Situation updates of Measles and Measles vaccination recommendation for HCWs in Hong Kong

SMO(SS), CDD, SEB

Centre for Health Protection

Department of Health, HKSAR

Overview

- Global and regional measles situations
- Measles in Hong Kong
  - Epidemiology overview
  - Latest situation in 2019
- Vaccination recommendation
  - For general public
  - For Health Care Workers (HCWs)

GLOBAL & REGIONAL SITUATIONS

Measles

Mode of transmission

- airborne by droplet spread
- direct contact with nasal or throat secretions of infected persons
- articles soiled with nasal or throat secretions

Symptoms

- fever, cough, runny nose, red eyes and white spots inside the mouth
- red blotchy skin rash 3 to 7 days later , usually from face to body and lasts 4 - 7 days (up to 3 weeks leaving with brownish staining and sometimes fine skin peeling)
- severe cases - lung, gut and brain can get involved and lead to serious consequences or even death.

Incubation period

usually ranges from 7-18 days, up to 21 days

Communicable Period

4 days before to 4 days after rash onset

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Vaccine Preventable Disease

United States Centers for Disease Control and Prevention (US CDC)

- Vaccine is effective
  - *two doses of MMR vaccine are 97% effective*
  - *one dose is 93% effective against measles*

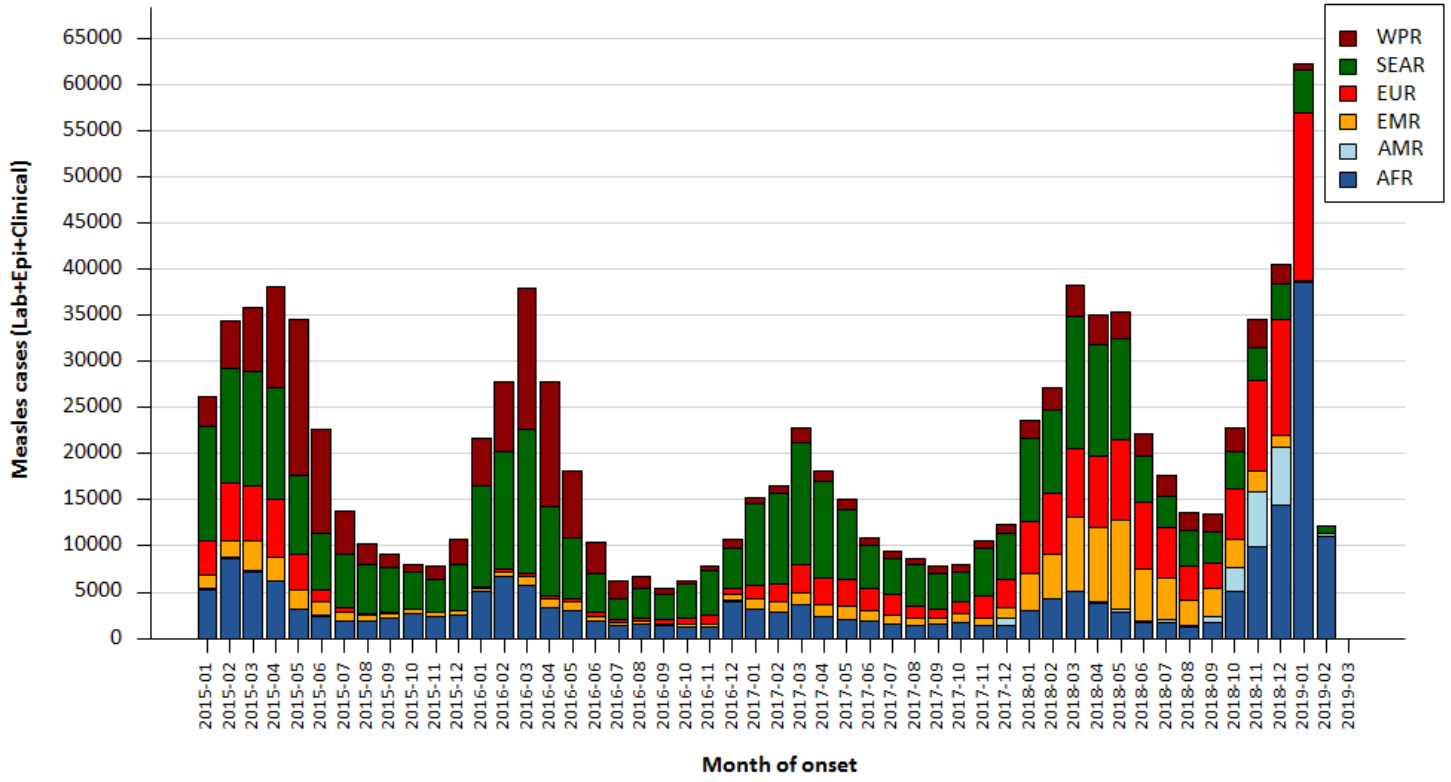
World Health Organization (WHO)

- Long term protection
  - *evidence shows that healthy people in general can enjoy long term, even lifelong protection after receiving measles vaccination as recommended*
- Herd Immunity
  - *95% coverage is needed to protect people who are unvaccinated or non-immune to measles from the risk of infection and transmission and to prevent outbreaks*

Global situation – Measles Cases (2015 - early 2019)

Measles case distribution by month and WHO Region (2015-2019)

World Health Organization



Notes: Based on data received 2019-03 - Data Source: IVB Database - This is surveillance data, hence for the last month(s), the data may be incomplete.

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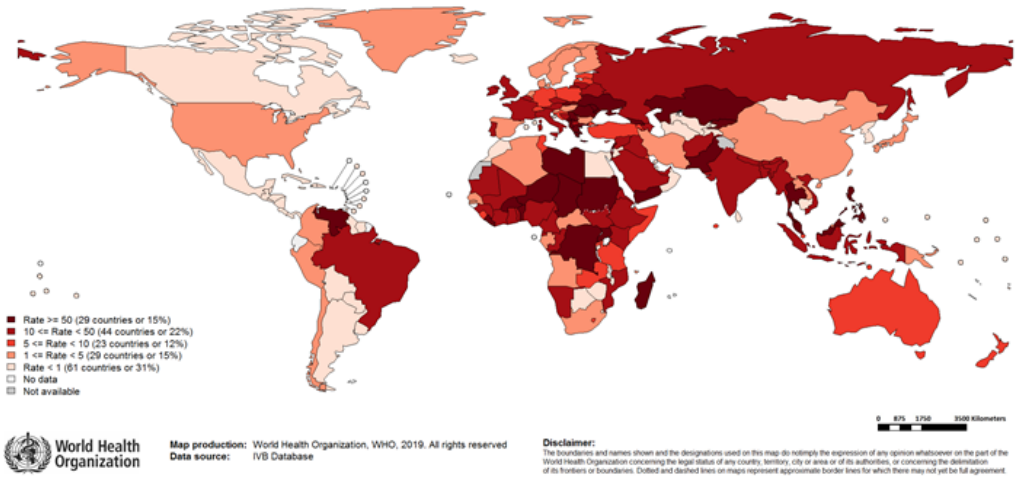
Global situation
– Measles 12-month Incidence (early 2019)

Measles Incidence Rate per Million (12M period)

World Health Organization

Top 10**		
Country	Cases	Rate
Ukraine	63948	1439.02
India	63364	47.85
Madagascar	59407	2386.35
Pakistan	30747	159.14
Philippines	19401	187.78
Yemen	11746	425.82
Brazil	10262	49.42
Nigeria	5847	31.44
Venezuela (Bolivarian Republic of)	5668	179.55
Thailand	5579	81.02

Other countries with high incidence rates***		
Country	Cases	Rate
Georgia	3176	809.09
Liberia	3194	692.27
Albania	1476	504.38
Serbia	4176	473.46
Israel	3377	412.24
Montenegro	201	319.75
Kyrgyzstan	1509	253.37



