



# 流感防治與疫苗接種政策



臺中榮民總醫院感管中心顧問/兒童感染科 陳伯彥



# 2024 疾病管制署

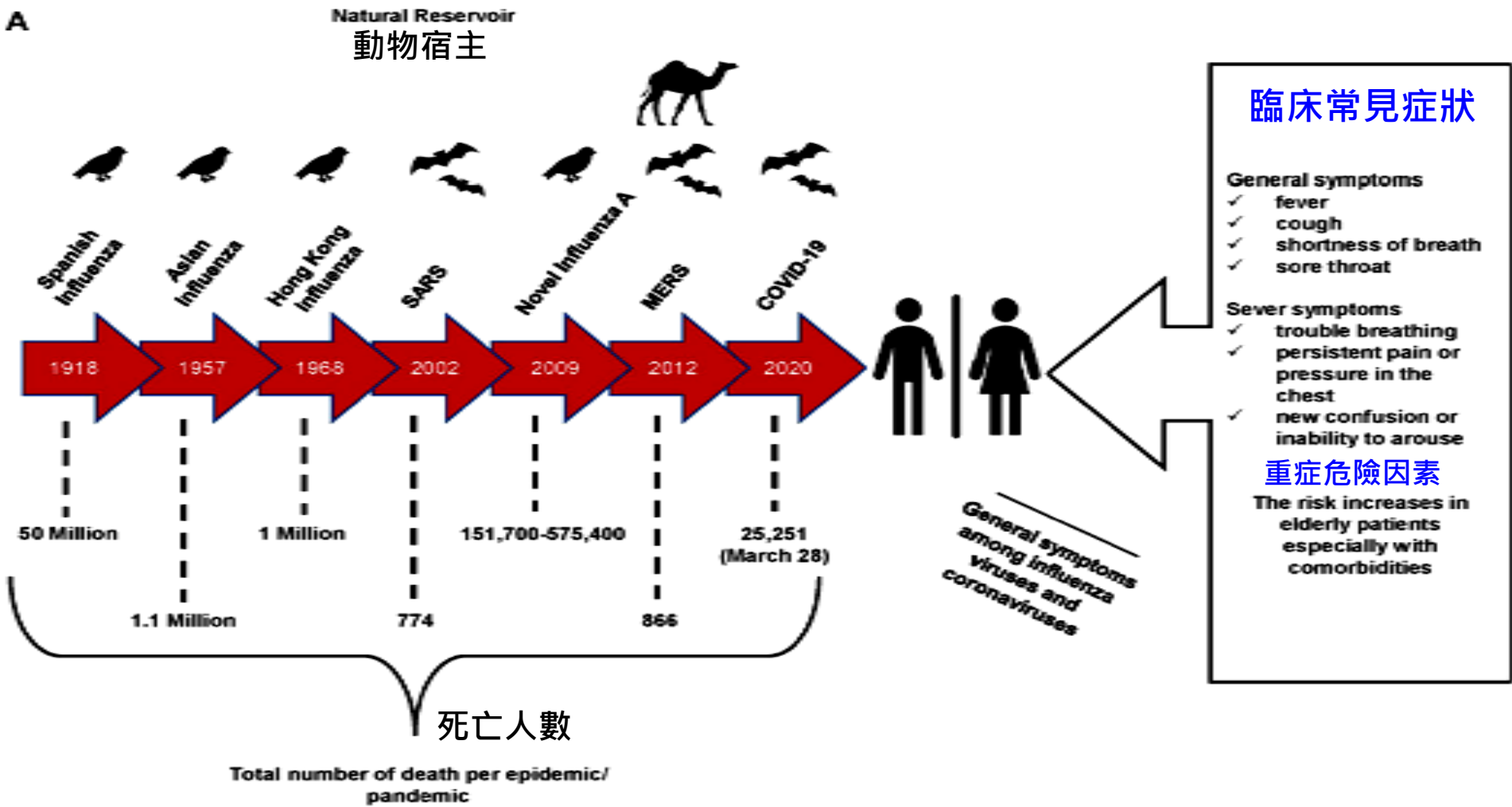
## 流感防治與疫苗接種政策

- 臺灣流感疫情現況
- 我國流感防治政策
- 流感的診斷、治療與預防
  - ✓流感抗病毒藥物介紹、療效
  - ✓使用建議及公費抗病毒藥劑
  - ✓流感疫苗介紹
  - ✓流感疫苗接種政策
- 流感疫苗的安全性與不良事件通報
- 疫苗冷運冷藏
- 流感疫苗接種處置費
- Q&A



# 百年來呼吸道傳染病大流行的臨床特徵

General characteristics of SARS-CoV-2, SARS-CoV, MERS-CoV & influenza A viruses

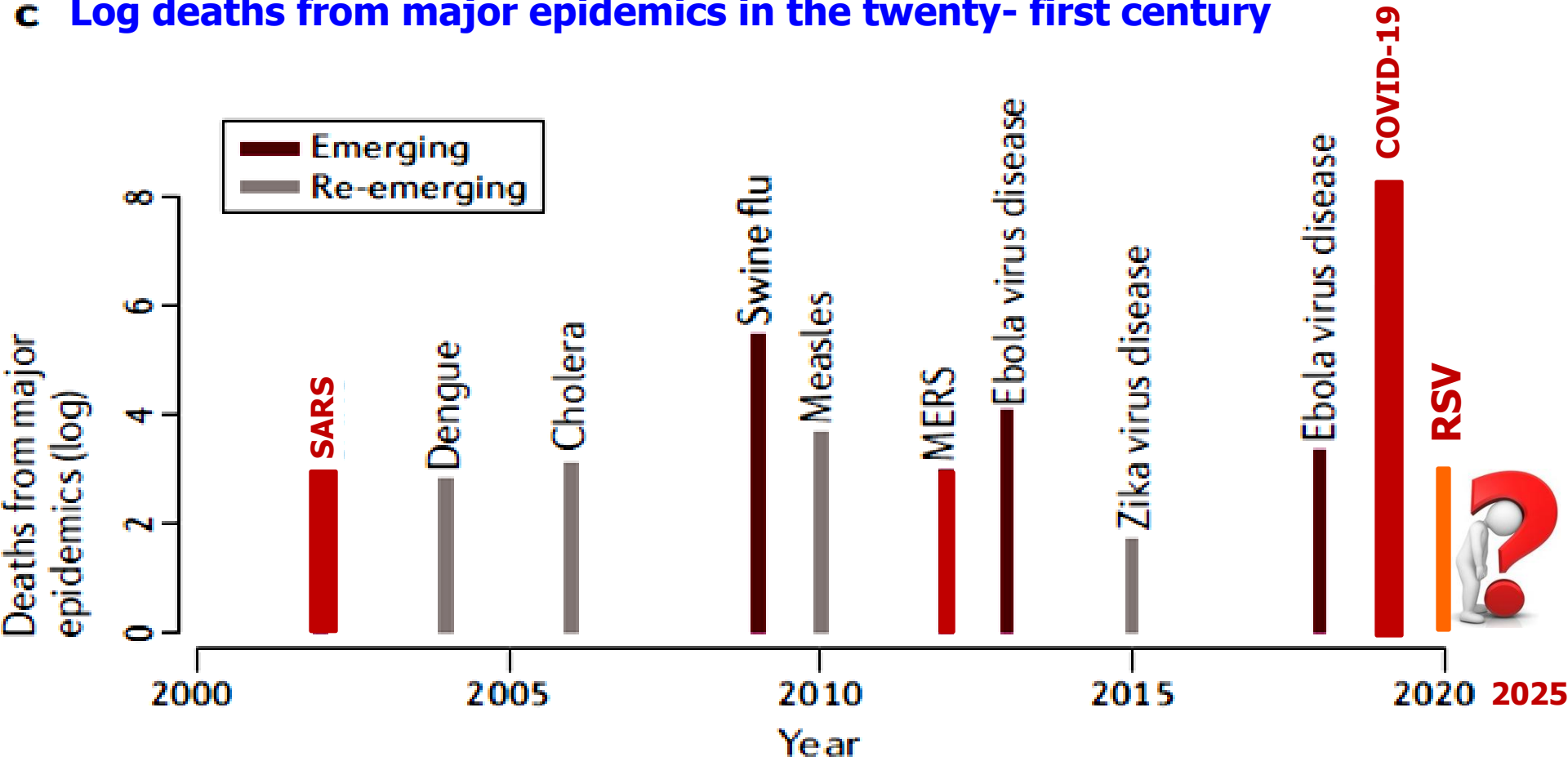




# 新冠疫情後還會有其它的大疫情嗎？

Human connectivity and infectious disease outbreaks in pre-modern and modern times

**c Log deaths from major epidemics in the twenty- first century**



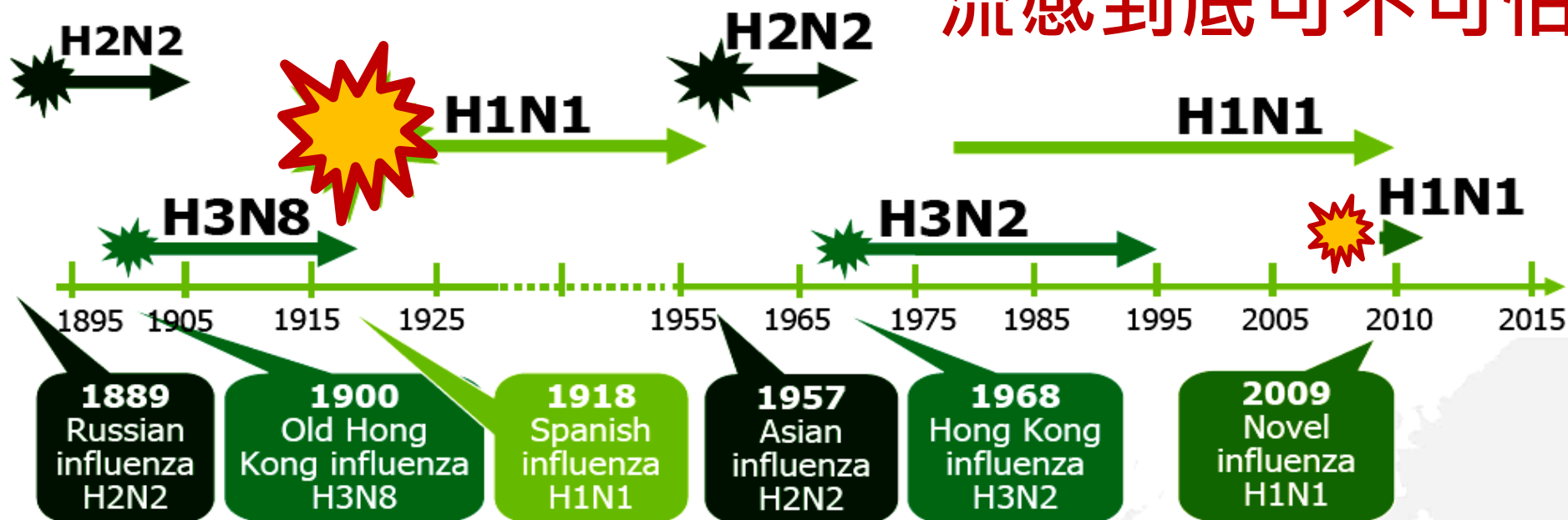


# 歷史上流行性感冒大流行與演變



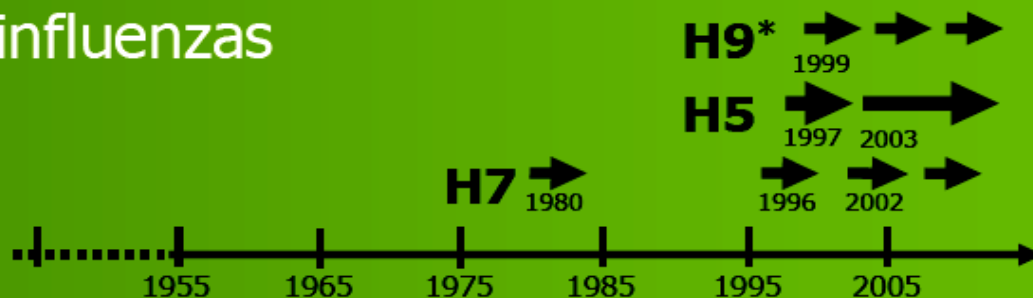
Recorded human pandemic influenza  
(early sub-types inferred)

流感到底可不可怕



Recorded new avian influenzas

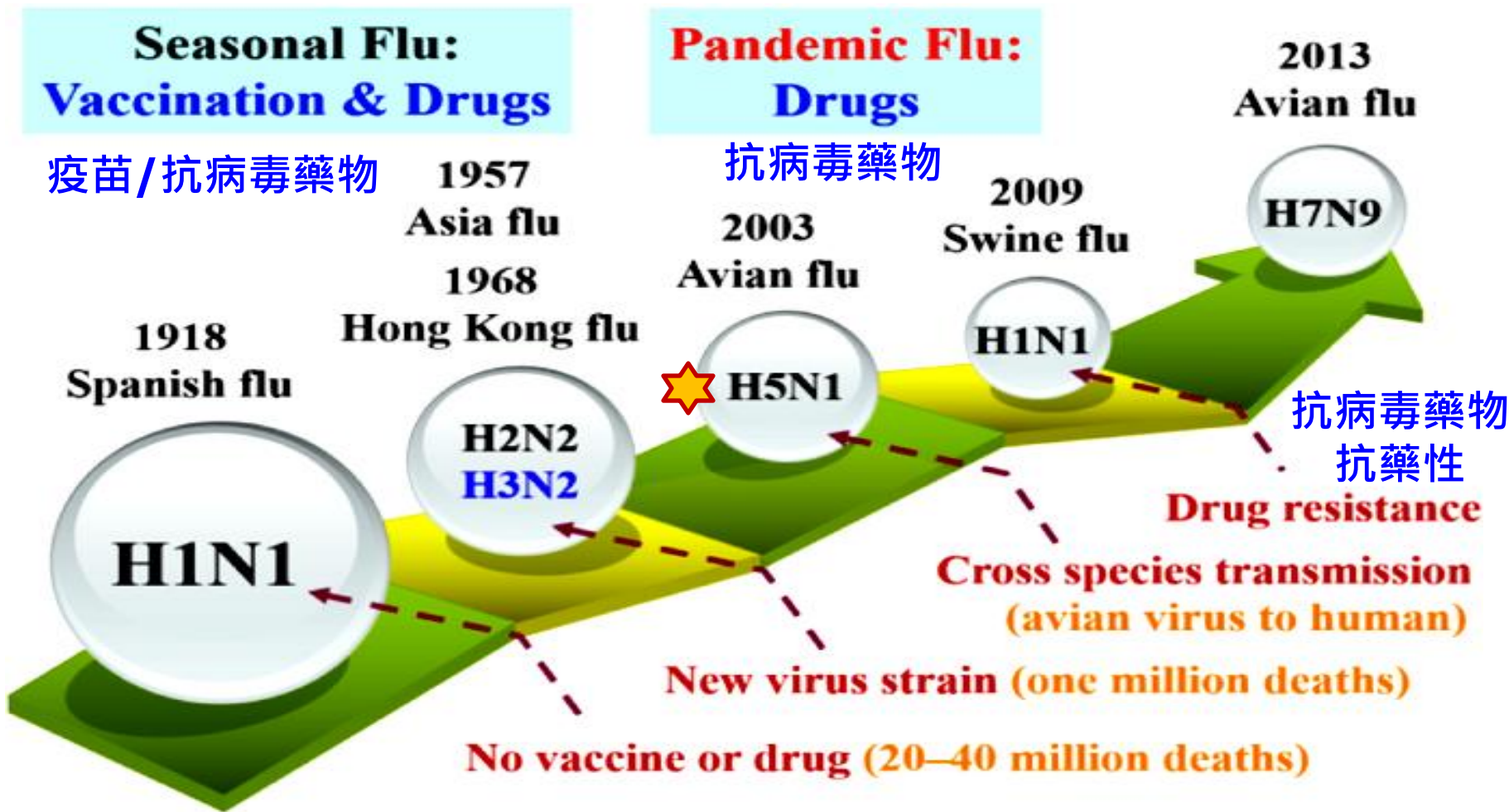
禽流感





# 歷史記錄上重要的流感大流行

Timeline showing influenza pandemics caused by influenza A viruses





# 2018~2025 北半球西太平洋區流感病毒流行情形



## INFLUENZA LABORATORY SURVEILLANCE INFORMATION

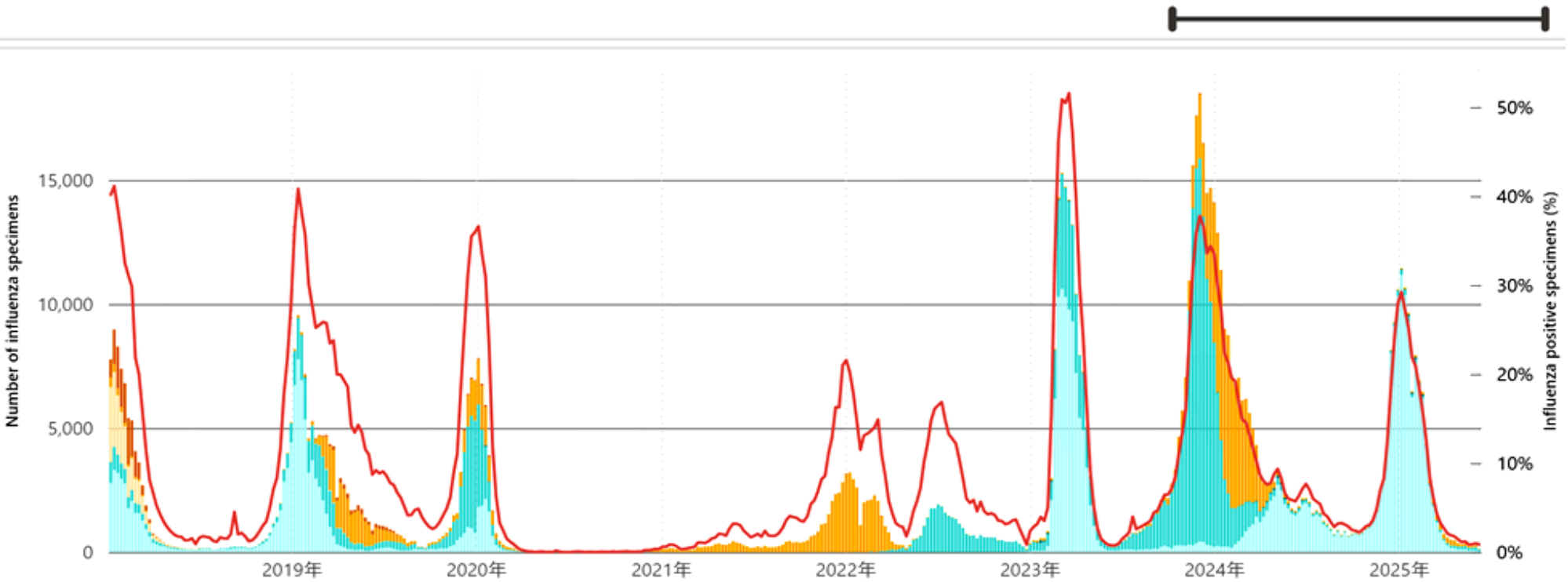
### Virus detections by subtype reported to FluNet



| Country, area or territory | WHO region | Influenza transmission zone | Hemisphere | *Surveillance site t... |
|----------------------------|------------|-----------------------------|------------|-------------------------|
| 全部                         | WPR        | Eastern Asia                | 全部         | 全部                      |

