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Centre for Health Protection

Acute flaccid paralysis surveillance and other activities related to polio in Hong Kong

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Table 1. Goals of the *Polio Endgame Strategy 2019–2023*

Goal One: Eradication	• Interrupt transmission of all wild poliovirus (WPV) • Stop all circulating vaccine-derived poliovirus (cVDPV) outbreaks within 120 days of detection and eliminate the risk of emergence of future VDPVs
Goal Two: Integration	• Contribute to strengthening immunization and health systems to help achieve and sustain polio eradication • Ensure sensitive poliovirus surveillance through integration with comprehensive vaccine-preventable disease (VPD) and communicable disease surveillance systems • Prepare for and respond to future outbreaks and emergencies
Goal Three: Certification & Containment	• Certify eradication of WPV • Contain all polioviruses

Source: WHO

- AFP surveillance system
- Other activities
  - EV surveillance system
  - Immunization service

Polio Endgame Strategy 2019-2023

Acute Flaccid Paralysis (AFP) Surveillance System

Poliomyelitis

- Statutory notifiable in Hong Kong since 1948
- Notification of suspected or confirmed cases of poliomyelitis is required by law
- It's a viral infection recognized by acute onset of flaccid paralysis

Acute poliomyelitis

(Last updated on 14 July 2008)

Description

Acute flaccid paralysis of one or more limbs with decreased or absent deep tendon reflexes on the affected limbs. There is no sensory or cognitive loss and no other apparent cause.

There are two types of paralytic poliomyelitis:

- **Wild-type Paralytic Poliomyelitis**: an AFP case with wild poliovirus isolation
- **Vaccine-associated Paralytic Poliomyelitis (VAPP)**: an AFP case in which vaccine-like poliovirus is isolated from stool samples, and the virus is believed to be the cause of the disease

WHY AFP surveillance

To achieve "Polio eradication", we have to

- complete removal of wild poliovirus (WPV) from circulation in the world
- every case of poliomyelitis must be detected and responded

Acute Flaccid Paralysis (AFP) Surveillance:

- It is the gold standard for detecting cases of poliomyelitis.
- Its objective is to detect poliovirus wherever it may still circulate. It is also the key to detecting re-importation of poliovirus into polio-free areas.

The four steps of surveillance are:

- finding and reporting children with acute flaccid paralysis (AFP)
- transporting stool samples for analysis
- isolating and identifying poliovirus in the laboratory
- mapping the virus to determine the origin of the virus strain.

History of the AFP surveillance in Hong Kong

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In 1996, WPRO WHO requested country/area have to set up a *National Committee for the Certification of Wild Poliovirus Eradication* (NCC)

The sensitive case definition will capture acute poliomyelitis but also other diseases, including GBS, transverse myelitis and traumatic neuritis, etc

In 1997, **AFP surveillance system** established

Case definition

Acute onset of focal weakness or paralysis characterized as flaccid (reduced muscle tone) among children under 15 years of age

Sensitivity

At least 1 non-polio AFP cases per 100,000 population aged < 15

Acute flaccid paralysis

(Last updated on 14 July 2008)

Description

Acute flaccid paralysis (AFP) is defined as acute onset of focal weakness or paralysis characterized as flaccid (reduced muscle tone). The AFP surveillance has been set up primarily for detecting acute poliomyelitis among children under 15 years of age.

Acute flaccid paralysis may result from different causes, such as paralytic poliomyelitis, Guillain-Barré syndrome, transverse myelitis, traumatic neuritis, infectious and toxic neuropathies, tick paralysis, myasthenia gravis, porphyria, botulism, insecticide poisoning, polymyositis, trichinosis and periodic paralysis.

After investigation, a reported AFP will be further classified into paralytic poliomyelitis, polio-compatible, and non-polio AFP based on the respective clinical, epidemiological and laboratory findings. A case of paralytic poliomyelitis is notifiable.

