

Meeting Report

EXPERT CONSULTATION ON ACCELERATED CONTROL OF JAPANESE ENCEPHALITIS IN THE WESTERN PACIFIC REGION



14–16 March 2016
Manila, Philippines



Expert Consultation on Accelerated Control of Japanese Encephalitis in the Western Pacific Region

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WORLD HEALTH ORGANIZATION
REGIONAL OFFICE FOR THE WESTERN PACIFIC

RS/2016/GE/04(PHL)

English only

MEETING REPORT

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JAPANESE ENCEPHALITIS IN THE WESTERN PACIFIC REGION

Convened by:

WORLD HEALTH ORGANIZATION
REGIONAL OFFICE FOR THE WESTERN PACIFIC

Manila, Philippines
14–16 March 2016

Not for sale

Printed and distributed by:

World Health Organization
Regional Office for the Western Pacific
Manila, Philippines

February 2018

NOTE

The views expressed in this report are those of the participants of the Expert Consultation on Accelerated Control of Japanese Encephalitis in the Western Pacific Region and do not necessarily reflect the policies of the conveners.

This report has been prepared by the World Health Organization Regional Office for the Western Pacific for Member States in the Region and for those who participated in the Expert Consultation on Accelerated Control of Japanese Encephalitis in the Western Pacific Region in Manila, Philippines from 14 to 16 March 2016.

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Keywords:

Encephalitis, Japanese – epidemiology, prevention and control / Vaccination / Laboratories – standards, utilization / Regional health planning

ABBREVIATIONS

AEFI	adverse event following immunization
AES	acute encephalitic syndrome
JE	Japanese encephalitis
PATH	Program for Appropriate Technology in Health
SDG	Sustainable Development Goal
TAG	Technical Advisory Group on Immunization and Vaccine-Preventable Disease in the Western Pacific Region
UNICEF	United Nations Children's Fund
WHO	World Health Organization

SUMMARY

The Expert Consultation on Accelerated Control of Japanese Encephalitis in the Western Pacific Region was held on 14–16 March 2016 in Manila, Philippines. The Consultation was attended by 10 participants from 10 countries, 2 temporary advisers, 5 representatives from 4 partner organizations, and 6 World Health Organization (WHO) staff members from the Regional Office for South-East Asia, Regional Office for the Western Pacific and Philippines Country Office.

The participants discussed the burden of Japanese encephalitis (JE), surveillance for JE and acute encephalitis syndrome, progress towards controlling JE in the Western Pacific Region, and challenges, issues and lessons learnt by countries. Participants discussed accelerated control of JE, which was one of eight immunization goals included in the *Regional Framework for Implementation of the Global Vaccine Action Plan in the Western Pacific*. Participants reviewed recent literature on the incidence of JE, impact of JE vaccination, and surveillance and epidemiology of JE globally and in the Western Pacific Region. Participants discussed in detail the proposed targets and strategies for accelerated control of JE in the Region.

The Consultation concluded that accelerated control of JE in the Western Pacific Region is imperative. During the three-day consultation, participants discussed strategies, targets and timelines for accelerated control of JE; reviewed guidelines, scientific literature, and epidemiologic and vaccination programme data; and made preliminary recommendations on strategies and targets for achieving accelerated JE control goals in the Region. Participants deferred to the Technical Advisory Group on Immunization and Vaccine-Preventable Diseases in the Western Pacific Region (TAG) regarding setting a timeline for achieving targets for achieving accelerated JE control in the Region.

The Consultation recommended that the primary strategy for accelerated JE control in the Western Pacific Region should be catch-up vaccination in children aged under 15 years, followed by routine immunization for incoming birth cohorts. The Consultation also recommended that the primary target be a coverage target of greater than or equal to 95% with primary series among children aged under 15 years and that an incidence target that is less than or equal to 0.5 JE cases per 100 000 population under 15 years of age be used in any country or area that has high-quality surveillance that will allow them to obtain valid incidence estimates. The Consultation further encouraged each country to strive to have high-quality surveillance in at least one area or facility with a defined catchment population in an area in which JE is a priority disease and that they conduct periodic coverage surveys in at least some areas in most or all countries. Finally, WHO was requested to provide technical assistance to countries to: develop action plans for accelerated control of JE through immunization, review JE surveillance data, develop a tool to evaluate JE surveillance standards, and determine a timeline for accelerated JE control targets in consultation with the TAG.

