeded in reducing mortality. Innovations in existing vaccines will bring additional benefits such as greater effectiveness, thermostability, easier administration and lower cost.

At the same time, the development of vaccines and other immunization innovations is facing increasingly complex manufacturing and regulatory processes, as well as rising costs of research, development and production. As new vaccines (for example, for dengue and malaria) become available and underutilised vaccines (for example, those against HPV, cholera, typhoid, rotavirus, rabies and rubella) are administered more widely, already burdened supply and logistics systems will face an even greater need for innovations. Finally, the number of health workers as well as their knowledge and skills will need to

be enhanced, better coordinated and better supervised. While the challenges are many, the introduction of new vaccines also represents an opportunity to strengthen immunization systems and to act as a catalyst to implement many of the required reforms. As national immunization investments increase, so must government oversight and accountability.

Immunization funding needs for research and development, procurement and delivery are expected to more than double in the coming decade. New and more complex vaccines will bring new funding requirements and countries will confront difficult decisions in dealing with competing health priorities. Resources will need to be allocated more efficiently and guided by national priorities, capacity, clear information on the costs and benefits of choices and improved financial management. Expenditures must be linked to outputs and impacts, showing a clear investment case for immunization.

As the economies of many low- and middle-income countries continue to grow, so will their potential to fund immunization. Countries that have relied on development assistance will be able to fund an increasing proportion of their immunization programmes and eventually could be able to fully sustain them. Some will be able to extend new financial and technical support to global immunization projects. At the same time, vaccine manufacturers in some of these countries are expected to make an even more significant contribution to the supply of high-quality, affordable vaccines, spreading the sources of production more widely and increasing competition.

The growing availability of information, penetration of mobile phone coverage and social networks can boost public demand for immunization, and ensure that people are made aware of both the benefits derived from vaccines and their potential risks. The immunization community can take advantage of social networks and electronic media to more effectively allay fears, increase awareness and build trust.

The lessons learned from past decades, the unmet needs, and the opportunities and challenges that this decade presents have been carefully considered in the formulation of the guiding principles, measures of success and recommended actions articulated in the following sections.

3. Guiding principles

Six principles have guided the GVAP elaboration:

- **Country ownership:** Countries have primary ownership and responsibility for establishing good governance and for providing effective and quality immunization services for all.
- **Shared responsibility and partnership:** Immunization against vaccine-preventable diseases is an individual, community and governmental responsibility that transcends borders and sectors.
- **Equity:** Equitable access to immunization is a core component of the right to health.
- **Integration:** Strong immunization systems, as part of broader health systems and closely coordinated with other primary health care delivery programmes, are essential for achieving immunization goals.
- **Sustainability:** Informed decisions and implementation strategies, appropriate levels of financial investments, and improved financial management and oversight are critical to ensure the sustainability of immunization programmes.
- **Innovation:** The full potential of immunization can be realised only through learning, continuous improvement and innovation in research and development, as well as innovation and quality improvement across all aspects of immunization.

These six fundamental principles can realistically and effectively guide the full spectrum of immunization activities throughout the DoV. Although the GVAP will need to be translated into specific regional, country and community contexts, these guiding principles are universally applicable and relevant to each of the DoV goals and Strategic Objectives that are described below.

4. Measures of success

The Decade of Vaccines is about taking action to achieve ambitious goals. Early in the decade, this means achieving already established elimination and eradication goals. It means addressing the public health emergency to secure a world free of polio. It means assuring the global or regional elimination of measles, rubella and neonatal tetanusⁱ. Finishing this agenda has never been more critical. Success will encourage the achievement of additional ambitious goals. Failure will mean millions of preventable cases of disease and death will continue to occur.

Decade of Vaccines Goals

Achieve a world free of polio
Meet global and regional elimination targets
Meet vaccination coverage targets in every region, country and community
Develop and introduce new and improved vaccines and technologies
Exceed the MDG 4 target for reduction in child mortality

Later in the decade, success will be defined by expanding immunization services to meet vaccination coverage targets in every region, country and community. In 2015, coverage of target populations should reach the GIVS goal of at least 90% national vaccination coverage and at least 80% vaccination coverage in every district or equivalent administrative unit for DTP-containing vaccines. By 2020, coverage of target populations should reach these levels for all vaccines in national immunization programmes, unless alternate targets exist. Vaccine introductions should also be monitored, with the goal of at least 80 low- or middle-income countries introducing one or more appropriate new or underutilized vaccines by 2015. These technical accomplishments will not be sustained unless countries take full ownership of their routine immunization programmes (see Strategic Objective 1 below).

During this decade millions of additional deaths and cases of disease should become preventable due to the development, licensure and introduction of new and improved vaccines and technologies for high burden diseases. Specifically, progress should be tracked towards the licensure and launch of vaccines against one or more major diseases not currently vaccine preventable (such as dengue, hepatitis C, cytomegalovirus, respiratory syncytial virus, leishmaniasis, hookworm and group A streptococcus) and at least one new platform delivery technology.

If these immunization-specific goals are achieved, hundreds of millions of cases and millions of future deaths will be averted by the end of the decade, billions of dollars of productivity will be gained, and immunization will contribute to exceeding the Millennium Development Goal (MDG) 4 target (and the target that succeeds it post-2015) for reduction in child mortality. For example, it is estimated that if the coverage targets for introduction and/or sustained use of 10 vaccines alone (measles, rubella, yellow fever, Japanese encephalitis, hepatitis B, Hib, HPV, meningococcus A, pneumococcus, and rotavirus) in 94 countries during the decade are met, a total of 24-26 million future deaths could be averted as compared to a hypothetical scenario under which these vaccines have zero coverage (see also Section 6).

ⁱ By 2015, achieve maternal and neonatal tetanus elimination (defined as less than 1 case of neonatal tetanus per 1000 live births) in every district, measles elimination in at least 4 WHO regions and rubella elimination in at least two WHO regions. By 2020, achieve measles and rubella elimination in at least 5 WHO regions.

Continuous progress towards six Strategic Objectives will enable the achievement of the DoV goals:

1. **All countries commit to immunization as a priority.** Key indicators to monitor progress towards this Strategic Objective at the country level are the presence of a legal framework or legislation that guarantees immunization financing and the presence of an independent technical advisory group that meets defined criteria.
2. **Individuals and communities understand the value of vaccines and demand immunization as both their right and responsibility.** Progress towards increased understanding and demand can be evaluated by monitoring the level of public trust in immunization, measured by surveys on knowledge, attitudes, beliefs and practices.ⁱⁱ
3. **The benefits of immunization are equitably extended to all people.** Progress towards greater equity can be evaluated by monitoring the percentage of districts with less than 80% coverage with 3 doses of DTP-containing vaccine and coverage gaps between lowest and highest wealth quintile (or another appropriate equity indicator).
4. **Strong immunization systems are an integral part of a well-functioning health system.** The strength of health systems can be evaluated based on dropout rates from DTP1 to measles first dose. The quality of data is important for monitoring the functioning of a health system. Data quality can be evaluated by monitoring whether immunization coverage data is assessed as high quality by WHO and UNICEF.
5. **Immunization programmes have sustainable access to predictable funding, quality supply and innovative technologies.** Key indicators to monitor progress towards this Strategic Objective will be the percentage of routine immunization costs financed through government budgets and globally installed capacity for production of universally recommended vaccines within 5 years of licensure / potential demand.
6. **Country, regional and global research & development (R&D) innovations maximize the benefits of immunization.** Key indicators of progress towards this Strategic Objective include proof of concept for a vaccine that shows greater or equal to 75% efficacy for HIV/AIDS, tuberculosis (TB), or malaria and the initiation of phase III trials for a first generation universal influenza vaccine. In addition, country R&D capacity can be measured by the institutional and technical capacity to manufacture vaccines and / or carry out related clinical trials, operational and organizational research.

Achieving the DoV vision and goals will be possible only if all stakeholders involved in immunization commit and take actions to achieve the six Strategic Objectives, uphold the DoV Guiding Principles when implementing all of the actions, and regularly monitor and evaluate progress towards both Strategic Objectives and goals using the indicators described above (see also Appendix 1).

An accountability framework is needed that defines the methodology and source of data for these indicators, identifies which stakeholders will be responsible for what actions, and articulates the process and responsibilities for monitoring and evaluating progress over the course of the decade. The GVAP lays the groundwork for each of these elements. Further development and implementation of the accountability framework at the country, regional and global levels could take place over the course of 2012, leveraging the findings of the Commission on Information and Accountability for Women's and Children's Health, and aligning wherever possible with other accountability efforts and initiatives by all stakeholders at the country level to deliver and monitor progress.

ⁱⁱ The WHO Strategic Advisory Group of Experts (SAGE) working group on vaccine hesitancy will develop a definition of vaccine hesitancy and recommend specific questions from surveys (either existing or new) to fully formulate this indicator.

