

Situation update of enterovirus infection

Dr Edmond MA

SEB/CHP

11 Jun 2010



Hong Kong situation



女傳母 入院一日死亡 腸病毒殺女護士

2010年05月27日

★★★★★(18人) 瀏覽人次: 137,633 [Facebook](#) [Twitter](#)

【本報訊】可致命的腸病毒今年提早爆發，更罕有地導致兒科女護士疑被兩名女兒傳染腸病毒，上周五發燒，周六迅速惡化，翌日死亡。其長女就讀的黃埔花園迦南幼稚園另

全身紅疹 救護員穿保護袍送院 手足口病疑孫傳染婆婆

2010年05月31日

★★★★★(3人) 瀏覽人次: 23,567 [Facebook](#)

【本報訊】再有一名老婦懷疑被年幼親人傳染手足口病，全身出紅疹，她報稱其孫兒早前確診手足口病，到現場，為安全起見，穿上藍色保護袍將她

黃埔迦南幼稚園學童感染手足口病停課清潔

27/05/2010 9:52AM

聯合醫院一名兒科部護士，懷疑感染腸病毒死亡。女死者長女就讀的黃埔花園迦南幼稚園，亦有四名學童先後感染手足口病，目前情況穩定。

黃埔花園迦南幼稚園由今日起停課七天，至下星期三。校方在大門貼出停課告示，清潔工人都戴上口罩，在校內進行消毒。

女死者留醫的伊利沙伯醫院，已將個案轉交死因裁判官跟進。初步化驗顯示，她的咽喉以及肛門樣本，對腸病毒呈陽性反應，但仍待進一步的化驗結果確定。

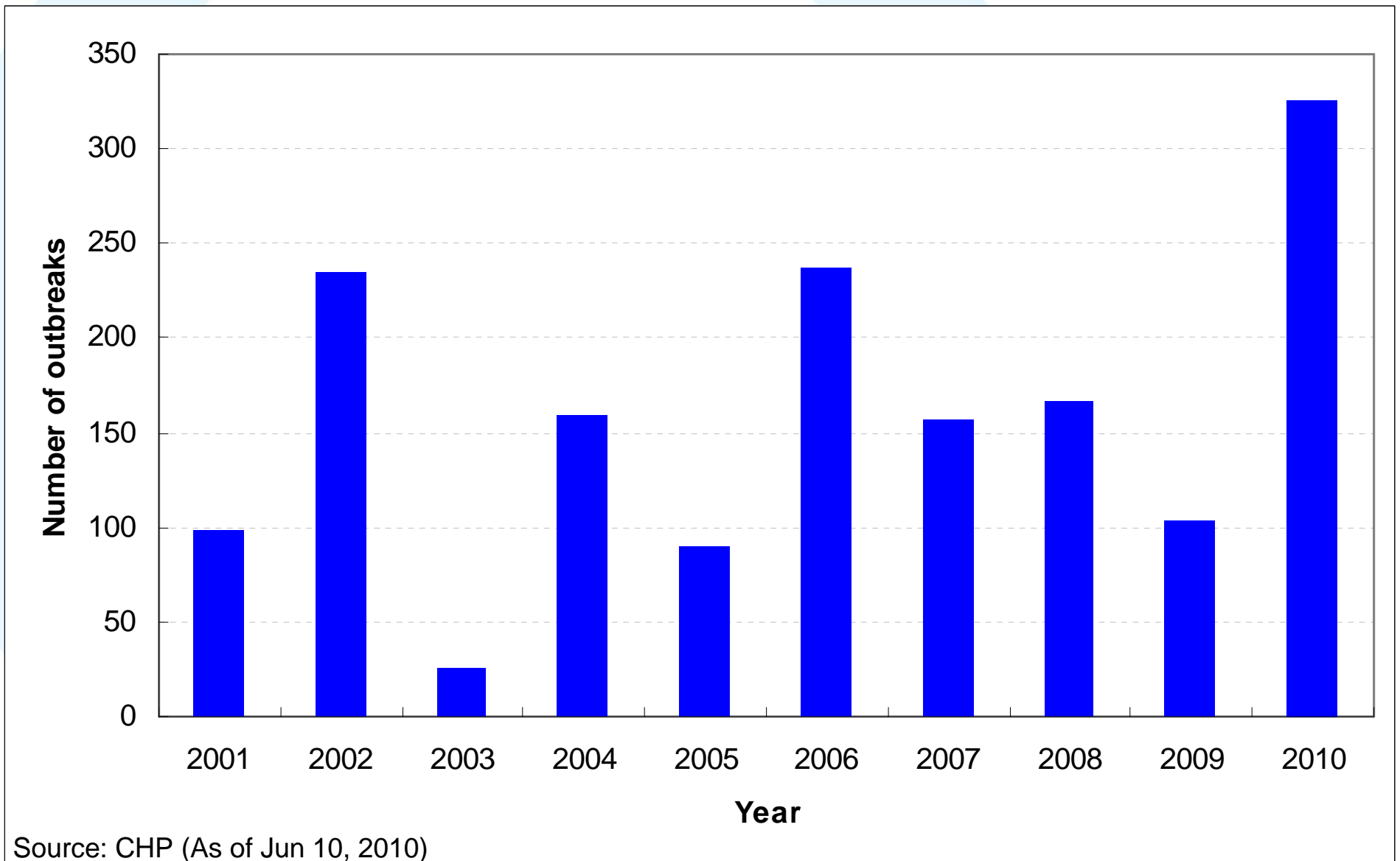
手足口病高峰期 週一岳籲注意個人衛生

<http://news.wenweipo.com> [2010-05-30] [我要評論\(0\)](#)

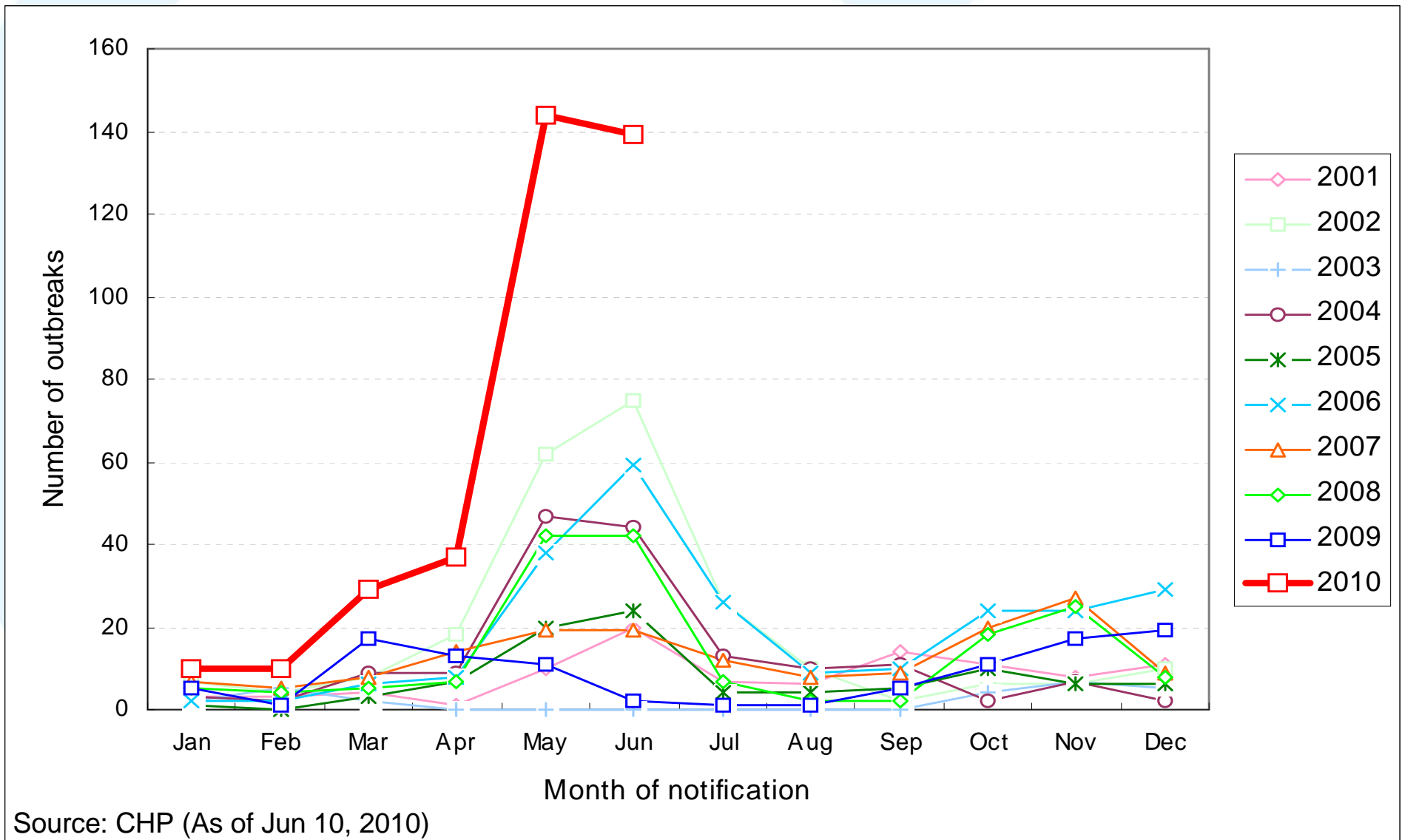
【文匯網訊】手足口病來勢洶洶，本港早前出現腦膜炎病徵的34歲女子，昨證實感染腸病毒71型。有微生物專家指出，專侵襲兒童為主、鮮有引發重症的手足口病，今年來襲的疫情較異常，出現轉攻成人、引發腦炎重症的罕見現象，不排除病毒已出現「變種」的可能性。食物及衛生局局長週一嶽則指出，內地今年以來的手足口病個案，已較往年激增4至5倍，預計香港今年的個案亦較過去2、3年增多。他強調，手足口病牽涉數十種病毒，難以靠疫苗預防，呼籲市民注意個人及食物衛生。目前毋須要求全港學校停課。