1. INTRODUCTION

1.1 Meeting organization

The Expert Consultation on Accelerated Control of Japanese Encephalitis in the Western Pacific Region was attended by 10 participants from 10 countries and areas, 2 temporary advisers, 5 representatives from 4 partner organizations, and 6 WHO staff from the regional and country offices of the Western Pacific and South-East Asia regions. Dr Yin Zundong, Deputy Director, Associate Professor, National Immunization Programme, Chinese Center for Disease Control and Prevention, served as chair of the Consultation. The list of participants and meeting programme are included in Annex 1 and 2, respectively.

1.2 Meeting objectives

The objectives of the meeting were:

- 1) to review evidence on Japanese encephalitis (JE) epidemiology, surveillance and vaccination programmes in the Western Pacific Region, and on JE control through immunization and the measurement of JE vaccination programme impact; and
- 2) to recommend strategies, targets and timelines to the Technical Advisory Group on Immunization and Vaccine-Preventable Diseases in the Western Pacific Region (TAG) that will enhance efforts to achieve the Region's accelerated JE control goal.

2. PROCEEDINGS

2.1 Opening session

Dr Mark Jacobs, Director, Division of Communicable Diseases, WHO Regional Office for the Western Pacific, welcomed participants and commended Member States for their efforts to combat JE and encouraged them to do more given that advances in vaccines and new global guidance provide important tools for JE control. Dr Jacobs encouraged the Consultation to recommend appropriate strategies, targets and timelines to achieve the goal of accelerated JE control in the Western Pacific Region that will be sent to the TAG for consideration during their meeting in July 2016.

2.2 Overview of meeting and expected outcomes

The main activities during the three-day meeting were: sharing the experiences of JE vaccination in countries; reviewing recent literature that focused on JE incidence, impact of vaccination, epidemiology and surveillance; and working in groups to discuss strategies, targets and timelines, and development of recommendations.

The expected outcomes were the following:

- Define the strategies, targets and timelines for the JE accelerated control goal:
 - Determine if the strategy outlined in the 2015 WHO JE vaccine position paper (catch-up vaccination of a target population followed by routine vaccination) is sufficient or additional strategies are needed.
 - Determine the target(s).
 - Outline measures to monitor progress towards achieving the target(s).
 - Determine the timeline for achieving the target(s).

- Make recommendations to the TAG.

2.3 Global and Western Pacific regional overview of JE

JE is the leading cause of viral encephalitis in Asia. It is estimated that 67 900 JE cases occur annually, of which more than half (40 400) are in the Western Pacific Region.¹ The estimated overall incidence rate is 1.8 cases per 100 000 population and the estimated incidence rate in the Western Pacific Region is 2.3 cases per 100 000. Approximately 75% of cases occur in children aged under 15 years. There are 24 countries with risk for JE virus transmission: 12 in the Western Pacific Region and 12 in the South-East Asia Region. As of 2016, 8 of the 12 countries in the Western Pacific Region with endemic transmission have introduced JE vaccine into some or all JE risk areas. In October 2014, the WHO Regional Committee for the Western Pacific endorsed an accelerated control goal for JE that called for strategies, targets and timelines to be established through consultation with experts and Member States.

2.4 JE surveillance in the Western Pacific Region

In 2008, WHO published recommended standards for surveillance for selected vaccine-preventable diseases, including JE. The primary goal of JE surveillance in countries with JE virus transmission risk is to characterize the epidemiology and burden of JE in order to advocate and guide programmatic interventions. Where JE immunization is already ongoing, the primary purpose of surveillance is to identify high-risk populations or geographical areas in need of improved vaccination coverage and areas with new disease transmission, and to document the impact of control measures. The WHO surveillance standards proposed a clinical case definition, which consisted of a case of acute encephalitis syndrome (AES). The WHO-recommended standards for surveillance call for comprehensive AES surveillance with aggregate reporting and case-based surveillance with laboratory confirmation in sentinel hospitals in all JE-endemic countries, except for countries that have achieved a high level of JE control. In countries that have achieved high-level control, the standard is case-based surveillance with laboratory confirmation throughout the country, or in all risk areas.

2.5 JE laboratory network

The JE laboratory network in the Western Pacific Region currently consists of one global specialized laboratory in Japan, two regional reference laboratories (one in China and the other in Japan), seven national laboratories (one each in Cambodia, the Lao People's Democratic Republic, Malaysia, Papua New Guinea and the Philippines, and two in Viet Nam), and ten subnational laboratories in China. The JE laboratory provides data that can be used to estimate burden of disease, inform vaccine introduction and monitor impact. The JE testing algorithm used collecting cerebrospinal fluid (CSF) and paired serum specimens from AES cases at sentinel surveillance sites and from hospital referral, and testing specimens for JE and dengue immunoglobulin M (IgM) using WHO-recommended kits. Results are to be communicated back to the programme within seven days. A proportion of specimens with positive and equivocal results are referred to regional reference laboratories as well as to the global specialized laboratory for confirmatory testing by WHO and specialized testing for differential diagnosis at regional reference laboratories and the global specialized laboratory. Quality assurance and quality control are essential to monitor laboratory performance and data.

