

# MEASLES-RUBELLA

## News in Brief

**Progress towards measles elimination:** The Western Pacific Region is making unprecedented progress towards measles elimination as it closes in on its 2012 goal. Although the annualized incidence from January–June 2011 is 17.0 per million population, high-quality, large-scale supplementary immunization activities (SIAs) conducted in high-priority countries over the past 12 months should substantially reduce transmission across the Region. These countries include Papua New Guinea (June 2010–July 2011), China (September 2010), Viet Nam (September–November 2010), Cambodia (February–April 2011) and Philippines (April–June 2011). Cambodia will conduct a second phase of its SIA in October–November 2011, targeting children 5–9 years old in high risk areas. Lao People's Democratic Republic will conduct a national SIA in November–December 2011, targeting people 9 months to 19 years with measles-rubella (MR) vaccine. Malaysia is planning a subnational SIA to address immunity gaps among children in high-risk areas.

**WHO position on rubella vaccine:** WHO published a new position paper on rubella vaccine (*Weekly Epidemiological Record*. 2011; 86:301–316) on 15 July 2011 that provides countries updated guidance for use of rubella containing vaccine (RCV). WHO recommends that countries use the opportunity of accelerated measles control and elimination activities to introduce RCV. All countries that have not yet introduced RCV and are providing two doses of measles vaccine using routine immunization and/or SIAs should consider the inclusion of RCV in their immunization programmes. To avoid the potential increased risk of congenital rubella syndrome after RCV introduction, countries should achieve and maintain immunization coverage of 80% or greater with at least one dose of RCV delivered through routine services or regular SIAs, or both.

## Timeliness and completeness of monthly data reporting

### National reports (Table 1A)

From January to June 2011, completeness and timeliness of monthly reporting of measles and rubella cases to the Western Pacific Regional Office was 92% and 87%, respectively. Completeness of reporting for the Region ranged from 82% to 100% by month and varied from 50% to 100% by country and area. Completeness of monthly reporting was particularly low for the Pacific island countries and areas and Papua New Guinea (50% each) and Viet Nam (67%). Timeliness of monthly reporting for the Region ranged from 76% to 94% by month and from 0% to 100% by country and area. Timeliness was particularly low for Papua New Guinea

(0%), the Pacific island countries and areas (33%), and Viet Nam (67%).

### National measles laboratory reports (Table 1B)

From January to June 2011, completeness and timeliness of data submitted by national measles laboratories (NMLs) to the Regional Office was 86% and 78% respectively. All other NMLs achieved at least 80% completeness. Timeliness of monthly reporting was particularly low for NMLs in Fiji and Viet Nam (northern) (50% each) and Papua New Guinea (67%). Laboratories from China and Japan do not report laboratory data directly to the Western Pacific Regional Office.

## Incidence and Deaths (Table 2A)

A total of 15 342 confirmed measles cases were reported in the Region from January–June 2011, corresponding to an annualized measles incidence of 17.0 per million population, a 37% decrease compared to the 27.0 per million incidence in 2010. The countries with the highest annualized measles incidence were Philippines (119.8), New Zealand (45.8), Cambodia (35.1), Malaysia (22.8) and Singapore (19.7).

Thirty-six measles related deaths were reported from January–June 2011 (case fatality rate [CFR]=0.2%): 25 were reported from the Philippines (CFR=0.4%), 8 from China (CFR=0.1%), two from Viet Nam (CFR=1.4%), and one from Cambodia (CFR=0.4%).

Clinically confirmed cases accounted for 4425 (29.1%) of all confirmed cases in the Region with classification data. Countries and areas with over 10% of confirmed measles cases that were clinically confirmed include Lao People's Democratic Republic (100%), Viet Nam (69%), Philippines (56%), Hong Kong (China) (33%), Cambodia (32%), Japan (24%) and China (11%). Clinically confirmed cases are considered failures of surveillance because either specimens were not collected or contact tracing was inadequate to establish epidemiologic linkage to other confirmed cases.

