

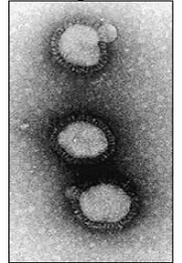
# 流感的防治

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# 流行性感冒（流感，Influenza）

- 正黏液病毒科(Orthomyxoviridae)
- 基因體含**8段**(A、B型)或7段(C型)單股RNA
- 依核蛋白(NP)及M蛋白可分為A型、B型、C型及D型

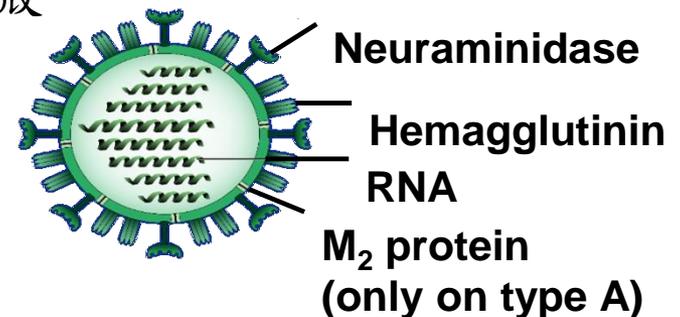


— **A流感病毒**：人畜共通，會感染人類、哺乳動物與鳥類，可能引起較嚴重的疾病，造成全球大流行，病毒變異迅速。

— **B流感病毒**：只會感染人類，引起的疾病與A流感相似，造成的流行較小。

— C流感病毒：較少引起疾病且較輕微

— D流感病毒：感染牛類，未引起人類感染



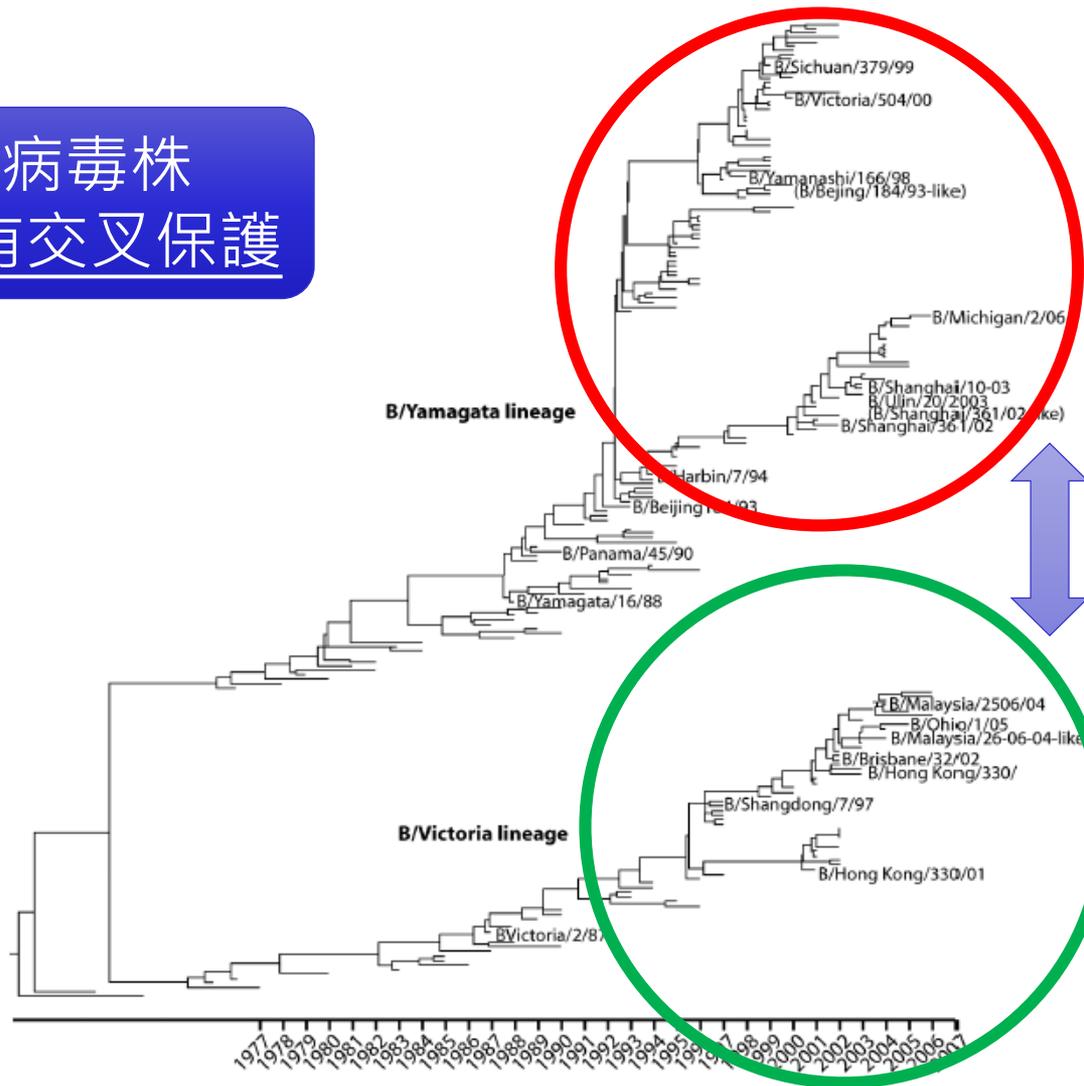
# A 流感病毒的分型與變異

- 依HA（血球凝集素）的不同來區分
  - HA：1~18種亞型
  - NA：1~11種亞型
- 抗原微變（drift）
- 抗原移型（shift）

	Human	Pig	Horse	Bird	Bats
<b>H types</b>					
H1	✓	✓		✓	
H2	✓	✓		✓	
H3	✓	✓	✓	✓	
H4		✓		✓	
H5	✓	✓		✓	
H6	✓			✓	
H7	✓		✓	✓	
H8				✓	
H9	✓	✓		✓	
H10	✓			✓	
H11-H16				✓	
H17-H18					✓
<b>N types</b>					
N1	✓	✓		✓	
N2	✓	✓		✓	
N3				✓	
N4				✓	
N5				✓	
N6	✓			✓	
N7	✓		✓	✓	
N8	✓		✓	✓	
N9	✓			✓	
N10-N11					✓

# 兩種B型流感病毒株抗原 演化差異大

兩種B型病毒株  
幾乎沒有交叉保護



山形株

兩種B型病毒株  
分開演化

維多利亞株

兩種B型流感病毒株的抗原演化史(1970~2006)

# 流感

- 潛伏期短，約二天。（1-5天）
- 台灣地區，一年四季均可能，但以冬天為主
- 傳染途徑：以飛沫為主
- 傳染期：發病一週內

# 流感的症狀

- 症狀突發
- 發燒，超過38°C
- 全身性症狀
  - 畏寒、冒冷汗、寒顫、頭痛、肌肉酸痛、全身倦怠
- 呼吸道症狀
  - 咽部疼痛、咳嗽等

甚麼是類流感？

# 流感與感冒的不同

項目	流感 (Influenza)	感冒 (Cold)
疾病類別	急性病毒性呼吸道疾病	上呼吸道感染的疾病
致病原	流感病毒，可分為A、B、C三型因為它很容易發生變異，所以容易發生大流行。	大約200多種，包括比較常見的：鼻病毒、副流感病毒、呼吸道細胞融合性病毒、腺病毒等。
臨床症狀	主要為發燒、頭痛、肌肉痛、疲倦、流鼻涕、喉嚨痛以及咳嗽等症狀。	症狀較輕微，常見包括打噴嚏、流鼻水、鼻塞及喉嚨痛，偶有輕微咳嗽、發燒或全身酸痛的情形。
併發症	最常見的併發症是肺炎，包括病毒性及細菌性肺炎，其他還包括中耳炎、鼻竇炎、腦炎、腦病變、雷氏症候群及其他嚴重之繼發性感染等。	急性中耳炎、急性鼻竇炎、下呼吸道感染。
治療方法	依照醫師處方給予抗流感病毒藥物治療以及支持療法。	感冒是自己會好的，如果症狀嚴重，可就醫吃藥緩解症狀。
預防方法	注重呼吸道衛生及咳嗽禮節，接種流感疫苗。	注重呼吸道衛生及咳嗽禮節

# 流感的嚴重度及併發症

- 視病毒株型別
- 宿主的抵抗力
  - 兩歲以下及65歲以上為高危險群
  - 潛在的共病症、慢性病、免疫低下等，如：重大傷病等
  - 其他：如孕婦、肥胖、
- 併發症
  - 呼吸道：肺炎、哮吼、(細)支氣管炎、呼吸衰竭等
  - 中樞神經異常：腦炎、急性瀰漫性腦脊髓炎等
  - 其他：如心肌炎、肝功能異常、噬血症候群等

# 流感併發重症高危險群

- 6 個月到 59 個月的兒童
- 50 歲(含)以上的成人
- 有以下疾病的成人及兒童：慢性肺疾病(含氣喘)、心血管  
疾病(單純高血壓除外), 腎臟, 肝臟, 神經學, 血液性, 或代  
謝性疾病(含糖尿病)
- 有免疫低下的人(含藥物導致或HIV感染導致)
- 流感季期間懷孕婦女
- 6個月大到18歲需接受長期阿斯匹靈(aspirin)治療者
- 護理之家或常照中心的住民
- 過度肥胖者(BMI值  $\geq 40$ )

(從美國CDC的建議修飾而來)

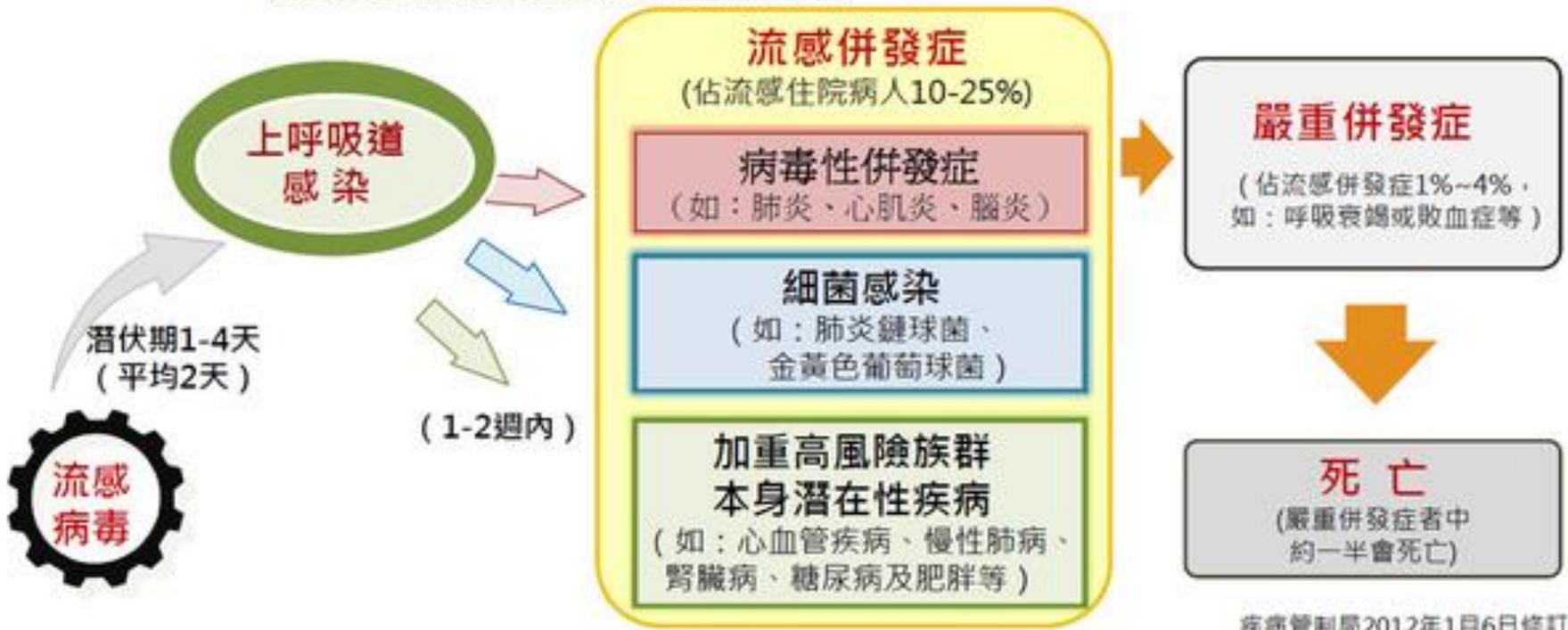
# 流感病程之可能樣態

**流感普通症狀**  
發燒、頭痛、  
喉嚨痛、咳嗽、  
肌肉酸痛

**危險徵兆**  
呼吸困難、呼吸急促、發紺（缺氧）、  
血痰或痰液變濃、胸痛、意識改變、  
低血壓或高燒持續72小時  
※65歲以上長者或有潛在疾病者，應提高警覺!

**儘速轉診  
至大醫院**

門診就醫(約1%需住院)