¹ Campbell GL, Hills SL, Fischer M, Jacobson JA, Hoke CH, Hombach JM, et al. Estimated global incidence of Japanese encephalitis: a systematic review. *Bull World Health Organ.* 2011;89(10):766–74.

2.6 Accelerated control of JE and regional framework

In 2012, the World Health Assembly endorsed the *Global Vaccine Action Plan 2011–2020* (GVAP) that detailed strategies and activities to achieve the Decade of Vaccines vision. The *Regional Framework for Implementation of the Global Vaccine Action Plan in the Western Pacific* guides national immunization programmes and was developed to fulfil this mission. Accelerated control of JE was one of the eight goals set in the Regional Framework. It proposed targets for accelerated JE control, including: i) accelerate the control of JE by extending vaccination to all JE risk areas where JE incidence exceeds very low levels; ii) reach regional vaccination coverage targets with the primary series of JE vaccine in routine immunization programmes, and at least 90% coverage for a primary series of JE vaccine among children aged under 15 years in each country's JE risk area overall, by a year to be determined; and iii) consider an incidence target of less than 0.5 per 100 000 children aged under 15 years in every national or subnational JE risk area, by a year to be determined.

2.7 WHO guidance on measuring the impact of JE vaccination programmes through surveillance and other methods

Vaccine effectiveness and impact studies can inform and sustain vaccine policy decisions; allow parents, health-care providers and decision-makers to appreciate the benefits of vaccination; assess the programmatic use of vaccine; and monitor progress towards national and international child health goals. Vaccine effectiveness measures the extent by which the incidence of the target disease is reduced among vaccinated persons compared to similar unvaccinated persons when the vaccine is delivered in the context of a public health programme. Vaccine impact measures the reduction in the incidence of the target disease in a population as a consequence of a vaccination programme, compared to what the incidence would have been in the absence of the programme.

Because JE disease is relatively rare, a case-control study design is the most feasible method for assessing JE vaccine effectiveness. Common methods for assessing vaccine impact by evaluating trends in disease burden data include population-based active surveillance, sentinel site surveillance and periodic surveys. High-quality JE disease surveillance in a large population, and also at sentinel hospitals, can measure and monitor the impact of JE vaccine and contribute to evidence-based decision-making.

2.8 PATH update on JE vaccine project

PATH (formerly Program for Appropriate Technology in Health) works on several vaccine-preventable diseases including JE. In 2003, PATH received a grant from the Bill & Melinda Gates Foundation to launch the JE Project. In 2005, WHO recommended a gradual shift to new-generation JE vaccines, such as the SA 14-14-2 vaccine. From 2005 to 2012, PATH conducted clinical trials in multiple populations. In 2006, PATH established a collaboration with Chengdu Institute of Biological Products, a Chinese manufacturer, to ensure a supply of low-cost SA 14-14-2 vaccine and in 2009, PATH supported the construction of a new Chinese manufacturing facility. In 2013, WHO prequalified the vaccine, and Gavi, the Vaccine Alliance announced its support for catch-up campaigns for children aged under 15 years in select countries.

PATH's JE Vaccine Introduction and Sustainability Project (VISP, 2013–2017) was designed to reduce morbidity and mortality of JE and ensure that every child at risk of JE infection is protected by a safe, efficacious and affordable vaccine. VISP has sponsored/provided technical assistance to convene JE subject matter experts for key activities at global, regional and country levels.

2.9 Gavi update on JE support

JE was included in Gavi's Vaccine Investment Strategy in 2008 and in November 2013, following prequalification of JE vaccine SA 14-14-2, the Gavi Board opened a JE window using SA 14-14-2 vaccine. Of the 24 JE-endemic countries, 11 countries are eligible for JE support from Gavi, including three countries in the Western Pacific Region (Cambodia, the Lao People's Democratic Republic and Viet Nam), who had all applied for Gavi funding by the time of this Consultation.

Gavi support aligns with WHO guidance, as outlined in the 2015 WHO JE vaccine position paper, to conduct a catch-up campaign for children aged between 9 months and less than 15 years. Gavi support includes bundled vaccine (including autodisposable syringes, reconstitution syringes and safety boxes) and operational costs. A vaccine introduction grant (VIG) is also available for JE routine introduction.

