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EXPANDED PROGRAMME ON IMMUNIZATION:

Regional Framework for Implementation of the Global Vaccine Action Plan in the Western Pacific

Corrigendum

1. Annex 1, Draft Regional Framework for Implementation of the Global Vaccine Action Plan in the Western Pacific, has been updated.

DRAFT
Regional Framework for Implementation
of the Global Vaccine Action Plan
in the Western Pacific

World Health Organization
Western Pacific Region

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Abbreviations

AEFI	adverse events following immunization
AFP	acute flaccid paralysis
cMYP	comprehensive multi-year plans for immunization
CRS	congenital rubella syndrome
cVDPV	circulating vaccine-derived poliovirus
DTP	combined diphtheria-tetanus-whole cell pertussis toxoid
DTaP	combined diphtheria-tetanus-acellular pertussis toxoid
EPI	Expanded Programme on Immunization
EVM	effective vaccine management
GIVS	Global Immunization Vision and Strategy
GVAP	Global Vaccine Action Plan
HBsAg	hepatitis B surface antigen
HepB	hepatitis B vaccine
Hib	haemophilus influenza type B
HPV	human papillomavirus
HSCC	Health Sector Coordinating Committee
ICC	Interagency Coordinating Committee
IDP	institutional development plan
IPV	inactivated polio vaccine
ITD	intratypic differentiation
JE	Japanese encephalitis
JRF	Joint Reporting Form (UNICEF-WHO)
MCV	measles-containing vaccine
MDG	Millennium Development Goal
MLM	mid-level manager
MNT	maternal and neonatal tetanus
MR	measles-rubella
NIP	National Immunization Programme
NT	neonatal tetanus
NRA	National Regulatory Authority
NIPH	National Institute of Public Health
NITAG	National Immunizations Technical Advisory Group
OPV, bOPV, tOPV	oral polio vaccine, bivalent OPV, trivalent OPV
ORI	outbreak response immunization

RED	Reach Every District
SIA	supplementary immunization activity
TT	tetanus toxoid
UNICEF	United Nations Children's Fund
VAPP	vaccine-associated paralytic poliomyelitis
VDPV	vaccine-derived poliovirus
VPD	vaccine-preventable disease
WHA	World Health Assembly
WHO	World Health Organization
WPV	wild poliovirus

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Executive Summary

Since the inception of the Expanded Programme on Immunization (EPI), vaccination has prevented millions of deaths and disabilities in the Western Pacific Region, achieved dramatic and visible declines of once highly endemic diseases, stopped the transmission of wild poliovirus across the Region, and dramatically reduced the transmission of measles virus and hepatitis B virus in many countries in the Region.

Despite these achievements, inequitable access to vaccination remains a major problem in many countries, with coverage gaps of up to 30% between the highest and lowest socioeconomic quintiles. Low reliability of reported administrative vaccination coverage data in many countries has not been resolved and deprives programmes of an essential monitoring tool. Moreover, while it is expected that the future health impact of vaccination can be enhanced through the expanded use of new vaccines that are significantly more expensive, the vast majority of the Region's population resides in middle-income countries that do not have access to external support mechanisms for the introduction of new vaccines, such as the GAVI Alliance, and cannot afford to self-finance these vaccines.

Measles elimination requires very high levels of vaccination coverage with measles-containing vaccine, also a marker of progress for Millennium Development Goal (MDG) 4, and requires greater efforts to identify and reach highly vulnerable populations and communities to close the remaining immunity gaps.

In May 2012, the 194 Member States of the World Health Assembly endorsed the *Global Vaccine Action Plan 2011–2020* (GVAP), a global framework that builds on its predecessor, the *Global Immunization Vision and Strategy 2006–2015* (GIVS). A wide array of stakeholders were involved in the development of GVAP.

GVAP offers a road map for achieving the Decade of Vaccines vision by the provision of universal access to vaccination. Five goals are outlined in GVAP: (1) achieve a world free of poliomyelitis; (2) meet global and regional elimination targets; (3) meet vaccination coverage targets in every region, country and community; (4) develop and introduce new and improved vaccines and technologies; and (5) exceed the MDG for reducing child mortality.

To translate GVAP into action, four sets of activities have been defined: (1) tools for translation of GVAP into regional/local implementation; (2) an accountability framework; (3) commitments from

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the stakeholder community; and (4) communications on Decade of Vaccines opportunities and challenges.

The *Regional Framework for Implementation of Global Vaccine Action Plan in the Western Pacific* has been prepared to translate strategies and activities recommended by GVAP to the context of the Western Pacific Region, to accelerate progress towards achievement of regional immunization goals, and to help stakeholders better understand how to work together in implementing GVAP in the Region.

1. Introduction

1.1 Vaccine-preventable diseases and immunizations in the Western Pacific Region

Immunizations are widely recognized as one of the most effective public health interventions in the world, and national immunization programmes in the Western Pacific Region are often flagship programmes. Over the past 20 years, immunizations have prevented millions of deaths and disabilities in the Region, achieved dramatic and visible declines in once highly endemic diseases, stopped the transmission of wild poliovirus across the Region, and dramatically reduced the transmission of measles virus and hepatitis B virus in many countries in the Region.

With maturation of the programmes, there has also been increasing attention to issues of vaccine safety, greater reliance on routine vaccine delivery strategies to achieve national immunization goals, and adoption of a life-course approach to extend the benefits of immunization past infancy and early childhood. Innovative work has been done in countries of the Region to develop and evaluate strategies to reach high-risk populations and to introduce new vaccines. High-quality regional surveillance and accredited laboratory networks have been established to measure disease burden, detect outbreaks and evaluate vaccination impact for many vaccine-preventable diseases, including poliomyelitis, measles, rubella, congenital rubella syndrome, Japanese encephalitis, rotavirus diarrhoea, and diseases caused by *Haemophilus influenzae* type b and *Streptococcus pneumoniae*.

Despite these achievements, immunization programmes in the Western Pacific Region could fall behind without clear and ambitious goals and plans. Inequitable access to immunizations remains a major problem in many countries, with coverage gaps of up to 30% between the highest and lowest socioeconomic quintiles. The low reliability of reported administrative vaccination coverage data in many countries has not been resolved and deprives programmes of an essential monitoring tool. While the biggest future health impacts of immunizations will be achieved through expanded use of new vaccines, the vast majority of the Region's population reside in middle-income countries that do not have access to external support for new vaccines and cannot afford to self-finance them.

Polio eradication, measles and maternal and neonatal tetanus (MNT) elimination, and accelerated hepatitis B control goals require very high levels of routine vaccination coverage, and greater efforts to identify and reach high-risk populations and communities to close remaining immunity gaps, including more aggressive scaling-up of strategies shown to work, are urgently needed.

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1.2 Immunization goals

WHO Member States have committed to four global immunization goals, and Member States of the Western Pacific Region have two additional regional immunization goals. Poliomyelitis eradication and MNT elimination are long-standing global immunization goals. GVAP reaffirmed these goals and established a new target year for MNT elimination. The Western Pacific Region was certified polio-free in 2000 and has maintained that status to date; maintaining polio-free status is a regional goal. MNT has been eliminated in all but a few countries and is on track to be eliminated across the Region within the next few years. GVAP calls for five of the six WHO regions to achieve rubella elimination by 2020. Rubella control programmes using combination measles-rubella vaccine will have been initiated by 2015 in all but one of the countries and areas of the Region. GVAP includes a goal to develop and introduce new and improved vaccines and technologies, with a target that all low- and middle-income countries introduce one or more new vaccines by 2020. Since the endorsement of GVAP, five of 23 low- and middle-income countries in the Region have introduced new vaccines.

In 2003, the Region established two new immunization goals to be reached by 2012: measles elimination and accelerated hepatitis B control. The interim hepatitis B control goal of reducing chronic hepatitis B infections to less than 2% prevalence in 5-year-old children by 2012 was achieved overall for the Region, and the Region is on track to achieve the final goal of less than 1% chronic infection rates in 5-year-old children by 2017. Although measles incidence has declined dramatically in the past five years, transmission remains geographically widespread and some countries are experiencing resurgences in the disease.

Agreed global and regional immunization goals

Sustaining polio-free status
Maternal and neonatal tetanus elimination
Measles elimination
Hepatitis B accelerated control
Rubella elimination
Introduction of new vaccines

Given the ambitious vision for the Decade of Vaccines (2011–2020) and the fact that it has been more than 10 years since the Western Pacific Region established new immunization goals, a situation analysis was conducted to identify possible new priorities. This situation analysis included a review of existing national and regional immunization plans and policies, administrative and survey coverage data, programme reviews, consultant reports, and review of progress towards current goals as well as constraints that have hampered their achievement. WHO regional focal points, WHO

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country staff and national immunization programme staff provided input on priority areas of work in March 2013 in Manila. Based on that analysis, two additional regional immunization goals that build on GVAP and country initiatives are proposed:

Proposed additional regional immunization goals

Meeting regional vaccination coverage targets
Accelerated control of Japanese encephalitis

GVAP includes a goal to meet vaccination targets in every region, country and community, aiming to reach 90% national-level coverage for all vaccines in national immunization programmes, unless otherwise recommended. In the Western Pacific Region, however, 21 countries have already surpassed 90% coverage with three doses of diphtheria-tetanus-pertussis vaccine, and several countries have established national goals of 95% coverage. To support countries working towards higher vaccination coverage, the framework adapts the GVAP coverage target to 95% national-level coverage for all vaccines in national immunization programmes. Japanese encephalitis (JE) is a leading cause of encephalitis in Asia, and vaccination is the most effective approach to control. With the recent availability of new Japanese encephalitis vaccines, countries have expanded initiatives to vaccinate at-risk populations. Nine of 12 countries with JE risk now include JE vaccine in their immunization schedules for some or all risk areas, and one country has controlled JE with other measures.

Each goal, including the rationale and key challenges, is discussed in more detail in later sections of this document. It is anticipated that detailed strategic plans of action will later be developed for new regional immunization goals endorsed by the Regional Committee for the Western Pacific.

1.3 Global Vaccine Action Plan (GVAP) 2011–2020

In May 2012, the *Global Vaccine Action Plan 2011–2020* (GVAP) was endorsed by the 194 Member States of the World Health Assembly. GVAP builds on the *Global Immunization Vision and Strategy 2006–2015* (GIVS), endorsed by the World Health Assembly in 2005, and outlines a vision in which the full benefits of immunization are extended to all people, regardless of where they are born, who they are or where they live. Developing GVAP brought together multiple stakeholders involved in immunization, including the Bill & Melinda Gates Foundations, GAVI Alliance, the United Nations Children’s Fund (UNICEF), the United States National Institute of Allergy and Infectious Diseases and WHO, along with all partners – governments and elected officials, health professionals, academia, vaccine manufacturers, global agencies, development partners, civil society, media and the private sector.

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GVAP set five goals for the Decade of Vaccines. These goals are:

- (1) achieve a world free of poliomyelitis
- (2) meet global and regional disease elimination targets [includes neonatal tetanus, measles and rubella elimination targets]
- (3) meet vaccination coverage targets in every region, country and community
- (4) develop and introduce new and improved vaccines and technologies
- (5) exceed the MDG 4 target for reducing child mortality.

To achieve these goals, GVAP proposes six strategic objectives, 20 strategies and 85 activities. Successful implementation of GVAP is estimated to avert an additional 25 million deaths by the end of the decade and result in billions of dollars in gained productivity.¹

1.4 Aims of the Regional Framework for Implementation of the Global Vaccine Action Plan in the Western Pacific

GVAP describes a wide range of strategies and activities to achieve the Decade of Vaccines vision. Through extensive consultation with Member States, the *Regional Framework for Implementation of the Global Vaccine Action Plan in the Western Pacific* has been prepared to translate the strategies and activities recommended by GVAP to the context of the Western Pacific Region. The regional framework supports Member States in implementing GVAP by consolidating all regional and global immunization goals, describing priority actions appropriate for the Region and highlighting strategies essential to achieve the goals and to strengthen immunization programmes in the Western Pacific Region. The framework builds on GVAP and country initiatives with two additional goals and provides a structure for GVAP annual reporting requirements.

The Regional framework begins by reviewing existing global and regional immunization goals and the two additional immunization goals. For each goal, key challenges and relevance to GVAP's strategic objectives are described (Chapter 2). Then, GVAP-recommended strategies and activities are reviewed by potential contribution to achievement of each immunization goal, as well as the status of and needs for implementation of the activities at country level in the Region. Based on

¹ pp. 80–82, Global Vaccine Action Plan 2011–2020

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the review, priority actions are proposed for achieving GVAP's strategic objectives in the Western Pacific Region and accelerating progress to achieve immunization goals (Chapter 3). Finally, the framework proposes region-specific indicators and targets for monitoring and reporting implementation of GVAP in the Western Pacific (Chapter 4).

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2. Immunization goals in the Western Pacific Region

This section reviews the rationale for the agreed global and regional immunization goals, and proposes two additional goal building on GVAP and country initiatives. This section also describes key challenges for achieving the goals and relevance to GVAP strategic objectives. The six agreed immunization goals are:

- (1) sustaining polio-free status
- (2) maternal and neonatal tetanus elimination
- (3) measles elimination
- (4) hepatitis B accelerated control
- (5) rubella elimination
- (6) introduction of new vaccines.

The two additional goals are:

- (7) meeting regional vaccination coverage targets
- (8) accelerated control of Japanese encephalitis.

2.1 Agreed goal: Sustaining polio-free status

2.1.1 Targets

- Sustain regional polio-free status until global certification (tentatively by end 2018).
- Ensure timely detection and response to any wild, vaccine-related and Sabin polioviruses.
- Eliminate vaccine derived poliovirus risk by introducing in OPV-using countries at least one dose of IPV by October 2015, and withdraw type 2 component of tOPV by mid-2016.
- Initiate and implement the other phases of the poliovirus laboratory containment.

2.1.2 Review of rationale

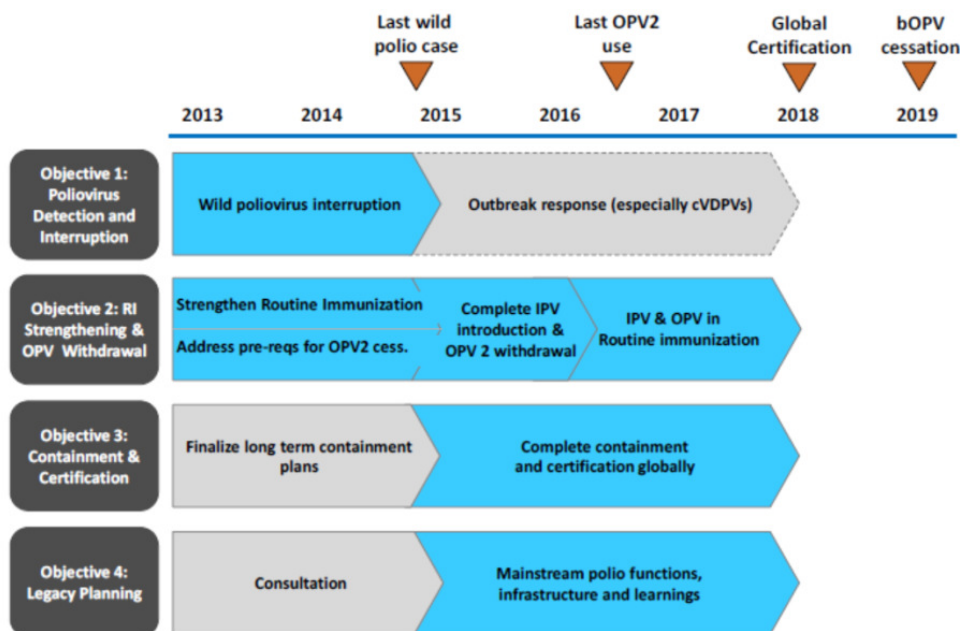
In 2000, the Western Pacific Region became the second WHO region to achieve certification as polio-free. Despite importations of wild poliovirus, that status has been maintained. In 2012, WHA resolution 65.5 declared polio eradication a programmatic emergency for global public health and requested the development of a comprehensive polio endgame strategic plan. This plan was developed in consultation with governments, advisory institutions and key stakeholders. The plan was reviewed and its major components were endorsed during the 2013 meeting of the Strategic Advisory Group of Experts on Immunization. The final *Polio Eradication & Endgame Strategic Plan 2013-2018* was noted during the Sixty-sixth World Health Assembly in 2013.

Despite significant global progress made in reducing wild poliovirus (WPV) transmission, the circulation of vaccine-derived poliovirus (VDPV) and vaccine-associated paralytic poliomyelitis (VAPP) due to use of oral poliovirus vaccines (OPV) have emerged as important concerns. The global *Polio Eradication & Endgame Strategic Plan 2013–2018* outlines parallel implementation of endgame activities to prevent the emergence and circulation of VDPV, including synchronized replacement of attenuated OPV with inactivated poliovirus vaccines (IPV), starting with OPV type 2. The plan outlines four major objectives with corresponding areas of work (Fig. 1):

- (1) poliovirus detection and interruption;
- (2) routine immunization strengthening and OPV withdrawal;
- (3) certification of eradication and containment of all wild polioviruses in all WHO regions by the end of 2018; and
- (4) legacy planning with mainstreaming of essential polio functions into on- going public health programmes.