Week start date

2018/1/2 2025/6/9

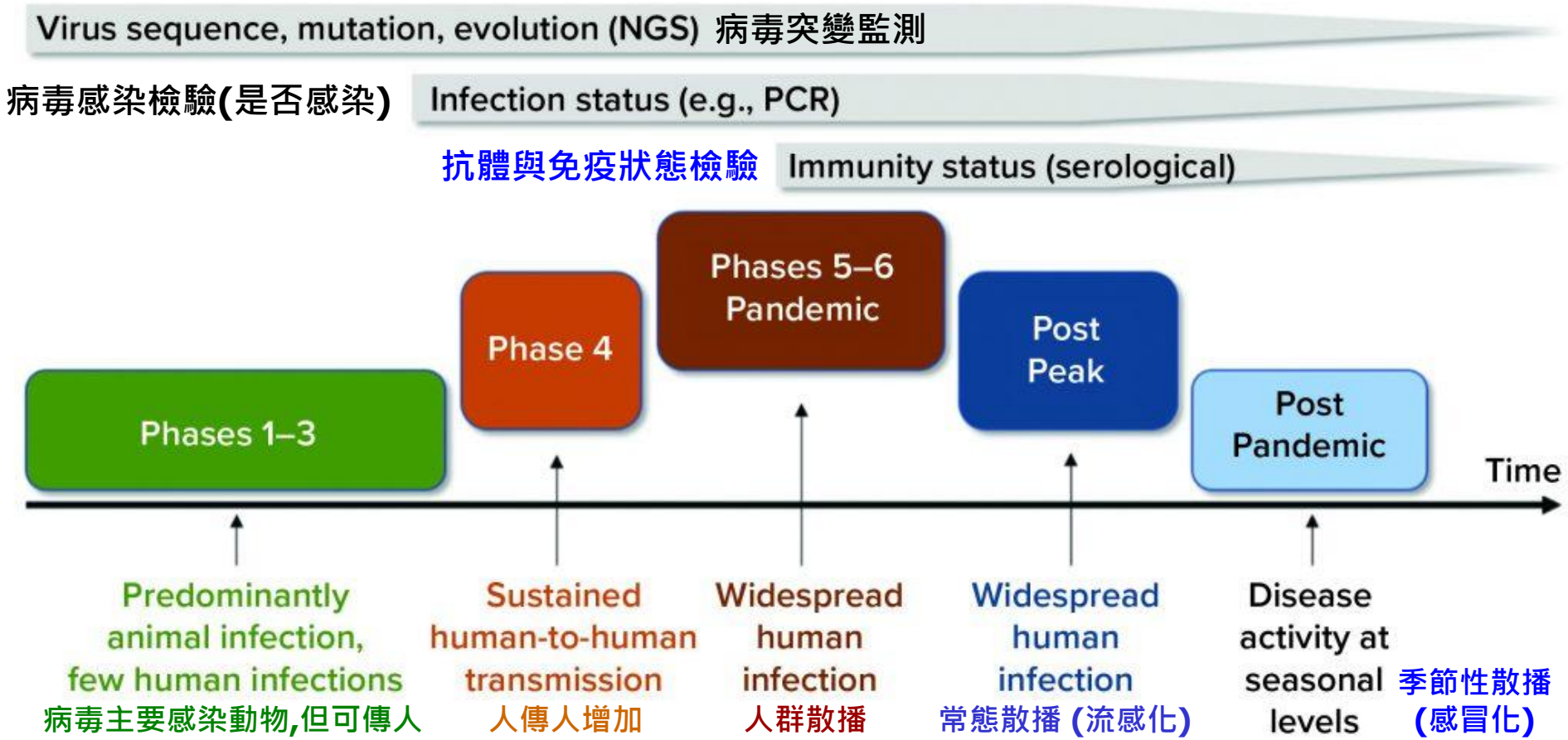




# 新冠肺炎病毒的診斷應用與演變

## Trends in COVID-19 Diagnostic Test Development

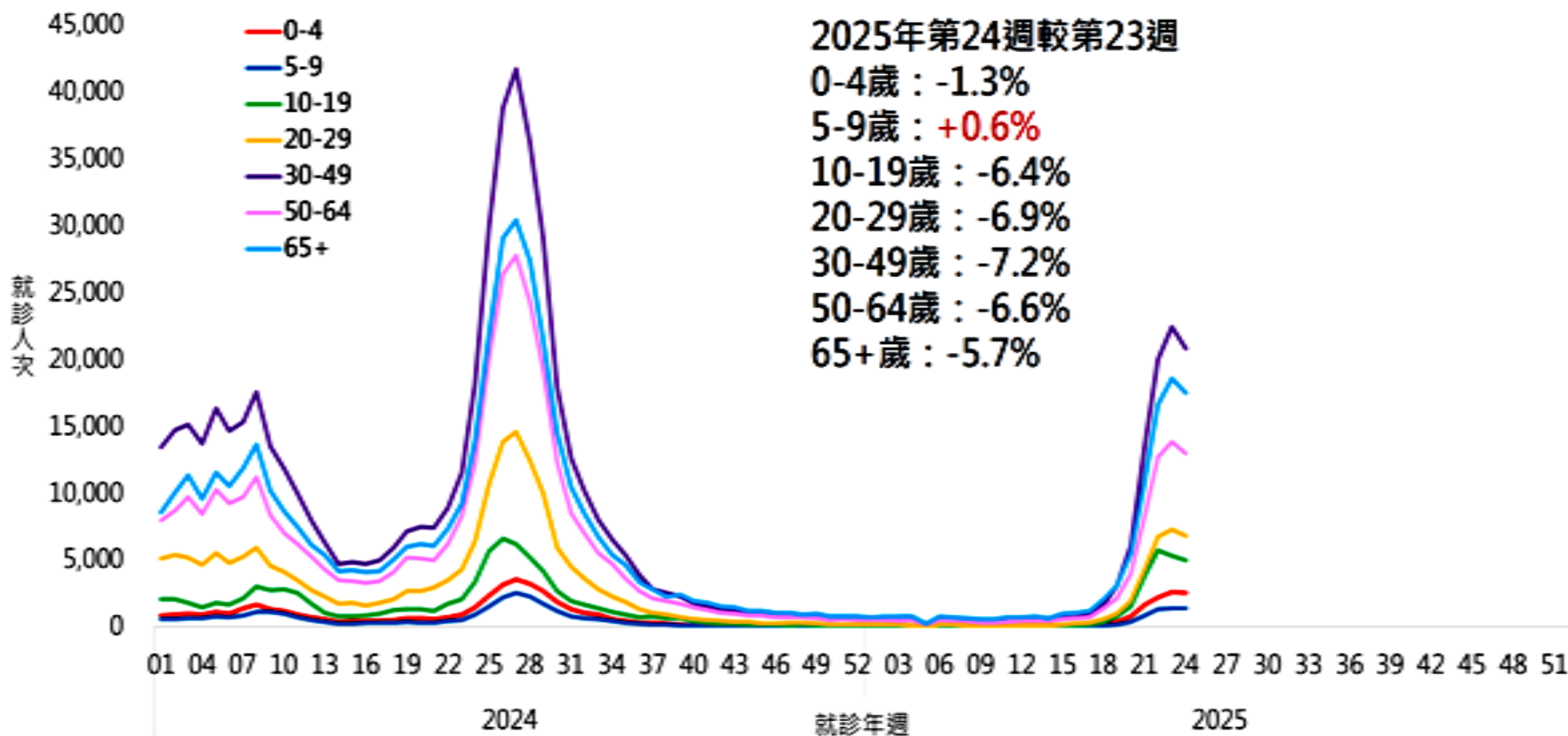
Timeline shows the value of diagnostic tests at different phases of the COVID-19 pandemic







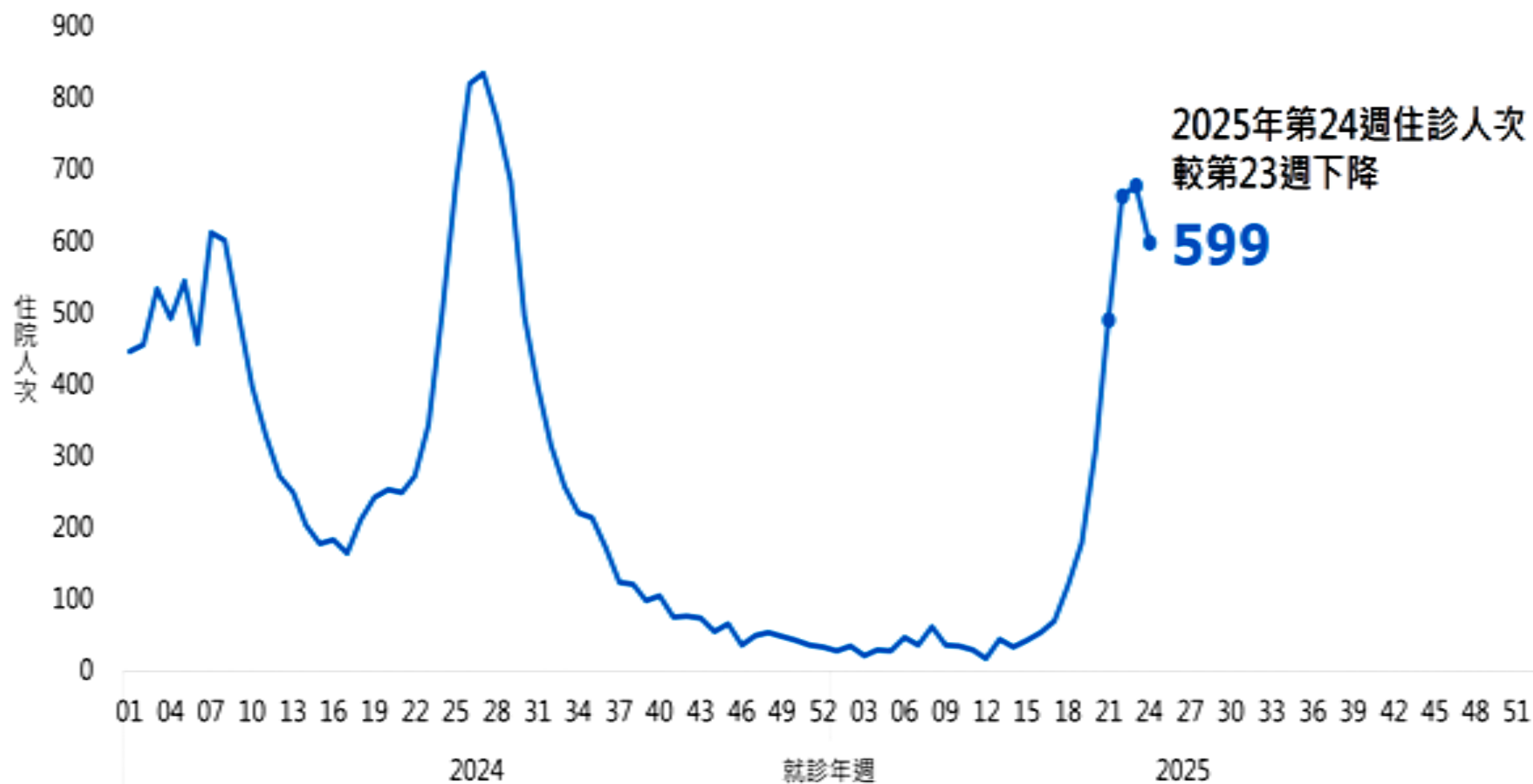
# 2024年起全國COVID-19病毒感染 (U07.1)門急診就診人次一年齡別



註：2024/9/1(第36週)起修訂名稱為「新冠併發重症」並調整病例定義



# 2024年起全國COVID-19病毒感染住診人次



註：2024/9/1(第36週)起修訂名稱為「新冠併發重症」並調整病例定義



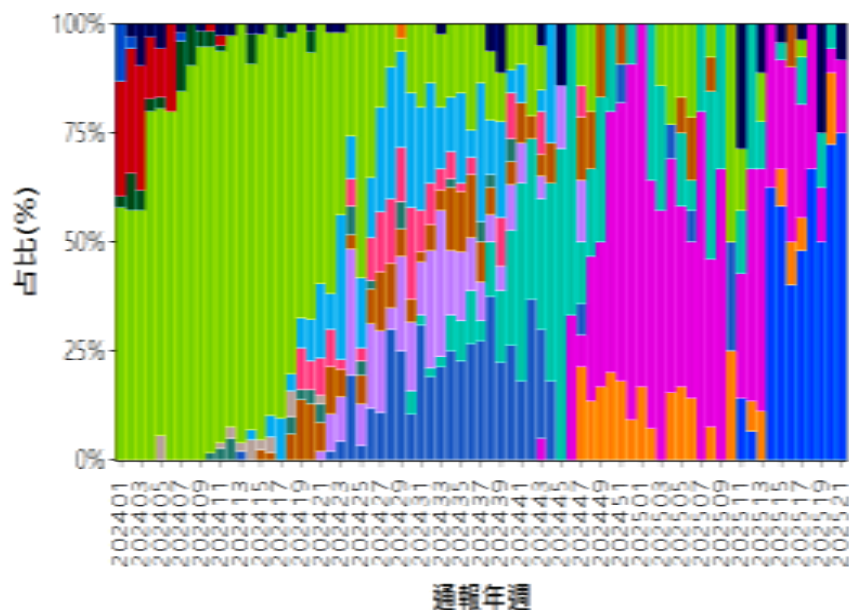
# SARS-CoV-2 Variants

## Omicron 變異株檢出趨勢

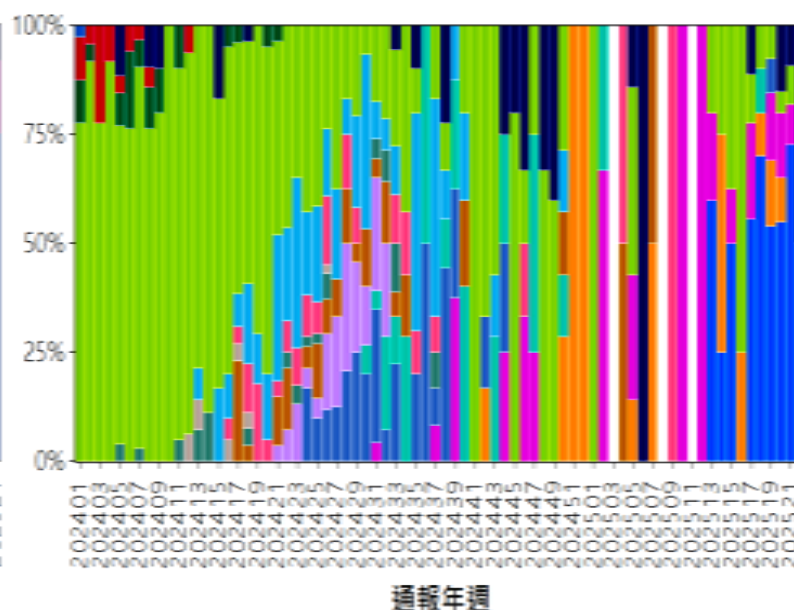
近四週監測變異株占比：

- ◆ 本土病例：NB.1.8.1 占68%為多，XEC 占11%、LP8.1 占8%、其他占8%、KP3.1.1 占5%
- ◆ 境外移入：NB.1.8.1 占59%為多，XEC 占13%、其他占11%、LP8.1 占9%、JN.1 占7%、KP3.3 占2%