# 臨床個案

- 黃o祥，35歲，男性
- 過去病史：無
- 就診日期：2016/02/25
- 就診主訴：
  - 發燒及呼吸急促 x 3天
  - 咳嗽 2週
  - 全身倦怠
  - 無肌肉痠痛

- 就診經過：

- 02/25：急診就診：低血氧，胸部X光：雙側肺炎 => 氣管內管插管

- =>加護病房住院，克流感使用



- 就診經過：

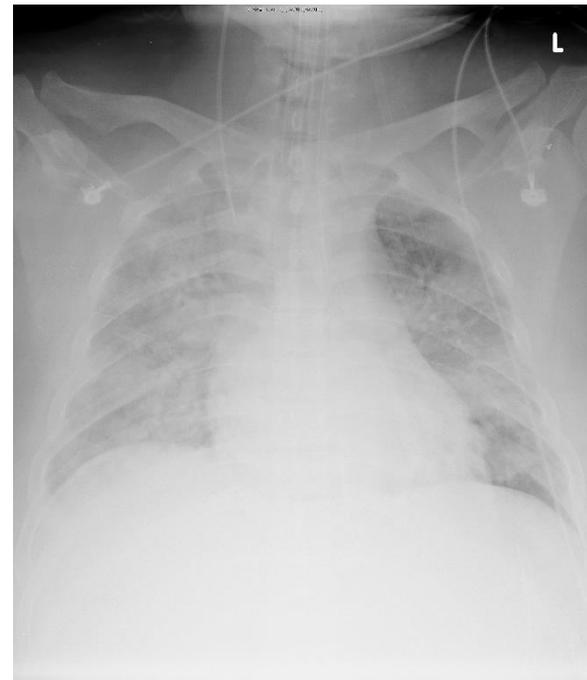
- 病毒培養：A 型流感 (H1N1)

- 02/26~03/02：急性腎損傷併腎病症候群 => 利尿劑+白蛋白使用，呼吸狀況改善

02/25



02/27



- 就診經過：

- 03/03：拔除氣管內管

- 03/14：轉入一般病房持續治療

- 03/23：病況改善出院

02/25



02/27



03/21



# 病例 2

- 七歲小女生，生長發育正常
- 過去沒有特殊疾病
- 這個流感季有接種流感疫苗

- 主述:

- 肌肉疼痛, 倦怠以及全身無力兩天

- 現病史:

- 12/28 ~ 12/31有發燒

- 到診所就診: 流感快篩證實 B流感, 12/30~12/31  
服用克流感

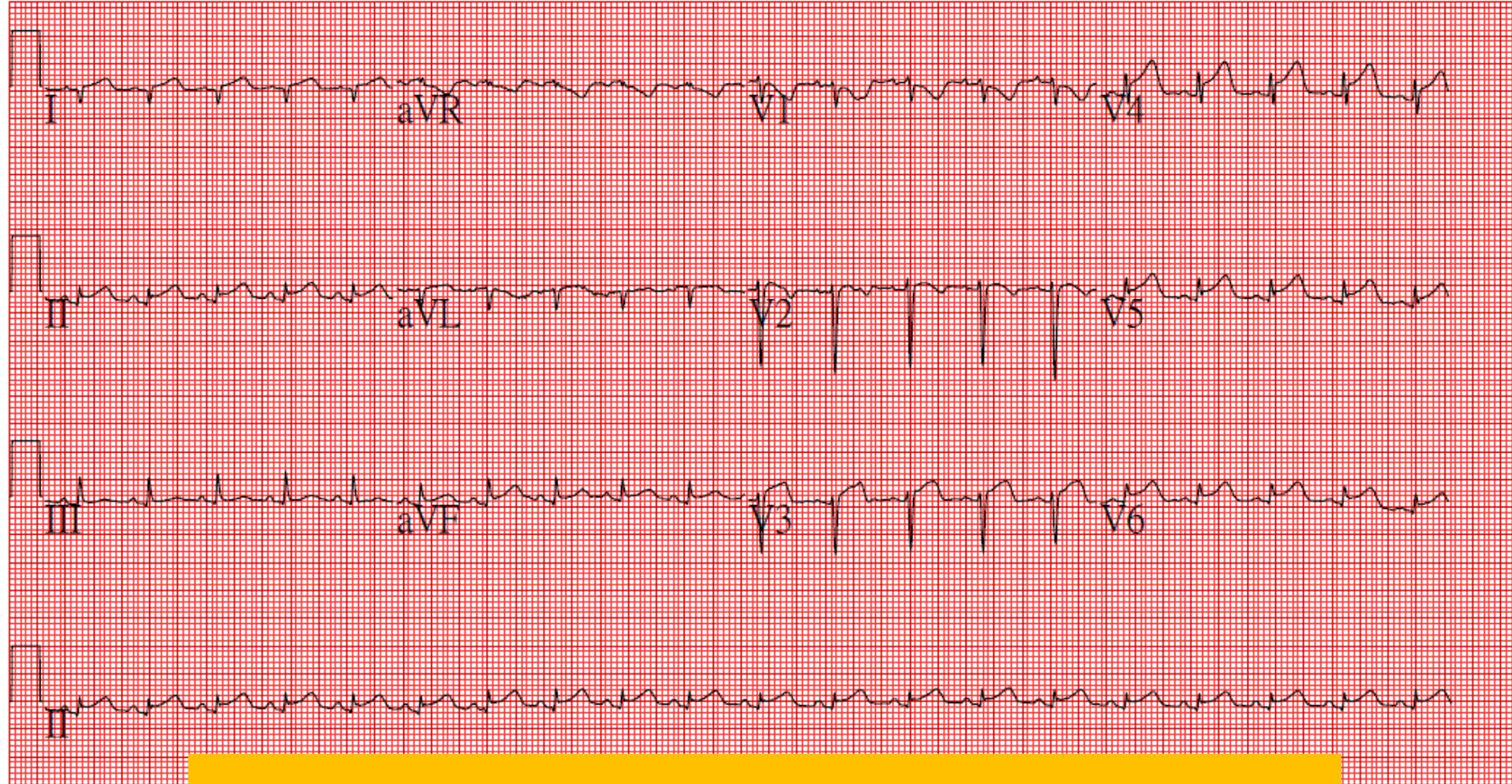
- 1/3 出現頭暈, 呼吸喘, 肌肉疼痛, 倦怠, 到某家醫院急診就診, 留觀檢查無異常, 出院

- 1/4 來本院門診就診, 建議住院, 沒有床位, 轉急診先處置

# EKG

轉診醫師:

未經確認的



**Diffused ST elevation**

# 胸部X光檢查



# 檢驗室檢查

檢驗項目	單位	1070104	1070104
血液組(B)			
WBC	1000/uL	11.1	8.5
RBC	million/uL	4.79	5.44
Hemoglobin	g/dL	14.4	14.7
Hematocrit	%	37.3	42.6
MCV	fL	77.9	78.3
MCH	pg/Cell	30.1	27.0
MCHC	gHb/dL	38.6	34.5
RDW	%	12.8	12.9
Platelets	1000/uL	203	202
Segment	%	76.0	57.9
Lymphocyte	%	17.0	35.2
Monocyte	%	5.0	6.7

檢驗項目	單位	1070104
生化組(B)		
Ca(Calcium)	mg/dL	
Na(Sodium)	mEq/L	
K(Potassium)	mEq/L	4.3
Cl(Chloride)	mEq/L	
Mg(Magnesium)	mEq/L	
Lactate(B)	mg/dL	
CK-MB	ng/mL	105.7
Troponin-I	ng/mL	0.763
Sugar	mg/dL	89
NT-ProBNP	pg/mL	
BUN	mg/dL	
Creatinine	mg/dL	0.54
AST/GOT	U/L	113

# 兒科加護病房

PHILIPS TSAI, PEI EN MI 1.0 1/4/2018  
Im:9 (F1/1) 21549956 CGMH PICU TIS 0.4 2:54:20 PM  
DOB: 2011/1/4  
Series Time:  
MRN:

Ped. Cardia  
S5-1 + Length 1.90 cm  
39 Hz  
13.0cm

2D  
HRes  
Gn 65  
C 47  
3 / 2 / 0

20mm 心包膜積水

28  
56

# 兒科加護病房

## 醫療處置:

- 心包膜穿刺並置放引流管 引流: 155ml
- 給予”強“心藥物
  - Milrinone 0.25mg/kg/min
  - Dopamine 6mcg/kg/min
- 靜注型免疫球蛋白IVIG (0.5mg/kg/dose)