香港媒體報道，兩名近日感染手足口病後出現神經系統併發症的家長，目前情況穩定。衛生署衛生防護中心發言人稱，三十四歲屯門醫院女支援助理員的糞便樣本化驗結果顯示，對腸病毒71型呈陽性反應，她已經退燒，神志完全清醒，目前在屯門醫院隔離病房接受治療。

No. of HFMD Outbreaks in institutions



No. of HFMD Outbreaks in institutions



Place of occurrence of institutional HFMD outbreaks

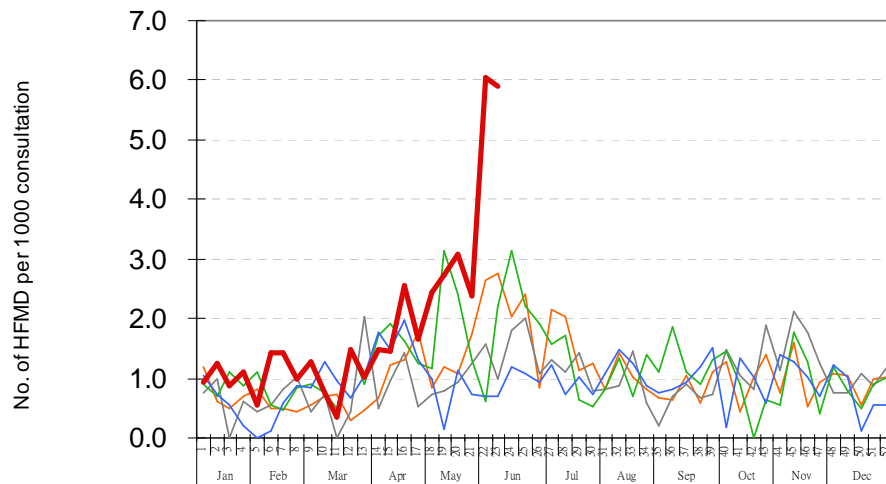
Most outbreaks (>70%) involved only ≤ 5 persons.

	2007		2008		2009		2010	
	No.	%	No.	%	No.	%	No.	%
KG/CCC	116	74	116	69	71	69	249	67
Primary school	23	15	39	23	13	13	85	23
Secondary school	16	10	8	5	14	14	29	8
Others	2	1	4	2	5	5	6	2
Total	157	100	167	100	103	100	369	100

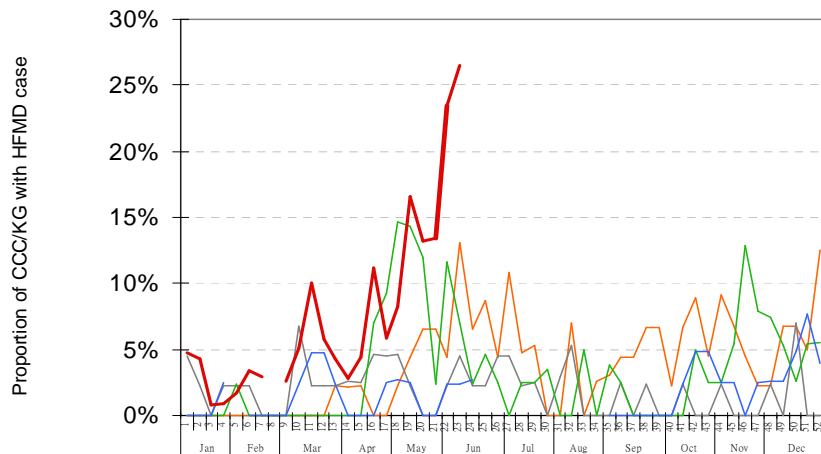
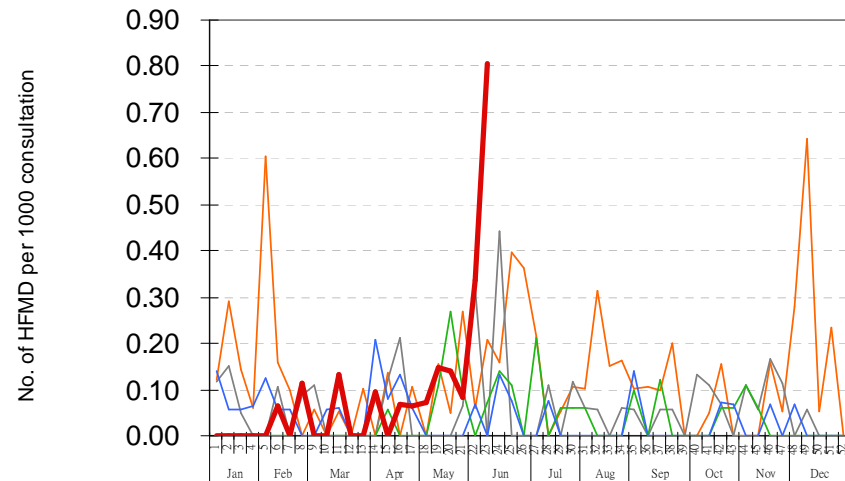


Sentinel Surveillance of HFMD

GP



GOPC



KG/CCC

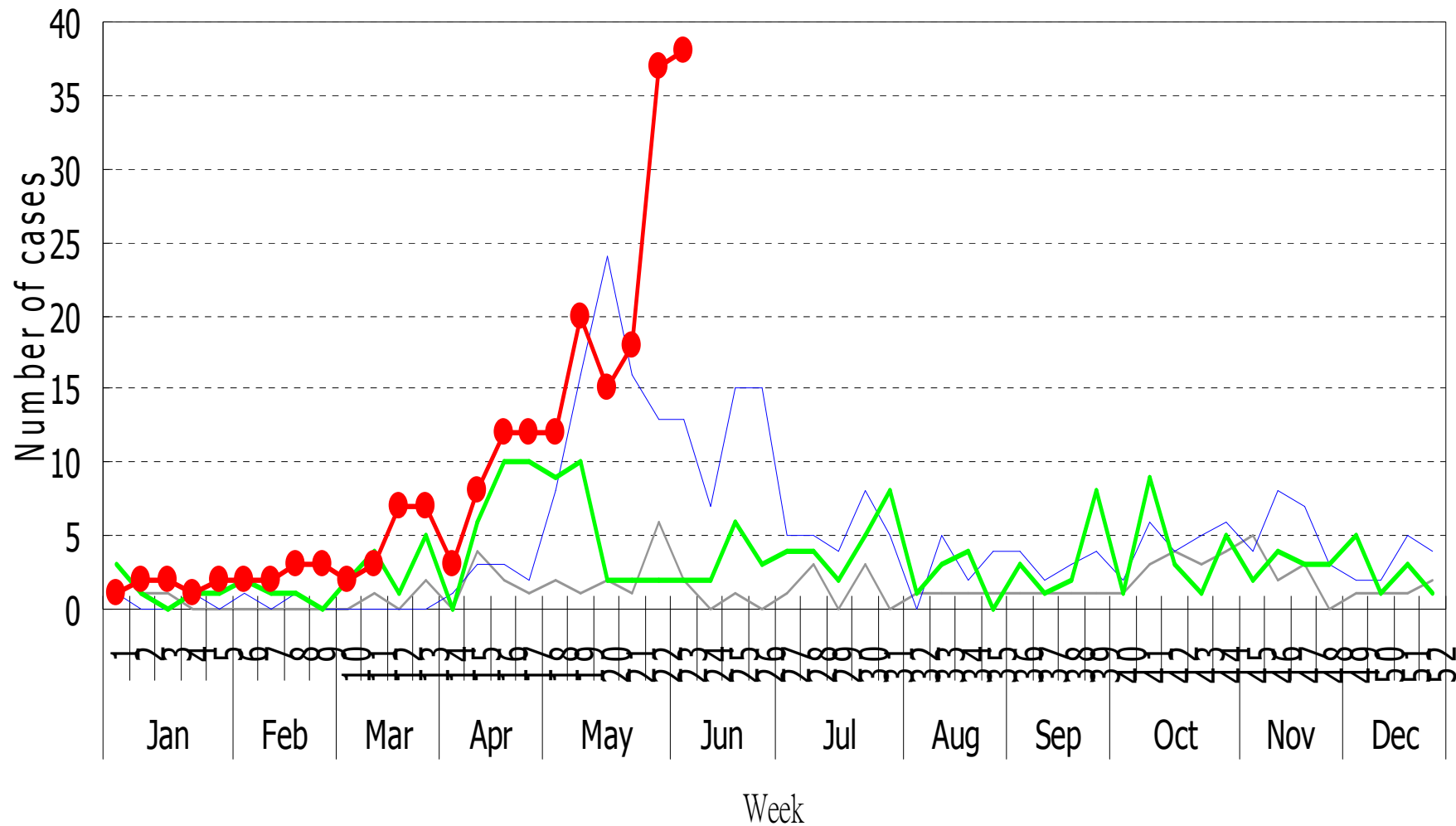
— 2006 — 2007 — 2008 — 2009 — 2010



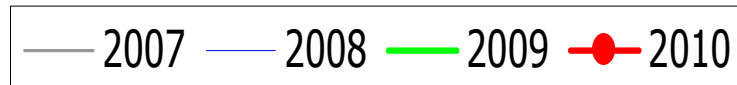
衛生署
Department of Health

Source: CHP (As of Jun 10, 2010)