本土病例

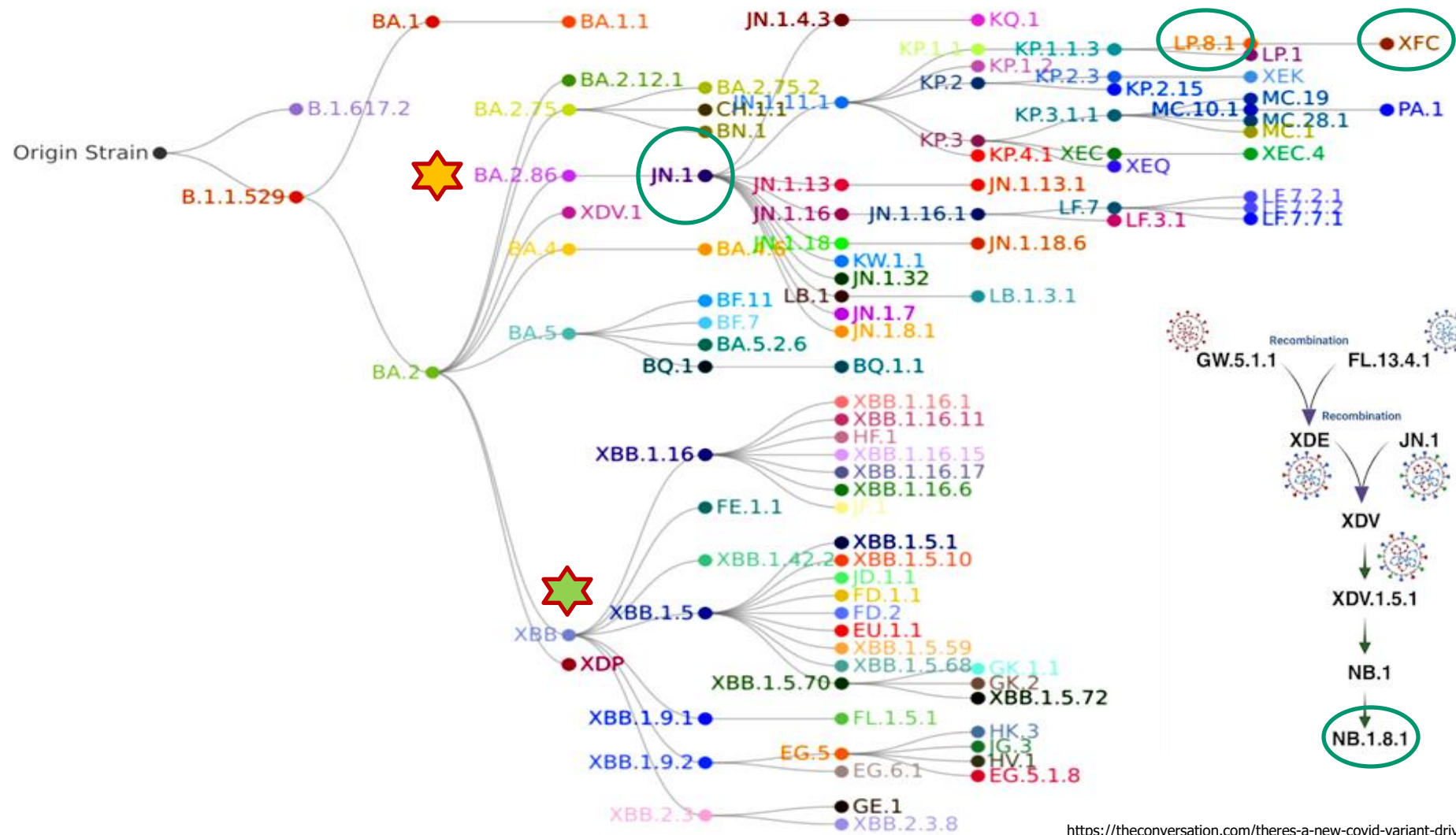


境外移入





# COVID-19流行變異株演化趨勢



<https://theconversation.com/theres-a-new-covid-variant-driving-up-infections-a-virologist-explains-what-to-know-about-nb-1-8-1-257552>

# 台灣COVID-19疫苗接種情形



## 1. 新冠JN.1疫苗接種情形

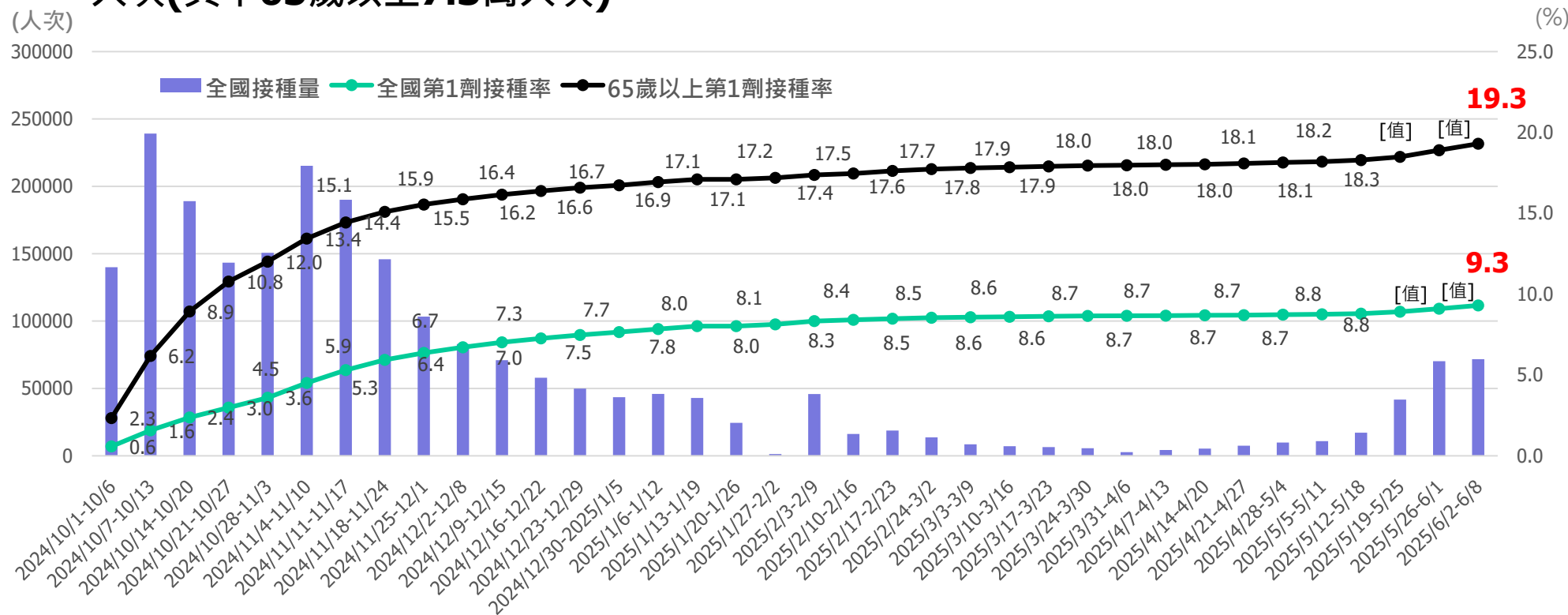
(自113.10.1至114.6.8)

□ 累計接種：**230萬人次**

□ 第1劑：**221.8萬人次**；第2劑：**8.2萬人次**(其中**65歲以上7.3萬人次**)

## 2. 庫存(更新至114.6.8)

**Moderna 298.3萬劑** (114.9.19-9.30屆效)

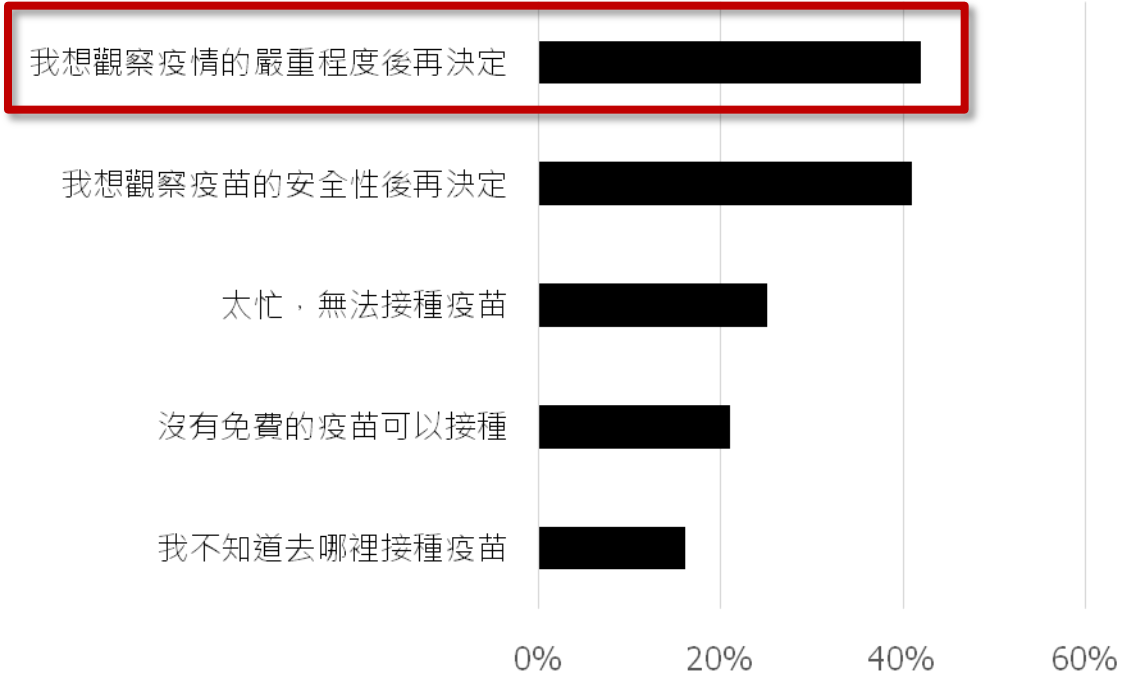




# 台灣市調(2024.11)顯示 民眾是否接種JN.1疫苗的原因是**疫情嚴重度**

## 仍在考慮是否要接種JN.1疫苗的原因

受訪者為未接種疫苗或仍在考慮是否接種的民眾 (n=328)



複選題，僅摘錄前5大原因

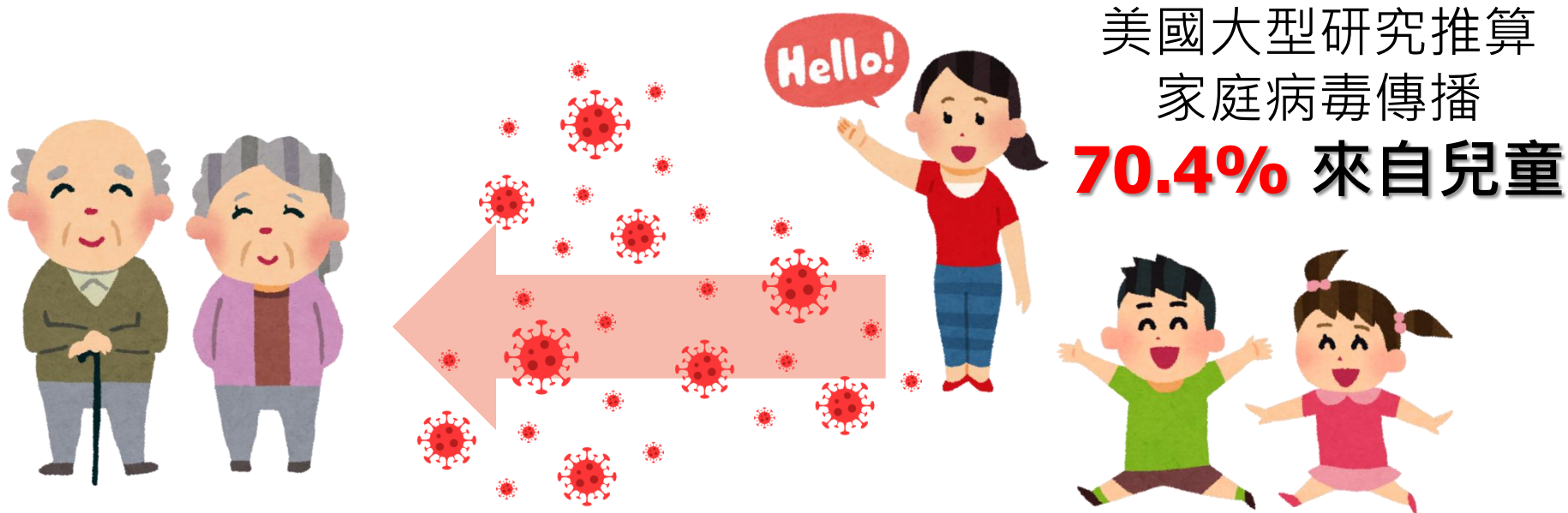
民眾總在疫情爆發才想到要打疫苗...  
疫情變化多端，打疫苗是計畫性工作  
**應不論疫情，盡早完成接種，早點安心！**



# 有些長輩以為都不出門就沒事了...?



感染病毒往往處於被動且不經意之時...



**現階段出生滿6個月以上即可接種 JN.1 新冠疫苗**  
**呼籲大家儘快接種，保護自己也保護身邊愛的人**



# 台灣COVID-19疫苗採購量

**114年採購量：共307萬2,590劑**

| 廠牌             | 採購劑型與數量                                       | 疫苗株    | 目前進度                                                                               | 規劃開打時間              |
|----------------|-----------------------------------------------|--------|------------------------------------------------------------------------------------|---------------------|
| <b>Moderna</b> | 單劑型(PFS)：<br>227萬2,590劑<br>多劑型(vial)：<br>50萬劑 | LP.8.1 | □廠商已於5/21送件申請病毒株變更<br>□第一批及第二批約229萬劑預計7/21-8/17期間陸續進口<br>→預估9月中核准及首批疫苗封緘放行         | 自114.10.1起與流感疫苗同步開打 |
| <b>Novavax</b> | 單劑型(PFS)：<br>30萬劑                             | JN.1   | 由於JN.1藥證已於5/29核准，因劑型改為PFS，已請廠商儘速申請劑型變更<br>→需視廠商申請作業與取得授權相關資料等時間，進口期程可能延後，不及於10/1開打 | 無法同步開打              |

**115年採購量：依目前115年概算初核額度僅可採購約180萬劑**

●正爭取預算不足數，如有爭取到預算則可採購計250萬劑



# 世界衛生組織要提醒你的十件事



1. 流感大流行與禽流感不同
2. 流感大流行是一再發生的事件
3. 世界可能瀕臨另一次流感大流行的危險
4. 所有的國家均將受到影響
5. 廣泛散播的疾病將會發生
6. 醫療物資將不足
7. 將會有很多人死亡
8. 經濟和社會將受重創
9. 每一個國家都必須有所準備
10. 當大流行威脅增加時，  
世界衛生組織將向全球發佈警訊



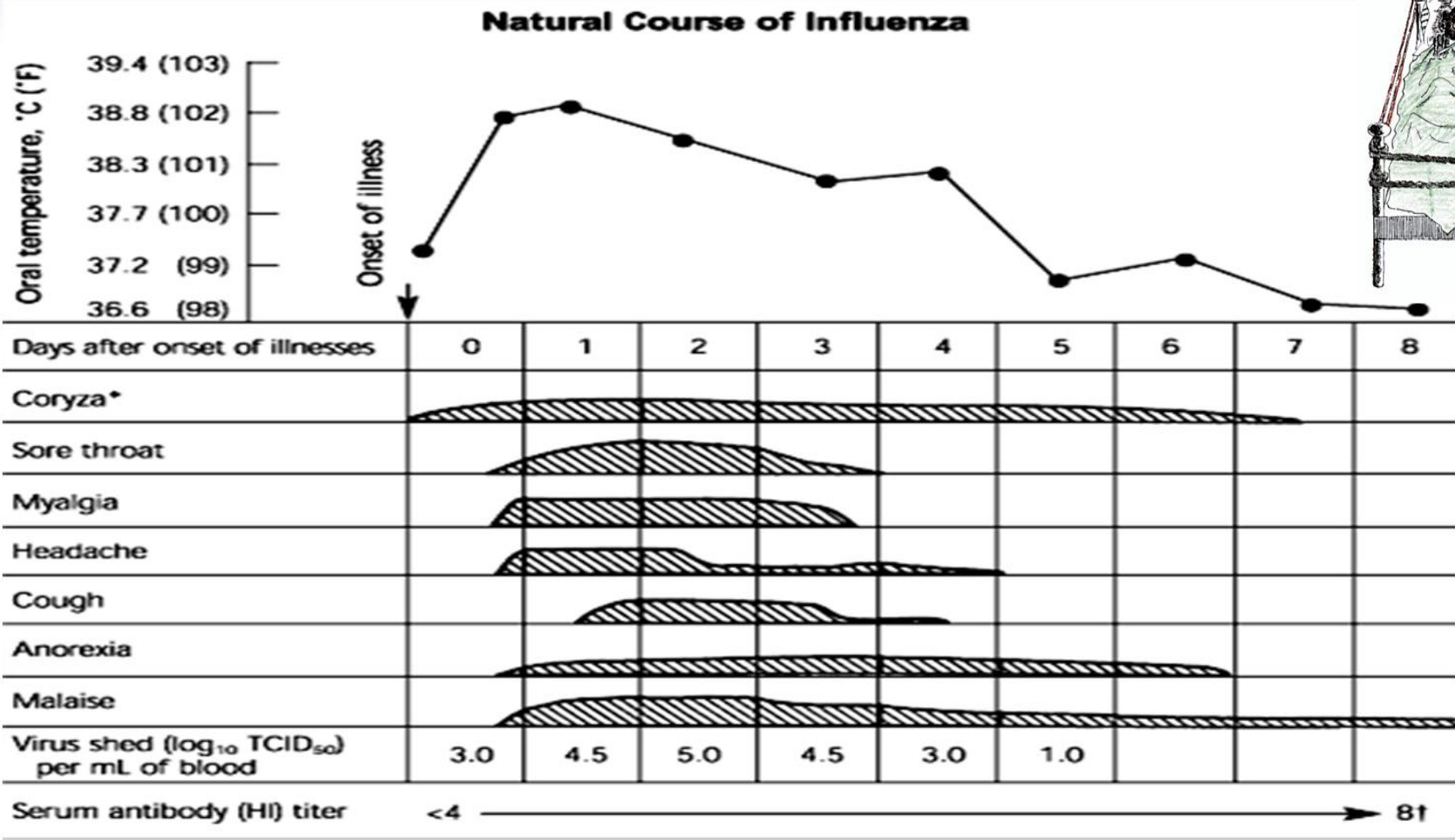
禽流感



**Be Prepared  
Be Aware  
Be Ready**



# 人類感染流感的病程症狀與病毒量



# 類流感的臨床疾病定義

Influenza-like illness, ILI

即疑似流感病例，臨床上同時出現

①突然發病、有發燒(耳溫 $\geq 38^{\circ}\text{C}$ )及呼吸道症狀；

②且有肌肉酸痛或頭痛或極度倦怠感；

③需排除單純性流鼻水、扁桃腺炎及支氣管炎；

但未經實驗室證實者謂之。

**+ 群聚現象：全家感冒一起看病,好朋友或同學都感冒了**

# 流感的併發症



## 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

儘速轉診  
至大醫院

65歲以上長者或有潛在疾病者，應提高警覺

門診就醫(約1%需住院)



