

WORLD HEALTH ORGANIZATION
REGIONAL OFFICE FOR THE WESTERN PACIFIC



REPORT

**NINETEENTH MEETING OF THE TECHNICAL ADVISORY GROUP ON
IMMUNIZATION AND VACCINE-PREVENTABLE DISEASES
IN THE WESTERN PACIFIC REGION**

Manila, Philippines
23–27 August 2010

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Convened by:

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NOTE

The views expressed in this report are those of the participants of the Nineteenth Meeting of the Technical Advisory Group on Immunization and Vaccine Preventable Diseases in the Western Pacific Region and do not necessarily reflect the policies of the World Health Organization.

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This report has been printed by the Regional Office for the Western Pacific of the World Health Organization for the participants of the Nineteenth Meeting of the Technical Advisory Group on Immunization and Vaccine-Preventable Diseases in the Western Pacific Region, which was held in Manila, Philippines, 24–27 August 2010.

SUMMARY

The 19th Meeting of the Technical Advisory Group (TAG) on Immunization and Vaccine Preventable Diseases (VPDs) in the Western Pacific Region was held from 24 to 27 August 2010 in Manila, Philippines. A meeting of the Regional Interagency Coordinating Committee was convened concurrently with the TAG Meeting.

The objectives of the meeting were to identify challenges and provide recommendations for the Region and Member States in the context of strategies outlined in the Global Immunization Vision 2006–2015. These aimed to achieve measles elimination and the hepatitis B control milestone by 2012 (twin goals), plus maternal and neonatal tetanus elimination (MNTE) and maintaining poliomyelitis-free status.

The TAG acknowledged continued regional progress towards achieving these goals. It endorsed the strategic approaches contained in the revised regional plans for measles elimination and rubella control. It requested the Regional Director and Member States to establish a regional and national verification process for measles elimination, encouraged a new Regional Committee (RC) resolution reaffirming the measles elimination goal and establishing a verification process. It also recommended that countries and areas should make stronger efforts to increase specimen collection and contact tracing to establish epidemiologic linkages. Expert committees may be established to assist in case classification. Countries/areas that had not yet adopted a rubella control goal were encouraged to do so even when measles vaccination coverage was <80%, provided they commit to conducting periodic supplementary immunization activities (SIAs) with measles–rubella (MR) or measles–mumps–rubella (MMR) vaccine. The TAG endorsed the Hepatitis B Control Strategic Plan 2010–2014. It re-emphasized the importance of improving hepatitis B (HepB) vaccine birth dose and three-dose coverage in countries that would not achieve the HepB control milestone by 2012, and for those that have adequate coverage to begin the verification process. The TAG clarified that achievement of the HepB control milestone and goal would be considered only when seroprevalence targets were achieved among five-year-olds. Coverage data may be used as indicators of progress towards the goal and milestone. To maintain poliomyelitis-free status, the TAG recommended all countries to boost population immunity in areas with low routine immunization performance. Risk assessments for the detection and spread of imported poliovirus will identify high-risk areas and should be used to optimize immunization and surveillance performance and inform preparedness plans. The TAG encouraged countries that had not yet achieved MNTE to ensure the necessary resources to achieve this goal.

The TAG noted that recommendations on new and underutilized vaccine introduction (NUVI) made during the 2009 TAG Meeting remained valid. Countries should make proactive efforts to obtain the data necessary for informed decision-making on NUVI. Surveillance for diseases targeted by these vaccines should be further developed and consolidated under ministries of health. The TAG encouraged countries and areas to accelerate their efforts to increase district level immunization coverage and to validate the accuracy of both numerators and denominators in administrative reporting. The TAG called upon WHO to facilitate intercountry information exchanges and develop standardized tools to monitor programme performance. The TAG also recommended universal adoption of school entry immunization requirements. Member States were encouraged to participate in Regional Immunization Week. The new Effective Vaccine Management (EVM) assessment tool should be used to strengthen the cold chain, logistics and vaccine management. Member States were encouraged to vaccinate high-risk persons against the pandemic influenza A (H1N1) 2009 virus and use lessons learnt to

improve preparedness plans. Strengthening of National Regulatory Authorities (NRAs) was encouraged, particularly with several countries in the Region developing vaccine manufacturing capacity. WHO Regional and Country Offices and Member States themselves were encouraged to explore innovative fund-raising mechanisms to close increasing funding gaps.

CONTENTS

	<u>Page</u>
1. INTRODUCTION	1
1.1 Objectives	1
1.2 Organization	1
1.3 Opening ceremonies	1
2. PROCEEDINGS.....	3
2.1 Achieving and sustaining measles elimination.....	3
2.2. Accelerating control of rubella and prevention of congenital rubella syndrome (CRS) in the Western Pacific Region	12
2.3 Hepatitis B control.....	14
2.4 Maintaining poliomyelitis-free status through 2012	21
2.5 Achieving maternal and neonatal tetanus (MNT) elimination	30
2.6 Vaccine preventable diseases laboratory update	32
2.7 New vaccines.....	34
2.8 Routine immunization strengthening.....	35
2.9 Interagency Coordinating Committee	40
3. CONCLUSIONS AND RECOMMENDATIONS	44
3.1 Conclusions	44
3.2 Recommendations	49

ANNEXES

ANNEX 1 TIMETABLE

ANNEX 2 LIST OF PARTICIPANTS

ANNEX 3 RECOMMENDATIONS FROM THE SECOND MEETING ON
VACCINE PREVENTABLE DISEASES LABORATORY NETWORKS
IN THE WESTERN PACIFIC REGION, 22-26 FEBRUARY 2010,
MANILA, PHILIPPINES

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1. INTRODUCTION

1.1 Objectives

The 19th Meeting of the Technical Advisory Group (TAG) on Immunization and Vaccine Preventable Diseases in the Western Pacific Region was conducted in Manila, Philippines from 24 to 27 August 2010 with the following objectives:

- (1) to identify the major challenges to and provide recommendations on achieving measles elimination and hepatitis B (HepB) control by 2012 (twin goals), including reviewing and endorsing or modifying the recommendations from a technical consultation on verification of measles elimination in the Western Pacific Region;
- (2) to review and propose solutions to country-specific challenges to achieving the twin goals of maternal and neonatal tetanus elimination and maintaining poliomyelitis-free status; and
- (3) to recommend how strategies contained in the Global Immunization Vision and Strategy 2006–2015, including protecting more people, introducing new vaccines, and immunization in the context of global interdependence, can best be implemented in countries and areas in the Western Pacific Region to address the above-mentioned challenges and achieve Millennium Development Goals (MDGs) 4 and 5.

1.2 Organization

Attending the meeting were five TAG members, two temporary advisers, 29 participants from 16 countries and areas, 24 representatives from 12 partner agencies, five United Nations Children's Fund (UNICEF) officials from regional and country offices and 27 WHO staff from Headquarters (HQ), the Regional Office and country offices. The timetable of the meeting is provided in Annex 1. The list of participants is included in Annex 2.

1.3 Opening ceremonies

Dr Shin Young-soo, Regional Director, WHO's Western Pacific Regional Office, welcomed TAG members, participants and partners to the Meeting. He highlighted how 10 years ago, thanks to the efforts of all Member States, the Western Pacific Region had declared victory against poliovirus. The Region has remained poliomyelitis-free ever since. Eradicating poliomyelitis (polio) encouraged the establishment of two new goals: the elimination of measles by 2012 and the control of HepB, with an underlying commitment to use these goals to strengthen routine immunization systems.

Dr Shin said that the Region had seen a 58% decrease in measles cases from 2008 to 2009, and a 92% decrease in measles-related mortality since 2000. He stated that the Region would move rapidly towards the 2012 measles elimination goal, with China conducting the largest immunization campaign in history. This will target over 100 million children and adolescents with measles vaccine in September 2010. Papua New Guinea, the Philippines and Viet Nam will complete large-scale measles vaccination campaigns in the coming year.

Dr Shin noted that early integration of hepatitis B vaccine into national programmes and pioneering birth-dose vaccinations in the most difficult circumstances had led to a large decrease in HepB infection among children in the Region. Twenty-seven countries are expected to meet

the 2012 target of less than 2% chronic HepB infection among five-year-olds. He stated that the Region had remained poliomyelitis-free despite importations and that China and Mongolia had responded vigorously to threats from importation-related outbreaks and importations along the borders of Tajikistan and the Russian Federation. Dr Shin noted that maternal and neonatal tetanus elimination (MNTE) was coming closer to reality, with all countries concerned undertaking specific activities to reach the goal. He cited the Lao People's Democratic Republic's high-quality campaign combining tetanus toxoid (TT) immunization with oral poliomyelitis vaccine (OPV) and other vaccines, vitamin A administration and deworming medicine.

Dr Shin affirmed that the Region was leading all others in new vaccine introduction, and was the first to provide *Haemophilus influenzae* type B (Hib) vaccine to infants in all its low-income Member States. More than 15 countries have introduced Hib vaccine in the last three years, which should have a substantial impact on childhood mortality. Also, the Region led all others in the rapid deployment of pandemic H1N1 (2009) vaccine to 16 of its Member States. Over the past three years, WHO has played a leading role in supporting low-income countries to make informed decisions on introducing vaccines against rotavirus, pneumococcus and Japanese encephalitis by establishing surveillance systems for these pathogens.

Dr Shin said that progress towards the regional goals had been accompanied by increasing routine immunization coverage. Reported routine immunization coverage with a first dose of measles vaccine increased from 92% in 2003 to 96% in 2009. Reports of three doses of diphtheria-tetanus-pertussis (DTP3) coverage increased from 94% to 97% during the same period. In 2009, 89% of districts from 20 Member States reported at least 90% DTP3 coverage.

Dr Shin emphasized that in an environment of decreasing resources, it was important to remember that immunization programmes – and their disease eradication, elimination and control initiatives – substantially contributed to reducing child and maternal mortality while strengthening health systems and infrastructure.

Dr Shin concluded by thanking everyone for their commitment. He expressed particular appreciation to the Australian Agency for International Development, the Canadian International Development Agency, the Church of Jesus Christ of Latter Day Saints, the Government of Luxembourg, the United States Centers for Disease Control and Prevention, the Government of Japan, the Korea Centers for Disease Control and Prevention, Rotary International District 2650, Shinnyo-en, and the United Nations Foundation for helping protect so many children from vaccine-preventable and other diseases. Dr Shin thanked the Global Alliance for Vaccines and Immunization (GAVI) for its continued support to both Member States and WHO and extended his gratitude to the Ministry of Health, Labour and Welfare of Japan for funding this meeting.

2. PROCEEDINGS

2.1 Achieving and sustaining measles elimination

Dr Wang Xiaojun, EPI/WHO in the Western Pacific Regional Office, provided updates on regional progress towards measles elimination and the latest global discussions on feasibility of measles eradication.

2.1.1 Update on regional measles elimination and the feasibility of global measles eradication

(1) Regional measles elimination

The number of measles cases reported in 2009 from the Western Pacific Region reached a historic low of 61 297, corresponding to a measles incidence of 34 per million population. This represented a 58% decrease compared with 2008. Much of this decrease was attributable to a 60% reduction in measles cases in China from 2008 to 2009. Nevertheless, China accounted for 80% of the Region's measles cases in 2009. Measles incidence varied by country in 2009. Reported incidence was less than one per million in 22 countries and areas, and higher than 10 per million population in six countries.

Based on a review of available data, 25 countries and areas have probably eliminated measles, but these account for only 4.1% of the regional population. Four countries are set to eliminate measles by 2012, accounting for another 2.3% of the population. The final eight countries face challenges to achieving the goal of measles elimination by 2012, but are implementing the WHO-recommended strategies. Notable achievements were made in 2009 and 2010, especially in China and Japan. In China, after dropping 60% in 2009 compared with 2008, the number of measles cases decreased a further 18% from January to July 2010 compared with the same period in 2009. In Japan, measles cases decreased by 94% from 2008 to 2009 and a further 56% in the first seven months of 2010 compared with the same period in 2009.

The reported coverage of first and second dose measles-containing vaccine (MCV1, MCV2) in the Region was 96% and 94% in 2009. However, gaps in achieving at least 95% coverage of MCV2 were evident in some countries. Based on WHO–UNICEF Joint Reporting Forms on immunization (JRFs) submitted annually by ministries of health, eight countries achieved >95% for both MCV1 and MCV2. Seven countries reached 95% for either MCV1 or MCV2, and 21 countries did not meet 95% for either. Since 1996, 30 countries and areas have conducted 94 national or subnational supplementary immunization activities (SIAs) against measles, immunizing approximately 235 million children. School entry immunization requirements were implemented in 16 of 36 countries and areas in the Western Pacific Region reporting 2009 data on the JRF.

Surveillance performance has been improving regionally. The completeness and timeliness of national surveillance reporting to WHO's Western Pacific Regional Office increased steadily from 2007 to 2010, reaching 94% and 78% respectively from January to July 2010. In 2009, the discarded measles rate, an indicator of sensitivity, was 2.8 per 100 000 population (target ≥ 2) and the percentage of reported suspected measles cases with adequate specimens was 72%. However, special attention is needed to improve three indicators of surveillance performance. In 2009, only 43% of districts reported > 1 per 100 000 discarded

measles cases (target $\geq 80\%$). Only 43% of reported cases were adequately investigated (target $\geq 80\%$) and 25% of suspected cases were confirmed by clinical criteria because they could not be discarded or confirmed by laboratory methods or by epidemiologic linkage (target $< 10\%$).

Common challenges to measles elimination include heterogeneity of immunization coverage and surveillance quality among and within countries, plus difficulties in obtaining accurate epidemiologic data. They also include changing epidemiology and unexpected outbreaks, occurrence of measles virus importations within the Region and from other regions, gaps in monitoring genotype changes, and complexity of case classification. Financial and human resource mobilization and adequate political commitment present underlying barriers in several countries.

Experiences from several countries were shared to highlight key issues. In Cambodia, 4779 acute fever and rash (AFR) cases were reported in 2009, resulting in a discarded measles rate of 26.4 per 100 000 population. This was well above the two per 100 000 target. Over-reporting of suspected measles cases could have resulted from the adoption of an overly sensitive, non-specific surveillance case definition for measles (AFR) since 2008 and/or cash incentives for reporting suspected cases. Such over-reporting resulted in an increased workload for health staff conducting case investigations, specimen collection and shipment, and for laboratory staff conducting serologic testing. Viet Nam experienced a large measles outbreak from October 2008 that has continued through 2010. The outbreak began among young adult students in Ha Noi and then spread south. In all four regions of Viet Nam, cases occurred first among young adults, and after a few months, age distributions shifted to involve mainly children who sustained the epidemic. The Philippines was affected by a large measles outbreak beginning in late 2009 and peaking in March 2010, primarily affecting young children in the National Capital Region. The outbreak demonstrated gaps in routine and supplementary immunization as well as an increased risk of measles virus transmission in densely populated urban areas. In 2008–2009, Australia reported approximately 100 imported or import-related measles cases from 13 countries in all six WHO regions.

(2) Feasibility of measles eradication.

In May 2008, the World Health Assembly Executive Board (EB) asked WHO to assess the feasibility of global measles eradication. WHO Headquarters responded by assessing seven aspects of measles eradication feasibility including (i) biological feasibility, (ii) programmatic feasibility, (iii) vaccine market analysis, (iv) impact on health systems, (v) economic analysis, (vi) risk analysis in the post-measles era, and (vii) political feasibility. WHO convened a global technical consultation meeting in July 2010 to review commissioned feasibility studies addressing these seven areas.

- (i) Measles eradication is biologically feasible using currently available tools, as already demonstrated in the Americas. Five out of six WHO regions have established measles elimination goals (2000 for the Americas Region, 2010 for the Eastern Mediterranean and the European Region, 2012 for the Western Pacific Region and 2020 for the African Region).
- (ii) Measles eradication is programmatically feasible if existing challenges are overcome. These include perceiving measles as a mild disease in the European Region, challenges in accessing conflict areas in the Eastern Mediterranean Region, transmission among susceptible young adults in the Western Pacific Region, plus weak health infrastructure in the African Region. There is also a need to scale up implementation of key strategies in the South-East Asian Region, especially in India.

Overcoming these challenges requires increased political commitment and adequate human and financial resources.

- (iii) Manufacturing capacity of measles vaccine, measles–rubella (MR) vaccine, and measles–mumps–rubella vaccine (MMR) is sufficient to meet the projected demand to achieve global measles eradication by 2020. However, manufacturers should be advised of supply needs well in advance through shared demand forecasts. Risk of vaccine stock-outs may be mitigated through stockpiles or long-term supply contracts.
- (iv) Measles eradication impact on health systems was positive overall, according to a survey conducted in Cameroon, Tajikistan, Brazil, Viet Nam, Bangladesh and Ethiopia. Countries with stronger health systems may benefit more from this initiative, whereas poorly resourced countries with weak health systems may not take advantage of the benefits the measles eradication efforts provide to routine systems. These include improved microplanning, identifying and developing strategies to treat hard-to-reach populations, better monitoring and supportive supervision, plus development of high-quality surveillance systems, data management and interpretation skills.
- (v) Measles eradication is highly cost-effective, more so than achieving and maintaining 90%, 95% and 98% mortality reduction, according to two independent cost-effectiveness studies carried out in Brazil, Bangladesh, Colombia, Ethiopia, Tajikistan and Uganda. The investigators concluded that measles eradication ranked among the top best buys in public health.
- (vi) The risk of measles reintroduction during the post-eradication era was considered low from both natural and laboratory sources. Measles vaccination (possibly with a single dose at 15–18 months) would need to continue for some time after eradication.
- (vii) A stakeholder survey revealed inadequate political will among donor and development agencies to support the measles eradication goal. However, the survey may not have been representative, given the low response rate.

The conclusion of the participants of the global technical consultation meeting was that measles could and should be eradicated globally, with a tentative target year of 2020. As next steps, the outcomes of this meeting will be presented to the next meeting of the Strategic Advisory Group of Experts (SAGE) on Immunization for review. Then SAGE will report its assessment and recommendations to the Director-General of WHO. A new World Health Assembly (WHA) resolution will be proposed if both the SAGE and WHO's Director-General support the proposal of global measles eradication by 2020.

2.1.2 Laboratory evidence of progress towards measles elimination

Dr Youngmee Jee, Scientist, EPI/WHO in the Western Pacific Regional Office, summarized the progress of the measles and rubella laboratory network (LabNet) in the Western Pacific Region. This has grown to include 382 laboratories, consisting of one WHO global specialized laboratory, three WHO regional reference laboratories (RRLs) in Australia, China and Hong Kong (China), 16 national measles–rubella laboratories (NMLs) and 31 provincial and 331 prefectural laboratories in China

The quality of the network laboratories is maintained by a well-established accreditation scheme. As of August 2010, among 48 fully functional NMLs including 31 provincial laboratories in China, 44 were fully accredited based on annual site reviews by WHO and other criteria. All network laboratories in the Region, including 31 provincial laboratories in China, passed proficiency tests in 2008–2009. All NMLs have established a confirmatory testing mechanism by submitting a proportion of specimens to be confirmed by RRLs. In 2008–2009, concordance rates of confirmatory testing results of samples from most NMLs were >90% for both measles and rubella.

LabNet tests a large number of specimens annually. In 2008, the Western Pacific Region network laboratories tested 115 973 and 32 311 samples for measles and rubella respectively. In 2009, 61 100 and 25 834 samples were tested for measles and rubella respectively. As the Region is approaching the target year for measles elimination, much emphasis has been placed on the molecular epidemiology of circulating viruses by providing training opportunities for molecular analysis and by conducting virologic investigation of cases in some countries.

2.1.3 Plan to achieve and sustain measles elimination in the Western Pacific, 2010–2020

Dr David Sniadack, Acting Team Leader for EPI/WHO in the Western Pacific Regional Office, summarized the recently updated Regional plan for achieving and sustaining measles elimination in the Region from 2010–2020. This document is built upon previous regional documents, including the Regional plan of action 2003–2005 *Field guidelines for measles elimination* published in 2004, and the Regional measles elimination plan for 2008–2012. The current plan was updated based on the evolving measles epidemiology, latest technical developments and updated United Nations population estimates.

The goal of achieving measles elimination in the Western Pacific Region by 2012 and sustaining this through 2020 is supported by four strategic objectives: (1) achieve and maintain 95% population immunity by applying the Global Immunization Vision and Strategies (GIVS); (2) conduct high-quality case-based measles surveillance; (3) ensure high-quality laboratory performance; (4) strengthen linkages to achieve the first three objectives. Numerous strategic approaches are included to support attaining and sustaining the four strategic objectives. The plan also covers management of infectious waste and articulates the benefits of measles elimination to child survival and health systems.

Each country and area should prepare or update its national plan to achieve and sustain measles elimination, addressing technical, operational and financial issues. The Western Pacific Regional Office will provide technical assistance to countries and areas in all areas related to measles elimination. As of September 2010, an estimated US\$ 24.9 million will be required to eliminate measles by 2012 in priority countries and areas needing external support. These include Cambodia, Kiribati, the Lao People's Democratic Republic, Mongolia, Papua New Guinea, the Philippines, Solomon Islands, Vanuatu, Viet Nam and western China. Budgeted activities include SIAs, epidemiologic and laboratory surveillance, technical support and verification. With current and expected partner commitments, a funding gap of US\$ 19.4 million remains to achieve the 2012 goal. Beyond 2012, an estimated US\$ 6.7 million will be required to sustain measles elimination from 2013 to 2015 and US\$ 9.7 million between 2016 and 2020. These estimates do not include costs for outbreak response immunization.

2.1.4 Country reports on measles elimination

(1) Cambodia

Dr Ya Nareth, Senior Officer, National Immunization Programme in Cambodia, gave an update of the measles situation and country response plan.

Measles vaccine was introduced in Cambodia in 1986, with a one-dose schedule at nine months. The reported MCV1 coverage increased from 37% in 1993 to 92% in 2009. Phased measles SIAs were conducted between 2000 and 2004 targeting children aged nine months to 14 years. Follow-up SIAs were conducted in 2007 targeting children aged nine months to 59 months old, with reported coverage of 104%. Measles cases dramatically decreased after the phased measles SIAs in 2004, with very low incidence in 2005–2006. The surveillance case definition of measles was changed to AFR in 2007 and cash incentives for reporting measles cases were introduced. These changes were temporally associated with a dramatic increase in the number of reported cases and a corresponding increase in workload for case investigations, specimen collection and laboratory testing. The degree of over reporting appears to vary by province.