Measles cases from countries with known discrepancies between case-based and aggregate surveillance, as reported by country			
Country	Year	Cases	Data Source
DR Congo	2018	67072	SITUATION EPIDEMIOLOGIQUE DE LA ROUGEOLE EN RDC, Week of 05/03/2019
	2019	17646	
Somalia	2018	9135	Somali EPI/POL Weekly Update Week 09
	2019	720	

Notes: Based on data received 2019-03 and covering the period between 2018-02 and 2019-01 - Incidence: Number of cases / population* * 100,000 - * World population prospects, 2017 revision - ** Countries with the highest number of cases for the period - *** Countries with the

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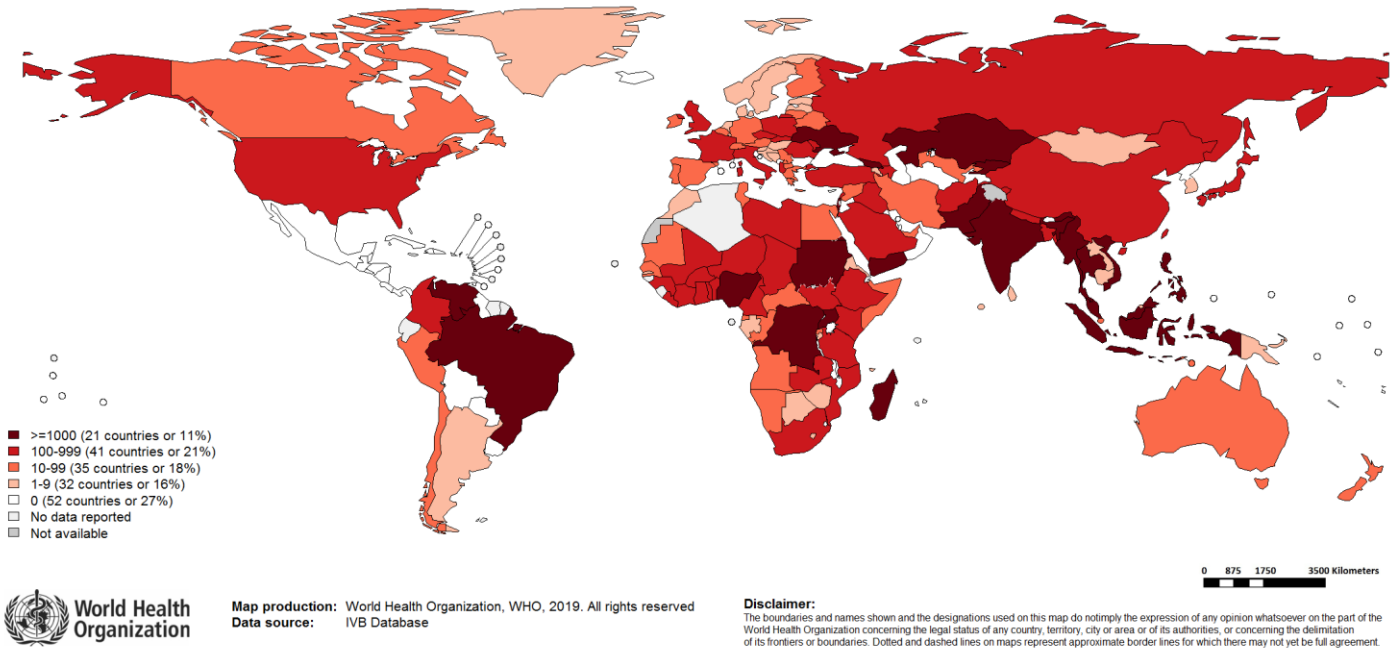
Global situation – Measles Cases (6-month period)

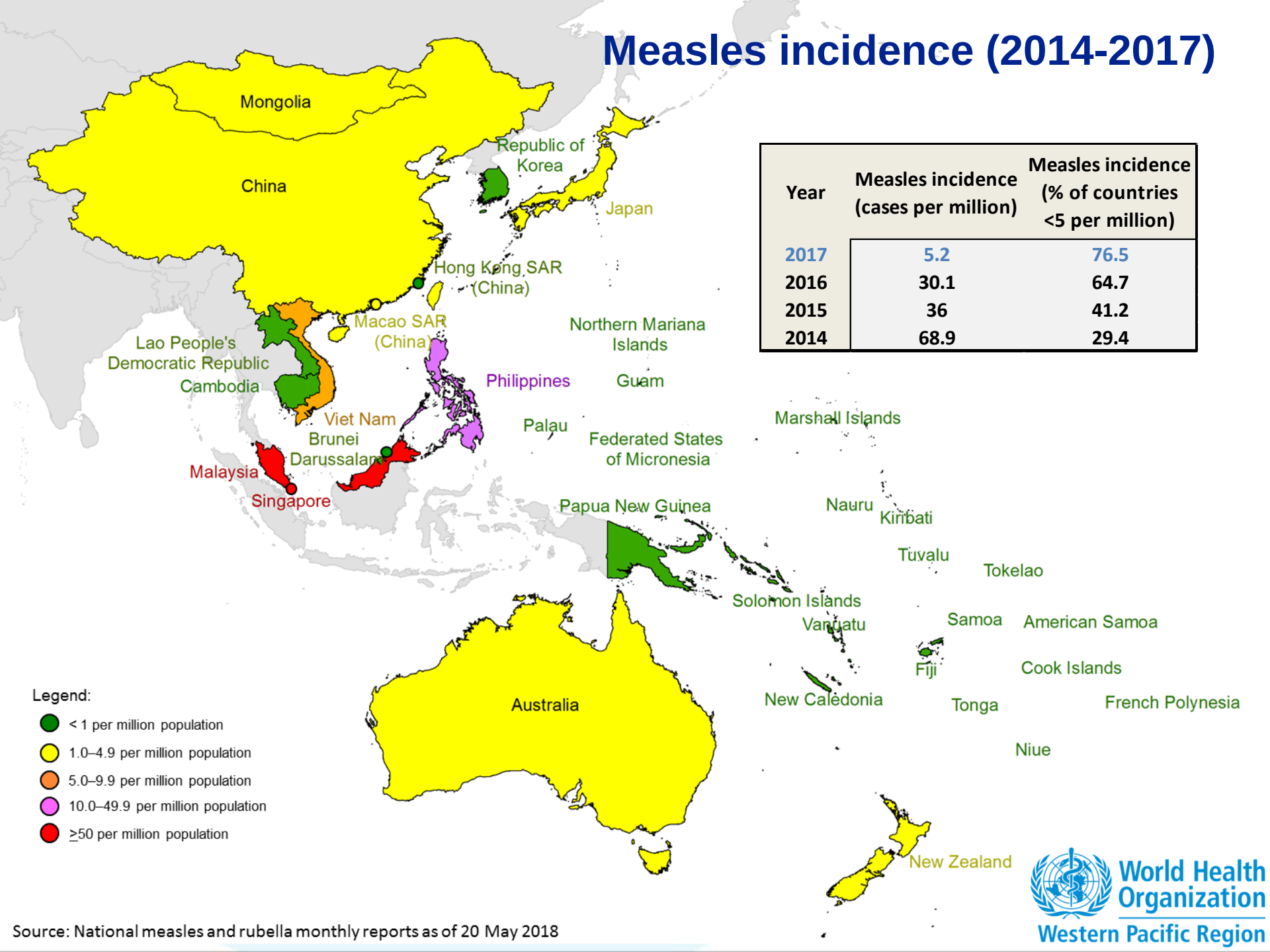
Top 10*	
Country	**Cases**
Madagascar	59388
Ukraine	40031
India	14304
Brazil	9198
Philippines	8212
Venezuela (Bolivarian Republic of)	5668
Thailand	4871
Pakistan	4775
Yemen	4057
Israel	3146



Notes: Based on data received 2019-03 - Surveillance data from 2018-08 to 2019-01 - * Countries with highest number of cases for the period

Measles incidence (2014-2017)