2.10 JE vaccination: Western Pacific Region country experiences/impact

2.10.1 China's experience

JE surveillance in China consists of both the National Notifiable Disease Reporting System (NNDRS) and a sentinel surveillance system for acute meningoencephalitis in four selected provinces. The National Notifiable Disease Reporting System has been collecting detailed epidemiological data and laboratory testing results of JE cases since 2007. JE vaccine was first introduced in China in the 1960s and JE vaccination was integrated into the national child immunization programme in 2008. Currently, the JE incidence rate is about 0.15 cases per 100 000 person-years for the population of all ages. In 2015, JE vaccination coverage was reported to be at least 99% among children. A surveillance system for adverse events following immunization (AEFIs) was established in 10 provinces in China in 2005, and as of 2013, it covered over 90% of counties in each province. In 2009, a JE impact evaluation was done; a vaccination campaign was conducted in 308 counties and the proportion of JE cases occurring in children aged 0-6 years decreased from 68.3% to 54.0% following the campaign. Funding from the national government for vaccine procurement and from provincial governments for programme implementation was key to improving JE vaccine coverage. Current challenges include low sensitivity of the surveillance system and suboptimal vaccination coverage in some rural areas.

2.10.2 The Republic of Korea's experience

The Republic of Korea's national JE vaccination programme started in the 1970s. The vaccine is delivered in both the public and private sectors (85-90% of JE vaccine delivered is via the private sector). JE vaccination coverage was 99.0% for the first dose, 97.2% for the second dose, and 94.3% for the third dose according to a survey done in 2014. JE vaccine is recommended for use in children aged at least 1 year, adults who are not immune to JE and have risk factors (e.g. living near pigsties or rice paddies, or having occupations or activities for which they are frequently outdoors) and travellers to countries with JE transmission. As of 2015, the JE incidence rate in the Republic of Korea was 0.078 per 100 000 population. The main lessons from JE vaccination in the Republic of Korea are that the vaccination requirement for school entry has been effective to promote high coverage; preparedness against AEFIs is important in maintaining public confidence in vaccination; and the country's web-based information system has facilitated successful implementation and sustainability of the programme. Key challenges include insufficient evidence for decision-making, issues related to quality control of the information system and the changing epidemiology of JE that requires close monitoring and regular risk assessment.

2.10.3 Malaysia's experience

JE vaccine was introduced in 1998. Target groups for vaccination are persons in risk groups, including residents working on pig farms, children aged 9 months to 15 years living near pig farms,

and all children aged 9 months to 15 years living in Sarawak where the disease was endemic. In 2001, JE vaccine was introduced into the routine immunization schedule for children in Sarawak aged 9 months to 15 years. JE incidence generally decreased between 1996 and 2013, though incidence increased somewhat in 2014 and 2015. In summary, JE incidence in Malaysia is low overall and JE vaccine is only given routinely in Sarawak. Strengthening surveillance and laboratory capacity will be important to improve the programme. Challenges for the programme include declining government revenue and resources to sustain the programme, competing priorities and changing disease patterns (e.g. increases in cases in persons aged 15 years and over).

2.10.4 The Lao People's Democratic Republic's experience

The Lao People's Democratic Republic began a phased JE vaccination campaign in 2013 in six northern provinces. In 2014, the campaign was extended to two additional northern provinces with support from PATH. In 2015, the campaign was extended to the 10 remaining provinces with support from Gavi. After the 2015 campaign, JE vaccine was introduced into the national immunization schedule in all provinces to children aged 9–11 months. An Expanded Programme on Immunization (EPI) coverage survey was done in 2015 and preliminary findings indicate that coverage with JE vaccine following the campaign was 84%. Strong political commitment at all levels is credited as a key to successful implementation of the campaign. A challenge of the JE vaccination programme in the Lao People's Democratic Republic is financial sustainability. The JE vaccination programme has been supported by the vaccine manufacturer through vaccine donation, PATH and Gavi. The Government of the Lao People's Democratic Republic will finance the procurement of vaccine and logistics for routine JE vaccination.

2.10.5 Papua New Guinea's experience

JE surveillance in Papua New Guinea started in 2010 with support from WHO. Initially, two sentinel sites were selected and the surveillance targeted children aged under 12 years, with surveillance activities supervised by paediatricians in the hospitals and laboratory support from the Central Public Health Laboratory. Currently, surveillance is only ongoing at one site in Port Moresby. In 2015, 63 samples were tested and 3 samples (5%) were positive for JE. Papua New Guinea's immunization programme is constrained and coverage for routine immunization has been very low. Resources are needed to strengthen JE surveillance and link hospital-based JE surveillance with data collected by EPI and the national surveillance programme.

