

**WORLD HEALTH ORGANIZATION  
REGIONAL OFFICE FOR THE WESTERN PACIFIC**



**WESTERN PACIFIC REGIONAL PLAN OF ACTION  
FOR MEASLES ELIMINATION**

**Manila, Philippines  
January 2003**

WESTERN PACIFIC REGIONAL PLAN OF ACTION  
FOR MEASLES ELIMINATION

*The Regional goal is to eliminate measles, with a target date to be established through an annual review process.*

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Manila, Philippines

January 2003

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## EXECUTIVE SUMMARY

Measles remains the leading cause of vaccine-preventable death and disability among children in the Western Pacific Region. Following certification of polio-free status in 2000, it is now time to direct attention to the elimination of this killer disease.

Central to this Regional Plan is a strategy for providing a second opportunity for measles immunization. A single dose of measles vaccine protects about only 85% of children, but 95% of the population must be immune to stop transmission. A second dose, given after the age of one year, will protect 99% of children. Therefore, to eliminate measles, children must have a second opportunity that reaches practically every child.

The plan describes objectives in three strategic areas, which are directed at producing, sustaining and verifying interruption of virus transmission:

- ✓ immunization;
- ✓ surveillance; and
- ✓ laboratory support.

The immunization objectives are to strengthen routine immunization and to provide a second opportunity for measles immunization. The surveillance objectives are to progress from aggregated data reporting to a full case-based system as incidence levels fall and to integrate measles surveillance with existing active acute flaccid paralysis (AFP) surveillance. The laboratory support objectives are to establish national accredited measles laboratories as part of a Regional laboratory network to confirm clinical diagnosis and identify the source of viruses. In addition, in a number of countries in the Region with inadequate measles control, further efforts will be needed to improve measles case management, including use of vitamin A in order to reduce measles-associated mortality and disability.

As the countries of the Region are in very different stages of and have different capacities for measles control, no Regional target date for elimination has been set. It is proposed that this date will be established through an annual review of progress in measles control in the Region.

## GLOSSARY OF TERMS

**Measles control:** Reduction of measles morbidity and mortality in accordance with targets; continued intervention measures are required to maintain the reduction.

**Measles elimination:** The situation in a large geographical area in which endemic transmission of measles cannot occur and sustained transmission does not occur following the occurrence of an imported case; continued intervention measures are required.

**Measles eradication:** Interruption of measles transmission worldwide as a result of deliberate efforts; intervention methods may no longer be needed. Eradication represents the sum of successful elimination efforts in all countries.

**Routine immunization:** The regular provision of immunizations to successive birth cohorts of children at fixed sites or by outreach activities.

**Mass immunizations.** A campaign that targets all children of a specified age (usually wider age range than for routine immunization) that are in the target area (usually national).

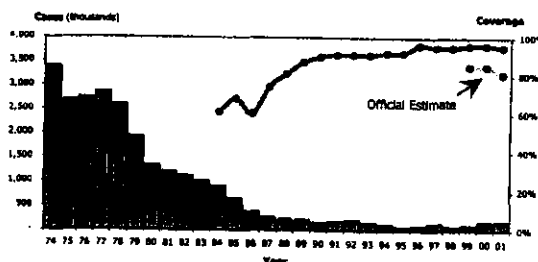
**Second opportunity:** A strategy to provide a first dose for children who were missed by the initial opportunity and a second dose to those who did receive a previous dose (to protect the small proportion not protected by a single dose).

## WESTERN PACIFIC REGIONAL PLAN OF ACTION FOR MEASLES

### 1 BACKGROUND

About 40 years ago, a vaccine was invented against measles. Safe, effective and cheap, it had the potential to wipe out a disease that has killed children for centuries. Yet, measles remains the leading cause of vaccine-preventable death among children, estimated at over 30 million cases and 875 000 deaths in 1999. Although measles immunization programs have produced impressive results, achieving an estimated 75% reduction in cases globally and a 95% reduction in cases in the Western Pacific, there are still an estimated 1 170 000 cases and 32 000 deaths in the Region (See Figure 1 for reported cases and immunization coverage). These cases, and the resulting disability and deaths, are preventable.

