

MEASLES-RUBELLA

Bulletin

News in Brief

The 19th Meeting of the Technical Advisory Group on Immunization and Vaccine Preventable Diseases in the Western Pacific Region (TAG) took place from 24 to 27 August 2010 in Manila, Philippines. Representatives from 16 countries and areas and 12 partner agencies participated. The TAG endorsed the strategic approaches contained in the revised *Plan for Achieving and Sustaining Measles Elimination in the Western Pacific Region, 2010-2020*, requested the Regional Director and Member States to establish a regional and national verification processes, and reaffirmed its recommendation to use measles elimination activities to accelerate rubella control and prevention of congenital rubella syndrome. The latest TAG recommendations on measles and rubella are provided in this issue of the *Bulletin*; the complete text of all conclusions and recommendations of the 19th TAG meeting can be found at http://www.wpro.who.int/sites/epi/meetings/TAG_2010.htm.

The World Health Organization Regional Committee for the Western Pacific held its sixty-first session in Malaysia from 11–15 October 2010. Resolution WPR/RC61/R7 on vaccine preventable diseases reaffirmed the EPI twin goals of measles elimination and hepatitis B control. The full text of the resolution is provided in this issue of the *Bulletin* and can also be found at http://www.wpro.who.int/rcm/en/rc61/rc_resolutions/WPR_RC61_R7.htm.

The Fourth Regional Hands-on Training Workshop on the Laboratory Diagnosis of Measles and Rubella was held from 22 to 27 November 2010 in Hong Kong (China); 13 participants from 12 national measles and rubella laboratories in 9 countries were trained on molecular detection of measles and rubella viruses using reverse transcription-polymerase chain reaction (RT-PCR) and genotyping/sequence analysis. During the training course, WHO annual proficiency test samples for measles and rubella ELISA were also distributed.

Four priority countries in the Western Pacific Region conducted measles supplementary immunization activities (SIAs) in the second half of 2010. Papua New Guinea launched its national measles SIA on 13 August 2010 targeting all children 6-35 months old; the SIA will continue through January 2011. China conducted a nationwide measles SIA from 11-20 September 2010 targeting different age groups by province, immunizing over 100 million children (provisional data). Viet Nam began a phase-wise nationwide SIA on 15 September 2010 targeting all children 9-71 months old; the SIA should be completed by end of November. The Philippines launched the first phase of a nationwide SIA targeting children 9-95 months on November 15, 2010 in Pasay City of Metropolitan Manila; phase 2 will begin in 2011.

Data Reporting (Table 1A, 1B)

From January to October 2010, overall completeness of reporting measles and rubella cases to the Regional Office was well above the 80% target every month, varying from 82% to 100%, and was 93% for the 10-month period. Timeliness by month fluctuated from 71% to 100%, and was 79% overall. Among 17 reporting units (16 countries and areas and the 20 Pacific island countries [PICs] as a group), 11 achieved at least 80% during the 10-month period for both completeness and timeliness of reporting. Completeness was less than 80% in two countries (Cambodia and Papua New Guinea); while timeliness was less than 80% in five countries (Cambodia, China, Lao People's Democratic

Republic, Papua New Guinea, Viet Nam) and the PICs.

During the same 10-month period, overall completeness and timeliness of data submitted by national measles laboratories (NMLs) to the Regional Office was 77% and 60%, respectively, with marked improvement since July 2010. Seven NMLs achieved the target of at least 80% for both completeness and timeliness. Completeness was below 80% for three NMLs (Cambodia, Lao People's Democratic Republic and Fiji); timeliness was below 80% for eight NMLs (Cambodia, Lao People's Democratic Republic, Malaysia, New Zealand, Papua New Guinea, Viet Nam [north and south], and Fiji). Data were not available from NMLs in China and Japan.

Table 1A. Completeness and timeliness of epidemiologic reporting, Western Pacific Region, 2008 - 2010