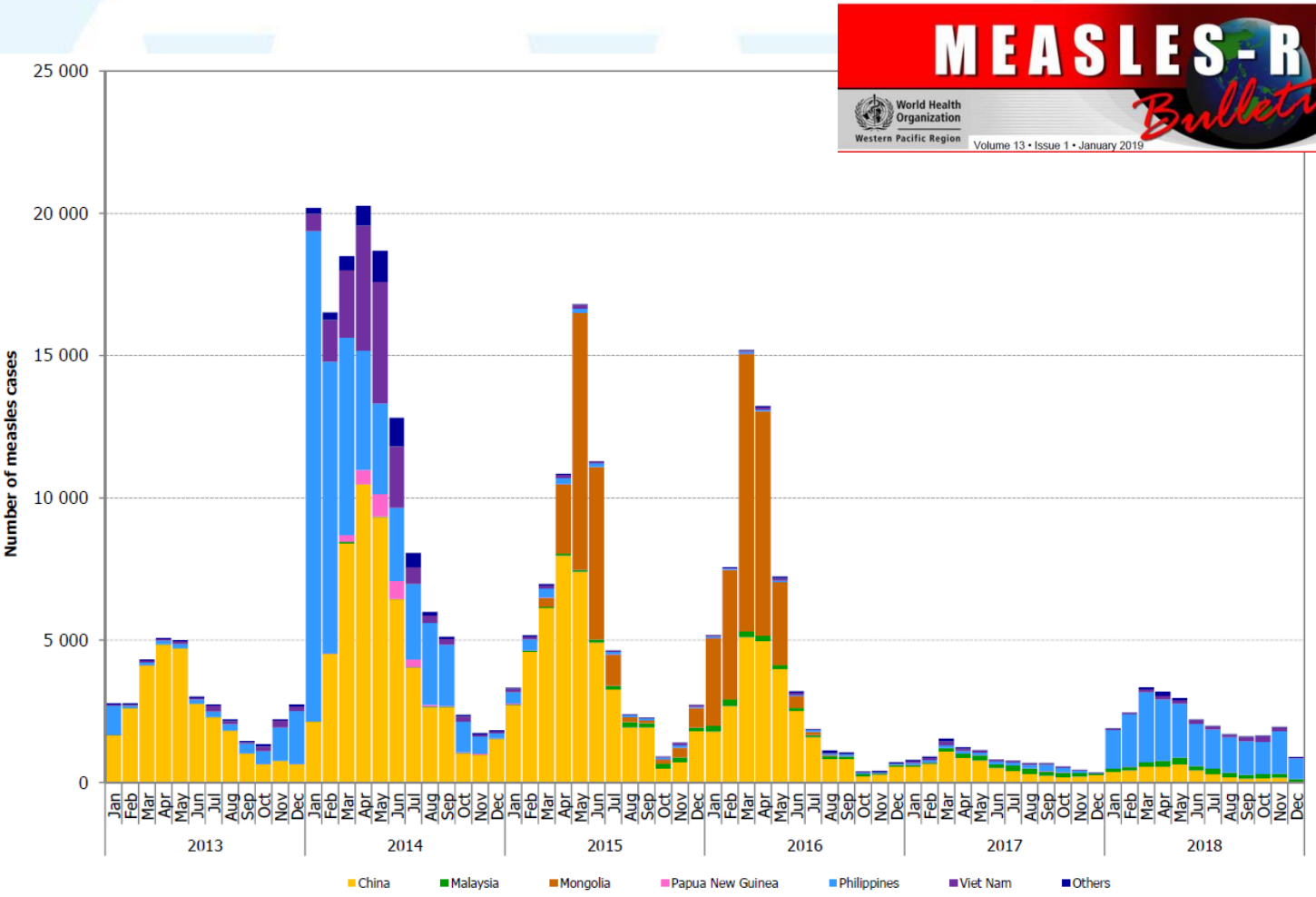
Year	Measles incidence (cases per million)	Measles incidence (% of countries <5 per million)
2017	5.2	76.5
2016	30.1	64.7
2015	36	41.2
2014	68.9	29.4



Source: National measles and rubella monthly reports as of 20 May 2018

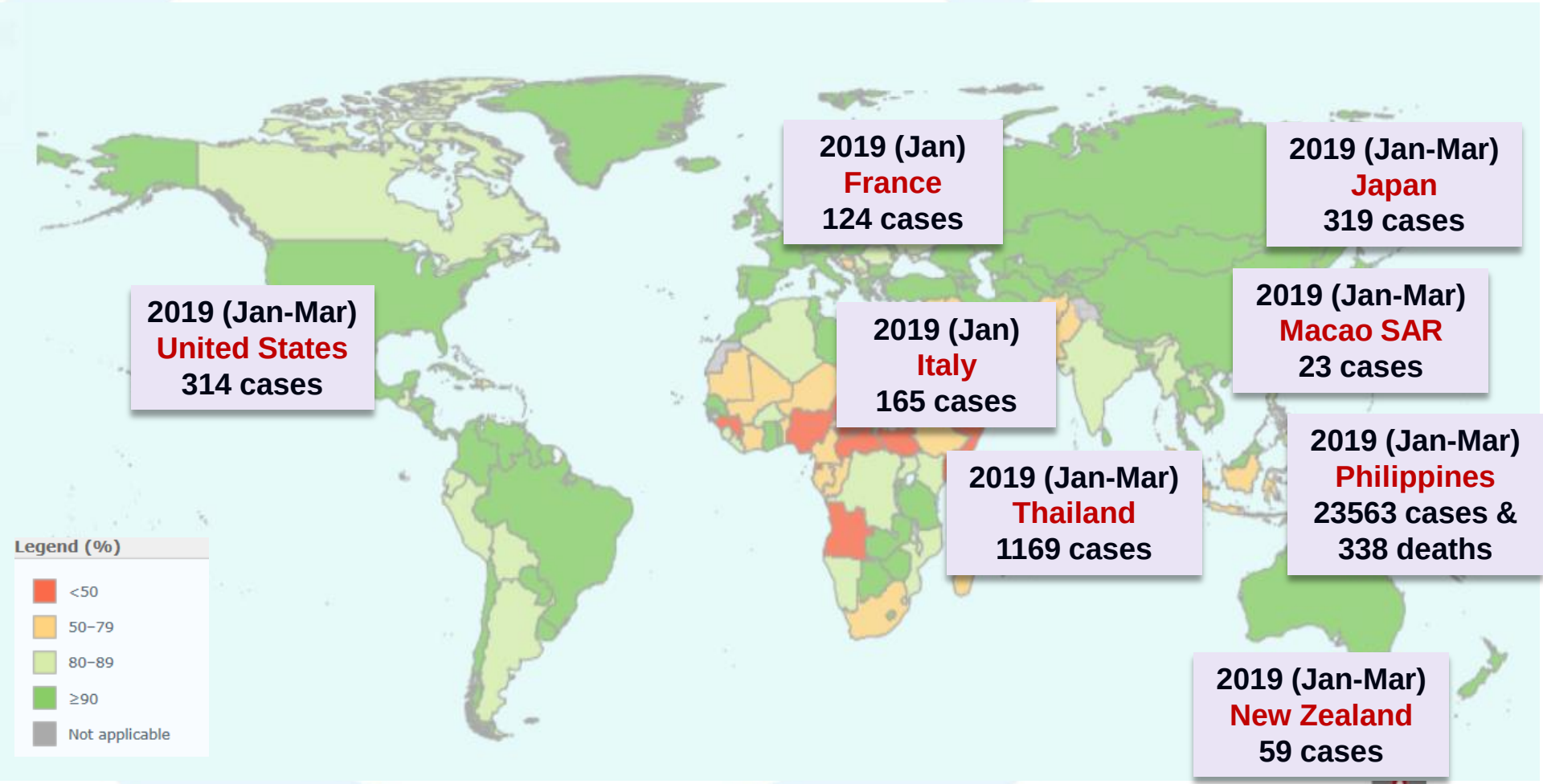
World Health Organization
Western Pacific Region

Regional situation – Measles Cases (2013-2018)



Source: Measles and rubella monthly country reports to WHO by 20 January 2019

Global measles situation (2019)