An outbreak of measles began in late 2009, continuing throughout the country in 2010, with 247 laboratory-confirmed cases reported through July. Many cases are occurring among children aged five years and older, suggesting either primary or secondary vaccine failures among children targeted through routine and previous SIAs.

Cambodia plans to conduct measles SIA in early 2011, targeting infants/children aged 9–59 months. The Ministry of Health considers 95% coverage achievable. However, challenges include a huge funding gap (US\$ 800 000), defining the actual target population, and accessing remote communities. The Japanese government has donated enough monovalent measles vaccine to immunize the 9–59-month-old target population. The Government of Cambodia is strongly committed to achieving the regional goal of measles elimination by 2012. It plans to give particular attention to districts with low performance and introduce a second routine measles dose, ideally at 18 months of age. It is considering adopting school entry immunization requirements, strengthening measles surveillance nationwide, exploring a more rational surveillance case definition and increasing the specimen collection rate.

(2) China

Dr Hao Lixin, Director of Division 1, National Immunization Programme, Chinese Center of Disease Control and Prevention, shared the status and national plans for measles elimination.

EPI was established in 1978 in China and a plan for measles elimination was launched in 2006. A national plan of action to achieve measles elimination by 2012 was updated in 2010 and jointly issued by five ministries. Measles incidence decreased by 60% in 2009 compared with 2008 as a result of more provinces conducting measles catch-up campaigns. In 2009, 52 461 cases were reported nationwide, corresponding to an incidence of 40 per million population.

Unvaccinated children reside primarily in the western provinces with difficult geographic access and inadequate infrastructure or resources. There are an estimated 42 million migrant children under 15 years old nationwide. Pockets of low coverage exist. One survey in Beijing showed 78% of surveyed children had completed their infant immunization series (three doses hepatitis B vaccine, three doses OPV, three doses DTP, and one dose measles vaccine) and 21% had received vaccination on time. Approximately 32% of the measles cases reported in China in

2009 were in migrants. An increasing number of migrant cases in large cities in eastern provinces are thought to be a critical challenge to measles elimination in 2012.

A national measles SIA is planned from 11 to 20 September 2010, targeting about 100 million children aged 8–59 months in 23 provinces, eight months to six years 11 months in three provinces, and eight months to 14 years in five provinces. After this, all 31 provinces will have conducted "catch-up" SIAs and 26 will have conducted "follow-up" SIAs. As before, pre-registration will be done by community workers. Pre-registration is an effective strategy for delivery of interpersonal communication and social mobilization. During preparation, an information sheet explaining the importance of measles SIA and the target population will be delivered.

China will continue to place more emphasis on unreached populations and will plan multiple long-term strategies to accelerate progress. These will include allocating more funds to less developed areas, reinforcing cooperation among relevant government departments, capacity-building and seeking international support.

(3) New Zealand

Mr David Wansbrough, Manager of Immunization Programme, Ministry of Health, reported on the recent measles outbreaks in New Zealand.

An increase in reported measles cases occurred in 2009 and 2010. An analysis of measles surveillance data revealed four clusters of cases. The first cluster in Otago began during epidemiologic week five in 2009 and involved measles virus genotype H1. The second in Auckland began in epidemiologic week 24 in 2009 and involved measles virus genotype B3. The third occurred in Canterbury, began in epidemiologic week 28 in 2009, and was associated with measles virus genotype D4. The fourth in the Northland region in 2010 was associated with genotype D8. Epidemiologic investigations confirmed that, at a minimum, the first H1 cluster in Otago and the last D4 in Northland were caused by importations.

There were fewer cases in 2009–2010 than in the measles outbreaks of 1997. Immunization coverage was believed to be high on the South Island, resulting in limited spread of measles. On the North Island, however, immunization coverage is low in some areas and it is surprising that transmission was not more extensive. Age-specific incidence was highest among infants in three of the four clusters. In Otago, incidence was highest in the 15–19-year age group.

In response to these clusters, the country temporarily changed the recommended age of MCV1 from 15 months to 12 months. In Canterbury, where the largest cluster was reported, a supplementary dose at six months was provided. In addition, a call-back system was implemented in which parents and/or persons of 13 to 20 years old who had received MCV1 only were advised to have a second dose. The Ministry of Health issued a strong message that unimmunized children would be excluded from school if there was a measles outbreak in their classroom. There was good compliance to the vaccination call-back and Ministry of Health communication, as indicated by the increased number of monthly immunizations given from July to September 2009.

New Zealand has a diverse population: the percentages of New Zealand/European, Maori, Pacific islanders and Asian people are 40%, 27%, 11% and 7% respectively. Although the clusters of measles cases did not occur specifically among minority groups, specific actions are planned targeting different types of unimmunized, including "willing but unable", "not motivated", "distrusting" and "refusals".

(4) The Philippines

Dr Ma. Joyce Ducusin, EPI Manager, Department of Health, shared the country's experience and plans.

In the Philippines, a high-quality SIA conducted in 2004 led to the interruption of measles virus transmission by endemic strain D3. No laboratory-confirmed case was detected for 2½ years following the SIA. Since that time, the country has focused on improving routine immunization. The Demographic Health Survey (DHS) conducted in 2008 indicated a 10% increase in fully immunized coverage and a 5% improvement in MCV1 coverage compared with the 2003 DHS results.

Measles cases appeared in November 2006, with presumably imported D9 and G3 strains. A follow-up SIA in 2007 slowed down but did not stop transmission of measles virus, and a large measles outbreak began in late 2009, continuing during 2010. A large proportion of cases were concentrated in Metro Manila. However, cases were also reported from many provinces in other regions. Outbreak response immunization (ORI) was conducted in late February and early March, and in the National Capital Region (Metro Manila), reached 278 000 (28%) of targeted children. Although the number of reported measles cases decreased dramatically following ORI, it was unclear whether the decrease was a result of ORI or an expected seasonal decrease.

To reinterrupt measles virus transmission, a nationwide door-to-door SIA targeting all children of 6–95 months old will be conducted in phases. It will involve intensive community preparation and then certification of measles-free areas. The upcoming SIA will first be piloted in Pasay, expanded to the National Capital Region, then to Regions III, IVA, VII and XI, and finally to all remaining areas. The estimated budget is US\$ 12.6 million. Approximately US\$ 1.2 million has been pledged thus far (US\$ 1 million from the Church of Jesus Christ of Latter Day Saints, US\$ 130 000 from the United Nations Foundation, and US\$ 70 000 from the Government of Japan). The government is expected to provide the remainder. Efforts to strengthen routine immunization will continue, including introduction of routine MCV2 as MMR at 12–15 months of age (MCV1 will continue to be given at 9–11 months of age).

(5) Viet Nam

Dr Nguyen Tran Hien, Director, National Institute of Hygiene and Epidemiology, gave a presentation on measles epidemiology and the country's plan of action to eliminate measles.

A nationwide measles outbreak began in October 2008 involving primarily young adults in Ha Noi and other northern provinces, continuing through 2010. Extensive population movements during a national holiday (Tet) in late January 2009 facilitated virus transmission across the country. The number of reported cases peaked in February and March 2009. A bimodal age distribution was noted, with the highest incidence among children one to six years old and adults 18 to 26 years old. Those aged seven to 17 years were probably protected by the national catch-up SIA conducted in 2002–2003 targeting children of nine months to 10 years of age. Persons over 26 years old were born before measles vaccine was introduced into the national programme and were probably protected by natural immunity from prior infection.

Viet Nam plans to conduct a nationwide measles SIA in the last quarter of 2010 targeting children one to five years old, to be followed by a change in the age of routine administration of MCV2 from six years to 18–24 months in 2011. For the upcoming national SIA, central and local governments will contribute US\$ 4 million for operational costs. The UN Foundation has provided approximately US\$ 3.1 million for bundled vaccine. UNICEF has contributed US\$ 200 000 to support training and workshops. WHO has provided US\$ 100 000 to support

monitoring and supervision. Viet Nam is also considering vaccination of high-risk young adults. However, additional financial resources are required.

Training on measles surveillance and data management is planned for 2010–2011, addressing the need to improve case notification and investigation. Efforts will also be made to improve measles and rubella laboratory capacity.

2.1.5 Verification of measles elimination

(1) Verification process for measles elimination

Dr Wang Xiaojun reviewed the relevant recommendations from the 2009 TAG meeting. In 2009, the TAG recommended that WHO's Western Pacific Regional Office should convene a task force to define criteria and processes for verification of measles elimination. WHO's Western Pacific Regional Office convened a technical consultation on verification of measles elimination in the Western Pacific Region on 15–16 June 2010. It invited experts and officials from Australia, China, Japan, the Philippines, the Republic of Korea, Viet Nam and Pacific island countries and areas (PICs), as well as global experts and WHO country officers. The process for verification of measles elimination should include sound evidence of the absence of endemic measles virus transmission. The process should be external and independent. Applying standard methods and criteria for required documentation will help guide activities at both country and regional levels. National verification will form the basis for eventual regional verification of elimination. This will only become possible as a result of successful verification processes being accomplished in all Western Pacific Region countries and areas. Both national level committees and a regional commission will be responsible for verifying measles elimination, with the 21 PICs considered as one epidemiological block. Committee and commission members should be leading professionals in relevant technical areas. Ideally, they should not be directly involved in the management or operations of the National Immunization Programme (NIP). Regional commission members will be appointed by the WHO Regional Director, and national committee members will be appointed by the Minister of Health. At least one member from the national TAG or equivalent body should be appointed to the national committee to provide effective linkages between the two bodies. A subregional committee for the 21 PICs will have similar functions to national committees.

The Regional commission will provide guidance to national committees and verify national and regional measles elimination status on the basis of documentation submitted by the national committees. National committees will determine when countries and areas are ready to request verification by the Regional commission, and will advise the Ministry of Health on requirements of verification. They will compile and analyse the data provided, conduct field visits and propose solutions when needed. Each country must maintain elimination status by sustaining high immunization coverage and high-quality surveillance. Therefore, periodic assessments by national committees and the Regional commission will be needed to maintain verification of elimination. Both the Regional commission and national committees will also be expected to play an advocacy role for measles elimination.

A proposed time-frame of activities could include nomination of Regional commission chairman and members in 2011, followed by establishment of guidelines for verification of measles elimination, establishment of national committees, and organization of a national verification workshop.

(2) Verification criteria for measles elimination in the Western Pacific Region

Dr David Sniadack summarized the key agreements on verification criteria from the technical consultation on measles elimination in the Western Pacific Region. Five components of verification should be considered: (1) high population immunity, (2) measles incidence and epidemiology for as many years as possible, (3) high-quality epidemiologic surveillance, (4) virologic analysis of measles chains of transmission, and (5) sustainability of measles elimination in the context of a well-functioning NIP.

High population immunity is a fundamental requirement for eliminating measles. Documentation may be required to demonstrate that all birth cohorts following measles vaccine introduction are adequately protected. Data sources may include administrative data by district, WHO–UNICEF Joint Reporting Forms (JRFs), SIA reports, reports from coverage surveys, DHS, Multiple Indicator Cluster Surveys (MICS), serologic survey results and estimated measles reproductive numbers (R).

Measles elimination refers to absence of endemic cases. Measles incidence of <1 per million population could be considered as an operational definition for measles elimination. Table 1 describes different mechanisms for confirming measles (laboratory-confirmed, epidemiologically linked and clinically confirmed) and potential sources of infection (endemic, imported, import-related and unknown). To calculate measles incidence relative to the operational definition above, the numerator may include cases classified as laboratory-confirmed and epidemiologically linked, but excluding imported cases (i.e. cells 1, 2, 7, 8, 10 and 11).

Table 1 Mechanisms for confirming measles

Source/mechanism	Laboratory-confirmed	Confirmed by epidemiologic linkage	Clinically confirmed
Endemic	1	2	3
Imported	4	5	6
Import-related	7	8	9
Unknown	10	11	12

Clinically confirmed cases have uncertain etiologies of infection, and the inability to determine source of infection makes it difficult to monitor endemicity of transmission. Therefore, the number of cases classified as "clinically confirmed" (i.e. cells 3, 6, 9 and 12) and as "unknown source" (cells 10, 11 and 12) should be as few as possible.

Epidemiologic analysis of measles should include a description of its epidemiology over time in a given country or area through epidemic curves, spot maps and tables showing age distribution and vaccination status. Expected trends as countries approach measles elimination would include increased intervals between clusters/outbreaks, decreased number of cases in clusters/outbreaks, decreased duration of clusters/outbreaks, increases in sporadic cases and a loss of seasonality. For incidence and epidemiologic descriptions to be meaningful, surveillance must be sensitive, representative and accurate. Potential indicators of high-quality surveillance could include discarded non-measles rate at national level, discarded non-measles rate at subnational level, percentage of cases with adequate investigation, and percentage of cases with adequate specimens collected.

Virologic analysis and high-quality laboratory performance are required to verify measles elimination. Indicators of laboratory performance include WHO accreditation, 80% of positive cases be confirmed at WHO-accredited laboratories, and 80% of outbreaks to be accompanied by virologic and genotypic analysis. To demonstrate an ability to maintain measles elimination, countries should incorporate elimination activities in their multi-year plans on immunization or equivalent documents. Regional commission reviews will consider the above five components in assessing a country's or area's elimination status. The Regional commission may use its discretion to consider alternative evidence for measles elimination for countries/areas that are unable to provide recommended standardized data, as was done for certification of regional polio-free status.

2.2. Accelerating control of rubella and prevention of congenital rubella syndrome (CRS) in the Western Pacific Region

2.2.1 Status of rubella control and CRS prevention in the Western Pacific Region

Dr Wang Xiaojun reviewed the current status of rubella control and CRS prevention in the Western Pacific Region. In 2009, the TAG recommended that Western Pacific Region countries should decrease rubella and CRS incidence to fewer than 10 cases per million population and fewer than 10 CRS cases per million live births (LB). Ideally, this was to be done by 2015 in order to maximize opportunities for integration with measles elimination activities. Countries were encouraged to employ a combination of routine and supplementary immunization strategies, including using MR or MMR during measles SIAs and introduction of rubella-containing vaccine (RCV) through routine immunization in countries achieving 80% RCV. They should target child-bearing age women (CBAW) with RCV at suitable opportunities. Countries were also encouraged to establish sentinel CRS surveillance to monitor trends in CRS incidence and programme impact.

Rubella is endemic in the Western Pacific Region. China began reporting rubella cases in 2004, resulting in a large increase in reported cases for the Region, peaking at 127 305 in 2008; 73 655 cases were reported in 2009. In 2009, Cambodia, China, the Lao People's Democratic Republic, Singapore, Macau (China), Malaysia and Viet Nam reported rubella incidence higher than 10 per million population. From 2007 to 2009, 83% of the regional rubella cases were reported from people aged < 20 years. However, surveillance sensitivity may differ by country and within countries.

Western Pacific Region countries and areas have provided RCV through routine childhood immunization, selective vaccination of female targets and/or incorporating RCV into the measles SIAs. As of 2009, 30 out of 36 Western Pacific Region countries used RCV in their routine vaccination programmes. From 2007 to 2009, among countries and areas in which males and/or females up to 20 years old had been protected by RCV, average rubella incidence was 2.3 per million population. Among countries introducing RCV recently or yet to use RCV, rubella incidence was 59 per million population.

A majority of countries have integrated rubella surveillance into measles surveillance under a common case definition (either suspected measles or AFR). Specimens collected from suspected measles or AFR cases are tested for rubella, if negative for measles immunoglobulin M (IgM). Some countries, including China, have a separate parallel surveillance system for rubella with a unique case definition. Congenital rubella syndrome (CRS) is underreported and underrecognized in the Region. According to one global study conducted by Felicity Cutts, 12 600 (1500–21 400) CRS cases were estimated in the Western Pacific Region in 1996. However, no CRS case was reported that year from Western Pacific Region countries in the JRFs. From 2000 to 2009, only 27 CRS cases were reported from seven countries. CRS

surveillance was conducted in 19 countries and areas of the Western Pacific Region in 2008–2009, according to JRF reports.

2.2.2 Regional plan for accelerating control of rubella and prevention of CRS in the Region

Dr David Sniadack reviewed the Regional plan for accelerating control of rubella and prevention of CRS in the Western Pacific Region for 2010–2015.

The rationale for accelerating rubella control in the Region includes: (1) rubella and CRS are endemic in the countries that have not or have recently introduced RCV; (2) measles surveillance is increasingly detecting rubella cases; (3) bundled MR at US\$ 0.65 per child is relatively cheap and cost-effective; and (4) the 2009 TAG recommended finalizing the regional plan for accelerating rubella control and CRS prevention. Moreover, the 2003 Regional Committee resolved to use measles elimination to prevent CRS.

The goal of the Regional rubella control and CRS prevention plan is to reach rubella incidence of ≤ 10 /one million population, excluding imported cases, and CRS incidence of ≤ 10 /one million LBs, excluding imported cases. Strategic objectives include: (1) achieve and maintain high immunization coverage against rubella; (2) establish or strengthen surveillance for rubella and CRS; (3) develop and maintain an accredited rubella laboratory network to support every country or area in the Region; and (4) strengthen linkages to achieve the first three strategic objectives.

Vaccination strategies to control rubella in a given country should be based on its history of rubella vaccination. The 21 countries that have long-standing rubella-containing vaccine (RCV) programmes and protect females up to 20 years should maintain high routine vaccination coverage. They should assess susceptibility in child-bearing age women (CBAW) to determine whether additional vaccination strategies are needed. Four countries that have used RCV for over 10 years and protect all persons up to 15 but < 20 years of age may protect all persons < 20 years through SIAs targeting susceptible age groups or special routine strategies targeting older teenagers. For the remaining 11 countries that have either introduced RCV recently or are not using RCV, those with MCV1 coverage $\geq 80\%$ for three years should introduce RCV into their routine immunization programmes. For those with MCV1 coverage < 80% and/or not yet introducing RCV into their routine schedules, SIAs may be conducted targeting appropriate age groups to protect male and female birth cohorts up to 20 years. To maximize efficiencies, MR or MMR may be used during periodic measles SIAs to maintain adequate population immunity against both measles and rubella. Countries and areas with susceptible CBAW may vaccinate CBAW with RCV at convenient times, such as during premarital counselling, postpartum and when bringing newborn children for vaccination. All countries and areas should ensure immunity in health care workers to prevent nosocomial transmission of rubella.

Monitoring measles surveillance performance through standard indicators gives an indication of the quality of surveillance for rubella. A suspected rubella case definition may be added to measles/rubella surveillance, referring to a person of any age in whom a health worker suspects rubella. A health worker should suspect rubella when a patient presents with fever, maculopapular rash and (1) cervical and/or suboccipital and/or postauricular lymphadenopathy or (2) arthralgia/arthritis. Lymphadenopathy is particularly common among children and arthralgia/arthritis among adults with rubella. To maximize surveillance sensitivity, specimens should be collected for suspected measles and rubella cases, with sequential testing for both.

Sentinel CRS surveillance provides a baseline, monitors the impact of the rubella vaccination programme and helps ensure that high-quality medical services are provided for children with disabilities. A suspected CRS case is defined as any infant under one year of age

in whom a health care worker suspects CRS. A health care worker should suspect CRS in an infant when one or more of the following birth outcomes are detected: congenital cataract(s), congenital heart disease, hearing impairment, pigmentary retinopathy, congenital glaucoma, or an infant whose mother has a history of suspected or confirmed rubella during pregnancy.

Estimated funding required to achieve control of rubella by 2015 will be US\$ 92.5 million. Building upon integration with measles elimination activities, the budget needed for measles elimination alone will increase from US\$ 24.9 million to US\$ 25.6 million in 2010–2012 if MR instead of monovalent measles vaccine is used for SIAs.

2.3 Hepatitis B control

2.3.1 Global update

Dr Steven Wiersma, Medical Officer, IVB/WHO/HQ, presented a global update on hepatitis B control.

By 2008, over 90% of countries had introduced hepatitis B vaccine into their national immunization programmes. Globally, coverage with three doses of hepatitis B vaccine has been increasing steadily, from 18% in 1999 to 69% in 2008. In 2008, coverage ranged from 41% in the South-East Asian Region to 89% in the Western Pacific Region. Eighty-five countries (44%) have national policies for administration of a dose within 24 hours of birth. In 2008, the Strategic Advisory Group of Experts (SAGE) on immunization recommended that all regions and associated countries should develop goals for hepatitis B control appropriate to their epidemiologic situations. It was emphasized that country goals were essential for regions and countries with intermediate or high endemicity of hepatitis B virus (HBV) infection or significant subpopulations with these levels of infections. It was also noted that serologic surveys of hepatitis B surface antigen served as a primary tool to measure impacts of immunization and achievement of the control goals supplemented by acute disease surveillance and mortality data.

Five months later, in 2009, the SAGE provided further recommendations to support hepatitis B birth dose vaccination. SAGE recommended that infants should receive the first dose of hepatitis B vaccine as soon as possible (< 24 hours) after birth. This should be followed by two or three more timely doses to complete the series. Immunization programmes should work with maternal and child health programmes to promote the administration of the hepatitis B vaccine birth dose. Timely (within 24 hours) delivery of a birth dose of hepatitis B vaccine should be a performance measure for all immunization programmes.

Dr Wiersma reported on the development of a guidance document on best practices for assessing the impact of hepatitis B vaccination programmes. The document will be based on a literature review and guidance from experts on conducting serologic prevalence surveys, and is in the final stages of review. WHO is also working to document best practices for administering hepatitis B vaccine birth dose. A consultation will be held in October 2010 in Melbourne, Australia to learn from country and regional experiences.

In 2010, the Eastern Mediterranean Region became the second to adopt a regional hepatitis B control goal, after the Western Pacific Region. The goal adopted by the Eastern Mediterranean Region is to reduce the prevalence of chronic hepatitis B infection to < 1% among children < 5 years old by 2015. The age for measuring impact and the time line for achieving the goal differ between the two regions. In 2010, the World Health Assembly (WHA) adopted a resolution on viral hepatitis. This resolution designated 28 July as World Hepatitis Day. In response to the WHA resolution, WHO has convened a task force, which has grouped key

activities into four areas: (1) prevention; (2) identification and treatment; (3) integration; and (4) innovation.

Dr Wiersma concluded with a reminder of the 1998 WHO Conference on Global Disease Elimination and Eradication as Public Health Strategies where a working group on viral diseases recommended hepatitis B virus infection as a “primary candidate for elimination or eradication”.