5. Actions to achieve Strategic Objectives

Strategic Objective 1: All countries commit to immunization as a priority.

Committing to immunization as a priority first and foremost means recognizing the importance of immunization as a critical public health intervention and the value that immunization represents in terms of health and economic returns. Countries demonstrate a commitment to immunization by setting ambitious but attainable national targets and allocating adequate financial and human resources to programmes to achieve these targets; ensuring their national immunization plans are fully integrated into national health plans with appropriate budgets and formulated with the participation of all major stakeholders; and demonstrating good stewardship and implementation of their national health plans. Country commitment to immunization does not, however, imply that immunization programmes will be prioritized or funded at the expense of other vital health programmes.

National legislation, policies and resource allocation decisions should be informed by credible and current evidence regarding the direct and indirect impact of immunization. Much of the evidence base exists but does not reach policy-makers, as those who generate the evidence are not always those who interact with these decision-makers. Collaboration between technical experts, who generate the evidence and the champions of immunization who construct context-specific messages that highlight the importance of immunization within health and social services, can unequivocally articulate the value of immunization and how immunization supports equity and economic development.

Independent bodies such as regional or national immunization technical advisory groups (NITAGs) that can guide country policies and strategies based on local epidemiology and cost effectiveness should be established or strengthened, thus reducing dependency on external bodies for policy guidance. These bodies can readily be supported by institutions or individuals charged with collating and synthesizing information required for informed decision-making. Regional support systems and initiatives, such as the PAHO ProVac initiativeⁱⁱⁱ,¹⁴, can be expanded to support countries in strengthening their decision-making. It is important that NITAGs or their regional equivalents, engage with academia, professional societies, and other national agencies and committees such as the vaccine regulatory agencies (NRAs), national Health Sector Coordination Committees (HSCCs), and Interagency Coordination Committees (ICCs) to ensure a cohesive and coordinated approach to achieving national health priorities. Strong links among Ministries of Health, Education^{iv}, Finance, Human Resources and legislators are also essential for sustainable programme implementation.

Support and formal endorsement of national policies and plans by the highest political and administrative levels, nationally and subnationally, is considered essential to ensuring commitment and sustainability. Governments and elected officials are responsible for putting in place needed legislation and budget allocations. As immunization is a strong indicator of the overall ability of the health system to deliver needed services, legislators should be encouraged to scrutinise, defend and closely follow immunization budgets, disbursements and immunization programme activities, both at the national level as well as within their respective constituencies. Civil society organizations (CSOs) can effectively advocate for increased commitments and hold governments accountable to commitments once they are made. Immunization programmes need to have management structures in place for effective programme implementation. Officials at the national and subnational levels responsible for implementation of the immunization plans can be held accountable for programme performance when they are sufficiently empowered to provide effective leadership and have the required management and programme monitoring skills.

ⁱⁱⁱ ProVac is a package of tools for generation of cost-effectiveness, epidemiological and economic impact of new vaccines and for training and strengthening national infrastructure for decision-making.

^{iv} Especially important for delivering immunization to older children and adolescents through school health programmes and for monitoring school entry requirements with immunization.

For high and middle-income countries, commitment to immunization is all of the above, but may also include maintaining or assuming the role of development partners. Together with global agencies, development partner countries can coordinate the sharing of information and best practices among countries, help bridge temporary funding gaps, and support capacity strengthening by working with stakeholders in different country settings.

Table 2: Summary of recommended actions for Strategic Objective 1

All countries commit to immunization as a priority.	
Establish and sustain commitment to immunization.	<ul style="list-style-type: none"> • Ensure legislation or legal framework in all countries, including provisions for a budget line for immunization, and for monitoring and reporting. • Develop comprehensive national immunization plans that are part of overall national health plans through a bottom-up process including all stakeholders. • Set ambitious but attainable country-specific targets within the context of morbidity and mortality reduction goals. • Scrutinise, defend, and more closely follow immunization budgets, disbursements and immunization programme activities. • Support local civil society organizations and professional associations to contribute to national discussions of immunizations and health.
Inform and engage opinion leaders on the value of immunization.	<ul style="list-style-type: none"> • Explore models to promote collaboration between the stakeholders that generate evidence on immunization and those who use it to set priorities and formulate policies. • Develop and disseminate the evidence base on the public health value of vaccines and immunization and the added value of achieving equity in access and use of immunization. • Develop and disseminate the evidence base for the broad economic benefits of immunization for individuals, households, communities, and countries. • Include immunization in the agendas of governing body meetings at all levels and in other social, health and economic forums.
Strengthen national capacity to formulate evidence-based policies.	<ul style="list-style-type: none"> • Create or strengthen independent bodies that formulate national immunization policies (for example, NITAGs or regional technical advisory groups). • Develop more effective ways for National Regulatory Agencies (NRAs), Health Sector Coordination Committees (HSCCs), and Interagency Coordination Committees (ICCs) to support immunization programmes as part of disease control programmes and preventive health care. • Create regional forums and peer-to-peer exchange of information, best practices and tools. • Create expanded and more transparent mechanisms for aggregating, sharing, and using information to monitor commitments.

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Strategic Objective 2: Individuals and communities understand the value of vaccines and demand immunization as both their right and responsibility.

Significant improvements in coverage and programme sustainability are possible if individuals and communities understand the benefits and risks of immunization; are encouraged to seek services; are empowered to make demands on the health system; and have ownership over the planning and implementation of programmes within their local communities. While there has generally been a high demand for vaccination services, reaching hard-to-reach populations, attaining higher coverage levels, and achieving equity objectives may require additional approaches to stimulate demand for vaccination.

Generating individual, household and community demand will require using traditional platforms more effectively as well as new strategies to convey the benefits of immunization, emphasize immunization as a core component of the right to health and encourage greater use of services. New efforts could take advantage of social media and approaches used by commercial and social marketing efforts to promote immunization and address any concerns. New mobile and internet technologies should also be utilized, drawing on the experiences and successes of other innovative public health campaigns. Communications and social research to identify the barriers and drivers of vaccination should inform the development of context-specific messages. Lessons on vaccines and immunization should be included in the primary school education curriculum. Multisectoral approaches that promote efforts such as female education and empowerment will help to improve utilization of immunization and health services in general.

Where appropriate, programme strategies could also include measures to incentivize households to seek immunization services and health care providers to increase their performance in vaccinating children, particularly those that have not been reached previously. At the household level, Conditional Cash Transfer Programmes (CCTs) often include vaccination of children as a requirement for receiving household income transfers. There is evidence that CCTs may have a positive impact on immunization coverage rates, even in countries with high coverage rates, and particularly for more marginalized populations. Because CCTs are often administered in countries as part of a broad package of social protection or poverty alleviation measures, these programmes provide an opportunity to link immunization programmes and the Ministry of Health with other broader development initiatives, including those administered by other Ministries.

At the health facility level, both households and health care providers can be additionally motivated through in-kind gifts at the time of vaccination, or through performance-based financing (PBF) bonuses to providers. There is some early evidence to suggest that performance-based financing of immunization services leads to increasing numbers of children vaccinated, though more rigorous analysis of the impact of PBF on immunization is still forthcoming.

Incentivizing health care workers and households through monetary and in-kind payments has implementation challenges that need to be carefully addressed. These schemes need to respect the autonomy of beneficiaries. Here social research is also needed to determine the conditions under which incentives contribute to improved coverage and the types and levels of incentives that are appropriate for a given context. Demand generation activities must be coupled with mechanisms to ensure reliability of vaccine supply.

Some reasons for hesitancy are undoubtedly amenable to improved communications and advocacy initiatives designed to counteract growing anti-vaccination lobby groups and to increase understanding about the value of vaccines or the danger of diseases. However, others are best addressed by ensuring the quality of services. Individuals will be less hesitant to use services if they perceive the quality of those services to be acceptable. They are more likely to come to vaccination sessions when scheduled services are convenient and predictably available; when practical counselling about why, where and when to come for vaccination is offered and what to expect following vaccination; when the health workers have a welcoming attitude; when waiting times are reasonable; and when services are offered without charge. Health care workers should receive communication skills training so they can effectively communicate with the media and with local communities when there are reports of serious adverse events following immunization, in order to allay fears and address vaccine hesitancy.

Making change happen will require meaningful participation of individuals, households and communities in the development and implementation of all demand generation strategies. It will also require new and stronger community-based advocates who have the local knowledge, credibility and frontline experience necessary to drive change. Participation of in-country CSOs will be crucial to develop strong advocacy efforts and should be supported by capacity building. Here again an effort that promotes collaboration

between evidence generators and evidence users could provide training for champions and link with local social and professional networks, which are an important source of grassroots immunization champions. This will especially be required as country programmes embrace a life course approach to immunization.