Source: WHO, US CDC, ECDC, Japan NIID, Philippines NDRRMC, NZ Immunization Advisory Centre, Macao CDC

Measles incidence & vaccine coverage
- Selected countries (12-month incidence / million population)

	Incidence	MCV1 (2017)	MCV2 (2017)
Philippines	155.9^	89%	**80%**
Malaysia	86.4	93%	99%
Thailand	81.0	99%	95%
Indonesia	16.9	75%	**63%**
Vietnam	12.6^	97%	**93%**
New Zealand	9.2	93%	**90%**
Singapore	8.2	95%	**90%**
Japan	3.3	96%	95%
Greece	154.5	97%	**83%**
Italy	44.3	92%	**86%**
France	43.3	90%	**80%**
United Kingdom	14.3	92%	**88%**
Hong Kong	4.9	98%	98%

Source: WHO measles data: http://www.who.int/immunization/monitoring_surveillance/burden/vpd/surveillance_type/active/measles_monthlydata/en/ (Data as of Mar 7, 2019). ^Note: Data for the Philippines and Vietnam was up to Jan 9, 2019.
WHO MCV1 & MCV2 coverage: http://apps.who.int/gho/data/node.main.A824?lang=en

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Overview

MEASLES IN HONG KONG

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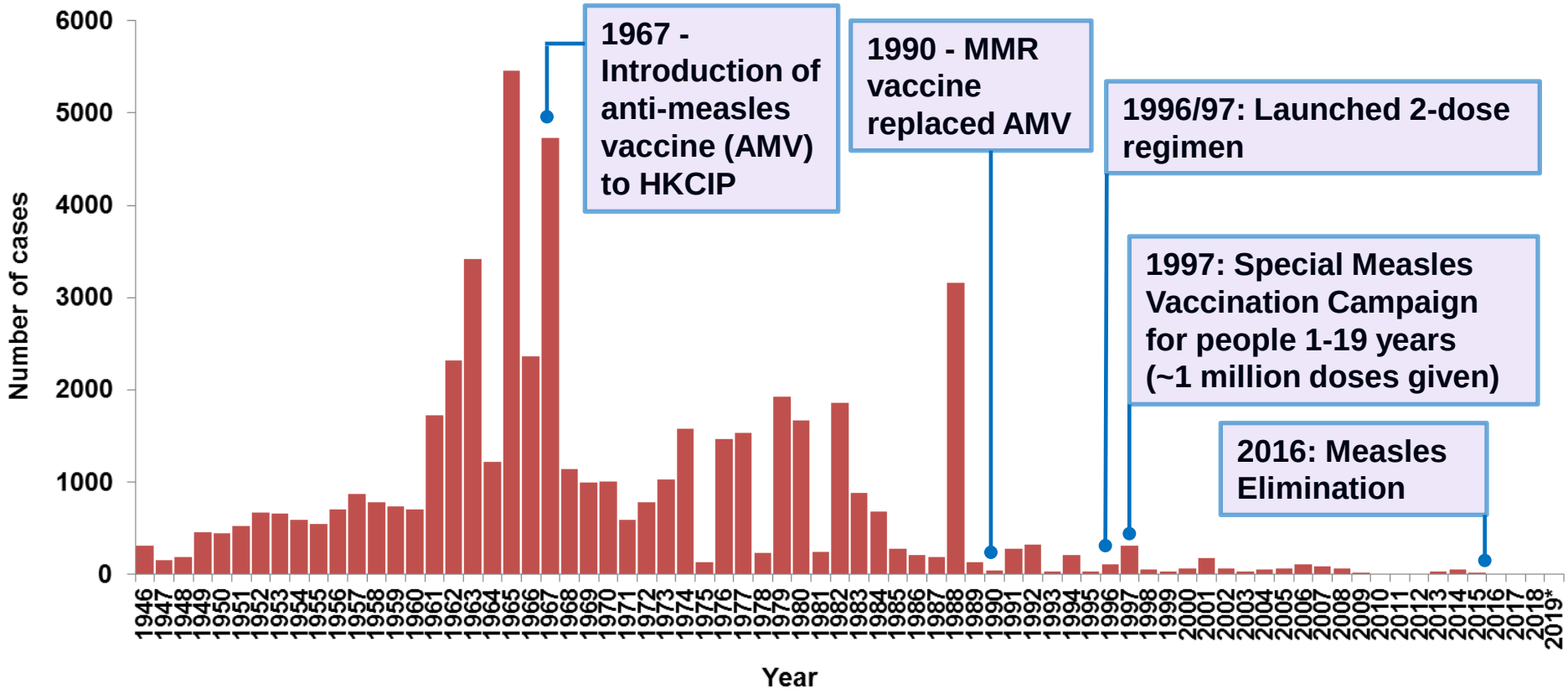
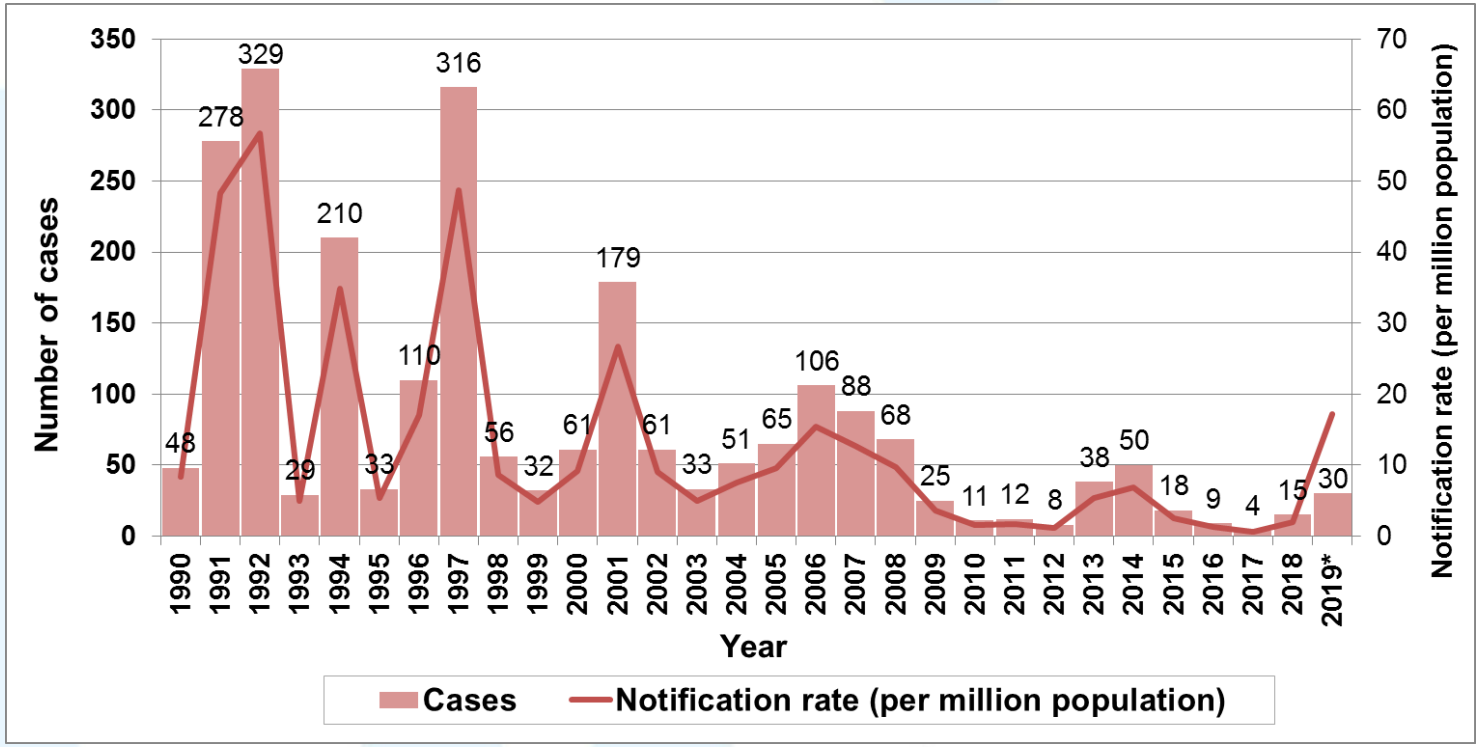
Measles notification in HK, 1946-2019*

- HK was verified by WHO as having achieved measles elimination in Sep 2016.
- Reported measles cases have remained at very low level since 2016.