How to report AFP
- HA NDORS
- CENO-Online

https://cdis.chp.gov.hk/CDIS_CENO_ONLINE/ceno.html

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THe Government of the Hong Kong Special Administrative Region

CDS

Communicable Disease Information System

Username
Password
Forget password?
Login
More Info

The Communicable Disease Information System (CDIS) is an information system aimed at enhancing the capability of Hong Kong in the surveillance and control of communicable diseases through application of information science and the information technology.

In this website, using designated login ID and password, CDIS users can access CENO On-line, which is a secure and convenient web-based notification system under the CDIS.

WHAT IS CENO ON-LINE ?

WHAT TO REPORT?

WHAT TO REPORT

(a) Statutory notifiable diseases
(b) Other communicable diseases of topical public health concern
(c) Poisoning related to heavy metal or traditional Chinese medicine
(d) Suspected institutional outbreaks
(e) Unusual clu

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HOW TO REPO

OTHER COMMUNICABLE DISEASES OF TOPICAL PUBLIC HEALTH CONCERN

Though not specified in the First Schedule to the Prevention and Control of Disease Ordinance, medical practitioners are urged to report suspected or confirmed cases of the following diseases to CENO for arrangement of investigation and control as appropriate:

- Acute flaccid paralysis
- Brucellosis
- Cryptosporidiosis
- Myiasis (flesh fly)
- Severe paediatric enterovirus infection (other than EV71 and poliovirus)
- Severe paediatric influenza-associated complication/death
- *Vibrio vulnificus* infection
- Other communicable diseases of topical public health concern

HOW TO REPORT?

Other means

CENO ON-LINE
https://cdis.chp.gov.hk/
Available to registered medical practitioners practising in Hong Kong*. Login ID and password are required for access.

FAX
2477 2770
Notification forms can be downloaded from the CHP website.

TELEPHONE
2477 2772
CENO operates from 9 a.m. to 6 p.m. on Monday, and 9 a.m. to 5:45 p.m. from Tuesday to Friday. After office hours or on public holidays, any urgent notification should be made to the Medical Control Officer.

EMAIL
diseases@dh.gov.hk
CENO provides an option for notification using email which can be digitally signed and encrypted. Message content should include the sender's name and contact telephone number, and the patient's clinical and contact information.

MAIL
Central Notification Office, 3/F., 147C Argyle Street, Kowloon.
The above channels are preferable to mail, as the latter takes considerably longer time to reach CENO.

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Information flow and monthly reporting of AFP surveillance to WHO

2. Two stools for lab investigation

1. Report case via NDORS or CENO-Online

4. Contact case MO for any further information needed

CDIS

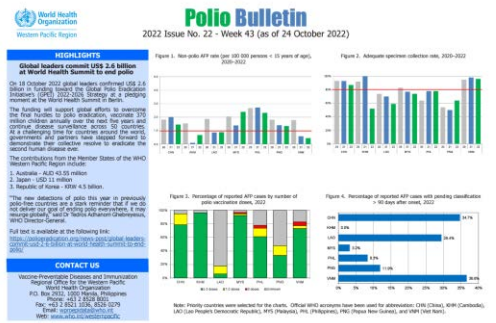
5. Consolidate the cases reported

3. Retrieve cases from CDIS and input findings after investigation

Surveillance section

Epidemiology section

6. Submitted the cases to WHO



PHLSB

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Monthly / on need basis

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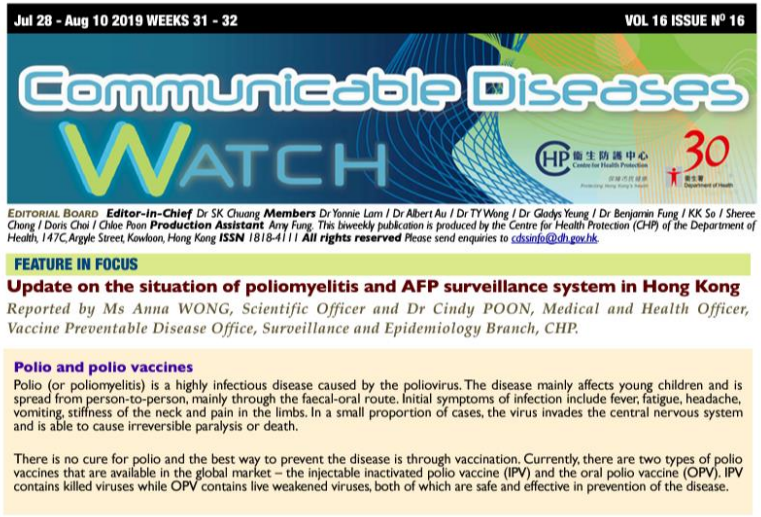
AFP case received
- CHP contact the case MO for details of the case, and remind the reporting party to send 2 adequate stools for laboratory investigation
- Input information of the cases into the system