Country	2008		2009		2010†											Completeness	Timeliness
	Completeness	Timeliness	Completeness	Timeliness	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct			
					10 Feb	10 Mar	10 Apr	10 May	10 Jun	10 Jul	10 Aug	10 Sep	10 Oct	10 Nov			
Australia	100%	67%	100%	100%	02 Feb	05 Mar	07 Apr	10 May	10 Jun	09 Jul	09 Aug	09 Sep	08 Oct	09 Nov	100%	100%	
Brunei Darussalam	75%	58%	100%	100%	02 Feb	02 Mar	01 Apr	03 May	02 Jun	03 Jul	07 Aug	07 Sep	09 Oct	06 Nov	100%	100%	
Cambodia	75%	25%	100%	83%	09 Feb			19 May	08 Jun	05 Jul	07 Aug	08 Sep			60%	50%	
China	92%	0%	92%	0%	11 Feb	12 Mar	15 Apr	10 May	10 Jun	12 Jul	10 Aug	10 Sep	12 Oct	10 Nov	100%	50%	
Hong Kong (China)	100%	100%	100%	100%	04 Feb	05 Mar	08 Apr	05 May	10 Jun	09 Jul	09 Aug	09 Sep	08 Oct	09 Nov	100%	100%	
Japan	67%	58%	100%	92%	02 Feb	04 Mar	07 Apr	10 May	09 Jun	07 Jul	06 Aug	10 Sep	07 Oct	06 Nov	100%	100%	
Lao PDR	50%	8%	58%	42%	12 Jan	05 Mar	14 Apr	09 May	07 Jun	28 Jun	06 Aug			08 Nov	80%	70%	
Macao (China)	100%	50%	100%	83%	02 Feb	04 Mar	06 Apr	05 May	01 Jun	07 Jul	06 Aug	03 Sep	06 Oct	05 Nov	100%	100%	
Malaysia	58%	8%	58%	42%	08 Feb		07 Apr	10 May	14 Jun	06 Jul	10 Aug	07-Sep	08 Oct	08 Nov	90%	80%	
Mongolia	100%	67%	100%	75%	05 Feb	09 Mar	06 Apr	17 May	10 Jun	08 Jul	05 Aug	08 Sep	08 Oct	08 Nov	100%	90%	
New Zealand	100%	100%	100%	92%	05 Feb	04 Mar	14 Apr	05 May	09 Jun	05 Jul	09 Aug	06 Sep	04 Oct	04 Nov	100%	90%	
Papua New Guinea	75%	42%	67%	17%	16 Feb			21 Apr	22 Jun		04 Aug	09 Sep	20 Oct	08 Nov	70%	40%	
Philippines	83%	50%	75%	58%	05 Feb	02 Mar	05 Apr	05 May	02 Jun	07 Jul	02 Aug	03 Sep	01 Oct	11 Nov	100%	90%	
Republic of Korea	25%	8%	50%	17%		09 Mar	07 Apr	10 May	10 Jun	09 Jul	10 Aug	08 Sep	09 Oct	10 Nov	90%	90%	
Singapore	100%	83%	100%	67%	08 Feb	05 Mar	06 Apr	04 May	07 Jun	02 Jul	10 Aug	06 Sep	07 Oct	03 Nov	100%	100%	
Viet Nam	100%	25%	83%	25%	10 Feb	05 Mar	20 May	20 May	15 Jun	11 Jul	11 Aug	11 Sep		10 Nov	90%	30%	
Pacific island countries*	75%	42%	67%	42%	10 Feb	18 Mar	15 Apr	14 May	22 Jun	06 Jul	16 Aug	20 Sep	08 Oct	10 Nov	100%	60%	
Completeness	80.9%		85.3%		94%	82%	88%	100%	100%	94%	100%	94%	82%	94%	92.9%		
Timeliness		46.6%		60.8%	82%	71%	65%	82%	76%	82%	88%	82%	71%	88%		78.8%	

† Surveillance data through October 2010

* PICs are expected to report to the Western Pacific Regional Office by the 15th (or the next working day) of the following month.

Legend: black = timely report; red = untimely report

Table 1B. Completeness and timeliness of laboratory reporting, Western Pacific Region, 2008 - 2010

Country	2008		2009		2010										Completeness†	Timeliness*
	Completeness	Timeliness	Completeness	Timeliness	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct		
					04 Feb	04 Mar	01 Apr	05 May	04 Jun	05 Jul	04 Aug	02 Sep	04 Oct	08 Nov		
Australia	100%	75%	100%	83%	04 Feb	04 Mar	01 Apr	05 May	04 Jun	05 Jul	04 Aug	02 Sep	04 Oct	08 Nov	100%	100%
Cambodia	58%	25%	50%	17%					21 Jun		29 Jul	23 Sep		09 Nov	40%	20%
China	0%	0%	0%	0%											0%	0%
Hong Kong (China)	100%	100%	100%	100%	06 Feb	08 Mar	08 Apr	07 May	09 Jun	09 Jul	09 Aug	09 Sep	08 Oct	10 Nov	100%	100%
Japan	0%	0%	0%	0%											0%	0%
Lao PDR	42%	8%	8%	0%					07 Jun	07 Jul	09 Aug	08 Sep	08 Oct		50%	50%
Macao (China)	58%	8%	100%	92%	02 Feb	10 Mar	08 Apr	07 May	03 Jun	08 Jul	09 Aug	09 Sep	07 Oct	05 Nov	100%	100%
Malaysia	83%	58%	75%	8%	18 Feb	05 Mar		14 May	08 Jun	08 Jul	17 Aug	29 Sep	08 Oct	09 Nov	90%	50%
Mongolia	100%	100%	92%	92%	05 Feb	09 Mar	08 Apr	07 May	07 Jun	07 Jul	02 Aug	07 Sep	08 Oct	04 Nov	100%	100%
New Zealand	67%	0%	83%	8%	19 Feb	09 Mar	21 Apr	13 May	14 Jun	13 Jul	13 Aug	09 Sep	15 Oct	15 Nov	100%	20%
Papua New Guinea	0%	0%	0%	0%		10 Mar	12 Apr	11 May	25 May		23 Aug	11 Sep	08 Oct	10 Nov	80%	40%
Philippines	67%	17%	100%	33%	09 Feb	10 Mar	16 Apr	11 May	25 May	29 Jun	06 Aug	09 Sep	08 Oct	09 Nov	100%	80%
Republic of Korea	83%	50%	75%	50%	04 Feb	08 Mar	09 Apr	09 May	09 Jun	09 Jul	10 Aug	09 Sep	05 Oct	04 Nov	100%	100%
Singapore	100%	58%	100%	100%	06 Feb	05 Mar	07 Apr	07 May	08 Jun	07 Jul	06 Aug	07 Sep	07 Oct	08 Nov	100%	100%
Viet Nam, North	50%	25%	92%	58%	13 Feb	12 Mar	13 Apr	17 May	10 Jun	09 Jul	09 Aug	09 Sep	08 Oct	10 Nov	100%	60%
Viet Nam, South	67%	50%	92%	75%		12 Mar	15 Apr	24 May	11 Jun		09 Aug	07 Sep	09 Oct	08 Nov	80%	40%
Fiji	8%	0%	67%	58%			10 Apr	10 May		06 Jul	09 Aug	20 Sep	08 Oct	10 Nov	70%	60%
Completeness	57.8%		66.7%		59%	71%	71%	76%	82%	71%	88%	88%	82%	82%	77.1%	
Timeliness		33.8%		45.6%	41%	59%	41%	41%	65%	65%	71%	65%	76%	76%		60.0%