Measles cases & outbreaks 1990 – 2019*

*Data as of 27 March 2019 2pm

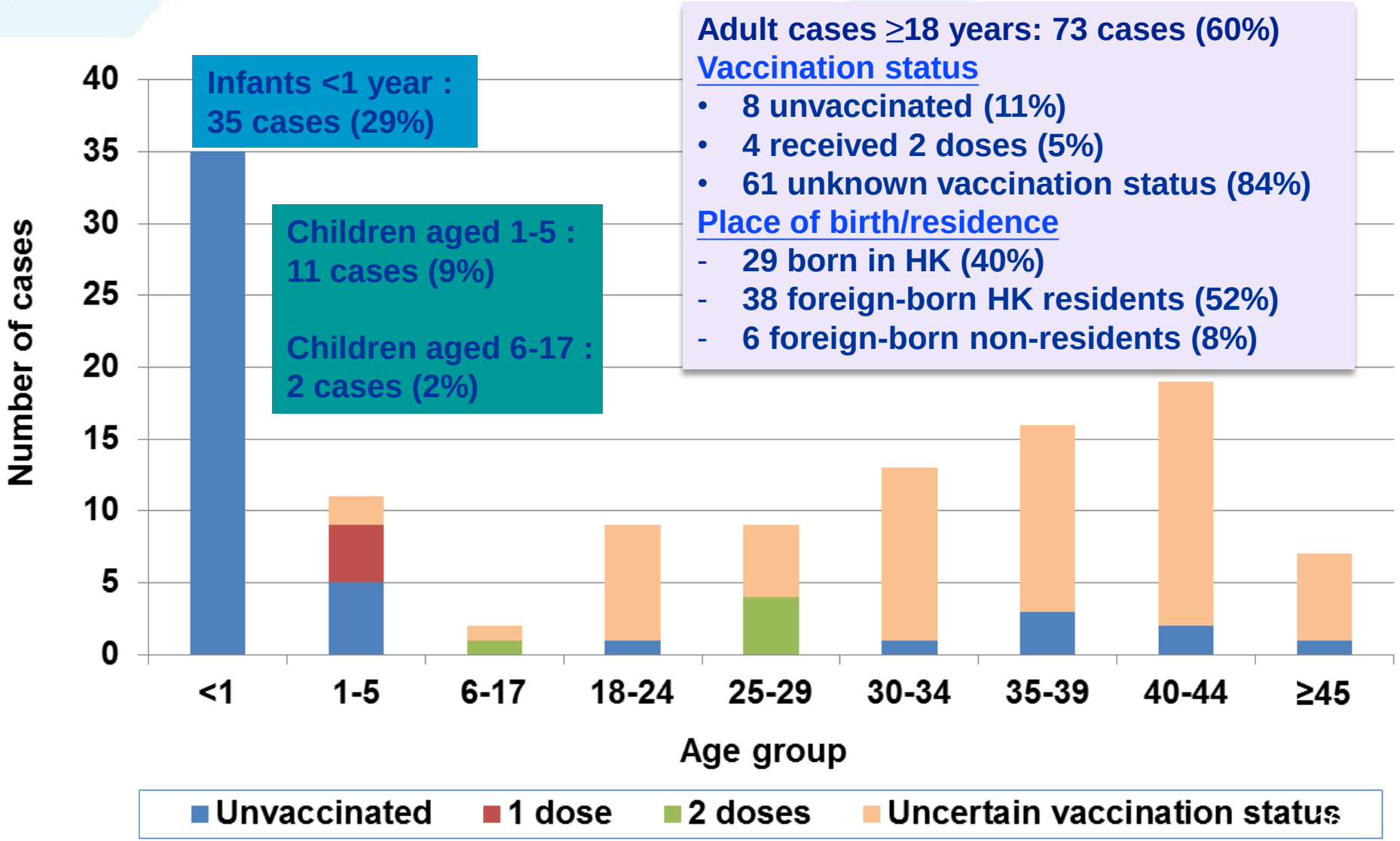


Measles clusters/Year	2014	2015	2016	2017	2018
No. of clusters (total persons affected)	6 (10)^	1 (5)	-	-	2 (4)
Cluster size (persons)	2	5	-	-	2
Outbreak setting	Hospital (4) Home (2)	Hospital	NA	NA	Home

^ Two clusters involved in more than one cluster.

Vaccination status of measles cases by age group and place of birth/residence, 2014 - 2019*(N=121)

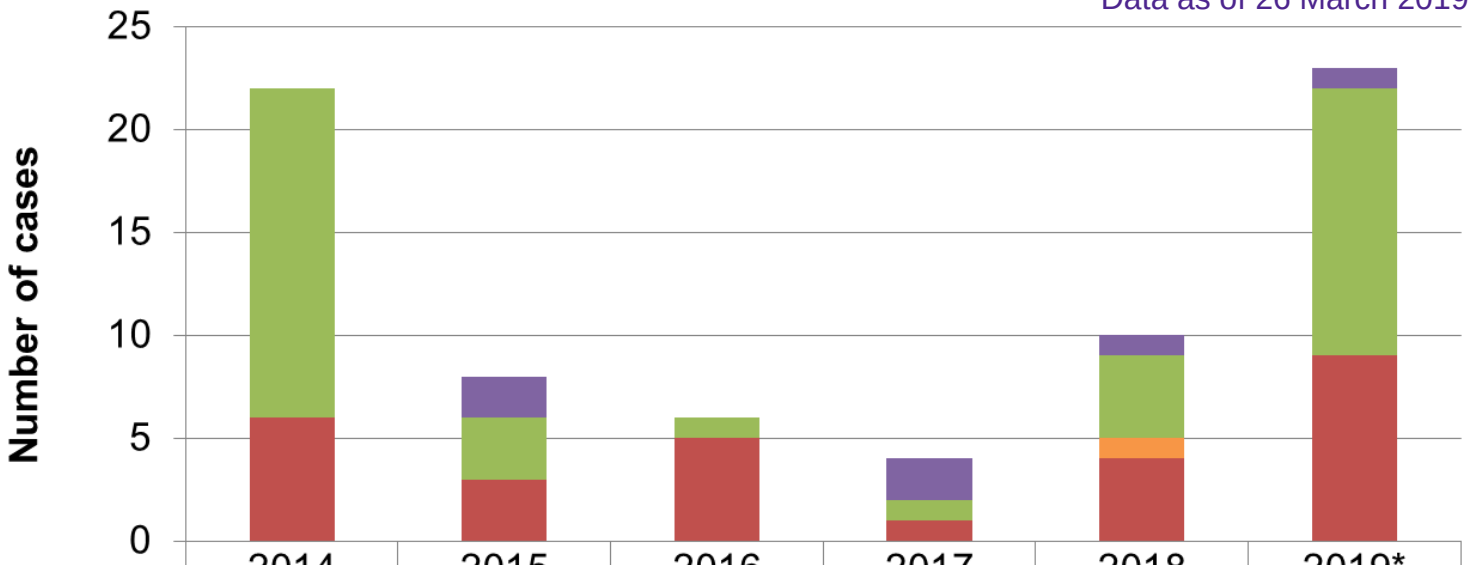
*Data as of 26 March 2019



Reported adult measles cases by population subgroup, 2014-2019* (n=73)

*Data as of 26 March 2019

Foreign born	60%
HK born	40%



	2014	2015	2016	2017	2018	2019*
Foreign born non-residents	0	2	0	2	1	1
Foreign born residents	16	3	1	1	4	13
HK born non-residents	0	0	0	0	1	0
HK born residents	6	3	5	1	4	9