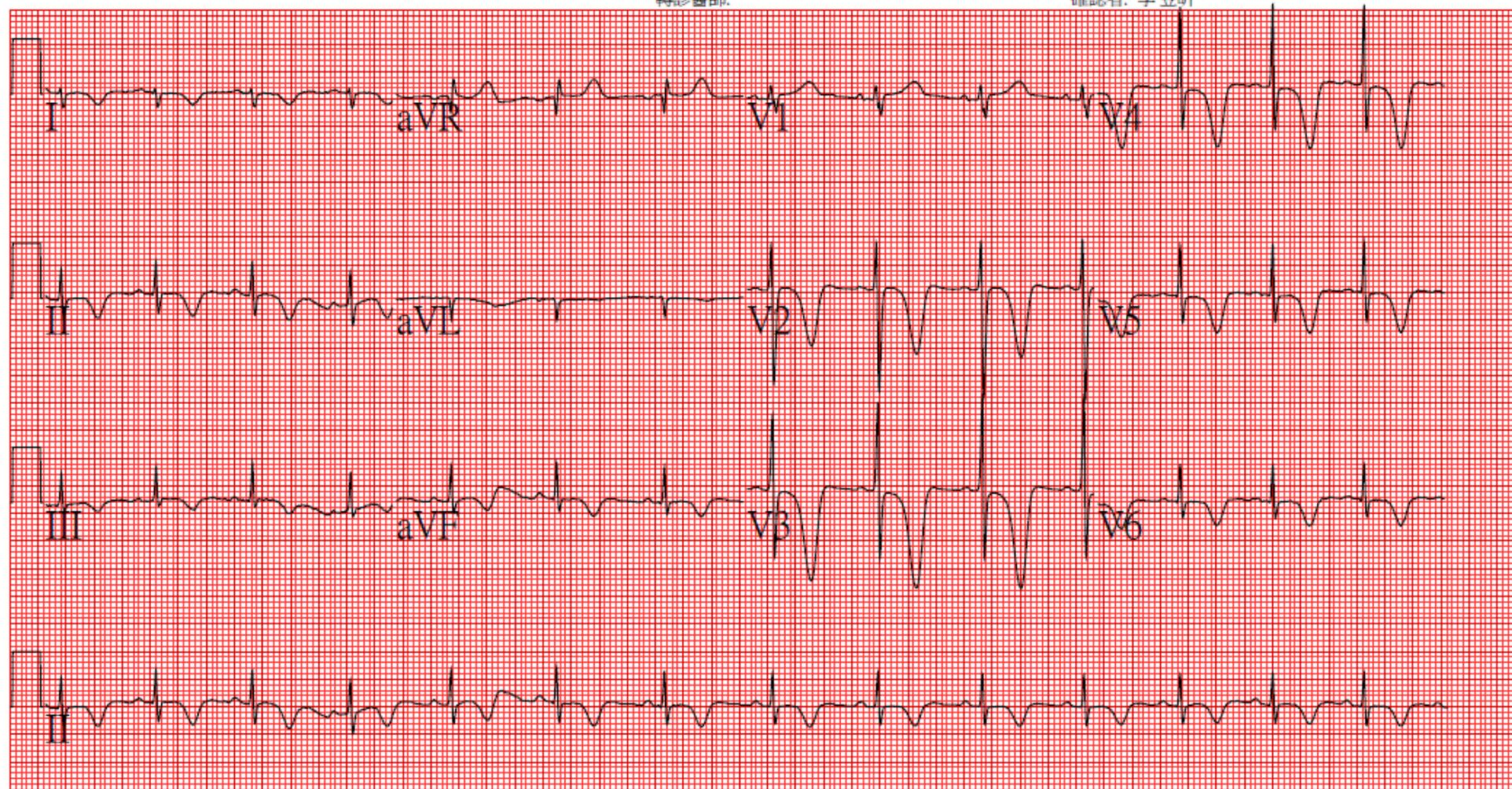


- 心超:
  - 無心包膜積水
  - 正常心臟超音波圖
- 心電圖:
  - 廣泛性 T 波倒置
  - QT波延長

# 1/13 EKG

12/13/13

12/13/13



1/4 CXR住院時



1/14 CXR出院時



# 最後診斷

- **B**流感, 併發急性心肌炎及急性心包膜炎  
合併心包膜填塞及休克



**Comparison of clinical presentation between hospitalized children with influenza in CGMH** (Wang YH et al JMII 2003, Lin CH et al PIDJ 2006)

Symptoms	Flu A (n = 84)	Flu B (n = 92)	<i>p</i> value
	No. (%)	No. (%)	
Fever	76 (91)	90 (98)	.049
Cough	68 (81)	80 (87)	.277
Sore throat	-	12 (13)	-
Coryza	60 (71)	68 (74)	.712
Seizure	4 (4.8)	5 (5.4)	1.000
<b>Nausea/vomiting</b>	<b>29 (35)</b>	<b>18 (20)</b>	<b>.025</b>
Diarrhea	13 (16)	12 (13)	.644
Abdominal pain	8 (9.5)	15 (16)	.183
Headache	7 (8.3)	7 (7.6)	.859
<b>Myalgia</b>	<b>2 (2.4)</b>	<b>18 (20)</b>	<b>.000</b>
<b>Visual hallucination</b>	-	<b>10 (11)</b>	-
<b>Confusion state</b>	<b>18 (22)</b>	<b>4 (4.3)</b>	<b>.001</b>

**Comparison of clinical presentation between hospitalized children with influenza in CGMH** (Wang YH et al JMII 2003, Lin CH et al PIDJ 2006)

Clinical diagnosis	Flu A (n = 84) No. (%)	Flu B (n = 92) No. (%)	<i>p</i> value
Bronchiolitis/ bronchopneumonia	33 (39)	37 (40)	.900
<b>Pneumonia</b>	<b>17 (20)</b>	<b>9 (9.8)</b>	.051
Croup	3 (3.6)	2 (2.1)	.671
URI	14 (17)	27 (29)	.047
<b>CNS dysfunction</b>	<b>26 (31)</b>	<b>11 (12)</b>	<b>.000</b>
Conjunctivitis	1 (1.2)	7 (7.6)	.066
<b>Myositis</b>	<b>-</b>	<b>11 (12)</b>	<b>-</b>
Concomitant bacterial infection	8 (9.5)	9 (9.8)	.849

# Influenza B-associated rhabdomyolysis in Taiwanese children (Wu CT et al Acta Paed 2010;99:1701-4)

- A retrospective analysis in patients aged <17 years in **CGMH** in Taiwan, **2000–2007**
- Definition of rhabdomyolysis
  - Gross pigmenturia without haematuria
  - An initial CK level over five times the upper limit of the normal range (>1000 IU/L)
  - Excluded other potential conditions other than flu B
- **24 cases** analyzed
- a 7:3 male : female ratio
- Mean age **7.2 ± 1.9** years, range 3.9–12 years
  - 63% aged 6 ~ 9 years

**Table 2** Clinical manifestations of influenza B-associated rhabdomyolysis in children

Symptom/sign	Influenza B (24) (%)
Fever	24 (100)

**Table 3** Laboratory findings on admission

Characteristics	Mean $\pm$ SD	Range	95% CI
CK (U/L)	4212 $\pm$ 4327	1022–21 473	1385–5040
AST (U/L)	145 $\pm$ 111	57–506	47–162
Myoglobin (blood) (mg/L)	1164 $\pm$ 761	546–2536	359–1767
Myoglobin (urine) (mg/L)	1154 + 1163	190–4021	415–1893

(Wu CT et al Acta Paed 2010;99:1701-4)

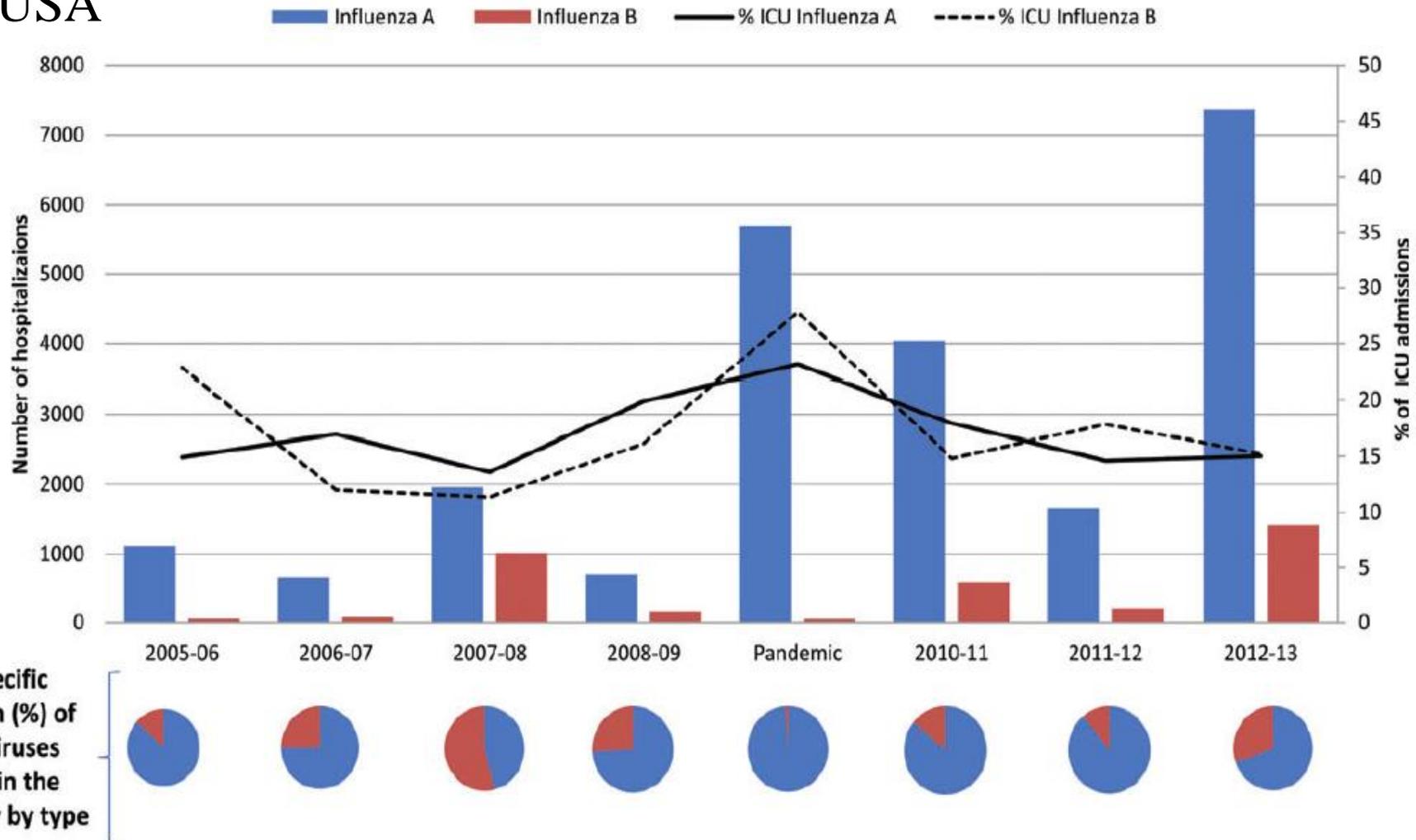
# Influenza B-associated rhabdomyolysis in Taiwanese children (Wu CT et al Acta Paed 2010;99:1701-4)

- Median **interval** between the onset of influenza and onset of IBAR was **3.4 days** (range, 1–14)
- **Calf muscles** involved in all cases
- Mean initial blood creatine kinase of 4212 U/L
- Median time to **clinical recovery** was **5 days** (range 1–24)
- No patient had renal failure

**Conclusion: Outcomes of IBAR are good with proper medical care**

# Comparing Clinical Characteristics Between Hospitalized Adults With Laboratory-Confirmed Influenza A and B Virus Infection

In USA



(CID 2014;59:252-5)

# Hospitalization for Influenza A Versus B

(Tran D et al Pediatrics 2016;138(3):e20154643)

- Using active surveillance data from the **Canadian Immunization Monitoring Program Active at 12 pediatric hospitals**
  - Compared clinical characteristics and outcomes of children  $\leq 16$  years admitted with laboratory-confirmed influenza B or seasonal influenza A
- Over 8 nonpandemic influenza seasons (2004-2013),
  - identified **1510 influenza B** and **2645 influenza A** cases
  - **median ages** were 3.9 and 2.0 years, respectively ( $P < .0001$ )
  - influenza B patients more likely to **have a vaccine-indicated condition** (OR, 1.30; 95% CI, 1.14–1.47)