Expert Panel review
- Reports of cases with inadequate stools and residual paralysis at day 60 will be sent to Expert Panel for review

Nil return
- Enquire “Zero-report” from 26 participating hospitals to differentiate zero-reporting from non-reporting



Information dissemination
- Regular update (monthly/quarterly) the participating hospitals for the performance indicator
- Published articles in the on-line publication “Communicable Diseases Watch” to public

Communication
- Communicate with relevant parties for any issues evolved when necessary (e.g. Laboratory containment)

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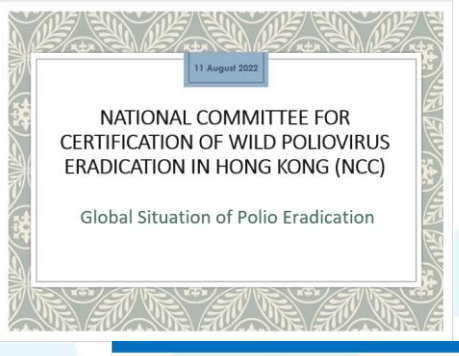
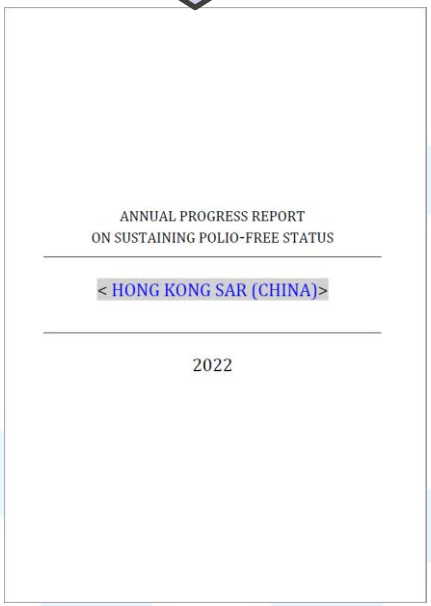
Annually

Annual NCC meeting in August

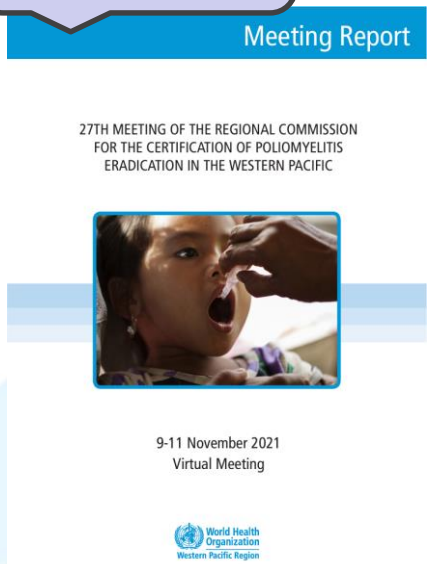


Submitted Annual progress report to WPRO in September



RCC meeting in November. Prof Lau, NCC chairman, represented HKSAR to update WRPO for Hong Kong situation

RCC publishes the annual report after the meeting



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https://apps.who.int/iris/bitstream/handle/10665/352186/RS-2021-GE-32-virtual-eng.pdf?sequence=1&isAllowed=y

Review the system Quality by the 5 surveillance indicators

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INDICATORS OF SURVEILLANCE PERFORMANCE

- **Completeness of reporting**

At least 80% of expected routine (weekly or monthly) AFP surveillance reports should be received on time, including zero reports in which no AFP cases are detected. The distribution of reporting sites should be representative of the country's geography and demography.