2.3.2 Regional update

In 2005, the Western Pacific Regional Office Regional Committee adopted a resolution to reduce chronic hepatitis B infection to less than 2% among five-year-olds by 2012 as an interim milestone towards the final regional goal of less than 1%. Dr Karen Hennessey, Technical Officer, EPI/WHO, Western Pacific Regional Office, provided an overview of regional progress in hepatitis B control.

The strategy for reducing chronic infection rates from a regional average of 8%–9% to <2% among five-year-olds is to have $\geq 65\%$ birth dose and $\geq 85\%$ three-dose hepatitis B vaccine coverage. The strategy does not include supplemental vaccination campaigns to enhance routine coverage. Part of the rationale for adopting the control goals is to strengthen routine EPI.

The Western Pacific Region has made tremendous progress towards hepatitis B control, with 27 countries and areas, comprising 87% of the Region’s population, estimated to reach the 2012 milestone based on seroprevalence or immunization coverage data. However, nine priority countries have not reached the immunization coverage targets needed to reach the 2012 milestone. These are Cambodia, the Lao People's Democratic Republic, Papua New Guinea, the Philippines and Viet Nam, plus four PICs (Kiribati, Samoa, Solomon Islands and Vanuatu).

In 2008, the TAG recommended that countries with low birth dose or routine coverage should develop action plans to improve coverage. In 2009, it was advised that these countries should conduct national or international programme evaluations within 12 months. Some priority countries have documented plans to increase hepatitis B coverage as part of national plans or comprehensive multi-year plans. No priority countries were able to conduct programme evaluations. All countries with high vaccination coverage are on track to conduct seroprevalence surveys, except for 10–13 PICs. The large and nationally representative serologic surveys recommended in the Western Pacific Regional Office certification guidelines are a challenge for PICs due to their small populations. Alternative survey methods are needed that are acceptable for certification of PICs. Alternative survey methods would also be useful for programme assessment or post-certification monitoring.

Several countries have data from serologic surveys suggesting that they have met the regional milestone, but have not begun the certification process. Reasons for not certifying may be because it is not a priority, the certification process is not clear, or the term “certification” implies final stages of control, which countries fear may result in decreased support. The 2005 Regional Committee Resolution states that 2012 is the year in which chronic infection prevalence of less than 2% among five-year-old children should be achieved. However, in 2008, recommendations from an International Expert Meeting on Hepatitis B Control in the Western Pacific Region suggested that the 2012 target year should be interpreted as the year in which countries achieved coverage targets. They could then be considered “provisionally certified” and validated five years later. The TAG was asked to provide clarification on the interpretation of the target year 2012.

2.3.3 Hepatitis B control in Papua New Guinea

Mr Stephen Toikilik, National EPI Manager, National Department of Health, provided an overview of hepatitis B control in Papua New Guinea.

Over 80% of the country's 6.5 million people live in rural settings. This has important implications for all health programmes, but presents a particular challenge for providing newborn infants with a birth dose of hepatitis B vaccine within 24 hours. Birth dose administration is most feasible in hospital settings due to access to skilled health workers and the cold chain. Nationally, 52% of births take place in hospitals. However, this varies greatly, from 37% in the Momase region to 73% in the Islands region. The almost equal distribution of facility and home births will require more than one strategy to provide a birth dose of hepatitis B vaccine.

The EPI has been able to sustain routine vaccination coverage despite challenges presented when the government implemented major constitutional reform and structural adjustment. From 2005 to 2009, coverage with three doses of hepatitis B vaccine ranged from 56% to 70% and birth dose coverage within 24 hours ranged from 27% to 35%. A birth dose coverage of 26% means that facilities are missing opportunities to administer birth dose vaccine. Another challenge with increasing vaccination coverage is that outreach services by districts and health facilities have been reduced and this has impacted on coverage for all antigens. Mr Toikilik stated that there was no clear high-level advocacy for hepatitis B as compared with other initiatives such as measles.

Strategies for increasing three-dose coverage of hepatitis B vaccine include strengthening low performing districts through monitoring and supervision, strengthening advocacy efforts, and developing educational and awareness materials. Strategies for increasing birth dose coverage within 24 hours include introducing an incentive scheme for facility deliveries, integrating hepatitis B vaccine birth dose training in the nursing curriculum, and encouraging the use of hepatitis B vaccine out of the cold chain as needed. To increase coverage in home births, an important strategy is to provide community-based administration of hepatitis B birth dose vaccine by village health volunteers, as was done in a project led by the Burnet Institute and National Department of Health. This project provided a comprehensive postnatal care package in East Sepik. Initial reports suggest that birth dose coverage increased from 30% to 80%.

Other important efforts include identifying and involving nongovernmental organizations that have a workforce that can potentially provide injections, plus collaborating with Maternal and Child Health (MCH) professionals on formulating a training plan.

2.3.4 Hepatitis B control in the Lao People's Democratic Republic

Dr Anonh Xeuatvongsa, National EPI Manager, Ministry of Health, provided an overview of national hepatitis B control.

The key challenge for preventing perinatal hepatitis B virus transmission in the Lao People's Democratic Republic is providing a timely hepatitis B vaccine birth dose to the 80% of babies that are delivered without a skilled birth attendant. An important part of planning for vaccine needs and delivery takes place at the district and health centre levels, where staff develop microplans together. Monovalent hepatitis B vaccine is available at every health centre for administering birth dose vaccine within 24 hours and up to seven days after birth. A low proportion of vaccinations occur at fixed posts. In 2009, 15% of vaccines were provided through fixed posts, 35% through same-day outreach and 50% by overnight outreach.

Coverage with three doses of hepatitis B vaccine increased from 49% in 2005 to 67% in 2009. Coverage with birth dose within 24 hours increased from 6% in 2007 to 20% in 2009. Challenges for achieving high birth dose coverage include outreach limited to four times a year, incomplete utilization of fixed sites and insufficient and irregular flow of funding. They also include vaccine stock-outs, poor awareness of the benefits of immunization among ethnic minorities, inaccurate target populations and reliance on earmarked donor funds.

Activities aimed at increasing routine immunization coverage include a recently approved policy for free vaccine delivery (soon to be implemented nationwide) and expansion of outreach to six times a year. They include expansion of the cold chain to reach 80% of health centres with refrigerators by 2010, and Effective Vaccine Management (EVM) assessment in 2010 to improve vaccine supply and stock management. Activities aimed at increasing hepatitis B vaccine birth dose coverage include a fee waiver for facility deliveries in selected areas (being considered by the Ministry of Health and partners), promoting integration of MCH and EPI services and expanding hepatitis B vaccine birth dose visits. They also include considering Uniject for remote areas, continuing skilled birth attendant courses and birth certificate projects, reviewing hepatitis B-related plans with the Western Pacific Regional Office in 2010, and possibly conducting a seroprevalence study for programme assessment and collection of data for advocacy purposes.

2.3.5 Hepatitis B control in the Philippines

Dr Ma. Joyce Ducusin, Medical Specialist, Department of Health, provided an overview of hepatitis B immunization activities in the Philippines.

Hepatitis B vaccine was introduced in 1995, but did not reach over 50% coverage until 2003. Coverage dramatically increased from 51% in 2003 to 89% in 2007 and has remained at that level for the last three years. A nationwide birth dose policy was implemented in 2007 and coverage increased from 9% in 2007 to 34% in 2009. Dr Ducusin described an assessment strategy called “3As + 3Fs” used to scale up hepatitis B birth dose coverage in hospitals. The “A”s stand for assess, analyse and agree on next steps; the “F”s mean having at least three follow-up sessions. Surveys conducted in 90 hospitals showed that birth dose increased from 22% before to 70% after assessments were conducted. Furthermore, these surveys showed that hospitals with standing orders for birth dose vaccination, a copy of hepatitis B vaccination policy and staff trained on hepatitis B were more likely to have > 90% birth dose coverage.

Other activities related to increasing vaccination coverage included intensifying efforts to reach urban poor and developing an essential newborn care guideline integrating hepatitis B vaccination. Efforts have been made to increase birth dose coverage among home births. However, these are viewed as an interim measure, with the ultimate goal of increasing facility births to > 90%. To continue to increase birth dose coverage in facility settings, the 3As+3Fs assessments will be expanded to include 100 new hospitals and health facilities in up to 121 local government units. The health facility assessments will include a component to ensure that the urban poor will be reached. To achieve the hepatitis B control target, external support for resource mobilization and technical support for conducting a prevalence study when the timing is appropriate will be needed.

2.3.6 Hepatitis B control in Cambodia

Dr Chheng Morn, Deputy Director, National Immunization Programme, provided an overview of hepatitis B control in Cambodia.

In Cambodia, 56% of babies are delivered at home. Coverage with three doses of hepatitis B vaccine increased steadily from 64% in 2002 to 95% in 2009. The coverage of hepatitis B

birth dose vaccination within 24 hours also increased from 25% in 2007 to 55% in 2009. Preliminary data comparing the first semester of 2009 and 2010 data indicate that birth dose coverage will further increase in 2010.

The Ministry of Health supports increasing facility births by providing an incentive of US\$ 15 per health centre delivery. Health centre deliveries increased from 22% in 2005 to 44% in 2009. Despite this, traditional birth attendants are crucial players in home delivery, and vaccination by midwives at the time of delivery is not fully implemented. Activities to improve routine immunization include implementing the Coverage Improvement Plan to support difficult operational districts (ODs) or health centres, increasing fixed sites while protecting communities dependent on outreach, and implementing a special strategy targeting high-risk areas, with an emphasis on communication.

Activities and considerations geared towards increasing timely birth dose coverage include using GAVI/Health Systems Strengthening (GAVI/HSS) funds to encourage timely birth dose in 10 ODs and improving the quality of hepatitis B birth dose data. (A field visit revealed overreporting of birth dose coverage.) Activities also include ensuring that birth dose vaccination by midwives is included in health facility training and exploring the possibility of using hepatitis B vaccine out of the cold chain. They also include ensuring national funding is available for monovalent hepatitis B vaccine, and GAVI co-financing of combination vaccine.

2.3.7 Hepatitis B control in Viet Nam

Professor Nguyen Tran Hien, Director and National EPI Manager, National Institute of Hygiene and Epidemiology, provided an overview of hepatitis B control in Viet Nam.

Dr Nguyen presented data from various hepatitis B surface antigen prevalence surveys. A Thanh Hoa population survey published in 2003 found hepatitis B surface antigen prevalence of 12.5% among infants of 9–17 months. Among children aged four to five years, it was 18.4%; and among adults aged 25–39 years, 18.8%. Based on unpublished data from a Programme for Appropriate Technology (PATH) project, mothers from Thanh Hoa Provincial Hospital had a hepatitis B surface antigen prevalence of 9.7% (65/631). Among those, 38.5% (25/65) were hepatitis E surface antigen positive. This project also reported a hepatitis B surface antigen positive rate of 5.4% (34/631) from cord blood, and 50% (17/34) of those were hepatitis E surface antigen positive. Other studies confirm these high rates of chronic infection, including a 1994 study among pregnant women finding a hepatitis B surface antigen prevalence of 12.5%. Five studies among healthy populations conducted between 1988 and 2005 reported prevalence rates from 8% to 25%.

Viet Nam has had a successful hepatitis B vaccination programme, starting with introduction of the vaccine in 1997. From 2004 to 2006, coverage with three doses of hepatitis B vaccine was over 90%. Birth dose coverage targets recommended in the regional certification guidelines were almost achieved, with 64% coverage in 2006. However, 12 severe adverse events following immunization (AEFI) were reported in 2007–2008, resulting in a dramatic decline in coverage for both routine hepatitis B vaccination and birth dose. Routine coverage increased from 67% in 2007 to 94% in 2009. Birth dose coverage experienced a slower recovery, from 27% in 2007 to 40% in 2009.

Low coverage was attributed to decreased confidence in EPI. Parents hesitated to bring their children for vaccination, health workers were afraid to vaccinate children, and vaccine shortages occurred due to temporary suspension of vaccine distribution. Training and retraining of EPI and hospital staff were conducted on the national guidelines for the use of vaccines. To strengthen birth dose coverage, the Ministry of Health produced guidelines requesting health care

facilities to implement hepatitis B birth dose vaccination, as not all hospitals and health facilities were doing this, especially in rural areas. In addition, efforts to increase cold chain capacity were made by providing refrigerators.

These efforts have helped increase birth dose coverage. However, another challenge has recently arisen regarding vaccine distribution. To ease field implementation and to increase vaccine safety, the domestically produced monovalent hepatitis B vaccine used for birth dose vaccination was changed from a two-dose to a single-dose vial in June 2010. However, this process led to field stock-outs of vaccine. The strategies for addressing this include increasing vaccine stocks and strengthening vaccine procurement and management.

There is commitment from the national government to hepatitis B control and funding is increasing. Furthermore, a national seroprevalence survey to measure rates of chronic infection among children is planned for December 2010.

2.3.8 Pacific island country experience with prevalence studies

Dr Raul Bonifacio, former Technical Officer, WHO South Pacific, presented the experience of conducting chronic hepatitis B seroprevalence studies in the Pacific.

The majority of PICs are hyperendemic, with chronic hepatitis B prevalence of >8% among adults. Because of this, they have had long-standing and largely successful immunization programmes reaching the coverage targets recommended for hepatitis B control. Regional certification guidelines¹ recommend conducting national seroprevalence studies for countries that are likely to have achieved hepatitis B control based on having high immunization coverage. These surveys should:

- (1) be nationally representative;
- (2) have a sample size that will yield hepatitis B surface antigen estimates within $\pm 0.5\%$ with 95% confidence; this level of precision requires sample sizes of approximately 3000 children if a national prevalence is assumed to be 1%; and
- (3) use standard laboratory procedures, including proper quality control and procedures.

Most PICs would not be able to conduct a survey with such precision, even with a finite population correction. Alternative survey designs for certification of PICs would be useful for motivating countries to measure the impact of their immunization programmes and apply for certification. Seven PICs (American Samoa, Fiji, the Federated States of Micronesia, Marshall Islands, New Caledonia, Palau and Tonga) have conducted seroprevalence studies. Some study designs are geographically representative, e.g. the Tonga, Palau and American Samoa studies. Other designs have limited geography, e.g. the Fiji study. These studies also used a variety of sampling designs including community-, school- and hospital-based sampling.

None of these studies meets the certification guidelines criteria for precision as the sample sizes are too small. Lessons learnt from the studies include that some PICs may have an efficient and representative way to sample children. This was the case for Tonga, which has only one hospital on the main island, 75% of population on the main island, and free health care, making access largely equal. Another approach used was to include multiple countries in one survey. This was done for the study conducted in 1998 that included Fiji, Kiribati, Tonga and Vanuatu.

¹

Guidelines for certification of achievement of hepatitis B control goal in the Western Pacific Region, Manila, Philippines., World Health Organization, Manila, April 2007.

The benefits of a multicountry design are that it provides consistency in study methodology, field implementation and laboratory procedures across countries.

2.3.9 Alternatives to national seroprevalence surveys

Dr Eric Mast, Associate Director of Science, Global Immunization Division, United States Centers for Disease Control and Prevention, gave a presentation on monitoring the impact of hepatitis B immunization.

National seroprevalence surveys are an important tool for measuring the impact of immunization programmes, and directly document disease reduction according to certification guidelines. But they may not be feasible in some countries because of their high cost in terms of financial and human resources required. Also, the sample size will require the total target population in small countries, and a country might achieve the target but still have pockets of higher prevalence due to variations in chronic hepatitis B prevalence or immunization coverage.

Two alternatives to national surveys are pooling data from multiple countries or subnational sampling of high-risk areas, on the assumption that these areas represent those with the highest prevalence. Pooling data from multiple countries would result in lower costs and consistency of methodology across countries if all countries followed a similar protocol. Constraints would be that all countries might not be represented unless it was forced by design, and individual countries would have wide confidence intervals. A consideration for the TAG or the Expert Resource Panel is whether a country would be considered certified if it had reached vaccination coverage targets and the prevalence target was reached for the pooled countries.

Advantages of subnational serosurveys are that they are less costly and more feasible to conduct than national surveys. The constraint is that they will not yield a national estimate. A consideration for the TAG or Expert Resource Panel is whether a country would be certified if it had reached vaccination coverage targets and seroprevalence targets had been met for a selected population.

The next step towards elimination of hepatitis B virus transmission is to ensure disease reduction has occurred in all areas of the country. The maternal and neonatal tetanus elimination (MNTE) initiative provides experience in monitoring outcomes at subnational level. This initiative conducts assessments in the highest-risk districts and these districts must pass standard criteria to be considered in national level elimination. This method requires being able to identify high-risk districts based on chronic infection rates or vaccine coverage indicators. Dr Mast described an updated hepatitis B burden model that can facilitate monitoring of hepatitis B programmes, evaluate the progress towards control goals and assess the impact that vaccination targets will have on chronic hepatitis B infection rates.

2.3.10 Hepatitis B Expert Resource Panel

Professor Andrew J. Hall, London School of Hygiene and Tropical Medicine, presented the roles and activities of the Hepatitis B Expert Resource Panel (ERP).

In 2009, the TAG recommended that the Western Pacific Regional Office Hepatitis B ERP should hold quarterly teleconference discussions and (at least) annual meetings to monitor and facilitate continued progress towards the 2012 goal. In response, the Western Pacific Regional Office and the ERP have developed a proposal to increase the roles and activities of the ERP. Historically, the group mainly acted as a pool of experts to serve on certification panels when countries initiated the certification process.

Specific activities that the panel will undertake in the next year address: (1) ensuring the consistency of certification; (2) improving the certification process; (3) providing guidance on whether specific countries with seroprevalence data should initiate the certification process; (4) providing guidance on survey options for the certification of PICs; (5) assisting countries to reach coverage targets and control goals; (6) providing guidance on setting the target year for the 1% goal; and (7) providing guidance on future goals.

The ERP members are committed and have approved the proposed roles and activities. The ERP has agreed to meet in February 2011 and will report on progress during the next TAG.

2.4 Maintaining poliomyelitis-free status through 2012

2.4.1 Global status of poliomyelitis eradication

Dr Roland Sutter, Coordinator, Research and Product Development, Health Security and Environment, Global Polio Eradication Initiative, WHO/HQ, summarized the global situation.

(1) Afghanistan

In response to a wild poliovirus type 1 case in Kandahar (onset of paralysis 23 May), a mop-up vaccination campaign was held in five districts of Kandahar province with bivalent oral poliomyelitis vaccine (bOPV). It was held from 29 June to 1 July, targeting more than 330 000 children under five. Various discussions are ongoing with relevant parties who can play a part in reaching children in inaccessible areas. A mop-up was also held in the northern areas bordering Tajikistan from 1 to 3 June, in synchronization with Tajikistan. These immunization activities bookended subnational Immunization Days (SNIDs) from 7 to 9 June, with bOPV administered in the Southern, South-Eastern and Eastern regions. While access improved across the Southern region, Taliban obstruction was reported in the east, in Nuristan and Kunar, where it remains difficult to reach many areas across dangerous terrain due to heavy mining on roads. Due to the deteriorating security situation in Kandahar, both WHO Southern Region team leaders and UNICEF Chief of Zonal Office have been relocated to Kabul.

(2) India

India's extraordinary reduction in case numbers has continued, with no cases of type 1 reported in Uttar Pradesh or Bihar since November 2009. India completed SNIDs in June and early July, using bOPV in western Uttar Pradesh, central Bihar and high-risk destination states for mobile populations. A mop-up round with mOPV1 was conducted in districts of Bihar bordering Nepal. With the monsoon season approaching, the SNIDs are the last large-scale campaigns before September. However, staggered mop-ups were planned throughout July, using a mix of bOPV, monovalent OPV type 1 (mOPV1) and monovalent OPV type 3 (mOPV3).

India is responding swiftly to two recent type 1 cases in West Bengal. Central government representatives have been dispatched to the district, together with nine Surveillance Medical Officers from the East region, in order to close the gaps in SIA quality rapidly in that district. A large-scale mop-up in West Bengal using mOPV1 was held on 13 June and 11 July.

(3) Nigeria

Like India, Nigeria has seen a dramatic reduction in wild poliovirus cases, with no new cases reported in June. Mr Bill Gates, Co-chair of the Bill and Melinda Gates Foundation, travelled to Nigeria in June to meet political and traditional leaders, including President Goodluck Jonathan and state governors. Mr Gates applauded the efforts being

undertaken in Nigeria to eradicate polio, and highlighted those efforts needed to complete eradication. During his visit, a group representing business, political, religious, women's, medical, nongovernmental and media communities met to sign the "Polio Eradication Pledge". They recognized the remaining challenges to eradicating polio from Nigeria and promised to leverage support for the programme. Mr Gates's visit coincided with a meeting of the northern traditional leaders' committee in Jigawa state. Here, the leaders reaffirmed their commitment to ensuring the highest possible coverage in all the northern states.

Staggered subnational Immunization Plus Days (IPDs) were held in June, allowing the reallocation of technical resources to support the highest-risk areas. IPDs in July for the first time focused on 106 of the highest-risk local government areas (LGAs), with these targeted district-specific approaches a key pillar of the newly launched strategic plan.

(4) Pakistan

Pakistan continued to report cases regularly. The 27 cases reported to July 2010 were from just 12 towns, districts or agencies (tribal agencies/federally administered tribal areas, Peshawar and adjoining districts in North West Frontier province, Quetta block in Balochistan and Karachi in Sindh).

Mop-up vaccination campaigns were held with mOPV1 from 14 to 16 June in response to recent cases. Special SIAs were held in Karachi, targeting underserved population groups, and in persistently infected "union-councils" (subdistricts) of Killa Abdullah district in Balochistan. Additional technical support was deployed to support the planning, implementation and monitoring of activities. National immunization days (NIDs) were held from 12 to 14 July 2010.

Environmental surveillance in Karachi continues to detect poliovirus. The most recent positive sample is the fourth since May. While no type 1 polio cases have yet been detected in Karachi, this underscores the risk that ongoing transmission poses to this key urban reservoir.

(5) Re-established transmission countries

Angola had type 1 transmission in the northern states of Luanda Norte and Luanda Sul, mining areas bordering the Democratic Republic of Congo. With frequent population movements across the border, the risk of international spread remained high. Mop-up activities in these states using mOPV1 have been held, synchronized with southern DRC, following NIDs using trivalent OPV (tOPV). Independent monitoring suggested that upwards of 20% of children had been missed during the mop-up. As Angola rapidly became the greatest risk to polio eradication in Africa, all tiers of government should urgently commit to addressing vaccination coverage gaps.