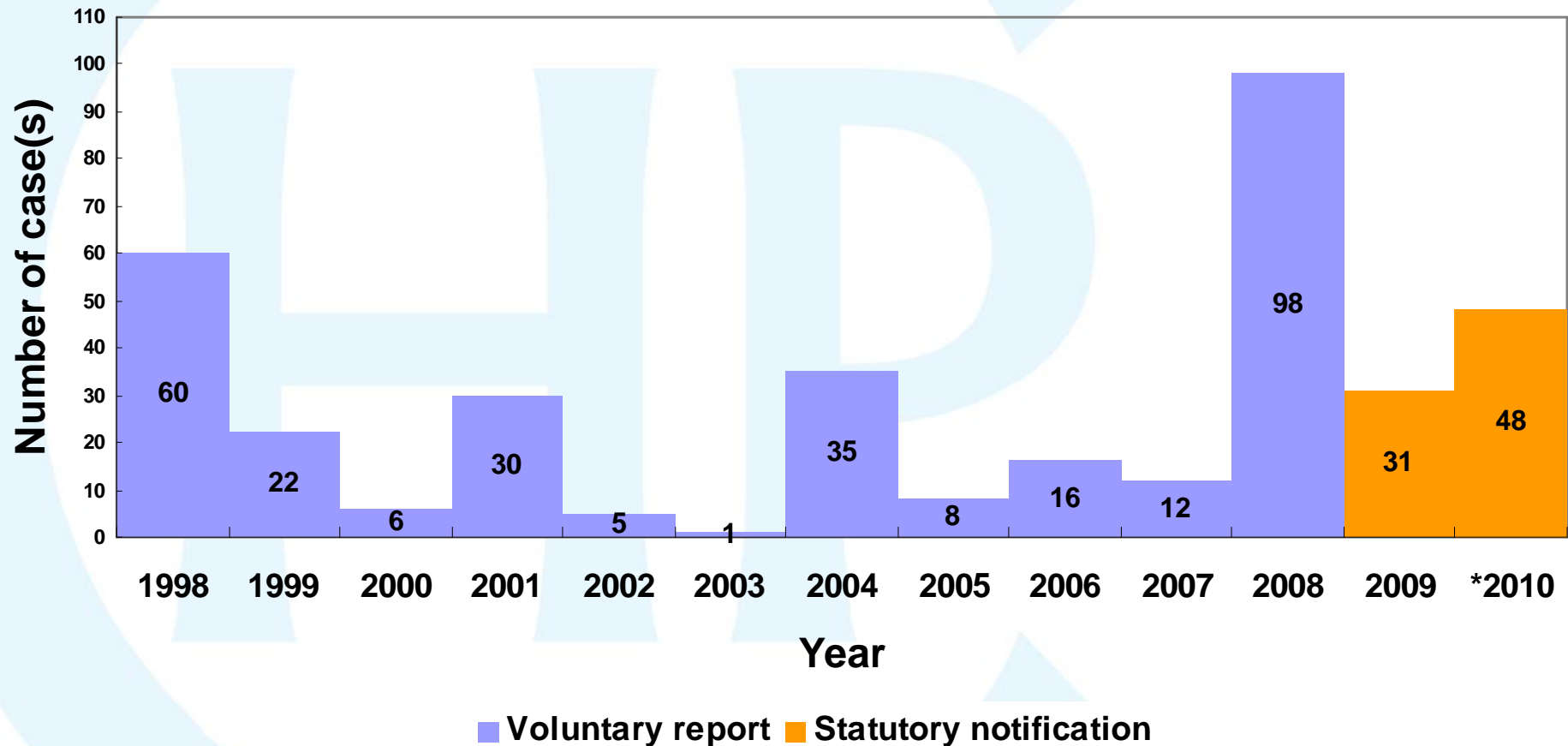
Admission to Public Hospital due to HFMD



Source: CHP (As of Jun 10, 2010)



EV 71: cyclical rise in activity every 3-4 yrs



EV71 has become notifiable since 6 Mar 2009

*As of June 10



Characteristics of EV71 cases

	2010 (As of 10/6/2010)	1998 - 2009
Number of cases	48	324
Age distribution		
≤12 years (%)	42 (87.5%)	299 (92.3%)
≤ 5 years (%)	37 (77.1%)	251 (77.5%)
Male to female ratio	1.3:1 (27:21)	1.4:1 (190:133)
Clinical presentation	HFMD: 43 Herpangina : 2 Others: 3	HFMD: 300 Herpangina : 10 Others: 14
Severe complications	Meningitis: 4 Meningo-encephalitis: 1 Diplopia: 1	Meningitis / encephalitis: 18 Acute cerebellar ataxia: 1 AFP: 1 Myocarditis: 1 Shock: 1
Death (CFR%)	0 (0%)	4 (1.2%)



Severe cases due to enteroviruses

(reported from April 22 to June 10, 2010)

	Date of record	Sex/Age	Clinical diagnosis	Laboratory result	Current condition
1.	22 April	F/18months	Viral meningitis	EV71	Discharged
2.	5 May	F/18yr	Meningoencephalitis	EV71	Discharged
3.	26 May	F/35yr	Viral encephalitis	Cox A16	Died
4.	27 May	F/10yr	Viral meningitis	EV71	Stable
5.	28 May	F/34yr	Viral meningitis	EV71	Discharged
6.	28 May	M/43yr	Brainstem encephalitis	EV71	Stable
7.	28 May	M/2 months	Viral meningitis	Echovirus 9	Discharged
8.	1 June	F/3yr	Acute cerebellitis	Cox A4	Discharged
9.	2 June	F/12days	Viral meningitis	EV71	Stable
10.	3 June	M/13yr	Viral meningitis	Cox B5	Stable
11.	4 June	M/23yr	Viral meningitis	Echovirus 9	Discharged
12.	9 June	M/4 yr	Viral meningitis	Enterovirus*	Stable
13.	10 June	M/7 yr	Viral meningitis	Enterovirus*	Stable



衛生署

Department of Health

*The serotyping result is pending

EV71 account for most severe cases Taiwan Epidemic in 1998

TABLE 3. CLINICAL COMPLICATIONS IN 96 PATIENTS WITH SEVERE ENTEROVIRAL INFECTION.

COMPLICATIONS*	NO. OF PATIENTS (%)	ENTEROVIRUS 71 (N=78)	number of isolates	
			COXSACKIEVIRUS A16 OR A24, COXSACKIEVIRUS B5, OR ECHOVIRUS 6 OR 7 (N=9)	OTHER ENTEROVIRUSES (N=9)
Encephalitis	39 (41)	30	5	4
Encephalitis and pulmonary edema or hemorrhage	25 (26)	25	0	0
Aseptic meningitis	11 (11)	5	1	5
Pulmonary edema or hemorrhage	10 (10)	9	1	0
Myocarditis and encephalitis	2 (2)	2	0	0
Myocarditis	1 (1)	1	0	0
Acute flaccid paralysis and encephalitis	1 (1)	1	0	0
Acute flaccid paralysis	1 (1)	1	0	0
Other	6 (6)	4	2	0

*The categories of complications are mutually exclusive.

Severe cases due to other enteroviruses – case reports

Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 13, No. 7, July 2007

Rhombencephalitis and Coxsackievirus A16

To the Editor: Hand, foot, and mouth disease (HFMD) is a com-

Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 15, No. 10,

low and T2-high cerebellar lesions ventricle (Figure) showed a mild leu (10⁹/L) and a C-re within reference. Blood chemistry markable. Cerebr examination sho pleocytosis (74/ μ I

Fatal Coxsackievirus A-16 Pneumonitis in Adult

François Legay,*¹ Nicolas Lévêque,†
Arnaud Gacouin,* Pierre Tattevin,* Julien Bouet,*
Rémi Thomas,* and Jean-Jacques Chomel†

Coxsackievirus A-16 (CVA-16) is the agent of hand, foot, and mouth disease in children. We report a case of fatal pneumonitis in an adult due to a CVA-16 strain with a low (78.6%) rate of sequence homology with the reference strain. A modified, more virulent, strain of CVA-16 could be emerging.