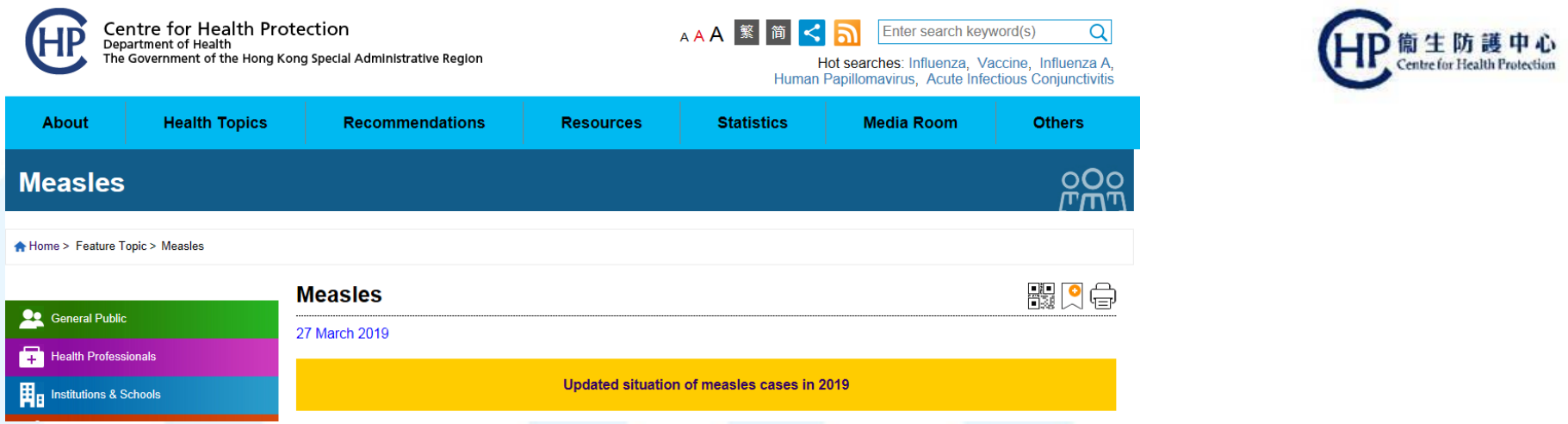
Cases/Year	2014	2015	2016	2017	2018	2019*
Total	50	18	9	4	15	25
Adult cases	22 (44%)	8 (44%)	6 (67%)	4 (100%)	10 (67%)	23 (92%)
Children cases	28 (56%)	10 (56%)	3 (33%)	0	5 (33%)	2 (8%)

Measles cases in Hong Kong by importation status and place of importation(2014-2019)*

*Data as of 28 March 2019, 4pm

Year	Total	Imported cases	Place of importation
2014	50	24	Mainland China (14), Philippines (6), India (1), Kenya (1), Taiwan (1) and the United States (1)
2015	18	4	Mainland China (3) and Indonesia (1)
2016	9	1	Indonesia (1)
2017	4	3	Australia (1), Indonesia (1) and Italy (1)
2018	15	6	Mainland China (2), Philippines (2), Indonesia (1) and Pakistan (1)
2019*	31^	10	Philippines (6), Mainland (2), Japan (1) and multiple destinations (1)

^ other cases (including some with travel history) are still under investigation and pending classification



Latest update in 2019 – featuring outbreak at the Hong Kong International Airport

MEASLES IN HONG KONG

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MEASLES CASES IN HONG KONG (2019) - PERSONS

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DAILY UPDATE ON MEASLES SITUATION IN HONG KONG As of 4:00 PM, March 28, 2019

In 2019, as of March 28, the Centre for Health Protection of the Department of Health received notification of 31 cases of measles infection. They were 18 males and 13 females, aged from 8 months to 46 years.

Eleven of the cases affected nine workers of the Hong Kong International Airport (HKIA) and two crew members of a local airline. Another cluster involved an infant aged 11 months and her relative living in the same household, both had travelled to Mainland China during their incubation period. The remaining cases so far did not have any epidemiological linkage identified and the majority had travel history outside Hong Kong during their incubation period. The details are shown in the table below.

Summary of measles cases in 2019 (as of March 28, 2019):

Case number	Sex/Age	Date of rash onset	Travel history within incubation period	Place of birth	Genotype	Documented evidence of measles vaccination	Remarks
1	M/41	29/12/2018	Japan	Hong Kong	D8	Unknown	
2	F/40	09/01/2019	Philippines	Non-local born	B3	Unvaccinated	
3#	F/11 months	12/01/2019	Mainland (Fujian)	Hong Kong	B3	Unvaccinated	
4	F/39	12/01/2019	Philippines	Non-local born	B3	Unvaccinated	
5#	F/33	16/01/2019	Mainland (Fujian)	Non-local born	(RT-PCR –ve)	Unknown	
6	M/22	23/01/2019	Germany	Hong Kong	D8	Unknown	
7	F/38	28/01/2019	Philippines	Non-local born	B3	Unvaccinated	
8	F/38	22/02/2019	Philippines	Non-local born	B3	Unknown	
9	M/34	27/02/2019	Nepal & United States	Non-local born	B3	Unknown	
10^	M/23	04/03/2019	United States & Korea	Hong Kong	B3	Unknown	Flight attendant of an airline
11	F/26	10/03/2019	Philippines	Non-local born	B3	Unknown	
12	M/41	11/03/2019	Mainland (Shenzhen)	Non-local born	(RT-PCR –ve)	Unknown	
13	M/38	16/03/2019	Australia (Sydney)	Hong Kong	D8	Unknown	
14	M/34	06/03/2019	Nil	Non-local born	(RT-PCR –ve)	Unknown	
15	F/11 months	19/03/2019	Taiwan (Taichung)	Hong Kong	B3	Unvaccinated	
16^	M/22	19/03/2019	Nil	Hong Kong	B3	2 doses	Baggage handler ↓ (Level 7, T1, HKIA)
17^	M/40	14/03/2019	Nil	Non-local born	B3	Unvaccinated	Airport security guard (Level 5, T1, HKIA)
18^	F/46	19/03/2019	Nil	Non-local born	B3	Unvaccinated	Baggage handler (Level 5, T1, HKIA)
19^	M/41	12/03/2019	Philippines (Manila)	Non-local born	B3	Unknown	Pilot of an airline
20	M/27	20/03/2019	Japan (Fukuoka)	Hong Kong	B3	Unknown	
21^	M/23	22/03/2019	Macao & ↓ Mainland (Zhuhai)	Hong Kong	Pending	Unknown	Airport security guard ↓ (Level 7, T1, HKIA)
22^	F/25	23/03/2019	Nil	Hong Kong	Pending	Unknown	Airport security supervisor ↓ (T1 & T2, HKIA)

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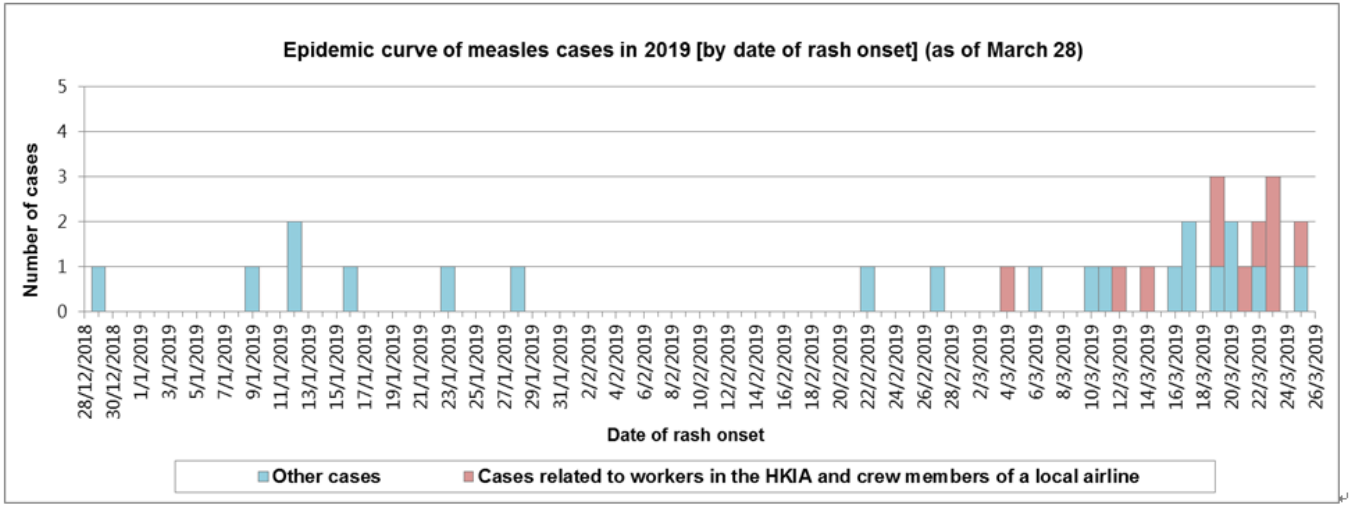
Measles cases in Hong Kong (2019) - PERSONS & TIME