The first case of the year has been reported in Cameroon, from Extreme Nord province, bordering Borno state in Nigeria and Chad (greater N'Djamena area). There have been no cases reported in Nigeria's Borno state since July 2009. Chad continued to focus on improving SIA operations in key areas, particularly in the greater N'Djamena area (the epicentre of national transmission), with renewed government commitment reflected by continued operational improvements. In particular, more effective microplanning and vaccinator performance were observed. As of 24 June, the Democratic Republic of Congo had been polio-free for 12 months. However, a subsequent cluster of cases in north-eastern Angola, close to Democratic Republic of Congo's border, underlined the need to raise childhood immunity to protect against wild poliovirus importations.

(6) Importation countries

In April and June 2010, Nepal reported two type 1 polio cases from districts bordering India. The genetic sequencing suggests two separate importations of viruses originating in Bihar, India. NIDs were held on 10 April and 22–23 May, using bivalent OPV. Subnational immunization days (SNIDs) were conducted on 19–20 June, covering districts bordering India and the Kathmandu valley, using mOPV1. Additional campaigns were planned for July.

The bulk of West African cases in 2010 (18 of 29 cases) were from Senegal, with other cases reported from Liberia, Mauritania, Mali, Niger and Sierra Leone. However, the number of cases being reported rapidly dwindled, thanks to repeated multicountry immunization activities. From 25 June, SIAs were synchronized across six countries: Senegal, Mauritania, Mali, Liberia, Burkina Faso and Gambia. Guinea briefly postponed its activities due to elections, and held them on 2 July. Guinea poses a particular risk due to subnational acute flaccid paralysis (AFP) surveillance gaps (meaning undetected poliovirus circulation cannot be ruled out). Additionally, viruses recently found in neighbouring countries (Mali and Liberia) originated in Guinea. All countries have conducted at least three SIAs since detection of their latest respective cases, and some have conducted five.

No wild poliovirus cases have been reported across the Horn of Africa for 2010. While on 27 June, Sudan had officially been poliomyelitis-free for more than 12 months, the risk remains of undetected circulation of poliovirus as a result of subnational surveillance gaps in some areas, including parts of southern Sudan. Recent efforts have helped fill these gaps, and this progress is being consolidated to rule out circulation with certainty or to detect any cases rapidly. In southern Sudan, efforts at strengthening routine immunization continued, with training concluded in June for all 10 state and 79 county (district) cold-chain officers/assistants on vaccine and cold-chain management. This included training for polio SIAs as well as the reverse cold chain for AFP surveillance. On 21–23 June 2010, northern Sudan carried out its first Child Health Days campaign for 2010. The house-to-house interventions provided were OPV, vitamin A, deworming tablets, awareness messages on child protection and peace promotion.

2.4.2 Global Polio Eradication Initiative Strategic Plan 2010–2012 and implications for the Western Pacific Region

On 18 June, the new Global Polio Eradication Initiative Strategic Plan 2010–2012 was launched at a key stakeholder meeting. The Ministers of Health of Nigeria, Angola and Senegal, other senior health ministry officials, existing and potential funders, vaccine manufacturers and key partner organizations, attended the event. It was co-hosted by WHO Director-General Margaret Chan and UNICEF Executive Director Tony Lake – to discuss the implementation, monitoring, economics and financing of the new Plan.

The Strategic Plan mainly focuses on interrupting wild poliovirus transmission in countries with ongoing transmission. Topics relevant for the Western Pacific as a polio-free Region are the following: reaching certification standard surveillance quality in all countries by 2012, invigorated by the Regional Certification Commission. Other topics are: introduction of supplemental surveillance activities where appropriate (e.g. environmental surveillance) and, after new international guidelines are available (expected in 2012), ensuring that current wild poliovirus importation response plans are in place taking these into consideration.

2.4.3 Managing risk of wild poliovirus importations

(1) Poliovirus importation into WHO's European Region

Dr Rebecca Martin, Team Leader, Vaccine-Preventable Diseases and Immunization, WHO/EURO, told how WHO's European Region had experienced the first importation of wild poliovirus since polio-free certification in 2002. As of 1 August 2010, Tajikistan had reported 452 laboratory-confirmed cases of wild poliovirus type 1. These were reported from 32 of 61 administrative territories (58 districts and three cities – Dushanbe, Khudjand and Kurgan-Tube). There was no evidence of transmission to the Gorno-Badakhshan Autonomous oblast (GBAO).

There had been 20 deaths among the confirmed polio cases (4.4%): four in infants (aged under one year), eight in children aged one to five years, six in children aged 6–14 and two in people aged 15 or older. Of the 452 confirmed cases, 89 (20%) were in infants (aged under one year), 223 (49%) in children aged one to five years, 88 (19%) in children aged 6–14, and 52 (12%) in people aged 15 years or older. In addition, seven AFP cases had been laboratory-confirmed for wild poliovirus type 1 in the Russian Federation. The latest reported case was confirmed in a girl aged almost six months, in Khabarovsk, with a date of onset of 2 July.

In Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, WHO provided continuous technical assistance in strengthening AFP surveillance for possible polio cases. It was realized that at this stage, surveillance was critical to ensure that any spread of poliovirus was rapidly detected, and to show the effectiveness of aggressive control measures in interrupting transmission. WHO Europe conducted a rapid assessment of AFP surveillance in Tajikistan from 26 to 30 July 2010. Four field teams travelled to four regions and 15 districts/cities for three days of field visits to review AFP surveillance practice at all levels. The teams concluded that the AFP surveillance in Tajikistan at that time was sensitive enough to detect most cases, and cases were reported and investigated through the system.

(2) Immunization response

In Tajikistan, preliminary administrative reports from all four rounds of SIAs conducted since the outbreak was confirmed showed very high nationwide coverage: 99.3% or higher. This ranged from 90.6% in the Rasht Valley for the third round, to 99.8% in many districts for all four rounds. For all rounds, subsequent monitoring was used to assess coverage in officially targeted age groups only. Further rounds of SIAs with mOPV1 would be considered following consideration of the epidemiological data on the outbreak and laboratory results for specimens taken from AFP cases in May and July.

Three rounds of SIAs with mOPV1 were conducted in Uzbekistan in June–July, with high nationwide coverage reported. Final reports showed nationwide coverage of over 100% during each round. Reported administrative coverage in the regions was 99.8%–106.7%. Independent monitoring data showed similarly high results. The Ministry of Health of Uzbekistan vaccinated with mOPV1 42 963 of 61 108 refugees under 15 years old on the border or in refugee camps. Documenting these vaccination activities (immunization cards for refugees) was not performed.

In Kyrgyzstan, the first round of NIDs (scheduled for 19–23 July) was extended to 27 July. Awareness was high and the public and medical professionals welcomed the campaign. The country deployed 103 mobile teams to hard-to-reach areas. Each vaccinated child was given a special vaccination card, also to be used in the second round (23–27 August). UNICEF and WHO staff, as well as officials of the Ministry of Health, conducted field monitoring throughout the country. According to the Ministry, the campaign achieved 98% coverage nationwide.

In Turkmenistan, the first round of NIDs started on 12 July, targeting all children aged zero to five years. Major cities (Ashgabat and Turkmenbashi) started immunization activities earlier, on 24 May, and preliminary reports show nationwide vaccination coverage was 99%. The second round of NIDs was carried out from 16 to 22 August 2010, targeting children aged zero to 15 years. With the Ministry of Health and the medical industry, the WHO Country Office, Turkmenistan developed a budget and vaccine requirements. As with the other country campaigns, WHO Europe, WHO Headquarters and UNICEF have worked with partners to raise the necessary funds and provide vaccine.

The Government of Kazakhstan approved a decree to conduct one round of nationwide SIAs with trivalent oral polio vaccine (tOPV).

Dr Martin highlighted as key factors in the polio outbreak in Tajikistan: (1) problems in immunization coverage (resulting in susceptibility), (2) accuracy of administrative coverage data, (3) catch-up activities postponed due to lack of funding, (4) challenges in AFP surveillance (reliable and timely case detection), (5) health system reforms and (6) geo-political issues. Key factors for an effective response based on experience in the European Region include: (1) ongoing government collaboration, partnerships and coordination at global, interregional, regional and country level, (2) resource mobilization, (3) securing and providing vaccine in a timely manner, (4) powerful communication strategies at global, regional and country levels, (5) regular risk assessment for the Region and (6) working through the Regional Certification Commission.

(3) Risk assessment for not staying poliomyelitis-free

Although wild poliovirus importations cannot be prevented, spread of imported virus can be limited through high population immunity. This can be achieved through universally high routine immunization coverage, booster dose schedules and supplementary immunization. In case an imported wild poliovirus still finds pockets of susceptibility and manages to circulate, high-quality surveillance is essential for rapid response, as is an up-to-date national preparedness plan. The proposed risk assessment is not a scientific methodology and its results are not statistically significant. Rather, it is a simple and practical methodology that uses available data without creating additional data demands. It also takes local knowledge into consideration. Despite its limitations, it can be useful to quantify and document risk over time.

While an immediate and comprehensive risk assessment is a key component in an importation event, routine risk assessments should be conducted by all countries and for relevant subnational levels (mainly dependent on population size). Proposed risk criteria to be considered include: (1) AFP surveillance indices for the past three years, (2) subnational surveillance gaps, (3) best estimates of national coverage, (4) percentage of susceptible accumulated children for the past five years, (5) subnational coverage gaps, (6) AFP cases with fewer than three doses of OPV, (7) population movements (to/from polio-affected areas, international and domestic) and (8) development and local indicators as appropriate.

These parameters should be grouped in dimensions corresponding to population immunity, surveillance quality, programme performance and threat profile. It has been agreed that the contribution of each dimension to the total score should vary according to its relevance. Scores that vary from -1 to +1 for most of the parameters are assigned to each of them according to their compliance with defined thresholds. The parameter "bordering polio-affected countries" in the threat dimension is considered an important contribution to the risk assessment and is given a higher weight in determining the overall score. Due to small populations in most PICs, the standard approach needs to be modified. Capacity-building for NIPs and subnational level health staff is still required.

(4) Response to Tajikistan polio outbreak and assessing importation risk in China

Dr Hao Lixin, Director, Division 1, National Immunization Programme, Chinese Center for Disease Control and Prevention, summarized the measures undertaken.

As soon as the Ministry of Health received news of the outbreaks, a formal circular was sent to each province in China, emphasizing the need to accelerate surveillance and immunization activities. Inspection and quarantine efforts were strengthened in all ports, including international airports. Every passenger under 15 years old from the polio-affected countries was checked for AFP and recommended to be vaccinated with OPV. Xinjiang, Tibet and Yunnan are the provinces bordering poliovirus-endemic countries (India, Pakistan and Afghanistan) as well as Tajikistan. Heilongjiang province borders the Russian Federation.

The China Centers for Disease Control and Prevention (CDC) initiated a serological survey of polio antibodies among children under 15 years old in four cities in Xinjiang, two in Tibet and three in Yunnan province. The survey was conducted in July and August 2010. A coverage survey of polio vaccination among children born between 1 June 2005 and 30 May 2009 has also been planned. Thirty clusters of children (seven children in each) will be randomly sampled based on "probability proportional to size" (PPS) cluster sampling methods. Two hundred and ten children will be surveyed in every city. Immunization certificates and records will be reviewed by investigators and the consistency between immunization certificates and records will be checked. Environmental surveillance has started in Xinjiang and Tibet.

Responses to the polio outbreaks in the European Region following importation of wild poliovirus from India, in Xinjiang and Heilongjiang provinces, included technical support from central level enhancing AFP surveillance and risk assessments in Xinjiang and Heilongjiang provinces. China CDC quickly issued a series of bulletins from the beginning of May. These specified the acceleration of AFP case classification, completion of laboratory testing without delay, performance of VP1 sequencing directly without enzyme-linked immunosorbent assay (ELISA) ITD tests by the RRL, and shipping viral isolates to the polio RRL within 72 hours. China CDC also enhanced AFP surveillance and in-depth analysis of AFP surveillance data, including review of pending cases, clusters of compatible AFP cases, unexpected clusters of AFP cases and performance indicators at national and subnational level.

Training courses to enhance AFP surveillance and risk assessment were carried out in Xinjiang and Heilongjiang provinces. The annual Polio Laboratory Network Seminar was held from 19 to 21 May, the annual AFP Surveillance Working Meeting from 8 to 10 June, and the Workshop to Strengthen AFP Surveillance in Xinjiang, Tibet and Yunnan Provinces from 14 to 15 July 2010.

Risk assessment in Xinjiang found the reported coverage of OPV3 routine immunization to be over 95% in each prefecture. However, it was estimated that true coverage was lower than 95% in 40% of prefectures. A convenience survey conducted in Xinjiang showed that coverage was higher than 95% in SIAs for OPV in 2010. There are three ports in Xinjiang: (1) Khunjerab land port (to Pakistan), open from 1 May to 31 December, with about 11 000 people entering and exiting annually, most of whom are migrant workers; (2) Karasu port (to Tajikistan), open from 4 May to 31 December, with about 3000 people entering and exiting annually; and (3) Urumqi airport (to Tajikistan), with four international flights weekly, with about 28 800 people entering annually. The risk of polio importation and outbreak in Xinjiang was summarized as follows: risk exists but is low; the importation risk is not significantly greater than before; and imported virus into Xinjiang has little chance of inducing major outbreaks, but could possibly result in local transmission.

Risk assessment in Heilongjiang province found the reported coverage of OPV3 routine immunization to be more than 95% in each prefecture. But it was estimated that true coverage was lower than 95% in 57% of prefectures. An SIA for OPV was not done in 2009, but is planned for 2010. There are three important ports in Heilongjiang: (1) Jiamusi Fuyuan water port (to Khabarovsk in Russia) open from 1 May to 30 October, with about 500 people (10 children under 15 years) entering and exiting daily; (2) Shuangyashan Raohe water port open from 1 May to 30 October, with about 200 people (12 children under 15 years) entering and exiting daily; and (3) Harbin airport with four international flights weekly, with about 30 000 people entering annually. Active searches for AFP cases were carried out in Heilongjiang province. Up to 30 July 2010, 1157 hospitals had been checked, with 4 133 532 outpatient records and 720 804 inpatient records reviewed. No missed AFP cases were found. Enteric poliovirus monitoring among healthy children under five years old was also carried out. The risk of importation and outbreak in Heilongjiang was summarized as follows: risk exists if poliovirus transmission continues in Khabarovsk; people move frequently between Khabarovsk and Heilongjiang, and imported virus into Heilongjiang may cause local transmission in very limited geographic areas.

(5) Establishing a wild poliovirus importation preparedness plan in the Philippines

Dr Ma. Joyce Ducusin, Medical Specialist, Department of Health, summarized how the first plan had been developed in 2001 and was approved by the Department of Health. The plan was revised twice (2005 and 2008) but never issued. The 2008 revision was not done in consultation with programme, laboratory or international partners. In 2010, the 4th revision of the plan was undertaken so that in the event of importation, the country could launch a rapid response. Potential causes of delay can be anticipated and addressed in advance, and new International Health Regulations 2005 (IHR 2005) and the recommendations made in WHA Resolution 59.1 2006 can be incorporated.

Elements of the plan that have been changed include the Organizational Management Committee membership, its roles and functions, pragmatic concerns that could result in delays in response addressed, wide consultations with key stakeholders and enhanced monitoring through rapid coverage assessment (RCA). The new plan includes the creation of national/subnational committees, enhancing surveillance, strengthening laboratory capacity, immunization response and risk assessment (initial and continuous assessment). It also includes post-incident evaluation, plus documentation and destruction of wild poliovirus from the laboratory once the outbreak is controlled. The updated plan will be used to secure political commitment, plan for emergency funds in case of occurrence and officially create the committees as stipulated in the guidelines. It will provide opportunities for capacity-building of laboratory, EPI and surveillance staff, strengthen disease surveillance, reporting, feedback and response mechanisms at all levels.

2.4.4 New WHO position paper on polio vaccines and immunization in the pre-eradication era

Dr Roland Sutter reported that on 4 June 2010, WHO had published new guidance to Member States on the use of polio vaccines (including IPV) and polio immunization in the pre-eradication era. Developed with guidance from SAGE and the SAGE Working Group on inactivated poliovirus vaccine (IPV), the new WHO paper supports countries in decision-making on polio vaccination schedules and vaccines, given their risk of poliovirus importations and the probable transmission potential.

All children worldwide should be immunized against polio, and every country should seek to achieve and maintain high levels of coverage with polio vaccine. The potential for wild poliovirus importation (which in May 2010 was considered to be at least moderate in all countries) and transmission are crucial factors to be considered when defining national policy on

polio immunization. OPV alone, including a birth dose (known as zero dose because it does not count towards the primary series), is recommended in all polio-endemic countries and in countries at high risk for importation and subsequent spread. The birth dose should be given as soon as possible after birth to increase the seroconversion rates of subsequent doses and to induce mucosal protection before enteric pathogens can interfere with the immune response. Administering the first dose of OPV at a time when infants are still protected by maternally derived antibodies may, at least theoretically, prevent vaccine-associated paralytic polio (VAPP).

OPV alone, preferably with a birth dose, is also recommended in all countries with a moderate or high potential for wild poliovirus transmission, which is reflected by the force of infection (determined mainly by the level of immunization coverage, sanitation and overall socioeconomic status). A birth dose of OPV is not considered necessary in countries where the risk of poliovirus transmission is low, even if the potential for importation is high or very high.

Where the risk of wild poliovirus importation is high or very high, the transmission potential should be reduced to a low level before alternatives to OPV alone may be considered. Using routine immunization coverage with three doses of poliovirus vaccine as the main determinant of transmission potential, WHO, based on expert opinion, suggests that in countries with a high risk of wild poliovirus importation, a sequential IPV–OPV schedule should not be introduced unless immunization coverage is approximately 95%. Alternatively, where there is a lower importation risk, coverage should reach approximately 90%. Where a sequential IPV–OPV schedule is used, the initial administration of one or two doses of IPV should be followed by ≥ 2 doses of OPV to ensure both sufficient levels of protection in the intestinal mucosa and a decrease in the burden of VAPP. IPV alone may be considered an alternative to OPV alone (or an IPV–OPV sequential schedule) only in countries that have the lowest risk of wild poliovirus importation and transmission. Switching from OPV to IPV for routine vaccination during the pre-eradication era is not cost-effective, as determined on the basis of existing economic analyses and current IPV costs.

Dr Sutter concluded that in the Western Pacific Region, with 15 countries having already introduced IPV, there were probably no other candidates for adding IPV now (except possibly Brunei Darussalam, Japan and Singapore). Evaluation of the impact of change from OPV to IPV is important and should be encouraged (i.e. in New Zealand, Australia, and possibly Malaysia).

Maintaining polio-free status should remain the highest priority for the Western Pacific Region. Given the current situation with wild poliovirus at the Region's borders, the immediate priority should be to strengthen surveillance and enhance population immunity. WHO's position may help guide countries to make decisions regarding routine polio vaccine policies in the pre-eradication era. However, given the recent dramatic increase in risk of poliovirus importation, this may not be the right time for countries to change vaccination policies from OPV to IPV.

2.4.5 Work of the Regional Certification Commission, 2009–2010

Professor Anthony Adams, Chairman of the Regional Certification Commission (RCC), reported that at its 15th meeting in December 2009, the RCC had concluded that the Western Pacific Region remained free of polio during 2009. This was despite the persisting risk of wild poliovirus importation from endemic areas, and despite the existence of sub-areas in the Region where insufficient immunity levels may allow wild poliovirus spread after importation.

The RCC considered that the overall quality of immunization and surveillance activities, including the performance of the Regional polio laboratory network, had remained commendable in most Member States. But subnational performance gaps continue in several countries. However, with polio gone from the Region for over a decade, other disease control and public

health efforts receive priority. Limited resources do not allow special efforts beyond the minimum routine activities, particularly for preventive SIAs and comprehensive AFP surveillance reviews.

(1) Immunization against poliomyelitis

While importations of wild poliovirus cannot be prevented, spread of the virus can be prevented by high population immunity. The minimum requirement for immunization coverage with three doses of polio vaccine for polio eradication is at least 80%, as agreed at the World Health Assembly in 2006. This should be universally reached throughout a country. In 2009, there were five countries that reported coverage below 80% (Fiji, the Lao People's Democratic Republic, Palau, Papua New Guinea and Samoa). In some countries (e.g. Cambodia and Papua New Guinea), coverage gains may also be influenced by adjusted denominators, based on recent census data.

Further data analysis by the RCC suggested that the range of subnational performance levels behind a satisfactory national coverage can be large: e.g. from 51%–136% at operational district (OD) level in Cambodia (annual progress report to RCC, 2008) and 18%–90% at the provincial level in Papua New Guinea (annual progress report to RCC, 2008). Likewise, analysis of groups of districts with certain coverage brackets revealed in some countries (e.g. the Philippines) that fewer than 80% of districts achieve at least 80% coverage. Finally, analysis of immunization status of AFP cases that represent a decent sample of the general population suggests coverage problems in some countries as well as incomplete case investigation, as no information on immunization status is available.

Since the last TAG meeting, SIAs have been conducted only in China, targeting 20.8 million children under four years with two rounds in high-risk areas of 22 provinces. Reported coverage was 98%. Papua New Guinea is adding one dose of OPV to the ongoing measles SIAs. Any further preventive SIAs are limited by the lack of resources.

(2) AFP/ poliomyelitis surveillance

Complete and timely investigation of AFP cases remains essential to detect polioviruses reliably. In terms of key aspects of AFP surveillance quality, two countries did not reach the minimum non-polio AFP rate of one per 100 000 children under 15 in 2009 (Mongolia and Papua New Guinea). Adequate stool specimen collection rates of at least 80% were not reached by several countries including Cambodia, the Lao People's Democratic Republic, Papua New Guinea, the Philippines and the PICs. Reporting of AFP cases in 2010 (as of 2 August 2010) was alarmingly low in Cambodia, Papua New Guinea and the PICs.

(3) Wild poliomyelitis importation preparedness

The World Health Assembly adopted a resolution stating that poliovirus importation into a polio-free area constituted a potential international health threat, as also stipulated under IHR 2005. The resolution focuses on appropriate response to the importation of wild polioviruses and essential indicators. These include conducting an initial investigation, conducting a complete risk assessment within 72 hours of confirmation of the index case and establishing an emergency action plan based on the existing polio preparedness plan. If the response calls for SIAs, a minimum of three large-scale immunization rounds should be conducted. The first SIA should take place within four weeks of confirmation of the index case, with an interval of four weeks between subsequent rounds. This requirement highlights the need for an active and current national plan to be in place and widely distributed before an importation event.