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Fig. 1. Overview of Eradication and Endgame Strategic Plan, 2013–2018



RI = routine immunization

Of these four objectives, numbers two and three are the most pressing issues to address in the Region. The Region was certified polio-free in 2000 and has completed phase 1 laboratory containment activities. WPV importations and circulating VDPV have been detected and successfully controlled, and the Region has been able to continuously sustain its polio-free status since certification.

All 43 laboratories in the Regional Polio Laboratory Network – comprised of one global specialized laboratory, two regional reference laboratories, nine national laboratories and 31 provincial laboratories (China) – are accredited. All countries in the Region have access to an accredited laboratory. Ongoing efforts to further expand capacity to increase the timeliness of laboratory confirmation and to perform environmental testing will further support the rapid detection and characterization of poliovirus for programme action.

2.1.3 Key challenges

- Several countries have immunity and surveillance gaps, and two countries (Papua New Guinea and the Philippines) were identified by the Regional Certification Commission in 2012 as being at high risk of polio importation.

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- Communicating and advocating with the 17 OPV-using countries (Cambodia, China, Cook Islands, Fiji, Kiribati, the Lao People's Democratic Republic, Mongolia, Nauru, Papua New Guinea, the Philippines, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu and Viet Nam) on the need to introduce at least one dose of IPV dose by November 2015 and withdraw OPV type 2 by April 2016.
- Financing IPV in the 12 OPV-using countries in the Region that are not GAVI-eligible.
- Developing and implementing endgame national plans of action in a tight timeline to meet global requirements. These plans will include: evaluating bivalent OPV and IPV demand and supply, including provision of technical assistance for development of Sabin-IPV production capacity in China and Viet Nam, identifying financing for IPV, and determining optimal IPV vaccination schedules.
- Providing accurate and timely technical assistance to countries to support planning, development and implementation. Human and financial resources in the Region to support development of endgame national plans of action are limited.

2.1.4 Key challenges and link to GVAP strategic objectives

Key challenges in sustaining polio-free status and implementing Polio Endgame Strategy	Link to relevant GVAP strategic objective (SO)					
	SO1 Country commitment	SO2 Understand and demand	SO3 Equitably extended to all	SO4 Strong systems	SO5 Sustainable access	SO6 Research and development
1. Close immunity and surveillance gaps	✓	✓	✓	✓	✓	
2. Political support and advocacy to key stakeholders for vaccine switch	✓	✓	✓		✓	✓
3. Financial support	✓		✓		✓	
4. Developing national plan of action	✓	✓	✓	✓	✓	
5. Provide technical support to countries		✓	✓			

- SO1: **Countries commit** to immunizations as a priority
 SO2: **Individuals and communities understand** the value of vaccines and **demand** immunization as their right and responsibility
 SO3: Benefits of immunization are **equitably extended** to all people
 SO4: **Strong** immunization **systems** are an integral part of a well-functioning health system

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- SO5: Immunization programmes have **sustainable access** to predictable funding, quality supply and innovative technologies
- SO6: Country, regional and global **research and development innovations** maximize the benefits of immunization

2.2 Agreed goal: Maternal and neonatal tetanus elimination

2.2.1 Targets

- By 2015, to achieve maternal and neonatal tetanus (MNT) elimination in the Western Pacific Region, defined as <1 neonatal tetanus (NT) case/1000 live births in each district.
- Maintain elimination in every country and area (based on annual WHO/UNICEF District Data Spreadsheet).

2.2.2 Review of rationale

Maternal and neonatal tetanus deaths can be easily prevented by hygienic delivery and cord-care practices, and/or by immunizing mothers with tetanus vaccine. When tetanus develops, mortality rates are high, especially when appropriate medical care is not available.

In 1988, WHO estimated that 787 000 newborn infants died from NT and the estimated annual global mortality rate was approximately 6.7 NT deaths per 1000 live births. In 1989, the Forty-second World Health Assembly called for elimination of neonatal tetanus by 1995. The goal was expanded in 1999 to include elimination of maternal tetanus. However, due to slow implementation of the recommended strategies, the target date was postponed to 2000, and then to 2005. As part of GVAP, Member States endorsed a target year of 2015.

In recent years, MNT elimination has gained renewed momentum in the Western Pacific Region following a plateau. Elimination in Viet Nam and China was validated in 2005 and 2012, respectively. In China, the primary strategy to eliminate MNT was to increase facility-based deliveries through increased access and removal of financial barriers. While not as rapid, this strategy has broad benefits beyond MNT elimination, including the timely administration of the hepatitis B birth dose. MNT is considered to have been eliminated in 34 of the 37 Western Pacific Region countries and areas, with only Cambodia, Papua New Guinea and the Philippines yet to validate elimination.

2.2.3 Key challenges

- Optimally, MNT elimination should be sustained with a primary series of three doses of combined diphtheria-tetanus-whole cell pertussis toxoid (DTP) given in infancy, a booster dose of a tetanus toxoid-containing vaccine at age 4–7 years and another booster in adolescence, (e.g. at age 12–15 years). A sixth tetanus toxoid-containing dose to adults is recommended to provide additional assurance of long-lasting, possibly lifelong protection. Most countries and areas of the Region that have eliminated MNT have instituted a schedule with tetanus toxoid being administered to infants, children and women of reproductive age but have not yet instituted adolescent and adult boosters.
- In areas where immunization fails to reach a substantial proportion of pregnant women, tetanus supplementary immunization activities (SIAs) may be required. All women of reproductive age living in high-risk districts should be targeted with three properly spaced doses of tetanus-containing vaccine.
- The overwhelming majority of tetanus cases occur in newborn babies or mothers as a result of unclean deliveries, poor postnatal hygiene and dangerous cord-care practices. Deliveries in health facilities and/or assisted by medically trained attendants can effectively reduce MNT and other causes of maternal and neonatal mortality, and have been used as the main strategy to successfully eliminate MNT in some Western Pacific Region countries.
- NT surveillance should be maintained and improved to monitor elimination and identify areas where MNT is still occurring. Although NT presents with characteristic clinical signs, most deaths occur at home and may not be reported.

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2.2.4 Key challenges and link to GVAP strategic objectives

Key challenges in maternal and neonatal tetanus elimination	Link to relevant GVAP strategic objectives (SO)					
	SO1 Country commitment	SO2 Understand and demand	SO3 Equitably extended to all	SO4 Strong systems	SO5 Sustainable access	SO6 Research and development
1. Life course approach to immunization	✓	✓	✓	✓		
2. Vaccination of pregnant women/women of reproductive age	✓	✓	✓	✓		
3. Clean deliveries/safe cord care					✓	
4. NT surveillance					✓	

SO1: **Countries commit** to immunizations as a priority

SO2: **Individuals and communities understand** the value of vaccines and **demand** immunization as their right and responsibility

SO3: Benefits of immunization are **equitably extended** to all people

SO4: **Strong** immunization **systems** are an integral part of a well-functioning health system

SO5: Immunization programmes have **sustainable access** to predictable funding, quality supply and innovative technologies

SO6: Country, regional and global **research and development innovations** maximize the benefits of immunization

2.3 Agreed goal: Measles elimination

2.3.1 Targets

- Countries and areas should make sustained, intensified efforts to accelerate progress towards achieving and sustaining measles elimination in accordance with the Regional Committee for the Western Pacific resolution WPR/RC63.R5; and
- The *Guidelines on Verification of Measles Elimination in the Western Pacific Region* should be used by the Regional Office for the Western Pacific and by Member States, with submission of annual progress reports by the national and subregional verification committees to the Regional Verification Commission as a means of monitoring progress or achievement of elimination.

2.3.2 Review of rationale

In 2003, the Regional Committee resolved to eliminate measles in the Western Pacific Region (WPR/RC54.R3), and in 2005 established 2012 as the target year for elimination (WPR/RC56.R8). The target year was reaffirmed in 2010 (WPR/RC61.R7) and in 2012 (WPR/RC63.R5). In the 2010 resolution, the Regional Committee urged Member States to establish independent national verification processes following the establishment of the standardized regional verification mechanism. The *Guidelines on Verification of Measles Elimination in the Western Pacific Region* were finalized during the second meeting of the Regional Verification Commission in March 2013. In the 2012 resolution, the Regional Committee urged Member States to establish national verification committees that regularly report to the Regional Verification Commission.

The first dose of routine measles-containing vaccine (MCV1) coverage in the Western Pacific Region increased from 96% in 2009 to 98% in 2012. The number of countries with $\geq 95\%$ MCV1 coverage increased from 12 (33%) in 2009 to 15 (42%) in 2012. The number of countries and areas that provide a routine second dose of measles-containing vaccine (MCV2) increased from 32 (89%) in 2009 to 33 (92%) in 2012, and the number reporting $\geq 95\%$ MCV2 coverage increased from 10 (28%) in 2009 to 11 (31%) in 2012.

Large-scale measles immunization campaigns from 2009 to 2012 provided measles vaccine to more than 226 million children and resulted in dramatic reductions in the number of reported confirmed measles cases. In addition, GAVI Alliance announced a window of support beginning in 2013 for measles-rubella (MR) SIAs covering children 9 months to 14 years of age, that will provide GAVI-eligible countries (Cambodia, the Lao People's Democratic Republic, Papua New Guinea, Solomon Islands and Viet Nam) with another opportunity to conduct a large-scale campaign.

Surveillance quality continues to improve with most indicators exceeding recommended targets at the Regional level. From 2009 to 2012, measles case-based surveillance was conducted in all 37 Western Pacific Region countries and areas, including 14 countries and two areas that report data individually, and 21 Pacific island countries and areas that report data as one epidemiological block.

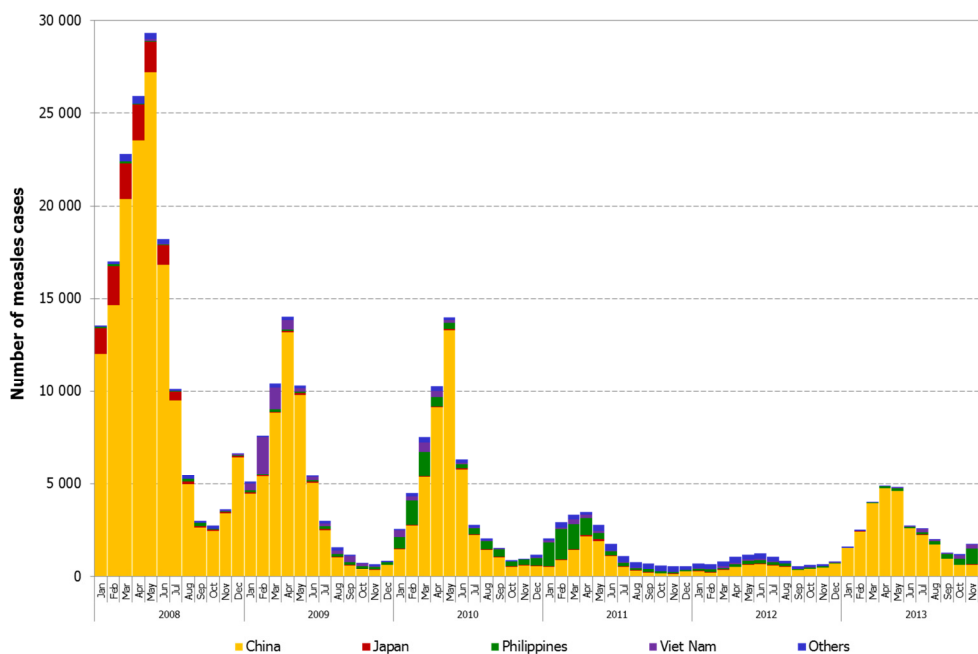
Measles surveillance data are reported monthly to WHO and supported by 385 laboratories participating in the WHO Global Measles and Rubella Laboratory Network. National measles laboratories support case-based surveillance and genetic characterization of measles virus strains.

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The number of countries and areas with adequate data that met the target for suspected cases discarded as non-measles per 100 000 population increased from seven (50%) of 14 in 2009 to nine (64%) of 14 in 2012. From 2009 to 2012, suspected cases with adequate investigations increased from 38% to 89%, suspected cases with adequate specimens collected for laboratory testing increased from 79% to 93%, and the proportion of blood specimens received by the laboratory with results available within seven days increased from 55% to 96%.

From 2009 to 2012, reported confirmed measles cases decreased by 82% from 61 297 to 10 794, and confirmed measles incidence per million population decreased by 83% from 34.0 to 5.9. In 2012, the highest confirmed measles incidence was reported from Malaysia (63.7 per million), the Philippines (15.9 per million) and New Zealand (12.3 per million). The number of confirmed cases reported from China, the country with the largest number of cases, decreased by 88% from 52 461 in 2009 to 6183 in 2012 (Fig. 2). However, measles cases in 2013-2014 have increased due to a resurgence in China, the Philippines and Viet Nam.

Fig. 2. Confirmed measles cases by month of rash onset reported in the Western Pacific Region, 2009–2013



2.3.3 Key challenges

- High population immunity is needed to eliminate measles. Coverage of $\geq 95\%$ with two doses of measles-containing vaccine (MCV1 and MCV2) is needed to eliminate transmission; countries may require SIAs.
- Endemic measles virus transmission continues in China, Malaysia and the Philippines. These three countries have over 80% of the Region's total population and none are eligible for GAVI Alliance support for combined measles-rubella SIAs.
- Measles elimination requires sensitive and timely detection and reporting of all measles cases using active case-based surveillance of suspected cases, with confirmation and typing through an accredited measles laboratory network.
- Sustaining elimination requires rapid response to measles outbreaks. In elimination settings, a single measles case indicates the presence of an outbreak. The approach to outbreak response immunization (ORI) varies depending on the level of susceptibility in the population of various age groups in the affected areas. The changing epidemiology of measles, including transmission in adults and young infants outside the target age of routine and supplementary measles vaccination activities, may need to be addressed to achieve elimination throughout the Region.

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2.3.4 Key challenges and link to GVAP strategic objectives

Key challenges in measles elimination	Link to relevant GVAP Strategic Objective (SO)					
	SO1 Country commitment	SO2 Understand and demand	SO3 Equitably extended to all	SO4 Strong systems	SO5 Sustainable access	SO6 Research and development
1. Endemic measles virus transmission	✓	✓	✓	✓	✓	
2. High population immunity needed	✓	✓	✓		✓	
3. Close surveillance gaps	✓			✓	✓	
4. Conduct rapid outbreak response	✓				✓	✓

SO1: **Countries commit** to immunizations as a priority

SO2: **Individuals and communities understand** the value of vaccines and **demand** immunization as their right and responsibility

SO3: Benefits of immunization are **equitably extended** to all people

SO4: **Strong** immunization **systems** are an integral part of a well-functioning health system

SO5: Immunization programmes have **sustainable access** to predictable funding, quality supply and innovative technologies

SO6: Country, regional and global **research and development innovations** maximize the benefits of immunization

2.4 Existing goal: Hepatitis B accelerated control

2.4.1 Target

- Reduce the seroprevalence of chronic hepatitis B infection, measured through hepatitis B surface antigen (HBsAg), to less than 1% in 5-year-old children by 2017.

2.4.2 Review of rationale

Before hepatitis B vaccine was introduced, hepatitis B transmission was hyperendemic throughout most of the Region, with infection rates in children exceeding 6%. As a result, the Region has one of the highest rates of liver disease in the world. Countries in the Region responded to this

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huge public health problem by being among the first to adopt hepatitis B vaccine and in 2003 endorsed the first WHO regional accelerated hepatitis B control goal.

By 2005, every country and area in the Region had included hepatitis B vaccination as part of their national immunization policy. By 2007, all countries included a timely birth dose as part of a three-dose vaccination schedule except for Japan and New Zealand, which conduct antenatal screening and targeted vaccination. The Region has steadily increased both birth dose and three-dose coverage and has the highest rates of vaccination coverage compared to other WHO regions. In 2011, 19 million children (85%) received a hepatitis B birth dose within 24 hours of birth, while 22 million (96%) children completed the three doses of hepatitis B vaccination.

Since the first regional hepatitis B control resolutions were adopted in 2003, 10 million chronic hepatitis B infections and 2.5 million future hepatitis B-related deaths have been prevented in the Region. Globally, the Western Pacific Region has the highest coverage with three routine doses of hepatitis B vaccine. Country commitments and actions towards controlling hepatitis B have led to this remarkable public health achievement. With this important progress in mind, technical advisory bodies have recommended to set 2017 as the target year to achieve a final control goal of less than 1% prevalence of chronic infection in 5-year-old children.

2.4.3 Key Challenges

Despite the successes, important work remains towards reaching the <1% goal. Hepatitis B is a highly transmissible virus and newborn infants and children have a high risk of acquiring chronic infection if they are exposed. This translates into two distinct but related public health interventions: administering birth-dose vaccination followed by at least two subsequent doses to complete protection against infections acquired during perinatal, infant and early childhood periods. Challenges in succeeding with these interventions are as follows:

- Many countries in the Region have not yet achieved 90% coverage with a hepatitis B birth dose within 24 hours of birth. This coverage level is estimated to be needed to achieve and sustain less than 1% hepatitis B seroprevalence. Key areas for increasing birth dose coverage include: 1) increasing the number of health facility deliveries; 2) using skilled birth attendants; and 3) integrating vaccination with essential newborn care.