潛伏期1-4天  
(平均2天)

上呼吸道  
感染

(1-2週內)

## 流感併發症

(佔流感住院病人10-25%)

### 病毒性併發症

(如：肺炎、心肌炎、腦炎)

### 細菌感染

(如：肺炎鏈球菌、  
金黃色葡萄球菌)

### 加重高風險族群 本身潛在性疾病

(如：心血管疾病、慢性肺病、  
腎臟病、糖尿病及肥胖等)

## 嚴重 併發症

(佔流感併發症  
1%~4%，如：  
呼吸衰竭或敗  
血症等)

## 死亡

(嚴重併發症  
者中約一半  
會死亡)



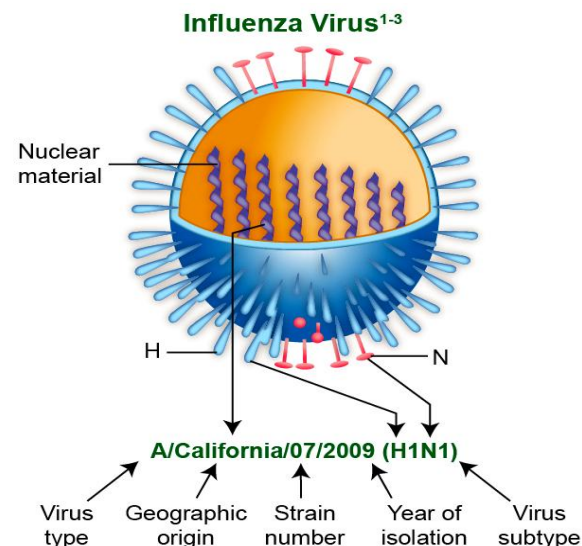
# 流行性感冒病毒



- ✓ **A、B、C、D型**
- ✓ **A型流感病毒以兩種表面抗原蛋白來區分 (H1N1, H3N2, H2N2?)**
- ✓ **B型流感為單一血清型，但分為兩個分枝 (抗原性)：**

**1. Victoria lineage (維多利亞株)**

**2. Yamagata lineage (山形株)**



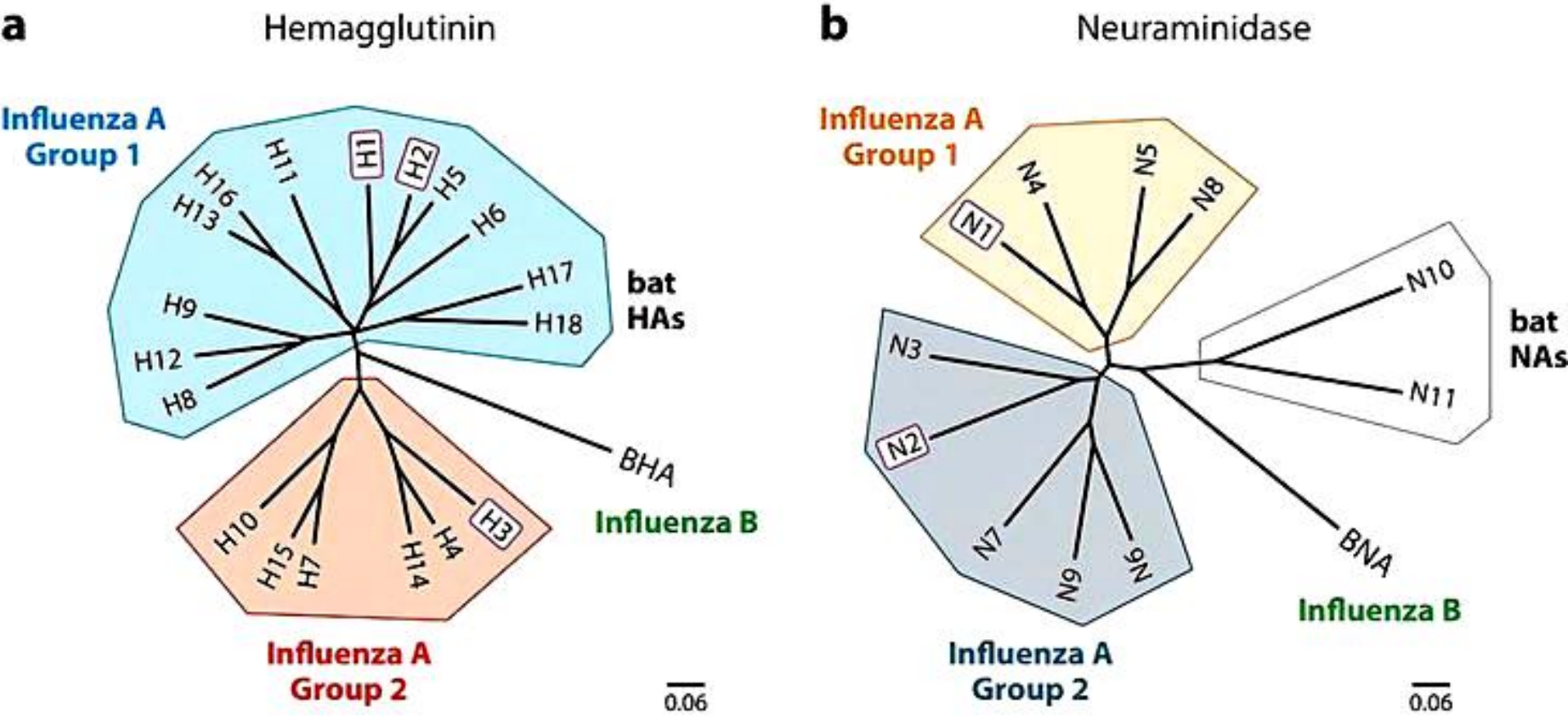
|                            | Type A | Type B | Type C              | Type D |
|----------------------------|--------|--------|---------------------|--------|
| 全球大流行 (pandemic influenza) | ✓      |        |                     |        |
| 局部性流行 (epidemic influenza) | ✓      | ✓      |                     |        |
| 症狀較輕微的上呼吸道感染               |        |        | ✓                   |        |
| 可感染人類、豬與鳥類                 | ✓      |        |                     | ✓      |
| 在各年齡層造成中度到嚴重的疾病            | ✓      | ✓      | 大部人都感染過<br>(主要於學齡前) | 2016.9 |





# 流感病毒抗原種類

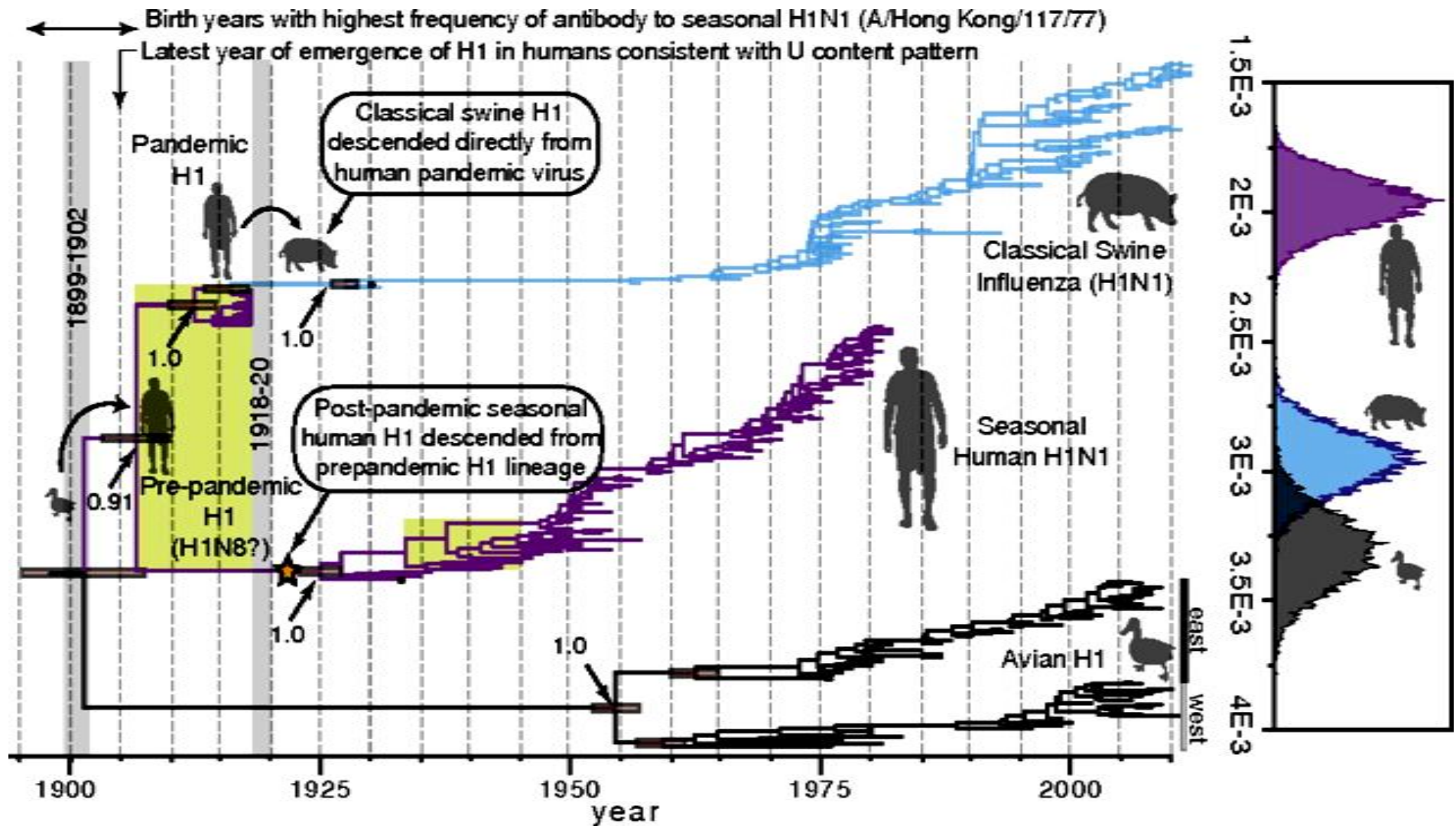
## HA/NA types of Influenza virus



# 1918年的甲型H1N1流感病毒持續存在及突變中



Genesis and pathogenesis of the 1918 pandemic H1N1 influenza A virus

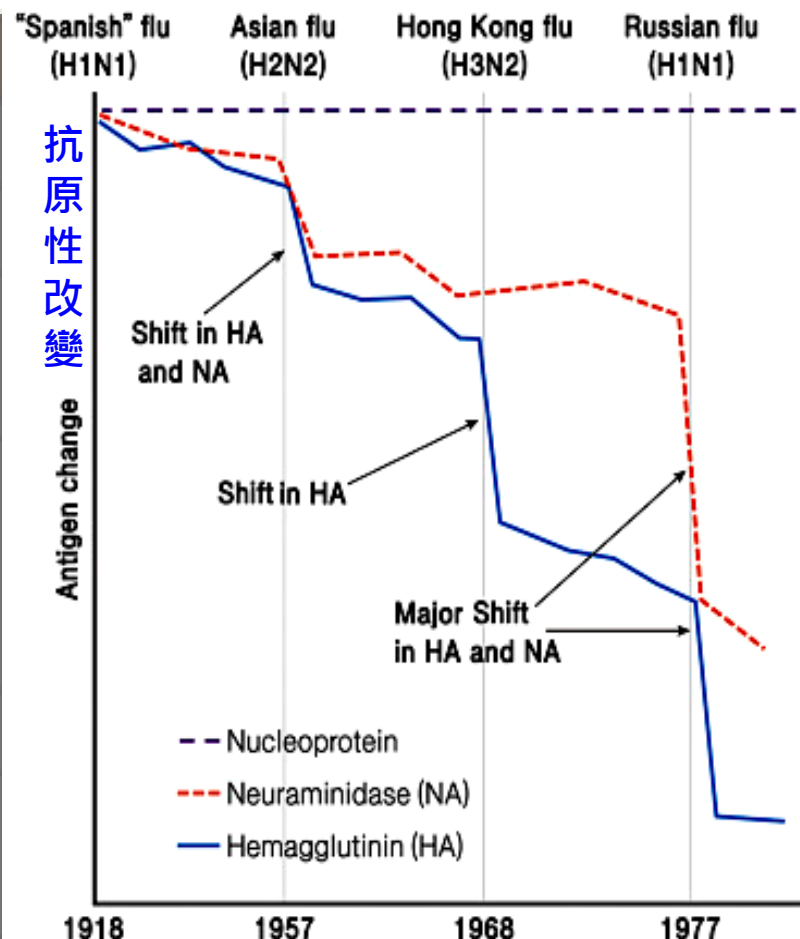




# 流感病毒的變異性

Influenza virus: the flu, Genetic Drift & Shift, Neuraminidase & Hemagglutinin

| Genetic Shift 基因轉變               | 基因漂變 Genetic Drift                                                                                      |
|----------------------------------|---------------------------------------------------------------------------------------------------------|
| Reassortment of segmented genome | Random mutations                                                                                        |
| Completely new surface antigen   | Slightly different surface antigen                                                                      |
| Happens suddenly                 | Happens slowly                                                                                          |
| "Everyone" is susceptible        | Some of the population is immune<br>(antibodies from previous infections are still partially effective) |
| Epidemics & occasional Pandemics | Epidemics                                                                                               |
| Influenza A                      | Influenza A & B                                                                                         |
| Rotavirus                        | <u>Many other viruses</u>                                                                               |





# 流感的季節性

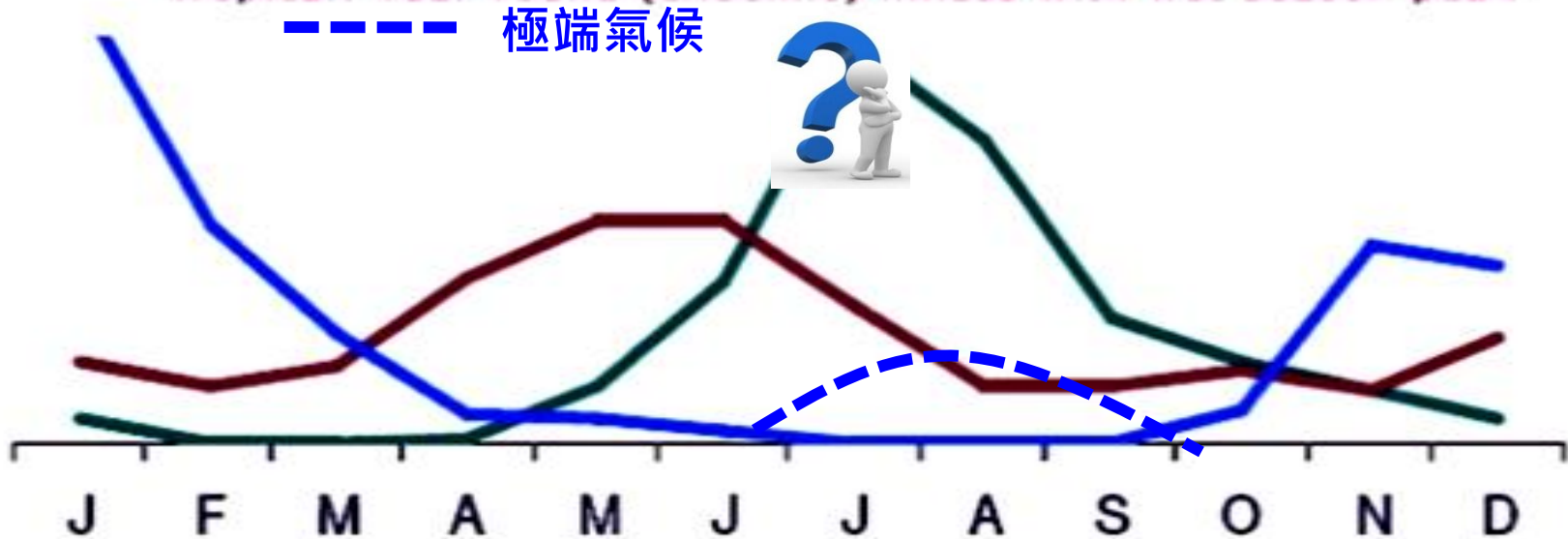
## Influenza activity and peaks

Summary of Influenza Activity and Occurrence in Different Climates

Northern Hemisphere: Winter peak

Southern Hemisphere: Winter peak

Tropical: Year-round (endemic) illness with wet season peak



Adapted from: Relchelderfer PS, Kendal AP, Shortridge KF, Hampson A, et al. Influenza surveillance in the Pacific Basin. In: Current Topics in Medical Virology 1988: 412-38