**TABLE 4** Treatment and Illness Severity of Hospitalized Patients by Influenza Type

Treatment	Influenza Type <sup>a</sup>			
	Seasonal A (n = 2645)	Influenza B (n = 1510)	Unadjusted OR/P	Adjusted OR/P <sup>b</sup>
Antiviral				
Antibiotic	400/2643 (15.1)	202/1508 (13.4)	0.87 (0.72–1.04)	—
Measures of illness severity	1913/2640 (72.5)	1050/1508 (69.6)	0.87 (0.76–1.00)	—
Respiratory complications				
Group				
Croup	101 (3.8)	51 (3.4)	0.88 (0.62–1.24)	—
Pneumonia (radiologically confirmed)	595 (22.5)	364 (24.1)	1.09 (0.94–1.27)	—
Extrarespiratory complications				
Myositis	18 (0.7)	101 (6.7)	10.46 (6.31–17.35)	6.95 (4.15–11.64)
Myocarditis	6 (0.2)	6 (0.4)	1.75 (0.56–5.45)	—
Hepatitis	24 (0.9)	22 (1.5)	1.61 (0.90–2.89)	—
Meningitis	6 (0.2)	4 (0.3)	1.17 (0.33–4.15)	—
Encephalitis	42 (1.6)	36 (2.4)	1.51 (0.97–2.37)	—
Length of hospital stay, median (IQR), d	3.0 (2.0–5.0)	3.0 (2.0–5.0)	0.60	—
Mortality				
Attributable to influenza	10 (0.4)	16 (1.1)	2.82 (1.28–6.23)	2.65 (1.18–5.94)
All-cause	10 (0.4)	18 (1.2)	3.18 (1.46–6.90)	2.95 (1.34–6.49)
Admitted to ICU	337 (12.7)	190 (12.6)	0.99 (0.82–1.19)	—
Required mechanical ventilation <sup>c</sup>	212 (62.9)	124 (65.3)	1.11 (0.76–1.61)	—
Required extracorporeal membrane oxygenation <sup>c</sup>	7 (2.1)	6 (3.2)	1.54 (0.51–4.64)	—
Length of ICU stay, median (IQR), d <sup>c</sup>	3.0 (1.0–6.5)	3.0 (1.0–7.0)	0.62	—

(Tran D et al Pediatrics 2016;138(3):e20154643)

# Hospitalization for Influenza A Versus B

(Tran D et al Pediatrics 2016;138(3):e20154643)

- Proportion of **deaths** attributable to influenza **significantly greater for influenza B** (1.1%) than influenza A (0.4%)
  - Adjusted for age and health status, **OR was 2.65** (95% CI, 1.18–5.94)
  - A similar adjusted OR was obtained for **all-cause mortality** (**OR, 2.95**; 95% CI, 1.34–6.49)
- Among healthy children with influenza B, **age  $\geq 10$  years** (relative to  $< 6$  months) was associated with the greatest odds of **ICU admission** (**OR, 5.79**; 95% CI, 1.91–17.57)

# Hospitalization for Influenza A Versus B

(Tran D et al Pediatrics 2016;138(3):e20154643)

## CONCLUSIONS:

- **Mortality** associated with **pediatric influenza B infection was greater** than that of influenza A
- Among healthy children hospitalized with **influenza B, those 10 years and older** had a significant **risk of ICU admission**



# Epidemiological and virological characteristics of influenza B: results of the Global Influenza B Study

(Caini S et al Influenza and Other Respiratory Viruses 2015; 9 (Suppl. 1):3–12)

- To collect information on global epidemiology and burden of disease of influenza B since 2000
- **26 countries** in the Southern (n = 5) and Northern (n = 7) hemispheres and intertropical belt (n = 14) provided virological and epidemiological data
- The database included **935,673 influenza cases (2000–2013)**
- **Overall median proportion of influenza B was 22.6%**, with no statistically significant differences across seasons

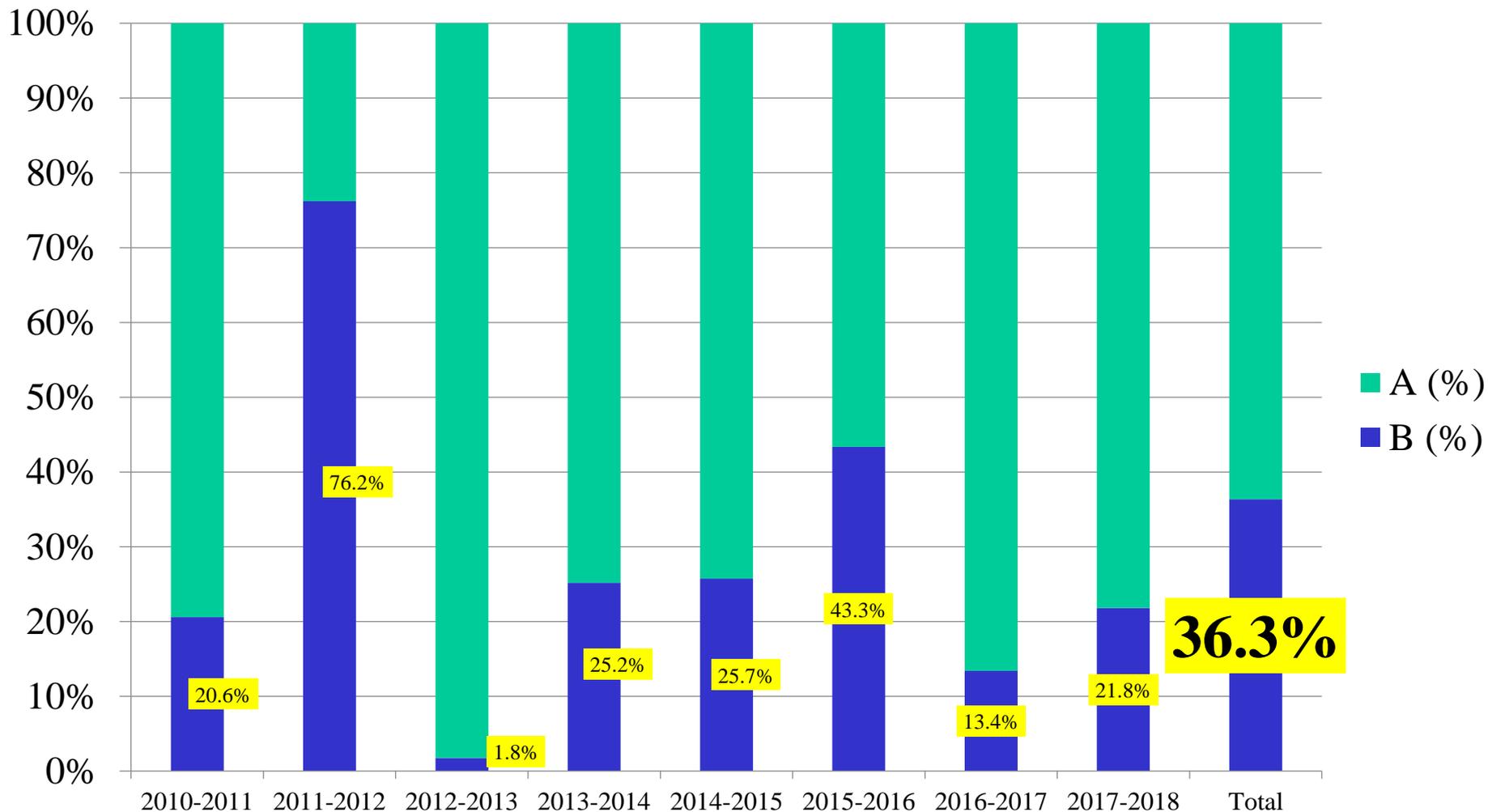
# Epidemiological and virological characteristics of influenza B: results of the Global Influenza B Study

(Caini S et al Influenza and Other Respiratory Viruses 2015; 9 (Suppl. 1):3–12)

- During seasons where **influenza B was dominant or co-circulated (>20% of total detections)**, **Victoria** and **Yamagata** lineages predominated during **64%** and **36%** of seasons, respectively,
- **A vaccine mismatch was observed in 25% of seasons**
- Proportion of influenza B was **inversely correlated** with maximum ILI rate in the same season in the **Northern** and (with borderline significance) **Southern hemispheres**
- Patients infected with **influenza B were usually younger (5–17 years)** than patients infected with influenza A

# Subtypes of Influenza in Taiwan

2000 – 2010 Influenza A (61%) vs. **B (39%)**

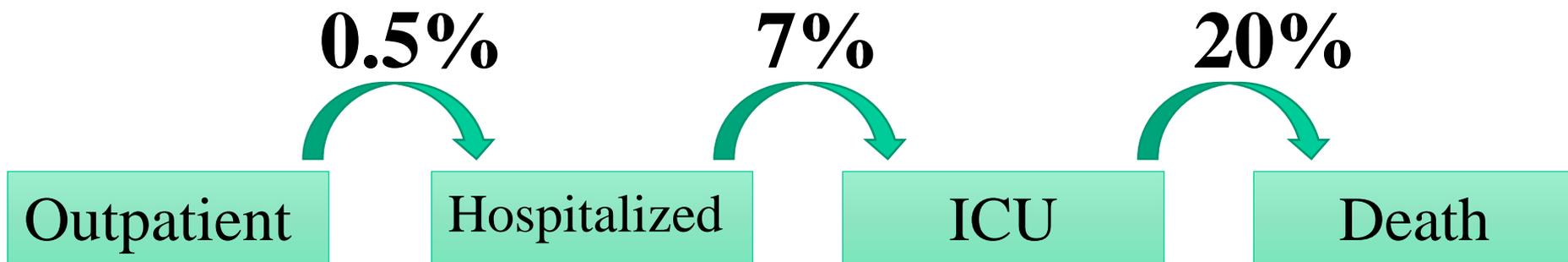


2010 – 2018 Taiwan CDC 病毒監測

Yang MC et al. *Hum Vaccin Immunother.* 2017 Jan 2;13(1):81-89.

# Flu in Taiwan

- In Taiwan, among outpatient cases of influenza, about 0.5% require hospitalization, of which 7% of the patients with serious complications need intensive care, and of which the mortality rate is about 20%.



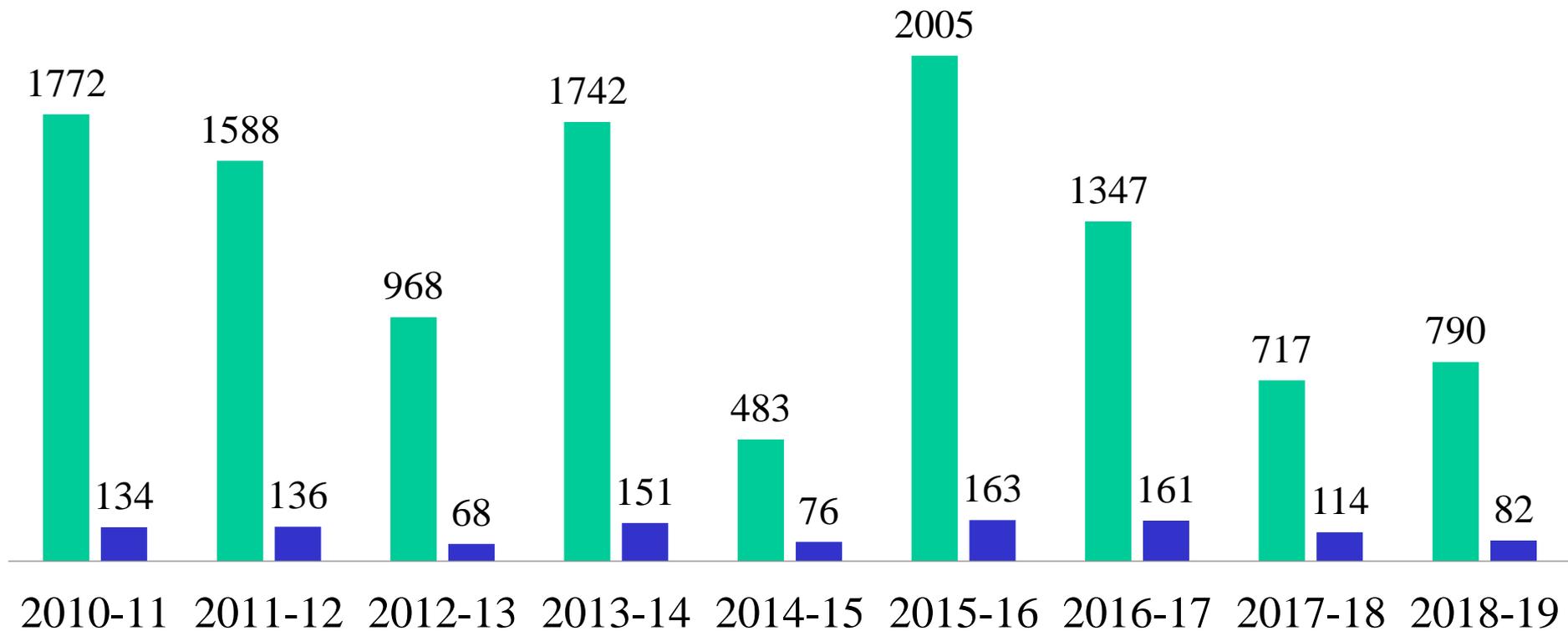
<https://www.cdc.gov.tw/professional/info.aspx?treeid=78b629884c927028&nowtreeid=E02C24F0DACDD729&tid=9BA8ECA515DCAAF5>