- **Sensitivity of surveillance**

At least **one** case of non-polio AFP should be detected annually per 100 000 population aged under 15 years. To ensure even higher sensitivity in endemic regions, this rate should be **two** per 100 000 children aged under 15 years, and three per 100 000 in countries with recent outbreaks.

- **Completeness of case investigation**

All AFP cases should have a full clinical and virological investigation, and at least 80% of AFP cases should have "adequate" stool specimens. Adequate stool specimens are two stool specimens of sufficient quantity for laboratory analysis, collected at least 24 hours apart, within 14 days after the onset of paralysis, and arriving at the laboratory by reverse cold chain and with proper documentation.

- **Completeness of follow-up**

At least 80% of AFP cases should have a follow-up examination for residual paralysis 60 days after the onset of paralysis.

- **Laboratory performance**

All AFP case specimens must be processed in a WHO-accredited laboratory within the Global Polio Laboratory Network.

Performance indicator

1. Completeness of reporting

At least 80% of expected routine APF surveillance reports should be received on time from the reporting sites.

- 13 public hospitals and 13 private hospitals return the routine AFP surveillance reports to DH on a monthly bases

List of public hospitals and private hospitals in Hong Kong participating in monthly zero-reporting

Public hospitals	Private hospitals
1. Alice Ho Miu Ling Nethersole Hospital	1. Canossa Hospital (Caritas)
2. Caritas Medical Centre	2. CUHK medical centre
3. Hong Kong Children's Hospital	3. Evangel Hospital
4. Kwong Wah Hospital	4. Gleneagles Hospital Hong Kong
5. Pamela Youde Nethersole Eastern Hospital	5. Hong Kong Adventist Hospital – Stubbs Road
6. Prince of Wales Hospital	6. Hong Kong Adventist Hospital – Tsuen Wan
7. Princess Margaret Hospital	7. Hong Kong Baptist Hospital
8. Queen Elizabeth Hospital	8. Hong Kong Sanatorium & Hospital
9. Queen Mary Hospital	9. Matilda International Hospital
10. Tseung Kwan O Hospital	10. Precious Blood Hospital
11. Tuen Mun Hospital	11. St. Paul's Hospital
12. United Christian Hospital	12. St. Teresa's Hospital
13. Yan Chai Hospital	13. Union Hospital

2. Sensitivity of surveillance

At least **one** case of non-polio AFP should be detected annually per 100 000 population aged under 15 years.

- 8 cases are required in 2022

Performance indicator

3. *Completeness of case investigation*

At least 80% of AFP cases should have "adequate" stool specimens.

- *"Adequate" stool specimens:*
- *two stool specimens of sufficient quantity*
- *collected at least 24 hours apart,*
- *within 14 days after the onset of paralysis,*
- *arriving at the laboratory by reverse cold chain and with proper documentation.*

4. *Completeness of follow-up*

At least 80% of AFP cases should have a follow-up examination for residual paralysis 60 days after the onset of paralysis

5. *Laboratory performance*

All AFP case specimens must be processed in a WHO-accredited laboratory within the Global Polio Laboratory Network.

- PHLSB being the designated National Polio Laboratory for HK, has remained fully accredited by the WHO since 1997.

AFP surveillance performance indicators for HK

		2017	2018	2019	2020	2021	2022#
1. Completeness of reporting							
Percentage of surveillance site providing routine report (including "zero reports") on time	> =80%	97%	90%	90%	90%	93%	92%
2. Sensitivity of surveillance							
Number of non-polio AFP cases per 100 000 population aged < 15	> 1	1.88	1.22	1.56	1.33	1	0.63 (5 cases)
3. Completeness of case investigation							
Percentage of AFP cases investigated	> 80%	100%	100%	100%	100%	100%	100%
Percentage of AFP cases investigated < 48 hrs	> 80%	100%	100%	100%	100%	100%	100%
Percentage of AFP case with 2 adequate* stool specimens	> 80%	80%	81%	71%	91%	89%	66 %
4. Completeness of follow-up							
Percentage of AFP cases follow-up at 60 days	> 80%	> =80%	100%	100%	100%	91%	100%
5. Laboratory performance							
Percentage of specimen results sent from national laboratory within 14 days of receipt of the specimen in the laboratory	> =80%	100%	100%	100%	92%	100%	100%