Current advocates must recruit new voices – potentially including educators, religious leaders, traditional and social media personalities, family physicians, community health workers and immunization champions. Researchers and technical experts will also have an important role in creating greater community awareness and providing credible responses to misinformation regarding immunization.

Generating individual and community demand will reinforce country commitment to vaccines and immunization (Strategic Objective 1). Activities to generate demand for vaccines and immunization should build on the broader movement to help people hold their governments accountable for access to health services.

Table 3: Summary of recommended actions for Strategic Objective 2

Individuals and communities understand the value of vaccines and demand immunization as both their right and responsibility.	
Engage individuals and communities on the benefits of immunization and hear their concerns.	<ul style="list-style-type: none"> • Engage in a dialogue which both transmits information and responds to people's concerns and fears. • Utilise social media tools and lessons from commercial and social marketing efforts. • Leverage new mobile and Internet-based technologies. • Include immunization in the basic education curriculum. • Conduct communications research.
Create incentives to stimulate demand.	<ul style="list-style-type: none"> • Create incentives to households and health workers for immunization, where appropriate and while respecting the autonomy of beneficiaries (for example, cash or in-kind transfers, bundling of services, media recognition). • Conduct social research to improve the delivery of immunization services and the ability to meet the needs of diverse communities.
Build advocacy capacity.	<ul style="list-style-type: none"> • Recruit new voices, including those of educators, religious leaders, traditional and social media personalities, family physicians, community health workers, and trained immunization champions (among others). • Train healthcare workers on effective communication techniques, especially to address vaccine hesitancy and to respond to reports of serious adverse events following immunization in order to maintain trust and allay fears. • Engage, enable and support in-country CSOs to advocate to local communities and policy-makers and in local and global media regarding the value of vaccines. • Create national or regional advocacy plans that involve in-country CSOs. • Link global, national and community advocacy efforts with professional and academic networks.

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Strategic Objective 3: The benefits of immunization are equitably extended to all people.

Today, four out of every five children receive at least a basic set of vaccinations during infancy and are therefore able to lead healthier, more productive lives. Unfortunately, this means one in five children are not being reached. In this decade, the benefits of immunization should also be more equitably extended to all children, adolescents and adults. Achieving this Strategic Objective will mean that every eligible individual is immunized with all appropriate vaccines, irrespective of geographic location, age, gender, disability, educational level, socioeconomic level, ethnic group or work condition, thereby reaching underserved populations and reducing disparities in immunization both within and between countries.

Because disease burdens tend to be disproportionately concentrated in more marginalised populations, reaching more people will not only achieve a greater degree of equity, but will also achieve a greater health impact and contribute to economic development. Furthermore, disease eradication and elimination goals cannot be met without achieving and sustaining high and equitable coverage.

In 2002, WHO, UNICEF and other partners introduced the concept of Reaching Every District (RED), a first step toward achieving more equitable coverage. Through its various operational components - which include re-establishing outreach services, providing supportive supervision, engaging with communities, monitoring and use of data, district planning and resource management - the RED strategy was able to expand the provision of immunization services. Similarly, initiatives aimed at disease eradication and elimination or rapid mortality reduction have used strategies such as national or subnational immunization days (for polio eradication) and supplementary immunization activities (for measles and rubella elimination, measles mortality reduction and neonatal tetanus elimination). More recently strategies collectively referred to as periodic intensification of routine immunization (PIRI) have been used to reach the unreached with immunization, packaged together with other primary health care interventions.

Even these strategies continue to miss populations, for example those that reside outside of traditional social and governmental structures. To sustain the gains of these historical efforts and to achieve and sustain disease control goals, the RED strategic approach should be recast as "Reaching Every Community." To attain more equitable coverage, the definition of community should be expanded beyond geographically defined communities. Reaching every community will mean aiming to encompass every eligible individual, even those beyond typical government outreach.

Reaching every community will require understanding the barriers to access and use of immunization, identifying the underserved, and reviewing and revising micro-plans at the district and community levels to overcome these barriers. The rapid expansion of information technology should be leveraged to establish immunization registries and electronic databases that will allow tracking of each individual's immunization status, sending timely reminders when immunization is due and allowing the use of databases to facilitate easy access to data for informing actions. The introduction of unique identification numbers could be a catalyst for the establishment of such systems.

Drawing on the experiences of successful polio vaccination campaigns, decentralised planning and outreach should be used to reach populations that are remote, nomadic, or have been historically marginalised. New strategies for reaching the urban poor and urban migrants will also be necessary. Given the tenuous and evolving community structures, the inadequate security, and the fact that sometimes the most unifying force in these urban and peri-urban areas is a shared and deep-seated mistrust of outsiders, especially governments, new approaches to community outreach will be especially critical for reaching these groups.

Implementing strategies to reach all underserved populations will require engagement with the non-governmental sectors, including civil society organizations and private sector organizations in all aspects of immunization including advocacy, social mobilization, service delivery and monitoring programme performance. To support these collaborations, governments should allocate increased resources to underserved communities and ensure programmes have sufficient, well-trained personnel to execute strategies effectively. Partnerships across government sectors (for example, with educational institutions) and coordination with programmes that focus on vulnerable populations will be essential. In addition, efforts to provide high-quality immunization services to all children will need to continue unabated so that gains to date are not lost.

There are other dimensions of equity that merit consideration during the DoV, including disparities between countries, adolescent and adult immunization, and immunization during emergencies. Historically, it took decades before new vaccines used in high-income countries became available in low- and middle-income countries. Steps are being taken to address this inequity, including introduction of

new vaccines through the support provided by the GAVI Alliance. However, much more needs to be done to sustain and extend these gains, particularly to middle-income countries.

A "life course" approach must also be taken to make the benefits of immunization available to all at risk in every age group. As control of diseases through infant immunization is being achieved, the need to boost immunity to sustain and extend these gains is increasingly being recognized. In addition, new and existing vaccines that are beneficial for school children, adolescents and adults at special risk such as health workers, immune-compromised individuals, animal handlers, and the elderly (for example, vaccines against HPV, rabies, and influenza) are now available and being increasingly used. The success of maternal and neonatal tetanus elimination and the benefits to both women and infants of influenza vaccination during pregnancy has increased interest in exploring development of other vaccines that could be used during pregnancy (for example, group B streptococcus or respiratory syncytial virus vaccines). This will mean creating strategies for reaching individuals across their life course, and developing plans for the systems that will monitor and track progress.

Likewise, targeted plans are needed to ensure access to immunization during humanitarian crises, outbreaks and in conflict zones. These plans should include a focus on communication and also provisions for the development of vaccine stockpiles, among other things.

Social and operational research is needed to inform the design and test the effectiveness of all these delivery strategies. Key areas of focus for this research could include identifying the main causes of low coverage in particular areas and communities, assessing economic barriers to immunization, understanding the best approaches for reaching individuals of various ages, and assessing what incentives work best for reaching different groups, among others.

Table 4: Summary of recommended actions for Strategic Objective 3

The benefits of immunization are equitably extended to all people.	
Develop and implement new strategies to address inequities.	<ul style="list-style-type: none"> • Recast "Reaching Every District" to "Reaching Every Community" to address inequities within districts. • Engage underserved and marginalised groups to develop locally tailored, targeted strategies for reducing inequities. • Introduce appropriate new vaccines in national immunization programmes (see also Objective 5). • Establish a life course approach to immunization planning and implementation, including new strategies to ensure equity across the life span. • Prevent and respond to vaccine-preventable diseases during disease outbreaks, humanitarian crises, and in conflict zones.
Build knowledge base and capacity to enable equitable delivery.	<ul style="list-style-type: none"> • Track each individual's immunization status, leveraging immunization registries, electronic databases and national identification number systems. • Take advantage of community structures to enhance communication and deliver services (for example, traditional birth attendants, birth registries). • Involve CSOs in community outreach and planning. • Develop new approaches to community engagement for urban and peri-urban areas. • Train health workers and CSOs on how to engage communities, identify influential people who can assist in planning, organizing and monitoring health and immunization programmes, identify community needs and work with communities to meet those needs. • Conduct operational and social science research to identify successful strategies to reduce inequities and improve the quality and delivery of immunization services.

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Strategic Objective 4: Strong immunization systems are an integral part of a well-functioning health system.

The success of national immunization programmes to introduce new vaccines, attain quality, equity and coverage goals, and become financially sustainable depends upon a well-functioning health system. The many interconnected components of an immunization system require multi-disciplinary attention to build a cohesive, non-fragmented and well-functioning programme that coordinates and works in synergy with other primary health care programmes.

Health systems encompass a range of functions from policy and regulation to information and supply chain systems, human resources, overall programme management and financing. Health systems include both the public and private sectors, and in some countries the private sector can play a valuable role in educating households about the need for and benefits of vaccination, as well as providing health care. Some of these functions have been dealt with in other sections of this document. This section discusses the actions required to foster greater coordination between immunization and other programmes within health systems and to strengthen the information, human resources, supply chain and logistics components of health systems.