Several countries still have to submit updated importation preparedness plans to the RCC, including Cambodia, China, Fiji, Malaysia, Solomon Islands, Vanuatu and Viet Nam.

2.5 Achieving maternal and neonatal tetanus elimination (MNTE)

2.5.1 Combining TT SIAs with other interventions in the Lao People's Democratic Republic

Dr Anonh Xeuatvongsa, National EPI Manager, Ministry of Health, reported that efforts towards MNTE had included a rapid increase in protection against maternal and neonatal tetanus through three rounds of tetanus toxoid (TT) SIAs. These were conducted in selected high-risk areas from November 2009. Over 800 000 women of child-bearing age were targeted in 99 districts (including all poverty districts). The first round was conducted in November 2009 in conjunction with the semi-annual Child Health Days, which in 2008 had demonstrated success in delivering a package of essential health services, namely vitamin A, mebendazole and OPV.

To maximize the effectiveness of such combined service delivery, deworming medicine was also offered to CBAW during the first round, in line with the national nutrition policy. To increase immunity against polio in all children under five years, OPV was offered in those districts not covered before, targeting another estimated 200 000 children. Reported coverage for all four interventions was high, with 91% for TT and 89% for deworming for CBAW, and 84% for vitamin A, and 88% coverage each for OPV and deworming for children.

Following this success, the second round was completed in February/March 2010, mainly focusing on TT immunization of CBAW. However, to maximize access opportunities, selected districts were able to provide OPV, and in some remote districts, routine immunization for children was also available. The reported TT coverage of the second round was 80%.

Monitoring of the TT SIAs revealed that many CBAW had already completed five TT doses in routine immunization (with proof of TT vaccination card). It was therefore advised that all districts should undergo a detailed risk assessment to identify which ones needed a third TT round and which required catch-up interventions due to high drop-out between the two rounds.

2.5.2 EPI, MCH and community health collaboration towards MNTE in China

Dr Xu Zongyu, Deputy Director, Children's Health Division, Department of Maternal and Children Health and Community Health, Ministry of Health, reported that the Chinese government's commitment was to achieve the MNTE goal by 2010. This target date was established in the "National Programme on Children's Development in China" for 2001–2010 and was endorsed by the State Council. Accordingly, the Safe Motherhood Programme has been carried out since 2000, led by the Ministry of Health, the National Working Committee on Children and Women and the Ministry of Finance. The programme was expanded from 378 national poverty counties (rural areas) in 12 provinces in 2000 to 2297 counties in 23 provinces by 2009.

Increased cleanliness and hospital deliveries, as a high public health priority and the main strategy to achieve the MNTE goal in China, have resulted in a large decrease in neonatal tetanus cases. The reported clean delivery rate and hospital delivery rate at the national level improved in 2009 to 99% and 96% respectively. These two strategies have been integrated into rural health system reform as a long-term plan to achieve and maintain MNTE.

China promotes hospital delivery by providing RMB 300–400 (approximately US\$ 45–60) as a subsidy to the mother to pay for delivery costs in hospital in poor areas. This subsidy usually covers the full cost of a delivery at township hospitals and 50%–70% of the cost at

county hospitals. In remote mountainous areas, a “fast green channel” is being established to provide transportation for every mother, thereby improving hospital access.

In 2010, an MNTE panel led by MCH/the Ministry of Health and coordinated by the Bureau of Diseases Control, was established with participation of the China Centers for Disease Control the Capital Institute of Paediatrics and Peking University. The panel is supported by WHO and UNICEF. The globally recommended scoring or “points system” for MNT risk assessment is being applied to classify all 333 prefectures (indicators to be used in the risk assessment framework having been agreed). The indicators reflect not only classical MCH measurements of achievement, but also other socioeconomic characteristics that help provide the macro-context of the prefecture and use EPI surveillance data for neonatal tetanus (NT) in a strong collaborative approach towards a common goal.

One validation survey is to be conducted in eastern China and another will be conducted in western China. This regional breakdown is consistent with the overall demographics of the country, where populations in the western provinces are generally more mobile, dispersed and of lower socioeconomic and educational status than in the eastern provinces. Based on 2009 data from the National Notifiable Disease Reporting System (NNDRS), two prefectures had case rates of >1.0 per 1000 live births (LBs). Therefore, the MNTE validation exercise is expected in 2011 after corrective MCH measures have been taken in these two prefectures as well as in others still considered at risk.

2.5.3 Round-table update on MNTE status

(1) Cambodia

Dr Chheng Morn, Deputy, National Immunization Programme, reported that a risk assessment had been jointly conducted by the NIP, UNICEF and WHO last December. A workshop had been completed from 1 to 2 July 2010 to develop action plans to ensure transition from medium MNT risk status in 2010 to low-risk MNT status in 2011 in 15 ODs. Participants included provincial health directors, EPI and MCH managers and representatives of provincial governments. They also included OD, MCH and EPI directors from the 15 ODs, national EPI managers, international agencies and NGOs.

Workshop participants determined the MNT risk for individual ODs and constituent health centre catchment areas according to a high, medium or low risk classification. Those with medium or high risk then identified the problems and priority activities to achieve a low risk classification. In addition, targeted TT SIAs will be conducted in four ODs still considered to be high-risk (Banlung, Kep, Kratie, Staung). NT surveillance, including case response, will be strengthened and protection at birth (PAB) indicator monitoring will be expanded nationwide.

(2) Papua New Guinea

Mr Stephen Toikilik, National EPI Manager, National Department of Health, reported that the EPI comprehensive multi-year plan (cMYP) 2011–15 included MNTE activities. He said that a recent joint meeting of the Reproductive Health and EPI divisions of the National Department of Health, UNICEF and WHO had stressed the need for close collaboration between EPI and MCH divisions. The meeting resulted in a series of action points, including (1) collection of data on: (a) NT cases and deaths, (b) antenatal care (ANC) coverage and (c) DTP3 coverage of the past five years from the National Health Information System (NHIS); (2) development of a draft MNTE action plan; (3) advocacy with senior health officials; and (4) establishing MNTE as an agenda item in Reproductive Health Technical Advisory meetings.

(3) The Philippines

Dr Ma. Joyce Ducusin, Medical Specialist, Department of Health, reported that further implementation of the MNTE national plan of action (presented at the 18th TAG meeting) had begun. Coordination meetings with WHO and UNICEF are being conducted to establish requirements for external technical support in TT SIA planning, implementation and monitoring and strengthening NT surveillance. While a pilot TT SIA was successfully completed in August 2009 in a northern high-risk area, another pilot will be conducted in the high-risk areas of Mindanao in the south as different political, economical and cultural aspects may be relevant.

2.5.4 How to maintain MNTE

Ms Diana Chang Blanc, Regional Immunization Specialist, UNICEF East Asia Pacific Regional Office, discussed what strategic changes might be needed after MNTE was achieved. Not many changes would be recommended, as validation of MNTE represents only a snapshot of success achieved, and programme vigilance must be sustained. As MNT cannot be eradicated, cases may continue to occur sporadically, and regular review of subnational data is still critical, while implementation of key strategies must continue.

Promotion of clean delivery practices should include good coordination between reproductive health and child survival programmes, plus ongoing skills development of midwives and medically trained birth attendants. They should also include provision of subsidies to rural/remote communities to promote institutional births, community education to promote hygienic birth practices and proper cord care, with clean delivery kits provided to mothers during ANC contacts.

High immunization coverage for infants and children through routine DTP immunization may be optimized through “reaching every district” (RED) strategies and integrated outreach. It may also be optimized through minimizing missed opportunities, tracking defaulters and integrating booster doses for school-aged children through school-based strategies or alternatives. At the same time, continued strong immunization programmes for women are required through minimizing missed opportunities for TT immunization during ANC contacts and optimizing routine TT immunization through RED strategies and integrated outreach. Periodic TT SIAs in areas with inadequate routine TT coverage may still be required.

Quality NT surveillance requires case investigation and response for neonatal deaths occurring from three to 28 days after birth. It requires good collaboration and data exchange with MCH, search for NT cases/deaths during outreach, identification of problem areas, trends or sudden shifts in cases and data on confirmed cases to guide appropriate case response and local action plans.

2.6 Vaccine-preventable disease laboratory update

Dr Youngmee Jee provided brief updates and outcomes of the Second Vaccine-Preventable Disease Laboratory Network meeting held in February 2010.

The meeting was held in Manila, Philippines from 22 to 26 February 2010. Three consecutive sessions on polio (22–23 February), Japanese encephalitis (JE, 24 February) and measles/rubella (25–26 February) reviewed the performances of the three laboratory networks.

Approximately 90 participants included national laboratory staff, plus advisers from the United States Centers for Disease Control and Prevention (US CDC), Atlanta. They included staff from the National Institute for Infectious Diseases (NIID), Japan, WHO Headquarters and

South-East Asian Regional Office staff. They also included secretariat from the Western Pacific Regional Office and country EPI officers. There were 25 representatives from 12 polio laboratories in 11 countries, 16 representatives from nine JE network laboratories and 34 representatives from 19 measles/rubella network laboratories.

The meeting provided a forum to discuss updates on the status of the EPI laboratory networks and to identify ways to strengthen the quality of performances of network laboratories to maintain polio-free status and support achieving measles elimination and JE control in the Region.

2.6.1 Conclusions on the polio laboratory network

The meeting concluded that the performance of the regional polio laboratory network had been maintained in polio-free certification standards and that AFP surveillance activities were efficiently supported. The network provides critical evidence in support of the continued polio-free status of the Region. The network's activities in implementing new test algorithms and real-time polymerase chain reaction (PCR) procedures were all on track.

Participants commented on the expanding knowledge and experience of the Polio Eradication Initiative on outbreaks due to vaccine-derived polioviruses (VDPVs). This warrants a critical review of the operational definitions used to define circulation. Improved access to guidelines for the investigation and response to VDPV detections was requested.

The critical role that polio laboratories played in investigations of EV71 outbreaks highlights their valuable contribution to public health within the Western Pacific Region. WHO should continue its advocacy with national authorities and partner agencies for continued support to the regional polio laboratory network. Recommendations for the network include: (1) implementation of the new algorithm for virus isolation; (2) introducing the new real-time PCR technique for intratypic differentiation of polioviruses; (3) VDPV screening to reduce laboratory reporting time; (4) timely sharing of cell sensitivity testing results; and (5) data management issues.

2.6.2 Conclusions on the JE laboratory network

A one-day meeting of the Regional JE Laboratory Network was held on 24 February as part of the Second Meeting of the Vaccine-Preventable Disease Laboratory Networks in the Western Pacific Region. The aims were: (1) to discuss the progress of the JE network laboratories in the Region; (2) to identify challenges and ways to strengthen the performance of network laboratories; and (3) to discuss the progress of implementation of the recommendations from the last meeting held in July 2008. Participants included 23 representatives from network laboratories, laboratory coordinators from WHO HQ and the South-East Asia Regional Office, WHO country EPI officers, advisers from the US CDC and country EPI focal points. The meeting provided a forum to discuss updates on the status of regional JE network laboratories. Recommendations included (1) implementation of the confirmatory testing mechanism; (2) initiation of accreditation using the WHO JE laboratory check-list; and (3) improving data management and reporting.

2.6.3 Conclusions on the measles and rubella laboratory network

The meeting concluded that measles and rubella network laboratories provided high-quality support for achieving the regional goal of measles elimination by 2012 by confirming suspected cases and identifying measles virus genotypes circulating in the Region. The network should continue to obtain genotype and sequence information on measles and rubella viruses circulating in the Region.

The network had implemented most of the recommendations from the last meeting in 2008, including monthly reporting of a case-based line list to the Western Pacific Regional Office. The laboratories should regularly communicate and collaborate with the national surveillance or epidemiology groups and the Western Pacific Regional Office to minimize discrepancy of laboratory and surveillance data. This will also minimize delays in testing samples and regular reporting of laboratory data to the Western Pacific Regional Office.

Recommendations for the measles and rubella laboratory network included: (1) implementation of regular confirmatory testing; (2) obtaining more genotyping and molecular epidemiological information by strengthening strain surveillance for measles and rubella viruses; (3) improving data management and reporting using MS Access format; (4) use of alternative sampling; and (5) establishing and improving the quality assurance measures of commercial laboratories in countries where measles/rubella testing is performed in commercial laboratories.

For all EPI network laboratories, strengthening communications between network laboratories and EPI/surveillance programmes was emphasized.

2.7 New vaccines

2.7.1 Regional status of new vaccine introduction

The first decade of the 21st century witnessed licensure of several new vaccines targeting diseases of public health importance, along with unprecedented global commitment to facilitating adoption of these vaccines by developing countries. Dr Manju Rani, Scientist, EPI/Western Pacific Regional Office, provided an update on the introduction of new vaccines.

(1) Hib conjugate vaccine

As of June 2010, 30 out of 36 countries and areas were providing Hib vaccine in national immunization programmes, with Vanuatu planning to introduce it by the end of 2010. Thirteen countries and areas have introduced the vaccine in the last three years. Availability of outside funding has been a major factor in facilitating the introduction of Hib vaccine in the Western Pacific Region. In the remaining five countries, the burden of Hib disease is low and the vaccine is available in the private sector.

(2) Pneumococcal conjugate vaccines (PCV)

Uptake of PCV has been increasing among developed countries in the Western Pacific Region, with 14 countries and areas using them in NIPs as of June 2010. Three countries and areas (Macau [China], Hong Kong [China] and Singapore) introduced PCV in 2009. However, no low- or middle-income country has yet introduced these vaccines. New vaccines with wider serotype coverage (PCV10 and PCV13) have been licensed and WHO-prequalified in the last two years. GAVI support for these will soon be available, facilitating introduction in low-income countries.

(3) Rotavirus vaccines

In December 2009, WHO updated its rotavirus vaccine position paper to recommend inclusion of the vaccine in all NIPs. To date, only seven countries and areas in the Western Pacific Region include the vaccine in national programmes, though it is available in many countries in the private sector. Availability of fully liquid vaccine has reduced cold-chain storage requirements, making the vaccine more suitable for low-resource settings.

(4) Human papillomavirus (HPV) vaccines

WHO's 2009 position paper on HPV vaccine recommends inclusion of HPV vaccination in NIPs provided cervical cancer is a public health priority, vaccine introduction is feasible and cost-effectiveness has been considered. As of June 2010, six countries and areas had introduced HPV vaccine, and Malaysia was planning to introduce the vaccine in 2010.

2.7.2 Regional status of invasive bacterial disease (IBD), rotavirus and JE surveillance

Surveillance for diseases targeted by new and underutilized vaccines is designed to document the disease burden to inform decision-making on vaccine use and to monitor its impact after introduction into routine use. WHO supports surveillance for several new VPDs: rotavirus, IBD and JE.

Seven countries are participating in the Western Pacific Region's rotavirus surveillance network: Cambodia, China, Fiji, the Lao People's Democratic Republic, Mongolia, Papua New Guinea and Viet Nam. Two RRLs for rotavirus have been designated: Murdoch Children's Research Institute in Melbourne, Australia, and the Korea Centers for Disease Control (KCDC), Republic of Korea. Recent progress in rotavirus surveillance includes standardization of surveillance procedures, revision of the database and development of a referral mechanism for strain characterization and quality control at the RRLs. In data from sentinel hospitals in the seven countries in 2009, 52% of hospitalized diarrhoea cases were due to rotavirus. Most cases occurred in children of 6–23 months old.

Five countries participate in the Western Pacific Region IBD surveillance network: Cambodia, Mongolia, Papua New Guinea, the Philippines and Viet Nam. Two RRLs have been designated for IBD: University of Melbourne, Australia, and KCDC. During 2009, 716 cases of probable bacterial meningitis were enrolled and a vaccine-preventable etiology was identified in 13%. Cambodia, the Philippines and Viet Nam performed integrated meningitis–encephalitis surveillance. They found that 10%–14% of cases in 2009 were due to JE. Separate JE surveillance is being considered in several countries where its geographic distribution still needs to be defined.

Lessons learnt from the first two years of new VPD surveillance implementation will be shared at an upcoming regional workshop. These lessons will be used to improve the overall quality of the surveillance networks.

2.8 Routine immunization strengthening

2.8.1 Joint Reporting Form (JRF) review

Dr Jorge Mendoza-Aldana, Technical Officer, EPI/Western Pacific Regional Office, reported on progress in monitoring immunization programmes with the JRF, following up on a recommendation from the 2009 TAG meeting. The JRF is an annual global survey of countries about surveillance and immunization for VPDs. JRF reports for 2009 were submitted by all

countries and areas in the Western Pacific Region. Twenty-seven (75%) of countries and areas submitted their 2009 reports by 15 April, the deadline used in previous years. However, only three (8%) submitted reports by the new deadline, 15 March 2010.

High immunization coverage is important to achieving MDGs 4 and 5, maintaining polio-free status and achieving the measles elimination and hepatitis B control goals. The JRF is a critical source of immunization coverage data at the national and subnational levels. JRF data indicate that the Western Pacific Region has higher hepatitis B third-dose coverage than other regions. It is among the best performing regions for Bacille Calmette-Guérin vaccine (BCG), diphtheria-tetanus-pertussis vaccine (DTP), polio, hepatitis B and measles vaccine coverage. Among 11 countries and areas that submitted JRFs in each of the last three years, the proportion of children living in districts with at least 90% DTP3 coverage increased by 7% in 2009 as compared with 2007. But this decreased by 8% as compared with 2008. Based on JRF data, it is estimated that in 2009, 540 000 one-year-olds in China had not received three doses of DTP vaccine. This number, however, is much lower than that in India (8.6 million), Nigeria (3.2 million), Pakistan (760 000), Indonesia (730 000), Ethiopia (610 000) or the Democratic Republic of Congo (600 000).

A one-page questionnaire was given to participants asking for their feedback on the process and content of the JRF. Results will be used in planning the 2010 JRF survey.

2.8.2 Strengthening routine immunization programmes in the Western Pacific Region

(1) Regional overview

The 58th World Health Assembly (2005) urged Member States to adopt the Global Immunization Vision and Strategy (GIVS) as the framework for strengthening NIPs between 2006 and 2015. The first goal of GIVS is to increase vaccination coverage to at least 90% at the national level and at least 80% in every district by 2010 or earlier.

The Regional Committee for the Western Pacific urged Member States in its 54th Session (2003) to use measles elimination and hepatitis B control strategies to strengthen NIPs. It urged them to offer all children two doses of measles vaccine so that the 95% population immunity of each birth cohort could be achieved and maintained in every district. It urged them to ensure that at least 80% of each birth cohort in every district received three doses of hepatitis B vaccine by the age of 12 months. It also urged them to improve the quality of routinely reported immunization coverage data and to monitor immunization (including timely birth dose of hepatitis B vaccine) and disease data at district level.

National vaccination coverage has steadily improved in many of the priority countries in the Region² since 2005. Some countries have achieved >90% national vaccination coverage for one or more routine vaccines in the last few years. The district coverage goal of >80% remains to be achieved for many priority countries. The proportion of districts with >80% vaccination coverage of MCV1 and DTP3 has increased in some countries since 2006–2007. However, a significant proportion of districts in many priority countries still have low coverage (<50% or 50%–79%) for MCV1 and DTP3.

² National vaccination coverage has steadily improved in many of the priority countries in the Region

Specific issues for routine immunization systems strengthening are:

- (i) Some priority countries will need additional time beyond the target year of 2010 to achieve the national vaccination coverage goal of >90%.
 - (ii) Most priority countries will need additional time beyond the target year of 2010 to achieve the district vaccination coverage goal of >80%.
 - (iii) The routine immunization programmes of several priority countries, even with the additional vaccines administered through SIAs, have not yet been able to attain and sustain the Regional coverage goal for measles elimination of 95% population immunity within each district. A significant proportion of districts in these countries still have low vaccination coverage (<50% or 50%–79%) for MCV1.
 - (iv) The routine immunization programmes of most priority countries have not yet been strong enough to achieve immunization targets for hepatitis B control (at district level, HepB-birth >65% and HepB3 >80%). A significant proportion of districts in some countries still have low vaccination coverage (<50% or 50%–79%) for HepB-birth and HepB3.
 - (v) The routine immunization programmes of some priority countries are not strong enough to ensure that poliovirus imported into the country or emerging within the country's VDPV does not spread. A significant proportion of districts in some countries still have low vaccination coverage (<50% or 50%–79%). for OPV3
 - (vi) District EPI data available at the regional level are limited in quantity and quality. There is no systematic mechanism in the Western Pacific Region to collect and analyse district EPI data from priority countries. Yet these data are essential to facilitate technical support and resource mobilization by WHO and partners to strengthen routine immunization programmes.
- (2) Intercountry Workshop on Monitoring EPI Performance and Vaccination Coverage at the District Level

The Western Pacific Regional Office convened the Intercountry Workshop on Monitoring EPI Performance and Vaccination Coverage at the District Level from 5 to 7 July 2010 in collaboration with WHO country office staff from several countries in the Region. The workshop aimed to identify challenges and ways to improve EPI performance and coverage monitoring at the district level. Experiences and lessons learnt were exchanged among participants from two provinces of China, from Cambodia, the Lao People's Democratic Republic, Mongolia, Papua New Guinea, the Philippines and Bangladesh.

Major recommendations from workshop participants to WHO included: (1) developing a standardized tool and a regional mechanism to collect and analyse data on routine immunization programme performance at the district level; (2) working with countries to identify low-performing districts and mobilizing more support and resources to these districts; and (3) supporting countries to develop and expand pilot projects for monitoring and strengthening routine immunization programmes at the subnational level.

- (a) The Philippines

The Philippines initiated the "Reaching Every *Barangay* (REB)" strategy in 2004 as an adaptation of the WHO/UNICEF strategy, Reaching Every District (RED). REB aims to

improve immunization coverage and reduce missed opportunities at the *barangay* level, the fourth administrative level in the Philippines. REB was launched in August 2004. It has been supported by cascaded training throughout the country, a joint Department of Health/WHO/US CDC intensive supervisory visit in mid-2005, and policy support issued by the Secretary of Health in 2006, 2007 and 2008. To date, over 95% of immunization programme health workers have been trained on REB. The joint intensive supervisory visit was also a good opportunity to validate and improve the quality of collection, reporting and analysis of EPI data.