8 cases are required in 2022

as of 31 October 2022

So, this year

- To meet the target of 1 non-polio per 100 000 children under age 15, we need to have another 3 cases
- However, among the 5 cases reported this year, 2 of them failed to provide two adequate stools for laboratory investigation. Hence, we need to have another 5 cases with adequate specimen to meet the WHO target

To ensure the sensitivity of the surveillance system can meet the WHO criteria, please notify CHP if you have encountered any cases fulfilling the AFP case definition. **We need another 5 cases provided 2 adequate stool specimens this year** to meet the WHO performance target. Please notify CHP if you have encountered any cases fulfilling the AFP case definition.

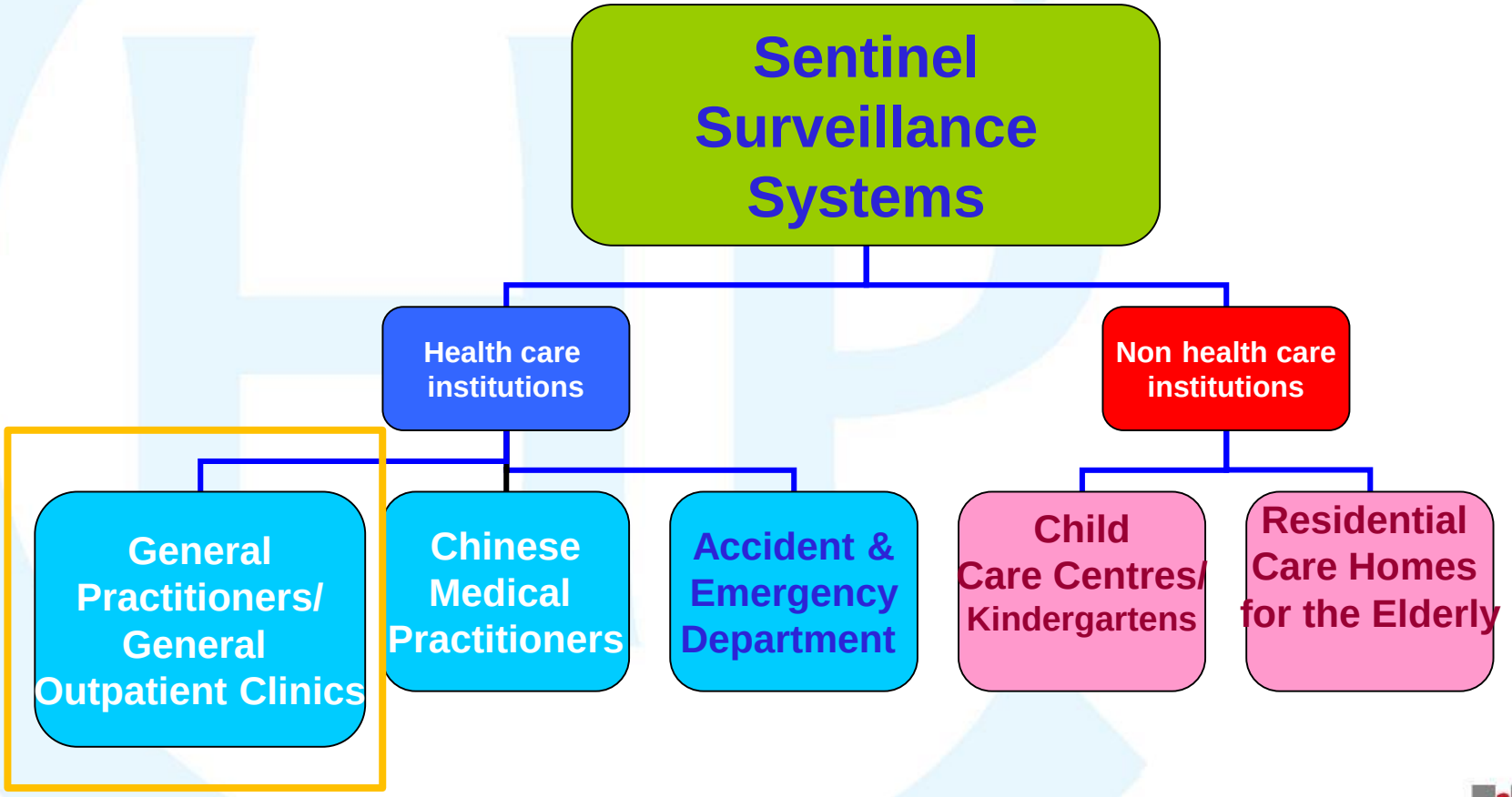
Enterovirus surveillance

Surveillance of poliovirus from clinical specimen

Source of specimen

- *Sentinel Surveillance for Hand, Foot and Mouth Disease (HFMD)*
- *PHLSB Non-polio enterovirus typing from respiratory specimen and faecal specimen*

1. Sentinel Surveillance System



Outpatient Clinic

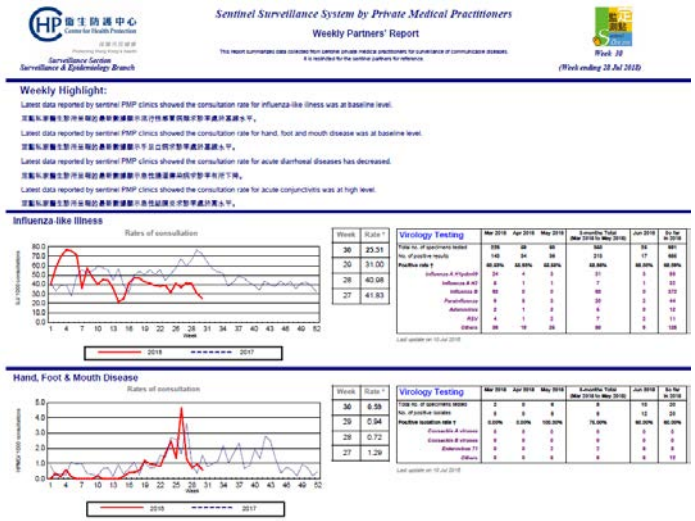
HFMD

PHLSB

Collect specimen for testing

Throat swab, rectal swab, stool

Lab result



Sentinel Surveillance System by Private Medical Practitioners

Weekly Partners' Report

Weekly Highlight:

Latest data reported by sentinel PMP clinics showed the consultation rate for influenza-like illness was at baseline level.