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- Several countries have not reached the hepatitis B three-dose coverage target of at least 95% nationwide. Increasing three-dose coverage relates to strengthening routine immunization services in general.
- Raising awareness and resources for hepatitis B has been challenging. Reasons include the fact that HBV infection is largely silent in infants and children and liver disease is not always associated with HBV infection because of delayed onset.

2.4.4 Key challenges and link to relevant to GVAP strategic objectives

Key Challenges in hepatitis B accelerated control	Link to relevant GVAP Strategic Objective (SO)					
	SO1 Country commitment	SO2 Understand and demand	SO3 Equitably extended to all	SO4 Strong systems	SO5 Sustainable access	SO6 Research and development
1. Home births	✓		✓	✓	✓	✓
2. Birth attendants lack vaccination training					✓	✓
3. Policies not in place for birth attendants to vaccinate	✓			✓	✓	
4. Poor access to routine immunization	✓	✓	✓	✓	✓	✓
5. Poor awareness of benefits of vaccination	✓	✓	✓		✓	✓

- SO1: **Countries commit** to immunizations as a priority
SO2: **Individuals and communities understand** the value of vaccines and **demand** immunization as their right and responsibility
SO3: Benefits of immunization are **equitably extended** to all people
SO4: **Strong** immunization **systems** are an integral part of a well-functioning health system
SO5: Immunization programmes have **sustainable access** to predictable funding, quality supply and innovative technologies
SO6: Country, regional and global **research and development innovations** maximize the benefits of immunization

2.5 Agreed goal: Rubella elimination

2.5.1 Targets

- The Western Pacific Region should aim to eliminate rubella with a target date to be determined.
- All Member States that have not yet introduced rubella-containing vaccine in their routine immunization programmes should do so as soon as possible. Rubella case-based data should
- be submitted to the WHO Regional Office for the Western Pacific on a monthly basis beginning in January 2014.

2.5.2 Rationale

Despite control efforts in most countries in the Western Pacific Region, modelling estimates for 1996 and 2008 indicated that the number of infants born with congenital rubella syndrome (CRS) was stable at approximately 10 000 cases each year, according to unpublished data by E. Vinnicky. Applying defect rates from previous epidemics, one would expect from among 10 000 CRS cases that 5800 children would be born deaf and 1790 blind.

Rubella elimination has been shown to be technically feasible as the WHO Region for the Americas has verified elimination of rubella in all Member States. Measles elimination activities provide a unique opportunity to achieve simultaneous rubella elimination. GVAP calls for two WHO Regions by 2015 and five WHO Regions by 2020 to eliminate rubella in all of their countries and areas. Rubella elimination is defined as a period of >12 months without occurrence of CRS cases associated with endemic transmission in the presence of high-quality surveillance.

At the beginning of 2013, rubella-containing vaccine was routinely provided in all but six Western Pacific Region countries and areas. By 2015, all countries and areas of the Region are expected to have introduced rubella-containing vaccine into their routine immunization schedules. In addition, MR vaccine is planned for use in catch-up and follow-up campaigns in Cambodia, the Lao People's Democratic Republic, Papua New Guinea, the Philippines, Solomon Islands, Vanuatu and Viet Nam over the next three years. Beginning in 2013, GAVI Alliance will provide financial support

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for countries and areas to conduct a wide-age-range SIA using combined MR vaccine followed by the introduction of rubella vaccine in the national routine immunization programmes. Five of the six countries that have not yet introduced rubella-containing vaccine into the routine immunization programme are GAVI-eligible.

Currently, rubella is being integrated with measles surveillance and laboratory testing. In addition to confirmation of rubella cases, the regional measles and rubella laboratory network characterizes the rubella virus strain and supports rubella serosurveys and CRS surveillance. Reported numbers of rubella cases have been increasing, which is most likely a result of strengthened MR surveillance.

2.5.3 Key Challenges

- The Western Pacific Region does not yet have an elimination goal.
- Protection of two populations: In many countries, it will be necessary to provide rubella vaccination to children <15 years of age, while at the same time ensuring that women of reproductive age are protected. Financing for needed catch-up campaigns to close immunity gaps among women of reproductive age is unclear in countries not eligible for GAVI-support (note: GAVI is funding MR SIAs for those 9 months to 15 years).
- Many countries would like to transition away from SIAs to reliance on high routine vaccination delivery strategies to achieve immunization goals. It is unclear how long it would take to eliminate rubella and CRS through routine infant vaccination alone.
- The manner in which rubella vaccines are being introduced in some countries of the Region is not consistent with WHO recommendations and could inadvertently increase the risk of CRS by delaying infection and concentrating transmission among unimmunized women of childbearing age.
- Surveillance of rubella and CRS: Only a few countries have established CRS surveillance.

2.5.4 Key challenges and link to GVAP strategic objectives

Key challenges in rubella and CRS elimination	Link to relevant GVAP strategic objective (SO)					
	SO1 Country commitment	SO2 Understand and demand	SO3 Equitably extended to all	SO4 Strong systems	SO5 Sustainable access	SO6 Research and development
1. Establish an elimination target	✓	✓	✓	✓	✓	
2. Protect children with rubella vaccine	✓	✓	✓		✓	
3. Protect women of reproductive age	✓	✓			✓	✓
4. Rubella surveillance				✓		
5. CRS surveillance	✓			✓		✓

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 SO6: Country, regional and global **research and development innovations** maximize the benefits of immunization

2.6 Agreed goal: Introduction of new vaccines

2.6.1 Target

- All low- and middle-income countries introduce one or more new vaccines by 2020.²

2.6.2 Rationale

New vaccines have the potential to greatly increase the impact of national immunization programmes in the Region and prevent millions of additional illnesses and deaths. Substantial disease burden has been documented for JE, rotavirus and human papillomavirus (HPV) in countries of the

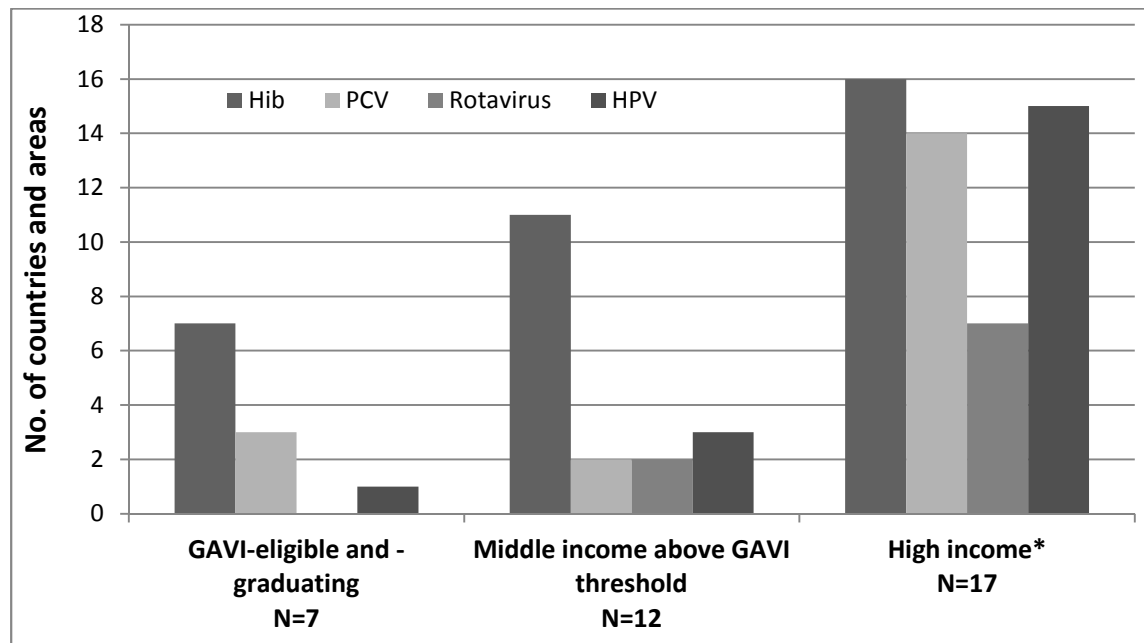
² The *Global Vaccine Action Plan* defines a new vaccine as one not currently included in a country's national immunization schedule.

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Western Pacific, and pneumococcus is estimated to cause substantial proportions of childhood pneumonia and meningitis cases. According to data from the WHO Regional Office for the Western Pacific, from 2009 to 2012, 40–60% of children hospitalized for gastroenteritis at sentinel hospital surveillance sites throughout the region have tested positive for rotavirus infection. Vaccination with HPV vaccines in countries of the Region would prevent an estimated two to 32 cervical cancer deaths and four to 52 cervical cancer cases per 1000 pre-adolescent girls vaccinated, according to recent findings. Other vaccines that countries may consider for introduction nationally or in selected populations include rubella, seasonal influenza, meningococcal conjugate, hepatitis A, oral cholera and typhoid polysaccharide vaccines. Vaccines likely to be licensed in the near future include dengue and typhoid conjugate vaccines.

Despite their potential impact, the introduction of new vaccines in the Region has been slow. Most countries now include *Haemophilus influenzae* type b (Hib) vaccine in their national immunization schedule, but national introductions of pneumococcal conjugate, rotavirus and HPV vaccines have been limited primarily to high-income countries (Fig. 5). Over 90% of the Region's population resides in countries classified by the World Bank as middle-income (average gross national income per capita US\$ 1026 to US\$ 12 475) and has little access to external support for new vaccines. New vaccines cost many times more per dose than traditional EPI vaccines. The addition of even one of these vaccines significantly increases the vaccine budget of a national immunization programme. Although high coverage has been reached through private sector use of several new vaccines, the benefit is limited to people who can afford to pay, thereby reinforcing economic and health inequities.

Fig. 5. Countries and areas that have introduced new vaccines, by income level, Western Pacific Region, 2013



*Including Pacific island countries and areas associated with the United States

One of the five goals of the Decade of Vaccines is to develop and introduce new and improved vaccines and technologies. Achievement of the part of the goal targeting vaccine introduction will be measured by the number of low- and middle-income countries that have introduced one or more new or underutilized vaccines. Targets for this global indicator are 90 low- and middle-income countries in 2015 and all low- and middle-income countries in 2020.

The complexity of the new vaccine landscape makes it increasingly difficult for countries to evaluate new vaccines for introduction. Epidemiologic analysis of disease burden and economic evaluation are critical components in evaluating and prioritizing new vaccines for introduction. Other steps in an evidence-based decision-making process include estimating costs and cost-effectiveness, assessing the role of other disease prevention and control measures, and considering vaccine characteristics, vaccine supply and the strength of the immunization programme and the health system. Specific disease control goals (e.g. polio eradication requiring use of IPV) are also important in prioritizing new vaccines for introduction. To facilitate a systematic approach to the process, and to achieve the Decade of Vaccines goal, countries should adopt evidence-based approaches and include these in national plans for introduction of new vaccines.

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Most estimates of the potential impact of new vaccines in the Region have been developed with little regional or country involvement, resulting in limited ownership and use of the data. Understanding of, and confidence in, the methods used to evaluate new vaccines for introduction is especially critical for middle-income countries, since these countries need to use the data to advocate for increased government funding for vaccines. Capacity-building to collect and use relevant data is an important strategy for achieving the Decade of Vaccines goal for new vaccine introduction.

Regional models such as the ProVac Initiative in the WHO Region of the Americas have been successful in building national capacity to evaluate new vaccines and to prioritize introduction using local data, and they have developed strategies and tools for doing so. Strategies to achieve a Western Pacific Region goal of evidence-based new vaccine introduction should encompass technical support to countries to develop evidence-based plans and capacity-building to sustain and strengthen the evaluation of new vaccines in the future. Establishing this goal would facilitate providing assistance to all countries of the Region rather than focusing only on GAVI-eligible countries.

2.6.3 Key challenges

- A plan to support countries to achieve the new vaccines introduction goal should define strategies and activities needed in the Western Pacific Region. Two major strategies may be the development of national plans for evidence-based new vaccine introduction and national capacity-building for evaluation of new vaccines. Provision of technical support will require substantial engagement of experts in vaccine-preventable disease epidemiology and surveillance, economic evaluation of vaccines and other areas, as well as resources to support this engagement.
- National plans for evidence-based introduction of new vaccines should address the epidemiologic and economic analysis required to assess the value of new vaccines, programmatic and operational issues including costing and financing, vaccine supply, prioritization of new vaccines, and the use of comprehensive approaches to reduce morbidity and mortality due to diarrhoea, pneumonia and cervical cancer. Development of these plans will require cross-disciplinary input and collaboration with both local and international experts.
- Country-specific data on the burden of diseases targeted by new vaccines are limited. However, synthesis of data from a variety of sources can provide an evidence base for determining the public health priority of many vaccines. Eight low- and middle-income countries participate in

- the Western Pacific Region networks for surveillance of rotavirus and invasive bacterial disease, developing important data on disease burden and distribution.
- Progress of this initiative may be monitored through the number of countries developing plans and introducing new vaccines, the total population living in countries that have introduced these vaccines and the total population receiving the vaccines. However, population coverage in this Region is largely driven by progress in China. For GVAP, progress in new vaccine introduction is monitored by counting the number of countries introducing vaccines.

2.6.4 Key challenges and link to GVAP strategic objectives

Key Challenges in evidence-based introduction of new vaccines	Link to relevant GVAP Strategic Objective (SO)					
	SO1 Country commitment	SO2 Understand and demand	SO3 Equitably extended to all	SO4 Strong systems	SO5 Sustainable access	SO6 Research and development
1. Development and implementation of regional initiative			✓	✓		
2. Development of national plans for appropriate introduction of new vaccines	✓	✓	✓	✓	✓	
3. Limited data and need for data synthesis				✓		✓
4. Domestic vaccine production capacity			✓		✓	
5. Approaches to monitor progress			✓	✓		

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SO3: Benefits of immunization are **equitably extended** to all people

SO4: **Strong** immunization **systems** are an integral part of a well-functioning health system

SO5: Immunization programmes have **sustainable access** to predictable funding, quality supply and innovative technologies

SO6: Country, regional and global **research and development innovations** maximize the benefits of immunization

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2.7 Additional goal: Meeting regional vaccination coverage targets

2.7.1 Proposed targets

- Reach $\geq 95\%$ national coverage for all vaccines used in the national immunization programmes, unless otherwise recommended, by 2020.
- Reach $\geq 90\%$ in every district or equivalent administrative unit for all vaccines used in the national immunization programmes unless otherwise recommended, by 2020.

2.7.2 Rationale

The vaccination coverage targets set by the *Global Immunization Vision and Strategy 2006–2015* (GIVS), endorsed by the World Health Assembly in 2005 in resolution WHA58.15, were $\geq 90\%$ national vaccination coverage and $\geq 80\%$ vaccination coverage in every district by 2010. These targets have been maintained and further elaborated in GVAP as $\geq 90\%$ national coverage and $\geq 80\%$ coverage in every district with three doses of DTP-containing vaccines by 2015, and $\geq 90\%$ national vaccination coverage and $\geq 80\%$ vaccination coverage in every district with all vaccines in national programmes, unless otherwise recommended, by 2020.

Global immunization goals have set vaccination coverage targets. Further, strengthening routine immunization service delivery is one of the highest national health priorities for many countries globally. In these contexts, many national immunization programmes in the Western Pacific Region have already set routine vaccination coverage targets of $\geq 90\%$ (China, Kiribati, the Lao People's Democratic Republic, Papua New Guinea and Solomon Islands) or $>95\%$ (Cambodia, Mongolia, the Philippines and Viet Nam) at the national level.

Sufficient vaccination coverage achieved and sustained by strong routine immunization service delivery is also a critical prerequisite for accelerating disease control and achieving and sustaining disease elimination. Coverage levels needed to achieve and sustain regional measles elimination are $\geq 95\%$ at the national level and $\geq 95\%$ in every district with two doses of MCV. Coverage levels needed to achieve the goal for hepatitis B accelerated control are $\geq 90\%$ at national level and $\geq 90\%$ in every district with the birth dose of hepatitis B vaccine (HepB), as well as $\geq 95\%$ at national level and $\geq 85\%$ in every district with the three doses of HepB.

2.7.3 Key Challenges

National vaccination coverage has steadily improved in many priority countries in the Region over the last five years. Twenty-one countries have already surpassed 90% coverage with three doses of diphtheria-tetanus-pertussis vaccine at the national level. However, the district coverage goal, i.e. $\geq 80\%$ vaccination coverage in every district, is yet to be achieved for many priority countries. While the proportion of districts with $>80\%$ vaccination coverage of MCV1 and DTP3 has increased in some countries since 2006–2007, a significant proportion of districts in many priority countries still have low coverage ($<50\%$ or 50–79%) for MCV1 and DTP3.