2.10.6 Philippines data analysis

JE vaccine has not yet been introduced in the Philippines, although a systematic review of JE in the Philippines collected data on JE transmission in the country. Eighteen clinical studies reported a total of 247 laboratory-confirmed JE cases in the Philippines from 1972 to 2013.² JE surveillance in the Philippines identified 1032 suspected JE cases from 2011 to March 2014, of which 497 cases were tested and 73 (15% of tested) were laboratory-confirmed JE cases. JE surveillance was expanded in the past several years, and the surveillance for acute meningitis-encephalitis syndrome (AMES) consisted of nine sentinel sites in nine regions in 2016. In 2015, samples from 1099 suspected cases were sent to the national laboratory, including 943 from sentinel sites. Most of the 122 laboratory-confirmed cases were reported between April and August, 91% of the cases were children aged under 15 years.

² Lopez AL, Aldaba JG, Roque VG Jr, Tandoc AO 3rd, Sy AK, Espino FE, et al. Epidemiology of Japanese encephalitis in the Philippines: a systematic review. *PLoS Negl Trop Dis* 2015 Mar 20;9(3):e0003630.

2.11 JE vaccination: South-East Asia Region country experiences/impact

2.11.1 South-East Asia regional JE surveillance/vaccination experiences

Among the JE-endemic countries in the WHO South-East Asia Region, four (India, Nepal, Sri Lanka and Thailand) have introduced JE vaccination at national or subnational levels and have surveillance in place, and six have not introduced JE vaccination but do have limited surveillance in place. JE was a significant public health problem in India, Nepal, Sri Lanka and Thailand before vaccines were introduced, and in 2014, of the 3217 cases reported to the WHO Regional Office for South-East Asia through the WHO–UNICEF Joint Reporting Form (JRF), 92% were from India and Nepal. In the South-East Asia Region, JE diagnosis and case management are well established in some places and, though laboratory-based surveillance is being conducted in many of the countries, a substantial amount of the laboratory-based surveillance is being conducted at sentinel sites and supported by WHO. In 2015, the South-East Asia Region's Immunization Technical Advisory Group recommended that countries integrate JE vaccination into national immunization schedules in at-risk areas in all countries in the Region where JE is a public health priority.

2.11.2 Thailand's experience

Thailand has an integrated JE control programme, which was started in 1980 and includes outbreak control spraying, health education and vaccination. JE vaccine was introduced into endemic provinces in 1990. In 2000, the vaccine was introduced nationwide for children. Incidence of encephalitis decreased from 1980 to 2013, with a small increase in 2013. Thailand's JE vaccine coverage through routine immunization is high. Challenges include the need to strengthen surveillance so that the country can evaluate impact of the programme and the threat of possible vaccine supply shortages in the future due to limited numbers of vaccine manufacturers.

2.11.3 Indonesia's experience

Indonesia plans to implement subnational, phased introduction of JE vaccine in 2017, beginning with Bali. It will be catch-up vaccination among children aged 9 months to 14 years (approximately 915 000 children), followed by introduction into the routine immunization programme at 9 months of age (initial annual target: 71 000 infants). Funding for the catch-up campaign will be from Gavi and PATH, and the Indonesian Ministry of Health will provide funds for vaccine and operational costs for routine immunization. A vaccine introduction grant will support planning and timely introduction into the routine immunization programme. Facilitating factors include past experience with new vaccine introduction campaign, AEFI surveillance and strong school-based immunization programmes. Because JE vaccine is not produced in Indonesia, choosing between different vaccine types was difficult.

2.12 Review of recent JE literature

2.12.1 Impact/Incidence

A review on JE incidence and JE vaccine impact was done of literature published between January 2011 and March 2016 and indexed in PubMed. Eight relevant studies on incidence and impact were presented during the meeting. The articles reviewed are listed in Annex 3.

2.12.2 Epidemiology/Surveillance

Of the 12 countries with JE-endemic areas in the Western Pacific Region, 11 have JE surveillance programmes. A literature review on JE surveillance was done of literature published between January 2011 and March 2016 and indexed in PubMed. Studies from Australia, Cambodia, the Philippines, Japan, Singapore and Viet Nam were discussed. The articles reviewed are listed in Annex 4.

2.13 Strategies to achieve the JE accelerated control goals

Consultation attendees were divided into two working groups to discuss strategies to achieve the JE accelerated control goals. Questions on strategies were used to guide the working group session (Annex 5) and the groups reported on the main points of these discussions to the plenary.