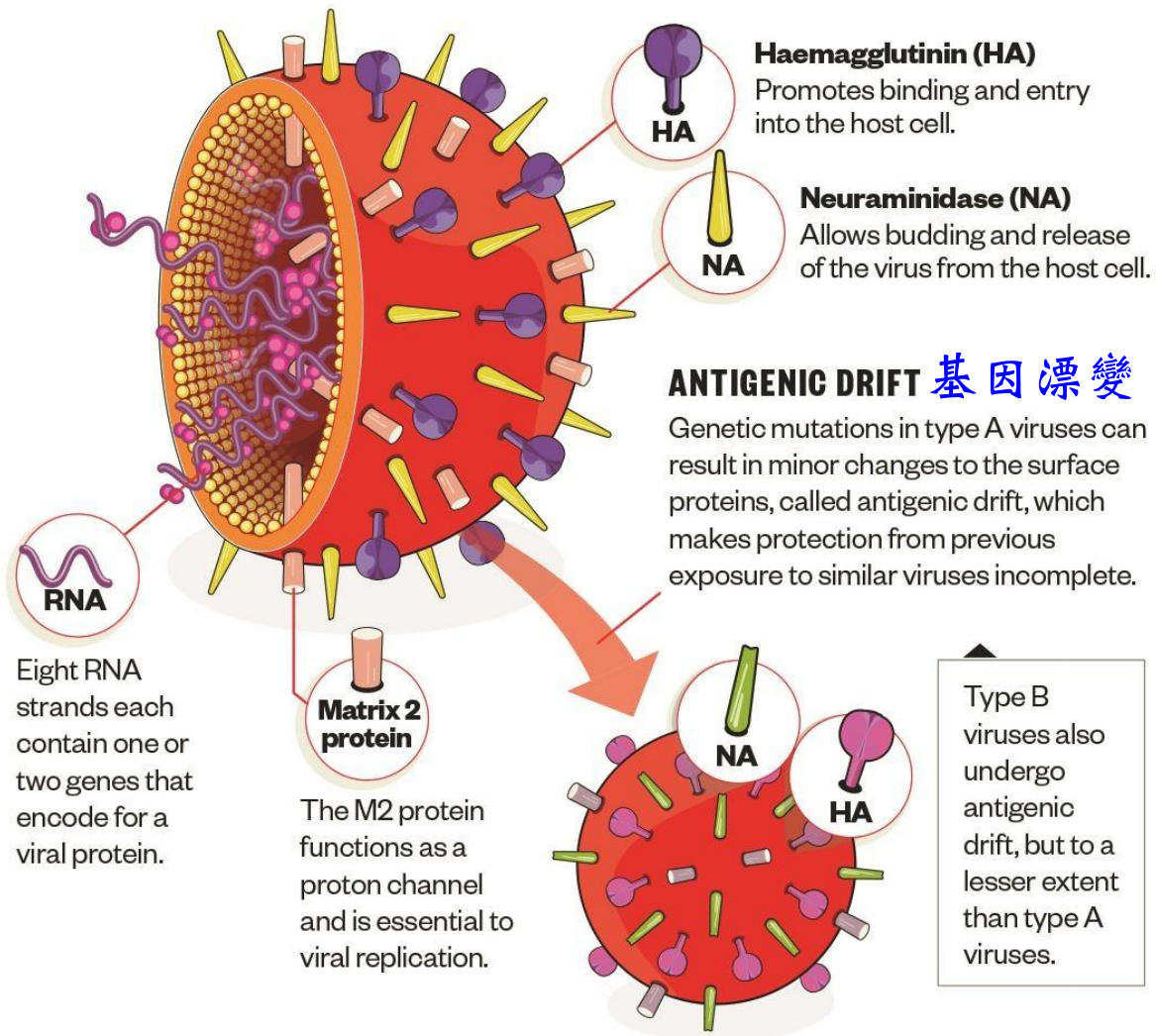
Jim Matthews (2006, April 10) Seasonal Occurrence of Influenza. Presented at Potential Engineering Approach to a Pandemic. <http://www.vaccine2006.org/program.html>





# 流感病毒對世界的衝擊與挑戰

## Impact and challenges of the flu virus



**IMPACT OF FLU**

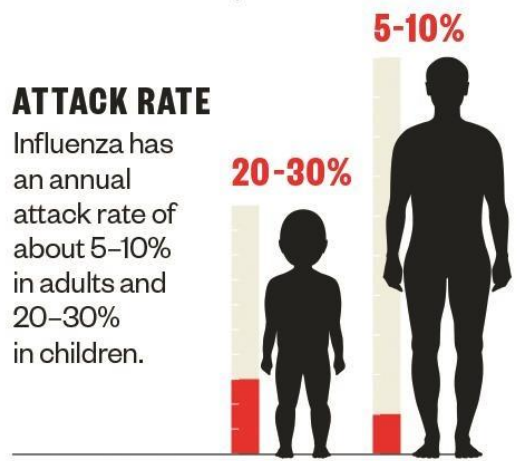
The World Health Organization estimates that flu causes about

**3-5 MILLION**

cases of severe illness, and about

**250K-500K**

deaths annually worldwide.





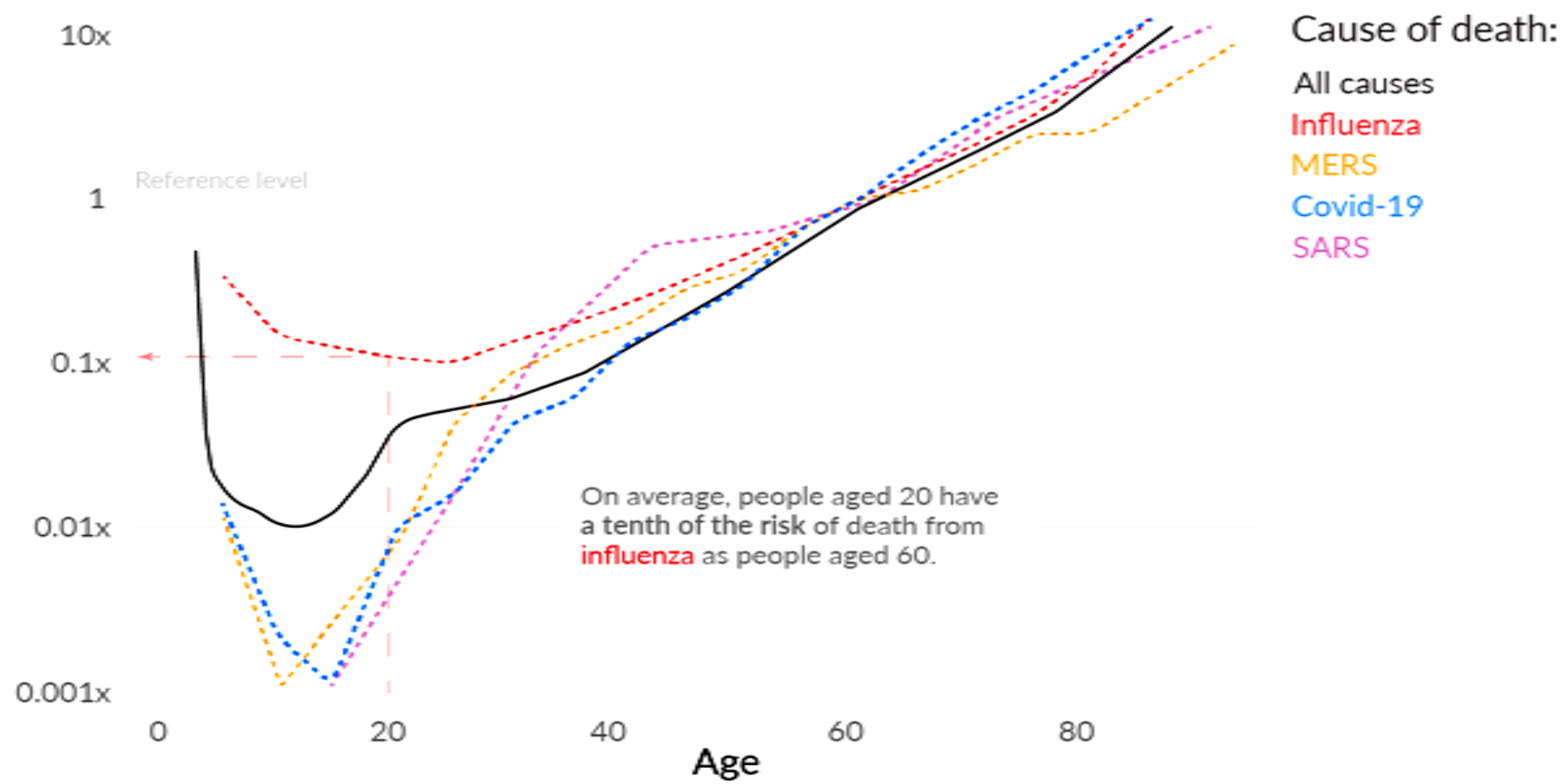


# 呼吸道疾病導致死亡的風險與年齡有關

The risk of death from respiratory diseases increased exponentially with age

## Relative risk of death

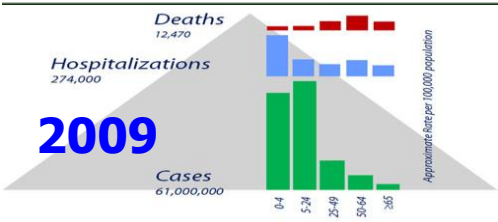
How much higher is the risk of death compared to someone aged 60?





# 歷年流感病毒與新冠肺炎病毒的死亡率比較

## Mortality from Influenza & Coronaviruses



|                                              | Number of deaths<br>(adjusted to year 2000<br>population) | Mean age at death<br>(years) | Years of life lost<br>(adjusted to year<br>2000 population) |
|----------------------------------------------|-----------------------------------------------------------|------------------------------|-------------------------------------------------------------|
| 2009 influenza pandemic                      | 7500-44 100*;<br>8500-17 600†                             | <u>37.4</u> (青少年)            | 334 000-1 973 000;<br>328 900-680 300                       |
| 1968 influenza pandemic                      | 86 000‡                                                   | <u>62.2</u> (中老年人)           | 1 693 000                                                   |
| 1957 influenza pandemic                      | 150 600‡                                                  | <u>64.6</u> (中老年人)           | 2 698 000                                                   |
| 1918 influenza pandemic                      | 1 272 300‡                                                | <u>27.2</u> (成人)             | 63 718 000                                                  |
| 1979-2001 average influenza<br>A H3N2 season | 47 800                                                    | <u>75.7</u> (老年人)            | 594 000                                                     |
| 2003 SARS-CoV                                | 774                                                       | <u>Unknown</u> (青壯年)         | Unknown                                                     |
| 2012 MERS-CoV                                | 858                                                       | >65.0                        | Unknown                                                     |
| 2019 SARS-CoV-2                              | 302 059§ ↑                                                | <u>Unknown</u> (中老年人)        | Unknown                                                     |



# 流感防治策略

|         | 季節性流感                      | 流感大流行                      |
|---------|----------------------------|----------------------------|
| 疫情監視    | 重症病例監視<br>流行趨勢監視<br>病毒活動監視 | 重症病例監視<br>流行趨勢監視<br>病毒活動監視 |
| 民眾溝通    | 個人衛生<br>人口密集機構             | 個人衛生<br>機關團體防疫             |
| 疫苗接種    | 高危險群、高傳播族群                 | 全民                         |
| 抗病毒藥劑使用 | 縮短症狀持續時間<br>降低重症與死亡率       | 圍堵<br>預防性投藥<br>重症治療        |
| 公共衛生介入  | 自主健康管理                     | 隔離、檢疫、停課                   |

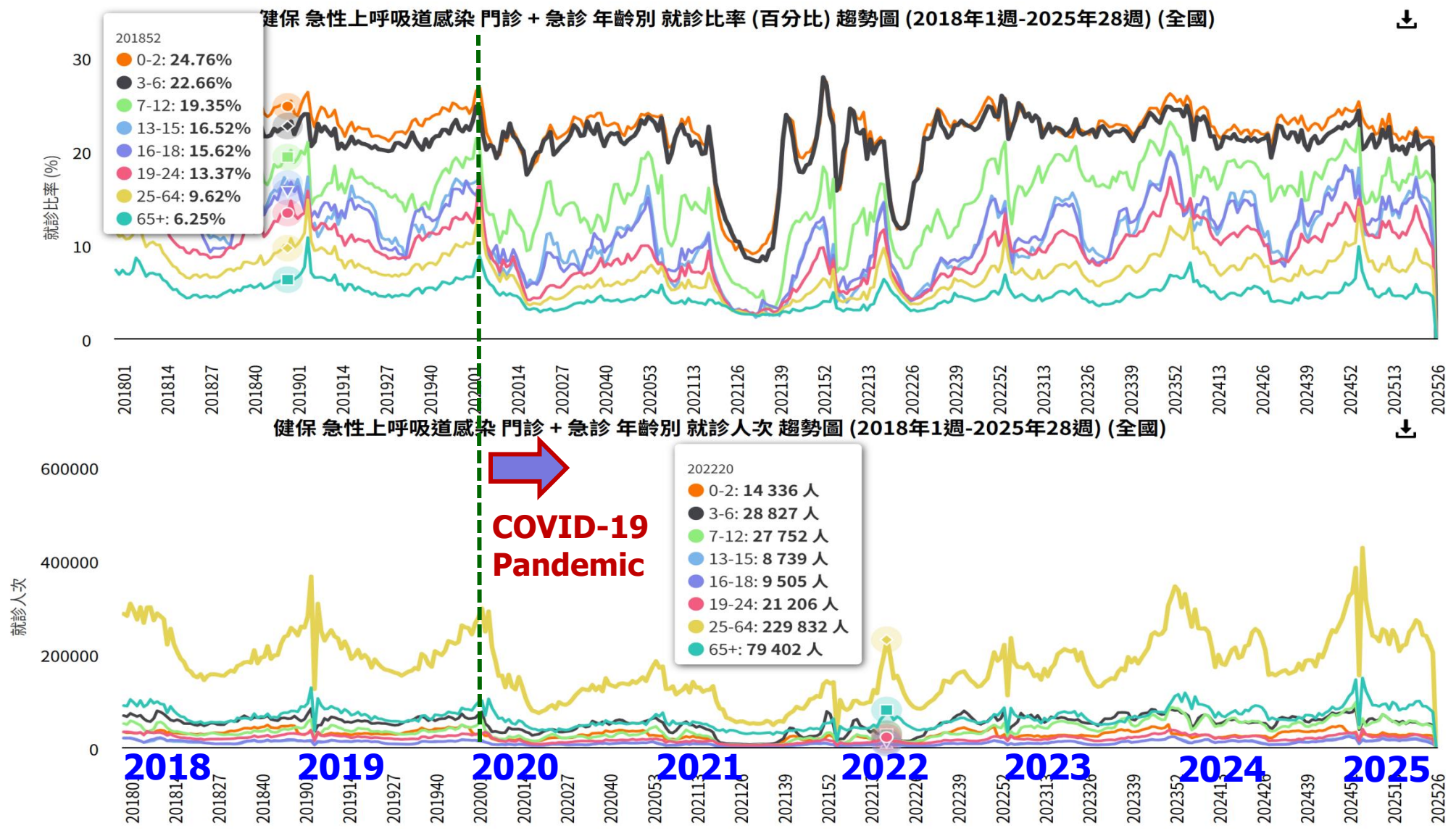


# 流感的監視系統

- 一、偵測流感發生之人、時、地變化情形，即時掌握流行趨勢，並妥適處理及採取必要防疫措施。
- 二、提供流感疫情警示。
- 三、建立臺灣本土流行病學基本資料。
- 四、偵測流感病毒株的發生及變異情形。
- 五、流感病毒流行趨勢分析及預測。
- 六、提供流感疫苗政策及防治計畫參考。