- In many countries, the system for registering newborn and community residents is not sufficiently reliable to target and vaccinate all eligible children. EPI in several countries still use estimates of target children at subnational levels, e.g. province and district levels, obtained from the estimated total population of a given area multiplied by the national universal birth rate. This method neither gives a reliable number of target children at subnational levels nor enables coverage at subnational levels to be correctly monitored and analysed.
- In several countries, certain provinces and/or districts continued to have significantly low vaccination coverage and were eventually affected by outbreaks of vaccine-preventable diseases. Constant weakness of immunization programmes in such provinces or districts may be caused by, among other things: (1) insufficient country commitment and support to the overall immunization programme; (2) insufficient external technical and financial support to high-priority areas in the country; (3) insufficient commitment and funding of local governments; (4) lack of technical and managerial capacity of mid-level health managers; (5) lack of human resources at peripheral levels; and (6) lack of communities' and individuals' knowledge on, demand for and involvement in immunization services.
- There is insufficient synergy between routine immunization programmes and specific disease control or elimination initiatives in immunization planning, financing and implementation. While many countries in the Region have planned, invested in and carried out several large-scale SIAs with MCV in an effort to strengthen their routine immunization programmes in the 10 years since the regional measles elimination initiative started in 2003, several countries in the Region were affected by large measles outbreaks from 2009 to 2012.

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- Several countries lack a reliable system for recording and tracking the vaccination status of each individual (e.g. up-to-date vaccination card). The record of vaccination status of each individual should be kept and updated, not only for establishing and effectively implementing a life-course approach to immunization such as school-based immunization but also for planning and implementing high-performance SIAs.

2.7.4 Key challenges and link to GVAP strategic objectives

Key challenges in meeting regional vaccination coverage targets	Link to relevant GVAP strategic objective (SO)					
	SO1 Country commitment	SO2 Understand and demand	SO3 Equitably extended to all	SO4 Strong systems	SO5 Sustainable access	SO6 Research and development
1. Unreliable population estimates at sub-national levels or lack of reliable nationwide birth and civil registration system				✓		
2. Existence of provinces and districts with constantly weak immunization programme		✓	✓	✓		
3. Lack of reliable system to monitor and evaluate performance of immunization programme of each district (and community)	✓		✓		✓	
4. Insufficient synergy between routine immunization programmes and specific disease control or elimination initiatives in immunization planning, financing and implementation	✓			✓	✓	
5. Lack of reliable system for recording and tracking each individual vaccination status (e.g. up-to-date vaccination card)			✓			

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SO6: innovative technologies
Country, regional and global **research and development innovations** maximize the benefits of immunization

2.8 Additional goal: Accelerated control of Japanese encephalitis

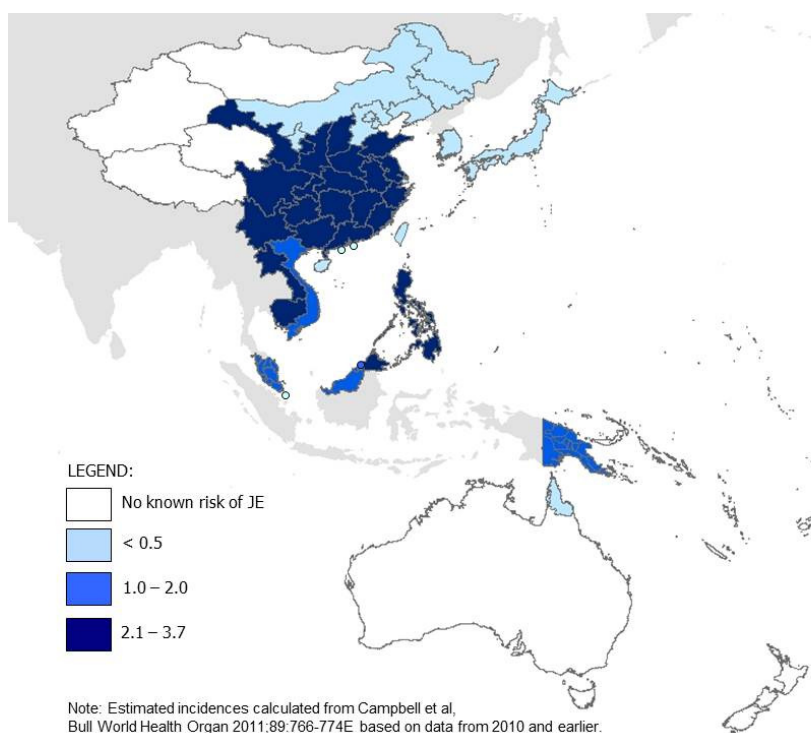
2.8.1 Proposed targets (to be further specified following technical consultation)

- Accelerate the control of Japanese encephalitis (JE) by extending vaccination to all JE risk areas where JE incidence exceeds very low levels.
- Reach regional vaccination coverage targets with the primary series of JE vaccine in routine immunization programmes, and $\geq 90\%$ coverage for a primary series of JE vaccine among children under 15 years old in each country's JE risk area overall, by a year to be determined.
- Consider an incidence target of less than 0.5 per 100 000 children under 15 years old in every national or subnational JE risk area, by a year to be determined.

2.8.2 Rationale

Japanese encephalitis is a leading cause of viral encephalitis in the Western Pacific Region and is highly fatal with a proportional case fatality ratio of 20–30%; an additional 20–25% of patients with encephalitis survive the illness but have long-term neurological sequelae. The Western Pacific Region accounts for more than half of the 68 000 cases estimated to occur globally each year. Elimination of JE transmission is not possible due to the zoonotic cycle of infection. However, experience in Japan and the Republic of Korea has demonstrated that the incidence of human disease can be reduced to very low levels by a vaccination programme with high coverage among young children (Fig. 3).

Fig. 3. Estimated JE incidence in the Western Pacific Region, 2011

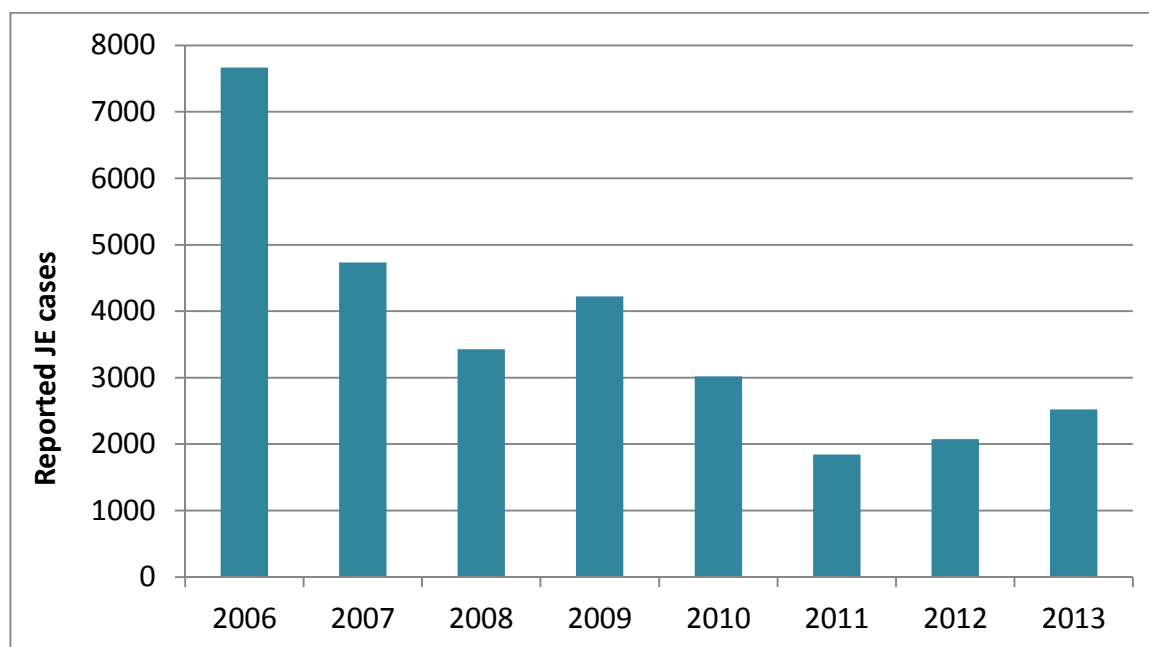


As of 2013, sentinel or national surveillance for JE had been established in nearly all countries in the Region with known or suspected endemic JE transmission. A network consisting of 20 WHO-accredited JE laboratories has been established to provide quality testing for JE surveillance. Among children attending sentinel surveillance hospitals in the Region, 13–21% of suspected meningitis/encephalitis cases from 2009 to 2012 were confirmed as JE.

Several live and inactivated JE vaccines are now licensed in the Region. Four countries (China, Japan, the Republic of Korea and Viet Nam) manufacture JE vaccine. With the recent availability of new Japanese encephalitis vaccines, including two WHO-prequalified vaccines, countries have expanded initiatives to vaccinate at-risk populations. Four of the 12 countries with endemic JE transmission have introduced JE vaccine in all JE risk areas (Australia, China, Japan and the Republic of Korea), and five have introduced JE vaccine or made it available in some JE risk areas (Brunei Darussalam, Cambodia, the Lao People’s Democratic Republic, Malaysia and Viet Nam). One country has controlled JE with other measures. Numbers of reported JE cases have been declining in the Region (Fig. 4), primarily due to expansion of vaccination coverage in China and Viet Nam.

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Fig. 4. Number of JE cases reported by countries and areas in the Western Pacific Region, 2006–2013



Source: WHO/UNICEF Joint Reporting Form on Immunization

2.8.3 Key challenges

- Proposed targets for incidence and coverage are based on a preliminary analysis and should be refined based on review of the scientific literature and expert consultation. A JE accelerated control strategy for the Western Pacific Region should define the strategies and actions necessary to achieve this goal.
- There are currently two WHO-prequalified JE vaccines, only one with an indication for the full paediatric age range. While several countries use domestically produced vaccines, most depend on vaccines available for purchase on the international market and several have expressed a strong preference for a WHO-prequalified product. In addition, booster dose requirements for the currently available JE vaccines are not fully known.
- Rapid reduction in JE disease burden requires a wide age-range campaign for children under 15 years old in endemic areas, followed by integration of JE vaccine into routine immunization programmes. Implementation of a large campaign and integration of this additional vaccine into routine programmes require both country commitment and substantial financial and human resources.

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- JE surveillance is fragmented among a number of different systems including national notifiable disease reporting systems, sentinel JE surveillance systems and sentinel meningitis-encephalitis surveillance. Case definitions, testing algorithms and reporting are not fully standardized across the systems. Data for monitoring progress toward an incidence-based accelerated JE control goal are available from a limited number of countries. If an incidence target is chosen, a process for incidence estimation will be needed to determine if the target has been reached.

2.8.4 Key challenges and link to GVAP strategic objectives

Key challenges in Japanese encephalitis accelerated control	Link to relevant GVAP strategic objective (SO)					
	SO1 Country commitment	SO2 Understand and demand	SO3 Equitably extended to all	SO4 Strong systems	SO5 Sustainable access	SO6 Research and development
1. Need for expert consultation to further define targets and strategies	✓		✓	✓	✓	
2. No WHO-prequalified vaccine					✓	✓
3. Resources for campaign and ongoing routine immunization	✓		✓			
4. Harmonization and strengthening of surveillance data				✓		

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3. Framework for implementation of the Global Vaccine Action Plan in the Western Pacific Region

In an effort to determine and enumerate priority GVAP activities and propose a regional framework of action for implementation of GVAP so as to achieve GVAP strategic objectives in the Western Pacific Region and accelerate progress towards the Region's immunization goals, the EPI team of WHO Regional Office for the Western Pacific reviewed GVAP strategies and activities from the viewpoint of relevance to immunization goals and conducted a regional survey with WHO country staff and national EPI managers from October 2012 to February 2013 to determine the status of implementation of GVAP activities at the country level and technical assistance needs. Some strategies and activities are aligned with specific immunization goals, while others are not. Similarly, some GVAP strategies and activities have been already implemented by many countries, and others are not relevant to most countries in the Region.

This section summarizes GVAP activities relevant to the Region's immunization goals, their implementation status at the country level and technical assistance needs. Then, a series of priority actions are proposed to achieve GVAP strategic objectives in the Western Pacific Region and to accelerate progress towards achieving immunization goals through implementation of priority GVAP activities.

3.1 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 national immunization plans are fully integrated into national health plans, with appropriate budgets and formulated with stakeholder participation; 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.

GVAP recommends countries to carry out three strategies with 13 associated activities to ensure and strengthen national commitment to immunization as a priority (Table 1).

Table 1. Strategies and activities for GVAP Strategic Objective 1

1-1. Establish and sustain commitment to immunization.	1-2. Inform and engage opinion leaders on the value of immunization.	1-3. Strengthen national capacity to formulate evidence-based policies.
<p>Ensure legislation or legal framework in all countries, including provisions for a budget line for immunization, and for monitoring and reporting.</p> <p>Develop comprehensive national immunization plans that are part of overall national health plans through a bottom-up process that includes all stakeholders.</p> <p>Set ambitious but attainable country-specific targets within the context of morbidity and mortality reduction goals.</p> <p>Scrutinize, defend and follow more closely immunization budgets, disbursements and immunization programme activities.</p> <p>Support local civil society organizations and professional associations to contribute to national discussions on immunization and health.</p>	<p>Explore models to promote collaboration between the stakeholders that generate evidence on immunization and those who use it in order to set priorities and formulate policies.</p> <p>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.</p> <p>Develop and disseminate the evidence base for the broad economic benefits of immunization for individuals, households, communities and countries.</p> <p>Include immunization in the agendas of governing body meetings at all levels and in other social, health and economic forums.</p>	<p>Create, or strengthen existing, independent bodies that formulate national immunization policies, for example, national immunization technical advisory groups or regional technical advisory groups.</p> <p>Develop more effective ways for national regulatory agencies, health sector coordination committees and interagency coordination committees to support immunization programmes as part of disease control programmes and preventive health care.</p> <p>Create regional forums and peer-to-peer exchange of information, best practices and tools.</p> <p>Create expanded and more transparent mechanisms for aggregating, sharing and using information to monitor commitments</p>

3.1.1 Contribution of GVAP activities to immunization goals

All five GVAP-recommended activities under Strategy 1-1 – establish and sustain commitment to immunization – and three of four GVAP-recommended activities under Strategy 1-3 – strengthen national capacity to formulate evidence-based policies – are considered critical or needed

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for almost all disease-specific control initiatives and to strengthen routine immunization programmes. Most of these are also considered critical or needed for new vaccine introduction:

- ensuring legislation or legal framework;
- developing comprehensive national immunization plans;
- setting ambitious but attainable country-specific targets;
- scrutinizing, defending and following immunization budgets, disbursements and immunization programme activities;
- supporting local civil society organizations and professional associations to contribute to national discussions on immunization and health;
- creating or strengthening existing, independent bodies that formulate national immunization policies;
- creating regional forums and peer-to-peer exchange of information, best practices and tools; and
- creating expanded and more transparent mechanisms for aggregating, sharing and using information to monitor commitments.

For many disease-specific control initiatives and new vaccine introduction, the following three GVAP-recommended activities under Strategy 1-2 – inform and engage opinion leaders on the value of immunization – are also considered critical or needed:

- promoting collaboration among the stakeholders to generate evidence on immunization and those who use it in order to set priorities and formulate policies;
- developing and disseminating the evidence base for the broad economic benefits of immunization; and
- including immunization in the agendas of governing body meetings at all levels and in other social, health and economic forums.

For evidence-based introduction of new vaccines, the following activity is also considered critical:

- Developing and disseminating 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.

3.1.2 Status of and needs for implementation of GVAP activities in the Western Pacific

Region

Twenty countries responded to the Regional survey of GVAP implementation status. Of these, 11 countries have developed legislation or a legal framework, including provisions for a budget line for immunization. Eight of nine Pacific island countries and areas have a budget line for immunization. Eight countries need technical assistance to estimate immunization costs and learn from experiences of other countries. Almost all countries responding to the survey (19 of 20) have developed and have been implementing a comprehensive national immunization plan, including country-specific targets. Most countries answered that they had established a system to monitor immunization budgets, disbursements and immunization programme activities, and had been supporting local civil society organizations and professional associations to contribute to national discussions on immunization and health. Some countries noted a need to strengthen such systems and activities.

Box 1-1. National commitment and national immunization planning in Papua New Guinea

Papua New Guinea has significant geographical constraints, with 17% of the population having no access to the road system. Growing mineral and liquid natural gas wealth has not yet translated into significant improvement in the country's Human Development Index.

The Government of Papua New Guinea has recently emphasized improvement of the health system through rural primary health care services, including investment in midwifery schools and community health training. Papua New Guinea has a strong system of evidence-based decision-making through the Child Health Advisory Group and Interagency Coordinating Committee.

Government commitment to research and development includes a partnership between the Papua New Guinea Institute of Medical Research, universities, WHO and the Australian Government Department of Foreign Affairs and Trade (DFAT). WHO and DFAT provide technical and financial support to improve the routine immunization system in collaboration with the Government of Papua New Guinea and development partners.

The Government's funding of the third round of tetanus toxoid campaign, full procurement of routine vaccines and around 50% (more than required) co-financing of pentavalent vaccine demonstrates the sustainability of this programme.

The Government has integrated interventions such as deworming and vitamin A supplementation into the campaigns to use resources efficiently. Based on lessons learnt from this experience and with technical support from WHO, an integrated EPI and maternal and child health outreach activity will form the basis for strengthening the country's routine immunization programme.