Latest data reported by sentinel PMP clinics showed the consultation rate for hand, foot and mouth disease was at baseline level.

Latest data reported by sentinel PMP clinics showed the consultation rate for acute diarrhoeal diseases has decreased.

Latest data reported by sentinel PMP clinics showed the consultation rate for acute conjunctivitis was at high level.

Influenza-like illness

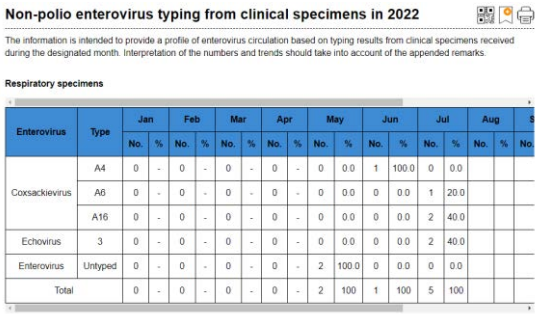
Hand, Foot & Mouth Disease

Virology Testing

2. *PHLSB non-polio enterovirus typing*

- All enterovirus-positive specimens are subjected to identification of enterovirus type 71, and selected specimens will proceed for typing of other enterovirus
- Included both respiratory specimen and faecal specimen received
- Result will be published at CHP website

	Respiratory					Faecal				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Number of specimen tested positive and proceed to typing	745	1402	34	31	30	213	237	6	11	10
- Coxsackie-virus	286	570	14	20	21	167	213	5	9	6
- Echovirus	15	26	0	0	3	5	7	0	0	1
- Enterovirus	354	746	11	11	6	34	6	1	2	3
- Untyped	90	60	0	0	0	7	11	0	0	0



Non-polio enterovirus typing from clinical specimens in 2022

The information is intended to provide a profile of enterovirus circulation based on typing results from clinical specimens received during the designated month. Interpretation of the numbers and trends should take into account of the appended remarks.