Severe cases due to other enteroviruses



Enterovirus Meningitis in Greece From 2003–2005: Diagnosis, CSF Laboratory Findings, and Clinical Manifestations

Kamal Dumaidi, Filanthi Frantzidou,* Anna Papa, Eudoxia Diza, and Antonis Antoniadis

TABLE 1. Cases of enteroviral meningitis in Greece 2003–2005

Journal of Clinical Laboratory Analysis 20:177–183 (2006)

Patient number	Date of diagnosis	Sex	Age (years)	Location	Culture	RT-PCR	Neutralization test (NT)	Sequence of VP1-2A region
4/03	03/03	M	32	Thessaloniki	Negative	Positive		
11/03	06/03	M	4	Thessaloniki	Negative	Positive		
12/03	06/03	F	12	Thessaloniki	Negative	Positive		COX A9
14/03	08/03	M	30	Thessaloniki	Negative	Positive		
18/03	09/03	F	12	Thessaloniki	Positive	Positive	Untypeable	ECHO 9
27/03	11/03	M	62	Thessaloniki	Positive	Negative	COX B	COX B5
28/03	11/03	M	41	Thessaloniki	Negative	Positive		
33/03	12/03	M	11	Thessaloniki	Positive	Positive	COX B	COX B5
35/04	01/04	F	22	Thessaloniki	Negative	Positive		
37/04	01/04	M	11	Thessaloniki	Negative	Positive		
38/04	01/04	M	7.5	Thessaloniki	Negative	Positive		
30A/04	04/04	M	45	Thessaloniki	Positive	Positive	COX B	COX B5
46/04	07/04	M	14	Thessaloniki	Negative	Positive		ECHO 11
48/04	07/04	M	14	Thessaloniki	Positive	Positive	COX B	COX B5
52/04	08/04	M	8	Thessaloniki	Negative	Positive		ECHO 11
64A/04	10/04	M	12	Drama	Positive	Positive	ECHO 11	ECHO 11
82A/04	10/04	M	0.06	Patra	ND	Positive		ECHO 14
63A/04	11/04	F	0.17	Drama	ND	Positive		ECHO 11
74A/04	12/04	F	2.5	Patra	ND	Positive		ECHO 11
110A/05	04/05	F	0.097	Larisa	ND	Positive		ECHO 5
115A/05	04/05	M	56	Bolos	ND	positive		ECHO 9

Neurological conditions with enterovirus positive

Year	Neurological condition with enterovirus positive	
	Children < 15 years old Number of cases (death)	Adult ≥ 15 years old Number of cases (death)
2004	31(1)	32(1)
2005	32(1)	35(2)
2006	20(0)	33(0)
2007	16(0)	22(0)
2008	22(2)	14(0)
2009	14(0)	26(1)
2010(Jun 10)	8 (0)	5(1)

Neurological conditions include encephalitis, encephalopathy & viral meningitis

Source: 2010 : Severe cases with enterovirus positive reported to CHP/DH

2004 – 2009 : Hospital Authority's discharge and death data



Cardiac conditions with enterovirus positive

Year	Cardiac condition with enterovirus positive	
	Children < 15 years old Number of cases (death)	Adult ≥ 15 years old Number of cases (death)
2004	0(0)	0(0)
2005	1(1)	0(0)
2006	0(0)	0(0)
2007	0(0)	0(0)
2008	1(1)	0(0)
2009	0(0)	0(0)
2010(Jun 10)	0(0)	0(0)

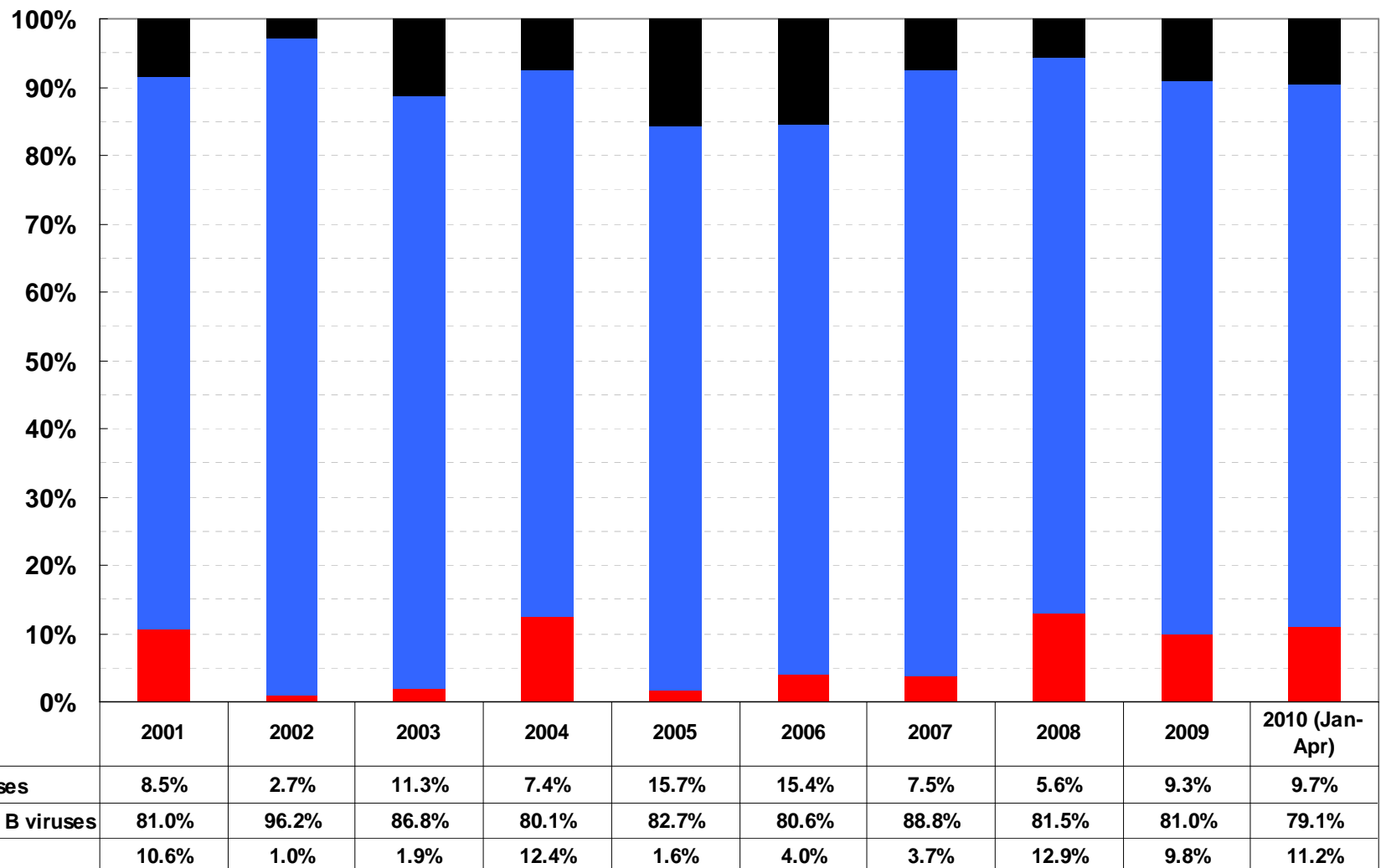
Cardiac conditions include myocarditis & pericarditis