Figure 1. Regional Reported Measles Cases and Measles Vaccine Coverage, Western Pacific Region, 1974-2001



Note: China officially adopted the best estimate method in 1999 as the administrative method underestimated births. Both best estimate and administrative methods for estimating coverage have been reported for years 1999-2001. (Because China accounts for most births in the Region, the change in reporting in China affected the Regional coverage significantly).

The countries of the Region have achieved polio-free status (certified on 29 October 2000). Now it is the time to add to this achievement and eliminate measles from the Western Pacific Region by building on the control efforts to date (Annex 1) and by using the strategies in the Global Measles Mortality Reduction and Regional Elimination Strategic Plan (2001-2005).

*A second opportunity for measles immunization is a critical success factor in achieving elimination.*

### 2 RATIONALE

Until it is eliminated, measles will continue to cause large epidemics, which are costly in terms of loss of life, disability and health resources, which are diverted to control outbreaks. On average, in a non-immune population, one child with measles will infect nearly 20 others. If, on the other hand, at least 95% (19 of 20) are immune to measles, transmission of the virus is effectively interrupted. Each child would, on average, pass the infection to just less than one child, leading to eventual elimination of measles. Therefore, to eliminate measles, it is necessary to achieve ~95% population immunity.

Measles elimination is achieved when population immunity is high enough to interrupt indigenous transmission, and an importation leads to only a limited outbreak. Measles elimination does not mean zero cases because importations and limited secondary transmission are likely to occur. The extent of spread from an importation is an indicator of population immunity. Mathematical modelling suggests that if population immunity is close to the threshold level needed to maintain elimination, an importation is likely to cause an outbreak of less than about 50 cases.

Measles immunization at age nine months protects about 85%; a second dose, given after age 12 months protects 99% of children. Therefore, with even 100% coverage of a single dose the ~95% population immunity for elimination cannot be achieved, but with very high coverage of two doses it can. The second opportunity achieves two important outcomes:

1. Children who missed the first dose are given one, essential to achieve the population immunity threshold; and
2. Children who received the first dose but are in the ~15% who did not seroconvert are given a second dose that will then protect practically all of

these 'vaccine failures' to achieve the population immunity threshold.

**Goal:**  
***To eliminate measles from the Region, with a target date to be established through an annual review process.***

### 3. REGIONAL OBJECTIVES

The following Regional objectives are proposed to monitor progress towards the elimination goal:

- ✓ to annually review Regional progress to establish the target date for Regional measles elimination;
- ✓ to achieve and maintain the interruption of measles transmission in countries with an existing elimination goal;
- ✓ to achieve further morbidity and mortality reduction in the remaining countries as a basis for the eventual elimination of measles in the Region;
- ✓ to establish surveillance indicators that can be used for the purposes of monitoring progress and certification of elimination; and
- ✓ to develop National Plans of Action for Measles as components of Multi-Year Immunization Plans and Annual Immunization Workplans (Annex 2).

### 4. STRATEGIES AND ACTIVITIES

#### 4.1. Strategies

Three strategies need to be implemented for measles elimination: immunization, surveillance and laboratory support:

1. to achieve and maintain 95% population immunity to measles in each birth cohort within each district of each country in the Region (Immunization Strategy);
2. to develop and maintain effective surveillance in each country in the Region (Surveillance Strategy); and

3. to develop and maintain effective access to an accredited laboratory for each country in the Region (Laboratory Support Strategy).

In addition, improved case management with associated vitamin A supplementation is a key component of measles morbidity and mortality reduction.

#### 4.1.1 Immunization Activities

1. Establish and/or strengthen functional national coordination bodies.
2. Achieve effective and timely routine delivery of measles vaccine to each new birth cohort.



Measles Immunization

3. Achieve effective second opportunity measles vaccine delivery.
4. Routinely monitor population immunity.



Acute Measles

#### 4.1.2 Surveillance Activity

1. Develop case-based surveillance (including response to cases) with laboratory confirmation.

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#### 4.1.3 Laboratory Support Activity

1. Provide laboratory support for measles diagnosis and virus tracking through a Regional network of accredited laboratories.

### 5. ANNUAL PROGRESS REVIEW

An annual Regional review will establish when it is appropriate to set an elimination target date. The criteria (see Annex 3) have been derived from the three strategies (immunization, surveillance, and laboratory support). They are:

- ✓ two opportunities for every child to receive measles vaccine;
- ✓ functioning case-based surveillance; and
- ✓ national access to an accredited measles laboratory.