Most countries among those responding to the Regional survey (17 to 19 of 20) have carried out several activities for developing and disseminating an evidence base on the public health value of vaccines and immunization and the economic benefits of immunization, while many countries need technical assistance to further expand the evidence base, including to collect, analyse and disseminate

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evidence. Most countries responding to the survey (18 of 20) have already included immunization in the agendas of governing body meetings while some Pacific island countries and areas (such as Fiji, Guam, Niue and Tokelau) need external support for this activity.

Most non-Pacific island countries and areas responding to the survey (10 of 11) have established or are planning to establish national immunization technical advisory groups (NITAGs). Among nine Pacific island countries and areas responding to the survey, five have NITAGs or an independent body and two plan to establish NITAGs. Cambodia and the Lao People's Democratic Republic need technical assistance to establish a NITAG. Several countries and areas (Fiji, Mongolia, Niue, the Philippines, Solomon Islands and Tokelau) need technical assistance and advocacy to strengthen existing bodies. Many non-Pacific island countries and areas responding to the review (7 of 11) have an established interagency coordinating committee (ICC) or a health sector coordinating committee (HSCC). Among them, the Philippines needs to harmonize the work of its ICC. Among nine Pacific island countries and areas responding to the survey, four have developed ICCs/HSCCs, but they require further strengthening. National regulatory authorities (NRAs) should be: established in the Lao People's Democratic Republic and Mongolia; assessed in Viet Nam with standard WHO monitoring; and strengthened in Cambodia and Papua New Guinea. Several countries and areas (Cambodia, the Lao People's Democratic Republic, Mongolia, Niue, Papua New Guinea, the Philippines and Viet Nam) need technical assistance to establish or strengthen NRA functions.

Box 1-2. National immunization programme reform in Japan – establishment of a National Immunization Advisory Group

Partially due to a series of lawsuits against the Government for adverse events following immunization (AEFI) in the 1990s, the national immunization programme in Japan lagged behind other developed countries in introducing new vaccines into the routine vaccination schedule. To address this issue, a reform of the national immunization programme was initiated in 2010. After three years of deliberations, the Immunization Law was amended and enacted in April 2013. The reform has four major components: (1) development of a national immunization plan; (2) introduction of three new vaccines into the routine vaccination schedule (HPV vaccine, Hib vaccine and pneumococcal conjugate vaccine); (3) establishment of a system for mandatory reporting of AEFI; and (4) creation of the Immunization and Vaccine Committee of the Health Science Council, to provide technical advice to the Ministry of Health, Labour and Welfare for development of national immunization policies.

The committee has three subcommittees on: (1) overall direction of immunization policy; (2) research and development of vaccines; and (3) evaluation of AEFI. Members of the committee include medical experts, representatives from local government, a health economist, a lawyer and a media representative. Governmental organizations, academia, manufacturers, wholesalers and consumer representatives are invited as presenters as necessary. Key issues presently under discussion in the committee include development of a five-year national immunization plan, introduction of additional new vaccines into the routine vaccination schedule (chicken pox and pneumococcal polysaccharide vaccines are scheduled to be introduced in October 2014), evaluation of AEFI, and future directions for vaccine research and development.

3.1.3 Priority actions for the Western Pacific Region

To achieve GVAP Strategic Objective 1 in the Western Pacific Region and to accelerate achievement of the regional immunization goals, the following priority actions are proposed to be carried out in collaboration with Member States and other stakeholders.

- 1-1. Develop the evidence base on the public health value of vaccination and the economic benefits of immunization at regional level and ensure the evidence is widely utilized by Member States and stakeholders.
- 1-2. Establish and strengthen independent national bodies (or an inter-country body for small countries and areas if necessary and feasible) to formulate evidenced-based national immunization policies.
- 1-3. Develop comprehensive multi-year plans for the national immunization programme with accurate estimates of costs and financial commitments needed to achieve national immunization goals.

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- 1-4. Develop detailed national plans of action to achieve each regional immunization goal and integrate them into comprehensive multi-year plans for the national immunization programme.

- 1-6. Increase advocacy for immunization financing; particularly for (1) scaling-up strategies that have been shown to be effective in reaching socially marginalized populations; (2) accelerating the introduction of new vaccines in middle-income countries; and (3) strengthening overall political commitment to immunizations in Pacific island countries and areas.

- 1-7. Involve local civil society organizations and professional associations to contribute to national discussions on immunization and health.

- 1-8. Further strengthen existing, or establish new if necessary and feasible, regional forums and mechanisms for peer-to-peer exchange of information, best practices and tools.

3.2 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 of the planning and implementation of programmes in their local communities. Although there has generally been a high demand for vaccination services, accessing hard-to-reach populations, attaining higher coverage levels and achieving equity objectives require additional approaches to stimulate demand for vaccination.

GVAP recommends countries to carry out three strategies with 12 associated activities to achieve strategic objective 2 (Table 2).

Table 2. Strategies and activities for GVAP Strategic Objective 2

<p>2-1. Engage individuals and communities on the benefits of immunization and hear their concerns.</p> <p>Engage in a dialogue which both transmits information and responds to people’s concerns and fears.</p> <p>Utilize social media tools and lessons learnt from commercial and social marketing efforts.</p> <p>Leverage new mobile and Internet-based technologies.</p> <p>Include immunization in the basic education curriculum.</p> <p>Conduct communications research.</p>	<p>2-2. Create incentives to stimulate demand.</p> <p>Create incentives for households and health workers in favour of immunization, where appropriate, while respecting the autonomy of beneficiaries (for example, cash or in-kind transfers, bundling of services, media recognition).</p> <p>Conduct social research to improve the delivery of immunization services and the ability to meet the needs of diverse communities.</p> <p>2-3. Build advocacy capacity.</p> <p>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).</p>	<p>Train health care workers in 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.</p> <p>Engage, enable and support in-country civil society organizations to advocate the value of vaccines to local communities and policy-makers and local and global media.</p> <p>Create national or regional advocacy plans that involve in-country civil society organizations.</p> <p>Link global, national and community advocacy efforts with professional and academic networks</p>
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3.2.1 Contribution of GVAP activities to immunization goals

Strategic Objective 2 relates to the achievement of newly proposed regional targets and current EPI coverage targets reflected in national immunization programmes. The proposed actions will have a positive impact on immunization coverage rates, even in countries with high coverage rates, and particularly for more marginalized populations.

The strategies are intended to: generate demand by explaining the benefits of immunization; listen to the concerns of individuals and communities on immunization; create incentives and stimulate demand; and build advocacy capacities to advocate the value of vaccines. Therefore these activities should lead to: 1) increasing numbers of children being vaccinated; and 2) building capacities to counteract growing anti-vaccination lobbying groups by increasing understanding of the value of vaccines and of the danger of diseases. This will strengthen vaccine-preventable diseases elimination programmes and the introduction of new vaccines

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3.2.2 Status of and needs for implementation of GVAP activities in the Western Pacific Region

Several GVAP activities for this strategic objective are being implemented in selected countries with encouraging results. Many of these activities are conducted by staff with minimal or no training in the area and while performing their regular work. This is encouraging because many developing countries in the Region do not have budgetary capacity to create communications and advocacy posts. Funding for immunization programmes in the Region is mostly earmarked for direct service delivery activities. For countries to adopt all of the proposed activities, sustained human and financial resources will be required for several years.

Many countries are working to engage individuals and communities, and would like more external support for this work. Many countries have begun expanding public access to information about immunizations and would like technical assistance to conduct research to develop more effective communication strategies for the following GVAP activities:

- engaging in a dialogue that both transmits information and responds to people's concerns and fears;
- utilizing social media tools and lessons learnt from commercial and social marketing efforts;
- leveraging new mobile and Internet-based technologies;
- including immunization in the basic education curriculum; and
- conducting communications research.

Creating incentives to stimulate demand is critical to achieving regional goals. Many countries are engaged in implementing and evaluating strategies to increase community demand for immunizations. Many countries indicated the need for assistance to conduct research to improve delivery of immunization services and conduct the following GVAP activities:

- creating incentives for households and health workers in favour of immunization, where appropriate, while respecting the autonomy of beneficiaries (for example, cash or in-kind transfers, bundling of services, media recognition);
- conducting social research to improve the delivery of immunization services and the ability to meet the needs of diverse communities; and

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- recruiting new voices, including those of educators, religious leaders, traditional and social media personalities, family physicians, community health workers and trained immunization champions, among others.

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Box 2-1. Incentives for households – a programme for conditional cash transfer in the Philippines

The Government of the Philippines uses conditional cash transfers as household incentives for immunization. The *Pantawid Pamilyang Pilipino* programme provides cash transfers to poor households, conditional upon investments in child education and health and use of maternal health services. The objective of the programme is to break the intergenerational transmission of poverty while providing immediate financial support to the household. Specific objectives are to keep children in school, keep children healthy and invest in the future of children. Poor households are identified through a transparent mechanism using a statistical model to estimate income. Households with children under 15 years old and/or a pregnant woman are identified and receive cash grants of Philippine pesos 500 to 1400 per household per month, depending on the number of eligible children.

A 2012 World Bank evaluation found that the programme enabled poor households to keep children 3 to 11 years old in school; reduced severe stunting among young children (6–36 months); increased health facility visits of children under 5 years old for growth monitoring, vitamin A supplementation and deworming; and increased the use of antenatal and postnatal care services. The study did not find significant improvements in the use of skilled or facility-based child delivery or in immunization coverage. Stronger coordination with local health care providers may be required to ensure that mothers and children receive all the intended basic health services. To strengthen the programme, community health teams have been established to assess health needs, deliver health messages and facilitate health service access.

Building advocacy capacity by training front-line health workers in effective communication techniques and recruiting new voices to champion immunizations is important in the Region. This could include school-entry immunization requirements, in which teachers become powerful new advocates for immunizations, and thus increase community demand, and other GVAP measures including:

- training health care workers in 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;
- engaging, enabling and supporting in-country civil society organizations to advocate the value of vaccines to local communities and policy-makers and local and global media;
- creating national or regional advocacy plans that involve in-country civil society organizations; and
- linking global, national and community advocacy efforts with professional and academic networks.

Box 2-2. Social media tools and National Immunization Week for advocacy in China

Challenges faced by the China National Immunization Programme include parental unfamiliarity with vaccine-preventable diseases, the ability of the Internet to spread misinformation about vaccines and immunization, and reaching migrant and minority children. To address these challenges, the Programme actively uses social media to promote immunization efforts for routine immunization and for polio and measles campaigns. The purpose of social media efforts is to improve parental awareness of the importance of immunization, allay parental anxiety about vaccines and immunization, increase vaccination coverage levels, and control vaccine-preventable diseases. Strategies used include advocacy among government leaders, cooperation across sectors, use of media tools and international cooperation. Several powerful examples of the use of these strategies include the Xinjiang polio outbreak of 2011, the measles SIA of 2010 and the vaccination response to the H1N1 influenza pandemic.

China has celebrated National Immunization Day annually since 1986. Each National Immunization Day (later changed to National Immunization Week) has been characterized by a theme. In 2013, the theme was “health care and immunization,” and involved television, online and print communications. The China National Immunization Programme has also promoted World Hepatitis Day with workshops, television and online communication. The programme is also working with the WHO China office and United States Centers for Disease Control and Prevention on a study of parental confidence in vaccines and immunization. China is also conducting multi-year strategic planning on health risk communication to support immunization efforts. This planning includes media outreach, research on public and stakeholder concerns, and strengthening multisectoral collaboration.

3.2.3 Priority Actions for the Western Pacific Region

To achieve GVAP Strategic Objective 2 in the Western Pacific Region and to accelerate achievement of the immunization goals, the following priority actions are proposed to be carried out in collaboration with Member States and other stakeholders.

- 2-1. Evaluate the results of social media efforts during Immunization Week and develop a plan to use the most effective tools in countries with the capacity to use social media.
- 2-2. Expand use of web-based technologies to disseminate public information on the value of immunizations.
- 2-3. Assess the use of cash incentives for households and for health care workers in terms of impact to improve and maintain immunization coverage levels and utilize incentive mechanisms, if appropriate and feasible.
- 2-4. Promote conduct of social research to identify factors affecting demand for immunizations and to guide development of more effective communication strategies.

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- 2-5. Include locally tailored education on the benefits of immunization into national initiatives to “reach every” district, village, community and/or child, as well as into the basic education curriculum.
- 2-6. Develop a curriculum for health care workers on effective communication techniques.

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

Achieving this strategic objective will mean that every eligible individual is immunized with all appropriate vaccines – regardless 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 marginalized 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. Disease eradication and elimination goals cannot be met without achieving and sustaining high and equitable coverage.

GVAP recommends countries to carry out two strategies with 11 associated activities to achieve strategic objective 3 (Table 3).

Table 3. Strategies and activities for GVAP Strategic Objective 3

<p>3-1. Develop and implement new strategies to tackle inequities.</p> <p>Recast “Reaching Every District” to “Reaching Every Community” in order to deal with inequities within districts.</p> <p>Engage underserved and marginalized groups to develop locally tailored, targeted strategies for reducing inequities.</p> <p>Introduce appropriate new vaccines into national immunization programmes (see also Strategic Objective 5).</p> <p>Establish a life-course approach to immunization planning and implementation, including new strategies to ensure equity across the life span.</p>	<p>Prevent and respond to vaccine-preventable diseases during disease outbreaks and humanitarian crises, and in conflict zones.</p> <p>3-2. Build knowledge base and capacity for enabling equitable delivery.</p> <p>Track each individual’s immunization status, leveraging immunization registries, electronic databases and national identification number systems.</p> <p>Take advantage of community structures to enhance communication and deliver services (for example, traditional birth attendants, birth registries).</p> <p>Involve civil society organizations in community outreach and planning.</p>	<p>Develop new approaches to community engagement for urban and peri-urban areas.</p> <p>Train health workers and civil society organizations in engaging communities, in identifying influential people who can assist in planning, organizing and monitoring health and immunization programmes, as well as community needs, and in working with communities to meet those needs.</p> <p>Conduct operational and social science research to identify successful strategies to reduce inequities and improve the quality and delivery of immunization services.</p>
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3.3.1 Contribution of GVAP activities to immunization goals

Several activities for this strategic objective are considered critical or needed to achieve most of the Region’s immunization goals. These GVAP activities are:

- recasting “Reaching Every District” to “Reaching Every Community”;
- engaging underserved and marginalized groups to develop locally tailored, targeted strategies for reducing inequities;
- establishing a life-course approach to immunization planning and implementation;
- tracking each individuals’ immunization status;
- taking advantage of community structure to enhance communication and delivery services; and
- preventing and responding to vaccine-preventable diseases during disease outbreaks and humanitarian crises, and in conflict zones.

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To achieve sustained polio-free status and routine vaccination coverage goals, the following activities are also critical or needed:

- involving civil society organizations in community outreach and planning;
- developing new approaches to community engagement for urban and peri-urban areas; and
- training health workers and civil society organizations to engage communities, identify influential people and work with communities.

The activity to introduce appropriate new vaccines into national immunization programmes is critical for; (1) sustaining polio-free status (IPV for the polio endgame); (2) rubella elimination (rubella-containing vaccine); (3) accelerated JE control (JE vaccine); and (4) introduction of new vaccines.

3.3.2 Status of and needs for implementation of GVAP activities in the Western Pacific Region

In 2002, WHO, UNICEF and other partners introduced the concept of Reaching Every District (RED), a first step toward achieving more equitable coverage throughout the country. The RED strategy has been expected to expand the provision of immunization services and close immunization gaps at subnational levels by: (1) re-establishing outreach services; (2) providing supportive supervision; (3) engaging with communities; (4) monitoring and use of data; and (5) district planning and resource management.

Several countries in the Western Pacific Region with a high proportion of provinces and districts with suboptimal vaccination coverage have started to adopt and implement the RED strategy to improve vaccination coverage at national and subnational levels. Using and further developing the RED strategy, these countries have been trying to take advantage of community structures to enhance communication and delivery of services; engage underserved and marginalized groups to develop locally tailored, targeted immunization strategies; involve civil society organizations in community outreach and planning; identify and enrol target children in underserved communities and groups; and monitor and trace individuals' immunization status.

Box 3-1. Strategy to Reach Every High-risk Community in Cambodia

Cambodia's Strategy to Reach Every High-risk Community is key for achieving national immunization goals, including measles elimination. In 2010, a national EPI review was used to identify characteristics of population groups that were underserved, marginalized and thus at risk for being under-immunized. These groups were found to be the urban poor, remote rural ethnic communities and migrant workers. Over 2000 high-risk communities were mapped and then prioritized during a measles SIA in 2011. During the SIA, routine immunization data were collected from immunization cards of over 32 500 children under 2 years old. These data were used to assign a specific risk status to each community; 1600 communities were identified as high-risk for under-immunization.

Cambodia's Strategy to Reach Every High-Risk Community relies on micro-planning at health centres to prioritize high-risk communities for immunization. Oversight and management takes place at national, provincial and district levels, and implementation relies on close cooperation with community and village volunteers.