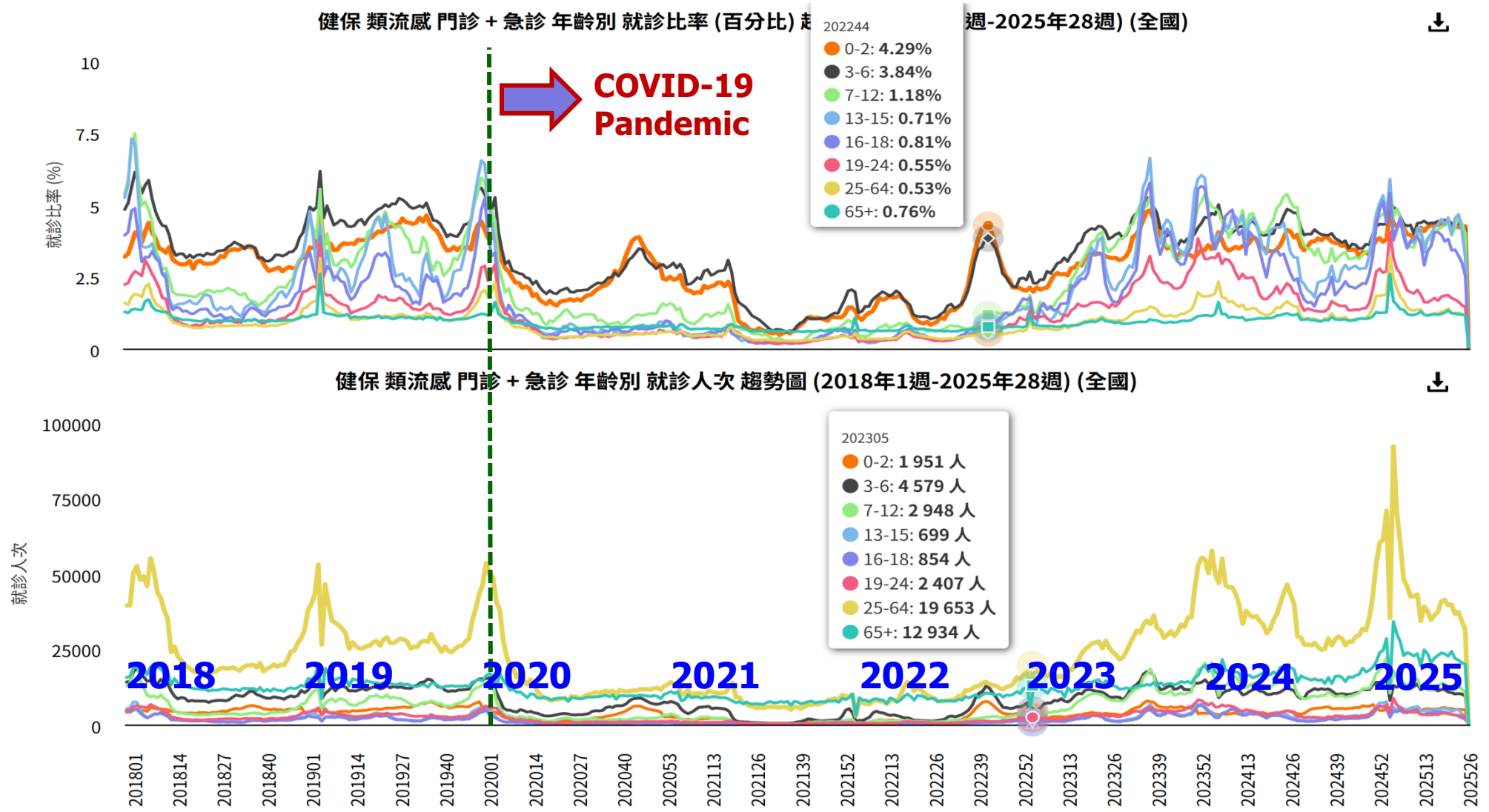


# 台灣健保急性上呼吸道門急診年齡別就診趨勢





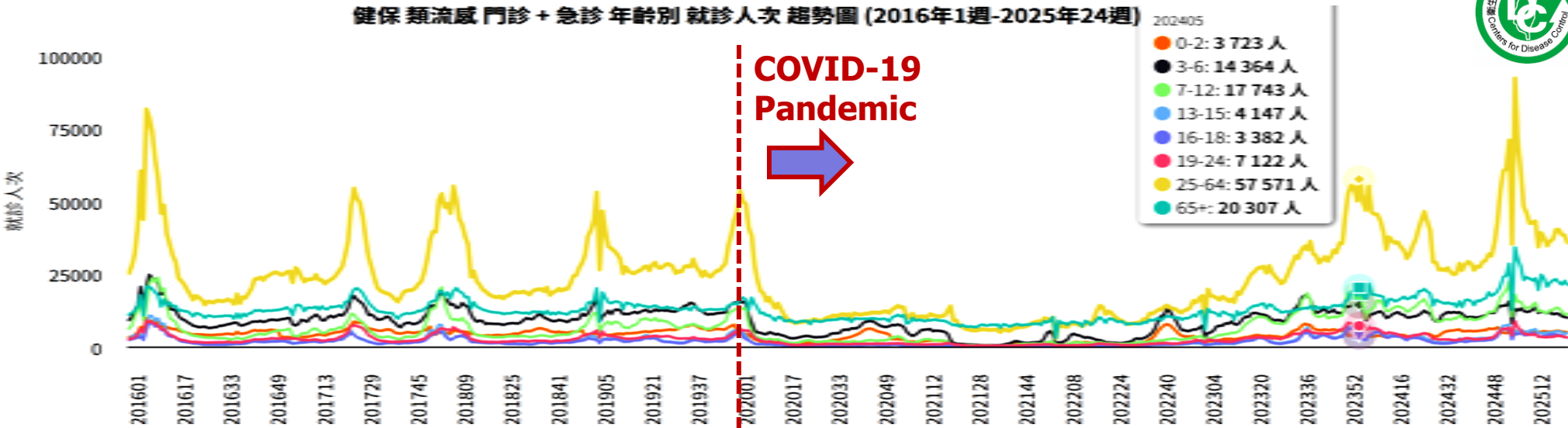
# 台灣健保類流感門急診年齡別就診趨勢



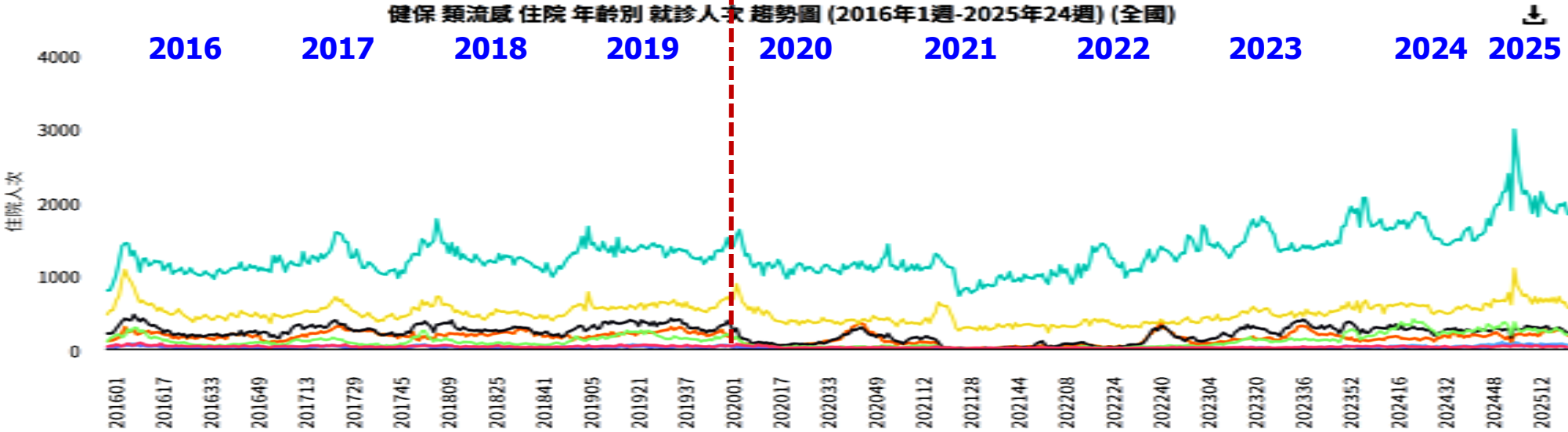
# 2016~2025台灣急/門診/住院類流感監測



健保類流感門診+急診年齡別就診人次趨勢圖 (2016年1週-2025年24週)



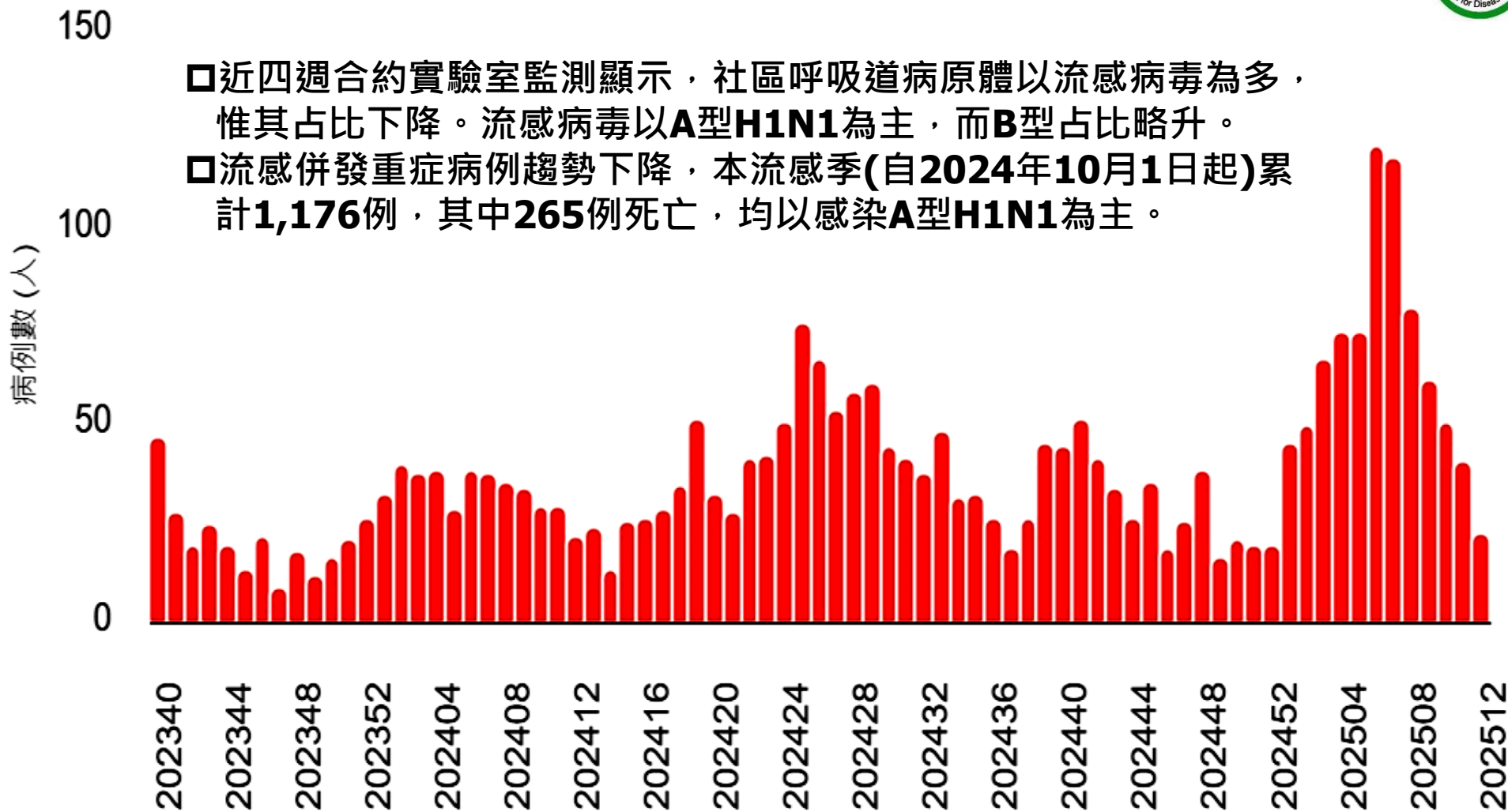
健保類流感住院年齡別就診人次趨勢圖 (2016年1週-2025年24週) (全國)





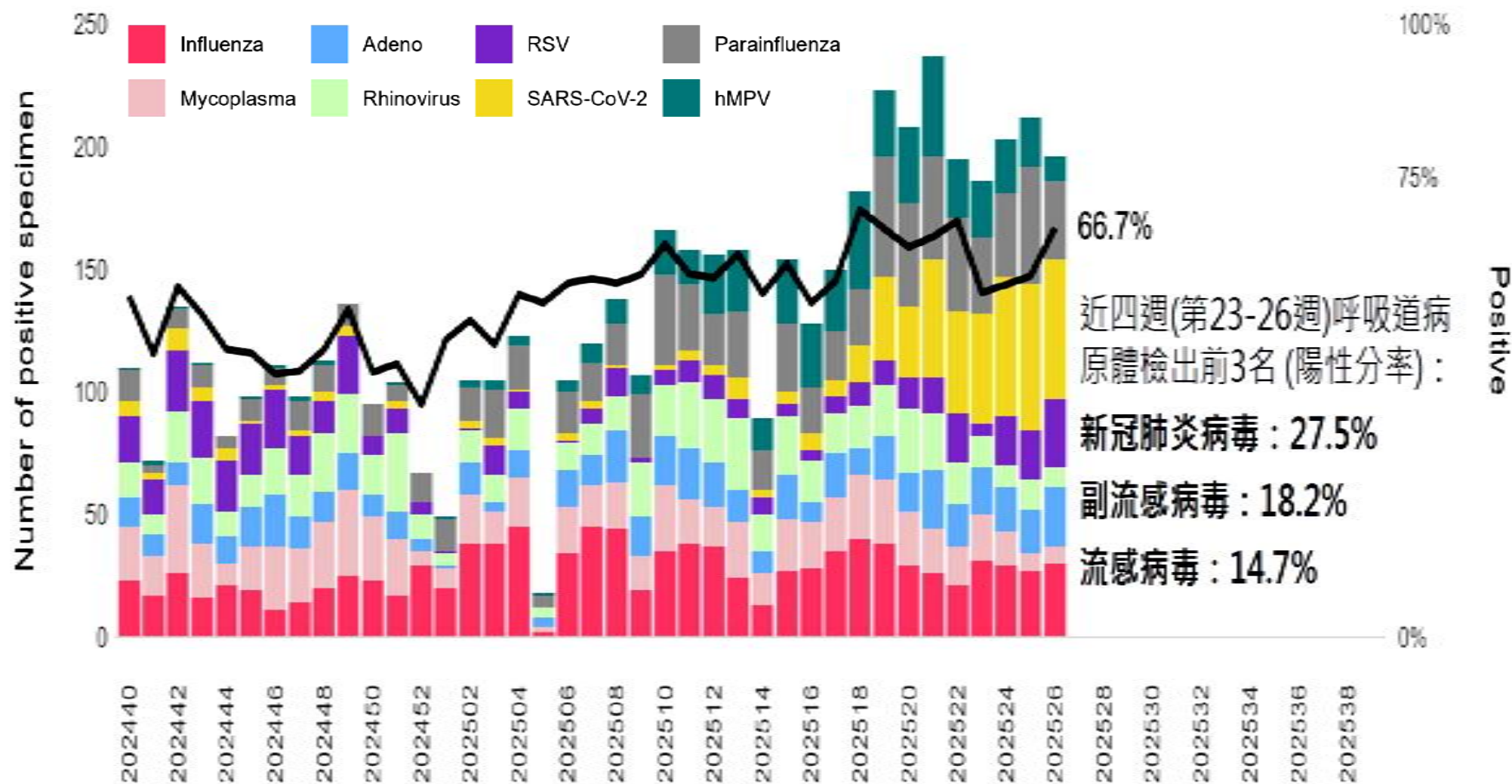
# 流感併發重症

- 近四週合約實驗室監測顯示，社區呼吸道病原體以流感病毒為多，惟其占比下降。流感病毒以**A型H1N1**為主，而**B型**占比略升。
- 流感併發重症病例趨勢下降，本流感季(自**2024年10月1日**起)累計**1,176**例，其中**265**例死亡，均以感染**A型H1N1**為主。





# 合約實驗室呼吸道病原體分子生物學檢出情形

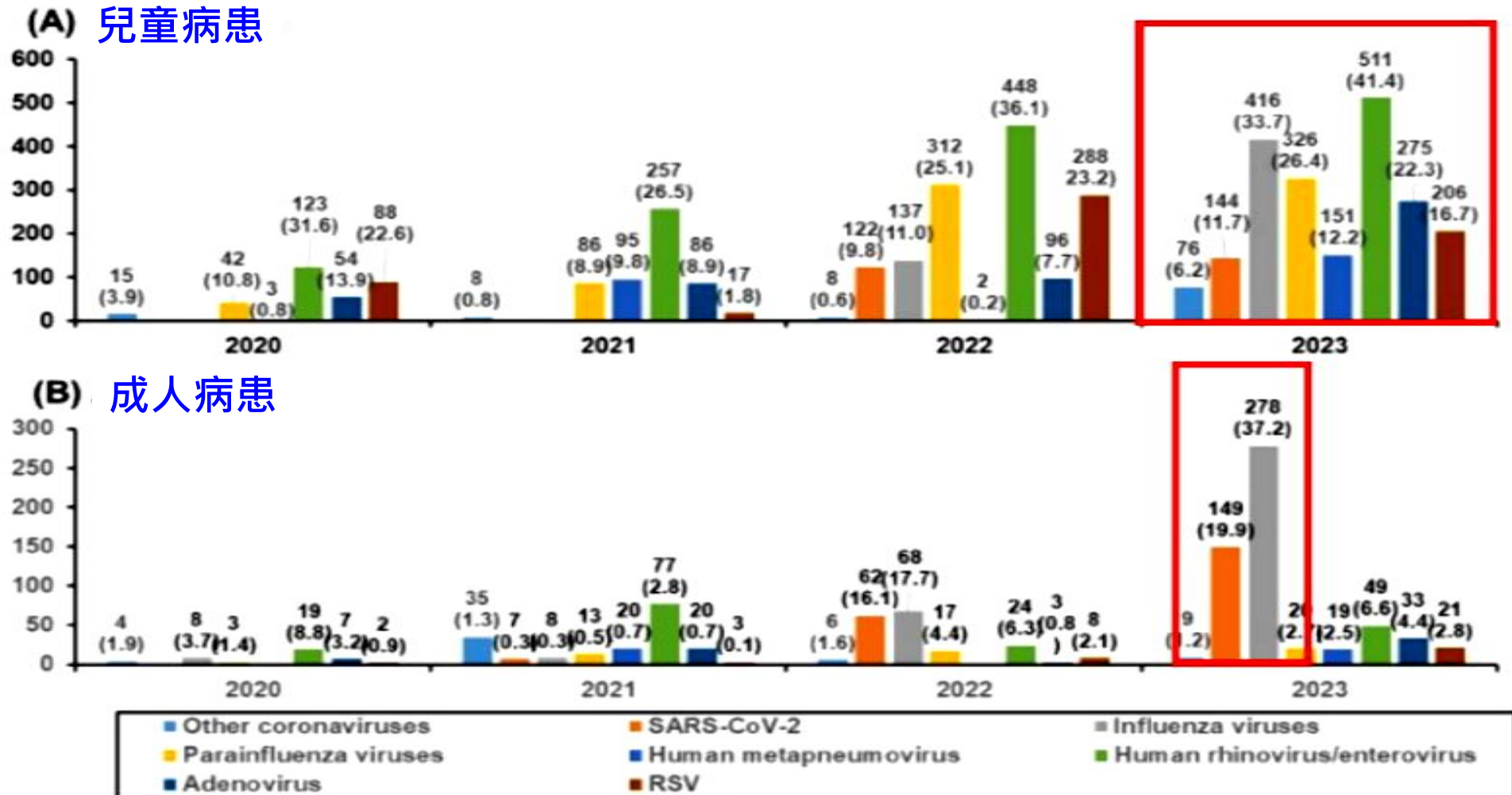






台灣中部基因檢驗發現

# 兒童常合併多種病原感染，成人以新冠/流感為主





全國 第四類法定傳染病 死亡病例趨勢圖 (2022年1週-2025年20週)  
[發病日 2022/01/02-2025/05/17]