Immunization service delivery should continue to serve as a platform for providing other priority public health interventions such as vitamin A, deworming, and bednets, among others. Other priority programmes should also serve as a platform to deliver immunization. Every contact with the health sector

should be used as an opportunity to verify immunization status and provide immunization when indicated. Furthermore, as new vaccines become available that target some but not all pathogens that cause particular syndromes, such as pneumonia, diarrhoea and cervical cancer, it is important that their introduction be an opportunity to scale up the delivery of complementary interventions. For example, the vaccines against pneumococcus and rotavirus should be complemented with other actions to protect, prevent, and treat related respiratory and diarrheal diseases.

New vaccine deployment should therefore be accompanied by comprehensive disease-control plans both within countries and globally. Coordination of immunization with other services should take place at all levels of a country's programmes, involve outreach efforts and participation by health centres, and should be a part of programme management. Coordinating immunization with integrated primary healthcare programmes may also facilitate social mobilisation efforts, helping to generate community demand for services (Strategic Objective 2) and address inequity (Strategic Objective 3). Additionally, efforts should be made to ensure that global vaccine programmes focused on eradication and elimination goals (for example, polio and measles campaigns) do not operate in silos. The choice of mechanisms to promote greater interaction and coordination between different programmes should be made by countries according to their local context. The synergies and efficiencies as a result of integration and coordination will be particularly beneficial in countries with fragile health systems.

Access to timely high-quality information is critical to the functioning of immunization. Critical information includes process indicators that allow the programme to monitor its performance and take corrective action, and outcome indicators that measure the impact of the programme. Output and impact indicators need to be analysed along with expenditures in order to identify bottlenecks and best practices and in order to gauge overall programme efficiency (value for money). Immunization information systems need to be linked to the broader health information systems, but at the same time be readily accessible and meet immunization programme needs.

Monitoring of immunization coverage and dropout rates has been in place since the onset of the Expanded Programme on Immunization (EPI) to guide programme effectiveness. While the quality and timeliness of reporting of data have steadily increased over the years, administrative coverage data is still of inadequate quality in many countries. Furthermore, the use of data to take corrective action at the district and community levels is still deficient. New approaches to immunization tracking through unique identification numbers (discussed in Strategic Objective 3) can improve the quality of immunization coverage data and facilitate the development of comprehensive immunization registries. New technologies, including hand-held communication devices and mobile phones, can support this effort and facilitate data sharing. Armed with higher-quality data and new data-analysis tools, programme managers at all administrative levels can use information to improve programme performance, allocate funding appropriately, and track progress more effectively.

Disease surveillance is critical to inform decision-making on adoption of new vaccines and strategies for their use in national programmes, as well as to monitor the impact of immunization and changes in disease epidemiology, and support sustained use. Robust epidemiological data will also be crucial for understanding vaccine effectiveness and guiding priorities in the R&D community and will help identify the areas of greatest R&D need (Strategic Objective 6). Disease surveillance platforms need to be strengthened to improve the quality and sharing of information. This will include strengthening laboratory capacity for microbiological confirmation of diagnosis and for tracking the spread of disease using molecular typing techniques.

On rare occasions, adverse reactions can affect the health of vaccine recipients. More frequently, coincidental health events can follow immunization and may be wrongly attributed to vaccines. In both instances, it is extremely important to detect and promptly Analyse Serious Adverse Events Following Immunization (AEFI). To assist low- and middle-income countries in managing those important issues, WHO and its partners have developed the Global Vaccine Safety Blueprint. This strategic plan proposes

to assist low- and middle-income countries to have at least minimal capacity for vaccine safety activities; enhance capacity for vaccine safety assessment in countries that introduce newly developed vaccines, that introduce vaccines in settings with novel characteristics or that both manufacture and use prequalified vaccines; and establish a global vaccine safety support structure. Implementing the Vaccine Safety Blueprint strategies to build capacity for safety surveillance during the DoV will ensure that everyone everywhere receives the safest vaccines possible and that safety concerns are not a cause of hesitancy in using vaccines.

With the increasing complexity of immunization programmes and with ambitious new goals, it is important that more trained health workers are available to manage the increased burden of work. This includes those who manage programmes at the national and subnational level, as well as frontline workers who deliver services and interact directly with communities. Programme managers need to be equipped with the technical knowledge on vaccines and immunization as well as with management skills. Frontline health workers, who deliver not only vaccinations but also primary health care interventions and health education, need coordinated, comprehensive and very practical pre- and in-service training with updated, relevant curricula and post-training supervision. Health care workers need not only to explain why immunization is important, but also give advice to individuals and communities on nutrition, create a healthier environment and recognize the danger signs when someone falls ill. Immunization programmes should ensure that this training and supervision is effectively extended to community-based health workers. CSOs can help with training and coordination of these workers.

Health workers can only be effective if sufficient supplies (vaccines, supplements and medicines) are available when they need them. The influx of new vaccines has outstripped the capacity of the current cold chain system in many countries. Thus, supply chains and waste management systems urgently need to be expanded and made more efficient and reliable. They should be streamlined to maximize effectiveness. They should also take into account and make an effort to minimize the environmental impact of energy, materials and processes used for immunization both within countries and globally. The availability of new technologies provides the opportunity to innovate, not only to improve immunization supply chain management, but also to seek increased synergies with other sectors and supply systems for other health interventions. Another potential area of innovation relates to understanding the lessons learned from private sector practices and supply chain management. In addition, tasks that could be outsourced to private sector companies to create greater efficiency should be explored.

It will be essential to ensure that immunization supply systems are staffed with adequate numbers of competent, motivated and empowered personnel at all levels. Likewise, improvements to health information systems should also support the management of resources, helping staff ensure that adequate quantities of vaccines are always available to meet demand. Efforts to strengthen supply chains should be implemented in such a way that they benefit both immunization programmes and broader national health efforts.

Developing stronger, more efficient, comprehensive approaches to disease control and immunization will require Ministries of Health to take the lead in strengthening and coordinating immunization programmes and health systems more broadly, including engaging CSOs, academia and private practitioners. They can draw on academics to help develop and deploy new tools and approaches to service delivery. CSOs can contribute to the development of integrated programmes so they are aligned with local realities and incorporate community-based human resources. Communities can ultimately hold their governments accountable by demanding integrated services. Regional and global organizations can also help by ensuring that data and best practices are shared in and across countries and that country programmes have access to analytical tools. Development partners can provide supplemental financial resources, if needed.

Table 5: Summary of recommended actions for Strategic Objective 4

Strong immunization systems that are an integral part of a well functioning health system.	
Develop comprehensive and coordinated approaches.	<ul style="list-style-type: none"> • Ensure that global vaccine programmes focusing on eradication and elimination goals (for example, polio and measles campaigns) are incorporated into national immunization programmes and do not operate independently. • Ensure that new vaccine deployment is accompanied by comprehensive plans to control targeted diseases. • Ensure coordination between the public and private sectors for new vaccine introduction, reporting of vaccine-preventable diseases and administration of vaccines, and ensure quality of vaccination in the public and private sectors. • Consider the inclusion of vaccines (as appropriate to national priorities) to health programmes across the life course.
Strengthen monitoring and surveillance systems.	<ul style="list-style-type: none"> • Improve the quality of all immunization administrative data and promote its analysis and use at all administrative levels to improve programme performances. • Develop and promote the use of new technologies for collection, transmission and analysis of immunization data. • Further strengthen and expand disease surveillance systems to generate information for decision-making, monitoring the impact of immunization on morbidity and mortality and changes in disease epidemiology. • Ensure capacity for vaccine safety activities, including capacity to collect and interpret safety data, with enhanced capacity in countries that introduce newly developed vaccines.
Strengthen capacity of managers and frontline workers.	<ul style="list-style-type: none"> • Ensure that immunization and other primary health care programmes have adequate human resources to schedule and deliver predictable services of acceptable quality. • Increase levels of pre-service, in-service and post-service training for human resources, and develop new, relevant curricula that approach immunization as a component of comprehensive disease control. • Promote coordinated training and supervision of community-based health workers.
Strengthen infrastructure and logistics.	<ul style="list-style-type: none"> • Innovate to improve cold chain capacity and logistics, as well as waste management. • Minimize the environmental impact of energy, materials and processes used in immunization supply systems, both within countries and globally. • Staff supply systems with adequate numbers of competent, motivated and empowered personnel at all levels. • Establish information systems that help staff accurately track the available supply.

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Strategic Objective 5: Immunization programmes have sustainable access to predictable funding, quality supply and innovative technologies.