However, reported coverage data have not been useful in predicting the occurrence of VPD outbreaks or the geographical distribution of measles cases during the 2009 outbreak. While this problem may be partly due to population movement, a different approach is needed to identify and prioritize areas for monitoring and supervision visits. Recently, increased focus has been placed on the number of children unreached with vaccination. This focus is also used to encourage local government officials to respond by improving immunization services.

(b) Viet Nam

Viet Nam has maintained over 95% immunization coverage at the national level for all routine EPI vaccines for children aged 12–23 months, but achieving high rates of timely hepatitis B birth dose remains a challenge. Some districts have not yet reached $\geq 80\%$ coverage. To address this, Viet Nam has designated EPI high-risk districts based on low population density, insufficient educational levels, presence of ethnic minorities without a written language, and geographically difficult access. To strengthen the routine immunization programme in such districts, the following actions have been taken:

- y increasing the number of village health workers and their training and participation in EPI activities;
- y increasing the availability of immunization services by increasing the number of days of fixed services and the provision of outreach services;
- y increasing the EPI budget and tolerating higher wastage rates for vaccines and injection supplies in order to permit more frequent use;
- y ensuring sufficient vaccine carriers, cold boxes and refrigerators for remote areas; and
- y implementing special communications strategies to promote community awareness and demand for immunization.

2.8.3 Regional Immunization Week: lessons learnt and the way forward

Mr Gabriel Anaya, Technical Officer, EPI/Western Pacific Regional Office, provided an update on Vaccination Week in the Region. Vaccination Week is an event that highlights the importance of protecting infants from VPDs and celebrates the achievements of immunization programmes and their partners in promoting healthy communities. Vaccination Week provides an opportunity to revitalize efforts to protect children against VPDs by focusing attention on the achievements of immunization. It also aims to do this by educating parents and caregivers about the importance of vaccination, creating events that attract community and media attention, and celebrating the accomplishments of collaboration through recognition of local partners and volunteers. Vaccination Week activities open doors for resource mobilization at the local, national and regional level.

During 2010, WHO's American Region (AMRO), Eastern Mediterranean Region (EMRO) and European Region (EURO), along with many countries, observed Vaccination Week from 24 April to 1 May. WHO issued a call to action to ensure that infants worldwide were fully immunized. Activities included vaccination events, social mobilization and media campaigns, proclamations by high ranking officials, and advocacy meetings.

Dr Shin Young-Soo, Regional Director for the Western Pacific Regional Office, and other WHO Regional Directors delivered video messages in observance of Vaccination Week. In his message, Dr Shin stated that, "Our Region will continue to explore with Member States ways to coordinate immunization and child health initiatives". Participation in future Vaccination Weeks is one way to strengthen immunization and child health initiatives throughout the Region.

2.8.4 Supply chain management: new Effective Vaccine Management assessment tools

Dr Md. Shafiqul Hossain, Technical Officer, EPI/Western Pacific Regional Office, gave an update on vaccine management assessment tools.

Efficient and effective supply chain systems to store, transport and distribute vaccine products are crucial elements of immunization programmes. Over the past decade, the number of vaccines available has increased substantially and most of the new vaccines are more expensive and bulkier than traditional ones. Greater storage capacity is thus required at all levels of the cold chain, and greater vaccine costs imply higher costs in vaccine wastage. Therefore, EPI managers must be able to forecast vaccine requirements accurately, maintain lower stock levels, reduce wastage and prevent equipment breakdown or malfunction.

To maintain high standards of performance in the vaccine supply chain, periodic assessments and improvement are necessary. Two tools, Vaccine Management Assessment (VMA) and Effective Vaccine Store Management (EVSM), have been used to help EPI managers and logisticians assess vaccine supply chains and use these assessments to improve vaccine management practices. However, there is a clear need to address the overlap between the two approaches and to produce a unified and updated tool. The new Effective Vaccine Management (EVM) assessment tool was developed in 2010. It combines the strengths of the two earlier approaches while addressing the identified weaknesses in each. EVM provides the tools and processes needed to demonstrate and document the implementation of good practices, identify weaknesses, develop and implement quality improvement plans and conduct follow-up assessments. In addition, EVM has important new features such as supplementary guidance materials and a web-based platform allowing for centralized updating procedures.

2.8.5 Progress of pandemic influenza A (H1N1) 2009 vaccine deployment and vaccination

Dr Hossain gave an update on pandemic influenza A (H1N1) 2009 vaccine deployment and vaccination. On 11 June 2009, WHO declared that influenza A (H1N1) 2009 transmission had reached phase 6, the pandemic phase, indicating community level outbreaks in multiple regions of the world. As vaccination is an important component of measures to mitigate the effects of the pandemic, development of a vaccine against influenza A (H1N1) had been initiated. By July 2009, 13 candidate vaccine viruses had been developed in WHO collaborating centres and essential reference laboratories and distributed to manufacturers, regulatory authorities and research institutions. Vaccine lot release by national authorities started in September 2009.

In July 2009, WHO assessed low- and middle-income countries globally to identify those needing assistance to access pandemic influenza A (H1N1) vaccine. Seventeen countries in the Western Pacific Region were identified. WHO supported countries to develop national

deployment and vaccination plans. WHO's pandemic influenza A (H1N1) vaccine donation initiative began in September 2009. During subsequent months, the vaccine was successfully deployed in 16 Western Pacific Region countries and, to date, more than three million doses have been administered.

2.8.6 Regional status of national regulatory authorities (NRAs) and adverse events following immunization (AEFI) surveillance systems

Dr Yoshikuni Sato, Medical Officer, EPI/Western Pacific Regional Office, reviewed the status of NRAs and AEFI surveillance in the Region. He stated that all countries and areas should establish procedures to ensure vaccine quality in accordance with WHO guidelines.

Six functions are included in the national vaccine regulatory process under the NRA: licensing and marketing authorization, supervision of clinical trials, post-marketing surveillance for AEFIs, lot release, laboratory access and regulatory inspections. Five countries in the Western Pacific Region produce vaccines; their NRAs should fulfil all six of these functions. NRA function requirements for other countries vary depending on whether they self-procure vaccines or procure through United Nations agencies. However, information on NRA functions is not available for most Member States of the Region. According to the JRF, seven Member States have national regulatory systems, three do not, and no information is provided for the remaining 26.

WHO supports Member States in conducting NRA assessments to compare against published indicators. In the Western Pacific Region, WHO has assessed NRAs in six out of 36 Member States. WHO prioritizes NRA assessments for vaccine-producing countries, since a functional NRA is mandatory for prequalification. For nonproducing countries, WHO conducts NRA assessments upon request.

All Member States should have AEFI surveillance systems meeting international quality standards. According to the JRF, 28 Member States conduct AEFI surveillance, seven do not, and no information on AEFI surveillance is available on the remaining two. Among Member States that conduct AEFI surveillance, quality varies widely.

NRA and AEFI surveillance are priority programmes in the Western Pacific Regional Office now, with efforts focused on Cambodia, China, the Philippines, the Lao People's Democratic Republic, Viet Nam and the PICs. Substantial progress has been made in Cambodia, China and Viet Nam. Political commitment, along with financial and human resources, will be important to further progress.

2.9 Interagency Coordinating Committee

Presentations were made by several EPI partners, as described below.

2.9.1 Asian Liver Center

Founded in 1996, the Asian Liver Center is the first non-profit organization established to address the disproportionately high incidence of HBV infection and liver cancer in Asians and Asian Americans. The Center's goal is hepatitis B virus eradication and reduction of hepatocellular carcinoma incidence and mortality worldwide using a four-pronged approach: collaboration, advocacy, research and education. The Center has been actively engaged in the Region with training, education and advocacy projects in many provinces in China. It has also been designing and updating communication materials aimed at increasing a mother's awareness

of the hepatitis B vaccine to prevent perinatal hepatitis B transmission in the Lao People's Democratic Republic.

2.9.2 Burnet Institute

The Burnet Institute is a public health and medical research foundation based in Melbourne, Australia. Its main programmatic focuses are service delivery, Maternal and Child Health, EPI, and HIV, mainly in Asia and the Pacific. The Burnet Institute has field offices in the Lao People's Democratic Republic, Myanmar, Indonesia, China and Papua New Guinea and regional offices in Thailand and Fiji. The Institute has led a project in East Sepik province, Papua New Guinea on the feasibility of providing hepatitis B vaccine using Uniject® out of the cold chain. This was part of an integrated postnatal care package including vitamin A for mothers and education on maternal and newborn health. The next steps will be to examine possible expansion to high-priority districts.

2.9.3 Global Alliance for Vaccines and Immunization

GAVI is rolling out a new strategy for 2011–2015. It is in the process of implementing the new GAVI board executive committee decisions relating to country eligibility, prioritization, joint health-strengthening systems platform and the revision of guidelines for new vaccine proposals and resource mobilization. A new funding window will be replacing Immunization Services Support. In 2011, GAVI will continue support for new vaccines, including pneumococcal conjugate vaccine, rotavirus vaccine, meningococcal conjugate vaccine, yellow fever vaccine and the second dose of measles vaccine.

2.9.4 International Vaccine Institute

The International Vaccine Institute (IVI) was established in 1997 in Seoul, Republic of Korea as an international organization under the Vienna Convention. It is dedicated to closing the gap in health between the rich and poor over 10 years. IVI is also a partner in a Bill and Melinda Gates Foundation-funded project called the Supporting National and Independent Immunization and Vaccine Advisory Committees (SIVAC) Initiative. This aims to improve the decision-making processes regarding immunization policies and focuses on GAVI-eligible and low-/middle-income countries.

2.9.5 Korea Centers for Disease Control

The Korea Centers for Disease Control (KCDC) is strongly committed to supporting EPI in the Western Pacific Region. In 2008–2010, KCDC contributed US\$620 000 to supporting the EPI laboratory network. WHO RRLs for Japanese encephalitis, rotavirus and bacterial meningitis have been designated (or are being designated) in KCDC. By the end of 2010, KCDC will move to Bio Technopolis in Osong, which is located around 200 km south of Seoul. It is expected that this new centre will play a key role in further strengthening the biotechnology industry in the Republic of Korea.

2.9.6 Latter Day Saints Church

The primary purposes of Latter Day Saints charities are to relieve suffering, to foster self-reliance in families of all nationalities and religions, and to provide opportunities for service. The Church's presence in the Philippines is very strong and includes 700 000 volunteers who can assist during SIAs. These volunteers assist in programmes to provide services and supplies to communities. These include wheelchairs, safe drinking water, vision screenings, food

production and preservation, disaster response and area initiatives. The Church also provided US\$ 1 000 000 in support of the measles SIAs in the Philippines in 2010.

2.9.7 Ministry of Health, Labour and Welfare, Japan

The Ministry of Health, Labour and Welfare values the cooperative relationship with the Western Pacific Regional Office as well as technology transfer to this Region. The Ministry has successfully implemented flu vaccination programmes and the government board is considering their expansion. The Japanese Government's voluntary contributions will continue to support countries and areas to assure polio-free status, safe injection practices and successful implementation of EPI programming. The Ministry of Health, Labour and Welfare will continue financial support of key technical meetings such as the Technical Advisory Group Meeting, the Regional Certification Meeting and the Pacific Immunization Programme Strengthening Workshop. It will also continue supporting vaccine security activities such as strengthening NRA.

2.9.8 National Institute of Infectious Diseases, Japan

The National Institute of Infectious Diseases (NIID) was established in 1947 to support the scientific background of health and medical administration of Japan. In 1990, NIID began serving as a Global Specialized Laboratory for polio, and later became a WHO Global Specialized Laboratory for measles and rubella. Activities include conducting global polio laboratory training along with the Japan International Cooperation Agency. They also include serving as a WHO collaborating centre for research and reference services for immunological and biological products and virus reference and research (enteroviruses). In 2008–2009, NIID began serving as a WHO regional reference laboratory for JE and HPV.

2.9.9 Rotary International District 2650

The process of funding in the Region involves close collaboration with the WHO Regional Office to match areas of interest with country needs. In addition to financial contributions, Rotary International District 2650 supports activities by identifying members to support them in-country. From 2003 to 2009, Rotary International District 2650 donated US\$ 3 000 000 for polio eradication. For 2010 to 2011, Rotary International Districts 2650 and 3810 have donated approximately US\$ 1 000 000 for strengthening EPI in the Philippines.

2.9.10 UNICEF

UNICEF is firmly committed to measles elimination, polio-free certification, MNTE, new vaccine introduction and strengthening routine immunization systems. In 2010, key focus areas included supporting countries in vaccine forecasting, procurement and security, microplanning and multi-year country planning. They also included resource mobilization, communication, advocacy, social mobilization, information, education and communication (IEC) strategy, cold-chain logistics and improving service delivery. No significant changes in the portfolio are expected in 2011. UNICEF will continue to support the development of communication strategies in pneumonia and diarrhoea control as well as aid to countries on EPI programming.

2.9.11 United States Centers for Disease Control and Prevention

US CDC confirms WHO's Western Pacific Regional Office's progress to date on immunization. It intends to continue its assistance to the Region in meeting its targets, especially for measles/rubella and hepatitis. US CDC's inputs include technical support through secondees to WHO and short-term consultancies as well as direct financial support for immunization

activities in the Region. US CDC appreciates that financial constraints are a major challenge for the Region. It encourages the Western Pacific Regional Office to continue to explore expanding the partner base to increase support for immunization from its regular budget. Further efforts could be made to engage other partner countries from within the Region as well as approaches to major foundations or corporations that may have specific immunization-related interests.

2.9.12 United States Agency for International Development, Philippines

The United States Agency for International Development (USAID) provides support to the Department of Health, Philippines in developing IEC materials for SIAs (*Garantisadong Pambata* Child Health Campaign). USAID has also supported translating IEC materials into major local dialects for H1N1 vaccine deployment. Proposed areas of future collaboration include supporting the strengthening of EPI's cold chain.

2.9.13 WHO's Western Pacific Regional Office

The Region received US\$ 19.8 million from partner contributions in 2008–2009 and US\$ 9.7 million in 2010. The global financial crisis is affecting partners' ability to commit for 2011 and some activities may be in jeopardy. Based on projections, a funding gap of US\$ 16 million is estimated for measles supplementary campaigns, US\$ 3.8 million for polio activities, US\$ 700 000 for hepatitis B activities and US\$ 1.7 million for core activities. The Regional Office resource mobilization efforts include increasing awareness of the importance and impact of EPI and obtaining political support from regional leaders. They include increasing opportunities for flexible funding to the Regional Office, enlarging the partner base to include new nontraditional partners and encouraging bilateral agencies to partner with developing countries.

3. CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

3.1.1 Achieving and sustaining measles elimination

The Western Pacific Region achieved an all-time low in measles incidence (61 297 cases, 34/million) in 2009, with a reduction in measles cases of 58% compared with 2008. Reported routine MCV1 and MCV2 coverage was 96% and 94% respectively in 2009. Surveillance continues to improve, and the regional measles laboratory network is growing, with improved performance.

Several Member States have made particularly vigorous efforts to eliminate measles. SIAs in 21 Chinese provinces in 2008 and 2009 resulted in a 60% decrease in measles cases from 2008 to 2009, and a further 18% decrease so far in 2010 compared with the same period in 2009. Japan began its five-year plan to eliminate measles in 2008. By 2009, the number of measles cases had decreased by 94%. However, measles still remains endemic in countries where over 90% of the regional population is located. A June 2010 Technical Consultation on the Verification of Measles Elimination in the Western Pacific Region recommended that verification of measles elimination should be carried out for individual countries, and eventually for the Region as a whole.

A regional Vaccine-Preventable Disease Laboratory Networks Meeting was conducted in February 2010. It demonstrated that the measles and rubella network laboratories were providing high-quality support to achieving the goal of measles elimination by 2012 by confirming suspected cases and identifying measles virus genotypes circulating in the Region.

WHO recommends the use of clinical case definitions of measles and rubella for the purpose of surveillance. Some countries have adopted surveillance case definitions of AFR for suspected measles and rubella, aiming to improve the sensitivity of surveillance for detecting both measles and rubella cases, but potentially resulting in cases inappropriately confirmed as measles (i.e. “false-positive” cases).

While remarkable progress has been made, challenges to measles elimination remain. These include low immunization coverage and inadequate surveillance sensitivity at national and/or subnational levels, outbreaks among young adults, inadequate monitoring of measles genotypes, importations, and inadequate financial resources and political commitment. Intensified efforts among Member States will require an increase in financial resources. However, a trend of decreasing external funding presents a substantial risk and additional challenge to achieving measles elimination on time.

3.1.2 Accelerating rubella control and CRS prevention

Rubella is endemic in many Member States of the Western Pacific Region, with a Regional incidence of 41 per million population in 2009. However, only seven countries and areas accounted for the majority of reported rubella cases; 21 countries had <1 rubella case per million population, and another eight had one to nine cases per million. The levels of rubella incidence vary by country due to the extent and duration of different vaccination strategies. Thirty out of 36 Western Pacific Region countries and areas, comprising 93.5% of the regional population, currently include rubella-containing vaccine (RCV) in their routine immunization programmes.

WHO's Western Pacific Region is already in the process of controlling rubella. Six Member States have not yet introduced RCV: Cambodia, the Lao People's Democratic Republic, Papua New Guinea, Solomon Islands, Vanuatu and Viet Nam. Case-based measles surveillance already identifies rubella cases, and the measles laboratory network is already evaluating measles immunoglobulin M (IgM)-negative specimens for rubella IgM. The CRS burden is under-recognized and underreported in many Western Pacific Region countries and areas because CRS surveillance is not conducted.

Because it is less infectious, rubella is easier to eliminate and easier still to control than measles. The basic reproductive number (R_0) for rubella ranges between three and eight, as compared with measles – with an R_0 ranging from 12 to 18. Measles elimination activities provide opportunities to accelerate control of rubella and prevention of CRS through integrated approaches to vaccination and surveillance. Using a combination vaccine such as MR or MMR instead of monovalent measles vaccine during routine immunization and SIAs is a convenient and cost-effective way to achieve rubella control while achieving measles elimination.

3.1.3 Hepatitis B control

WHO's Western Pacific Regional Office has made tremendous progress towards reaching the hepatitis B 2012 milestone of HBsAg prevalence of <2% among five-year-olds. It continues to serve as a global example of initiative and commitment to preventing chronic hepatitis B infection. However, the TAG is concerned that nine priority countries have low vaccination coverage and will not reach the 2012 milestone. The milestone was established as an interim measure for a Regional <1% chronic infection goal. It serves as an opportunity to assess barriers and support countries in strengthening their prevention efforts.

Data on the prevalence of chronic infection in countries with high hepatitis B vaccination coverage are needed to measure the impact of the vaccination programme. PICs in particular have had high coverage for many years, but are not able to conduct certification-standard surveys due to small population sizes. Only two countries have completed the certification process. Improvement of the process may facilitate and encourage countries to initiate certification.

The comprehensive and active role that the Hepatitis B ERP members have proposed is impressive and shows their commitment to hepatitis B control in the Region. These experts will provide Member States with critical support and advocacy opportunities. The TAG recognizes that additional funding is required to implement plans and ensure progress in regional hepatitis B control.

3.1.4 Maintaining poliomyelitis-free status until 2012

The TAG concurs with the conclusions made by the Regional Certification Commission (RCC) at its 15th meeting in December 2009. The Region has remained free of circulating poliovirus, but the TAG considers the recent poliomyelitis outbreaks in WHO's European Region as a stark reminder of the serious risks and dramatic consequences of a wild poliovirus importation should it enter poorly protected communities and be recognized with delay due to performance problems in surveillance. The TAG notes that coverage and/or surveillance gaps exist in several countries, at national or subnational levels.

3.1.5 Maternal and neonatal tetanus elimination

The TAG notes the continued momentum in the remaining countries of WHO's Western Pacific Region to achieve MNTE in the near future. and is impressed with the variety of activities being implemented and the close collaboration between EPI and MCH programmes.

3.1.6 New vaccines

(1) Regional status of new vaccine introduction

While substantial progress has been made in expanding utilization of conjugate Hib vaccines, uptake of other new vaccines such as HPV, pneumococcal conjugate and rotavirus vaccines remains limited. The vaccines could potentially alleviate the greatest disease burden in low-income countries with limited access to health care including screening and treatment for cervical cancer, and treatment of diarrhoea and pneumonia. However, the high price of the vaccines, along with limited external long-term predictable funding, remains a major barrier to introduction for routine use. In addition, the role of HPV vaccine as a public health tool for the control of cervical cancer is still debated.

(2) Regional status of IBD, JE and rotavirus surveillance

Significant progress has been made in consolidating rotavirus and IBD sentinel surveillance under the Ministry of Health in low-income countries with corresponding laboratory networks. Such surveillance contributes to disease burden evidence needed to consider vaccine introduction. It may be also useful in measuring the impact of Hib vaccination and pneumococcal and rotavirus vaccines in the future. Several countries are developing plans to initiate or expand JE surveillance. Evidence from this surveillance will be critical to support informed decision-making on the use of JE vaccine, and to measure the impact of vaccination.

3.1.7 Routine immunization strengthening

(1) Joint Reporting Form review

In 2009, the TAG recommended that Member States and areas should provide WHO with complete and timely programme monitoring and VPD surveillance data. The TAG requested the Western Pacific Regional Office to report on the status at the 2010 TAG meeting.

For 2009 data, the JRF submission schedule was moved from April to March. Although only 8% of countries met the new deadline, 75% of countries had submitted reports by April, as compared with 19% the year before. All countries have now submitted 2009 data reports.

The TAG acknowledges the remarkable efforts made by countries and areas to provide timely reports for 2009, and congratulates them all on achieving 100% completeness in reporting. It encourages them to sustain this achievement. The content of the report is of particular importance to continued meaningful support from WHO and other UN agencies. It will be available to all through global publications.

(2) Strengthening routine immunization programmes in the Western Pacific Region

A strong routine immunization programme is a critical foundation for a strong health system, for achievement of the regional goals in maintaining polio-free status, eliminating measles and controlling hepatitis B. It is also critical for implementation of the WHO-UNICEF Regional Child Survival Strategy for achieving MDG 4.

Several priority countries in the Region have been working to improve their routine immunization programmes, but continue to have challenges to achieving the GIVS national vaccination coverage goal (at least 90% by 2010). Other countries will not achieve the GIVS district vaccination coverage goal (at least 80% by 2010). A significant proportion of districts in these countries have coverage well below the targets established for measles elimination and hepatitis B control. They represent a risk for the spread of imported wild poliovirus or emergence of vaccine-derived polioviruses.