Source: 2010 : Severe cases with enterovirus positive reported to CHP/DH

2004 – 2009 : Hospital Authority's discharge and death data



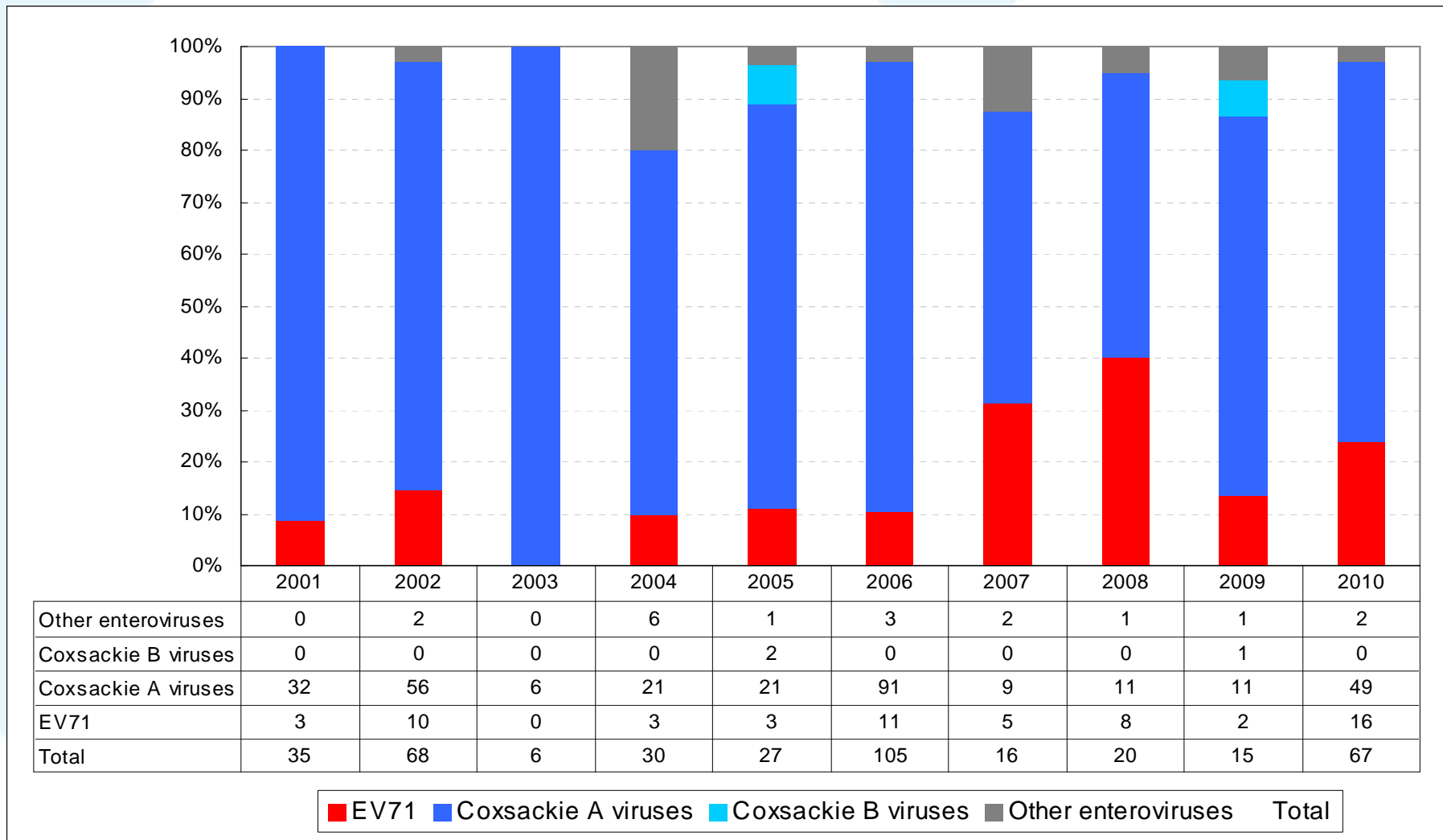
Laboratory surveillance



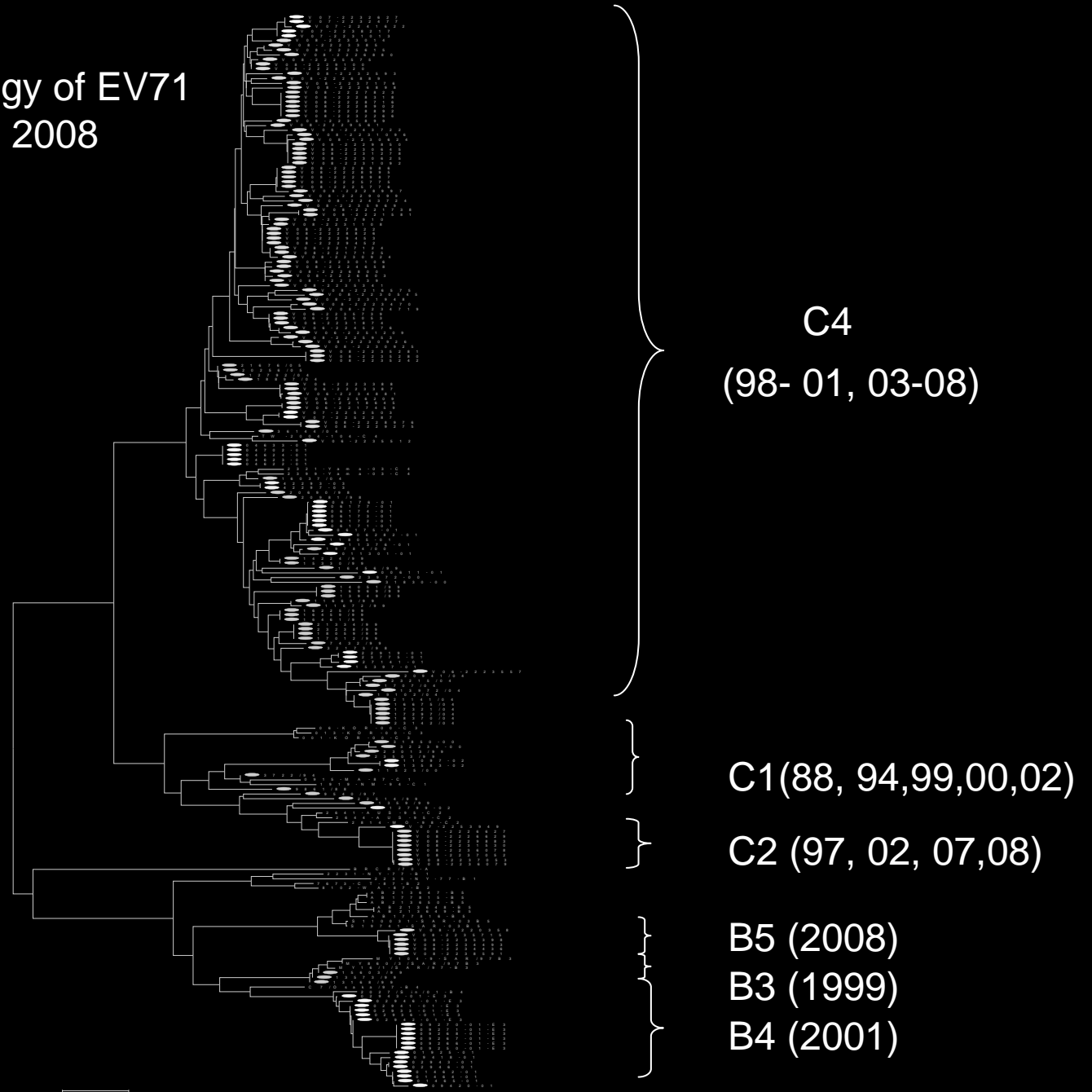
Source: PHL/SLB/CHP

■ EV71 ■ Coxsackie A and B viruses ■ Other Enteroviruses

Laboratory results of HFMD outbreaks



Molecular epidemiology of EV71
in Hong Kong, 1998 - 2008



Source: PHLSB/CHP

Molecular epidemiology

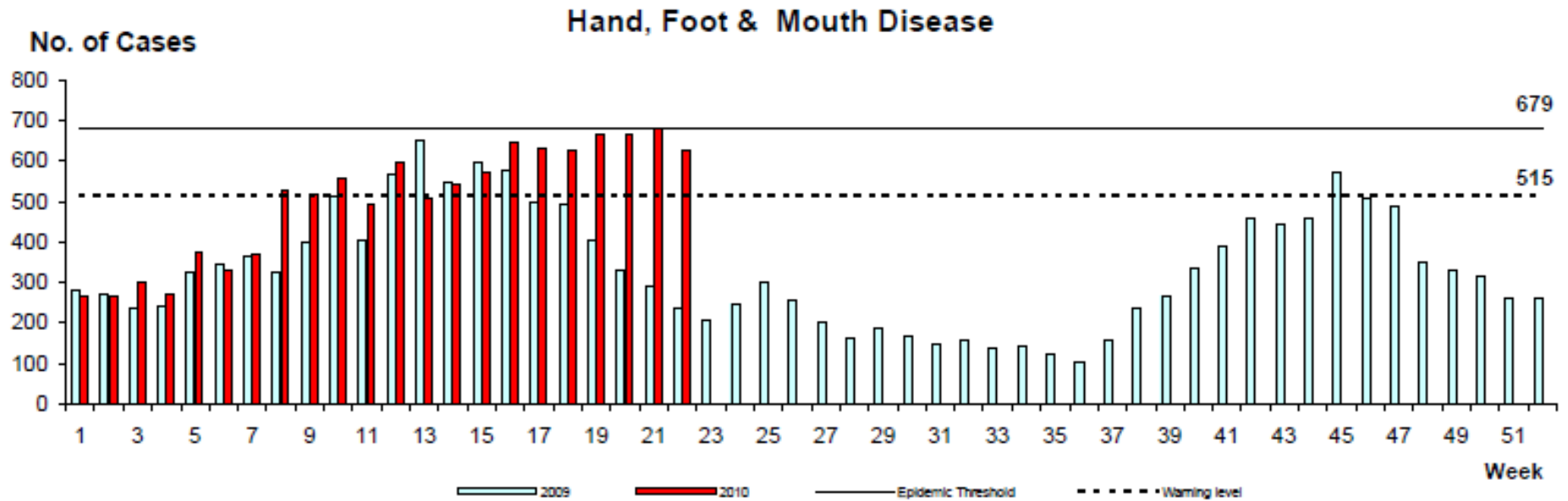
- Genotype of fatal cases in the past:
 - B3 (1999)
 - C4 (2000)
 - (2008)
 - (2009)
- In 2010, C4 remain the predominant genotype for EV71.
- Genetic sequencing studies of circulating enteroviruses in 2010 found that they are similar to those in previous years.