To meet the DoV goals, actions must be taken both within countries and globally to increase the total amount of available funding for immunization from both countries and development partners. Countries should ensure the financial sustainability of national immunization programmes through regular evaluation of resource needs; efficiency in service delivery; availability of adequate domestic financing; and resource mobilization from development partners to meet any funding gaps. Governments also need to explore alternative and innovative financing mechanisms for health and immunization. Some countries

have established trust funds or use dedicated tax revenues, among other strategies. In addition, it is important to move beyond budgets and into expenditures. Governments can improve vaccine access and prevent shortages in vaccines, immunization equipment or health workers by assuring that budgeted funds are disbursed in an on-going and timely fashion that responds to the programmes' needs.

While the financing of immunization services is first and foremost a core responsibility of governments, development partners should support national strategies through more predictable, longer-term financing, as well as explore the next generation of innovative financing mechanisms. Emphasis needs to be placed on mutual accountability between countries and their development partners in terms of immunization financing. One possible approach is to undertake annual resource tracking of immunization financing from partners and governments alike. For both countries and development partners, evidence-based advocacy and policy efforts should be focused on obtaining a renewed commitment to past funding pledges.

There is also a need to improve the allocation, accountability and sustainability of funding. Coordinating funding support from development partners and other external sources to target national budget priorities will ensure that funds are addressing the most pressing country needs. Funding allocation strategies should be revised periodically to confirm they are achieving goals, such as eradication and elimination of disease, as quickly and as effectively as possible. Feedback loops should be established to enhance programme sustainability, results and impact. One potential methodology to explore is a pay-for-performance funding system, understanding the need to balance the merits of this approach with the importance of ensuring the predictability of funding, the risks of creating perverse incentives, and the need for high quality data to implement such a scheme. This would include linking international, national, and local funding distribution to specific performance metrics and leveraging the resulting metrics to promote programme improvement.

Innovative pricing and procurement mechanisms are needed to alleviate funding pressure and to support the development and scale-up of new and existing vaccines. Innovations will be particularly important for those lower-middle-income countries that do not have access to the GAVI Alliance, UNICEF and PAHO pricing and procurement mechanisms. Mechanisms to explore include differential pricing using new approaches to define price tiers and pooled negotiation or procurement methods for lower-middle-income countries. Current pooled procurement models exist in both the vaccines and pharmaceuticals markets. One example is the PAHO revolving fund pooled procurement and short-term credit mechanism. This and other models could be assessed and modified to best suit the needs of the lower-middle-income countries and the individual vaccine markets.

Long-term sustainable funding will be an incentive to manufacturers, thereby improving supply security. In addition, supply-side interventions are needed. A growing proportion of affordable vaccines that are used to immunize the world's population are manufactured in middle- and lower-middle-income countries. In the coming decade, these countries will have not only a requirement to ensure the quality, safety and efficacy of vaccines used domestically, but also a growing global obligation to protect and enhance security of the global immunization enterprise. Potential supply-side interventions to ensure quality, safety and efficacy include identifying and disseminating best practices in manufacturing and quality control, investing in R&D capabilities, and initiating technology transfers and co-development agreements.

A crucial but often overlooked key driver that underpins all of these interventions is quality assurance (QA) of the vaccines. Good QA relies crucially on effective standardization, which ensures that each vaccine product can be manufactured consistently and also enables multiple manufacturers to make similar products to the same quality. Normative processes to achieve globally harmonized standards for vaccines already exist, including international biological reference materials, but action is needed to strengthen global standardization.

In addition, each country should develop the capacity to monitor and assure the safe use of vaccines, in line with the strategy defined in the WHO Global Vaccine Safety Blueprint initiative (as discussed in Strategic Objective 4). Action should also be taken to strengthen national regulatory systems and develop globally harmonized regulations to ensure the increasing demand for regulatory reviews can be managed in an effective and timely manner. This is an issue not just for low- and middle-income countries involved in technology transfer, but also for regulatory agencies in high-income countries where expertise and resources need to be maintained. These supply-side interventions need to be based on solid business cases developed by countries to ensure the impact of these significant and long-term investments.

Making change happen with respect to sustainable funding will require commitments from governments and development partners to increase resources and improve programme efficiencies, as well as from additional countries joining the development partner ranks. Likewise, sustainable supply will require the multi-sectoral involvement of governments (for example, science and technology, trade, industry and health sectors) to create an environment that helps suppliers strengthen their capabilities. Emerging economies have a particularly important role to play in both these cases, given their high rate of economic growth and the rapid expansion of the supply base there.

To increase alignment, activities currently performed by the UNICEF Supply Division and the GAVI Alliance to improve communication and coordination among countries, vaccine manufacturers and public-sector organizations should be further expanded. Countries need a forum where they can more clearly communicate expected demand for new vaccines and provide guidance on desired product profiles. This first-hand information would enable suppliers to make more informed product development and capacity planning decisions, thereby mitigating product development and supply risk. This information would also help development partners and other public-sector organizations establish more defensible and reliable strategies and support plans. This forum could further be utilised to enable suppliers to accurately communicate the possible current and future range of pricing and supply to countries and for countries to share information and experience with vaccine procurement.

Table 6: Summary of recommended actions for Strategic Objective 5

Immunization programmes have sustainable access to long-term funding and quality supply.	
Increase total amount of funding.	<ul style="list-style-type: none"> • Establish a commitment for governments to invest in immunization according to their ability to pay and the expected benefits. • Engage new potential domestic and development partners and diversify sources of funding. • Develop the next generation of innovative financing mechanisms.
Increase affordability for middle-income countries.	<ul style="list-style-type: none"> • Explore differential pricing approaches to define explicit criteria for price tiers and the current and future prices to be made available to lower middle-income and middle-income countries. • Explore pooled negotiation or procurement mechanisms for lower-middle-income and middle income countries.
Improve allocation of funding in low- and middle-income countries.	<ul style="list-style-type: none"> • Strengthen budgeting and financial management in-country to better integrate financial and health care planning and priority setting. • Coordinate funding support from development partners and other external sources. • Evaluate and improve funding support mechanisms on the basis of their effectiveness in reaching disease goals. • Base funding on transparency and objectivity in order to ensure the sustainability of programmes. • Promote the use of cost and cost-benefit arguments in fund raising, decision-making, and defence of immunization funding. • Explore pay-for-performance funding systems.
Secure quality supply.	<ul style="list-style-type: none"> • Build and support networks of regulators and suppliers to share best practices and to improve quality assurance capabilities and quality control. • Develop tools to strengthen global standardization of manufacturing and regulatory processes. • Strengthen national regulatory systems and develop globally harmonized regulations. • Ensure a forum where countries can communicate expected demand for vaccines and technologies and provide guidance to manufacturers on desired product profiles.

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Strategic Objective 6: Country, regional and global R&D innovations maximize the benefits of immunization.

In the coming decade, targeted and innovative research and development efforts are needed across discovery, development and delivery. Innovative R&D efforts will lead to: 1) identification of mechanisms of protection and pathogenesis; 2) well-defined and novel antigenic targets for development of new vaccines; 3) development of bio-processing, formulation, manufacturing and delivery technologies for new and improved vaccines; and 4) development of disease-burden and cost-effectiveness data for in-country decision-making.

WHO has conducted a detailed study of disease prioritisation and the Institute of Medicine (IOM) is in the process of developing a model to aid decision-makers toward ultimately prioritising preventive vaccines based on health, economic, demographic, programmatic and social impact criteria as well as

19 March 2012

scientific, technical and business opportunities. The DoV Collaboration has not undertaken a vaccine or disease prioritisation exercise. To complement the above efforts, a spectrum of R&D needs is presented across discovery, development and delivery, from which stakeholders can choose to invest according to their own priorities and their perceptions of the return on their investments.

Across all R&D activities, increased engagement and consultation with end users is needed to ensure technologies and innovation are prioritised according to their real demand and added value. New arrangements will also be required to facilitate access to the know-how and sharing of critical technologies, while acknowledging and respecting intellectual property rights. To be most effective, scientists from disciplines not previously engaged in vaccine research (systems biology, nanotechnology, structural biology and metabolomics) will need to be recruited to join the effort. Chemical and mechanical engineers, chemists and information technology specialists will also have key roles in this endeavour.

In addition, capacity building and human resource development is needed in low- and middle-income countries to conduct R&D, including finding better ways to conduct operational research and evaluate immunization programmes. R&D is being conducted in several institutions of excellence in many low- and middle-income countries. This capacity is producing indigenous data as well as fostering bilateral and multilateral collaborations in basic sciences and vaccine development. Capacity can be further strengthened through peer-to-peer training and exchanges between countries. Greater networking among research centres (from discovery to clinical trials) will facilitate the exchange of ideas and efficiently build partnerships among high-, middle- and low-income countries' institutions.