# 流感&新冠於秋冬季節經常共同或接續流行 國人出國旅遊頻繁，台灣疫情易與國際同步



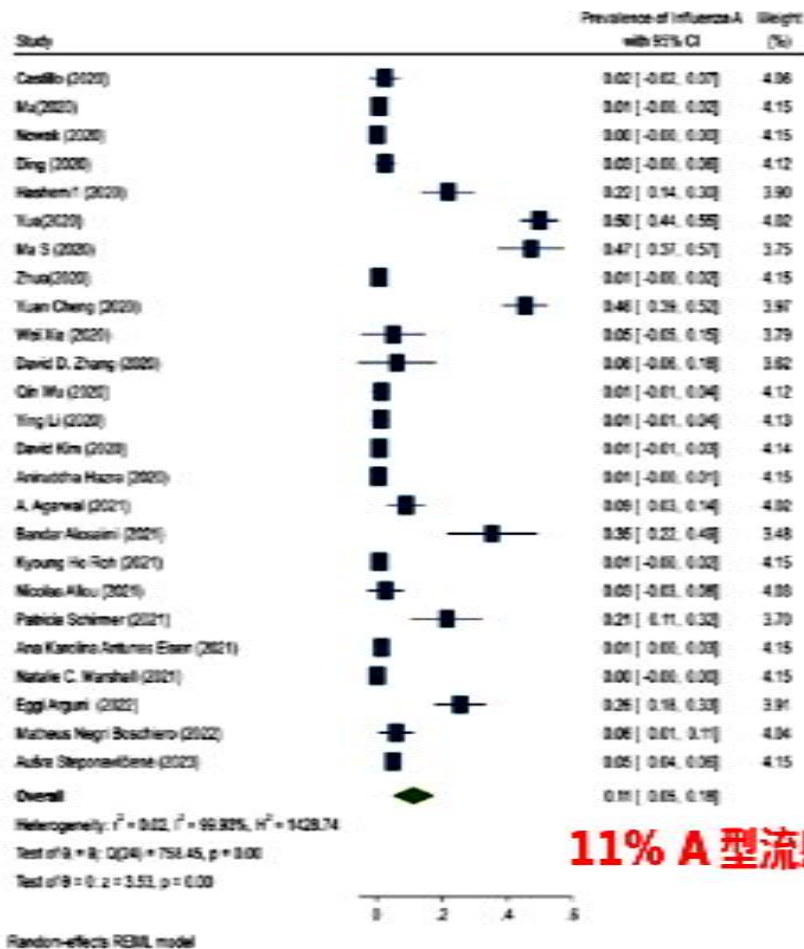
日本新冠 + 流感大爆發 一周倍增至**34**萬人感染 當局籲加強防疫 | 遊日注意<sup>1</sup>  
**2024.12.14**





# 綜合研究發現 新冠患者常合併流感感染

## Prevalence of Influenza A



## Prevalence of Influenza B

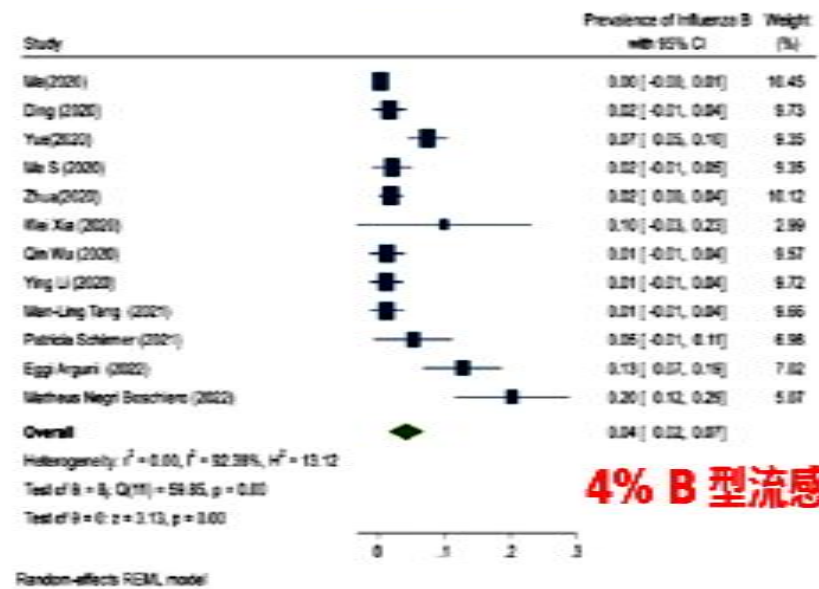
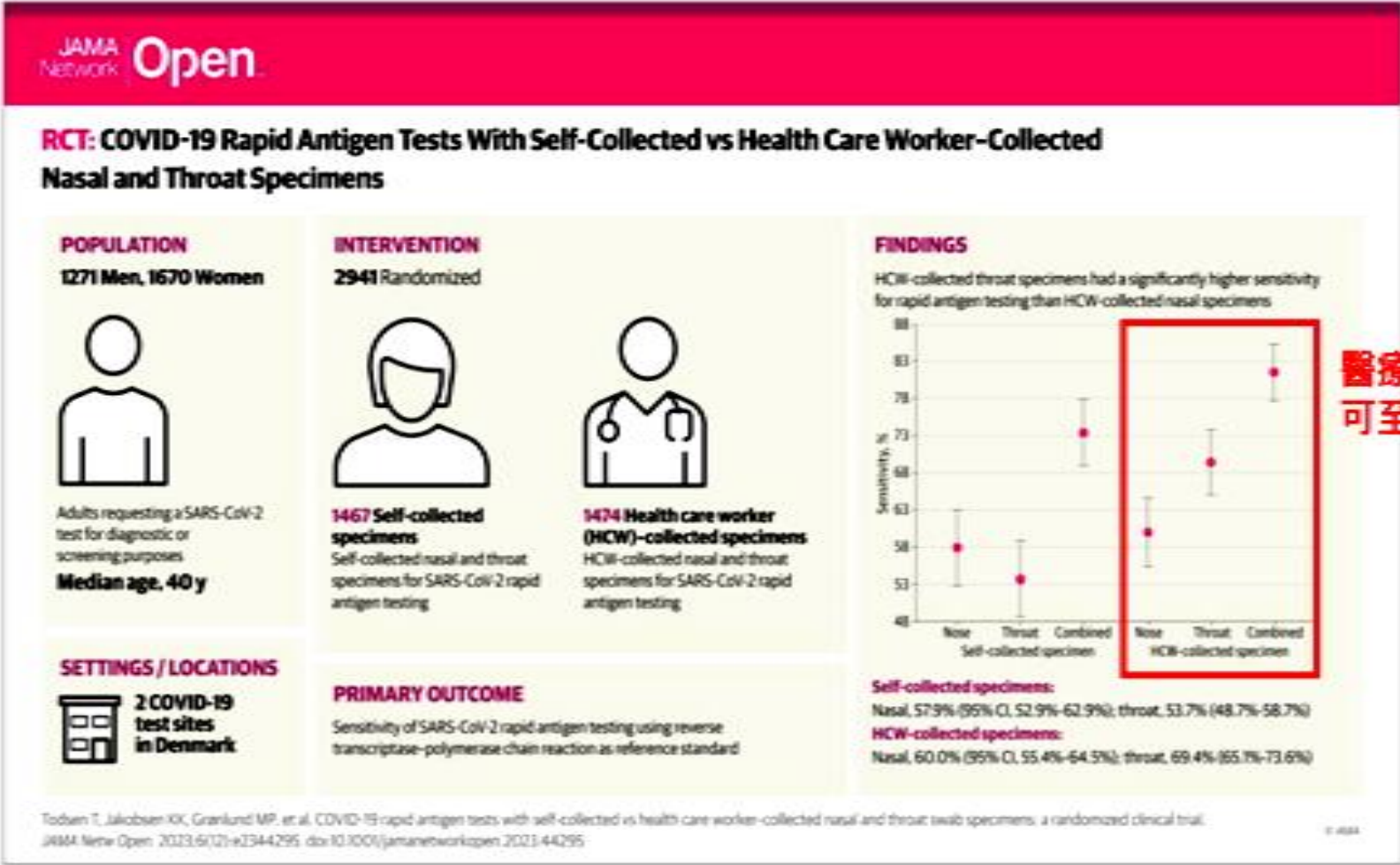


Fig. 11 Forest plot diagram for estimation of influenza B prevalence in COVID-19 patients according to each primary studies and overall estimate with a 95% confidence interval



# 醫療人員執行抗原快篩較病人自檢準確

高風險族群在家可先篩，若陰性則醫療人員請再次篩檢確認。







# 台灣機構群聚症候群感染事件統計

Number of reported diseases/syndromes of confirmed outbreaks — Taiwan, 2018/2022/2023

## COVID-19 疫情前

| Reported diseases/syndromes         | Total number of |
|-------------------------------------|-----------------|
| Influenza-like illness 類流感          | 217             |
| Acute respiratory infection 急性呼吸道感染 | 211             |
| Acute diarrhea 急性腹瀉                 | 161             |
| Varicella/chickenpox 水痘             | 116             |
| Tuberculosis 肺結核                    | 22              |
| Dengue fever 登革熱                    | 14              |
| Unknown cause of fever 不明熱          | 10              |
| Enterovirus 腸病毒                     | 9               |
| Pertussis 百日咳                       | 2               |
| Measles 麻疹                          | 1               |
| Total                               | 763             |

## COVID-19 疫情後(2022)

| Reported diseases/syndromes         | number of |
|-------------------------------------|-----------|
| Acute diarrhea                      | 290       |
| Acute respiratory infection 急性呼吸道感染 | 43        |
| Tuberculosis                        | 14        |
| Varicella/chickenpox                | 12        |
| Unknown cause of fever              | 1         |
| Total                               | 360       |

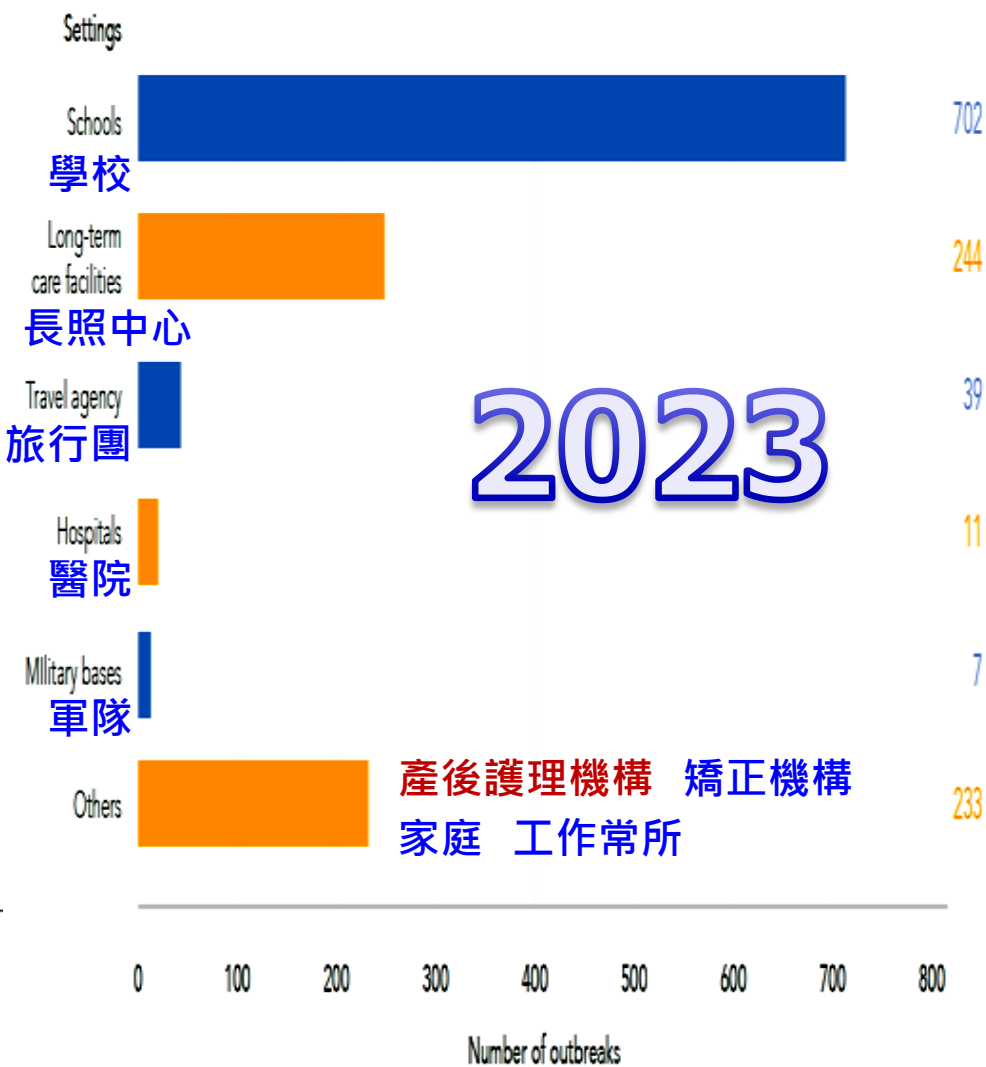
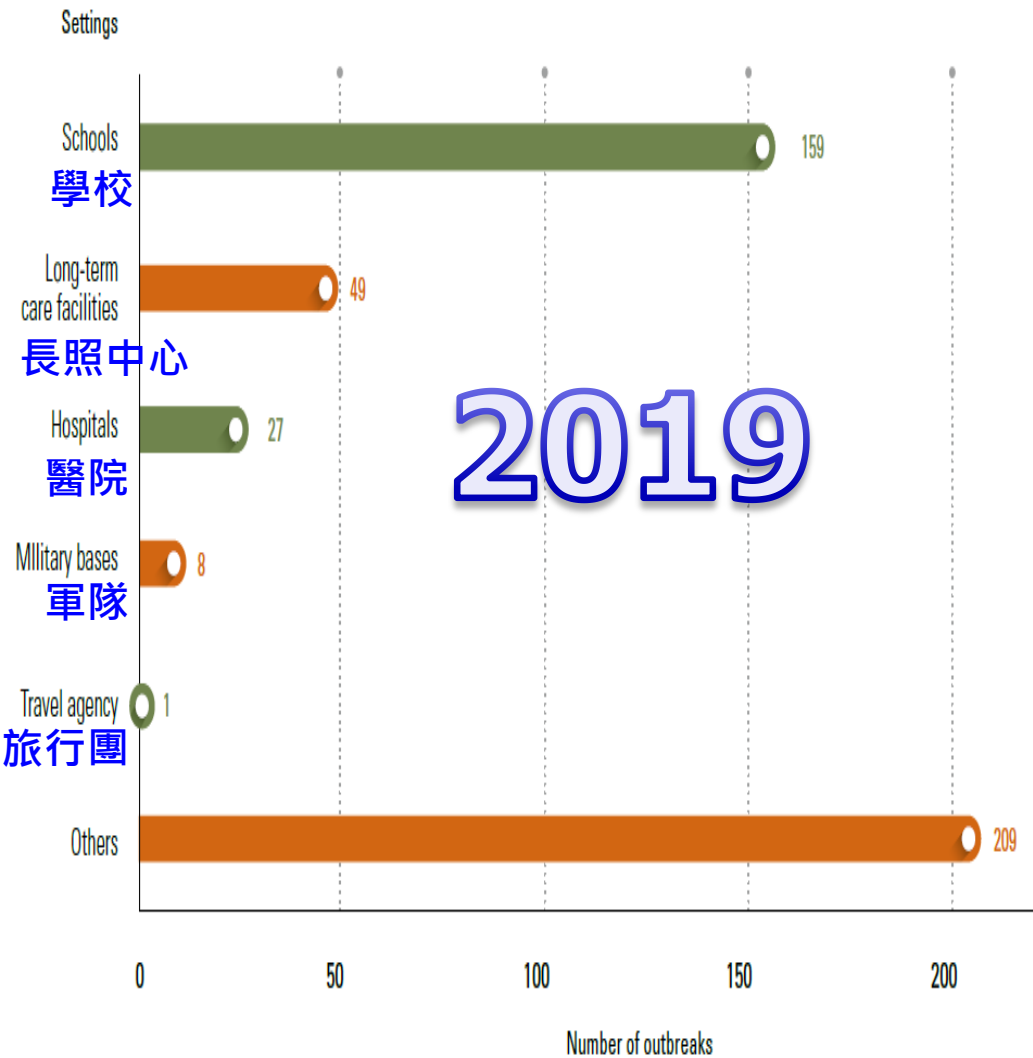
## COVID-19 疫情後(2023)

| Reported diseases/syndromes         | Number of outb |
|-------------------------------------|----------------|
| Acute respiratory infection 急性呼吸道感染 | 757            |
| Acute diarrhea                      | 309            |
| Enterovirus infections              | 111            |
| Varicella/chickenpox                | 43             |
| Tuberculosis                        | 11             |
| Fever of unknown cause              | 5              |
| Total                               | 1236           |