Case number	Sex/Age	Date of rash onset	Travel history within incubation period	Place of birth	Genotype	Documented evidence of measles vaccination	Remarks
23^	F/41	21/03/2019	Nil	Hong Kong	Pending	Unknown	MUJI shop assistant (Non-restricted area, Level 7, T1, HKIA)
24	F/43	17/03/2019	Mainland (Shenzhen)	Non-local born	Pending	Unknown	
25	F/39	22/03/2019	Nil	Non-local born	Pending	Unknown	
26^	M/28	23/03/2019	Nil	Hong Kong	Pending	Unknown	Customs & Excise Department Officer (Level 2, T1, HKIA)
27^	M/31	23/03/2019	Nil	Hong Kong	Pending	Unknown	MTR staff at Airport station
28^	F/21	25/03/2019	Nil	Hong Kong	Pending	2 doses	McCafe staff (Level 8, T1, HKIA)
29	M/43	17/03/2019	Japan (Okinawa)	Hong Kong	Pending	Unknown	
30	M/8 months	20/03/2019	Thailand (Bangkok & Hua Hin)	Hong Kong	Pending	Unvaccinated	
31	M/17	25/03/2019	Philippines	Non-local born	Pending	Unknown	

^Cases related to workers in HKIA and crew members of a local airline.
#Cases with epidemiological linkage.



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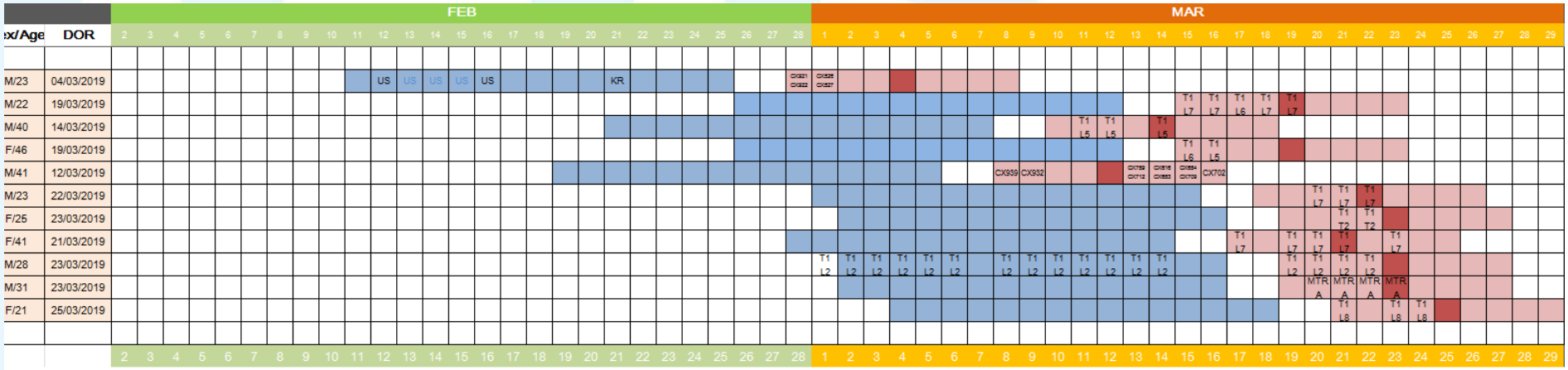
MEASLES CASES IN HONG KONG (2019) - TIME (HKIA CLUSTER)*



Red = Date of Rash onset
Blue = Incubation Period
Pink = Communicable period

*as of 28 Mar 2019, n=11

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MEASLES CASES IN HONG KONG (2019) - PLACE (HKIA CLUSTER)*

Source of map: JC Decaus Transport (Map of Hong Kong International Airport)

*as of 28 Mar 2019, n=11

Prevention & Control Measures

- **Health talk & video broadcast**
- **Measles vaccination exercise**
  - In liaison with Airport Authority, aims to protect those working at the airport who are non-immune to measles
- **Hotline (2125 1122)**
  - Public enquiries (9am to 5.45pm daily)
- **Risk Communication**
  - Health authorities (Japan, the Philippines, Mainland, Guangdong and Macao, WHO)
  - Letters to doctors, hospitals, employment agencies

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Prevention & Control Measures

- **Media + CHP Website**
  - Situation update
  - Public places visited by cases during communicable period
  - Potential non-immune contacts advised to observe for symptoms during the incubation period
  - To report symptoms and prior exposure/travel history to healthcare workers so that appropriate infection control measures can be implemented at healthcare facilities to prevent any potential spread

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Overview

MEASLES VACCINATION IN HONG KONG

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History of measles vaccination in Hong Kong

Year	Description
1967	Anti-measles vaccine (AMV) for children 6 months or older
1971	AMV for children 9 months or older
1979	AMV for children one year or above
1989	Regular catch up for Primary One students
1990	Replacement of AMV with MMR vaccine (for children at one year)
1996	Second dose for Primary Six students (approximate birth cohort 1985)
	Second dose advanced to Primary One with regular catch up for Primary Six students without 2 doses
1997	Special Measles Vaccination Campaign (SMVC) - July-November 1997 for children aged one to 19 years (born between 1978- 1996) - without 2 doses of measles-containing vaccine

Learn more about measles vaccine

Year of birth		Measles-containing vaccine provided by the Government	
		1st dose	2nd dose
Born before 1967*		Not provided	
Born between 1967 and 1988	All persons (except those attended Primary 6 in 1996/97 school year or after; or Primary 1 in 1997/98 school year or after)	Given AMV at the age of 6 months to one year	Refer to vaccination record#
	Attended Primary 6 in 1996/97 school year or after	Given AMV at the age of one year	Given MMR at Primary 6 in school#
	Attended Primary 1 in 1997/98 school year or after	Given AMV at the age of one year	Given MMR at Primary 1 in school
Born in 1989 or after	Attended Primary 1 before 1997/98 school year	Given MMR at the age of one year	Given MMR at Primary 6 in school#
	Attended Primary 1 in 1997/98 school year or after	Given MMR at the age of one year	Given MMR at Primary 1 in school

AMV: anti-measles vaccine
MMR: Measles, Mumps and Rubella vaccine

* For those who was born before 1967 in Hong Kong, it is expected that they have contracted measles in the past and thus have antibodies against measles.

Those born between 1978 and 1996 might have received a dose of MMR vaccine between July and November 1997 under the Special Measles Vaccination Campaign of the Government. Under the Campaign, a dose of MMR vaccine was provided to children and adolescents aged 1-19 years (born between 1978 and 1996) who had not received two doses of MMR vaccine or AMV.

Points to note:

- Healthy people in general can enjoy long term, even lifelong protection after receiving measles vaccination as recommended. One dose of MMR vaccine is 93% effective against measles while two doses are 97% effective.
- Consult doctor for advice on measles vaccination if you are unsure about your immunisation status or whether you had measles before.
- It takes about 2 weeks after vaccination for development of immunity against measles.