Discovery and basic research will lay the groundwork for impact in future decades. Research at the interface between host and pathogen is needed to enable the development of new vaccines. Advancing knowledge of innate and adaptive immune responses will permit more rational vaccine design. Strengthening the understanding of immunologic and molecular characteristics of microbes through systems biology will lead to identification of new antigenic targets for vaccine development and effective ways of predicting immune protective immune responses and mechanisms of protection. Appropriate studies of host genetics and biomarkers will contribute to understanding the causes of variation in human population responses to vaccines, including safety.

For the development of new and improved vaccines and vaccine technologies, the R&D community will benefit from adopting best practices in portfolio and partnership management, including identification of early indicators of success and failure to inform milestone-based investments. The community should also consider new approaches to ensure promising vaccine candidates are advanced from discovery to development, particularly where market incentives are insufficient. This is especially important for vaccines to prevent “neglected” diseases.

Research is needed to accelerate development, licensing and uptake of vaccines that are currently in early development, including development of technologies for more efficacious and less expensive manufacturing of vaccines. Greater access to the technology and know-how for adjuvants and their formulation into vaccines is needed to advance progress on developing new and more effective vaccines. Non-syringe delivery mechanisms and vaccine packaging that best suit the needs and constraints of countries, as well as thermostable vaccines and new bioprocessing and manufacturing technologies are priority research areas to accelerate the development of next-generation vaccines that are more effective, less expensive and easier to manufacture and deliver.

Additionally, the development and aggressive pursuit of a global regulatory science agenda will improve manufacturing efficiency, better characterize products, improve clinical trial design, and safeguard the highest standards for vaccine safety and efficacy. The challenge is considerable in achieving understanding of the adverse effects, finding ways to avoid them and yet not compromising the known efficacy of the existing product – and without incurring the costs of developing, testing and registering a new product. In this dimension, research on animal models and in *vitro* systems that better predict safety

and efficacy would shorten the development time to bring safe and effective vaccines to communities. Correlates of protection and safety will greatly help to bring these second generation products to licensure and use.

With respect to delivery, priority areas to improve programme efficiency and increase vaccine coverage and impact should include research on the use of effective information through modern communication technologies and social research to understand the cultural, economic and organizational determinants of immunization. Health economic analysis will guide the introduction and prioritization of vaccines, and hence representative epidemiological, immunological and operational studies and studies of vaccine impact will be needed.

Operational research on the most effective delivery approaches is also needed to overcome the challenges posed by life course immunization (newborn, infant, adolescent, pregnant women, elderly, among others) and vaccination in emergency and outbreak situations. Research on immunological interference effects and optimization of delivery schedules will be required as more new vaccines are introduced into routine programmes and immunization is extended beyond the first year of life. In the case of special populations, such as pregnant women, confirmation of safety will be particularly important. Furthermore, research is required to develop bio-markers to validate immunization coverage estimates and enable better measurement of population-level immunity profiles. In addition, research to develop field-usable and cost-effective diagnostic tools to establish etiology which are suited for use at point-of-care in low-income countries will be valuable additions to improving surveillance quality.

Concerted action among the research community, manufacturers, health professionals, programme managers, NITAGs, NRAs, and development partners will be needed to attain the full potential of research and development in the next decade. Methods and arguments for prioritization and allocation of scarce resources will have to be agreed upon by these groups, balancing the tensions between country-driven choices and the need for large-scale research efforts and markets in order to sustain development and commercialization. Health professionals, programme managers, NRAs and NITAGs can help identify areas where innovations could be made, and assess their real demand and added value. Development partners can help promote a judicious allocation of some resources for R&D, according to the agreed priorities. The research community and the manufacturers will hold the main responsibility for promoting innovation and pursuing the research agenda defined above.

Table 7: Summary of recommended actions for Strategic Objective 6

Country, regional, and global R&D innovations maximize the benefits of immunization.	
Expand capabilities and increase engagement with end-users.	<ul style="list-style-type: none"> • Engage with end users to prioritise vaccines and innovations according to perceived demand and added value. • Establish platforms for exchange of information on immunization research and consensus building. • Build more capacity and human resources in low- and middle-income countries to conduct R&D and operational research. • Increase networking among research centres for efficient building of partnerships among high-, middle- and low-income countries' institutions. • Promote collaboration between traditional research disciplines and scientists from disciplines not previously engaged in vaccine research.
Enable the development of new vaccines.	<ul style="list-style-type: none"> • Research on the fundamentals of innate and adaptive immune responses, particularly in humans. • Research on immunologic and molecular characteristics of microbes. • Improve understanding of the extent and causes of variation in pathogen and human population responses to vaccines.
Accelerate development, licensing and uptake of vaccines.	<ul style="list-style-type: none"> • Promote greater access to technology, know-how and intellectual property for adjuvants and their formulation into vaccines. • Develop non-syringe delivery mechanisms and vaccine packaging that best suit the needs and constraints of countries' programmes. • Develop thermostable rotavirus and measles vaccines. • Develop new bioprocessing and manufacturing technologies. • Develop a global, regulatory science research agenda. • Adopt best practices in portfolio and partnership management for R&D.
Improve programme efficiencies and increase coverage and impact.	<ul style="list-style-type: none"> • Research the use of more effective information through modern communication technologies. • Conduct representative epidemiological, immunological, social and operational studies and investigations of vaccine impact to guide health economics analysis. • Perform operational research on improved delivery approaches for life course immunization, and vaccination in humanitarian emergencies, fragile states and countries in and emerging from conflict. • Perform research on interference effects and optimum delivery schedules. • Perform research to develop improved diagnostic tools for conducting surveillance in low-income countries.

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6. Health returns on investment in immunization

The GVAP has outlined a set of ambitious goals and Strategic Objectives for the decade to broaden the impact and reach of immunization across the globe. By extending coverage for existing vaccines, introducing new vaccines and pursuing elimination and eradication for specific diseases, millions of deaths can be averted and billions of dollars in economic benefit can be generated.

It is projected that costs to sustain and scale up current immunization programmes, introduce new and underutilized vaccines, and conduct supplemental immunization activities to reach elimination and eradication goals in the world's 94 low- and lower-middle-income countries will rise from \$3.5-4.5B in

2011 to \$6-8B in 2020, costing approximately \$50-60B cumulatively over the course of the decade (from 2011–2020). The following estimates all pertain to these 94 countries.^v

An estimated \$42-51B of these costs (roughly 85% of the total) will support expanding routine immunization coverage and introducing additional vaccines to routine immunization programmes.^{vi} For example, pneumococcal vaccine coverage for the birth cohort in the 94 countries is projected to go from 8% in 2011 to approximately 90% by 2020. Similarly, coverage for the pentavalent vaccine (DTP-Hepatitis B-Hib) is projected to move from 50% in 2011 to more than 90% by 2020. To take another example, it is anticipated that up to five additional vaccines that are currently not licensed or widely used in low- and lower-middle-income countries will be introduced across many of the countries in the analysis during the decade: cholera, dengue, malaria, inactivated polio vaccine, and typhoid Vi conjugate vaccines. The need to strengthen delivery programmes to ensure they meet current needs, are well-maintained over the decade, have sufficient capacity to accommodate additional vaccines that are planned to be introduced, and facilitate immunization coverage aspirations across low- and lower-middle-income countries will lead to the costs of annual routine immunization increasing from approximately \$2.5B in 2011 to \$7.5B by 2020.

An estimated \$8-9B of these costs (the remaining 15% of the total) are for supplementary immunization activities (SIAs) for Accelerated Disease Control, Eradication and Elimination efforts throughout the decade, which will complement routine immunization programmes. This analysis assumes that these efforts would be focused on measles, meningococcus A meningitis, polio, rubella, tetanus and yellow fever and are projected to cost \$8-9B cumulatively over the decade.

The costs described above for routine and SIA programmes encompass the projected costs for the acquisition of vaccines and injection supplies as well as the delivery of those vaccines and supplies, including transportation and cold chain, human resources, training, social mobilization, surveillance and programme management. These costs do not include the additional costs or efficiencies that may be generated through the actions recommended in the GVAP where there is not sufficient evidence base regarding these costs at this time. Specifically, it does not include the additional costs for scaling up seasonal influenza vaccination or the additional resource needs for increased surveillance, increased civil society engagement, and current and additional technical agency support to implement the GVAP actions. Nevertheless, the costs do represent the majority of the cost of achieving the DoV Strategic Objectives.