A link with measles elimination occurs at the second routine measles (MCV2) dose during outreach sessions in high-risk communities. The MCV2 dose is given to children 18 to 23 months old and is used as an opportunity for systematic checks of immunization status and administration of missed vaccine doses. The results are encouraging: Cambodia has had no measles cases since November 2011, and in 2012 national coverage for the third dose of DTP reached to 95% with only 15% of districts having coverage below 80%.

Box 3-2. Engagement of health workers, civil society and communities by Reaching Every District strategy in Mongolia

In Mongolia, the Reach Every District (RED) strategy engages health workers, civil society and communities with health and welfare services. The country's harsh climate and low population density make the delivery of health services challenging.

Mongolia initiated the RED strategy implementation in 2008 with a goal of improving access to immunization and maternal and child health services in the most difficult-to-reach populations. Specific objectives of the RED strategy in Mongolia are: re-establishing outreach vaccination services; providing supportive supervision; linking services with communities; monitoring and using data for action; and planning and managing resources. However, Mongolia's RED strategy goes beyond immunization and includes other health programmes (integrated management of childhood illness, antenatal care and nutrition) and social welfare services. The strategy has engaged health care workers for local coordination and service delivery, international and national civil society organizations for social welfare services, and health volunteers and communities to map hard-to-reach populations. Currently, six provinces and five city districts are implementing the RED strategy with support from WHO, UNICEF and GAVI Alliance.

Areas implementing the RED strategy have reduced infant and child mortality and have improved coverage for routine vaccination and antenatal care. However, the absence of mechanisms for partnership and joint funding between the health and social sectors remains a challenge. To address these challenges, Mongolia plans to link social welfare and health services for communities through a "one window" approach, assign a national RED focal point, and provide financial sustainability for RED implementation by revising health-care financing formulas.

Many countries responding to the Regional survey on GVAP implementation answered that they carry out these activities without need for external support. However, several countries said that

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they would further strengthen and or scale up these activities. This will require external support in the next few years.

A “life-course” approach must also be taken in order to make the benefits of immunization available to all those at risk in each age group. As diseases are being successfully controlled through infant immunization, the need to boost immunity and to sustain and extend these gains is increasingly being recognized for new and existing vaccines that are beneficial for school children, adolescents and adults at special risk.

In the Western Pacific Region, primary school attendance is 96%, the highest rate of the six WHO Regions. Although not a substitute for timely infant vaccination, school entry requirements provide assurance of immunizations at key points in life and can greatly increase community awareness of, and demand for, immunizations.

Box 3-3. Malaysian School Health Programme

The School Health Programme in Malaysia included immunization as a critical component. The ministries of Health and Education established the Joint Committee on School Health in 1968 and school health teams in 1972. The Prevention and Control of Infectious Disease Act of 1988 provided further legislative support for the programme.

The Malaysian School Health Programme aims to create a healthy environment in the school, to optimize children’s health status, to detect health problems and disabilities in school children, and to build partnerships in health. To achieve these objectives, the Ministry of Health coordinates or provides health education, health screening, vaccination, curative and referral services, dental health services, and environmental health services, while the Ministry of Education addresses nutrition and health education through the curriculum.

The school health immunization programme is one component of school health services and is provided by school health teams including doctors, assistant medical officers, and public health and community nurses. Six vaccines are given by the school health team, which includes vaccines against diphtheria/pertussis, oral polio, measles and bacillus Calmette-Guerin (if no scar) for children in Grade 1, HPV for girls in Grade 7, and tetanus toxoid for Grade 9. Target coverage for each vaccine is 95%.

While some countries in the Region have developed and have been implementing school-based immunization programmes including the school entry immunization requirement successfully, many countries responding to the regional survey on GVAP implementation have been establishing or plan to establish a life-course approach to immunization planning and implementation, for which they require external technical support.

Almost all countries (19 of 20) responding to the regional survey on GVAP implementation have developed outbreak surveillance and response systems. Technical and financial support is

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needed to develop guidelines for immunization during outbreak response and to strengthen capacity in this area.

Introduction of appropriate new vaccines into national immunization programmes is critically important, particularly for four regional immunization goals in the Western Pacific Region: the polio endgame, rubella elimination, accelerated Japanese encephalitis control and evidence-based introduction of new vaccines. While most countries responding to the survey (17 of 20) have been introducing new vaccines into their national immunization programmes, many countries (11 of 20) need technical and financial support for cost-effectiveness analysis, impact studies and prioritizing potential new vaccines.

Box 3-4. The Lao People's Democratic Republic: introduction of Japanese encephalitis (JE) vaccines to accelerate JE control

Japanese encephalitis (JE) was first identified in the Lao People's Democratic Republic in the 1980s and then became widely recognized as laboratory testing became increasingly available and surveillance systems strengthened. JE, which has been identified in most of the northern provinces of the Lao People's Democratic Republic, occurs with a strong seasonal pattern peaking during the rainy season (May to September) and affects primarily children under 15 years old. Approximately 50% of acute encephalitis syndrome cases in surveillance since 2010 were confirmed to be JE. Few cases have been identified in southern or central provinces, but this may reflect poor sensitivity of the surveillance system rather than absence of transmission.

The Lao Ministry of Health decided to conduct a JE immunization activity targeting the six northern provinces that reported most of the laboratory-confirmed JE cases. Through an agreement between PATH and the vaccine producer, Chengdu Institute of Biological Products, doses of the live attenuated SA 14-14-2 JE vaccine were provided for the estimated target population in the six provinces of 570 000 children 1 to 14 years old. After health workers were trained and a JE communications strategy was implemented, the immunization activity was conducted. Strong political commitment and community participation resulted in high community demand for the vaccine. Administrative data showed high coverage (99% overall), which was confirmed by external monitoring teams deployed to participating provinces.

The Ministry of Health plans to continue JE vaccination and efforts to strengthen encephalitis surveillance in these areas, and is exploring options to expand JE vaccination to other regions of the country.

3.3.3 Priority actions for the Western Pacific Region

To achieve GVAP Strategic Objective 3 in the Western Pacific Region and to accelerate achievement of immunization goals, the following priority actions are proposed to be carried out for the Western Pacific in collaboration with the Member States and other stakeholders.

- 3-1. Ensure all newborn infants are identified and enrolled to the national immunization programme; make the reported or estimated vaccination coverage at provincial and district levels valid; and record and track the immunization status of all eligible children through:

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- (1) establishing national birth registries and using birth registries for coverage targets;
 - (2) ensuring that all infants and children have a standardized and updated national vaccination card; and
 - (3) conducting periodic high-quality household coverage surveys, if needed.
- 3-2. Further develop, improve and expand national initiatives for Reach Every District (village, community and/or child) through:
- (1) more actively involving, training and engaging health workers, civil society organizations and underserved and marginalized groups so as to engage the whole community in the overall immunization programme (e.g. identifying all eligible children, enhancing communication, planning and supporting immunization service delivery, etc.); and
 - (2) more widely applying the targeted high-risk community approach to every EPI activity, particularly to any large-scale SIAs (OPV, measles, MR, JE, etc.).
- 3-3. Promote establishment and conduct school-based immunization programmes such as school-entry immunization check, school-entry immunization requirement, school-based immunization programme, etc.
- 3-4. Increase the synergy between routine immunization services and supplemental activities to achieve accelerated disease control or elimination initiatives, such as using SIA micro-planning and validation surveys to identify high-risk communities for subsequent targeting by routine immunization services.
- 3-5. Introduce IPV, bOPV, rubella, JE and other new vaccines shown to be cost-effective into national immunization programmes.
- 3-6. Strengthen regional and national capacity for prediction, prevention, preparedness and response for outbreaks of vaccine-preventable diseases through:

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- (1) supporting countries to develop national guidelines, based on global guidelines and recommendations, for preparedness for and response to outbreaks of vaccine-preventable diseases;
 - (2) conducting annual national risk assessment on vaccine-preventable diseases; and
 - (3) developing and conducting regional and national training programmes.
- 3-7. More actively analyse, share and disseminate experiences, lessons learnt and best practices obtained in conduct of action proposed above among Member States through:
- (1) conducting operational and social science research on areas of the above proposed action;
 - (2) developing a regional data and knowledge base on areas of the above proposed action; and
 - (3) further facilitating inter-country exchange and collaboration through international meetings, workshops, and field visits, etc.
- 3-8. Accelerate coordination and collaboration between Member States and other stakeholders to more actively and promptly mobilize resources for implementation of the above proposed action.

3.4 Strategic Objective 4: Immunization programmes are integrated into a well-functioning health system

Countries in the Western Pacific Region have seen great improvement in health services coverage, performance and outcomes. As health services now focus on equitable approaches and reaching underserved sections of the population (see strategic objectives 2 and 3), they have also shifted focus from basic service provision to the quality of services and of the data generated.

As part of this effort to improve quality of services, GVAP focuses on strengthening immunization support systems by improving monitoring and surveillance systems, improving human resources capacity and availability, improving management capacity, and strengthening infrastructure and logistics.

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Rapidly strengthening economies are also growing in the Western Pacific Region countries, with most of them having moved out of the World Bank’s “low-income” category. This economic improvement, along with better health performance, however, is accompanied by a decreasing external support for health programmes, including immunization. Decreasing and unpredictable donor presence emphasizes the need for long-term sustainability of immunization programmes with increased country ownership.

In order to achieve sustainability, the focus must be shifted to streamlining immunization programmes to gain efficiencies, embedding immunization programmes more strongly in the health system, integrating overall immunization planning and budgeting into national health systems plans and budgets (Strategic Objective 5) and reinforcing the trust of the population by, among other activities, setting up a solid immunization safety surveillance system that ensures the use of safe and effective vaccines and provides appropriate response to negative situations that follow vaccination. With over 50 vaccine manufacturers producing over one billion doses of vaccines released in the Western Pacific Region, ensuring and monitoring vaccine safety is a high-order priority for immunization and health systems.

GVAP recommends countries to carry out four strategies with 15 associated activities to achieve strategic objective 4 (Table 4).

Table 4. Strategies and activities for GVAP Strategic Objective 4

<p>4-1. Develop comprehensive and coordinated approaches.</p> <p>Ensure that global vaccine programmes focusing on eradication and elimination goals (for example, poliomyelitis and measles campaigns) are incorporated into national immunization programmes and do not operate independently.</p> <p>Ensure that new vaccine deployment is accompanied by comprehensive plans to control targeted diseases.</p> <p>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.</p>	<p>4-2. Strengthen monitoring and surveillance systems.</p> <p>Improve the quality of all administrative data concerning immunization and promote its analysis and use at all administrative levels to improve programme performance.</p> <p>Develop and promote the use of new technologies for collection, transmission and analysis of immunization data.</p> <p>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.</p> <p>Ensure capacity for vaccine safety</p>	<p>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.</p> <p>Promote coordinated training and supervision of community-based health workers</p> <p>4-4. Strengthen infrastructure and logistics.</p> <p>Innovate to improve cold-chain capacity and logistics, as well as waste management.</p> <p>Minimize the environmental impact of energy, materials and processes used in immunization supply systems, both</p>
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<p>Consider the inclusion of vaccines (as appropriate to national priorities) in health programmes across the life-course.</p>	<p>activities, including capacity to collect and interpret safety data, with enhanced capacity in countries that introduce newly developed vaccines.</p> <p>4-3. Strengthen capacity of managers and frontline workers.</p> <p>Ensure that immunization and other primary health-care programmes have adequate human resources to schedule and deliver predictable services of acceptable quality.</p>	<p>within countries and globally.</p> <p>Staff supply systems with adequate numbers of competent, motivated and empowered personnel at all levels.</p> <p>Establish information systems that help staff to track the available supply accurately.</p>
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3.4.1 Contribution of GVAP activities to immunization goals

GVAP-recommended actions (Table 4) to achieve this strategic objective also fit the current immunization focus of the Western Pacific Region.

Disease control initiatives in the Region, such as sustaining polio-free status, measles elimination, hepatitis B control, and maternal and neonatal tetanus elimination have contributed to strengthening immunization systems and rely on them for their success and sustainability.

Achieving the highest standard in data quality has been the focus of approaches towards high-quality surveillance and programme monitoring and will continue in the GVAP era. Building sustainable surveillance capacity is a dynamic, continuous and long-term process. In this regard, GVAP recommended actions are nested in approaches of the WHO Regional Office for the Western Pacific, which seek that countries and areas utilize data in a timely fashion and establish a culture of systematic and regular assessment of their data quality.

Many vaccines are being offered routinely and almost 24 million MCV1 doses are annually administered in Western Pacific Region. Due to disease control goals set by Member States, countries are conducting frequent SIAs, especially for measles, tetanus and polio. The increased number of doses and opportunities of vaccination necessitate the need for increased vaccine safety capacity to be able to sustain confidence in the national immunization programmes. At the same time, in recent years, there are several new vaccines developed and some are already introduced in some middle-income countries in the Western Pacific Region. Therefore, it is essential to have effective vaccine safety surveillance systems including preparedness, monitoring and prompt response.

In order to provide immunization services to the client in the community, the programme must ensure that the vaccines are available at the right place, at the right time and in the right condition. Over the past decade, the number of vaccines available has increased substantially and

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most of the new vaccines are more expensive and are bulkier than traditional vaccines. Greater storage capacity is thus required at all levels of the cold chain. National immunization programmes must also be able to accurately forecast vaccine requirements, maintain lower stock levels, reduce wastage, and prevent equipment break-downs or malfunctions.

Among 15 recommended activities for this GVAP Strategic Objective, the following activities are considered critical or needed to achieve most of the regional immunization goals:

- ensure that new vaccine deployment is accompanied by comprehensive plans to control targeted diseases;
- consider the inclusion of vaccines in health programmes across the life-course;
- improve the quality of all administrative data concerning immunization and promote its analysis and use at all administrative levels to improve programme performance;
- 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 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;
- innovate to improve cold-chain capacity and logistics, as well as waste management;
- use immunization supply systems that minimize the environmental impact of energy, materials and processes used; and
- establish information systems that help staff to track the available supply accurately.

3.4.2 Status of and needs for implementation of GVAP activities in the Western Pacific Region

In general, commonly cited challenges identified from field work included: difficulty accurately estimating target populations and service coverage; the need for detailed plans for routine immunization of high-risk populations; low turnout for outreach sessions; infrequent services at fixed

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facilities; insufficient human resources for routine immunization; insufficient resources for cold chain and logistics management; limited ability of health workers to counsel caregivers on the effectiveness and safety of immunization; and competing priorities faced by caregivers (i.e. income generation rather than seeking vaccination services).

Despite the above, a number of best practices and promising approaches in countries of the Region can serve as motivating elements to other countries in need.

Almost all countries responding to the regional survey (19 of 20) answered that they had developed a comprehensive plan that includes new vaccine deployment to control target diseases. Cambodia, Mongolia, Niue, Solomon Islands and Tokelau reported the need for external support to develop or further improve a national plan accompanying new vaccine deployment, while nine countries said they need external support to include vaccines across the life-course in their health programmes.

Improving the quality of all immunization data and promoting their analysis and use at all levels in order to improve programme performance are considered critical challenges in several countries in the Region. Nonetheless, almost all countries responding to the regional survey (17 of 20) are implementing or have planned data quality assessments, while the remaining three countries (Japan, Kiribati and Viet Nam) are to start planning soon. Mongolia has been successfully using its comprehensive RED strategy to improve the quality of all administrative data concerning immunization and promote its analysis and use at all levels to improve programme performance.

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Box 4-1. Mongolia's initiative for improving administrative and immunization data at all levels by RED strategy

An initiative to improve administrative and immunization data through the RED strategy has been implemented recently in Mongolia. Software called RED 2.0 was developed by a district RED team and a local technology company to monitor RED-related activities at the health facility level.

The main database comprises data from district hospitals, outpatient clinics and family clinics. The software has sub-databases for children, reproductive-aged women, pregnant women, elderly, disabled people, citizens with civil registration documentation violations and others. Entry of a citizen's civil registration number leads to automatic filling of age and sex fields and placement of the record in the relevant sub-database. The software includes search functions and automatic error correction. It also has a function for population mapping and reporting. Each citizen's residence is mapped through Google Maps even if the address is not officially registered. Reports by name or address can be produced automatically at specified frequencies.

The software was developed through a bottom-up approach, based on field staff needs and input, so it covers not only the immunization programme but is also comprehensive across public health centre programmes. Most importantly, the database covers all populations and provides real-time information. Next, the RED 2.0 software will be linked with the Ministry of Health's e-Health initiative and introduced into all health facilities nationwide in a phased manner.

Several countries responding to the regional survey (13 of 20) have already developed the new data management system with software or a website (i.e. immunization registry, surveillance data collection and immunization information). Also, six countries will be planning it soon (i.e. SMS-based reporting system) while others (9 of 10) answered that they needed external technical and/or financial support to develop and promote the use of new technologies for collection, transmission and analysis of immunization data. Recently, Cambodia introduced web-based surveillance data collection and reporting.

Box 4-2. Web-based surveillance data collection and reporting in Cambodia

In 2011, Cambodia established a web-based measles surveillance data collection and reporting system. The system was developed in order to overcome three fundamental problems: (1) there was no link between the surveillance and laboratory databases; (2) the existing database was not consistent with programme indicators; and (3) the used Microsoft Access database was frequently affected by computer viruses and power supply disruptions.