Members of the working groups agreed that the strategy recommended in the 2015 WHO position paper on JE vaccines (a one-time campaign in the primary target population followed by incorporation of JE vaccine into the routine childhood immunization programme) would be feasible for most countries. The groups identified three factors that should be considered when deciding whether or not to implement a phased approach to catch-up and routine JE immunization: size of the country, resources available and logistical capacity.

The working groups discussed what the target population should be and there was general agreement that it should be children aged under 15 years, but that after JE control is achieved in children aged under 15 years, countries could consider expanding JE immunization to older populations. The working groups acknowledged that it would be important for countries to have data on the JE disease burden in their countries and to internally assess their surveillance capabilities to determine the scope of the JE surveillance that they perform.

The working groups identified three actions that should be put in place to advance the strategy: i) WHO should assist with defining components and minimum standards of the surveillance infrastructure, standards (tools for surveillance) and the incidence target; ii) political will and dedicated funding should be secured; and iii) the TAG could provide guidance to countries to implement the strategy based on country-specific needs.

2.14 Targets to achieve the JE accelerated control goals, measurement of outcomes and timelines

Consultation attendees were divided into two working groups to discuss strategies to achieve the JE accelerated control goals. Questions for working groups on targets, timelines and measures were used to guide the session (Annex 6) and the groups reported on the main points of these discussions to the plenary.

2.14.1 Targets

The working groups discussed a variety of incidence, vaccine coverage, and a combination of incidence and coverage targets. They also discussed setting an incidence target. The main advantage of having an incidence target is that incidence is a direct measure of disease occurrence and an incidence target will allow monitoring of JE vaccination programmes. There was general consensus that setting an incidence target of 0.5 cases per 100 000 targeted population was reasonable, but the working group members acknowledged that this would not be measurable in all settings because of limitations of surveillance and resources for testing specimens and that this target could not be achieved for many years in some countries, particularly those that have not yet introduced JE vaccine.

The working groups also discussed setting a coverage target and noted that the primary advantage is that it could be feasible and measured in countries that lack strong JE surveillance programmes. Because the TAG recommends that coverage of vaccines in national immunization programmes should be at least 95%, unless otherwise indicated, this should be the coverage target after JE vaccine is introduced into the national immunization programme.

A combination of targets was also discussed. Advantages of having a combination of targets is that it would allow correlation of both incidence and coverage and that countries could use incidence as the

target in countries (or subnational areas) that have appropriate surveillance in place and use of the coverage target in other countries (or subnational areas of those countries). There was general agreement that the primary target should be a coverage target that would be feasible to measure and to achieve in all countries that have introduced JE vaccine, and that countries or areas that have high-quality surveillance that will allow them to obtain valid incidence estimates should have an incidence target.

2.14.2 Measurement of outcomes

The working groups discussed measures that should be used to monitor progress towards achieving accelerated JE control targets. The groups identified the following outcomes that should be measured:

- Number of countries that have introduced JE vaccine
- Number of children vaccinated
- Vaccine coverage rates (at national and subnational levels) in a targeted population
- AES cases reported through the WHO–UNICEF Joint Reporting Form
 - Working groups acknowledged that this will be challenging because some countries report suspected AES cases and others report laboratory-confirmed cases, so standardization of AES reporting would be needed.
- Surveillance targets
 - Working groups acknowledged that this would require knowledge of the number of samples tested per population.
 - Working groups noted that the WHO 2008 standards should be reviewed, but acknowledged that not all countries use them, so assistance should be provided to countries for them to be able to follow the surveillance standards.

2.14.3 Timelines

The working groups discussed timelines for achieving incidence and coverage targets for accelerated JE control in the Region. It was recognized that setting a timeline for targets for countries that have not introduced JE vaccination and for setting incidence targets for countries that have not quantified the extent of disease. There was discussion about setting a timeline to achieve targets of 2030, the timeline set to achieve Sustainable Development Goals (SDGs), and setting a timeline to achieve interim targets of 2020, the timeline to achieve the Global Vaccine Action Plan goals, or 2025, a timeline intermediate between those established for the Global Vaccine Action Plan goals and SDGs. By the end of the session, there was general agreement that timelines to achieve targets should be determined in consultation with the TAG.

3. CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

Japanese encephalitis is a leading cause of viral encephalitis in the Western Pacific Region. Participants agreed that accelerated control of JE in the Western Pacific Region is imperative. During the three-day Consultation, participants discussed strategies, targets and timelines for accelerated control of JE; reviewed guidelines, scientific literature, and epidemiologic and vaccination programme data; and made preliminary recommendations on strategies, targets and timelines for achieving accelerated JE control goals in the Western Pacific Region.