Monitoring the routine immunization programme at district level is essential to improve its performance and eventually to achieve the GIVS goals and the regional disease-specific control targets. Many countries in the Region have a national system to monitor EPI performance at the district level, but capacity for data collection, analysis and utilization to improve programmes is still insufficient. Neither is there any standardized mechanism to collect and analyse district EPI performance data from priority countries at the regional level. This would enable WHO to enhance its support to strengthen the overall routine immunization programme.

(3) Regional Vaccination Weeks: lessons learnt and the way forward

Vaccination Week is an event that highlights the importance of protecting infants from VPDs. It celebrates the achievements of immunization programmes and their partners in promoting healthy communities. For 2010, WHO's American Region (AMR), Eastern Mediterranean Region (EMR) and European Region (EUR) and many countries observed Vaccination Week from 24 April to 1 May. There was a call to action to ensure that infants around the world were fully immunized. Events included vaccination, social mobilization and media campaigns, proclamations by high-ranking officials and advocacy meetings.

(4) Supply chain management: new Effective Vaccine Management assessment tools

Critical management and equipment failures continue to occur within vaccine stores and during distribution at all levels of the supply chain. Data indicate problems with both stock-outs and avoidable vaccine wastage in many countries, placing immunization services at risk. At the same time, new, bulkier and more costly vaccines and health technologies are placing increased demands on vaccine management systems. The new WHO EVM package was developed and launched in July 2010. It adapted approaches from the earlier EVSM and Vaccine Management Assessment (VMA), incorporating additional tools, guidance materials and a web-based platform for centralized updating. EVM provides countries with a mechanism for comprehensive assessment, planning, monitoring and improvement of vaccine management systems, including cold-chain equipment and capacity, stock control and transport systems.

(5) Progress of pandemic influenza A (H1N1) 2009 vaccine deployment and vaccination

In response to the influenza A (H1N1) 2009 pandemic, Member States deployed large volumes of vaccine and conducted or initiated vaccination campaigns. Some countries were well-prepared for this challenge because of the earlier threat from influenza A (H5N1), but preparedness varied. During the vaccine deployment and vaccination campaigns, there were many challenges faced by Member States and lessons learnt. It was found to be critical to have prior consensus within the government system and between government and partner agencies to achieve successful vaccine deployment and vaccination implementation. It was also found that firm national political commitment led to better vaccination implementation. These lessons should be utilized to prepare for future pandemics.

- (6) Regional status of National Regulatory Authorities (NRAs) and adverse events following immunization (AEFI) surveillance systems

Vaccine quality is an important factor in EPI programmes. High-performing AEFI surveillance contributes to ensuring vaccine quality as well as EPI programme quality by identifying programme errors and addressing community concerns regarding vaccines. The existence of NRA oversight in all countries is also a critical component of ensuring quality for both vaccines and the EPI programme.

3.1.8 Interagency Coordinating Committee

The Region is experiencing a period of financial uncertainty. Dependence on a limited number of traditional donors is affecting future planning as some donors are experiencing financial difficulties in meeting their own needs. Resource requirements for achieving the regional strategic goals for 2012 amount to more than US\$ 37 million, not counting the resource requirements for other components of EPI. With identified resources of less than US\$ 10 million per year, it will be difficult to achieve the goals. It is extremely important for the Region to explore innovative fund-raising mechanisms outside of the traditional approaches.

3.2 Recommendations

3.2.1 Achieving and maintaining measles elimination

- (1) Recommendations from the 2009 TAG Meeting on achieving high immunization coverage, SIAs, routine MCV schedules and surveillance remain valid. The TAG appreciates the Western Pacific Regional Office's efforts to update its regional plan and endorses the strategic approaches contained in the revised *Plan for achieving and sustaining measles elimination in the Western Pacific Region, 2010–2020*, which should be used for future planning nationally and regionally.
- (2) The TAG concurs with the recommendations from the Technical Consultation on the Verification of Measles Elimination in the Western Pacific Region and requests the Regional Director and Member States to establish a regional and national verification process. The TAG requests the Regional Verification Commission, once established, to develop more concrete procedures.
- (3) Given that only 28 months remain to achieve the measles elimination goal in the Western Pacific Region, the Regional Director should encourage the Regional Committee (RC) to draft a resolution reaffirming Member State commitment to achieving the measles elimination goal and establishing a verification process.
- (4) The TAG urges Member States and areas to commit the human and financial resources necessary to achieve and sustain measles elimination, and to include specific measles elimination activities as line items in national and subnational immunization budgets and health sector plans.
- (5) As countries approach elimination, expert committees should be established to provide expert advice on case classification of suspected measles and rubella cases. Countries approaching the elimination phase should strive to minimize the percentage of clinically confirmed cases to <10% and give more emphasis on collecting adequate specimens and establishing epidemiologic linkages through quality case investigations that include additional case finding. Where countries are not yet approaching elimination, expert committees should analyse the reasons for accumulation of susceptible cases (geographical or age groups) and advise on proper actions to reach the goal.
- (6) The TAG endorses the recommendations from the 2nd Meeting on Vaccine-Preventable Diseases Laboratory Networks in the Western Pacific Region (Annex 3) and requests all network laboratories to continue to make full efforts to obtain genotype and sequence information on measles and rubella viruses circulating in the Region, which is necessary for monitoring the measles elimination process.
- (7) Serological or clinical confirmation of reported suspected measles cases should be applied only to cases that satisfy the WHO-recommended clinical case definition of fever, rash and one or more of the following: cough, coryza or conjunctivitis.
- (8) The TAG requests all countries and areas to report epidemiologic and laboratory measles and rubella data and classification outcomes to the Regional Office at least monthly and in a timely manner. Countries are encouraged to use the standard formats/databases provided by the WHO's Regional Office.

- (9) The TAG recommends that countries and the Regional Office systematically review and document contributions of measles elimination activities to child health, routine immunization systems and health systems.

Country-specific recommendations

- (1) The TAG commends China for its plans to conduct a nationwide SIA in September 2010, and recommends the country to ensure effective strategies to achieve universally high SIA coverage with a special focus on reaching previously unreached populations (e.g. migrants, people in remote or poor areas, children born outside of family planning policy).
- (2) The TAG suggests that Viet Nam may wish to consider carefully monitoring the impact of its upcoming SIA targeting children one to five years old to determine whether measles virus circulation has been interrupted by conducting intensified surveillance following SIA implementation. The TAG also suggests that Viet Nam consider an additional SIA targeting young adults, prioritizing those at highest risk of measles, such as students, health care workers and others who live or work in communal settings.
- (3) The TAG expresses concern regarding the measles outbreak in the Philippines in 2010 and encourages the Philippine Government to make the required political and financial commitments to conduct a high-quality SIA in 2011 targeting children up to seven years old.
- (4) The TAG recommends that Cambodia ensure uninterrupted immunization and surveillance operations, including in the laboratory, analyse current measles epidemiology and lessons learnt from its 2007 SIAs to develop and implement an appropriate action plan for high-quality SIAs in early 2011, and introduce MCV2 for 15–18-month-old children in 2011, provided MCV1 coverage of at least 80% for three consecutive years is achieved (89% in 2008 and 92% in 2009).
- (5) The TAG urges the Lao People's Democratic Republic to significantly improve its measles surveillance efforts, particularly in case reporting and laboratory quality. The planned 2011 measles SIAs should be conducted in the same high-quality fashion as was done in 2007.

3.2.2 Accelerating rubella control and CRS prevention

- (1) Recommendations from the 2009 TAG Meeting on Accelerating Rubella Control and CRS Prevention remain valid. The TAG reaffirms its recommendation to use measles elimination activities to accelerate rubella control and CRS prevention, allowing flexibility in the target year for achieving rubella and CRS incidence levels consistent with good rubella control.
- (2) The TAG recommends that countries and areas with a rubella control goal use the revised *Regional Plan for Control of Rubella and Prevention of CRS in the Western Pacific Region, 2010–2015* as a guide for developing national plans to accelerate rubella control and CRS prevention. Strategies and activities proposed in the Regional Plan should be customized to fit local conditions.
- (3) Countries with MCV1 coverage <80% that have not yet introduced RCV may consider adopting a rubella control goal provided they commit to conducting periodic SIAs with MR or MMR. Such a "campaign approach" to rubella control is reasonable in these countries, given the need to continue periodic measles SIAs to sustain measles elimination.

- (4) Countries should review and monitor rubella epidemiology to customize approaches for rubella control and CRS prevention. Countries with a large proportion of rubella cases among CBAW should adopt practical vaccination strategies to increase population immunity among them.
- (5) The TAG encourages all countries to establish sentinel surveillance for CRS. For countries such as Cambodia, China, the Lao People's Democratic Republic, Mongolia, Papua New Guinea, the Philippines and Viet Nam, sentinel CRS surveillance may be established or expanded to evaluate the burden of CRS and monitor the impact of rubella vaccination.
- (6) The TAG reminds all National Measles Laboratories to test measles IgM-negative specimens for rubella IgM, and conversely, all rubella IgM-negative specimens for measles IgM. NMLs should be prepared to receive and test samples from CRS surveillance.

3.2.3 Hepatitis B control

- (1) Priority countries should increase timely hepatitis B birth dose (within 24 hours) and timely three-dose coverage to certification level targets ($\geq 65\%$ and $\geq 85\%$) by 2012 and beyond through implementation of detailed action plans.
- (2) The following countries should seek support from WHO to develop and implement detailed action plans for increasing birth dose and routine hepatitis B vaccination coverage: the Lao People's Democratic Republic, Papua New Guinea and Cambodia.
- (3) In the next 12 months, the following countries should:
 - a. include hepatitis birth dose and routine vaccination in existing evaluation plans (EPI review in Cambodia, post-introduction evaluation in Papua New Guinea); and
 - b. arrange a small team or consult for a comprehensive or targeted programme evaluation (the Lao People's Democratic Republic, the Philippines and Viet Nam).
- (4) Countries that have data suggesting that they may have achieved the hepatitis B control goal are encouraged to initiate the certification process with WHO's Western Pacific Regional Office.
- (5) By 2011, the Expert Resource Panel and the Western Pacific Regional Office should develop regional guidance for conducting smaller-scale seroprevalence surveys for certification (some PICs), programme assessment (the Lao People's Democratic Republic, Papua New Guinea and Cambodia) or post-certification monitoring. Such guidance should consider:
 - a. pooling data from multiple countries with small populations;
 - b. subnational serosurveys of five-year-olds in areas and population groups at historically high risk for hepatitis B infection; and
 - c. evaluating the potential role of the country monitoring and evaluation tool and reporting back to the TAG.
- (6) The TAG endorses the hepatitis B Expert Resource Panel's proposal to increase its role in facilitating regional hepatitis B control.

- (7) The TAG endorses the development of the 2010–2011 Regional Plan of Action and recommends that the WHO's Western Pacific Regional Office consider adding or strengthening activities related to:
 - a. establishment of hepatitis B birth dose as part of essential newborn care policies for facility births and maternal and neonatal care packages for home births, which may necessitate use of vaccine outside of the cold chain;
 - b. implementation of standing orders for birth dose vaccination in facilities; and
 - c. vaccination of high-risk adults, especially health care workers.
- (8) The TAG endorses the development of the 2010–2014 Hepatitis B Strategic Plan. In line with the 2010 World Health Assembly Viral Hepatitis Resolution, WHO's Western Pacific Regional Office should consider enhancing coordination across sectors. This should include those responsible for injection safety, safe blood supply, screening of individuals for hepatitis B, clinical treatment and HIV prevention.
- (9) The TAG encourages Partners to provide technical and financial support for regional and country hepatitis B control activities.
- (10) The TAG makes the following clarifications regarding the 2012 milestone:
 - a. the target year should be interpreted as the year in which prevalence is <2% among five-year-olds, consistent with the 2005 RCM resolution; and
 - b. achievement of targets should be measured in terms of overall regional prevalence and prevalence achieved in each country (or for groups of countries with small populations where data are being pooled), consistent with the 2002 TAG recommendations.
- (11) Although seroprevalence data are an essential element of certification, birth dose and hepatitis B three-dose vaccination coverage may be used as progress indicators.

3.2.4 Maintaining poliomyelitis-free status until 2012

- (1) The TAG urges all countries to maintain their efforts to boost population immunity against polio in areas with relatively low performance of routine immunization. This includes special approaches to enhance routine systems such as defaulter tracking, better utilization of fixed-site immunization service delivery, comprehensive outreach or targeted high-quality SIAs. All poliomyelitis partners should ensure that resources are made available to implement these efforts.
- (2) The TAG recommends that all countries review their performance levels in immunization and surveillance to assess whether the required standards are in place and conduct regular risk assessments at national and appropriate subnational levels to identify high-risk areas for immediate corrective action. The WHO/Western Pacific Regional Office Secretariat should provide technical guidance and conduct risk assessments by country at the Regional level. It should be noted that in Tajikistan, where a large polio outbreak occurred in 2010, the reported OPV3 coverage exceeded 85%. This serves as a reminder that countries with high reported immunization coverage should not be complacent.

- (3) The TAG reminds Member States that active and current preparedness plans for the detection of and response to wild poliovirus importation and VDPV emergence are an essential component of countries' efforts to stay polio-free. Technical support should be sought from the WHO/Western Pacific Regional Office Secretariat, particularly with respect to the following:
 - a. risk assessment within the IHR 2005 framework;
 - b. vaccine choices for outbreak control;
 - c. partner coordination; and
 - d. resource mobilization.

The TAG reiterates that importations of wild poliovirus cannot be prevented. However, circulation of imported wild poliovirus can be limited through uniformly high population immunity and rapid outbreak response SIAs as needed. Sensitive surveillance is essential to detect spread of imported wild poliovirus and VDPVs quickly and reliably. Thus, all health workers should be encouraged in timely reporting.

- (4) Each NIP should specifically review its national importation preparedness plan to ensure it meets all requirements to activate an appropriate surveillance and immunization response immediately on detection of wild poliovirus importation or circulating VDPV.
- (5) Events in Tajikistan highlight the necessity for ongoing and timely information exchange between all countries concerned. Because wild poliovirus outbreaks in polio-free regions may represent events of international public health concern, transparency and frankness in information sharing are critical. The TAG requests the WHO/Western Pacific Regional Office Secretariat to facilitate regular, timely and comprehensive communication, particularly between countries sharing borders.
- (6) The TAG welcomes the new algorithm for virus isolation that is now being implemented in all poliovirus network laboratories (except in Chinese provincial laboratories). Real-time polymerase chain reaction (PCR) for intratypic differentiation (ITD) and VDPV screening is now being implemented in laboratories with ITD function in OPV-using countries.
- (7) The TAG endorses the recommendations made by the 2nd Meeting on Vaccine- Preventable Disease Laboratory Networks in the Western Pacific Region held in Manila, Philippines from 22 to 23 February 2010. Since the Polio Eradication Initiative began over 20 years ago, many EPI and laboratory staff familiar with the disease and core programme aspects have left the programme. Continued high staff turnover requires regular assessment of capacities and decisions on whether additional training activities need to be conducted. The TAG recommends that critical review and continued support of all polio network laboratories in the Region should be done by conducting annual accreditation of laboratories (with on-site review for priority countries) and ensuring training opportunities for those needing additional support.

3.2.5 Maternal and neonatal tetanus elimination

- (1) The TAG reiterates its 2009 recommendation that all countries concerned continue their efforts to reach the elimination goal in the near future and strongly encourages all partners and political decision-makers to ensure the necessary priority, support and resources to complete the work.
- (2) NIPs should, particularly once TT SIAs have been conducted, strengthen NT surveillance to support risk assessment and validation claims. Characteristics of quality NT surveillance include timely investigation of all NT cases, relevant neonatal deaths (e.g. those occurring within three to 28 days after birth), regular data and performance analysis, validating areas with underreporting or absence of reporting, and taking corrective actions based on surveillance findings.
- (3) Where applicable, countries should regularly review their plans to maintain elimination status. These should include optimizing immunization schedules (e.g. shift from TT vaccination of pregnant women to providing tetanus/diphtheria [Td] childhood and/or adolescent booster doses) and conducting periodic district level risk assessment, with WHO and UNICEF participation as appropriate.

3.2.6 Vaccine-preventable diseases (VPD) laboratory networks

The TAG endorses the recommendations from the 2nd VPD Laboratory Networks Meeting, including those for the JE laboratory network (Annex 3).

3.2.7 New vaccines

- (i) Regional status of new vaccine introduction
 - (1) Detailed recommendations were provided for individual vaccines (HPV, JE, pneumococcal and rotavirus) by TAG in July 2009, and these still largely remain valid. Efforts should be continued to operationalize those recommendations.
 - (2) Countries should make proactive efforts to obtain sufficient data (e.g. epidemiological, funding and pricing) to enable an informed assessment on the introduction of new and underutilized vaccines.

3.2.8 Regional status of IBD, JE and rotavirus surveillance

Surveillance for vaccine-preventable diseases is a critical component of effective immunization programmes. Surveillance of diseases targeted by new and underutilized vaccines should be further developed and consolidated under ministries of health. Surveillance data should be regularly shared with key decision makers on vaccine introduction.

3.2.9 Routine immunization strengthening

- (i) Strengthening routine immunization programmes in the Western Pacific Region
 - (1) Countries, particularly those with a significant proportion of districts with low routine vaccination coverage, should strengthen their routine immunization programmes to meet the GIVS goal of $\geq 90\%$ coverage nationally and $\geq 80\%$ coverage in every district. Efforts should be made to ensure the accuracy of numbers of children vaccinated and of eligible children. In a few countries of the Region (e.g. the Lao People's Democratic Republic,

Papua New Guinea), the WHO/UNICEF estimates fall short of country-reported estimates. Such countries should engage with WHO/UNICEF to understand the reasons and take action to address the differences.

- (2) WHO should continue to facilitate country exchange of experiences and lessons learnt in district level monitoring and routine immunization programme strengthening by:
 - a. organizing a periodic intercountry EPI managers' workshop focusing on high-priority countries to share new information and monitor progress;
 - b. supporting priority countries to visit other countries to learn successful models; and
 - c. developing a database on coverage, surveillance and other indicators for routine immunization programmes performance at national and district levels to be shared among countries.
 - (3) WHO should work with countries, particularly those with a significant proportion or number of districts with low routine vaccination coverage, to develop a standardized tool and a regional mechanism to collect and analyse data on the routine immunization programme and other EPI activity performance at district level.
 - (4) WHO should work with countries to use this tool actively to identify low-performance and/or high-risk districts. It should support countries to mobilize additional support and resources to strengthen routine immunization programmes in these districts.
 - (5) The TAG recommends that countries utilize school entry and attendance requirements and/or verification of immunization status coupled with follow-up vaccination when needed to ensure high levels of immunization coverage and prevent transmission. This applies to nursery schools, pre-schools, primary and secondary schools and universities.
- (ii) Regional Vaccination Weeks: lessons learnt and the way forward

There has been success in various WHO regions in promoting immunization through vaccination campaigns, regional immunization advocacy, social mobilization initiatives and increased political commitment. Hence the TAG endorses the introduction of the first Vaccination Week in the Western Pacific Region in 2011 and encourages all countries and areas in the Region to participate in the planning and execution efforts.

- (iii) Supply chain management: new Effective Vaccine Management assessment tools

Member States are strongly encouraged to use the new EVM assessment tool, conduct the necessary assessments and implement the indicated improvements, such as training, updating cold-chain equipment inventories and cold-chain equipment repair and replacement. By doing so, countries will assure quality control and can be prepared for the introduction of an increasing number of new, bulkier and more costly vaccines.

- (iv) Progress of pandemic influenza A (H1N1) 2009 vaccine deployment and vaccination

In the post-pandemic period when a virus is still circulating, vaccination against the virus is still the best protection, when available. Member States are encouraged to vaccinate high-risk individuals with a monovalent (single virus) pandemic influenza A (H1N1) 2009 vaccine, or a trivalent seasonal influenza vaccine (which includes the H1N1 [2009] strain, as well as seasonal strains H3N2 and B), depending on availability.

Though pandemic influenza A (H1N1) 2009 was milder than initially anticipated, disease spread to 214 countries and areas across the globe, with more than 18 449 deaths. Member States should take heed of lessons from this pandemic influenza A (H1N1) vaccine deployment and vaccination experience and prepare themselves accordingly for the next pandemic.

(v) Regional status of NRAs and AEFI surveillance systems

All Member States re-confirm the necessity of having an NRA that functions according to WHO guidelines. The NRA can play a leading role in ensuring vaccine quality and contributing to immunization safety, particularly through its role in licensing and AEFI surveillance. For countries introducing new and underutilized vaccines procured through the United Nations system, NRAs should at least have capacity in licensing and post-marketing surveillance, including high-quality AEFI surveillance.

3.2.10 Interagency Coordinating Committee

- (1) National governments should explore bilateral opportunities with nontraditional partners in support of EPI activities at all levels.
- (2) Developed countries are encouraged to adopt developing countries at any scale, utilizing the “sister cities” concept to support the achievement of Regional goals.
- (3) WHO’s Western Pacific Regional Office should continue exploring innovative fund-raising methods to increase and diversify the Regional partner base.
- (4) WHO should ensure a favourable environment for partner contributions by examining its administrative and financial systems and removing disincentives for partners when possible.