The first phase of improvement was to update the case investigation form to align with measles elimination data requirements. With assistance from the WHO Regional Office for the Western Pacific, an online database was developed based on the new case investigation form. The web version includes reporting functions of measles elimination indicators at subnational levels and reporting of data to the Regional Office for the Western Pacific.

The second phase of improvement was to integrate the laboratory and surveillance databases, and link cases through an identification number. After case data are entered by National Immunization Programme (NIP) staff, the laboratory at the National Institute of Public Health (NIPH) receives an electronic notification. The NIPH then completes the testing, enters the result, and an automatic email is sent to NIP with the results. NIP then enters the final classification.

The new online database has resulted in timely reporting of laboratory results due to integration of the surveillance and laboratory datasets. In addition, the new system allows convenient review of data by programme managers and authorized people from any location, facilitating rapid feedback.

In summary, in the Western Pacific Region the following needs must be addressed for this GVAP strategic objective: sustaining a high level of surveillance and monitoring reporting; reconciling epidemiological and laboratory data; and building country capacity for data analysis, use and measurement of the system's data quality.

Systems for ensuring vaccine safety – for example web-based data collection, training and assessment, including systems for adverse events following immunization (AEFI) – have been established in 17 out of 20 responding countries; the remaining three countries (Kiribati, Vanuatu and Viet Nam) will begin planning soon. Twelve of the responding countries said technical and financial support was needed to ensure capacity for vaccine safety activities, including the capacity to collect and interpret safety data, with enhanced capacity in countries that introduce newly developed vaccines. According to the Joint Reporting Form (JRF), 26 Member States conduct AEFI surveillance. But the quality of AEFI surveillance systems and their functionality in the Region varies widely, and in many countries an expert committee on AEFI has not been established. China, the largest country in the Region, has successfully established a nationwide AEFI surveillance system and causality assessment capacity at the provincial and national levels.

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Box 4-3. Establishing a national AEFI surveillance system to enhance capacity for causality assessment in China

China established a national AEFI surveillance system in 2005 based on WHO guidelines. A pilot surveillance system was tested in 10 provinces in 2005–2006 and expanded to all provinces in 2008. During the course of nationwide vaccination campaigns for influenza H1N1 in 2009 and measles in 2010, work towards the successful WHO assessment of the national regulatory authority (NRA) in 2011, and increasing government financial support for AEFI reporting, this national AEFI surveillance system has been strengthened in several ways. Key achievements include: (1) improved laws, regulations and guidelines that clarify the institutions' authority and responsibilities for AEFI case identification, investigation and reporting; (2) preparation of an institutional development plan for the NRA; (3) creation of an online reporting system to archive data; (4) onsite supervision, training and regular institutional coordination among stakeholders to review vaccine safety signals, serious AEFI cases and vaccine quality; (5) strengthening the capacity for causality assessment; and (6) enhanced information feedback to health workers and the public concerning vaccine safety.

By the end of 2012, over 90% of counties had reported about 100 000 AEFI, compared with 1000–2000 cases reported by 5% of counties in 2005. Performance indicators for timeliness of investigation and reporting increased from 75% in 2005 to 90% in 2012. AEFI surveillance plays a critical role in maintaining public confidence in the quality of vaccines delivered through the national programme. Future priorities include enhancing capacity for causality assessment, vaccine safety signal detection and risk communication.

Increasing levels of pre-service, in-service and post-service training for human resources, and developing new, relevant curricula that approach immunization as a component of comprehensive disease control, are considered critical or needed to achieve regional immunization goals. Most countries reported conducting training to improve technical and managerial capacity of managers and frontline health workers. However, several countries said they need technical and financial support in this area. In the South Pacific, international and national training courses for national and provincial EPI managers using WHO's mid-level manager training modules have been conducted jointly by WHO, UNICEF and the Japan International Cooperation Agency.

Box 4-4. Pacific island and countries and areas: Capacity-building for mid-level managers and front-line workers

To build immunization programme capacity in the 21 Pacific island countries and areas, with populations ranging from 52 to 85 000 per country or area, WHO and UNICEF jointly conducted two training workshops for national immunization programme staff in Fiji in 2010 and 2011 using the new WHO mid-level managers (MLM) training modules. Following country requests to provide training access to additional national and local staff, in-country training workshops were held in 2012 in Cook Islands, Kiribati and Palau, and conducted in 2013 in the Federated States of Micronesia and Tokelau. In Kiribati, the training was organized jointly by WHO, UNICEF and JICA. In other countries and areas the training was organized by WHO.

Training courses were tailored to country-specific needs; for example in Palau, training for the immunization programme core team covered all eight MLM modules, while training for clinic staff covered areas relevant to front-line immunizations work. In the Federated States of Micronesia, training on the United States Centers for Disease Control and Prevention web-based data registry software was added to the monitoring section of the training.

A key challenge in Pacific island countries and areas is that trained personnel move away and so repeated trainings are required. In addition, since there are limited human resources, coordination of training activities is critical. In Fiji and Solomon Islands, MLM training was coordinated with effective vaccine management, assessment and training and in Solomon Islands with an international EPI review. Plans were made to strengthen supportive supervision, cold chain and programme data quality.

3.4.3 Priority Actions for the Western Pacific Region

Disease control initiatives in the Region, such as sustaining polio-free status, measles elimination, hepatitis B control, and maternal and neonatal tetanus elimination, have contributed to strengthening immunization systems and those initiatives rely on immunizations for their success and sustainability. In order to develop comprehensive plans that are sustainable, it is important to integrate these individual disease control programmes into the wider national immunization programme.

To achieve GVAP Strategic Objective 4 in the Western Pacific Region and to accelerate achievement of the regional immunization goals, the following priority actions are proposed to be carried out in collaboration with Member States and other stakeholders.

- 4-1. Develop and implement national plans for comprehensive approaches to control childhood diarrhoea and pneumonia, and cervical cancer (with reference to the *Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea* and the *WHO Guidance Note on Comprehensive Cervical Cancer Prevention and Control* (WHO 2013).

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4-2. Further strengthen monitoring and surveillance systems through:

(1) strengthening existing surveillance for acute flaccid paralysis (AFP), measles & rubella, Japanese encephalitis, invasive bacterial disease and rotavirus;

(2) exploring use of web-based systems for real-time reporting and analysis of surveillance data; and

(3) ensuring all countries in the Region establish a national AEFI surveillance system that includes detection, reporting, investigation, data analysis, causality assessment, communication and other responses.

4-3. Establish and strengthen national capacity to develop and conduct training programmes to improve technical and managerial capacity of human resources at all levels (e.g. developing a national training programme using WHO's training modules for mid-level managers for immunization programmes).

4-4. Conduct effective vaccine management (EVM) assessments, develop improvement plans and implement country-specific activities.

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

Achieving this strategic objective will mean taking action must be taken in countries and globally to increase funding for immunization both from countries and development partners. Countries should ensure the financial sustainability of national immunization programmes through regular evaluation of resource needs, ensuring adequate supply of assured quality and affordable vaccines, efficient service delivery, availability of adequate domestic financing and resource mobilization from development partners to meet any funding gaps. Assured-quality vaccines are essential to effective immunization programmes. For this reason, independent, competent and effective regulatory systems are necessary to oversee the supply of quality-assured vaccines.

GVAP recommends countries to carry out four strategies with 15 associated activities to achieve strategic objective 5 (Table 5).

Table 5. Strategies and activities for GVAP Strategic Objective 5

<p>5-1. Increase total amount of funding.</p> <p>Establish a commitment for governments to invest in immunization according to their ability to pay and the expected benefits.</p> <p>Engage new potential domestic and development partners and diversify sources of funding.</p> <p>Develop the next generation of innovative financing mechanisms.</p> <p>5-2. Increase affordability for middle-income countries.</p> <p>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.</p> <p>Explore pooled negotiation or procurement mechanisms for lower middle-income and middle-income countries.</p>	<p>5-3. Improve allocation of funding in low- and middle-income countries.</p> <p>Strengthen in-country budgeting and financial management to better integrate financial and health care planning and priority setting.</p> <p>Coordinate funding support from development partners and other external sources.</p> <p>Evaluate and improve funding support mechanisms on the basis of their effectiveness in reaching disease goals.</p> <p>Base funding on transparency and objectivity in order to ensure the sustainability of programmes.</p> <p>Promote the use of cost and cost-benefit arguments in fund-raising, decision-making and in defence of immunization funding.</p> <p>Explore pay-for-performance funding systems.</p>	<p>5-4. Secure quality supply.</p> <p>Build and support networks of regulators and suppliers to share best practices and to improve quality assurance capabilities and quality control.</p> <p>Develop tools to strengthen global standardization of manufacturing and regulatory processes.</p> <p>Strengthen national regulatory systems and develop globally harmonized regulations.</p> <p>Provide a forum where countries can communicate expected demand for vaccines and technologies and provide guidance to manufacturers on desired product profiles.</p>
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3.5.1 Contribution of GVAP activities to immunization goals

Among 15 GVAP-recommended activities for Strategic Objective 5, the following activities are considered critical or needed for six immunization goals: polio-free status, measles elimination, accelerated rubella control, maternal and neonatal tetanus elimination, strengthening routine immunization, and new vaccine introduction:

- establish a commitment for governments to invest in immunization;
- engage new potential domestic and development partners and diversify sources of funding;
- coordinate funding support from development partners and other external sources;

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- strengthen in-country budgeting and financial management to better integrate financial and health care planning and priority setting;
- explore pooled negotiations or procurement mechanisms for lower middle-income and middle-income countries;
- promote the use of cost and cost-benefit arguments in fund-raising, decision-making, and in support of immunization funding;
- 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/regional standardization of manufacturing and regulatory processes; and
- strengthen national regulatory systems and develop globally/regionally harmonized regulations.

3.5.2 Status of and needs for implementation of GVAP activities in the Western Pacific Region

Increase total amount of funding

In order to increase funding, almost all countries responding to the regional survey (19 of 20) have established government commitment to invest funds in immunization programmes. Some countries (9 of 20) have established a mechanism, such as ICCs, including various partners working in the area of immunization. Such committees provide support to national EPI units to; address programme priorities, discuss funds allocation, monitor the progress and use of allocated funds, coordinate resource mobilization, and avoid duplication. However, ICCs exist mostly in GAVI-eligible countries as they were created to meet a GAVI support requirement.

Some Pacific island countries and areas responding to the survey (4 of 9) have been developing innovative financing mechanisms (i.e. for new vaccines). Other countries (Japan, the Lao People's Democratic Republic, Mongolia and Papua New Guinea) are planning to develop a new mechanism. To enhance government commitment to support and invest in the national immunization programme and to engage international and domestic partners, international reviews of national immunization programmes have been carried out in the Western Pacific Region since the late 1980s, with the involvement of various national and international partners.

Box 5-1. The Philippines – Commitment of the Government to invest in immunization and innovative financing mechanisms

The Philippines national EPI effort was initially funded primarily by donations from partners such as Rotary International, the Canadian International Development Agency, WHO and others. The subsequent introduction of additional vaccines lead to a gradual increase in the EPI budget, with substantial increases since 2010 under the Government's universal health care focus.

The Mandatory Infants and Children Health Immunization Act of 2011 forms the legal basis for the immunization programme and budget. In 2012, there were 12 antigens included in the EPI effort with an annual budget of almost US\$ 45 million, and it will expand to 13 to 14 antigens in 2013 and almost US\$ 50 million. National funding provides for the vaccines and immunization supplies, while there is no provision for capital outlay and operational costs are shared by the local government, depending on its priorities, or supported by development partners.

While the proportion of children who are not fully immunized was steady at a relatively high level from 2003 to 2008, this proportion has recently decreased. Possible causes include human resources constraints at all levels, multiple responsibilities of health service delivery staff and the lack of prioritization of immunization services at the local level.

A recently signed "Sin Tax" law (taxes imposed on alcohol and tobacco products) may provide new opportunities. Of the new tax revenues, 80% will be allocated to universal health care under the National Health Insurance Program and 20% will be allocated nationwide to medical assistance and health facility enhancement. In addition, basic immunization services will be included in the Philippine Health Insurance Corporation's benefit package.

Increased affordability

Although "exploring differential pricing approaches" to increase affordability is not considered critical and/or needed for the regional immunization goals in the Western Pacific Region, several PICs responding to the survey have been exploring differential pricing approaches. Several countries and areas, such as Cook Islands, Mongolia and Tokelau need external support (e.g. technical assistance on accessing the vaccine product, price and procurement project database in Mongolia).

Discussions on a pooled procurement system in the Region have been held in some forums, but further discussion with experts, taking into consideration political and financial commitments, is needed.

Improve allocation of funding

To improve funding allocation, three GVAP activities, in particular, are more important or relevant in some countries in the Western Pacific Region than in others. They are: (1) strengthening in-country budgeting and financial management; (2) coordinating funding support from development partners and other external sources; and (3) promoting the use of cost and cost-benefit arguments.

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They are also considered necessary for achieving the regional immunization goals. Fourteen of twenty countries responding to the regional survey have recently been strengthening their systems of budgeting and financial management, although some countries need technical and financial support to further strengthen their systems. Many countries (12 of 20) have been coordinating funding support from external sources, including UNICEF and WHO, through the ICC mechanism and others, while some countries, such as China, the Lao People's Democratic Republic, the Philippines and Solomon Islands need technical assistance from WHO, UNICEF and/or nongovernmental organizations for a more effective and harmonized approach in supporting the government.

Secure quality supply

Five vaccine-producing countries in the Region have greatly contributed to using vaccines in their country and/or sharing the vaccines with other countries in the Region and globally. There are 10 countries in the Region procuring vaccines through international bidding processes, and 19 countries procure the majority of their vaccines through the United Nations procurement system. Most of the countries including countries using the United Nations procurement system have established a demand forecasting system to ensure the supply availability of vaccines for immunization programmes. However, each year, some countries experience vaccine stock-outs either at the district, provincial or national level, often due to faulty forecasting.

Seven countries in the Western Pacific Region have functional regulatory systems against WHO NRA indicators, of which four are vaccine-producing countries (Australia, China, Japan and the Republic of Korea) and three are vaccine-procuring countries (Malaysia, Singapore and New Zealand), to oversee the supply of assured quality vaccines for immunization programmes. Some of the independently vaccine-procuring countries and 19 countries using the United Nations procurement system do not have functional regulatory systems against WHO NRA indicators.

A collaborative mechanism, the Regional Alliance for National Regulatory Authorities for Vaccines in the Western Pacific, was established in March 2013 with the aim to establish or strengthen regulatory systems and functions in countries. Twelve countries developed or updated institutional development plans and integrated a regional work plan to support their implementation.

Box 5- 2. The Republic of Korea is strengthening regulatory capacity in the Western Pacific with the Regional Alliance for NRAs for Vaccines

To establish a collaborative platform to build regulatory capacity in the Region, the Regional Alliance for National Regulatory Authorities for Vaccines in the Western Pacific (Regional Alliance) has been established with the support of the Korea Ministry of Food and Drug Safety, a WHO Collaborating Centre for Biological Standardization.

The Technical Advisory Group in 2012 stated its support for the establishment of the Regional Alliance. Documents relating to the governance of the Regional Alliance were prepared and reviewed during the second workshop for NRAs for vaccines in the Western Pacific. Member States attending the workshop endorsed its establishment, and the Regional Alliance for NRAs for Vaccines in the Western Pacific was officially launched on 14 March 2013.

Governance of the Regional Alliance consists of the Regional Alliance Steering Committee, Regional Alliance Working Groups and the Secretariat. A website for the Regional Alliance has been developed and relevant documents will be posted. The Korea Ministry of Food and Drug Safety will continue to support other countries to implement activities in the IDPs in the Region through the platform of the Regional Alliance.

3.5.3 Priority Actions for the Western Pacific

To achieve GVAP Strategic Objective 5 in the Western Pacific Region and to accelerate achievement of the regional immunization goals, the following priority actions are proposed to be carried out in collaboration with Member States and other stakeholders.

- 5-1. Conduct comprehensive international reviews of the national immunization programme in priority countries to further strengthen government commitment to invest in immunization, engage new potential domestic and international development partners, and diversify sources of funding.
- 5-2. Consider establishment of a regional financing mechanism for immunization services and a mechanism for pooled negotiation or procurement for priority countries in the Western Pacific.
- 5-3. Monitor and facilitate sharing of information on new vaccine introductions and vaccine costs in Member States.
- 5-4. Further promote dialogue, coordination and collaboration among national and international immunization partners through the Interagency Coordination Committees to strengthen funding for the immunization programme in priority countries.

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- 5-5. Strengthen NRA functions and facilitate relevant technology transfer in order to accelerate entry of low-cost, safe and effective vaccines produced in Western Pacific Region countries and in the international market.
- 5-6. Strengthen regulatory capacity in countries through the Regional Alliance for NRAs for Vaccines in the Western Pacific: Conduct NRA self-assessment of the current status (strengths and gaps); and support institutional development planning to further strengthen national regulatory systems and regionally harmonize regulations.