**Table 1A. Completeness and timeliness of national reporting, Western Pacific Region, 2009 - 2011**

Country	2009		2010		2011 <sup>†</sup>						Completeness	Timeliness
	Completeness	Timeliness	Completeness	Timeliness	Jan	Feb	Mar	Apr	May	Jun		
					10 Feb	10 Mar	10 Apr	10 May	10 Jun	10 Jul		
Australia	100%	100%	100%	100%	08 Feb	10 Mar	08 Apr	06 May	09 Jun	07 Jul	100%	100%
Brunei Darussalam	100%	100%	100%	100%	08 Feb	09 Mar	07 Apr	09 May	07 Jun	09 Jul	100%	100%
Cambodia	100%	83%	75%	42%	10 Feb	10 Mar	10 Apr	10 May	08 Jun	10 Jul	100%	83%
China	92%	0%	100%	58%	14 Feb	10 Mar	12 Apr	11 May	13 Jun	10 Jul	100%	83%
Hong Kong (China)	100%	100%	100%	100%	09 Feb	09 Mar	07 Apr	06 May	09 Jun	08 Jul	100%	100%
Japan	100%	92%	100%	100%	04 Feb	07 Mar	05 Apr	06 May	10 Jun	08 Jul	100%	100%
Lao PDR	58%	42%	83%	75%	09 Feb	10 Mar	08 Apr	10 May	10 Jun	10 Jul	100%	100%
Macao (China)	100%	83%	100%	100%	07 Feb	04 Mar	06 Apr	05 May	07 Jun	01 Jul	100%	100%
Malaysia	58%	42%	92%	83%	09 Feb	07 Mar	08 Apr	06 May	09 Jun	15 Jul	100%	83%
Mongolia	100%	75%	100%	92%	09 Feb	07 Mar	09 Apr	05 May	07 Jun	10 Jul	100%	100%
New Zealand	100%	92%	100%	92%	07 Feb	07 Mar	05 Apr	12 May	08 Jun	05 Jul	100%	83%
Papua New Guinea	67%	17%	67%	33%	16 Feb	29 Mar				14 Jul	50%	0%
Philippines	75%	58%	100%	92%	06 Feb	14 Mar	10 Apr	03 May	03 Jun	07 Jul	100%	83%
Republic of Korea	50%	17%	92%	92%	10 Feb	08 Mar	07 Apr	09 May	10 Jun	10 Jul	100%	100%
Singapore	100%	67%	100%	100%	02 Feb	01 Mar	06 Apr	05 May	06 Jun	04 Jul	100%	100%
Viet Nam	83%	25%	92%	25%	10 Feb		10 Apr		02 Jun	10 Jul	67%	67%
Pacific island countries*	67%	42%	92%	58%	10 Feb	10 Mar				22 Jul	50%	33%
Completeness	85.3%		93.6%		100%	94%	88%	82%	88%	100%	92.2%	
Timeliness		60.8%		78.9%	94%	88%	88%	76%	88%	88%		87.3%

<sup>†</sup> Surveillance data through June 2011

Legend: black = timely report; red = untimely report

\* PICs and China are expected to report to the Regional Office by 15th (or the next working day) of the following month; all other countries and areas should submit reports by the 10th of the following month