Regional Situation



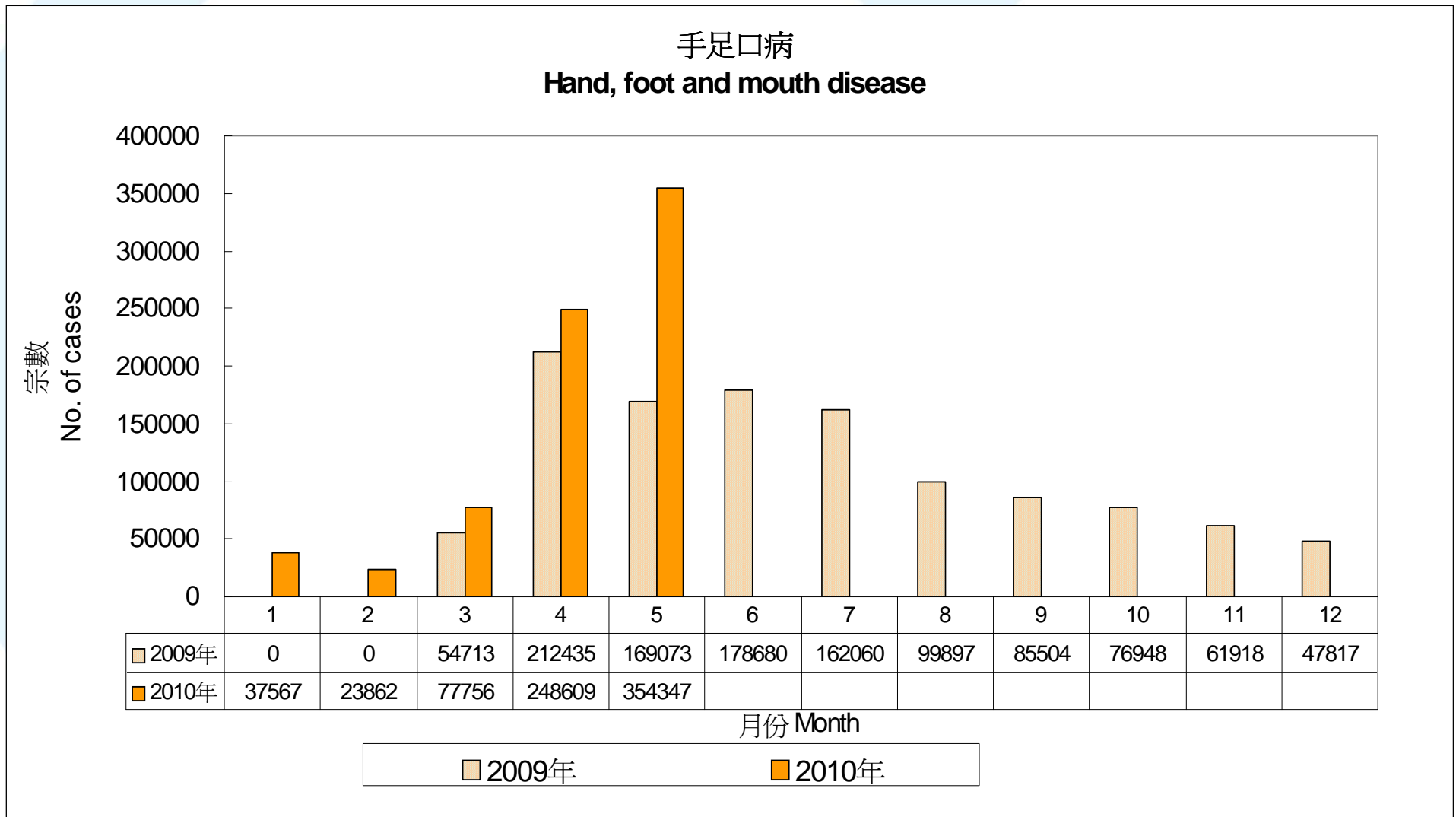
Singapore - HFMD



Week 22			Cumulative first 21 weeks		
2010	2009	2005-2009 Median	2010	2009	2005-2009 Median
628	235	334	11 028	8 894	8 796



Mainland China – HFMD



广东省卫生厅公布2010年4月全省法定报告传染病疫情

2010-05-14 14:58:51 广东省卫生厅 | 阅读次数(96) | 正文背景色：

【粤卫信】

+ 字体 -

广东省卫生厅今日公布了2010年4月全省法定报告传染病疫情。2010年4月（2010年4月1日零时至4月30日24时），全省共报告甲、乙类传染病发病23036例，死亡78人。除鼠疫、霍乱、传染性非典型肺炎、脊髓灰质炎、人禽流感、炭疽、白喉和血吸虫病无发病、死亡报告外，其余20种甲、乙类传染病均有报告。

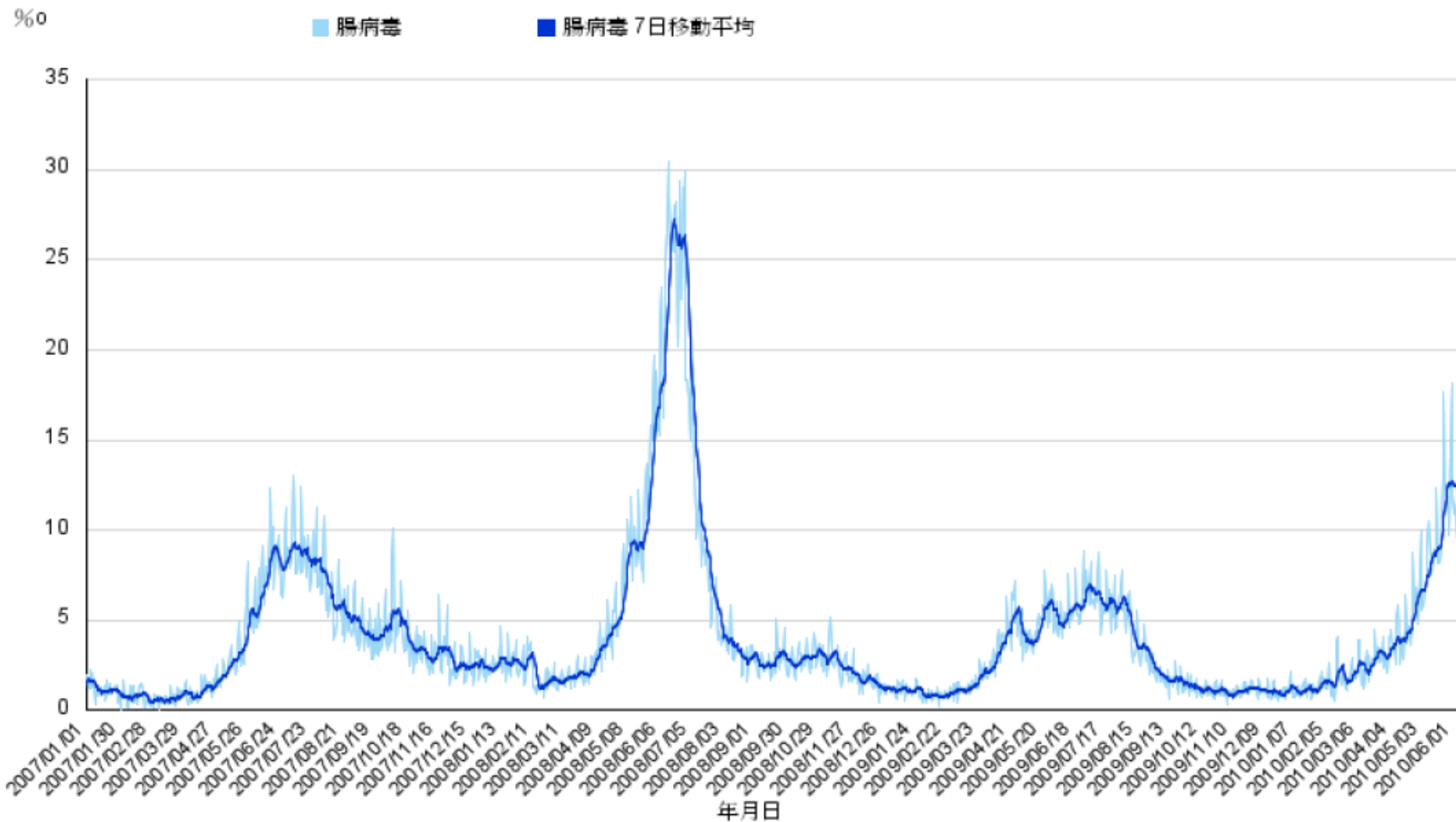
4月甲、乙类传染病报告发病数居前五位的病种为：肺结核、梅毒、乙肝、淋病和丙肝，占报告发病总数的92.37%；报告死亡数居前三位的病种为：艾滋病、狂犬病和肺结核，占报告死亡总数的94.87%。