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Department of Health

Revised in March 2019

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Birth year	2nd dose
1967 - 1977	Not covered by special campaign (Jul-Nov 1997)
1978 – **1984**	13-19yr covered by campaign
1985	Most **studying P6 at 1996/97 school year**
1986 – 1990 (depending on school year) - Special campaign - ***Catch-up at P6*** - Scheduled P1 dose	
1991 or after	Most **studying P1 at 1997/98 school year**

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Immunisation coverage of MMR

Survey Year	Birth cohort	Measles (1st dose)
2001	1995	98.1
	1996	98.5
2003	1997	98.1
	1998	98.3
	1999	99.1
2006	2000	99.0
	2001	99.4
	2002	99.5
2009	2003	99.6
	2004	99.8
	2005	99.8
2012	2006	99.3
	2007	99.0
	2008	98.7
2015	2009	99.1
	2010	99.3
	2011	99.0
2018	2012	99.8
	2013	100.0
	2014	99.6

School year	P1		P6	
	1st dose	2nd dose	1st dose	2nd dose
2017/18	98.91	98.12	98.5	98.13
2016/17	98.79	97.75	98.62	98.24
2015/16	98.77	97.11	98.41	97.88
2014/15	99.69	98.56	99.62	99.17
2013/14	99.66	98.47	99.7	99.28
2012/13	99.58	98.86	99.71	99.47
2011/12	99.56	98.66	99.59	99.18
2010/11	99.38	98.21	99.49	98.88
2009/10	99.55	98.46	99.63	99.13
2008/09	99.71	98.79	99.76	99.4
2007/08	99.62	98.92	99.79	99.5
2006/07	99.72	99.16	99.82	99.67
2005/04	99.83	98.84	99.86	99.56
2004/05	99.75	97.79	99.79	99.07
2003/04	98.41		99.43	
2002/03	98.56		99.46	
2001/02	99.21		99.29	
2000/01	99.22		99.53	
1999/00	98.84		99.03	
1998/99	99.01		98.29	
1996/97	99.46		99.02	

Source: Immunisation Coverage Survey & Administrative Statistics

Seroprevalence rates

Year	Age group (years)																	
	1-4		5-9		10-14		15-19		20-24		25-29		30-34		35-39		>39	
	No. tested	%	No. tested	%	No. tested	%	No. tested	%	No. tested	%	No. tested	%	No. tested	%	No. tested	%	No. tested	%
2001	100	92	100	90	100	81	100	83	100	86	100	86	100	90	100	98	100	95
2002	200	92	200	86.5	100	86	100	85	50	98	50	92	50	98	50	98	100	99
2003	200	91.5	184	97.3	121	95.9	126	97.6	50	96	50	96	50	92	50	96	100	100
2004	200	96	200	99	100	98	100	98	100	99	100	97	50	98	50	100	100	100
2005	200	96	200	98	200	97	100	99	50	100	50	98	50	98	50	100	100	100
2006	200	96	200	98.5	100	97	100	99	50	96	50	100	50	98	50	100	100	100
2007	200	96	200	99	100	100	100	99	50	96	50	100	50	98	50	98	100	100
2008	200	95	200	97.5	100	98	100	91	50	98	50	98	50	100	50	98	100	100
2009	200	93.5	200	96.5	100	99	100	97	50	100	50	100	50	96	50	98	100	100
2010	200	93	200	97.5	100	100	100	99	50	96	50	100	50	100	50	100	100	100
2011	200	95	200	98.5	100	99	100	97	50	98	50	96	50	96	50	96	100	99
2012	200	96.5	200	99	100	97	100	100	50	98	50	100	50	100	50	96	100	100
2013	200	97.5	200	98.5	100	100	100	96	50	98	50	96	50	98	50	100	100	100
2014	200	96	200	98	100	99	100	99	50	100	50	98	50	98	50	100	100	100
2015	200	98	200	99.5	100	100	100	96	50	98	50	96	50	98	50	94	100	99
2016	200	95.5	200	99.5	100	99	100	95	50	94	50	100	50	94	50	92	100	97
2017	200	95	200	100	100	98	100	99	50	100	50	98	50	98	50	98	100	100

Source: Laboratory Surveillance Statistics, CHP website

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Recommendations

MEASLES VACCINATION IN HONG KONG

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General population

- Non-immune
  - (i) not having received two doses of measles-containing vaccine; or
  - (ii) not confirmed to have measles infection in the past
- Most people in Hong Kong likely immune to measles
- No urgency for those who do not belong to risk groups to receive measles vaccination, resources can be reserved for those in most need

Health Care Workers (HCW)

- Personnel involving potential contact with patients, their blood or body substances in health care settings
- At potential risk of acquiring and transmitting infections in such settings
- Many overseas authorities have recommended HCW to receive vaccination to reduce the chance of getting or spreading vaccine-preventable diseases

SCVPD Recommendation Summary Statement – September 2017

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Summary

17. In order to protect HCW from being infected as well as to prevent the spread of infections to susceptible patients, SCVPD recommends:

a. HCW should be immune to hepatitis B and post-vaccination serological status should be ascertained.
b. HCW should be immune to measles and rubella, by either vaccination or medical evaluation.
c. HCW should be immune to varicella. HCW with negative or uncertain history of receiving two doses of varicella vaccines or disease of varicella or herpes zoster should be serologically tested. Vaccines should be offered to those without varicella zoster antibody.
d. All HCW should receive seasonal influenza vaccination annually once the vaccine is available.

18. Immune status of individual HCW should be assessed at the time of initial employment. A full vaccination history should be obtained and with documentation. The records of vaccination and serological status of each HCW should be kept by both employer and employee.

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Scientific Committee on Vaccine Preventable Diseases

Summary Statement on Vaccination Practice for Health Care Workers in Hong Kong

kground

Vaccination is one of the most effective tools to prevent infectious ases. In particular, protection for health care workers (HCW) is essential. W are at risk for exposure to infectious diseases. HCW who work with direct ent contacts or handle infectious material could not only get infected, but also ad infections to susceptible patients. Many overseas authorities have mmended HCW to receive vaccination to reduce the chance of getting or ading vaccine-preventable diseases.

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Summary

- HCW should be immune to hepatitis B and *post-vaccination serological status should be ascertained*
- HCW should *be* **immune to measles** and rubella, by *either vaccination or medical evaluation*
- HCW should be immune to varicella. HCW with *negative or uncertain history of receiving two doses of varicella vaccines or disease of varicella or herpes zoster should be serologically tested*. Vaccines should be offered to those without varicella zoster antibody
- All HCW should receive seasonal influenza vaccination annually once the vaccine is available

Summary

Hepatitis B	HCW should be immune to hepatitis B and post-vaccination serological status should be ascertained.	Laboratory evidence of immunity (natural or post-vaccination serological status)
Measles	HCW should be immune to measles, by either vaccination or medical evaluation.	**(i) Written documentation of vaccination with *2 doses* of measles containing vaccines administered at least 28 days apart; OR** **(ii) Laboratory evidence of immunity; OR** **(iii) Laboratory confirmation of disease**
Rubella	HCW should be immune to rubella, by either vaccination or medical evaluation.	(i) Written documentation of vaccination with *1 dose* of rubella containing vaccine; OR (ii) Laboratory evidence of immunity; OR (iii) Laboratory confirmation of disease
Varicella	HCW should be immune to varicella. HCW with negative or uncertain history of receiving two doses of varicella vaccines or disease of varicella or herpes zoster should be serologically tested. Vaccines should be offered to those without varicella zoster antibody.	(i) Written documentation of vaccination with 2 doses of varicella vaccines; OR (ii) Definitive history of varicella or herpes zoster (e.g. recall of physician-diagnosed disease in the past)

Summary of local measles situation

- Other than HKIA outbreak, mainly affecting subgroups
  - Non-local born: workers, tourists, students etc.
  - Travel history during incubation period
  - Unvaccinated or uncertain vaccination history
- HKIA outbreak – stop transmission
  - Case identification and contact tracing with rapid risk communication
  - Supplementary vaccination for non-immune
  - Other port and infection control measures
- General population susceptibility
  - High coverage and high seroprevalence rates

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THANK YOU

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