**Table 1B. Completeness and timeliness of laboratory reporting, Western Pacific Region, 2009 - 2011**

Country	2009		2010		2011						Completeness <sup>†</sup>	Timeliness*
	Completeness	Timeliness	Completeness	Timeliness	Jan	Feb	Mar	Apr	May	Jun		
					08 Feb	10 Mar	08 Apr	10 May	10 Jun	10 Jul		
Australia	100%	83%	100%	100%	08 Feb	03 Mar	05 Apr	04 May	03 Jun	01 Jul	100%	100%
Cambodia	50%	17%	42%	25%	07 Feb	07 Mar	07 Apr	09 May	09 Jun	09 Jul	100%	100%
China	0%	0%	0%	0%							0%	0%
Hong Kong (China)	100%	100%	100%	100%	09 Feb	09 Mar	09 Apr	09 May	09 Jun	09 Jul	100%	100%
Japan	0%	0%	0%	0%							0%	0%
Lao PDR	8%	0%	58%	58%	10 Feb	10 Mar	08 Apr	10 May	10 Jun	20 Jul	100%	83%
Macao (China)	100%	92%	100%	100%	07 Feb	04 Mar	07 Apr	05 May	08 Jun	07 Jul	100%	100%
Malaysia	75%	8%	92%	58%	09 Feb	07 Mar	08 Apr	10 May	09 Jun	10 Jul	100%	100%
Mongolia	92%	92%	100%	100%	08 Feb	04 Mar	06 Apr	04 May	07 Jun	09 Jul	100%	100%
New Zealand	83%	8%	100%	33%	09 Feb	11 Mar	08 Apr	10 May	10 Jun	07-Jul	100%	83%
Papua New Guinea	0%	0%	75%	33%	10 Feb	08 Mar	12 Apr	09 May		01 Jul	83%	67%
Philippines	100%	33%	100%	83%	08 Feb	10 Mar	08 Apr	10 May	25 May	10 Jul	100%	100%
Republic of Korea	75%	50%	100%	100%	10 Feb	09 Mar	08 Apr	10 May	08 Jun	10 Jul	100%	100%
Singapore	100%	100%	100%	100%	07 Feb	07 Mar	08 Apr	06 May	07 Jun	08 Jul	100%	100%
Viet Nam (northern)	92%	58%	100%	58%	08 Feb	21 Mar	09 Apr	10 May	16 Jun	12 Jul	100%	50%
Viet Nam (southern)	92%	75%	83%	50%	09 Feb	10 Mar	08 Apr	10 May	08 Jun	08 Jul	100%	100%
Fiji	67%	58%	67%	50%	09 Feb	10 Mar	11 Apr	04 May		22 Jul	83%	50%
Completeness	66.7%		77.5%		88%	88%	88%	88%	76%	88%	86.3%	
Timeliness		45.6%		61.8%	88%	76%	76%	88%	71%	71%		78.4%

<sup>†</sup> Same standard for completeness is applied for both national and laboratory reporting.

\* Deadline for submission is on the 10th of the following month.

## Surveillance Performance Indicators (Table 2B)

### Case reporting rate

The annualized discarded measles rate from January–June 2011 was 2.9 per 100 000 population for the Region, exceeding the target of 2 per 100 000. Countries and areas achieving or exceeding the target included Viet Nam (11.6), Cambodia (10.3), Malaysia (7.1), Mongolia (5.8), Philippines (4.4), Lao Peoples Democratic Republic (3.0), Hong Kong (China) (2.6), China (2.4), and Macau (China) (2.2). Countries with discarded measles rates below the target included Brunei Darussa-

lam, Japan, Papua New Guinea, and Republic of Korea. None of the Pacific island countries reported any discarded measles cases. Australia, New Zealand and Singapore do not report discarded measles cases.

Surveillance sensitivity was not uniform at subnational levels. Only 37% of second-level administrative reporting units reported  $\geq 1$  discarded measles cases per 100 000 population (target  $\geq 80\%$ ). Four countries and areas achieved or exceeded the target: Hong Kong (China), Macao (China), Malaysia and the Philippines.

**Table 2A. Measles case classification and incidence, by country and area, Western Pacific Region, 2010 - 2011 <sup>1</sup>**