† Same standard for completeness is applied for both epidemiologic and laboratory reporting.

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

Incidence and deaths (Table 2A)

From January to October 2010, 51 645 confirmed measles cases were reported to the Regional Office, corresponding to an annualized incidence of 34.2 per million population. In comparison, reported measles incidence in all of 2009 was 34.0 per million. Countries and areas with the highest annualized incidence were the Philippines (68.0), Cambodia (61.1), China (38.4), the Lao People's Democratic Republic (28.2), and Viet Nam (18.0). Sixty-four measles-related deaths have been reported in the Region (case fatality rate [CFR] = 0.1%): 31 from the Philippines (CFR=0.6%), 26 from China (CFR = 0.06%), six from Cambodia (CFR=0.8%)

and one from Viet Nam (CFR=0.07%).

Clinically confirmed cases accounted for 55% of all confirmed cases (not including China, which reports aggregate data only). Countries and areas with a particularly high percentage of clinically confirmed cases were the Lao People's Democratic Republic (96%), Hong Kong (China) (64%), Cambodia (60%), the Philippines (58%), Malaysia (52%), Viet Nam (52%) and Japan (28%). Clinically confirmed measles cases are a failure of surveillance to accurately classify cases as confirmed or discarded by laboratory methods or epidemiologic linkage.

Surveillance performance indicators (Table 2B)

Reporting rate

The annualized discarded measles rate during the period January to October 2010 was 2.1 per 100 000 population (target > 2); eight of 17 countries and areas achieved the target. Only 32% of second-level administrative units reported ≥ 1 discarded measles case per 100 000 population (target $\geq 80\%$), down from 43% in 2009. Brunei Darussalam, Macao (China) and the Philippines achieved the target.

Adequate case investigation

From January through October 2010, 33% of reported measles cases were adequately investigated, a decrease compared to 43% in 2009. Brunei Darussalam and Macao (China) exceeded the target rate of 80%; countries and areas with 60% to 79% of suspected cases with

adequate investigations were Malaysia (68%), the Republic of Korea (64%), Cambodia (62%) and Hong Kong (China) (61%).

Adequate specimens

Adequate specimens were collected from 66% of reported cases, down from 72% in 2009. Five countries and areas (Brunei Darussalam, Macao [China], Malaysia, Mongolia and Papua New Guinea) exceeded the 80% target. Countries and areas with 60% to 79% of suspected cases with adequate specimens were Cambodia (78%), the Republic of Korea (74%), the Philippines (66%), Hong Kong (China) (61%) and Viet Nam (61%). In the Lao People's Democratic Republic, adequate specimens were collected from only 24% of reported cases.

Performance of national measles laboratory (Table 3A, 3B)

Laboratory results within 7 days

During the period January to October 2010, among 15 548 serum or blood and 216 dried blood spot (DBS) specimens tested for anti-measles IgM, 39% had results within seven days after receipt of specimens by laboratory (target $\geq 80\%$). Three NMLs had particularly low timeliness in laboratory testing, including Cambodia (16%), Viet Nam (south) (16%) and the Philippines (40%). Explanations for poor laboratory testing timeliness in these NMLs included an overload of serum specimens related to measles outbreaks and suspected H1N1 cases in 2010 and delay of provision of testing kits.