4月全省共报告丙类传染病发病40881例，死亡5例。其中，手足口病32275例，死亡4例。报告发病数居前三位的病种为：手足口病、其它感染性腹泻病和流行性腮腺炎，占丙类传染病报告发病总数的97.05%。

广东省卫生厅
二〇一〇年五月十四日

Taiwan – HFMD rate at AED

2007/01/01-2010/06/06 急診腸病毒每日就診率及7日移動平均監測趨勢圖

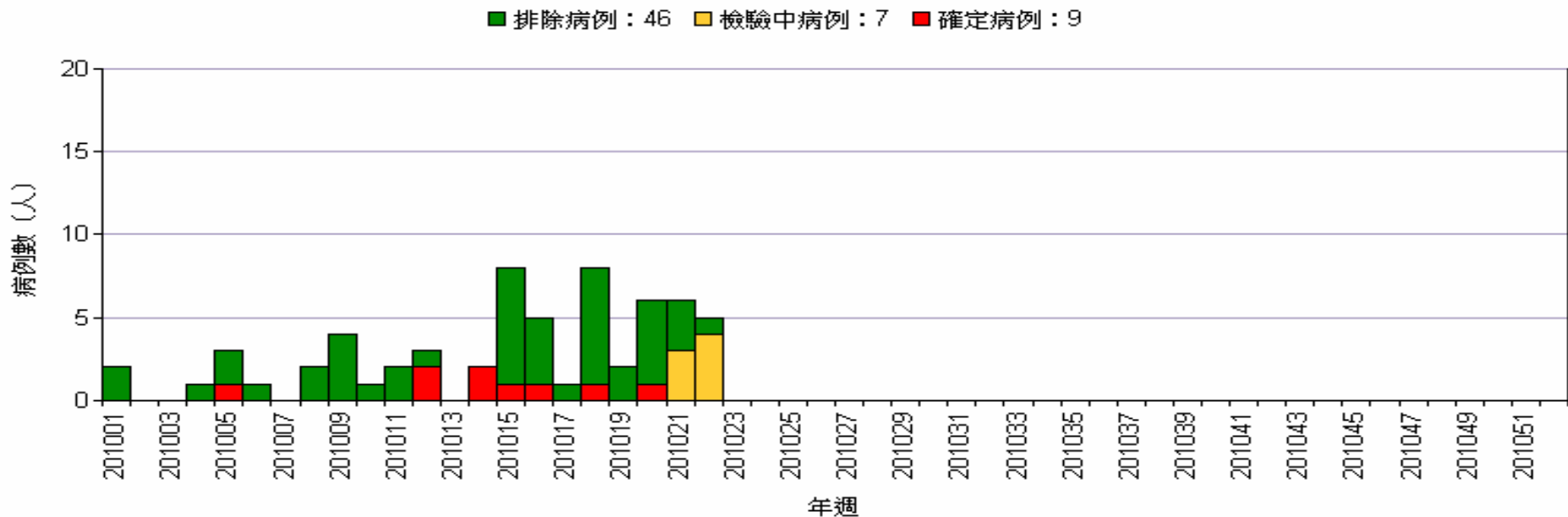


資料截止時間：2010年06月07日 06：00

資料來源：疾府管制局 2010年06月07日 09：28

Taiwan – Enterovirus infection with severe complication

全國腸病毒感染併發重症含本土及境外移入病例趨勢圖(2010/01/01~2010/6/6)



總通報病例數：62 6月6日新增重症通報個案0例

資料來源：疾病管制局 Taiwan CDC 2010/6/7

疾病名稱：腸病毒感染併發重症

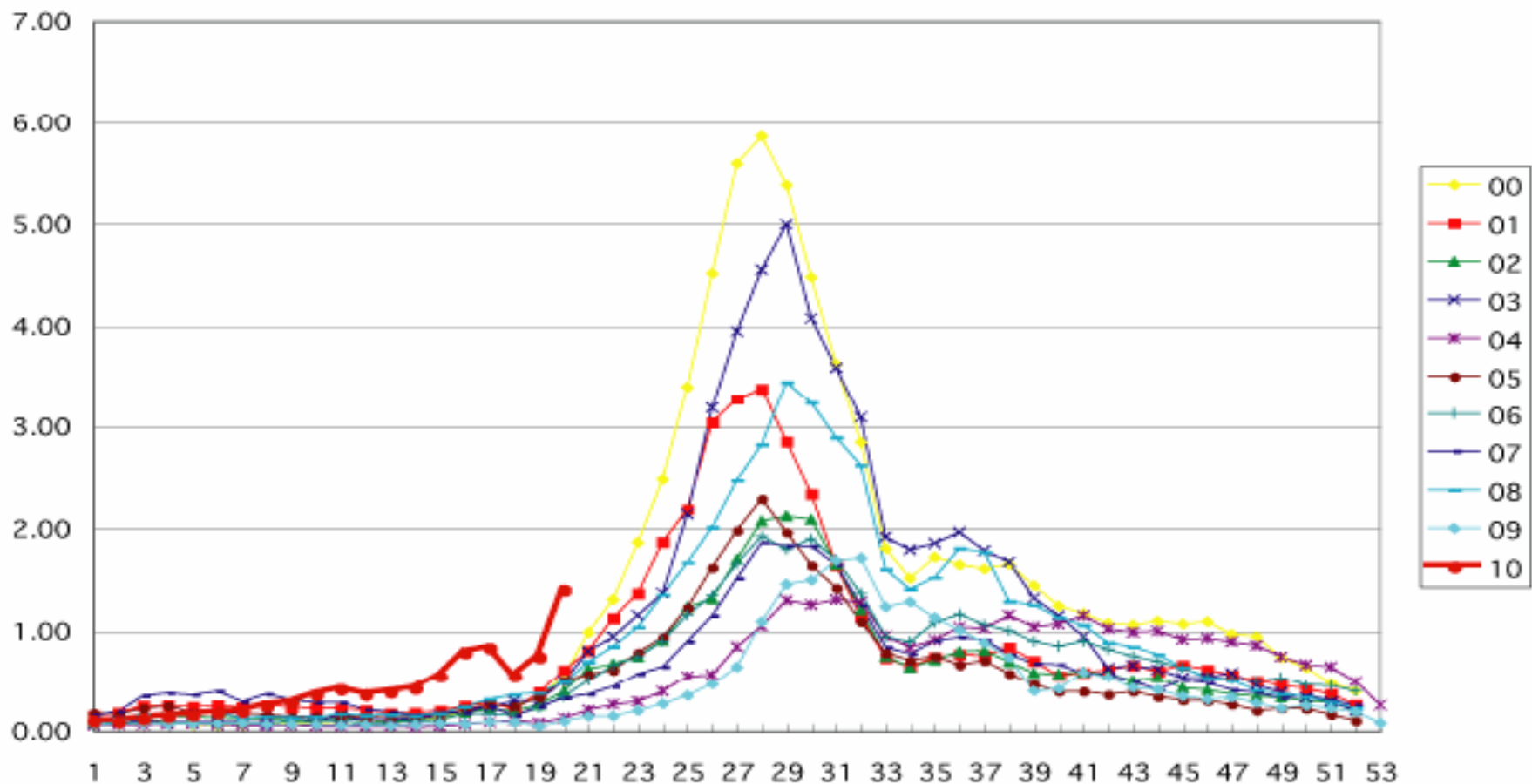
最近一例 確定病例 發病日	上週 累計數	本週 累計數	本月 累計數	本年 累計數	去年 確定總數	上週與前 三週 平均數比較	上週與過去 三年同期 平均數比較	今年累計 確定病例 死亡數
2010/5/22	0	0	0	9	29	▽0.33	▽11.33	0

註一：資料更新時間為2010/6/7 6:31 AM，本週為【2010/23】週，本月為【2010/6】月。

註二：本查詢結果為系統自動產生，數據隨時可能因未來修正而變動。

Japan – HFMD in sentinel

Hand-Foot-Mouth Disease cases reported per sentinel weekly



Source: Japan Infectious Disease Surveillance Center

Summary

- Hong Kong is experiencing a high season of HFMD and enterovirus infection in 2010 as a result of cyclical epidemic behaviour and regional increase in virus activity.
- Enteroviruses of multiple types are circulating in the community, but the predominant ones are still Coxsackie viruses.
- EV71 is associated with a higher chance of developing neurological complications. However, it is not unexpected that various enteroviruses may also cause severe complications.



Summary

- The proportion of adults among cases with neurological complications is not higher than previous years, and different types of enteroviruses were involved in these adult cases.
- The predominant strain of EV71 reported in HK is still C4. Genetic sequencing studies of circulating enteroviruses found that they are similar to those in previous years.
- Current data suggest that the higher number of adult cases with serious complications observed this year is attributable to greater incidence of enterovirus infection, and not genetic mutation of enteroviruses.