1. 疾病管制署健保IC卡資料庫次級資料2011年至2015年肺炎或流感門診及住院就診人次分析(未歸人)

# Laboratory-confirmed complicated influenza and influenza-associated deaths in Taiwan

■ Severe complicated ■ Deaths

H1N1	B	H3N2	H1N1	H3N2	H1N1	H3N2	B	H1N1
58.9%	65.1%	63.1%	46.8%	56.9%	75.80%	85%	80%	61.6%





# 流感的診斷

- 臨床診斷
- 流行病學的診斷
- 實驗室檢驗的診斷
  - 病毒培養與鑑定
  - 快速抗原偵測(流感快篩)
  - RT-PCR檢測
  - 血清學檢測

# 流感快篩(快速抗原檢測)

- 酵素免疫分析法
- 偵測流感病毒的核蛋白 (NP)
- 快速檢測A型或B型流感病毒感染
- 敏感度約50-70%，特異度約90-95%
- 在流感流行季節，不宜用陰性結果直接排除流感病毒感染
- 發生併發症的高風險族群，建議依照臨床症狀診斷並即時治療

# Rapid Tests for Influenza, Respiratory Syncytial Virus, and Other Respiratory Viruses: A Systematic Review and Meta-analysis (Bruning AH et al CID 2017;65:1026-32)

- Evaluating these tests against PCR as the reference standard
- Of 179 studies included, **134 evaluated rapid tests for influenza viruses**, 32 for respiratory syncytial virus (RSV), and 13 for other respiratory viruses
- Summary **sensitivity and specificity estimates of tests for influenza were 61.1% and 98.9%**
- For RSV, summary sensitivity was 75.3%, and specificity, 98.7%

**Table 2. Subgroup Analyses: Accuracy Estimates**

	Pooled Sensitivity (95% CI)	Pooled Specificity (95% CI)
Influenza		
Virus type		
Influenza A	68.1 (58.9–76.0)	99.2 (98.5–99.6)
H1N1	54.0 (47.6–60.3)	99.1 (98.5–99.5)
Influenza B	71.0 (56.8–82.1)	99.6 (99.2–99.8)
Influenza A+B	61.1 (53.3–68.3)	98.9 (98.4–99.3)
Population		
Children	66.1 (52.9–79.3)	98.3 (97.2–99.5)
Adults	34.1 (14.0–54.1)	99.2 (98.2–100.0)
Point-of-care testing	62.1 (47.6–74.7)	98.4 (96.7–99.2)
Rapid test		
QuickVue Influenza A+B	44.6 (29.1–60.0)	99.3 (98.8–99.9)
Sofia Influenza A+B	75.3 (59.2–91.5)	95.3 (91.5–99.2)
BinaxNow Influenza A&B	44.1 (23.3–64.9)	99.4 (98.6–100.0)
Directigen Flu A+B	35.8 (11.8–59.7)	99.2 (98.0–99.4)
mariPOC	76.1 (53.5–98.7)	99.4 (98.3–100.0)

# Rapid Tests for Influenza, Respiratory Syncytial Virus, and Other Respiratory Viruses: A Systematic Review and Meta-analysis (Bruning AH et al CID 2017;65:1026-32)

- A **growing need for rapid**, sensitive, and specific identification of viral pathogens to **allow effective prompt antimicrobial therapy, decrease extra diagnostic testing**, and implement **pathogen-specific infection control measures**
- **More sensitive and specific rapid multiplex molecular assays are in development**
  - Potential to rapidly and accurately identify not only respiratory viruses but also bacteria
  - **Fully automated molecular methods** are **commercially available** and presented as designed to be operated at the point of care
- Non-molecular rapid tests will still have a role in practical patient care
  - Be aware of their availability and performance characteristics

# How Are Influenza Test Results Interpreted?

(IDSA guideline, Harper SA et al CID 2009;48:1003-32)

**Table 5. Interpretation of rapid influenza antigen test results for specimens obtained from patients with influenza-like illness.**

Influenza activity	Positive predictive value <sup>a,b</sup>	Negative predictive value <sup>b,c</sup>
Very low (summer)	Very low	Very high
Low (early or late season)	Low to moderate	High
High (community outbreaks)	High	Low to moderate
Peak activity	Very high	Low

# Multiplex PCR system for the rapid diagnosis of respiratory virus infection: systematic review and meta-analysis (Huang HS et al CMI 2017; online)

- A summary of evidence for the diagnostic accuracies of **three multiplex PCR systems** on the detection of viral respiratory infections
  - BioFire FilmArray RP (**FilmArray**), Nanosphere Verigene RV+ test (**Verigene RV+**) and Hologic Gen-Probe **Prodesse assays**
- A comprehensive search up to 1 July 2017
- Twenty studies of 5510 patient samples eligible for analysis

Characteristics of BioFire FilmArray RP, Nanosphere Verigene RV+ Test and Hologic Gen-Probe Prodesse assays

Name	BioFire FilmArray	Verigene	GenProbe Prodesse
Technology	Melting curve analysis	Gold nanoparticles with silver signal amplification	Melting curve analysis
Assays	Respiratory panel	Respiratory virus plus test	ProFlu+, ProFAST+, ProAdeno+, ProParaflu+, Pro hMPV+
Targets	<ul style="list-style-type: none"> <li>• Adenovirus</li> <li>• Coronavirus HKU1</li> <li>• Coronavirus NL63</li> <li>• Coronavirus 229E</li> <li>• Coronavirus OC43</li> <li>• hMPV</li> <li>• Human Rhinovirus/enterovirus</li> <li>• FluA</li> <li>• FluA/H1</li> <li>• FluA/H3</li> <li>• FluA/H1–2009</li> <li>• Influenza B</li> <li>• Parainfluenza virus 1</li> <li>• Parainfluenza virus 2</li> <li>• Parainfluenza virus 3</li> <li>• Parainfluenza virus 4</li> <li>• RSV</li> </ul>	<ul style="list-style-type: none"> <li>• FluA–H1</li> <li>• FluA–2009 H1N1</li> <li>• FluA–H3</li> <li>• FluA</li> <li>• Influenza B</li> <li>• RSV A</li> <li>• RSV B</li> </ul>	<ul style="list-style-type: none"> <li>• ProFlu+: FluA, influenza B, RSV</li> <li>• ProFAST+: Seasonal FluA/H1, seasonal FluA/H3, 2009 H1N1 influenza</li> <li>• ProAdeno+: Adenovirus</li> <li>• ProParaflu+: Parainfluenza 1, parainfluenza 2, parainfluenza 3</li> <li>• Pro hMPV+: hMPV</li> </ul>
Throughput	1 sample per instrument	1 sample per processor	14 samples per run
Run time (hours)	1	<2.5	4–5
Hands-on time	2 minutes	5 minutes	1.5 hours
Sample preparation included?	Yes	Yes	No
Reagent storage conditions	Room temperature	2–8°C and –20°C	–70°C

FluA, influenza A virus; hMPV, human metapneumovirus; RSV, respiratory syncytial virus.

Accuracy estimates of included studies

Test	Sensitivity (95% confidence interval)	Specificity (95% confidence interval)	LR+ (95% confidence interval)	LR- (95% confidence interval)	AUC (95% confidence interval)
<b>Influenza A virus</b>					
FilmArray	0.911 (0.848, 0.949)	0.995 (0.988, 0.998)	186 (74.9, 368)	0.0928 (0.052, 0.153)	0.99 (0.98, 1)
Verigene	0.949 (0.882, 0.979)	0.982 (0.944, 0.995)	65.2 (15.9, 185)	0.058 (0.0206, 0.122)	0.99 (0.98, 1)
Prodesse	0.954 (0.871, 0.985)	0.983 (0.973, 0.989)	57.65 (40.48, 76.94)	0.053 (0.022, 0.0896)	0.99 (0.99, 1)
Summary	0.940 (0.902, 0.964)	0.987 (0.979, 0.992)	76.9 (42.4, 126)	0.06 (0.03, 0.101)	0.99 (0.98, 1)
<b>Influenza B virus</b>					
FilmArray	0.822 (0.689, 0.905)	0.994 (0.980, 0.998)	167.50 (40.9, 503.00)	0.188 (0.093, 0.313)	0.98 (0.94, 1)
Prodesse	0.963 (0.907, 0.986)	0.992 (0.969, 0.998)	136.73 (30.5, 385)	0.04 (0.014, 0.097)	0.99 (0.99, 1)
Summary	0.932 (0.877, 0.963)	0.993 (0.986, 0.997)	154.4 (66.5, 304)	0.072 (0.034, 0.124)	0.99 (0.99, 1)
<b>RSV</b>					
FilmArray	0.911 (0.821, 0.958)	0.987 (0.971, 0.994)	73.1 (29.4, 150)	0.09 (0.0412, 0.172)	0.98 (0.98, 0.99)
Verigene	0.977 (0.929, 0.993)	0.993 (0.962, 0.999)	219.30 (23.5, 868)	0.027 (0.0076, 0.072)	0.99 (0.98, 1)

FilmArray, Verigene RV+ and ProFlu+ demonstrated a summary sensitivity for FluA of 0.911 (95% CI, 0.848-0.949), 0.949 (0.882 - 0.979) and 0.954 (0.871-0.985), respectively

Multiplex PCRs demonstrated **high diagnostic accuracy**, with area under the receiver operating characteristic curve equal to or more than 0.98 for 5 viruses (**flu A & B, RSV, adenovirus, hMPV**) except for adenovirus (AUROC 0.89)

# Multiplex PCR system for the rapid diagnosis of respiratory virus infection: systematic review and meta-analysis (Huang HS et al CMI 2017; online)

## Conclusions:

- Point estimates calculated from eligible studies showed that the **three mPCRs** (FilmArray, Verigene RVt and ProFlut) are **highly accurate** and may provide important diagnostic information for early identification of respiratory virus infections.
- In patients with low pretest probability for FluA, these three mPCRs can predict a low possibility of infection and may justify **withholding empirical antiviral treatments**

# 流感的治療

- 症狀治療
  - 孩童避免使用aspirin退燒藥
- 抗病毒藥物：
- 輔助治療(adjunctive therapy)
  - 癒後血清、IVIG: 有某些助益
  - 類固醇: 有害

# 流感的治療

- 症狀治療
- 抗病毒藥物：
  - M<sub>2</sub> channel blockers: amantadine, rimantadine
  - Neuraminidase inhibitors: oseltamivir, zanamivir, peramivir, laninamivir
  - **Polymerase inhibitor: favipiravir**
  - **Cap-dependent endonuclease inhibitor: baloxavir**
- 輔助治療 (adjunctive therapy)

# 抗病毒藥物治療的效益

- 臨床試驗中，於發病後早期（48小時內）開始治療，可降低病毒量、縮短流感病程、減緩症狀
- 許多觀察性研究指出，對於出現嚴重症狀或可能出現併發症之高風險族群，即使超過48小時給藥，仍可減低出現併發症之風險、縮短住院日數、降低死亡率
- 考慮病患潛在疾病與症狀，必要時及早使用