Alternative sampling

From January to October 2010, dried blood spot (DBS) samples were obtained from 216 suspected measles cases in the Region. Of these, 205 were from Cambodia, none of which was IgM positive or equivocal. In contrast, 377 (16%) of 2350 serologic specimens were IgM positive for measles in Cambodia. The difference in IgM positivity rates between DBS and serologic specimens in Cambodia was statistically significant ($P < 0.0001$), and suggests the possibility that the quality of DBS collection and/or testing under field conditions in Cambodia may not be adequate.

Virus detection

Among 406 specimens tested in two regional reference laboratories (RRLs) and three NMLs from January to Oc-

tober 2010, 36 (8.9%) measles virus isolates were obtained. Laboratories isolating measles virus were located in Viet Nam (south) (23), New Zealand (9), Hong Kong (China) (2), Australia (1) and Singapore (1). Reverse transcription-polymerase chain reaction (RT-PCR) conducted in the following laboratories revealed 103 measles virus strains among 605 specimens tested in 2010: Republic of Korea (44), Australia (42), New Zealand (10), Hong Kong (China) (4) and Viet Nam (south) (3).

Genotyping

From January to October 2010, the number of specimens with identified genotypes increased to 312 compared with 53 in 2009 and were reported from China (214), the Republic of Korea (39), Australia (37), Singapore (13), New Zealand (5) and Hong Kong (China) (4). The genotypes of measles virus identified from these countries in 2010 included H1, D9, D4, D8 and B3.

Rubella

During the period January to October 2010, among 13 410 specimens tested, 3578 (27%) tested positive and 534 equivocal for anti-rubella IgM. Countries with the largest number of IgM-positive rubella specimens were Viet Nam (1913; 1524 from the south and 389 from the north), the Philippines (1392), Malaysia (95), Cambodia (56), Singapore (43) and the Lao People's Democratic Republic (26).

Table 2A. Measles case classification and incidence, by country and area, Western Pacific Region, 2009 - 2010 ¹

Country	2009										2010 ¹									
	Population (in millions) ³	Suspected measles cases	Confirmed measles cases				Discarded cases	Pending classification	Deaths due to measles	Measles incidence per 1 million pop.	Population (in millions) ³	Suspected measles cases	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 ²	21.29	105	91	14	0	105	0	0	0	4.9	21.51	63	58	5	0	63	0	0	0	3.5
Brunei Darussalam	0.40	8	2	0	0	2	6	0	0	5.0	0.41	7	0	0	0	0	7	0	0	0.0
Cambodia	14.81	4779	115	0	750	865	3910	0	0	58.4	15.05	2133	304	0	462	766	1198	169	6	61.1
China	1345.75	59 950 ⁵	No data	No data	No data	52 461 ⁴	No data	No data	39 ⁵	39.0	1354.15	43 335 ⁵	No data	No data	No data	43 335 ⁵	No data	No data	26 ⁵	38.4
Hong Kong (China)	7.02	32	9	0	13	22	9	1	0	3.1	7.07	23	4	0	7	11	10	2	0	1.9
Japan	127.16	729	413	11	281	705	24	0	0	5.5	127.00	409	273	2	109	384	25	0	0	3.6
Lao PDR	6.32	276	21	51	0	72	158	46	2	11.4	6.44	328	6	0	145	151	176	1	0	28.2
Macao (China)	0.54	20	0	0	0	0	20	0	0	0.0	0.55	24	0	0	0	0	24	0	0	0.0
Malaysia	27.47	2219	50	5	1	56	2163	0	0	2.0	27.91	874	51	1	56	108	661	105	0	4.6
Mongolia	2.67	178	4	0	4	8	170	0	0	3.0	2.70	134	0	0	0	0	127	7	0	0.0
New Zealand	4.27	253	134	56	63	253	0	0	0	59.3	4.30	48	15	17	8	40	0	8	0	11.2
Papua New Guinea	6.73	82	0	0	0	0	82	0	0	0.0	6.89	25	0	0	0	0	0	25	0	0.0
Philippines	91.98	2926	658	8	819	1485	1441	0	10	16.1	93.62	9074	2128	99	3075	5302	3379	393	31	68.0
Republic of Korea	48.33	72	12	0	5	17	55	0	0	0.4	48.50	220	92	12	2	107	111	2	0	2.6
Singapore ²	4.74	16	16	0	0	16	0	0	0	3.4	4.84	41	41	0	0	41	0	0	0	10.2
Viet Nam	88.07	9545	2682	2275	264	5221	3970	354	2	59.3	89.03	4260	564	84	689	1337	1848	1075	1	18.0
Pacific island countries and areas																				
American Samoa	0.07	0	0	0	0	0	0	0	0	0.0	0.07	0	0	0	0	0	0	0	0	0.0
Cook Islands	0.02	2	0	0	0	0	2	0	0	0.0	0.02	0	0	0	0	0	0	0	0	0.0
Fiji	0.85	84	4	0	0	4	76	4	0	4.7	0.85	62	0	0	0	0	0	62	0	0.0
French Polynesia	0.27	0	0	0	0	0	0	0	0	0.0	0.27	0	0	0	0	0	0	0	0	0.0
Guam	0.18	1	0	0	0	0	1	0	0	0.0	0.18	0	0	0	0	0	0	0	0	0.0
Kiribati	0.09	0	0	0	0	0	0	0	0	0.0	0.10	0	0	0	0	0	0	0	0	0.0
Marshall Islands	0.06	0	0	0	0	0	0	0	0	0.0	0.05	0	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	0.11	0	0	0	0	0	0	0	0	0.0
Nauru	0.01	0	0	0	0	0	0	0	0	0.0	0.01	0	0	0	0	0	0	0	0	0.0
New Caledonia	0.25	1	0	0	0	0	1	0	0	0.0	0.25	0	0	0	0	0	0	0	0	0.0
Niue	0.00	0	0	0	0	0	0	0	0	0.0	0.00	0	0	0	0	0	0	0	0	0.0
Northern Mariana Islands	0.08	0	0	0	0	0	0	0	0	0.0	0.06	0	0	0	0	0	0	0	0	0.0
Palau	0.02	0	0	0	0	0	0	0	0	0.0	0.02	0	0	0	0	0	0	0	0	0.0
Samoa	0.18	0	0	0	0	0	0	0	0	0.0	0.18	0	0	0	0	0	0	0	0	0.0
Solomon Islands	0.52	2	0	0	0	0	1	1	0	0.0	0.54	0	0	0	0	0	0	0	0	0.0
Tokelau	0.00	0	0	0	0	0	0	0	0	0.0	0.00	0	0	0	0	0	0	0	0	0.0
Tonga	0.10	0	0	0	0	0	0	0	0	0.0	0.10	0	0	0	0	0	0	0	0	0.0
Tuvalu	0.01	0	0	0	0	0	0	0	0	0.0	0.01	0	0	0	0	0	0	0	0	0.0
Vanuatu	0.24	1	0	0	0	0	0	1	0	0.0	0.25	0	0	0	0	0	0	0	0	0.0
Wallis and Futuna	0.02	0	0	0	0	0	0	0	0	0.0	0.01	0	0	0	0	0	0	0	0	0.0
Western Pacific Region	1800.63	81 281	4211	2420	2200	61 292	12 089	407	53	34.0	1813.05	61 060	3536	220	4553	51 645	7566	1 849	64	34.2