Low- and lower-middle-income country governments will continue to play a pivotal role in meeting resource needs. Assuming that country funding for immunization grows in line with projected GDP growth and all GAVI Alliance-eligible countries fully meet GAVI Alliance co-financing requirements, it is estimated that the available funding from country governments for routine immunization and supplemental immunization activities could total approximately \$20B over the decade. In addition, if the GAVI Alliance renews its current level of funding for the 2016-2020 period, GAVI resources will generate an estimated additional \$12B of funds for the decade, approximately \$11B for routine immunization programmes and approximately \$1B for SIA programmes. Based on these assumptions, country governments and the GAVI Alliance combined could provide a total of approximately \$32B in funding for the decade. These estimates could be considered the minimum available financing over the decade because they do not include contributions from development partners beyond that provided

^v Countries included in scope for the costing analysis include 92 low- and lower-middle-income countries according to the July 2011 World Bank Classification (available at <http://www.icsoffice.org/Documents/DocumentsDownload.aspx?Documentid=474>) in addition to 2 upper-middle-income countries (Azerbaijan, Cuba) which receive GAVI Alliance support for existing vaccines, but which have graduated from support for future vaccines.

^{vi} Diseases covered by the vaccines included in the scope of the costing analysis include: DTP, hepatitis B, Hib, HPV, Japanese encephalitis, measles, meningococcus A, mumps, pneumococcus, polio, rotavirus, rubella, TB, yellow fever.

through the GAVI Alliance (due to considerable uncertainty around future levels of development partner financing).

Meeting the estimated \$18-28B in additional funding will require commitment from all stakeholders: governments to continue making immunization a priority in resource allocation decisions; development partners to sustain and bolster access to funding for immunization in spite of competing priorities; and the entire community to continue efforts to reduce the cost of vaccine acquisition and immunization service delivery.

All stakeholders investing together will drive significant health and economic impact. Sustaining or extending coverage of existing vaccines and introducing new vaccines combined have the potential to avert millions of future deaths, avert hundreds of millions of cases and generate hundreds of billions of dollars in economic impact over the decade.

As an example of the potential impact of immunization, a sub-analysis of 10 vaccines, delivered during the decade,^{vii} that represent an estimated \$42B of the \$50-60B cost of the decade, have the potential to avert in total 24-26M future deaths (table 8) as compared to a hypothetical scenario under which these vaccines have zero coverage.^{viii}

^{vii} Vaccines included in health benefits analysis cover the following diseases in countries representing 99.5% of the birth cohort of the 94 countries included in the costing analysis: hepatitis B, Hib, HPV, Japanese encephalitis, meningitis A, pneumococcus, rotavirus, rubella, yellow fever, measles.

^{viii} Data were insufficient to estimate morbidity averted through immunization in these countries.

Table 8: Total future deaths averted, 2011-2020, assuming no vaccination as the counterfactual

Group	Vaccine	Number of future deaths averted ^{ix}
Original EPI vaccine ^x	Measles 1st dose	10.6M
	Measles 2nd dose	0.4M
	Measles SIA	3.1M
New or underutilized vaccines	Hepatitis B ^{xi}	5.3-6.0M
	Hib	1.4-1.7M
	Pneumococcus	1.6-1.8M
	Rotavirus	0.8-0.9M
	Human Papilloma Virus	0.5M
	Yellow Fever ^{xii}	0.03-0.04M
	Meningococcal A meningitis ^{xiii}	0.03M
	Japanese Encephalitis ^{xiv}	0.07M
	Rubella	0.4M
TOTAL (2011-2020)		24.6-25.8M

The figures for deaths averted represent the full estimated benefits that can be achieved during the decade for these 10 vaccines, through sustaining or enhancing current immunization levels and introducing additional vaccines into the national immunization programmes of the selected countries, using no vaccination as the counterfactual. They are not limited to only the incremental benefits of the additional actions undertaken during the Decade of Vaccines.

The current projections of costs, available funding and health impact will evolve as additional analysis is completed and new and better data become available. Additional analysis will allow for the expansion of the scope covered by this document, including increasing the number of diseases covered by the cost and health benefits analysis, quantifying impact on morbidity, quantifying economic benefits and further increasing the granularity of costing and funding projections. Additional analysis is needed to better understand vaccine R&D costs and benefits, which are not included in the current projections. New and better data will enhance the analysis with revised disease burden statistics, better vaccine price forecasts, improved population information and more consistent data across all countries, among other improvements. In addition, a process should be developed and maintained to allow for updates to cost, funding, and health and economic impact estimates at the country and global levels, ideally on an annual basis. This will facilitate enhanced planning, coordination and engagement among the many stakeholders that will be required to achieve the Strategic Objectives and goals of the DoV.

^{ix} Ranges shown for estimates where alternative assumptions were considered for the scope of countries and the demand forecast.

^x Data were insufficient to allow estimation of deaths averted from BCG, diphtheria, tetanus or pertussis vaccines.

^{xi} scaled up in the decade 2001 to 2010.

^{xii} Disease burden limited to only few regions.

^{xiii} Same as above.

^{xiv} Same as above.

7. Continuing momentum for the Decade of Vaccines

Ensuring success throughout the DoV requires additional focus and action beyond the development of the GVAP. Four critical sets of activities will be required in order to translate the GVAP in actions and results: development of tools for translation of the GVAP; development of a complete accountability framework; securing commitments from the stakeholder community; and communicating the DoV opportunities and challenges.

Tools are needed that provide the full thinking behind the GVAP with details needed to enable implementation. The production, publication and communication of these tools will help stakeholders better understand how to translate the actions recommended in the GVAP to their local context.

The GVAP lays the groundwork for an accountability framework, which will be finalized with more detailed roles and responsibilities for stakeholders, a complete set of indicators, the methodology and data sources for each indicator detailed and baselines established where required. Investments are needed to improve data quality and develop more robust monitoring and evaluation systems in-country. Regular audits should be conducted to verify data quality. Progress should be reviewed annually, beginning in 2013, by countries, the WHO Regional Committees and the WHA.

Commitments aligned to the GVAP from countries, civil society organizations, multilateral agencies, development partners and vaccine manufacturers can transform the GVAP from a document to a movement. Building these commitments and a strategy for coordinating these commitments will be required at the global, regional and country levels. Appropriate channels must be identified and targeted communications developed to ensure that the DoV messages reach and resonate with all stakeholders.

The period of time immediately following WHA 2012 will be critical to ensure that agenda setting translates into effective action. Key opportunities to sustain and build on the current momentum during the remainder of 2012 include the WHO Regional Committee meetings, the GAVI Alliance Board meeting, the UNICEF Executive Board meeting, the GAVI Alliance Partners' Forum and the Child Survival a Call to Action Summit.

The DoV Collaboration is a time-limited effort that ends with the completion of the GVAP and related activities identified above. There will be no new structure to support the implementation phase of the DoV/GVAP. Lead stakeholders need to assume ownership to support implementation and progress monitoring.

WHO will provide a leadership role for the GVAP as the normative lead agency in global health, including the role in defining norms and standards for production and quality control of vaccines as well for strengthening immunization delivery, programme monitoring and surveillance systems. In collaboration with other stakeholders, WHO will also advocate for and provide technical assistance to Member States to promote greater country ownership, create synergies between immunization and other primary health care programmes and implement research, notably to increase programme efficiencies and impact.

Appendix 1: Summary of recommended indicators

Goal-level indicators

Goal	By 2015	By 2020
Achieve a world free of polio	<ul style="list-style-type: none"> Interrupt wild polio virus transmission globally 	<ul style="list-style-type: none"> Certification of poliomyelitis eradication
Meet global and regional elimination targets	<ul style="list-style-type: none"> Neo-natal tetanus eliminated in all WHO regions Measles eliminated in at least four WHO regions Rubella/congenital rubella syndrome eliminated in at least two WHO regions 	<ul style="list-style-type: none"> Measles and rubella eliminated in at least five WHO regions
Meet vaccination coverage targets in every region, country and community	<ul style="list-style-type: none"> At least 80 low- and middle-income countries have introduced one or more new or underutilized vaccines Reach 90% national coverage and 80% in every district or equivalent administrative unit for DTP-containing vaccines 	<ul style="list-style-type: none"> Reach 90% national coverage and 80% in every district or equivalent administrative unit for all vaccines in national programmes, unless otherwise recommended
Develop and introduce new and improved vaccines and technologies		<ul style="list-style-type: none"> Licensure and launch of vaccine or vaccines against one or more major non-VPDs (such as dengue, hepatitis C, cytomegalovirus, respiratory syncytial virus, leishmaniasis, hookworm and group A streptococcus) Licensure and launch of at least one platform delivery technology
Exceed the MDG 4 target for reduction in child mortality	<ul style="list-style-type: none"> Reduce under five mortality rate by two-thirds (compared to 1990) 	<ul style="list-style-type: none"> Exceed the MDG-4 target for reduction of child mortality.