Respiratory specimens

Enterovirus	Type	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		S
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
Coxsackievirus	A4	0	-	0	-	0	-	0	-	0	0.0	1	100.0	0	0.0			
	A6	0	-	0	-	0	-	0	-	0	0.0	0	0.0	1	20.0			
	A16	0	-	0	-	0	-	0	-	0	0.0	0	0.0	2	40.0			
Echovirus	3	0	-	0	-	0	-	0	-	0	0.0	0	0.0	2	40.0			
Enterovirus	Untyped	0	-	0	-	0	-	0	-	2	100.0	0	0.0	0	0.0			
Total		0	-	0	-	0	-	0	-	2	100	1	100	5	100			

Faecal specimens

Enterovirus	Type	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	
Echovirus	3	0	-	0	-	0	-	0	-	0	0.0	1	100.0	0	-				

https://www.chp.gov.hk/en/statistics/data/10/641/708/702/7001.html

Immunization service

Polio-free countries must continue to ensure high levels of immunization coverage to prevent the re-establishment of poliovirus through importations from other countries. This can happen through international travellers, migrant populations or population sub-groups who refuse immunization.

Evaluate the immunisation coverage in HK

1. Immunisation coverage survey
2. Child Care Centre (CCC) immunization records inspection

3. School Immunisation Teams (SIT) administrative statistics

Age	Immunisation recommended
Newborn	B.C.G. Vaccine Hepatitis B Vaccine - First dose
1 month	Hepatitis B Vaccine - Second dose
2 months	DTaP-IPV Vaccine - First dose ← PCV13 - First dose
4 months	DTaP-IPV Vaccine - Second dose ← PCV13 - Second dose
6 months	DTaP-IPV Vaccine - Third dose ← Hepatitis B Vaccine - Third dose
12 months	MMR Vaccine - First dose PCV13 - Booster dose Varicella Vaccine - First dose
18 months	DTaP-IPV Vaccine - Booster Dose ← MMRV Vaccine – Second dose
Primary 1	DTaP-IPV Vaccine - Booster dose ←
Primary 5	9-valent HPV Vaccine - First dose
Primary 6	dTaP-IPV - Booster dose ← 9-valent HPV Vaccine - Second dose+

Table 1. Goals of the *Polio Endgame Strategy 2019–2023*

Goal One: Eradication	• Interrupt transmission of all wild poliovirus (WPV) — Last case: 1983 • Stop all circulating vaccine-derived poliovirus (cVDPV) outbreaks within 120 days of detection and eliminate the risk of emergence of future VDPVs — Last case: 2005
Goal Two: Integration	• Contribute to strengthening immunization and health systems to help achieve and sustain polio eradication • Ensure sensitive poliovirus surveillance through integration with comprehensive vaccine-preventable disease (VPD) and communicable disease surveillance systems • Prepare for and respond to future outbreaks and emergencies — Up-to-date contingency plan and importation plan
Goal Three: Certification & Containment	• Certify eradication of WPV — Western Pacific Region certify polio free in 2000 • Contain all polioviruses — Laboratory containment in-progress

Source: WHO

Polio Endgame Strategy 2019-2023

Take home messages

- Surveillance for AFP involves a very sensitive system that enables rapidly detecting, reporting, investigating and responding to confirmed poliomyelitis cases.
- It is a key strategy used by the Global Polio Eradication Initiative to measure progress towards reaching the global eradication goal.
- Finding and reporting children with AFP is the first step of the AFP surveillance system, which clinicians' participation is the most important and again:

Please notify CHP if you have encountered any cases fulfilling the AFP case definition.

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Thank you

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