¹ Monthly reports for January to October

² Reports only laboratory-confirmed cases

³ Population figures from World Population Prospects: The 2008 Revision, New York, United Nations, 2007.

⁴ Data from WHO/UNICEF Joint Reporting Form (JRF)

⁵ Based on the Notifiable Infectious Diseases statistic data of China CDC (<http://www.chinacdc.net.cn/n272442/n272530/n272757/32660.html>)

Green <1 confirmed measles case / 1 000 000 population
 Yellow 1-1.9 confirmed measles case / 1 000 000 population
 Red > 2 confirmed cases / 1 000 000 population

Table 2B. Measles surveillance performance indicators, by country and area, Western Pacific Region, 2009 - 2010 ¹

Country	2009					2010 ¹					
	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 ³	Percent clinically confirmed cases ⁴	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 ³	Percent clinically confirmed cases ⁴
	≥ 2	≥ 80%	≥ 80%	≥ 80%	≤ 10%	≥ 2	≥ 2	≥ 80%	≥ 80%	≥ 80%	≤ 10%
Australia ²	Insufficient data	Insufficient data	Insufficient data	Insufficient data	0.0%	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	0.0%
Brunei Darussalam	1.5	100.0%	87.5%	75.0%	0.0%	1.7	2.1	100.0%	85.7%	100.0%	0.0%
Cambodia	26.4	58.3%	41.5%	82.9%	86.7%	8.0	9.6	58.3%	62.4%	77.5%	60.3%
China	No data	No data	No data	No data	No data	No data	No data	No data	No data	No data	
Hong Kong (China)	0.1	0.0%	46.9%	71.9%	59.1%	0.1	0.2	0.0%	60.9%	60.9%	63.6%
Japan	0.0	0.0%	Insufficient data	Insufficient data	39.9%	0.0	0.0	0.0%	Insufficient data	Insufficient data	28.4%
Lao PDR	2.5	35.3%	42.4%	60.0%	0.0%	2.7	3.3	29.4%	18.9%	23.8%	96.0%
Macao (China)	3.7	100.0%	100.0%	100.0%	0.0%	4.4	5.3	100.0%	100.0%	100.0%	0.0%
Malaysia	7.9	86.7%	59.8%	72.4%	1.8%	2.4	2.8	73.3%	68.1%	80.5%	51.9%
Mongolia	6.4	47.6%	33.7%	98.9%	50.0%	4.7	5.6	33.3%	53.7%	91.0%	0.0%
New Zealand	Insufficient data	Insufficient data	Insufficient data	Insufficient data	24.9%	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	20.0%
Papua New Guinea	1.2	15.0%	25.6%	2.4%	0.0%	0.0	0.0	0.0%	40.0%	100.0%	0.0%
Philippines	1.6	82.4%	13.9%	56.5%	55.2%	3.6	4.3	94.1%	10.4%	65.8%	58.0%
Republic of Korea	0.1	0.0%	48.6%	59.7%	29.4%	0.2	0.3	6.3%	63.6%	74.0%	1.9%
Singapore ²	Insufficient data	Insufficient data	Insufficient data	Insufficient data	0.0%	Insufficient data	Insufficient data	Insufficient data	Insufficient data	Insufficient data	0.0%
Viet Nam	4.5	78.1%	48.5%	71.1%	5.1%	2.1	2.5	43.8%	55.8%	60.9%	51.5%
Pacific island countries and areas											
American Samoa	0.0	0.0%	Not applicable	Not applicable	Not applicable	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Cook Islands	10.2	100.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Fiji	8.9	50.0%	9.5%	13.1%	0.0%	0.0	0.0	0.0%	0.0%	0.0%	0.0%
French Polynesia	0.0	0.0%	Not applicable	Not applicable	Not applicable	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Guam	0.6	0.0%	100.0%	100.0%	0.0%	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Kiribati	0.0	0.0%	Not applicable	Not applicable	Insufficient data	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Marshall Islands	0.0	0.0%	Not applicable	Not applicable	Not applicable	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Micronesia, Federated States of	0.0	0.0%	Not applicable	Not applicable	Not applicable	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Nauru	0.0	0.0%	Not applicable	Not applicable	Not applicable	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