See Annex 3 for current status.

### 6. IMPLEMENTING THE PLAN

Implementing the strategies requires an analysis of current and previous measles



Laboratory

control efforts in each country to develop a national plan, if one is not already in place (see Annex 2).

A three- to five-year measles plan as a component of national multi-year immunization plans and annual immunization workplans should be developed to address the three strategies: immunization, surveillance, and laboratory support and a national measles elimination target date.

### 6.1 Immunization

#### 6.1.1 National Coordination

A national coordinating body, such as the inter-agency coordinating committee (ICC), or a measles-specific one, should be established or strengthened to:

- ✓ advocate for political participation in measles initiatives;
- ✓ coordinate multi-sectoral support;
- ✓ provide overall guidance in the development of national strategies and plans; and
- ✓ endorse National Measles Plans of Action.

To be effective, the coordinating bodies need competent, high level technical and political representation within their membership.

#### 6.1.2 Measles First Dose Delivery

The delivery of the Expanded Programme on Immunizations (EPI) vaccines to new birth cohorts requires a substantial on-going detailed operational planning effort (microplans) at district and facility levels.

Each country should strengthen its microplanning capacity by focusing efforts and resources at district and facility levels and ensuring that these add to general EPI initiatives (including communication strategies to promote timely uptake of measles and other EPI vaccines).

#### 6.1.3 Second opportunity for measles immunization

Countries need to offer children a second opportunity to receive measles vaccine to achieve 95% population immunity (Annex 4). The second opportunity needs to reach practically all children.

A national measles mass immunization targeting all age groups where population immunity is likely to be less than 95% is best where feasible. This mass immunization may be conducted as a one-round mass activity (over a 10 to 14 day period) or it may be staged according to specific country circumstances. The critical factor is achieving very high coverage, especially for the previously unreached.

A comprehensive set of options for delivery of the second opportunity need to be considered, comparing the advantages and limitations of each option to make the most appropriate decision for each country. Having chosen the method for the second opportunity, careful and consistent implementation will be needed to maintain population immunity at 95% or higher for each birth cohort.

For countries where it is not feasible to adopt a nationwide mass measles immunization strategy, the second opportunity should be started as soon as possible, if not already in place.

Monitoring of second opportunity coverage activities is needed, together with improved disease surveillance to guide decisions on mopping up immunizations.

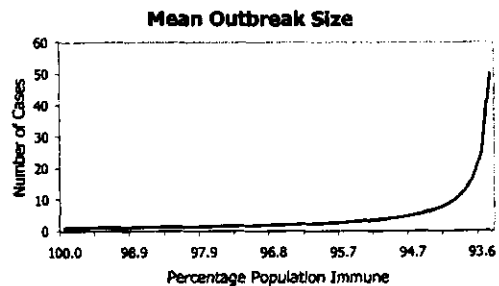
Strategies that can be included in a comprehensive set of options comprise:

- ✓ routine two-dose measles immunization (with the second dose either as part of the schedule or regular national measles mass immunizations every four years, targeting children aged nine-59 months)
- ✓ specific geographic location mass immunization where there is focal transmission of measles;
- ✓ periodic national measles mass immunizations as indicated by falling population immunity (five or more years after the initial wide age range mass immunization), targeting children from nine months to the birth cohort born the year

#### 6.1.4 Monitoring population immunity

Population immunity can be monitored using routine and/or survey coverage data, and validated through disease surveillance. As re-introductions of measles virus are practically inevitable, the number of cases and size of outbreaks can provide an indication of population immunity, after adjusting for the number of cases that the surveillance system identifies. Mathematical models, using coverage and disease data, can be used to estimate immunity based on the size of an outbreak (see Figure 2). Also, serologic survey data can be used to estimate population immunity. But, these additional sources of information are not required as a routine.

Figure 2. Population Immunity as a function of outbreak size.



District and facility level analysis of immunity data needs to be undertaken regularly to guide management decisions for immunization delivery.

Details of immunization strategies and procedures are presented in the *Field Guidelines for Accelerated Measles Control in the Western Pacific Region 2002*.

#### 6.2 Disease Surveillance

##### 6.2.1 Overall Policy Including Integration

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