3.6 Strategic Objective 6: Country, regional and global research and development innovations maximize the benefits of immunization

In the coming decade, innovative research efforts are needed across the areas of vaccine discovery, development and delivery. These efforts will lead to better understanding of: mechanisms of protection; identification of novel antigenic targets for vaccine development; new vaccine formulation and delivery technologies; and the development of disease-burden and cost-effectiveness data for in-country decision-making. In addition, operational research will define the most effective communications strategies and delivery approaches to overcome challenges posed by reaching every community, life-course immunization, and vaccinations in outbreak and emergency settings. Development of biomarkers to validate immunization coverage estimates and diagnostic tools to improve surveillance quality also will be important in achieving this objective.

Table 6. Strategies and activities for GVAP Strategic Objective 6

<p>6-1. Expand capabilities and increase engagement with end users.</p> <p>Engage with end users to prioritize vaccines and innovations according to perceived demand and added value.</p> <p>Establish platforms for exchange of information on immunization research and consensus building.</p> <p>Build more capacity and human resources in low- and middle-income countries to conduct research and development and operational research.</p> <p>Increase networking among research centres for efficient building of partnerships among the institutions of high-, middle- and low-income countries.</p> <p>Promote collaboration between traditional research disciplines and scientists from disciplines not previously engaged in vaccine research.</p> <p>6-2. Improve programme efficiencies and increase coverage and impact.</p> <p>Research the use of more effective information through modern communication technologies.</p>	<p>Conduct representative epidemiological, immunological, social and operational studies and investigations of vaccine impact to guide health economics analysis.</p> <p>Perform operational research on improved delivery approaches for life-course immunization, and vaccination in humanitarian emergencies, so-called fragile states, and countries in and emerging from conflict.</p> <p>Perform research on interference effects and optimum delivery schedules.</p> <p>Perform research to develop improved diagnostic tools for conducting surveillance in low-income countries.</p> <p>6-3. Accelerate development, licensing and uptake of vaccines.</p> <p>Promote greater access to technology, expertise and intellectual property for adjuvants and their formulation into vaccines.</p> <p>Develop non-syringe delivery mechanisms and vaccine packaging that best suit the needs and constraints of national programmes.</p>	<p>Develop thermostable rotavirus and measles vaccines.</p> <p>Develop new bioprocessing and manufacturing technologies.</p> <p>Develop a global, regulatory science research agenda.</p> <p>Adopt best practices in portfolio and partnership management for research and development.</p> <p>6-4. Enable the development of new vaccines.</p> <p>Research on the fundamentals of innate and adaptive immune responses, particularly in humans.</p> <p>Research on immunological and molecular characteristics of microbes.</p> <p>Improve understanding of the extent and causes of variation in pathogens and human population responses to vaccines.</p>
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GVAP recommends countries to carry out three strategies with 18 associated activities to achieve strategic objective 6 (Table 6).

3.6.1 Contribution of GVAP Activities to immunization goals

Of the 19 GVAP activities for Strategic Objective 6, the following four activities are particularly important to achieving the Region’s immunization goals:

- engage with end users to prioritize vaccines and innovations according to perceived demand and added value;
- conduct representative epidemiological, immunological, social and operational studies and investigations of vaccine impact to guide health economics analyses;

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- perform operational research on improved delivery approaches for life-course immunization, and vaccination in humanitarian emergencies, so-called fragile states and countries in and emerging from conflict; and
- perform research to develop improved diagnostic tools for conducting surveillance in low-income countries.

3.6.2 Status of Implementation of GVAP activities in the Western Pacific Region

Technical capacity to conduct high-quality operational research in some countries is still limited and will require external support. Areas of research include: evaluating the effectiveness of different communication strategies; evaluating vaccination impact, cost and cost-effectiveness; conducting serological studies to identify age-specific immunity gaps; and conducting studies to optimize vaccination schedules. Vaccine-producing middle-income countries identified several production-related technical support needs: greater access to technology, expertise and intellectual property for adjuvants; development of thermostable products; and development of new bioprocessing and manufacturing technologies.

Box 6-1. The role of research in relation to the immunization programme in Viet Nam

Research can address issues that arise in immunization programmes, such as defining disease burden and trends of vaccine-preventable diseases; measuring the immunogenicity and reactogenicity of vaccines and alternate vaccine schedules; cost-effectiveness analysis of vaccines; impact assessments of the immunization programme; effectiveness of vaccine delivery strategies such as school-based versus community-based delivery; and acceptability of vaccines and delivery systems for the community.

For the past ten years, Viet Nam National Immunization Programme has conducted much immunization-related research, including: (1) seroprevalence of hepatitis B nationwide and measles in selected provinces, measuring a baseline and evaluating progress towards control and elimination goals; (2) immunogenicity studies of measles second-dose vaccination, HPV vaccination by an alternate schedule, and a fourth (booster) dose of DTP vaccine; (3) cost-effectiveness analysis of rubella and rotavirus vaccines showing that both vaccines would produce health benefits and would be cost-effective; (4) overall impact assessment of the national EPI (1980–2010) estimating that the programme has averted 6.7 million episodes of illness and 42 900 deaths from five vaccine-preventable diseases; (5) usability and acceptability of an aerosol device for measles vaccine delivery showing high compliance with use; and (6) a typhoid incidence study showing high-risk areas where vaccination is needed.

The evidence resulting from this research has been used to advocate for the Government's policy and investment in immunization, and in communications and advocacy with other stakeholders and with communities. The research results have also contributed to the evaluation and monitoring of EPI activities and to planning for the future introduction of vaccines.

3.6.3 Priority Actions for the Western Pacific Region

To achieve GVAP Strategic Objective 6 in the Western Pacific Region and to accelerate achievement of the regional immunization goals, the following priority actions are proposed to be carried out in collaboration with Member States and other stakeholders.

- 6-1. Build more capacity and human resources in low- and middle-income countries to conduct immunization-related epidemiologic studies, economic evaluation and operational research.
- 6-2. Conduct representative epidemiological, social and operational studies and investigations of vaccine impact to guide health economics analysis and prioritization of new vaccines.
- 6-3. Perform operational research on improved delivery approaches for life-course immunization and vaccination in outbreak settings.
- 6-4. Support pilot testing of new vaccine delivery technologies and new diagnostic tools for surveillance of vaccine-preventable diseases.
- 6-5. Conduct rubella serosurveys to identify immunity gaps and guide development of vaccination strategies needed to eliminate rubella and CRS in the Region.

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4. Monitoring and reporting GVAP implementation in the Western Pacific Region

In May 2012, when the *Global Vaccine Action Plan 2011–2020* was endorsed, the World Health Assembly urged Member States to report every year to the regional committees on lessons learnt, progress made, remaining challenges and updated actions to reach national immunization targets (resolution WHA65.17). In May 2013, WHO headquarters proposed a framework for monitoring, evaluating and accountability i GVAP implementation of in order to guide the content of annual progress reports submitted to the regional committees and the Health Assembly through the Executive Board (WHA66/19).

Following the guidance of the Strategic Advisory Group of Experts on immunization, the proposed framework will be applied to: (1) monitor results (defined as progress towards the action plan's goals and strategic objectives); (2) document and monitor stakeholders' commitments to the action plan; (3) track resources invested in vaccines and immunization; and (4) include independent oversight and review of progress, through the Strategic Advisory Group of Experts reporting to the governing bodies.

For Member States to report annually to the regional committees, the WHO Regional Office and WHO country offices should work with Member States in monitoring results, defined as progress towards the global and regional immunization goals and progress towards GVAP strategic objectives. The *Secretariat Report on Global Vaccine Action Plan* presented to the World Health Assembly in May 2013 (WHA66.19) provides the list of indicators to monitor progress towards these goals and objectives (Annexes 1 and 2).

This chapter outlines a framework to monitor and report implementation of GVAP in the Western Pacific Region through adopting and modifying these indicators according to region-specific immunization goals and the situation and needs for implementation of GVAP in the Western Pacific.

4.1 Monitoring and reporting progress towards immunization goals

In response to WHA65.17, progress towards each of eight immunization goals should be monitored by indicators specified for each goal at both regional and country levels and reported annually to the Regional Committee once it is endorsed by the Regional Committee. Proposed indicators and targets for monitoring progress towards each regional immunization goal are summarized in Table 7.

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The WHO Regional Office should prepare an annual regional summary report on progress towards each immunization goal in collaboration with WHO country offices and Member States and submit the report to the Regional Committee.

Table 7. Indicators and targets for monitoring progress towards immunization goals

Immunization goal	Indicators and targets
1. Sustaining polio-free status	<ul style="list-style-type: none"> • Sustain regional polio free status until global certification (tentatively by end 2018). • Ensure timely detection and response to any wild, vaccine-related and Sabin polioviruses. • Eliminate vaccine-derived poliovirus risk by introducing in OPV-using countries at least one dose of IPV by October 2015, and withdraw type 2 component of tOPV by mid-2016. • Initiate and implement the other phases of the poliovirus laboratory containment.
2. Maternal and neonatal tetanus elimination	<ul style="list-style-type: none"> • By 2015, achieve maternal and neonatal tetanus elimination in the Western Pacific Region, defined as <1 neonatal tetanus (NT) case/1000 live births in each district. • Maintain elimination in every country and area (based on annual WHO/UNICEF District Data Spreadsheet).
3. Measles elimination	<ul style="list-style-type: none"> • By 2012, the Western Pacific Region should eliminate measles. • By 2017, 100% of countries have verified interruption of endemic measles virus transmission for a period of >36 months in the presence of verification standard surveillance, which is defined as follows: 1) reporting rate of non-measles non-rubella cases at the national level of ≥ 2 cases per 100 000 population per year; 2) $\geq 80\%$ of second administrative level reporting at least 2 non-measles non-rubella cases per 100 000 population per year; 3) $\geq 80\%$ of suspected cases with adequate investigation initiated within 48 hours of notification; and 4) $\geq 80\%$ of suspected cases with adequate specimen for detecting acute measles infection collected and tested in a proficient laboratory.
4. Hepatitis B accelerated control	<ul style="list-style-type: none"> • Reduce the seroprevalence of chronic hepatitis B infection, measured through hepatitis B surface antigen (HBsAg), to less than 1% in 5-year-old children by 2017.
5. Rubella elimination	<ul style="list-style-type: none"> • (Member States from the Western Pacific Region to select an elimination target year).
6. Introduction of new vaccines	<ul style="list-style-type: none"> • All low- and middle-income countries introduce one or more new vaccines by 2020.
7. Meeting regional vaccination coverage targets	<p>Proposed targets:</p> <ul style="list-style-type: none"> • Reach $\geq 95\%$ national coverage for all vaccines used in the national immunization programmes, unless otherwise recommended, by 2020. • Reach $\geq 90\%$ coverage in every district or equivalent administrative unit for all vaccines used in the national immunization programmes, unless otherwise recommended, by 2020.
8. Accelerated control of Japanese encephalitis	<p>Proposed targets:</p> <ul style="list-style-type: none"> • Accelerate the control of JE by extending vaccination to all JE risk areas where JE incidence exceeds very low levels. • Reach regional vaccination coverage targets with the primary series of JE vaccine in routine immunization programmes, and $\geq 90\%$ coverage for a primary series of JE vaccine among children under 15 years old in each country's JE risk area overall, by a year to be determined. • Consider an incidence target of less than 0.5 per 100 000 children under 15 years old in every national or subnational JE risk area, by a year to be determined.

Annex 1

4.2 Monitoring and reporting progress towards GVAP strategic objectives in the Western Pacific Region

Progress towards GVAP strategic objectives in the Western Pacific Region can be monitored by many indicators proposed in WHA66.19 (Annex 2). Proposed indicators to monitor progress towards GVAP strategic objectives in the Western Pacific Region are summarized in Table 8.

The WHO Regional Office for the Western Pacific should prepare an annual regional summary report on progress towards each GVAP strategic objective in collaboration with WHO country offices and Member States and submit the report to the Regional Committee.

Table 8. Proposed regional indicators for monitoring progress towards GVAP strategic objectives for the Western Pacific Region

GVAP strategic objectives	Proposed regional indicators
SO 1. All countries commit themselves to immunization as a priority	<ul style="list-style-type: none"> • Domestic expenditures per person targeted • Presence of an independent technical advisory group that meets defined criteria • Number of countries implementing Proposed Priority Actions (selected)
SO 2. Individuals and communities understand the value of vaccines and demand immunization both as a right and a responsibility	<ul style="list-style-type: none"> • Percentage of countries that have assessed (or measured) confidence in vaccination at subnational level • Percentage of unvaccinated and under-vaccinated people in whom lack of confidence was a factor that influenced their decision • Number of countries implementing Proposed Priority Actions (selected)
SO 3. The benefits of immunization are equitably extended to all people	<ul style="list-style-type: none"> • Percentage of districts with 80% or greater coverage with three doses of diphtheria-tetanus-pertussis-containing vaccine • Number of countries implementing Proposed Priority Actions (selected)
SO 4. Strong immunization systems are an integral part of a well-functioning health system	<ul style="list-style-type: none"> • Dropout rate between first dose and third dose of diphtheria-tetanus-pertussis-containing vaccines • Sustained coverage with diphtheria-tetanus-pertussis-containing vaccines $\geq 95\%$ for three or more years • Immunization coverage data assessed as high quality by WHO and UNICEF • Number of countries with case-based surveillance for vaccine-preventable diseases that meets quality standards • Number of countries implementing Proposed Priority Actions (selected)
SO 5. Immunization programmes have sustainable access to predictable funding, quality supply and innovative technologies	<ul style="list-style-type: none"> • Number of countries implementing Proposed Priority Actions (selected)
SO6. Country, regional and global research and development innovations maximize the benefits of immunization	<ul style="list-style-type: none"> • Number of countries implementing Proposed Priority Actions (selected)

Appendix 1.

Global indicators and targets for monitoring progress towards Decade of Vaccines Goals

Decade of Vaccines Goal	Target by 2015	Target by 2020
1. Achieve a world free of poliomyelitis	<ul style="list-style-type: none"> Interrupt wild poliovirus transmission globally (by 2014) 	<ul style="list-style-type: none"> Certification of poliomyelitis eradication (by 2018)
2. Meet global and regional elimination targets	<ul style="list-style-type: none"> Neonatal 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
3. Meet vaccination coverage targets in every region, country and community	<ul style="list-style-type: none"> Reach 90% national coverage and 80% in every district or equivalent administrative unit with vaccines containing diphtheria-tetanus-pertussis 	<ul style="list-style-type: none"> Reach 90% national coverage and 80% in every district or equivalent administrative unit with all vaccines in national programmes, unless otherwise recommended
4. Develop and introduce new and improved vaccines and technologies	<ul style="list-style-type: none"> At least 90 low- and middle-income countries have introduced one or more new or underutilized vaccines 	<ul style="list-style-type: none"> All low- and middle-income countries have introduced one or more new or underutilized vaccines Licensure and launch of vaccine or vaccines against one or more major currently non-vaccine preventable diseases Licensure and launch of at least one platform delivery technology
5. Exceed the Millennium Development Goal 4 target for reducing child mortality	<ul style="list-style-type: none"> Reduce by two thirds, between 1990 and 2015, the under-5 mortality rate (Target 4.A) 	<ul style="list-style-type: none"> Exceed the Millennium Development Goal 4 Target 4.A for reducing child mortality

Annex 1

Appendix 2.

Global indicators for monitoring progress towards GVAP strategic objectives

GVAP strategic objectives	Global indicators
SO 1. All countries commit themselves to immunization as a priority	<ul style="list-style-type: none"> • Domestic expenditures per person targeted • Presence of an independent technical advisory group that meets defined criteria
SO 2. Individuals and communities understand the value of vaccines and demand immunization both as a right and a responsibility	<ul style="list-style-type: none"> • Percentage of countries that have assessed (or measured) confidence in vaccination at subnational level • Percentage of unvaccinated and under-vaccinated people in whom lack of confidence was a factor that influenced their decision
SO 3. The benefits of immunization are equitably extended to all people	<ul style="list-style-type: none"> • Percentage of districts with 80% or greater coverage with three doses of diphtheria-tetanus-pertussis-containing vaccine • Reduction in coverage gaps between lowest and highest wealth quintile and another appropriate equity indicator
SO 4. Strong immunization systems are an integral part of a well-functioning health system	<ul style="list-style-type: none"> • Dropout rate between first dose and third dose of diphtheria-tetanus-pertussis-containing vaccines • Sustained coverage with diphtheria-tetanus-pertussis-containing vaccines $\geq 90\%$ for three or more years • Immunization coverage data assessed as high quality by WHO and UNICEF • Number of countries with case-based surveillance for vaccine-preventable diseases that meets quality standards
SO 5. Immunization programmes have sustainable access to predictable funding, quality supply and innovative technologies	<ul style="list-style-type: none"> • Percentage of doses of vaccine used worldwide that are of assured quality
SO6. Country, regional and global research and development innovations maximize the benefits of immunization	<ul style="list-style-type: none"> • Progress towards development of vaccines against HIV infection, tuberculosis and malaria • Progress towards a universal influenza vaccine (protecting against drift and shift variants) • Progress towards institutional and technical capacity for conducting vaccine clinical trials • Number of vaccines that have either been re-licenced or licenced for use in a controlled-temperature chain at temperatures above the traditional 2–8 °C range • Number of vaccine-delivery technologies (devices and equipment) that have received WHO prequalification compared to 2010