Country	2010										2011 <sup>1</sup>									
	Population (in millions) <sup>2</sup>	Suspected measles cases <sup>3</sup>	Confirmed measles cases				Discarded cases	Pending classification	Deaths due to measles	Measles incidence per 1 million pop.	Population (in millions) <sup>2</sup>	Suspected measles cases <sup>3</sup>	Confirmed measles cases				Discarded cases	Pending classification	Deaths due to measles	Measles incidence per 1 million pop.
			Lab	Epi-linked	Clinical	Total							Lab	Epi-linked	Clinical	Total				
Australia	22.27	No data	65	5	0	70	0	0	0	3.1	22.61	No data	97	10	0	107	0	0	0	9.5
Brunei Darussalam	0.40	7	0	0	0	0	7	0	0	0	0.41	5	2	0	0	2	2	1	0	9.9
Cambodia	14.14	3572	451	0	705	1 156	2416	0	6	81.8	14.31	1013	170	0	81	251	738	24	1	35.1
China	1341.34	56 766	26 297	116	11 768	38 181	18 529	56	39	28.5	1347.57	25 120	7 382	11	954	8347	16 469	304	8	12.4
Hong Kong (China)	7.05	24	4	0	7	11	13	0	0	1.6	7.12	99	3	1	2	6	91	2	0	1.7
Japan	126.54	461	306	3	121	430	31	0	0	3.4	126.50	341	223	8	72	303	38	0	0	4.8
Lao PDR	6.20	332	6	0	147	153	179	0	0	24.7	6.29	98	0	0	3	3	95	0	0	1.0
Macao (China)	0.54	28	0	0	0	0	28	0	0	0	0.56	7	1	0	0	1	6	0	0	3.6
Malaysia	28.40	1098	69	2	4	75	1023	0	0	2.6	28.86	1 812	234	36	59	329	1026	457	0	22.8
Mongolia	2.76	160	0	0	7	7	153	0	0	2.5	2.80	81	0	0	0	0	81	0	0	0
New Zealand	4.37	No data	15	21	12	48	0	0	0	11.0	4.41	No data	75	26	0	101	0	5	0	45.8
Papua New Guinea	6.86	26	0	0	0	0	26	0	0	0	7.01	41	0	0	0	0	0	41	0	N/A
Philippines	93.26	10 370	2881	137	3366	6384	3986	0	34	68.5	94.85	7838	2384	147	3153	5684	2081	73	25	119.8
Republic of Korea	48.18	246	95	16	3	114	132	0	0	2.4	48.39	87	12	0	3	15	67	5	0	0.6
Singapore	5.09	No data	54	0	0	54	0	0	0	10.6	5.19	No data	51	0	0	51	0	0	0	19.7
Viet Nam	87.85	6419	757	89	977	1823	2915	1681	1	20.8	88.79	6249	16	28	98	142	5130	977	2	3.2
<b>Pacific island countries and areas</b>																				
American Samoa	0.07	0	0	0	0	0	0	0	0	0	0.07	0	0	0	0	0	0	0	0	0
Cook Islands	0.02	0	0	0	0	0	0	0	0	0	0.02	0	0	0	0	0	0	0	0	0
Fiji	0.86	72	0	0	0	0	0	72	0	N/A	0.87	12	0	0	0	0	0	12	0	N/A
French Polynesia	0.27	0	0	0	0	0	0	0	0	0	0.27	0	0	0	0	0	0	0	0	0
Guam	0.18	0	0	0	0	0	0	0	0	0	0.18	0	0	0	0	0	0	0	0	0
Kiribati	0.10	0	0	0	0	0	0	0	0	0	0.10	0	0	0	0	0	0	0	0	0
Marshall Islands	0.05	0	0	0	0	0	0	0	0	0	0.05	0	0	0	0	0	0	0	0	0
Micronesia, Federated States of	0.11	0	0	0	0	0	0	0	0	0	0.11	0	0	0	0	0	0	0	0	0
Nauru	0.01	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0
New Caledonia	0.25	0	0	0	0	0	0	0	0	0	0.25	0	0	0	0	0	0	0	0	0
Niue	0.00	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0
Northern Mariana Islands	0.06	0	0	0	0	0	0	0	0	0	0.06	0	0	0	0	0	0	0	0	0
Palau	0.02	0	0	0	0	0	0	0	0	0	0.02	0	0	0	0	0	0	0	0	0
Samoa	0.18	0	0	0	0	0	0	0	0	0	0.18	0	0	0	0	0	0	0	0	0
Solomon Islands	0.54	0	0	0	0	0	0	0	0	0	0.55	0	0	0	0	0	0	0	0	0
Tokelau	0.00	0	0	0	0	0	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0
Tonga	0.10	0	0	0	0	0	0	0	0	0	0.10	0	0	0	0	0	0	0	0	0
Tuvalu	0.01	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0
Vanuatu	0.24	0	0	0	0	0	0	0	0	0	0.25	0	0	0	0	0	0	0	0	0
Wallis and Futuna	0.01	0	0	0	0	0	0	0	0	0	0.01	0	0	0	0	0	0	0	0	0
<b>Western Pacific Region</b>	<b>1798.34</b>	<b>79 581</b>	<b>31 000</b>	<b>389</b>	<b>17 117</b>	<b>48 506</b>	<b>29 438</b>	<b>1809</b>	<b>80</b>	<b>27.0</b>	<b>1808.80</b>	<b>42 803</b>	<b>10 650</b>	<b>267</b>	<b>4425</b>	<b>15 342</b>	<b>25 824</b>	<b>1 901</b>	<b>36</b>	<b>17.0</b>

<sup>1</sup> Monthly reports with data through June

<sup>2</sup> Population figures from United Nations World Population Prospects: The 2010 Revision