3.2 Recommendations

3.2.1 Recommendations for Member States

3.2.1.1 Strategies

- 1) The primary strategy should be that outlined in “Japanese Encephalitis Vaccines: WHO Position Paper – February 2015”: catch-up vaccination in children aged under 15 years, followed by routine immunization for incoming birth cohorts.
- 2) A phased approach to introduction (catch-up and routine) could be considered, depending on country-specific considerations (JE burden and available capacity and resources).
- 3) Member States are encouraged to share AEFI surveillance data with other countries in the Region.

3.2.1.2 Targets

- 4) The primary target proposed is a coverage target of greater than or equal to 95% with primary series among children aged under 15 years. This can be achieved through routine immunization, catch-up campaigns and periodic follow-up campaigns.
- 5) The proposed incidence target is less than or equal to 0.5 per 100 000 for those aged under 15 years. The incidence target should be used in any Member State or area that has high-quality surveillance that will allow them to obtain valid incidence estimates.

3.2.1.3 Measurement

- 6) Each Member State should strive to have high-quality surveillance in at least one area or facility with a defined catchment population in an area in which JE is a priority disease (and in which JE vaccination is being considered).
- 7) Periodic coverage surveys should be conducted in at least some areas in most or all countries. Member States should strive to integrate JE coverage surveys with coverage surveys for other vaccines and use available administrative data to estimate coverage between surveys.

3.2.1.4 Timeline

- 8) Timelines for Member States are to be determined in consultation with the TAG.

3.2.2 Recommendations for WHO

3.2.2.1 Strategies

- 1) WHO is requested to provide technical assistance to countries to develop action plans for accelerated control of JE through immunization.
- 2) WHO is requested to review surveillance and develop a tool to evaluate surveillance standards.

3.2.2.2 Measurement

- 3) WHO is requested to develop a JE surveillance indicator that measures the functionality of a surveillance system for use by Member States.

3.2.2.3 Timeline

- 4) WHO is requested to determine a timeline in consultation with the TAG.

ANNEXES

Annex 1. List of participants, temporary advisers, observers and Secretariat

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Annex 2. Meeting programme

Time	Monday, 14 March 2016	Time	Tuesday, 15 March 2016	Time	Wednesday, 16 March 2016
08:30–09:00 09:00–09:45	Registration 1. Opening ceremony <ul style="list-style-type: none"> Welcome remarks by the Responsible Officer Opening remarks of the Regional Director Self-introduction, Election of Officers (Chair, Vice-Chair, Rapporteur) Administrative announcements 	09:00–09:15 09:15–09:45 09:45–10:00 10:00–10:15 10:15–10:30	13. Summary of Day 1 JE vaccination: WPR Country experiences /impact 14. Lao PDR's experience 15. PNG's plans for introduction JE vaccination: SEAR Country experiences /impact 14. SEARO JE surveillance/vaccination experiences 15. Thailand's experience	09:00–09:15 09:15–10:15	21. Summary of Day 2 22. Working group session on targets (incidence vs coverage) and timelines to achieve the JE accelerated control goals
09:45–10:15	<i>GROUP PHOTO AND COFFEE BREAK</i>	10:30–11:00	<i>COFFEE BREAK</i>	10:15–10:45	<i>COFFEE BREAK</i>
10:15–10:25 10:25–10:45 10:45–11:05 11:05–11:25 11:25–11:45 11:45–12:15	2. Overview of meeting and expected outcomes 3. Global and regional overview of JE 4. JE surveillance in WPR 5. JE laboratory network 6. Accelerated control of JE and regional framework Discussion	11:00–11:15 11:15–11:45 11:45–12:15 12:15–12:45	16. Indonesia's experience Discussion Review of recent JE literature 17. Epidemiology/Surveillance Discussion	10:45–11:30 11:30–13:00	23. Reports on targets and timelines from working groups Discussion 23. Development of recommendations
12:15–13:15	<i>LUNCH BREAK</i>	12:45–13:45	<i>LUNCH BREAK</i>	13:00–14:00	<i>LUNCH BREAK</i>
13:15–13:45 13:45–14:15 14:15–14:30 14:30–14:45 14:45–15:00	7. WHO guidance on measuring the impact of JE vaccination programmes through surveillance and other methods Discussion 8. PATH update on JE vaccine project 9. Gavi update on JE support Discussion	13:45–14:15 14:15–15:15	18. Impact/Incidence Discussion Working groups to discuss strategies, targets and timelines: <i>Participants will be split into 2 groups to discuss issues in parallel</i> 19. Working group session on strategies to achieve the JE accelerated control goals	14:00–14:30 14:30–15:00	24. Meeting recommendations Closing session Adjourn
15:00–15:30	<i>COFFEE BREAK</i>	15:15–15:45	<i>COFFEE BREAK</i>		
15:30–15:45 15:45–16:00 16:00–16:15 16:15–16:45	JE vaccination: WPR Country experiences /impact 10. China's experience 11. Korea's experience 12. Malaysia's experience Discussion	15:45–16:30 16:30–17:30	20. Reports on strategies from working groups Discussion		
17:00–18:30	Reception				