New Caledonia	0.4	0.0%	100.0%	0.0%	0.0%	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Niue	0.0	0.0%	Not applicable	Not applicable	Insufficient data	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Northern Mariana Islands	0.0	0.0%	Not applicable	Not applicable	Not applicable	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Palau	0.0	0.0%	Not applicable	Not applicable	Not applicable	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Samoa	0.0	0.0%	Not applicable	Not applicable	Not applicable	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Solomon Islands	0.2	0.0%	0.0%	50.0%	0.0%	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Tokelau	0.0	0.0%	Not applicable	Not applicable	Not applicable	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Tonga	0.0	0.0%	Not applicable	Not applicable	Not applicable	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Tuvalu	0.0	0.0%	Not applicable	Not applicable	Insufficient data	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Vanuatu	0.0	0.0%	0.0%	0.0%	0.0%	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Wallis and Futuna	0.0	0.0%	Not applicable	Not applicable	Not applicable	0.0	0.0	0.0%	Not applicable	Not applicable	Not applicable
Western Pacific Region	2.8	43.1%	42.6%	71.6%	24.9%	1.8	2.1	31.5%	32.5%	66.2%	8.8%

¹ Monthly reports for January to October

² Reports only laboratory-confirmed cases

³ Excludes epi-linked cases; not applicable for countries reporting only laboratory-confirmed cases

⁴ Among all confirmed cases

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

Table 3A. Measles and rubella laboratory performance, Western Pacific Region, 2009

Country	Measles and rubella		Measles														Rubella					
			Serology									Virus detection					Serum and blood				Virus detection	
	Total number of suspected cases tested	Total number of samples received	Serum and blood						DBS		Results ≤ 7 days	Measles Virus isolation (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 pending	Measles IgM (-)		DBS samples			No. of samples tested	No. of isolates	No. of samples tested	No. of (+)							
Australia	158	256	117	27	4	0	86	73.5%	0	0	100%	78	0	78	42	37	68	102	7	1	0	0
Cambodia	3988	4022	3631	112	1	0	3518	96.9%	391	4	38.7%	0	0	0	0	0	116	3596	518	0	0	0
China																						
Hong Kong (China)	158	250	157	8	3	0	146	93.0%	0	0	96.2%	14	0	9	4	4	9	137	7	0	0	2
Japan																						
Lao PDR	223	223	223	27	6	0	190	85.2%	0	0	94.0%	0	0	0	0	0	27	196	43	23	0	0
Macao (China)	54	54	54	0	0	0	54	100%	0	0	98.2%	0	0	0	0	0	0	31	1	1	0	0
Malaysia	2104	2104	2103	53	19	0	2031	96.6%	0	0	100%	0	0	0	0	0	53	1455	288	93	0	0
Mongolia	177	177	177	3	4	0	170	96.0%	0	0	100%	0	0	0	0	0	3	174	3	0	0	0
New Zealand	463	640	443	55	17	0	371	83.7%	0	0	99.5%	153	0	151	48	10	74	106	0	0	0	0
Papua New Guinea																						
Philippines	2118	2118	2118	659	42	0	1417	66.9%	0	0	73.5%	0	0	0	0	0	659	1279	310	64	0	0
Republic of Korea	76	79	74	29	3	0	42	56.8%	0	0	96.1%	2	0	2	2	2	29	74	9	5	0	0
Singapore	474	527	172	8	5	0	159	92.4%	0	0	96.4%	200	0	0	0	0	8	374	29	5	0	0
Viet Nam (north)	4049	4049	3890	2184	293	0	1413	36.3%	0	0	58.0%	96	23	0	0	0	2184	2110	512	108	0	0
Viet Nam (south)	5927	7192	5927	2862	116	0	2949	49.8%	0	0	32.5%	165	36	84	32	0	2867	5927	1043	87	0	0
Fiji	76	76	76	5	2	0	69	90.8%	0	0	100%	0	0	0	0	0	5	76	5	1	0	0
Total	20 045	21 767	19 162	6032	515	0	12 615	65.8%	391	4	54.9%	708	59	324	128	53	6102	15 637	2775	388	0	2