<sup>3</sup> Australia, New Zealand and Singapore report only confirmed cases

Green <1 confirmed measles case / 1 000 000 population  
 Yellow 1-9.9 confirmed measles case / 1 000 000 population  
 Red >= 10 confirmed cases / 1 000 000 population

**Table 2B. Measles surveillance performance indicators, by country and area, Western Pacific Region, 2010 - 2011 <sup>1</sup>**

Country	2010					2011 <sup>1</sup>					
	Discarded measles rate per 100 000 pop	Second level units with ? 1 discarded cases per 100 000	Suspected cases with adequate investigation	Suspected cases with adequate blood specimens <sup>2</sup>	Percent clinically confirmed cases <sup>3</sup>	Discarded measles rate per 100 000 pop	Annualized discarded measles rate per 100 000 pop	Second level units with ? 1 discarded cases per 100 000 (annualized)	Suspected cases with adequate investigation	Suspected cases with adequate blood specimens <sup>2</sup>	Percent clinically confirmed cases <sup>3</sup>
	? 2	? 80%	? 80%	? 80%	? 10%	? 2	? 2	? 80%	? 80%	? 80%	? 10%
Australia <sup>4</sup>	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data
Brunei Darussalam	1.8	100%	85.7%	100%	Not applicable	0.5	1.0	0%	60.0%	100%	0%
Cambodia	17.1	75.0%	60.1%	79.3%	61.0%	5.2	10.3	50.0%	57.1%	86.5%	32.3%
China	1.4	51.6%	91.1%	72.6%	30.8%	1.2	2.4	77.4%	92.1%	85.4%	11.4%
Hong Kong (China)	0.2	0%	45.8%	66.7%	63.6%	1.3	2.6	100%	30.3%	90.8%	33.3%
Japan	0	0%	Insufficient data	Insufficient data	28.1%	0	0.1	0.0%	Insufficient data	Insufficient data	23.8%
Lao PDR	2.9	35.3%	19.3%	23.8%	96.1%	1.5	3.0	41.2%	29.6%	61.2%	100%
Macao (China)	5.2	100%	100%	100%	Not applicable	1.1	2.2	100%	100%	100%	0%
Malaysia	3.6	87.5%	71.9%	82.0%	5.3%	3.6	7.1	93.8%	40.3%	72.1%	17.9%
Mongolia	5.6	31.8%	65.0%	92.5%	100%	2.9	5.8	31.8%	72.8%	100%	Not applicable
New Zealand <sup>4</sup>	Insufficient data	Insufficient data	Insufficient data	Insufficient data	25.0%	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	0%
Papua New Guinea	0.4	5.0%	46.2%	100%	Not applicable	0	0	0%	12.2%	51.2%	Not applicable
Philippines	4.3	94.1%	14.5%	67.8%	52.7%	2.2	4.4	94.1%	36.9%	68.2%	55.5%
Republic of Korea	0.3	6.3%	61.8%	73.9%	2.6%	0.1	0.3	0%	62.1%	75.9%	20.0%
Singapore <sup>4</sup>	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data
Viet Nam	3.3	53.1%	59.0%	59.9%	53.6%	5.8	11.6	45.3%	33.7%	48.5%	69.0%
<b>Pacific island countries and areas</b>											
American Samoa	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
Cook Islands	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
Fiji	0	0%	0%	Not applicable	Not applicable	0	0	0%	0%	Not applicable	Not applicable
French Polynesia	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
Guam	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
Kiribati	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
Marshall Islands	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
Micronesia, Federated States of	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
Nauru	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
New Caledonia	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
Niue	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
Northern Mariana Islands	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
Palau	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
Samoa	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
Solomon Islands	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
Tokelau	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
Tonga	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
Tuvalu	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
Vanuatu	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
Wallis and Futuna	0	0%	Not applicable	Not applicable	Not applicable	0	0	0%	Not applicable	Not applicable	Not applicable
<b>Western Pacific Region</b>	<b>1.7</b>	<b>38.3%</b>	<b>76.3%</b>	<b>71.3%</b>	<b>35.4%</b>	<b>1.5</b>	<b>2.9</b>	<b>37.3%</b>	<b>69.8%</b>	<b>76.2%</b>	<b>29.1%</b>

