



POST REVIEW

Verification of measles elimination in Australia: Application of World Health Organization regional guidelines



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Abstract *Background:* The World Health Organization (WHO) Western Pacific Region (WPR) Guidelines on verification of measles elimination were established in 2012. This article outlines Australia's approach to addressing the guideline's five lines of evidence, which led to formal verification of elimination by the WHO Regional Verification Commission (RVC) in March 2014.

Methods: The criteria were addressed using national measles notifications, data from selected laboratories, the national childhood immunization register, and three national serosurveys (1998/1999, 2002, 2007).

Results: Australia met or exceeded all indicator targets with either national or sentinel data. Laboratory and epidemiological surveillance were of high quality, with 85% of cases documented as imported/import-related (target 80%); coverage

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with the first dose of measles vaccine was close to 94% in 2008–2012 and second dose coverage increased to 91% in 2012 (target >95%). There is ongoing commitment by the Australian Government to increase immunization coverage, and the absence of sustained transmission of any single measles genotype was demonstrated.

Conclusions: This is the first documentation of the successful application of the WPR RVC guidelines. The indicators afford some flexibility but appear to provide appropriate rigor to judge achievement of measles elimination. Our experience could assist other countries seeking to verify their elimination status.

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1. Introduction

Globally, efforts to control measles have been very effective, with a 74% reduction in measles-related mortality between 2000 and 2010 [1]. Sustained high coverage with a two-dose vaccination schedule resulted in elimination of endemic measles from the Americas between 2002 and 2013 (since then endemic transmission has been reestablished in Brazil), and in individual countries from other regions [2]. These successes led the World Health Organization (WHO) to conclude that measles eradication (interruption of measles transmission globally) is feasible and cost effective [3] and all six WHO regions have set elimination targets [2].

In 2010, the Western Pacific Region (WPR) reaffirmed its goal of measles elimination by 2012. A Regional Verification Commission (RVC) for the Elimination of Measles was established in January 2012, which developed guidelines on verification of measles elimination in the WPR [4], based on the WHO framework for verifying measles elimination [5]. The WPR guidelines include three verification criteria for measles elimination: (1) documented interruption of endemic measles virus transmission for a period of at least 36 months from the last known endemic case; (2) the presence of high quality (“verification standard”) surveillance; and (3) genotyping evidence that supports interrupted transmission. These criteria are assessed using indicators across five lines of evidence including a description of measles epidemiology, quality of epidemiological and laboratory surveillance, population immunity, vaccination program sustainability, and genotyping data. The individual lines of evidence are evaluated together to establish the case for measles elimination, but the RVC has the discretion to accept alternative evidence from countries unable to provide complete data for all indicators.

An Australian National Verification Committee (NVC) for the Elimination of Measles was convened in February 2013 to oversee the compilation of

data against the five lines of evidence for the period up until the end of 2012, and the NVC’s report, along with reports from 13 other countries, was considered by the RVC during its third meeting in October 2013 [6]. Based on the evidence provided, the RVC verified that measles elimination had been achieved by Australia, Macao Special Administrative Region of China, Mongolia, and the Republic of Korea [6]. Even though Heywood et al. [7] had argued that Australia achieved measles elimination by 2005, and probably several years earlier, this was prior to the development of regional guidelines and a formal verification process was not yet in place. Furthermore, national data to fulfill several criteria were unavailable at that time. This article summarizes Australia’s approach to addressing the WPR’s five lines of evidence and is the first to document the interruption of endemic measles virus transmission according to the WPR guidelines. Australia’s experience could assist other countries seeking to verify their measles elimination status.

2. Background: measles control in Australia

A number of measles control initiatives had been implemented in Australia prior to the end of the reporting period in 2012, including a two-dose vaccination schedule since 1993, a mass vaccination campaign for school-aged children in 1998, and a free vaccination program for young adults (2001) (Table 1) [8–10].

3. Lines of evidence and indicators

3.1. A detailed description of the epidemiology of measles

3.1.1. Data sources

Each country is required to describe the epidemiology of measles, ideally beginning prior to the introduction of measles vaccination, but with a

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