# 公費流感抗病毒藥劑種類

藥物學名	Oseltamivir	Zanamivir	Peramivir	Favipiravir
商品名	Tamiflu 克流感	Relenza 瑞樂沙	Rapiacta	Avigan
包裝	75 毫克膠囊 10 入之盒裝	盒裝有碟型吸入器 1 枚，及含 4 孔規則間隔之泡囊 5 入	點滴用注射袋 300mg	淡黃色的膜衣錠，每錠200mg
使用方式	口服	吸入	注射	口服
使用對象	成人及兒童（含足月新生兒）	五歲以上	小兒（早產兒與新生兒除外）與成人	成人
標準治療劑量	75mg 每天2次，共5天	每天 2 次，每次吸 2 孔，共 5 天	每日300mg	第 1 日每回服用 1600mg，每日2回。第 2 至 5 天每回 600mg，每日2回。總投藥期間為 5 天。
小兒是否需調整劑量	是	否	是	本藥劑具致畸胎性，禁使用於兒童，且無小兒投藥經驗
腎功能不佳是否調整劑量	是	否	是	是
備註	可能出現輕微噁心及嘔吐，未成年病患需注意神經精神症狀	用於慢性呼吸系統病患時需特別注意支氣管痙攣及呼吸困難等症狀	提供新型A型流感通報病例使用，且需由醫院申請並經醫療網指揮官同意	無我國藥物許可證，提供新型A型流感通報病例使用（限於其他抗流感病毒藥物無效或效力不足的情況），且需由醫院申請並經醫療網指揮官同意。本藥劑具致畸胎性，孕婦及有懷孕可能的婦人禁止使用

# 公費流感抗病毒藥劑使用對象

一、符合「流感併發重症」通報病例(屬第四類法定傳染病需通報於法定傳染病通報系統)

二、孕婦經評估需及時用藥者(領有國民健康署核發孕婦健康手冊之婦女)

三、未滿5歲及65歲以上之類流感患者

四、確診或疑似罹患流感住院(含急診待床)之病患

註：罹患流感因病況嚴重而需住院治療的病患，並不包括門診病人，依此條件使用公費藥劑者須備有「住院紀錄」

四、具重大傷病、免疫不全(含使用免疫抑制劑者)或流感高風險慢性疾病之類流感患者

註：

1.重大傷病：IC卡註記為重大傷病或持有重大傷病證明紙卡者。

2.流感高風險慢性疾病之ICD CODE為B20, Z21, D80-84, D86, D89, E08-13, E66, E85, G09, G20, G30-32, G35-37, G40, G45-46, G65, G70, G72, I00-02, I05-09, I11-13, I20-22, I24-25, I27-28, I34-37, I42-43, I44-45, I47-49, I50-51, I60-62, I63, I67-69, I70, I72, I73-74, I77, I79, J40-45, J47, J60-70, J82, J84, J96, J98, J99, K70-72, K73-76, B18-19, M05-06, M30-31, M32-34, M35, M94.1, N00-01, N03, N05, N04, N18-19, N26-27, Q89.01, Z90.81。

五、肥胖之類流感患者(BMI $\geq$ 30)

# 公費流感抗病毒藥劑使用對象

六、經疾病管制署各區管制中心防疫醫師認可之類流感群聚事件

註：選填此項者需填寫群聚編號

七、符合新型A型流感通報定義者(屬第五類法定傳染病需通報於法定傳染病通報系統)

八、新型A型流感極可能/確定病例之密切接觸者(接觸者名冊經傳染病防治醫療網區正/副指揮官或其授權人員研判需給藥者)

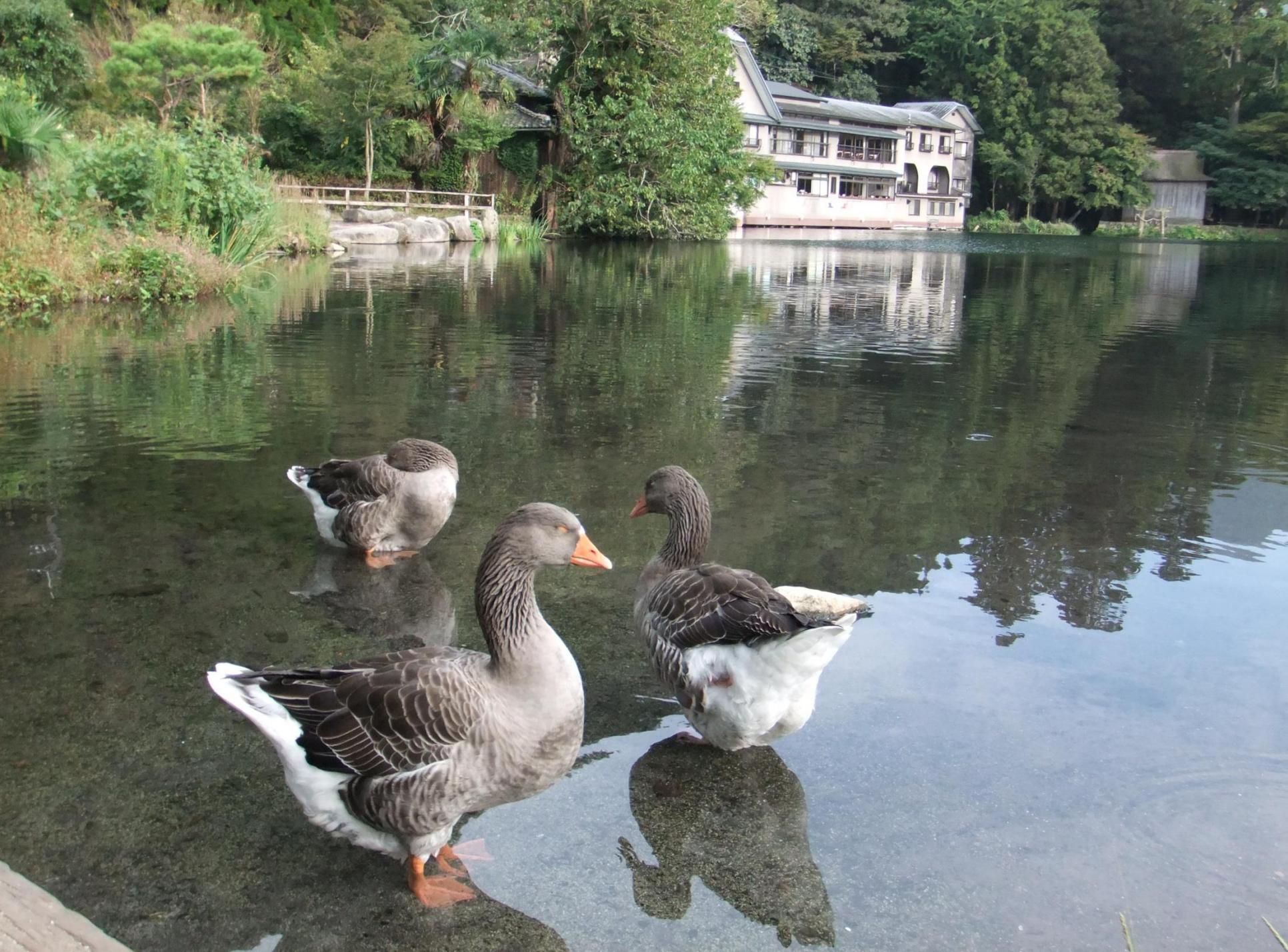
註：選填此項者需填寫所接觸之個案的法傳編號

九、動物流感發生場所撲殺清場工作人員(接觸者名冊經傳染病防治醫療網區正/副指揮官或其授權人員研判需給藥者)

註：選填此項者需填寫禽畜場名稱或編號

# 公費流感抗病毒藥劑**擴大使用對象**

- 擴大使用期間： 流感流行季
  - 每年 12 月 1 日至隔年 3 月 31 日
  - 將視每年疫情狀況調整
- 擴大使用對象：
  - 有類流感症狀，且家人/同事/同班同學有**類流感發病者**
    - 係指該就醫之類流感患者，其家人/同事/同班同學有類流感發病



# 流感的預防

- 個人衛生：避免接觸生病的人，經常洗手，遵守咳嗽禮儀
- **接種疫苗**：接種至少兩週後才有效
- 預防性抗病毒藥物的使用

# 流感疫苗發展史-發展演進

- 1933年：英國的Smith及其同事成功地從病人身上分離出A型流感病毒。
- 1939年：美國人Francis分離出B型流感病毒。
- 1939年：Burnet發現流感病毒可在雞胚胎蛋繁殖生長 (egg-based) 開啟了病毒特性的廣泛研究及不活化疫苗的發展。
- **1943年**：美國核准第一支不活化流感疫苗的使用執照。
- **1945年**：流感疫苗正式上市，並於二次世界大戰期間使用。
- **2003年**：美國核准第一支鼻噴劑型活性減毒流感疫苗上市。
- **2013年**：含四種流感病毒株(二A，二B)的疫苗問世

# 流感疫苗的作用

- 針對病毒的表面抗原產生免疫力，尤其是血球凝集素，能降低感染的可能性以及疾病的嚴重度（若發生感染時）
- 所產生的抗體只能對抗一種流感病毒的型別或亞型
  - 針對不同型別或亞型的病毒不具保護力或有限的保護力
- 所產生的抗體只能對抗一種流感病毒株的抗原
  - 針對同型別或亞型病毒的新變異株不具完全的保護力