<sup>1</sup> Monthly reports with data through June

<sup>2</sup> Excludes epi-linked cases

<sup>3</sup> Among all confirmed cases

<sup>4</sup> Reports only confirmed cases

Green	Reached or surpassed target
Yellow	Nearly reached target: 1.00-1.99 for discarded measles rate; 10.1-25% for percent clinically confirmed cases; 60-79% for other indicators
Red	Substantially below target

**Table 3. Measles and rubella laboratory performance, Western Pacific Region, 2011<sup>1</sup>**

Country	Measles and rubella		Measles															Rubella						
			Serology									Virus detection						Serum and blood				Virus detection		
	Total number of cases tested	Total number of samples received	Serum and blood					DBS		Results ≤ 7 days	Measles virus isolation/ detection (swab, urine, PBMC)		Measles RT - PCR		Measles genotypes		Total number of lab confirmed cases	Samples tested for rubella IgM	Rubella IgM (+)	Rubella IgM equiv	Rubella IgM pending	Rubella genotypes		
			Samples tested for measles IgM	Measles IgM (+)	Measles IgM equiv	Measles IgM (-)	Measles IgM pending	No. received	No. (+)		No. of samples tested	No. of isolates	No. of samples tested	No. of (+)	No. of samples with genotype <sup>2</sup>	Genotypes						No. of samples with genotype	Genotypes	
No.	No.	No.	No.	%	No.	No.	%	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.		
Australia	106	180	54	22	4	28	51.9%	0	0	-	100%	0	0	116	96	78	A, D4, D8, D9, H1	78	23	2	1	0	0	-
Cambodia	2220	2226	2128	228	0	1375	64.6%	525	1	0	75.9%	97	0	97	0	0	-	228	2128	486	1	525	0	-
China																180	D8, D11, D9, H1						157	1E, 2B
Hong Kong (China)	158	183	150	3	2	145	96.7%	0	0	-	97.3%	6	2	9	3	2	D8, D9	3	155	18	2	4	10	1E, 2B
Japan																107	A, D4, D8, D9, G3, UT						3	1E, 1j, 2B
Lao PDR	60	60	60	0	0	60	100%	0	0	-	100%	0	0	0	0	0	-	0	60	9	7	0	1	1E
Macao (China)	19	19	19	1	0	18	94.7%	0	0	-	94.7%	0	0	0	0	1	D8	1	19	0	1	0	0	-
Malaysia	1843	1896	1879	406	32	1441	76.7%	0	0	-	100%	0	0	0	0	29	A, D9, G3	406	1460	188	116	1	3	1i, 2B
Mongolia	81	81	81	0	0	81	100%	0	0	-	100%	0	0	0	0	0	-	0	81	11	3	0	0	-
New Zealand	286	346	224	34	4	186	83.0%	0	0	-	97.7%	1	0	124	58	26	D4, D8, D9	71	26	3	0	0	0	-
Papua New Guinea	36	36	36	0	0	36	100%	0	0	-	100%	0	0	0	0	0	-	0	36	16	1	0	0	-
Philippines	6302	6302	6189	3376	335	2472	39.9%	6	0	-	67.6%	0	0	0	0	6	D9	3376	2846	959	226	12	0	-
Republic of Korea	102	123	89	15	12	62	69.7%	0	0	-	100%	13	1	43	1	4	A, D9	15	89	8	17	0	0	-
Singapore	293	423	126	29	1	96	76.2%	0	0	-	97.1%	142	20	3	3	27	D4, D8, D9, G3	48	191	8	13	2	0	-
Viet Nam (northern)	2345	2345	1341	8	4	1293	96.4%	36	0	-	61.6%	0	0	0	0	0	-	8	2345	1349	172	13	0	-
Viet Nam (southern)	1587	1596	1376	4	9	1359	98.8%	4	0	-	93.7%	9	0	9	0	0	-	4	1583	1043	91	3	0	-
Fiji	10	10	4	0	0	4	100%	0	6	0	14.3%	0	0	0	0	0	-	0	10	0	0	0	0	-
<b>Total</b>	<b>15 448</b>	<b>15 826</b>	<b>13 756</b>	<b>4126</b>	<b>403</b>	<b>8656</b>	<b>62.9%</b>	<b>571</b>	<b>7</b>	<b>0</b>	<b>77.2%</b>	<b>268</b>	<b>23</b>	<b>401</b>	<b>161</b>	<b>460</b>		<b>4238</b>	<b>11 052</b>	<b>4100</b>	<b>651</b>	<b>560</b>	<b>174</b>	

<sup>1</sup> Monthly reports with data through June

<sup>2</sup> Sources include national and regional reference laboratory reports to WHO and to the Measles Nucleotide Sequence (MeaNS) database; in case of discrepant reports, the larger number is included in Table 3.