Strategic Objective level indicators

Strategic Objective	Indicators
All countries commit to immunization as a priority	<ul style="list-style-type: none">• Presence of a legal framework or legislation that guarantees immunization financing• Presence of independent technical advisory group that meets defined criteria
Individuals and communities understand the value of vaccines and demand immunization as both a right and a responsibility	<ul style="list-style-type: none">• Level of public trust in immunization, measured by surveys on knowledge, attitudes, beliefs and practices^{xv}
The benefits of immunization are equitably extended to all people	<ul style="list-style-type: none">• Percentage of districts with less than 80% coverage with 3 doses of DTP-containing vaccine• Reduction in coverage gaps between lowest and highest wealth quintile (or another appropriate equity indicator)
Strong immunization systems are an integral part of a well-functioning health system	<ul style="list-style-type: none">• DTP1 to measles first dose dropout rate• Immunization coverage data assessed as high quality by WHO and UNICEF
Immunization programmes have sustainable access to predictable funding, quality supply and innovative technologies	<ul style="list-style-type: none">• Percentage of routine immunization costs financed through government budgets• Installed capacity for production of universally recommended vaccines within 5 years of licensure / potential demand
Country, regional and global R&D innovations maximize the benefits of immunization	<ul style="list-style-type: none">• Proof of concept for a vaccine that shows greater or equal to 75% efficacy for HIV/AIDS, TB, or malaria• Phase III clinical trials of a first generation universal influenza vaccine initiated• Progress towards institutional and technical capacity to make vaccines and / or carry out related clinical trials, operational and organizational research

^{xv} The WHO Strategic Advisory Group of Experts (SAGE) working group on vaccine hesitancy will develop a definition of vaccine hesitancy and recommend specific questions from surveys (either existing or new) to fully formulate this indicator.

Appendix 2: Stakeholder responsibilities

There is an opportunity to achieve real progress in the next decade. Realization of this potential is contingent upon all stakeholders having clearly defined and coordinated responsibilities. Primary responsibility is held by individuals and communities, governments and health professionals, as recipients and providers of immunization respectively. Other stakeholders also have an important role in achieving the objectives.

Individuals and communities, as recipients of immunization, should do the following:

- Understand the risk and benefits of vaccines and immunization and view it as part of being a responsible citizen
- Demand safe and effective immunization programmes as a right from their leaders and government, and hold leaders and government accountable for providing them
- Participate in public-health discussions and be involved in key decisions about immunization processes
- Participate and contribute to the immunization delivery process and convey the needs and perspectives of their communities to the policy-makers

Governments, as the main providers of immunization, should do the following:

- Increase support for national immunization programmes and ensure financial sustainability by 2020
- Depending upon countries' income and as economies grow, fund an increasing proportion of domestic immunization programmes, progressing to fully funding domestic programmes, and then funding global immunization efforts
- Develop and introduce laws, regulations, and policies that support immunization programmes and a secure, high-quality supply base, if necessary
- Develop region- and country-specific plans, together with other stakeholders in region / country
- Prioritise and assume full ownership over their national immunization programmes to create equity-driven programmes that reach every community
- Work with stakeholders within and outside of governments
- Respond with timely information when public concerns are raised about safety and efficacy to sustain public trust
- Ensure immunization programmes are adequately staffed with personnel who are well trained and given appropriate incentives to manage the programme and deliver services
- Increase awareness of the importance of immunization to improve a population's health and its contributions to strengthening health systems and primary health care
- Effectively convey messages on vaccines to create demand
- Engage in dialogue with communities and media and use effective communications techniques to convey messages about vaccines and to address safety concerns
- Encourage and support research on vaccines and vaccination issues. Also encourage education at all levels on vaccines
- Collaborate regionally and internationally in advocacy programmes, evidence sharing, and coordinated preparedness
- Participate in open dialogues with manufacturers to ensure affordability of current and new vaccines
- As economies grow, fund an increased proportion of domestic immunization programmes, progressing to fully funding domestic programmes, and then funding global immunization efforts

Health professionals should do the following:

- Provide high-quality immunization services and information on them

- Introduce vaccine educational courses on immunization at universities and institutions training health care professionals along with continuing education for all healthcare providers (medical, nursing, pharmacy and public health practitioners)
- Identify areas where immunization services could be improved and innovations made
- Serve as proactive, credible voices for the value of vaccines and recruit other advocacy voices
- Use existing and emerging technologies to improve delivery and better capture information
- Engage in dialogue with communities and media and use effective communications techniques to convey messages about vaccines and to address safety concerns

Academia should do the following:

- Promote innovation to accelerate the development of new and improved vaccines, contribute to the optimization of vaccine formulation and immunization programme logistics, and lay the groundwork for the impact of immunization in future decades
- Pursue a multidisciplinary research agenda that focuses on transformational impact and is based on the needs of end users
- Develop vaccines and technologies that will optimize and maximize vaccine delivery
- Embrace new ways of working that speed up scientific progress
- Improve dialogue with other researchers, regulators and manufacturers in order to align actions and increase effectiveness in responding to local and global immunization challenges
- Provide the core data, methods and arguments that help drive the continued prioritisation of immunization both globally and locally
- Engage more with systematic reviews to identify areas where solid scientific evidence exists (which should be the basis of health policies) and those areas where such evidence is lacking (which would be the basis for future primary research)
- Provide evidence and outline best immunization practices
- Support the development of manufacturing capabilities
- Promote budget allocation for vaccine and immunization research

Manufacturers should do the following:

- Continue to develop, produce and supply innovative and high-quality vaccines that meet country needs
- Support research and an education agenda for immunization
- Participate in open dialogues with countries and the public sector to ensure sustainable access of current and new vaccines
- Continue to innovate manufacturing processes and pricing structures
- Support the media outreach for the EPI programme to increase awareness
- Support rapid scale-up and adoption as new or improved vaccines emerge
- Develop partnerships that support the growth of manufacturing capabilities and increase vaccine supply and innovation
- Work in coordination with other partners on vaccine and immunization advocacy

Global agencies, such as WHO, UNICEF, the World Bank, regional development banks and the GAVI Alliance, should do the following:

- Advocate for and provide technical support to promote country ownership
- Strengthen national capabilities and regional infrastructure
- Continue to define norms and guidelines to improve vaccine and immunization services, striving toward greater equity and sensitivity to gender and subpopulation (including minorities, age groups, etc.)
- Promote synergies between immunization and other health services as well with other sectors such as education, economic development and financing
- Fund the provision of vaccines and immunization-related activities

- Work with all stakeholders to improve technical assistance to strengthen immunization and other components of health systems
- Encourage, share and support evidence-based decision-making across the spectrum of development, health and immunization stakeholders
- Engage partners to generate popular demand for immunization and support programme research and improvements
- Promote the idea of sustainable national funding and engage rapidly emerging economies as funding partners
- Develop mechanisms for mutual accountability that hold all governments, programmes and development partners responsible for committed levels of support
- Promote a dialogue between manufacturers and countries to align supply and demand
- Pursue innovative financing and procurement mechanisms that reinforce country ownership, and promote equity and affordability for low- and middle-income countries

Development partners, such as bilateral agencies, foundations and philanthropists, should do the following:

- Fulfil institutional mandates and missions in the health field
- Support countries and regional entities to achieve national and regional goals, and contribute to the advancement of their priorities
- Promote country ownership and country-led health, vaccine and immunization plans that include budgets for improving access to services and reducing the equity gap in coverage
- Promote comprehensive, integrated packages of essential interventions and services that include vaccines and immunization and strengthen health systems
- Provide predictable long-term funding aligned with national plans and encourage new and existing partners to fund vaccines and immunization
- Build civil society capacity and support CSOs activities in countries
- Participate in international advocacy through access to open evidence that can be shared
- Maintain transparent and coordinated funding, accompanied by performance-based evaluation

Civil society, including NGOs and professional societies, should do the following:

- Get involved in the promotion and implementation of immunization programmes at both country and global level
- Participate in the development and testing of innovative approaches to deliver immunization services that reach the most vulnerable people
- Follow national guidelines and regulations in the design and delivery of immunization programmes that fulfil the duty of accountability to national authorities
- Educate, empower and engage vulnerable groups and communities on their right to health, including vaccines and immunization
- Build grass-roots initiatives within communities to track progress and hold governments, development partners and other stakeholders accountable for providing high-quality immunization services
- Contribute to improved evaluation and monitoring systems within countries
- Engage in country, regional and global advocacy beyond the immunization community to ensure vaccines and immunization are understood as a right for all
- Collaborate within and across countries to share strategies and build momentum for improved health, vaccines and immunization

Media should do the following:

- Understand benefits and concerns regarding immunization in order to accurately report on and effectively promote immunization programmes

- Engage in country, regional and global advocacy beyond the immunization community to ensure vaccines and immunization are understood as a right for all
- Use effective communications techniques to convey messages about vaccines and to address safety concerns

Private sector should do the following:

- Support the diversification of funding sources for immunization programmes (private sector, insurance providers, patients, etc.)
- Engage in country, regional and global advocacy beyond the immunization community and serve as champions for immunization to ensure vaccines and immunization are understood as a right for all