Reporting Criteria of EV71

An individual fulfilling either the **Clinical Criteria OR Laboratory Criteria** should be reported to CHP for further investigation.

Clinical Criteria

A person presented with the following condition :

1. Hand-Foot-Mouth Disease or herpangina; AND
2. One of the following complications:
 - Meningitis; OR
 - Encephalitis;OR
 - Acute flaccid paralysis; OR
 - Other central nervous system complication (e.g. cerebellar ataxia); OR
 - Myocarditis; OR
 - Pulmonary edema or hemorrhage

Laboratory Criteria

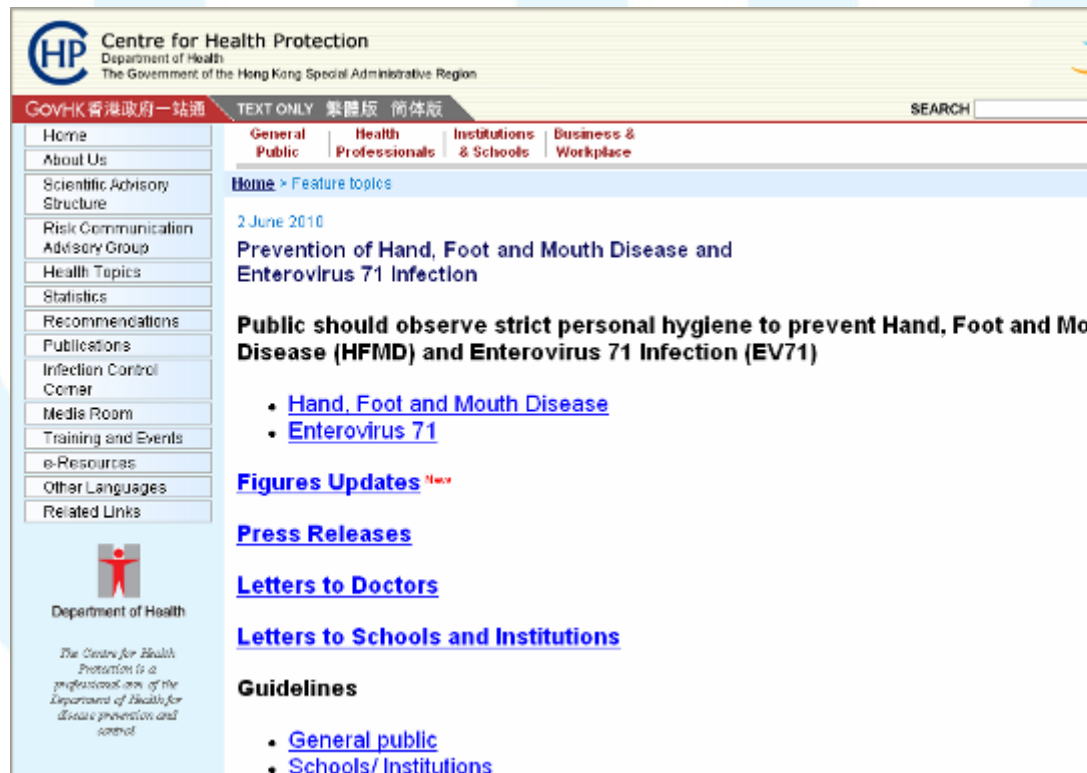
Any of the following:

- Isolation of EV71 from a clinical specimen
- Detection of EV71 by PCR from a clinical specimen



More information...

- A newly designed mini-website for HFMD and EV71 infection
- HFMD and EV71 Daily Update



The screenshot shows the homepage of the Centre for Health Protection's mini-website. It features a navigation menu on the left with categories like Home, About Us, Scientific Advisory Structure, Risk Communication Advisory Group, Health Topics, Statistics, Recommendations, Publications, Infection Control Corner, Media Room, Training and Events, e-Resources, Other Languages, and Related Links. The main content area includes a search bar, a 'Home > Feature topics' section with a date of 2 June 2010, and a headline: 'Prevention of Hand, Foot and Mouth Disease and Enterovirus 71 Infection'. Below this, it states 'Public should observe strict personal hygiene to prevent Hand, Foot and Mouth Disease (HFMD) and Enterovirus 71 Infection (EV71)' and lists links for 'Hand, Foot and Mouth Disease' and 'Enterovirus 71'. Other sections include 'Figures Updates', 'Press Releases', 'Letters to Doctors', 'Letters to Schools and Institutions', and 'Guidelines' with links for 'General public' and 'Schools/ Institutions'.

HAND FOOT MOUTH DISEASE (HFMD) AND ENTEROVIRUS 71 (EV71) INFECTION DAILY SITUATION UPDATE 手足口病及腸病毒 71 型感染每日概況

This is a daily report produced by Surveillance and Epidemiology Branch of the Centre for Health Protection. This report aims to monitor and summarize latest local situation of HFMD and EV71 infection. 「手足口病及腸病毒 71 型感染每日概況」由衛生防護中心監測及流行病學處出版，主要監察及總結本地手足口病及腸病毒 71 型感染的情況。

As of 4 June, 2010 12:00 noon 截至 2010 年 6 月 4 日中午 12 時

A. HIGHLIGHTS 重點

- 2 cases of EV71 infection and 15 HFMD outbreaks were recorded by CHP since last update on June 3. 自上次於 6 月 3 日的更新，衛生防護中心共錄得 2 宗腸病毒 71 型感染及 15 宗手足口病發病個案報告。
- HFMD activity continued to rise. 手足口病活躍程度持續上升。
- The usual peak season for HFMD and EV71 infection is from May to July. And in the past few years, a smaller winter peak also occurred from October to December. 手足口病及腸病毒 71 型感染的高峰期，一般為五月至七月，而過去數年於十月至十二月亦出現一個較小型的冬季高峰期。
- HFMD is a common disease in children usually caused by enteroviruses such as Coxsackie viruses and EV71. EV71 infection is of particular concern as it is more likely to be associated with severe medical complications and even death. 手足口病是一種常見於兒童的疾病，通常由腸病毒如何像奇奇病毒及腸病毒 71 型所引起。腸病毒 71 型感染受到特別關注，是因為它較大機會出現嚴重的併發症，甚至死亡。

B. LATEST FIGURES IN HONG KONG 本港最新個案數字

(Based on information available at 12:00 noon, cases recorded after 12:00 will be updated in the next report
資料截至今天中午 12 時，12 時後錄得的報告將於下期內更新)
*Remark: Statistics on HFMD also includes herpangina. 手足口病統計數字包括疱疹性咽頰炎。

B.1 HFMD institutional outbreaks^a

手足口病院舍爆發^a

Number reported since last update (from 12 noon, June 3 to 12 noon, June 4) 自上次更新後報告數目(6 月 3 日中午 12 時至 6 月 4 日中午 12 時)	15
Number reported this week (Week 23, May 30 to June 5) ^a 本週報告數目(第 23 週, 5 月 30 日至 6 月 5 日) ^a	88
Number reported last week (Week 22, May 23 to May 29) 上週報告數目(第 22 週, 5 月 23 日至 5 月 29 日)	55
Total number reported in 2010 2010 年報告總數	308

^aPreliminary data for this week. 本星期初步數據。

B.2 List of newly reported hand, foot and mouth disease (HFMD) outbreaks in schools and institutions^a

最新有手足口病爆發的學校及院舍名單^a
(As of 12 noon, 4 June 2010 截至 2010 年 6 月 4 日中午 12 時)

District 地區	Name of schools/institutions (Number of persons affected as of reporting) 學校及院舍名稱 (呈報時受影響人數)
Wong Tai Sin 黃大仙	Wong Tai Sin Catholic Primary School 黃大仙天主教小學 (2) St. Bonaventure College & High School 聖文德書院 (2)
Kowloon City 九龍城	Hong Kong Preschool (Kowloon Tong)[AM] 樂善幼兒學校(九龍城)(上午) (2) Munsang College (Secondary Section) 民善中學(中學部) (2) Cannan Kindergarten (Waterloo Road) 蕙南幼稚園(窩打老道) (3)
Sai Kung 西貢	Salvation Army Ming Tak Nursery School 救世軍明德幼兒園 (3) HKSPC Ocean Shores Nursery School 香港樂善兒童會龍景灣幼兒學校 (2) HKSKH St. Simon's Sai Kung Nursery School 香港聖公會聖西門西貢幼兒學校 (2) CAEMA Church Union Tszung Kwun O Alliance Kindergarten 基督教宣道會香港區聯會將軍澳五洲幼稚園 (2)
Sham 沙田	Np. Chi's Association Tai Pak Memorial School 吳氏宗親總會泰伯紀念學校 (2)
North 北區	Pentecostal Yu Leung Fat Primary School 五旬節于良發小學 (2)
Kwai Tsing 葵青	SKH Yan Laap Primary School 聖公會仁立小學 (2)

Thank you