Table 3B. Measles and rubella laboratory performance, Western Pacific Region, 2010¹

Country	Measles and rubella		Measles														Rubella					
			Serology									Virus detection					Total number of lab confirmed cases	Serum and blood				Virus detection
	Total number of suspected 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	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	DBS samples	No. received		No. (+)	No. of samples tested	No. of isolates	No. of samples tested			No. of (+)					No. of samples genotyped
Australia	89	157	57	13	0	41	71.9%	3	0	-	100%	13	1	75	42	37	42	52	11	0	3	0
Cambodia	2350	2350	2350	377	23	1950	83.0%	0	205	0	16.0%	0	0	0	0	0	377	2350	56	13	0	0
China																214 *						0
Hong Kong (China)	110	148	104	5	2	97	93.3%	0	0	-	97.1%	23	2	13	4	4	6	100	11	2	0	8
Japan																						0
Lao PDR	83	83	83	6	1	76	91.6%	0	0	-	86.7%	0	0	0	0	0	6	83	26	6	0	0
Macao (China)	49	49	49	1	0	48	98.0%	0	0	-	98.0%	0	0	0	0	0	1	49	2	2	0	0
Malaysia	752	752	725	48	12	665	91.7%	0	0	-	100%	0	0	0	0	0	48	619	95	51	0	0
Mongolia	130	130	130	0	0	130	100%	0	0	-	100%	0	0	12	0	0	0	130	7	0	0	0
New Zealand	218	240	133	5	6	118	88.7%	4	0	-	93.2%	50	9	112	10	5	21	58	1	0	22	0
Papua New Guinea	33	33	32	0	0	32	100.0%	1	1	-	75.0%	0	0	0	0	0	0	33	5	2	1	0
Philippines	6567	6594	6594	2527	208	3858	58.5%	1	0	-	40.4%	0	0	0	0	0	2509	4085	1392	226	1	0
Republic of Korea	284	435	253	56	30	167	66.0%	0	0	-	98.0%	0	0	201	44	39	81	194	15	14	1	0
Singapore	799	1023	159	16	3	140	88.1%	0	0	-	98.6%	162	1	0	0	13	16	701	43	30	0	0
Viet Nam (north)	1059	1059	781	224	45	511	65.4%	1	0	-	92.2%	0	0	0	0	0	224	858	389	52	2	0
Viet Nam (south)	4049	4241	4049	876	39	3121	77.1%	13	0	-	16.4%	158	23	192	3	0	878	4049	1524	134	844	0
Fiji	49	49	49	1	5	43	87.8%	0	10	0	88.1%	0	0	0	0	0	1	49	1	2	2	0
Total	16 621	17 343	15 548	4155	374	10 997	70.7%	23	216	0	39.1%	406	36	605	103	312	4210	13 410	3578	534	876	8

¹ Monthly reports for January to October

* Reported to the WHO Headquarters Genotype Database

Data discrepancies between national and laboratory reports

Discrepancies between national and laboratory reports continue to exist with respect to the number of laboratory-confirmed measles cases. Regionally, national reports indicated 3536 laboratory-confirmed cases from January to October 2010 (Table 2A) compared with 4135 cases from 4155 IgM-positive samples reported by the measles laboratory network (Table 3B). While the number of laboratory-confirmed cases reported nationally may be *greater than* the number of IgM-positive cases reported by the NML because non-serologic methods of confirmation may be used, the number of laboratory-confirmed cases reported nationally should not be

less than the number of IgM-positive cases reported by the NML. Countries in which the number of laboratory-confirmed cases reported nationally (Table 2A) was less than the number of IgM-positive cases reported by the NML(s) during the period January to October 2010 included Cambodia (304 vs. 377), Hong Kong (China) (4 vs. 5), the Philippines (2128 vs. 2509) and Viet Nam (564 vs. 1100). Close and regular collaboration between programme and epidemiology units and NMLs is essential to reconcile these and potentially other data discrepancies.