# 流感疫苗的產製方法

- 製造過程及技術需要” 種子病毒(seed virus) “ 的製造
  - 以雞胚胎來繁衍
  - 以細胞株來繁衍
- 以基因技術來產製疫苗

# 滅菌的（去活化）流感疫苗

- 台灣地區目前使用的疫苗
- 每劑疫苗含三種流感病毒株
  - 每年更新病毒株
  - 二株A流感病毒，一株B流感病毒

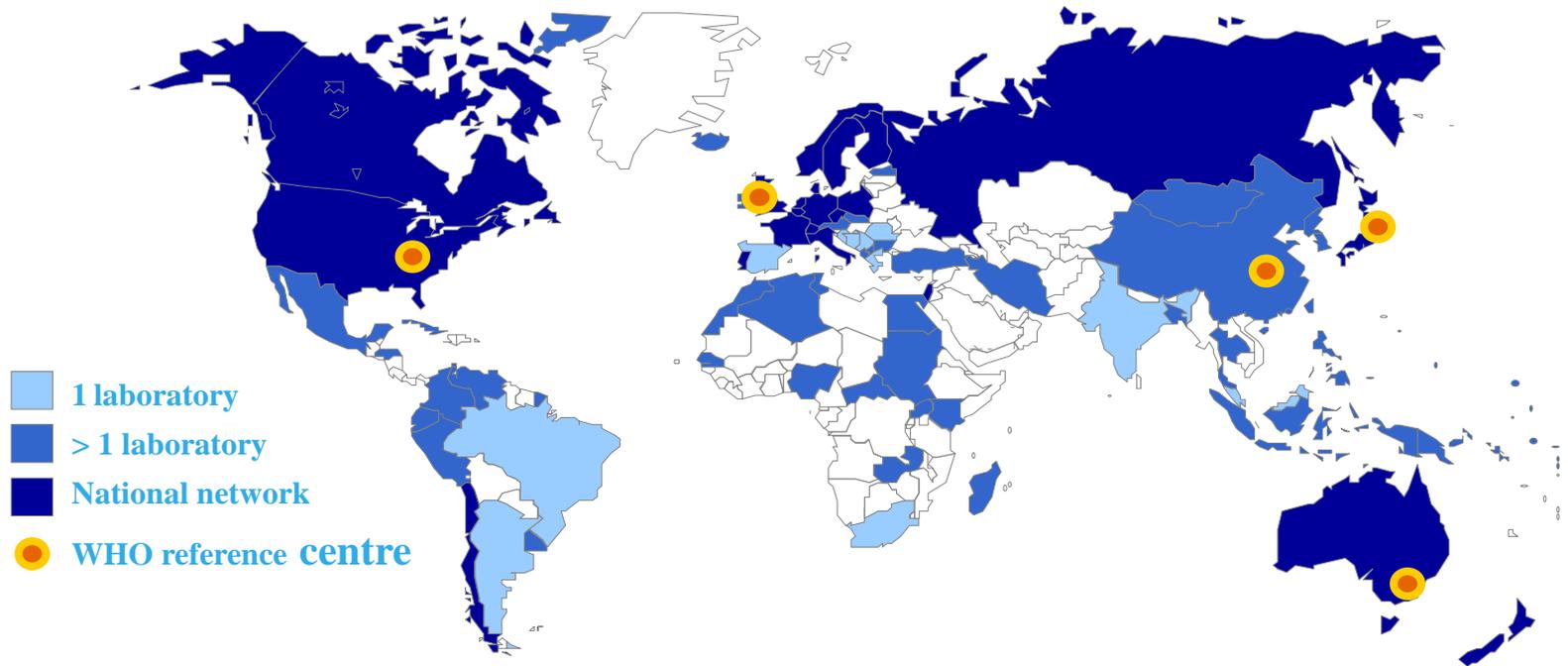
含四種流感病毒株(二A，二B)的疫苗在2013已問世

# 流感疫苗的病毒株

- 每年更新
- 根據新近分離出來的**流感病毒抗原性**分析, **流行病學資料**, 以及人們**接種後**的**血清學分析研究**

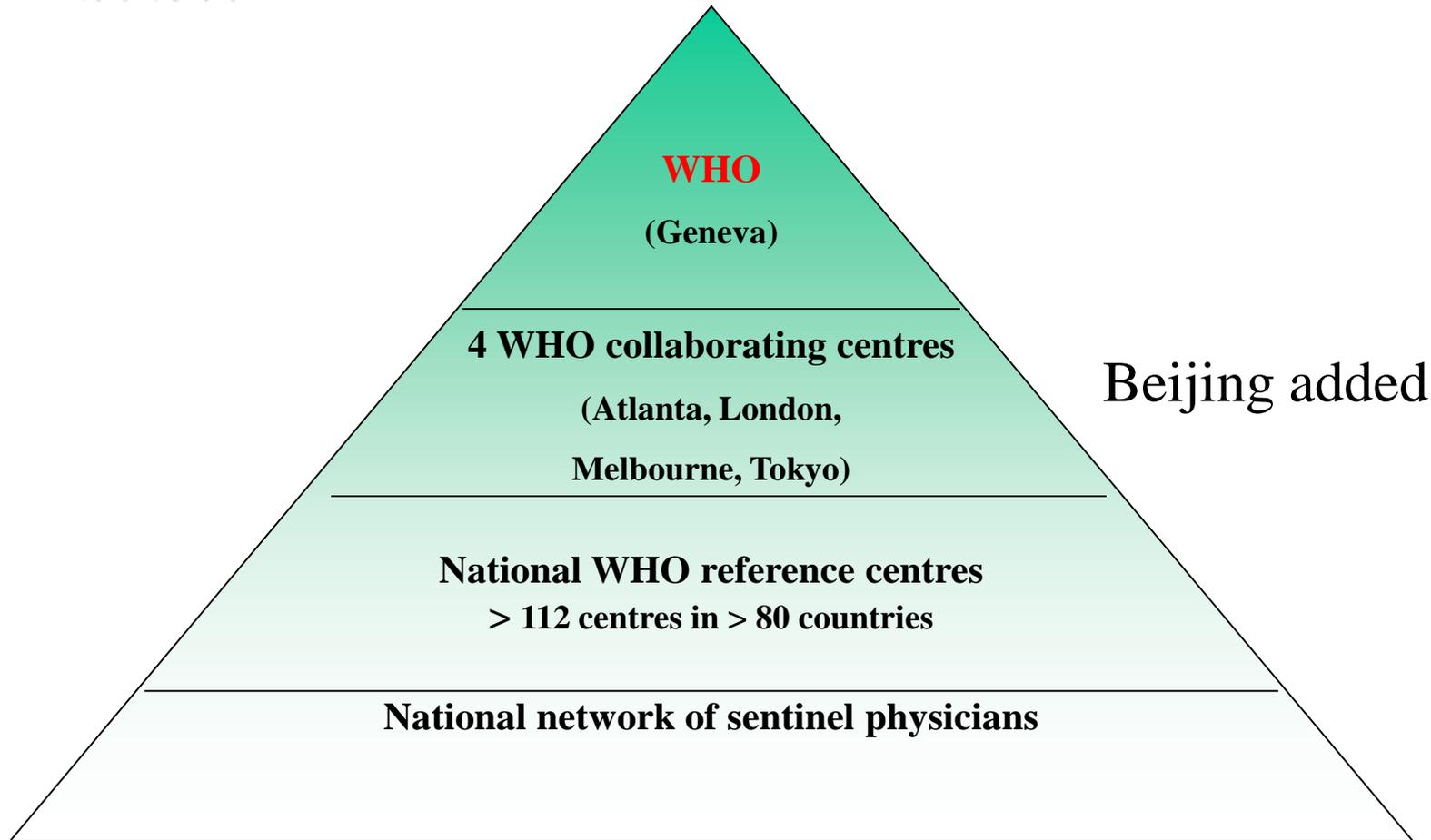
# 流感監測網

- 由世界衛生組織協調組成的全球流行病學監測網 (包含112 中心, >80 國家)
- 每年:
  - 採檢175,000 – 200,000 樣本
  - 分析2000 – 4000 流感病毒株



# 流感監測網

- 一個國際的監測網，提供流感個案的訊息及流行中的流感病毒株



**It is recommended that quadrivalent vaccines for use in the 2018-2019 northern hemisphere influenza season contain the following:**

- an A/Michigan/45/2015 (H1N1)pdm09-like virus;
  - an A/Singapore/INFIMH-16-0019/2016 (H3N2)-like virus;
  - a B/Colorado/06/2017-like virus (B/Victoria/2/87 lineage); and
  - a B/Phuket/3073/2013-like virus (B/Yamagata/16/88 lineage).
- 建議四價，扣除一價**

**It is recommended that the influenza B virus component of trivalent vaccines for use in the 2018-2019 northern hemisphere influenza season be a B/Colorado/06/2017-like virus of the B/Victoria/2/87-lineage.**

**It is recommended that trivalent vaccines for use in the 2017-2018 northern hemisphere influenza season contain the following:**

- an A/Michigan/45/2015 (H1N1)pdm09-like virus;
  - an A/Hong Kong/4801/2014 (H3N2)-like virus; and
  - a B/Brisbane/60/2008-like virus.
- 建議三價，外加一價**

**It is recommended that quadrivalent vaccines containing two influenza B viruses contain the above three viruses and a B/Phuket/3073/2013-like virus.**



- an A/Brisbane/02/2018 (H1N1)pdm09-like virus;
- an A/Kansas/14/2017 (H3N2)-like virus;
- a B/Colorado/06/2017-like virus (B/Victoria/2/87 lineage); and
- a B/Phuket/3073/2013-like virus (B/Yamagata/16/88 lineage).

## Recommended composition of influenza virus vaccines for use in the 2019-2020 northern hemisphere influenza season

### 2019/02/21 in Beijing

It is recommended that quadrivalent vaccines for use in the 2019-2020 northern hemisphere influenza season contain the following:

- an A/Brisbane/02/2018 (H1N1)pdm09-like virus;
- an A(H3N2) virus to be announced on 21 March 2019\*;
- a B/Colorado/06/2017-like virus (B/Victoria/2/87 lineage); and
- a B/Phuket/3073/2013-like virus (B/Yamagata/16/88 lineage).

It is recommended that the influenza B virus component of trivalent vaccines for use in the 2019-2020 northern hemisphere influenza season be a B/Colorado/06/2017-like virus of the B/Victoria/2/87-lineage.

\* In light of recent changes in the proportions of genetically and antigenically diverse A(H3N2) viruses, the recommendation for the A(H3N2) component has been postponed. **Till 3/21**

**Table 2. Antigenic Analysis of A(H3N2) Viruses – Haemagglutination Inhibition Assay**  
(with 20nM Oseltamivir, 4 HA units/50 microliters)

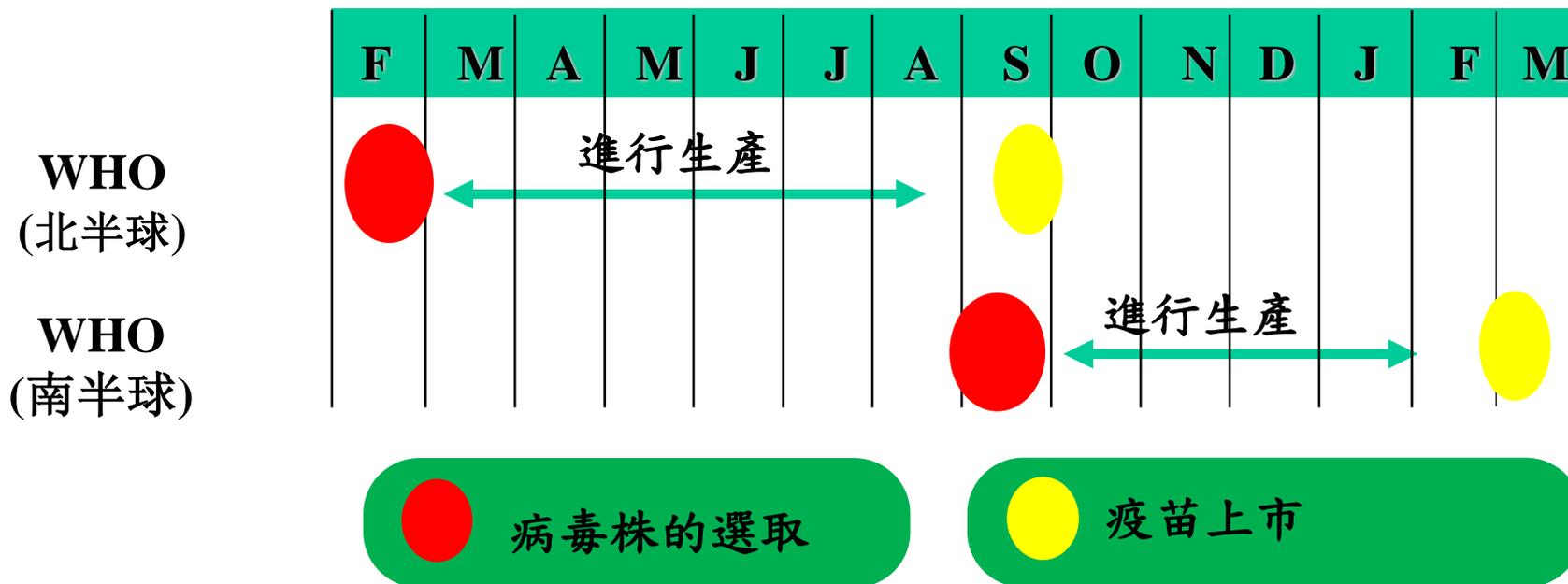
REFERENCE VIRUSES		REFERENCE FERRET ANTISERA					3C Clade	DATE COLLECTED	PASSAGE	
		2a1	2a1b		2a2	3C.3a				
		EGG SN/X307A	EGG UE/240	EGG NL/10260	EGG SZ/8060	SIAT KS/14				EGG KS/14
1	A/Singapore/INFIMH-16-0019/2016 X-307A	<b>2560</b>	320	160	160	80	80	2a1	REASS	E5E2E9/E1
2	A/Abu Dhabi/240/2018	640	<b>10240</b>	5120	160	80	40	2a1b	2018/01/01	E6
3	A/Netherlands/10260/2018	1280	10240	<b>5120</b>	160	160	80	2a1b	2018/02/15	E4/E2
4	A/Hong Kong/681/2018	2560	5120	5120	320	640	640	2a1b	2018/04/09	E6/E2
5	A Switzerland/8060/17	640	80	80	<b>2560</b>	40	40	2a2	2017/12/21	E5/E2
6	A/Kansas/14/2017	80	80	80	80	<b>160</b>	80	3a	2017/12/14	S3
7	A/Kansas/14/2017	160	160	320	40	<b>640</b>	<b>1280</b>	3a	2017/12/14	E7
TEST VIRUSES										
8	A/Florida/15/2019	80	160	160	80	160	20	2a1b	2019/02/04	S2
9	A/Hawaii/09/2019	80	320	40	40	80	<20	2a1b	2019/02/09	S1
10	A/California/127/2018	160	320	160	40	80	<20	2a1b	2018/12/31	S1
11	A/Hawaii/08/2019	160	320	80	80	160	<20	2a1b	2019/02/01	S1
12	A/New Mexico/09/2019	160	160	160	80	160	<20	2a1b	2019/02/05	S1
13	A/New Mexico/10/2019	160	160	160	80	160	<20	2a1b	2019/02/10	S1
14	A/Delaware/12/2019	40	80	80	20	80	<20	2a1b	2019/02/04	S1
15	A/Vermont/06/2019	40	80	80	40	160	<20	2a1b	2019/02/06	S1
16	A/Vermont/09/2019	80	160	160	80	80	<20	2a1b	2019/02/11	S2
17	A/Brisbane/34/2018	40	40	160	40	<b>320</b>	<b>320</b>	3a	2018/03/17	E2/E1
18	A/Louisiana/14/2019	40	40	20	20	<b>320</b>	<b>160</b>	3a	2019/02/06	S1
19	A/Maine/08/2019	40	80	40	20	<b>320</b>	<b>160</b>	3a	2019/02/06	S1
20	A/New Hampshire/13/2019	40	40	40	20	<b>320</b>	<b>160</b>	3a	2019/02/15	S1
21	A/North Dakota/12/2019	80	80	80	40	<b>320</b>	<b>160</b>	3a	2019/02/10	S1
22	A/South Dakota/10/2019	40	40	40	20	<b>320</b>	<b>160</b>	3a	2019/02/18	S1
23	A/Tennessee/09/2019	20	20	40	20	<b>320</b>	<b>160</b>	3a	2019/02/04	S1
24	A/Texas/45/2019	40	40	20	20	<b>320</b>	<b>160</b>	3a	2019/02/07	S1
25	A/Iowa/11/2019	40	40	40	40	<b>640</b>	<b>320</b>	3a	2019/02/07	S1
26	A/Wyoming/06/2019	80	80	160	40	<b>2560</b>	<b>640</b>	3a	2019/02/04	S1