Annex 3. JE impact and incidence articles reviewed

1. Campbell et al. Estimated global incidence of Japanese encephalitis: a systematic review. *Bull World Health Organization* 2011;89:766-74E.
2. Hsu et al. The incidence of Japanese encephalitis in Taiwan – A population-based study. *PLoS Negl Trop Dis* 2014;8:e3030.
3. Paul et al. A novel low-cost approach to estimate the incidence of Japanese encephalitis in the catchment area of three hospitals in Bangladesh.
4. Marks et al. Effectiveness of the Viet Nam produced, mouse brain-derived, inactivated Japanese encephalitis vaccine in northern Viet Nam. *PLoS Negl Trop Dis* 2012;6:e1952.
5. Muangchana et al. Effectiveness of mouse brain-derived inactivated Japanese encephalitis vaccine in Thai National Immunization Program: A case–control study. *Vaccine* 2012;30:361-7.
6. Murhekar et al. Low coverage and acceptable effectiveness of single dose Japanese encephalitis vaccine, Gorakhpur division, Uttar Pradesh, India, 2013. *J Infect* 2014;:517-20.
7. Upreti et al. Estimation of the impact of a Japanese encephalitis immunization program with live, attenuated SA 14-14-2 vaccine in Nepal. *Am J Trop Med Hyg* 2013;88:464-8.
8. Li et al. Immunogenicity and safety of currently available Japanese encephalitis vaccines: A systematic review. *Human Vaccines and Immunotherapeutics* 2014;10:3579-93.

Annex 4. JE epidemiology and surveillance articles reviewed

- Wang et al. Epidemiology of Japanese encephalitis: Past, present, and future prospects. *Ther Clin Risk Manag* 2015;11:435-48.
- Hanna et al. An outbreak of Japanese encephalitis in the Torres Strait, Australia, 1995. *Med J Aust* 1996;165:256-60.
- Chheng et al. A prospective study of the causes of febrile illness requiring hospitalization in children in Cambodia. *PLoS One* 2013;8:e6063.
- Touch et al. Epidemiology and burden of disease from Japanese encephalitis in Cambodia: Results from two years of sentinel surveillance. *Trop Med Int Health* 2009;14:1365-73.
- Arai et al. Japanese encephalitis: surveillance and elimination effort in Japan from 1982 to 2004. *Japanese J Infect Dis* 2008;61:333-8.
- Lopez et al. Epidemiology of Japanese encephalitis in the Philippines: A systematic review. *PLoS Negl Trop Dis* 2015;9:e000363.
- Koh et al. Japanese encephalitis, Singapore. *Emerg Infect Dis* 2006;12:525-6.
- Yen et al. Surveillance for Japanese encephalitis in Vietnam, 1998–2007. *Am J Trop Med Hyg* 2010;83:816–819.

Annex 5. Questions for working groups on strategies

- 1) Is the strategy put forth in the 2015 WHO position paper feasible?
- 2) How to define target group? Under 15 years? Another definition? More than one definition?
- 3) Under what circumstances could or should we consider a phased catch-up vaccination strategy/integration into routine immunization strategy?
- 4) Does the strategy need to be modified based on level (regional, national, subnational) implementation
- 5) Actions needed to be put in place to advance the strategy?

Annex 6. Questions for working groups on targets, timelines and measures

Targets

- What type of target(s) should be used?
 - Vaccination coverage?
 - Incidence?
 - Combination?
- What are the strengths/challenges of each type of target?
- What would be feasible and challenging targets to propose?
 - Coverage: $\geq 90\%$? $\geq 95\%$?
 - Incidence: $\leq 1/100,000$? $\leq 0.5/100,000$

Timeline

- What timeline should be considered?
 - By 2020?
 - By 2025?
 - By 2030?
- Should there be different timelines for Region, countries, and subnational areas?

Measures

What measures should be used to monitor impact and progress toward achievement of targets within accepted timeline?

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