Special Topics

Technical Advisory Group Recommendations

Recommendations from the 19th Meeting of the Technical Advisory Group on Immunization and Vaccine Preventable Diseases in the Western Pacific Region (TAG) on achieving and sustaining measles elimination and accelerating rubella control and prevention of congenital rubella syndrome (CRS) were as follows:

Measles Elimination

1. *Recommendations from the 2009 TAG meeting on achieving high immunization coverage, supplementary immunization activities, routine measles-containing vaccine (MCV) schedules and surveillance remain valid. The TAG appreciates the Region'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 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 to draft a resolution reaffirming Member State commitment to achieve the measles elimination goal and to establish a verification process.*
4. *The TAG urges member countries 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 budgets of national and subnational immunization 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 less than 10% and give more emphasis on collecting adequate specimens and establishing epidemiologic linkages through quality case investigations that include additional case finding. Where countries do not yet approach elimination, expert committees should analyse the reasons for accumulation of susceptibles (geographically, age groups) and advise 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 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. *The TAG recommends that serological or clinical confirmation of reported suspected measles cases should only be applied to cases that satisfy the WHO-recommended clinical case definition of fever, rash and one or more of the following: cough or 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 Regional Office.
9. The TAG recommends that countries and the Regional Office should systematically review and document contributions of measles elimination activities to child health, routine immunization systems, and health systems.

Country-specific recommendations

10. The TAG commends China for its plans to conduct a nationwide SIA in September 2010, and recommends that the country should ensure effective strategies to achieve universally high SIA coverage with a special focus on reaching the previously unreached populations (e.g. migrants, people in remote or poor areas, children born outside of family planning policy).
11. 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 if measles virus circulation has been interrupted, by conducting intensified surveillance following SIA implementation. The TAG also suggests that Viet Nam should consider an additional SIA that targets young adults, prioritizing those at highest risk of measles such as students, health care workers and others that live or work in communal settings.
12. The TAG expresses concern regarding the measles outbreak in the Philippines in 2010 and encourages the Government to make the needed political and financial commitments to conduct a high-quality SIA in 2011 targeting children up to seven years old.
13. The TAG recommends that Cambodia should ensure (a) uninterrupted immunization and surveillance operations, including those of the laboratory; (b) 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 (c) introduce MCV2 for 15- to 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).

14. The TAG urges the Lao People's Democratic Republic to significantly improve its measles surveillance efforts, particularly in case reporting and laboratory quality. Also, the planned 2011 measles SIAs in the Lao People's Democratic Republic should be conducted in the same high-quality fashion as was done in 2007.

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 member countries and areas with a rubella control goal should use the revised Regional Plan for Control of Rubella and Prevention of CRS in the Western Pacific Region, 2010 to 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 rubella-containing vaccine may consider adopting a rubella control goal provided they commit to conducting periodic SIAs with measles-rubella or measles-mumps-rubella vaccines. 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 child-bearing-age women should adopt practical vaccination strategies to increase population immunity among them.

Regional Committee Resolution WPR/RC61/R7 on Vaccine Preventable Diseases

On 7 October 2010, the World Health Organization Regional Committee for the Western Pacific reviewed the status of vaccine preventable diseases including measles elimination, hepatitis B control, and poliomyelitis eradication and resolved as follows:

The Regional Committee,

Noting resolution WPR/RC56.R8 that called for the elimination of measles by 2012 and a reduction in the seroprevalence of hepatitis B surface antigen (HBsAg) to less than 2% in five-year-old children by 2012 as an interim milestone towards the final regional goal of less than 1% HBsAg;

Aware of the ongoing risk that importations of wild poliovirus pose to the maintenance of poliomyelitis-free status in the Western Pacific Region;

Noting resolution WPR/RC54.R3 that calls for the use of measles elimination and hepatitis B control strategies as means to strengthen the Expanded Programme on Immunization and other public health programmes, such as those intended to prevent the spread of congenital rubella syndrome;

Mindful of the positive impact of poliomyelitis eradication, measles elimination and hepatitis B control strategies in the Western Pacific Region on child health, immunization systems and overall health;

Recognizing that many countries and areas have made dramatic progress towards the achievement of the 2012 goals of measles elimination and the reduction in seroprevalence of HBsAg to less than 2%, but that many others face substantial financial and operational challenges to achieve the 2012 goals,

1. REAFFIRMS the 2012 measles elimination goal and the hepatitis B control goal and milestone, and the maintenance of poliomyelitis-free status;

2. URGES Member States:

(1) to commit the human and financial resources necessary to achieve and sustain the measles elimination and

hepatitis B control goals, and to maintain poliomyelitis-free status;

(2) to develop and implement workplans to ensure high immunization coverage against measles, hepatitis B and poliomyelitis, and sensitive and timely epidemiologic and laboratory surveillance to achieve measles elimination and maintain poliomyelitis-free status;

(3) to report measles and poliomyelitis, and where feasible rubella, surveillance data to the Regional Office in a regular and timely manner;

(4) to establish an independent national verification process for measles elimination following the establishment by the WHO Regional Office for the Western Pacific of standardized regional verification mechanisms;

(5) to accelerate control of rubella and the prevention of congenital rubella syndrome;

(6) to vigorously implement all activities to maintain poliomyelitis-free status;

3. REQUESTS the Regional Director:

(1) to establish Regional verification mechanisms for measles elimination;

(2) to strengthen technical cooperation with Member States to achieve regional immunization goals;

(3) to seek additional resources to achieve regional goals utilizing frequent interagency coordination committee meetings and other mechanisms;

(4) to report progress periodically to the Regional Committee.