**NINETEENTH MEETING OF THE TECHNICAL ADVISORY GROUP ON IMMUNIZATION
AND VACCINE PREVENTABLE DISEASES IN THE WESTERN PACIFIC REGION
Manila, 24-27 August 2010**

**22 August 2010
English only**

TENTATIVE TIMETABLE

Time	Tuesday, 24 August 2010	Time	Wednesday, 25 August 2010	Time	Thursday, 26 August 2010	Time	Friday, 27 August 2010
0800-0830	REGISTRATION		4. Hepatitis B control		5. Maintaining poliomyelitis-free status through 2012		9. Routine immunization strengthening
0830-0900	1. Opening Opening speech Self-introduction Election of officers: Chairperson, Vice-Chairperson and Rapporteur Administrative announcements	0830-0835 0835-0850 0850-0900 0900-0915 0915-0930 0930-0945 0945-1000 1000-1015 1015-1040	(a) Overview (b) Global update on hepatitis B control (c) Regional update on hepatitis B control (d) Status, challenges and way forward in priority countries i. Papua New Guinea ii. Lao People's Democratic Republic iii. The Philippines iv. Cambodia v. Viet Nam Discussion	0830-0900 0900-0920 0925-0950 0950-1020	(a) Global status of polio eradication – overview and discussion (b) Global Polio Eradication Initiative's Strategic Plan 2010–2012 and implications for the Western Pacific Region and discussion (c) Managing risk of wild poliovirus importations i. Polio virus importation into the European Region and discussion ii. Risk assessment for not staying polio-free and discussion	0830-0845 0845-0900 0900-0915 0915-0930 0930-0945 0945-1000 1000-1015	(a) Joint Report Form (JRF) review and discussion Discussion (b) Issues of Routine Immunization Programme in the Western Pacific Region: Report from the Intercountry Workshop (c) Country experiences on improvement of routine immunization programmes i. Monitoring and strengthening EPI performance at the district level in the Philippines ii. Monitoring and strengthening EPI performance at the district level in Viet Nam (d) Regional immunization weeks: Lessons learnt and way forward Discussion
0900-0930	GROUP PHOTO AND COFFEE BREAK	1040-1100	COFFEE BREAK	1020-1045	COFFEE BREAK	1015-1045	COFFEE BREAK
0930-1000	2. Achieving measles elimination by 2012	1100-1115	vi. Preliminary recommendations for increasing hepatitis B vaccination coverage	1045-1110	iii. Response to Tajikistan polio outbreak and assessing importation risk and discussion	1045-1100	(e) Supply chain management
1000-1015	(a) Update on elimination in the Western Pacific Region and global eradication		(e) Estimating the prevalence of chronic hepatitis B infection	1110-1135	iv. Establishing a wild poliovirus importation preparedness plan and discussion	1100-1115	i. New Effective Vaccine Management assessment tools ii. Monitoring progress using Effective Vaccine Store Management assessments in Cambodia
1015-1030	(b) Laboratory evidence of progress towards measles elimination	1115-1130	i. Pacific island countries and areas experience with seroprevalence surveys	1135-1150	(d) The new WHO position paper on polio vaccines and polio immunization in the pre-eradication era and discussion	1115-1130	Discussion
1030-1100	(c) Plan for achieving and sustaining measles elimination in the Western Pacific Region: 2010–2020 Discussion (d) Endemic countries and/or countries with recent outbreaks	1130-1200 1200-1230	ii. Alternatives to national seroprevalence surveys Discussion	1150-1205 1205-1215	(e) Work of the Regional Certification Commission 2009–2010 and discussion (f) Way forward and conclusions	1130-1145 1145-1200 1200-1215	(g) Progress of pandemic (H1N1) 2009 vaccine deployment and vaccination implementation (f) Regional status of National Regulatory Authorities (NRAs) and Adverse Events Following Immunization (AEFI) surveillance systems Discussion
1100-1110	i. Measles elimination plan and risk of adult transmission in Viet Nam						
1110-1120	ii. Outbreak response immunization and plan to achieve and sustain measles elimination in the Philippines						
1120-1130	iii. Epidemiology of measles outbreak and plan to achieve and sustain measles elimination in Cambodia						
1130-1140	iv. Status and plans for measles elimination in China: How to reach the unreached						
1140-1150	v. Measles outbreak and elimination in New Zealand						
1150-1230	Discussion						
1230-1330	LUNCH BREAK	1230-1330	LUNCH BREAK	1215-1300	LUNCH BREAK	1215-1315	LUNCH BREAK

1330-1345	(e) Report from the Technical Consultation of the Verification of Measles Elimination in the Western Pacific Region	1330-1345	iii. Preliminary recommendations on seroprevalence surveys		6. Achieving maternal and neonatal tetanus elimination (MNTE)	1315-1500	10. Interagency Coordinating Committee
1345-1400	i. Verification process for measles elimination	1345-1400	(f) Certification of control	1300-1325	(a) Combining tetanus toxoid supplementary immunization activities (SIAs) with other health interventions and discussion		
1400-1430	ii. Verification criteria for measles elimination	1400-1420	i. Roles and responsibilities of the expert resource panel	1325-1350	(b) Expanded Programme on Immunization (EPI) and Maternal and Child Health (MCH) collaboration towards MNTE and discussion		
	Discussion		Discussion	1350-1400 1400-1420 1420-1430	(c) Roundtable update on MNTE status (d) How to maintain elimination and discussion (e) Way forward – UNICEF/Kiwanis collaboration		
1430-1500	COFFEE BREAK	1420-1440	COFFEE BREAK	1430-1445	COFFEE BREAK	1500-1530	COFFEE BREAK
1500-1515	3. Accelerating rubella control and congenital rubella syndrome (CRS) prevention	1440-1500	ii. Preliminary recommendations related to certification	1445-1455	7. Vaccine Preventable Disease laboratory update	1530-1700	11. Conclusions and recommendations
1515-1530	(a) Status of rubella control and CRS prevention in the Western Pacific Region	1500-1510	(g) Regional operational plan for hepatitis B control	1455-1510	8. New vaccines	1700-1730	12. Closing
1530-1600	(b) Plan for accelerating control of rubella and prevention of CRS in the Western Pacific Region	1510-1530 1530-1600	Discussion	1510-1525 1525-1600	(a) Regional status of new vaccine introduction (b) Regional status of invasive bacterial disease (IBD), Japanese encephalitis (JE) and rotavirus surveillance		
	Discussion		i. Preliminary recommendations for the Regional Office		Discussion		

WORLD HEALTH
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ORGANISATION MONDIALE
DE LA SANTE

REGIONAL OFFICE FOR THE WESTERN PACIFIC
BUREAU REGIONAL DU PACIFIQUE OCCIDENTAL

NINETEENTH MEETING OF THE
TECHNICAL ADVISORY GROUP (TAG) ON
IMMUNIZATION AND VACCINE PREVENTABLE
DISEASES IN THE WESTERN PACIFIC REGION

WPR/DCC/EPI(4)/2010/IB/2
22 August 2010

Manila, Philippines
24-27 August 2010

ENGLISH ONLY

INFORMATION BULLETIN NO. 2

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**SECOND MEETING ON VACCINE PREVENTABLE DISEASES LABORATORY
NETWORKS IN THE WESTERN PACIFIC REGION
MANILA, PHILIPPINES
22-26 FEBRUARY 2010
CONCLUSIONS AND RECOMMENDATIONS**

Laboratories from three vaccine preventable disease networks in the Western Pacific Region met held in Manila, Philippines from 22 to 26 February 2010. Three consecutive sessions of polio (22 to 23 February), JE (24 February) and measles/rubella (25-26 February) reviewed the performances of three laboratory networks to identify challenges of network laboratories and ways to strengthen the quality of the performances to maintain polio-free status, to strengthen JE and measles/rubella laboratory networks and also to monitor the implementation of recommendations from the first laboratory network meeting in July 2008.

The meeting provided a forum to discuss updates on the status of the EPI Laboratory Networks and to identify ways to strengthen the quality of the performances of network laboratories to maintain poliomyelitis-free status and to support achieving measles elimination and JE control in the Western Pacific Region.

3.1 Conclusions

3.1.1 Polio Laboratory Network

The meeting concluded that the performance of the regional polio laboratory network is sustained at polio-free certification standard and that AFP surveillance activities are efficiently supported. The network provides critical evidence in support of the continued polio-free status of the Region. The network's activities to implement new test algorithms and real-time PCR procedures were all on track.

Participants commented on the expanding knowledge and experience of the Polio Eradication Initiative with outbreaks due to VDPVs that warrants critical review of the operational definitions used to define circulation, and access to guidelines for the investigation and response to VDPV detections.

The critical role that polio laboratories played in investigations of EV71 outbreaks highlights their valuable contributions to public health within the Western Pacific region. WHO should continue its advocacy with national authorities and partner agencies for continued support to the regional polio laboratory network.

3.1.2 Conclusions for the JE Laboratory Network

A one day meeting of the Regional Japanese encephalitis (JE) Laboratory Network was held on 24 February as a part of the second meeting on the Vaccine Preventable Disease laboratory networks in the Western Pacific Region to discuss the progress of the JE network laboratories in the Region, identify challenges of network laboratories, discuss ways to strengthen the performances of network laboratories and report the progress of implementation of the recommendations from the last meeting held in July 2008. Participants included 23 representatives from network laboratories, WHO Laboratory Coordinators from Headquarters

and Southeast Asia Region, WHO country EPI officers, Advisers from the US CDC and country EPI focal points. The meeting provided a forum to discuss updates on the status of the regional JE network laboratories. Recommendations for the JE laboratories in the Region include implementation of confirmatory testing mechanisms, initiation of accreditation using WHO JE laboratory checklist and improvement of data management and reporting.

3.1.3 Measles and Rubella Laboratory Network

A two-day meeting of the Regional Measles and Rubella Laboratory Network was held from 25 to 26 February 2010 to review the performance of the measles /rubella network laboratories in the Region, to identify challenges for the laboratories, to identify ways to strengthen the performance of the laboratories in support of measles elimination and to discuss the progress of implementation of the recommendations from the laboratory meeting held in July 2008. Participants included representatives from network laboratories in member countries, the WHO Laboratory Coordinators from Headquarters, Western Pacific Region and Southeast Asia Region, WHO country EPI officers, Advisers from US CDC and country EPI focal points.

The meeting concluded that measles and rubella network laboratories provided high quality support to achieve the regional goal of measles elimination by 2012 by confirming suspected cases and identifying measles virus genotypes circulating in the Region. The network should continue to make full efforts to obtain genotype and sequence information on measles and rubella viruses circulating in the Region.

The network implemented most of the recommendations from the last meeting in 2008 including monthly reporting of a case based linelist to WPRO. The laboratories should regularly communicate and collaborate with the national surveillance or epidemiology groups and WPRO to minimize discrepancy of laboratory and surveillance data, and the delay in testing of samples and regular reporting of laboratory data to WPRO.

Discussions focused on how to solve remaining challenges for the Western Pacific Region Laboratory Network including improving sample collection for IgM detection and virus identification, validation of test kits used in subnational Laboratory Networks and timeliness and completeness of laboratory reporting using case-based linelist.

3.2 Recommendations

3.2.1 Polio Recommendations

(1) Implementation of new test algorithms

- All national and ITD network laboratories should fully implement the appropriate new test algorithms by end of the second quarter of 2010. Implementation should be in accordance with Supplement 1 to the Polio Manual, and should include revisions of Standard Operating Procedures (SOPs) and test worksheets. Revised SOPs and test worksheets should be shared with the Regional Laboratory Coordinators for review by the end of April 2010.
- With full implementation of new test algorithms in the Region, network laboratories should closely monitor the timelines of reporting to identify and remove obstacles to reporting of virus isolation results within 14 days and ITD results within 7 days. Network laboratories without ITD capacity should refer L20B positive isolates to designated regional reference laboratories for characterization within 7 days of detection.

- Results of wild poliovirus and VDPV detection should be reported to the national authorities within 24 hours of detection. To reduce the risk of within country and international spread of VDPVs and the risk of outbreaks of poliomyelitis, laboratories should promptly report VDPV detections to national authorities, especially country EPI units, who should promptly share such information with the WHO country and regional offices.
- Network laboratories should review work practices and staff assignments to identify barriers to implementation of the new test algorithms and to timely reporting of results. Resource needs workflow, cell preparation cycles, frequency of testing and staff assignments may require adjustments to meet the new testing algorithm requirements.
- Network laboratories should brief national EPI focal points and data managers on the implementation of the new test algorithms and how the new reporting formats will impact programme needs.
- WHO should continue to support implementation of the new test algorithms in network laboratories through provision of technical assistance (e.g. review of SOPs, test worksheets, reporting) and training in order to meet the set deadline.

(2) Quality Assurance

- As previously recommended during the laboratory network's meeting in July 2008, all network laboratories should report results of cell sensitivity tests to the laboratory coordinators for review within 48 hours of completing each test run. This is to facilitate collaboration in rapidly identifying problems and implementing actions to optimize procedures for accurate detection of polioviruses, including re-testing of specimens, as appropriate. Results should be provided in a trend chart including full details of titration experiments. Where available, the absolute passage number of cell lines should be provided in the format of PX/Y where X is the passage number of the frozen cells stock used and Y is the number of cell passages after retrieval from storage.
- For the 2010 proficiency test panel, to be distributed late 2010 or early 2011, all polio network laboratories except China will use the new test algorithm for virus isolation.

(3) Implementation of Real-time ITD RT-PCR and VDPV Screening

- Laboratories that introduced the real-time RT-PCR assays following the training in August 2009 (China CDC, Singapore SGH, Japan NIID and Malaysia IMR), should complete the implementation plan by end of April 2010 including performance of proficiency tests to be provided by US CDC.
- Once success in the implementation of real-time RT-PCR assays is achieved, discordant ITD-VDPV results in real-time RT-PCR assays should be resolved by VP1 nucleotide sequencing for identification of VDPVs.
- Expansion of the real-time RT-PCR assays to other network laboratories should be considered. Priority should be given to the laboratories with existing real-time PCR equipment, infrastructure and experience with real-time PCR assays.

(4) Data Management

- The WHO regional office, in collaboration with network laboratories, should develop a standardized polio laboratory database programme to improve data management in the region. Network laboratories should review the proposed database variables distributed during the meeting and submit by 15 March 2010 additional variables needed to customize country-specific database programmes.
- The WHO regional office should distribute standardized laboratory variable codes and guidelines on the new laboratory database structure to network laboratories and national EPI focal points to guide revisions in test worksheets and case investigation forms consistent with new test algorithms.
- The proposed database programme should be field tested in the network laboratories including provision of training of data managers by end of the third quarter of 2010. In the meantime, network laboratories should continue to report data to WPRO using the current reporting format at least monthly and no later than the 10th of the following month. WPRO should continue to monitor data quality and communicate findings to network laboratories in a timely manner.

(5) Expanding the scope of the polio laboratory network

- Network laboratories should report to national authorities and WHO regional and country offices results for polioviruses isolated from all sources including those identified through special surveys such as environmental surveillance and enterovirus surveillance. Reports for non-AFP specimens should be submitted at least on a monthly basis and poliovirus isolated from non-AFP cases should be reported using the standardized database and reporting format of AFP cases.
- Recognizing the importance of maintaining the polio-free status of region, poliovirus isolates from all specimen sources should be rapidly and appropriately characterized to identify isolates that can potentially circulate. Individual countries should establish mechanisms for referral of isolates from AFP and non-AFP sources for appropriate and timely characterization. All poliovirus isolates and L20B positive specimens should be referred for ITD testing using WHO recommended procedures within 7 days of detection, regardless of whether from AFP or non-AFP sources.
- Recognizing the public health importance of EV71 in the region, and evidence of an overlap in its clinical presentation with AFP, network laboratories with the capacity to characterize NPEVs are encouraged to do so for isolates obtained from AFP cases. Regional training opportunities for molecular identification of polioviruses and NPEVs should be considered in 2010-2011.
- Polioviruses isolated from patients >15 years of age who present with clinical symptoms compatible with poliomyelitis or AFP should be reported to the Regional Office in a timely manner. Laboratories can use the same reporting format as for AFP data.

(6) Biosafety Issues

- WHO regional Laboratory Coordinators should develop a regional plan to implement a biosafety campaign using training materials developed for use in the GPLN. Each polio laboratory will also be required to nominate a biosafety focal point who will liaise with WHO.

3.2.2 JE Recommendations

(1) Data management and reporting

- Designated national, regional reference and global specialized laboratories should report their laboratory testing data including zero reporting on a monthly basis using the reporting form (both aggregate and case linelist) to the Regional Office by the 10th of every month.
Action: all JE Labnet members Timeline: Ongoing

(2) Confirmatory testing

- National laboratories are recommended to send a proportion of samples to designated regional or global specialized laboratories for confirmatory testing. This should occur at least twice a year and include all positive and equivocal samples and from 10-100% of representative (in time and of geographical areas) negative samples. The number and selection of samples to be sent for confirmatory testing should be discussed in advance with the regional laboratory coordinator.
- The volume of samples should be at least 100µl for CSF and 250µl for serum. Samples should be shipped undiluted in leak-proof, externally threaded, screw cap vials.
- The GSL/RRLs should complete confirmatory testing and provide feedback to national laboratories and WPRO within 45 days of receiving the samples from the national laboratories.
- Samples for the first batch of confirmatory testing should be sent by the end of March 2010.
Action: all National JE Laboratory Network members Timeline: March 2010.

(3) Proficiency testing

- All WHO JE network laboratories should participate in the JE proficiency testing programme arranged by WHO. Testing of the proficiency panel should be completed and results report within two weeks of receipt of the proficiency panel.
- National JE laboratories are recommended to keep all JE or dengue IgM positive samples for future QA purposes and for consideration for inclusion in the JE proficiency panel.
Action: all WPR JE Labnet members, Timeline: Ongoing

(4) Validation of assays

- In-house JE IgM assays should be evaluated using the WHO reference serological panels. In-house assays with adequate sensitivity and specificity (to be decided by the JE Laboratory Working Group) should be used by WHO JE Labnet. Laboratories without in-house kits are recommended to use the Panbio JE/Dengue Combo kit.
Action: all JE Labnet members Timeline: 2nd quarter 2010

- Laboratories that are considering using the Japanese JE cell derived antigen to enhance their in-house assays should follow the protocol to be developed by NIID on discussion with the other GSL and RRLs and report their data to the JE laboratory Working group for analysis and advice.

Action: Selected JE Labnet members Timeline: 2nd quarter 2010

(5) On site review and accreditation

- After the field trial of the draft checklist in 2010, a formal accreditation procedure to evaluate laboratory performance of the network laboratories will be initiated by the end of 2010.

Action: WHO HQ, WPRO, Timeline: end of 2010

(6) Communications with Ministry of Health

- It is recommended that the WHO JE network laboratories establish regular communication with their Ministry of Health and National EPI and surveillance groups for Japanese encephalitis control. Action: All WPR JE Labnet members and WPRO, Timeline: as soon as possible.

(7) Training

- It is recommended that hands-on training courses similar to that held in the Republic of Korea in 2009 be conducted on a regular basis to develop capacity in the JE LabNet. Short-term training on advanced techniques for staff from the RRLs should be held at the GSL.

Action: WPRO, GSL and RRLs, Timeline: 2010-2011

(8) Coordination

- Considering the common goals and challenges in establishing JE laboratory-based surveillance in the two regions, Western Pacific Regional Office and Southeast Asia Regional Office should consider organizing bi-regional JE laboratory network meetings. Action: WPRO, SEARO Timeline: 2011

- Other programmes or initiatives working on emerging infectious diseases including JE are encouraged to share their plans and coordinate with WHO JE Labnets to avoid duplication of activities.

Action: WHO and other initiatives, Timeline: Ongoing

3.2.3 Measles and Rubella Recommendations

Recommendations for the measles and rubella laboratory network include implementation of regular confirmatory testing, obtaining more genotyping and molecular epidemiological information by strengthening strain surveillance for measles and rubella viruses, improving data management and reporting using MS Access format, use of alternative sampling and establishing and improving the quality assurance measures of commercial laboratories in countries where measles/rubella testing is performed in commercial laboratories were made.

Based on discussions and findings from network laboratories, the following recommendations were made:

For all EPI network laboratories, strengthening communications between network laboratories and EPI/surveillance programmes was emphasized.

Recommendations

(1) Data reporting

Case based measles and rubella laboratory data reporting should be fully implemented in all network laboratories. Data should be reported to the regional office on a monthly basis by the 10th day of the month. The new data reporting format in MS Access discussed at the meeting should be adopted by all network laboratories. . Countries where case based reporting is not feasible should also make every effort to share aggregated data with WPRO in a format and frequency agreed upon with the regional office

(2) Confirmatory testing

The confirmatory testing mechanism of serum samples established in the Region should be maintained and it is recommended that national laboratories send a representative 10% of samples or a minimum of 15 samples to the designated regional reference or global specialized laboratories, at least annually but preferably twice a year. A table including a linelist of the samples and the raw data (OD readings) obtained by the national laboratory should be included with the shipment. Before sending samples, the national laboratories should notify and consult with the regional laboratory coordinator to confirm the number and selection of samples to be sent.

(3) Molecular surveillance

As recommended by the Global Measles Laboratory Network Meetings (Sep 2008 and Oct 2009), laboratories are encouraged to submit representative genotype/sequence information on their measles and rubella viruses to the WHO genotype and MeaNS databases, preferably on a “real-time” basis, but at least by the end of the month in which the genotyping was completed. A copy of the information should be sent also to the regional laboratory coordinator.

- (a) Laboratories which participated in the regional hands on laboratory training in 2009 and other sequencing laboratories are encouraged to perform virus isolation and/or molecular detection of measles and rubella viruses to identify the genotype and obtain sequence information on circulating measles and rubella viruses.
- (b) Efforts should be made to collect sequence data from all chains of infection, especially in those countries where no baseline sequence data exists.
- (c) The Laboratory Network should utilize the well *validated* tools and samples available for enhancing molecular surveillance where appropriate, such as;
 - (i) Oral fluid, throat swabs, urine and PBMC as samples for virus detection
 - (ii) Detection of viral RNA in archival sera
 - (iii) Shipping of samples dried onto filter paper
 - (iv) Standardized PCR methods including the use of a validated, unique PCR control.

(4) Use of dried blood spots

Dried blood spots are in routine use in some countries. It is recommended that countries consider introducing the dried blood spot specimen collection technique where challenges in collecting samples and/or shipping under cold chain to national or reference laboratories exist.

(5) Measles and rubella positive samples for global PT

As recommended by the Global Measles Laboratory Network Meetings, National laboratories should store measles and rubella positive serum samples at -20°C or lower to use; for internal laboratory controls, for global proficiency test panels and for virus identification. Those laboratories with stocks of positive samples (preferably volumes larger than 0.5ml) are requested to contact the regional laboratory coordinator to facilitate using these samples in the WHO proficiency and QC programme.

(6) Quality assurance of commercial laboratories

As recommended by the Global Measles Laboratory Network Meetings in 2009, in countries where most measles and rubella IgM testing is performed in private/commercial laboratories, it is vital that the performance of private/commercial laboratories be monitored. Performance of these laboratories may be assessed through an external quality assurance programme and pre-existing quality assurance data should be assessed by the national laboratories, where possible.

(7) Communications

Laboratory and immunization/surveillance colleagues are encouraged to have *regular* interactions *and* meetings to ensure classification of suspected cases and to harmonize laboratory and surveillance data.

(8) Trainings

Follow-up hands on training courses focusing on molecular detection of measles and rubella viruses are encouraged in the Region.