## Adequate case investigation

A case is considered adequately investigated if it is investigated within 48 hours of report and 10 core data variables are completed in the case investigation form. From January–June 2011, 70% of suspected cases were adequately investigated. China and Macau (China) achieved or exceeded the 80% target. Countries and areas with a 60%–79% adequate investigation rate included Mongolia (73%), Republic of Korea (62%) and Brunei Darussalam (60%). Australia, Japan, New Zealand and Singapore do not report data in the standard format.

## Adequate specimens

Adequate specimens were collected from 76% of suspected cases from January–June 2011. Six countries and areas (Brunei Darussalam, Cambodia, China, Hong Kong [China], Macao [China], and Mongolia) achieved or exceeded the 80% target. Countries and areas with 60%–79% adequate specimen rate included Republic of Korea (76%), Malaysia (72%), Philippines (68%) and the Lao People's Democratic Republic (61%). Those with less than 60% included Papua New Guinea (51%) and Viet Nam (49%). Australia, Japan, New Zealand and Singapore do not report specimen collection among suspected cases.

## Performance of national measles laboratory (Table 3)

### Laboratory results within seven days

From January–June 2011, among 13 756 serum or blood and seven dried blood spot (DBS) specimens received for testing of anti-measles IgM antibody, 77% had results within seven days after receipt of specimens by laboratory (target  $\geq$  80%). Reporting timeliness from Fiji was particularly low (14%).

### Virus detection

Among 268 samples evaluated for virus isolation or detection in regional reference laboratories (RRLs) in Australia and Hong Kong (China) and in NMLs in New Zealand, Singapore, the Republic of Korea and Viet Nam in 2011, 23 (8.6%) measles virus isolates were obtained. Measles virus was isolated among samples from Singapore (20), Hong Kong (China) (2) and Republic of Korea (1). Genotypes may be determined from genetic sequence data collected by reverse transcriptase polymerase chain reaction (RT-PCR) following virus isolation

or directly from specimens without virus isolation. Among 401 specimens undergoing RT-PCR testing, 161 were positive from labs in Australia (96), New Zealand (58), Hong Kong (China) (3), Singapore (3) and the Republic of Korea (1).

### Genotyping

Measles genotypes were identified from 460 samples reported from 10 countries and areas, including China (N=180: 174 H1, 2 D8, 2 A, 1 D9, 1 D11), Japan (N=107: 51 D4, 38 D9, 5 D8, 2 A, 1 G3, 10 untypable), followed by Australia (N=78: 36 D9, 20 D8, 14 D4, 4 A, 1 H1, 3 pending), Malaysia (N=29: 25 D9, 2 G3, 2 A), Singapore (N=27: 21 D9, 4 D8, 1 D4, 1 G3), New Zealand (N=26: 12 D4, 11 D9, 3 D8), Philippines (N=6: 6 D9), Republic of Korea (N=4: 2 D9, 1 A, 1 pending), Hong Kong (China) (N=2: 1 D8, 1 D9) and Macau (China) (N=1: D8). Genotypes of measles virus identified from the Region in 2011 therefore included A (vaccine type), D4, D8, D9, D11, G3 and H1.

## Rubella

From January–June 2011, among 11 052 specimens received for rubella testing, 560 have pending results; 525 of these are from Cambodia. Among the remaining 10 492, 4100 (39%) samples were positive and 651 (6%) were equivocal for anti-rubella IgM antibody. Countries with the largest number of IgM-positive rubella specimens included Viet Nam (2392: 1349 from the north and 1043 from the south), Philippines (959), Cambodia (486) and Malaysia (188).

Rubella genotypes were identified from 174 samples from 6 countries and areas, including China (N=157: 136 1E, 21 2B), Hong Kong (China) (N=10: 4 1E, 3 2B, 3 pending), Japan (N=3: 1 1E, 1 1j, 1 2B), Malaysia (N=3: 2 1i, 2 2B), Lao People's Democratic Republic (N=1: 1E). Genotypes of rubella virus identified in the Region therefore included 1E, 1i, 1j and 2B.

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