# 流感疫苗製造時程

流感監測網



疫苗的產製



# 流感疫苗的保護效果

- 隨當年度流行病毒型別不同而有差異
- 在65歲以下的成人，保護效力約在70~90%之間
- 對老年人的保護力稍差，約可減少30~70%流感及肺炎（P&I）住院率
- 在幼兒的研究，完整施打流感疫苗可降低70%嬰幼兒因流感引起的住院比例

# The efficacy of influenza vaccination

Effectiveness and Efficacy* (95% CI)	Children&	adults	elders
<b>TIV</b>	<i>Preventing influenza-like illness</i>		
	<b>36 % (24-46 %)</b>	<b>20 % (11-29 %)</b>	<b>41 % (27-53 %)</b>
	<i>Preventing lab-confirmed infection</i>		
	<b>59 % (41-71 %)</b>	<b>61 % (48-70 %)</b>	<b>58 % (34-73 %)</b>
<b>LAIV</b>	<i>Preventing influenza-like illness</i>		
	<b>33 % (28-38 %)</b>	<b>10 % (4-16 %)</b>	<b>N/A</b>
	<i>Preventing lab-confirmed infection</i>		
	<b>80 % (68-87 %)</b>	<b>62 % (45-73 %)</b>	<b>N/A</b>

\* affected by age, immune status of the vaccinee and the antigenic matches.  
& lack of RCT evidence for efficacy of TIV to prevent ILI in children under 2 yrs.

Bridges CB JAMA 2000, Jefferson T et al Cochrane Database 2008 & 2010 & 2012

# The efficacy of influenza vaccination

Category	Efficacy	Children 2-16 y/o	Adults	Elderlies
Prevent influenza-like illness	Disease reduction rate	28% to 20%	21.5% to 18.1%	6% to 3.5%
	Risk ratio (95% CI)	0.72 (0.65-0.79)	0.84 (0.75-0.95)	0.59 (0.47-0.73)
	NNV	12	29	42
Prevent lab-confirmed influenza	Disease reduction rate	30% to 11%	2.3% to 0.9%	6% to 2.4%
	Risk ratio (95% CI)	0.36 (0.28-0.48)	0.41 (0.36-0.47)	0.42 (0.27-0.66)
	NNV	5	71	30

NNV, number needed to vaccinate

(Cochrane Syst Rev 2018, Issue 2)

# Influenza Vaccination in Older Adults

(Andrew MK et al Drugs & Aging 2019; 36:29–37)

- Older adults are particularly **vulnerable to poor outcomes from influenza** over both short- and long-term time horizons
- Although **immune responses generally decline with age**, the prevention of influenza with **vaccination** is an **important strategy** to support healthy aging

Table 1 Influenza vaccine formulations available for older adults

Vaccine	Type	Content	Dose, mL	Route
Inactivated tri- or quadrivalent vaccine	Subunit	15 ug HA per antigen	0.5	IM
Adjuvanted inactivated trivalent influenza vaccine	Subunit	MF59 adjuvant 15 ug HA per antigen	0.5	IM
High-dose inactivated trivalent influenza vaccine	Subunit	60 ug HA per antigen	0.5	IM
Recombinant quadrivalent influenza vaccine	Recombinant	45 ug rHA per antigen	0.5	IM

*HA* hemagglutinin, *rHA* recombinant hemagglutinin, *IM* intramuscularly

TABLE 1. Influenza vaccines — United States, 2018–19 influenza season\*

Trade name (Manufacturer)	Presentation	Age indication	HA (IIVs and RIV4) or virus count (LAIV4) per dose (each vaccine virus)	Egg-grown virus, <sup>†</sup> cell culture-grown virus, or recombinant HA	Adjuvanted (Yes/No)	Latex (Yes/No)	Route	Thimerosal (Yes/No) If Yes, mercury μg/0.5mL
<b>Quadrivalent IIVs (IIV4s)—Standard Dose—Contain inactivated virus</b>								
<b>Trivalent IIV (IIV3)—Standard Dose—Contains inactivated virus</b>								
Afluria (Seqirus)	0.5 mL PFS 5.0 mL MDV	≥5 yrs ≥5 yrs (needle/ syringe) 18 through 64 yrs (jet injector)	15 μg/0.5 mL	Egg	No	No	IM <sup>§</sup>	No Yes (24.5)
<b>Trivalent IIV3—High-Dose—Contains inactivated virus</b>								
Fluzone High-Dose (Sanofi Pasteur)	0.5 mL PFS	≥65 yrs	60 μg/0.5 mL	Egg	No	No	IM <sup>§</sup>	No
<b>Trivalent IIV3—Adjuvanted—Contains inactivated virus</b>								
Fluad (Seqirus)	0.5 mL PFS	≥65 yrs	15 μg/0.5 mL	Egg	Yes (MF59)	No	IM <sup>§</sup>	No
<b>Quadrivalent RIV (RIV4)—Contains recombinant HA</b>								
Flublok Quadrivalent (Sanofi Pasteur)	0.5 mL PFS	≥18 yrs 18 through 64 yrs (jet injector)	45 μg/0.5 mL	Recombinant	No	No	IM <sup>§</sup>	No
<b>Trivalent IIV3—High-Dose—Contains inactivated virus</b>								
Fluzone High-Dose (Sanofi Pasteur)	0.5 mL PFS	≥65 yrs	60 μg/0.5 mL	Egg	No	No	IM <sup>§</sup>	No
<b>Trivalent IIV3—Adjuvanted—Contains inactivated virus</b>								
Fluad (Seqirus)	0.5 mL PFS	≥65 yrs	15 μg/0.5 mL	Egg	Yes (MF59)	No	IM <sup>§</sup>	No
<b>Quadrivalent RIV (RIV4)—Contains recombinant HA</b>								
Flublok Quadrivalent (Sanofi Pasteur)	0.5 mL PFS	≥18 yrs	45 μg/0.5 mL	Recombinant	No	No	IM <sup>§</sup>	No
<b>Quadrivalent LAIV (LAIV4)—Contains live, attenuated, cold-adapted virus</b>								
FluMist Quadrivalent (AstraZeneca)	0.2 mL prefilled single-use intranasal sprayer	2 through 49 yrs	10 <sup>6.5–7.5</sup> fluorescent focus units/0.2 mL	Egg	No	No	NAS	No

# 流感疫苗的接種禁忌

- 曾對此疫苗中的任何成分或微量殘留物有嚴重過敏反應者。

舉例來說，2009年的H1N1新型流感疫苗可能的成分包括：白蛋白、卵蛋白、kanamycin和neomycin sulfate、formaldehyde（甲醛）、十六烷基三甲基溴化銨和polysorbate等成分；對上述物質有嚴重過敏者，不可接種。

- 疫苗不可以靜脈注射途徑給予。

若以靜脈注射發生急性過敏，反應會更為劇烈與快速，因此不建議執行。

- 接種者若有發燒，或患有急性感染症，也是流感疫苗的接種禁忌，通常建議延遲疫苗注射。

美國小兒科醫學會2017年最新建議對雞蛋(任何程度)過敏的兒童也可以接種流感疫苗

# 流感疫苗的建議接種對象

- 65歲以上的老年人
- 6個月大以上的兒童及學齡兒童
- 需要長期照護者
- 6個月大以上罹患慢性病如肺疾(氣喘、慢性阻塞性肺病變)、心血管疾病、代謝性疾病(如糖尿病)、腎衰竭、血紅素病變、以及免疫不全者，包括HIV帶原者
- 於流行季懷孕將超過14週之孕婦
- 6個月大到18歲需接受長期阿斯匹靈(aspirin)治療者
- 可能與高危險群接觸者，包括醫療人員，安養中心照護人員等
- 禽畜業者

# 106年度起計畫實施對象

## 提升原105年計畫實施對象接種率

- 滿6個月~國小入學前幼兒
- 國中小、高中職、五專1-3年級學生
- 50歲以上成人
- 高風險慢性病患或BMI  $\geq 30$
- 罕見疾病患者、重大傷病患
- 孕婦
- 安養/養護機構住民及工作人員
- 醫事及衛生等單位之防疫相關人員
- 禽畜養殖業者及動物防疫人員

預估接種量590萬人次

## 新增實施對象

- 6個月內嬰兒之父母（原產後6個月內之婦女併入該類對象）
- 幼兒園托育人員及托育機構專業人員

流感疫苗是全民疫苗  
只要 $\geq 6$ 個月,不管公費或  
自費皆要建議接種

預估接種量10萬人次

接種量達600萬劑，全人口接種涵蓋率達25%  
實施期程：106.10.1 至疫苗用罄

Thank you for your attention!!