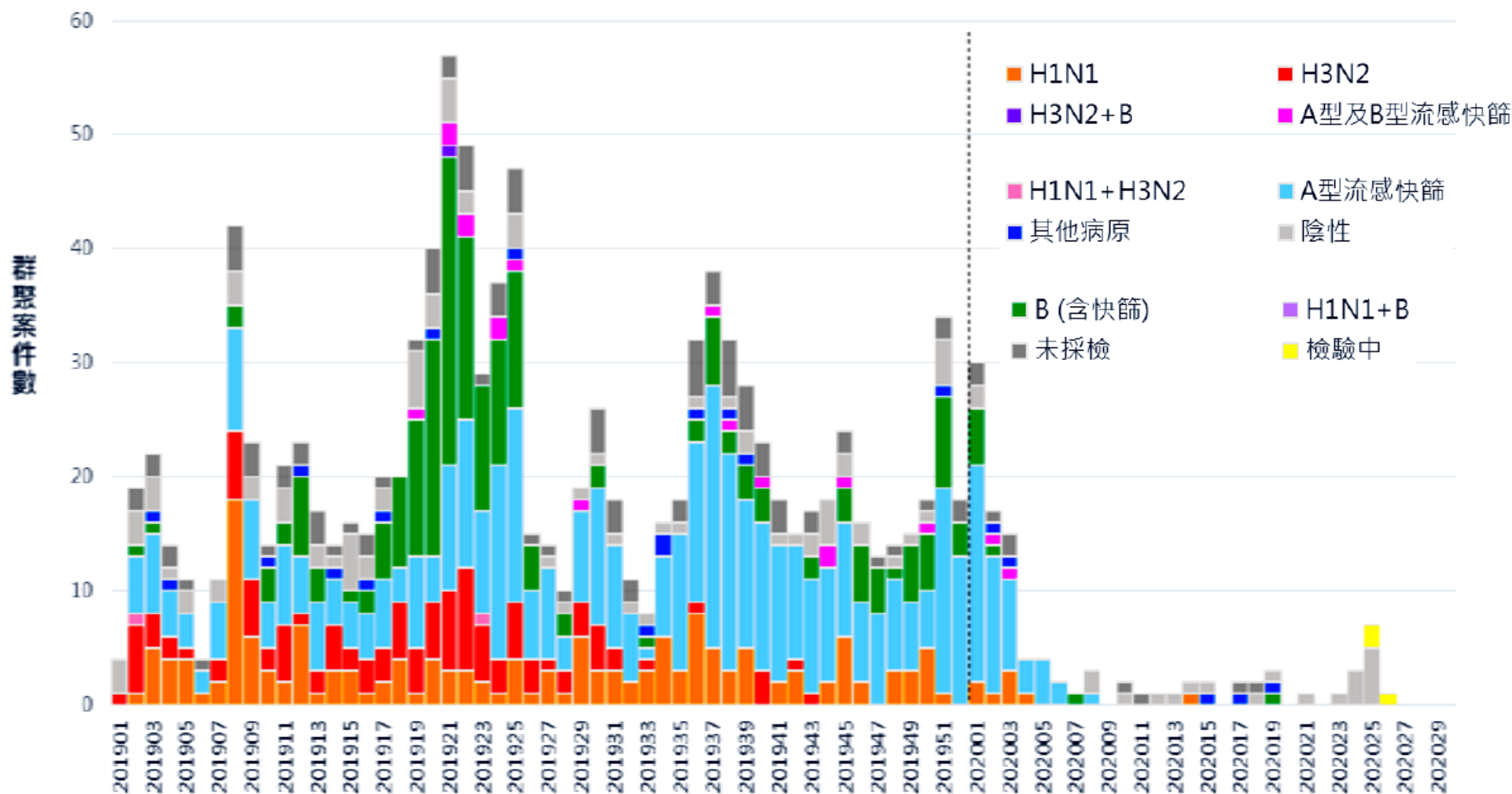




# 2020/2023 台灣新冠疫情前後群聚機構



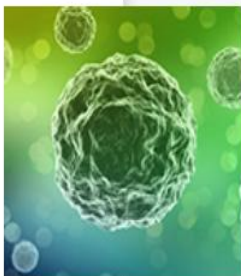
# 2019~20年流感陽性群聚趨勢-依病原



# 流感疾病資訊

## 疾病資訊

### 疾病介紹



### 最新消息及疫情 訊息

- ▶ 新聞稿
- ▶ 致醫界通函
- ▶ 流感防治一網通-公費...
- ▶ 統計資料查詢



更多...

### 重要指引及教材

- ▶ 季節性流感防治工作...
- ▶ 傳染病病例定義暨防...
- ▶ 「流感併發重症」核...
- ▶ 學校/幼兒園/補習班/...



更多...

### 流感疫苗

- ▶ 年度流感疫苗接種計畫
- ▶ 流感疫苗接種工作手冊
- ▶ 合約醫療院所專區
- ▶ 校園集中接種



更多...

### 流感抗病毒藥劑

- ▶ 儲備目的及使用原則
- ▶ 公費流感疫苗暨抗病...
- ▶ 公費流感抗病毒藥劑...
- ▶ 公費流感抗病毒藥劑...



更多...

### Q & A

- ▶ 季節性流感防治
- ▶ 季節性流感疫苗
- ▶ 流感抗病毒藥劑



更多...



# 年度流感疫苗接種計畫

- 113年度公費對象及疫苗介紹
- 113年度流感疫苗接種計畫
- 工作手冊 (113年7月更新)
- 教育訓練 (2024/6/20)
- 各縣市流感疫苗合約醫療院所
- 歷年接種數 (2022)
- 接種嚴重不良事件統計(2023/11/17)



# 台灣流感速訊

## 2024-2025 流感季流感併發重症發生率及死亡率統計

| 年齡別     | 病例數   | 死亡數 | 每十萬人口<br>累積發生率 | 每十萬人口<br>累積死亡率 |
|---------|-------|-----|----------------|----------------|
| 小於 3 歲  | 8     | 2   | 1.90           | 0.48           |
| 3-6 歲   | 5     | 1   | 0.71           | 0.14           |
| 7-18 歲  | 17    | 3   | 0.69           | 0.12           |
| 19-24 歲 | 5     | 0   | 0.33           | 0.00           |
| 25-49 歲 | 136   | 28  | 1.57           | 0.32           |
| 50-64 歲 | 321   | 63  | 6.08           | 1.19           |
| 65 歲以上  | 684   | 168 | 15.57          | 3.82           |
| 總計      | 1,176 | 265 | 5.02           | 1.13           |





# 台灣流感速訊

**病毒抗原性:**第 8-11 週流感病毒檢出件數 A 型高於 B 型，其中 A 型 H1N1 占 62.4%、B 型占 19.6%、A 型 H3N2 占 18.0%，近期 B 型占比略升。  
2024-2025 流感季之流感病毒抗原性分析顯示，96.0% (217/226) A/H1N1 流感病毒與疫苗株 A/Victoria/4897/2022 (H1N1)pdm09 抗原性相近，78.0% (32/41) A/H3N2 流感病毒與疫苗株 A/Thailand/8/2022 (H3N2) 抗原性相近；B型流感病毒分離株均為B/Victoria，且 100% (31/31)與疫苗株 B/Austria/1359417/2021 (B/Victoria lineage)抗原性相近。

| WHO 建議 2024-2025 流感季北半球流感疫苗株                | 相似株 (%)     | 低反應株 (%)  |
|---------------------------------------------|-------------|-----------|
| A/Victoria/4897/2022 (H1N1)pdm09            | 109 (97.3%) | 3 (2.7%)  |
| A/Thailand/8/2022 (H3N2)                    | 9 (81.8%)   | 2 (18.2%) |
| B/Austria/1359417/2021 (B/Victoria lineage) | 9 (100.0%)  | 0 (0.0%)  |

註：以血球凝集抑制法(Hemagglutination inhibition)檢驗，效價相差 8 倍以上為低反應株

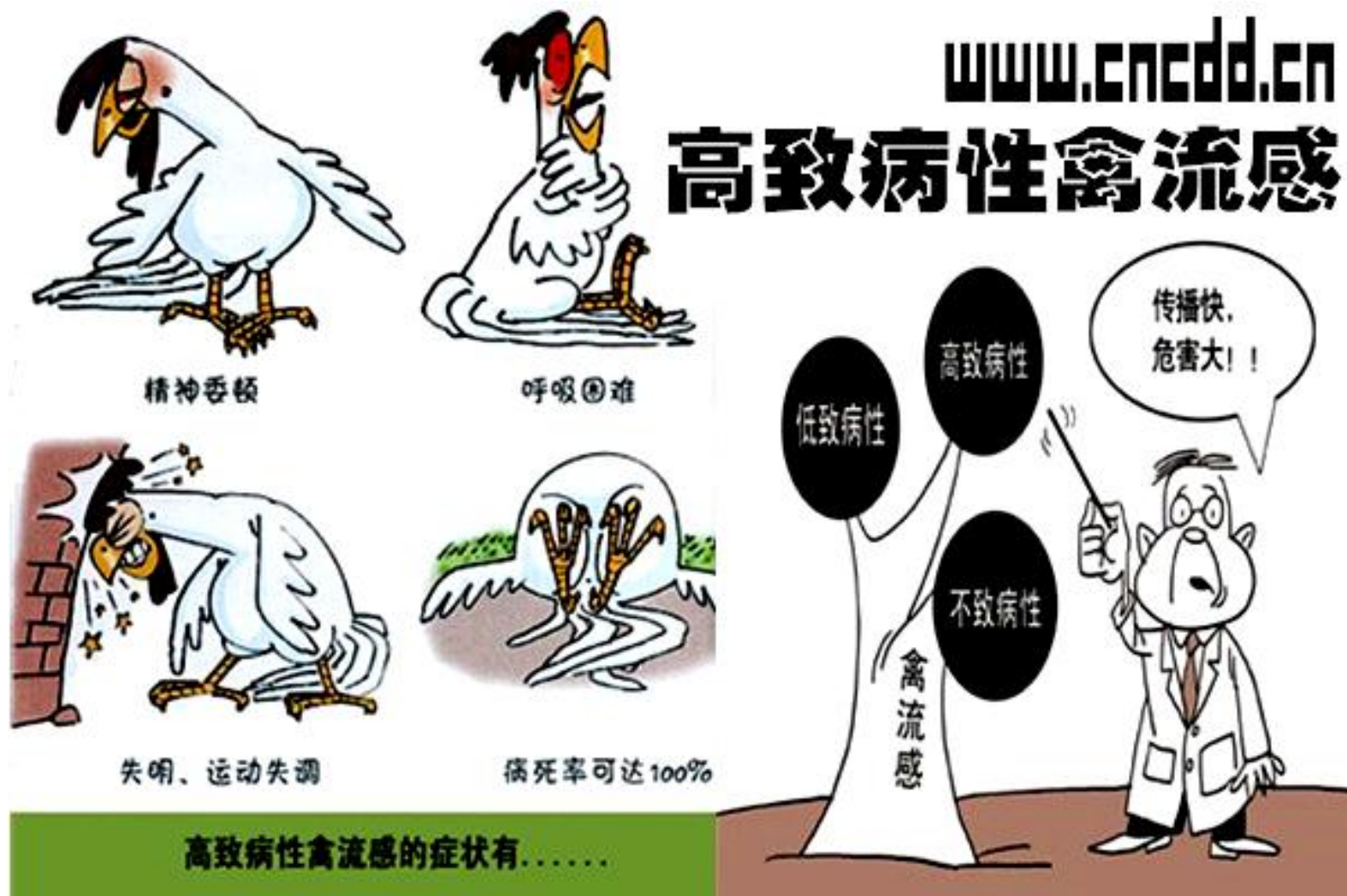
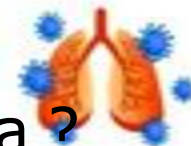
## 病毒抗藥性

2024-2025 流感季累積檢出克流感 (Oseltamivir) 抗藥性病毒株之分析結果如下表：

| 流感型別     | 檢驗數 | 病毒抗藥性, n (%) |
|----------|-----|--------------|
| A (H1N1) | 126 | 4 (3.2%)     |
| A (H3N2) | 7   | 0 (0.0%)     |
| B        | 8   | 0 (0.0%)     |

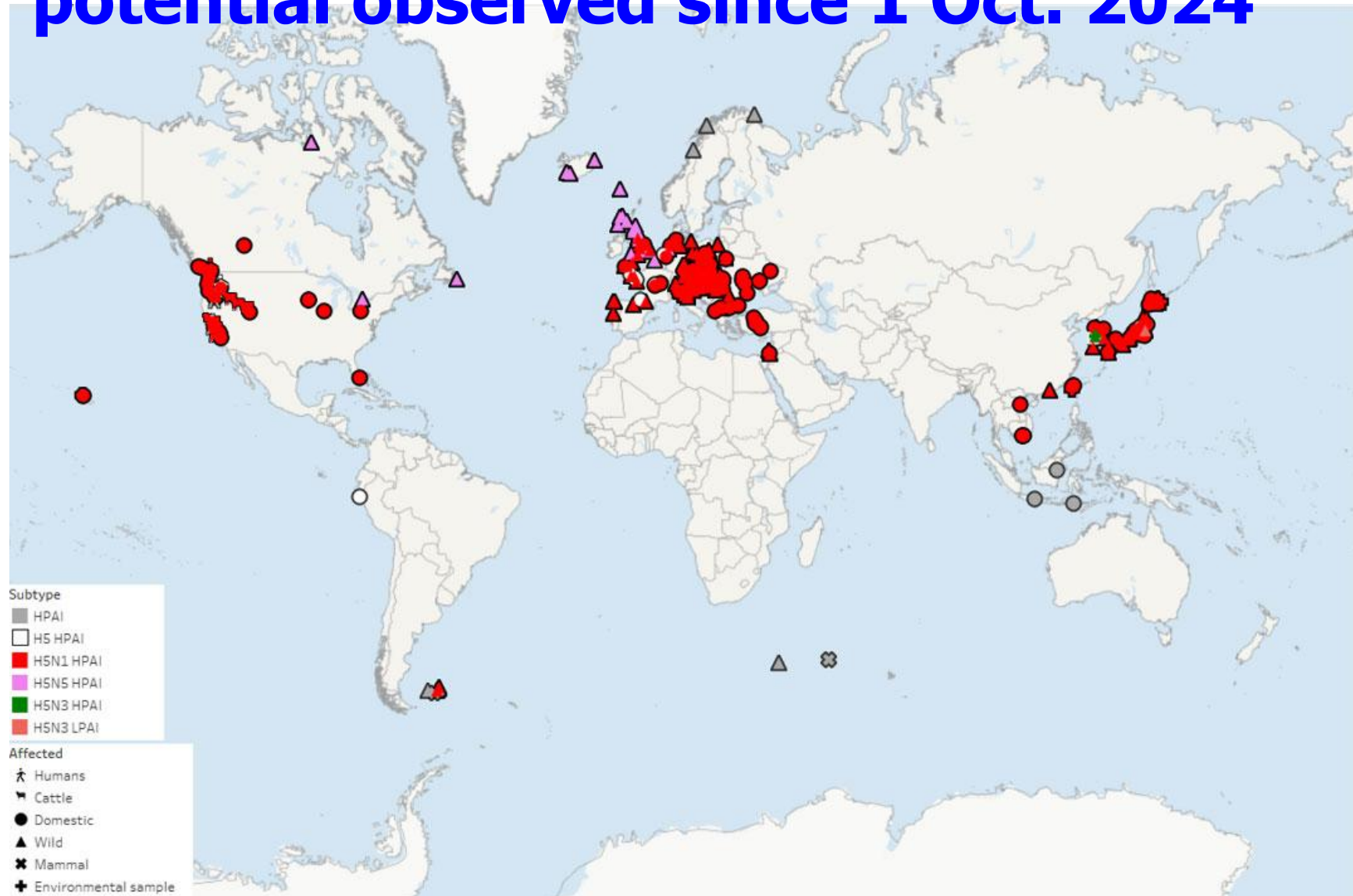
# 家禽的禽流感

How to Recognize Avian Influenza ?  
What to Do if You are Concerned ?





# Global distribution of AIIV with zoonotic potential observed since 1 Oct. 2024



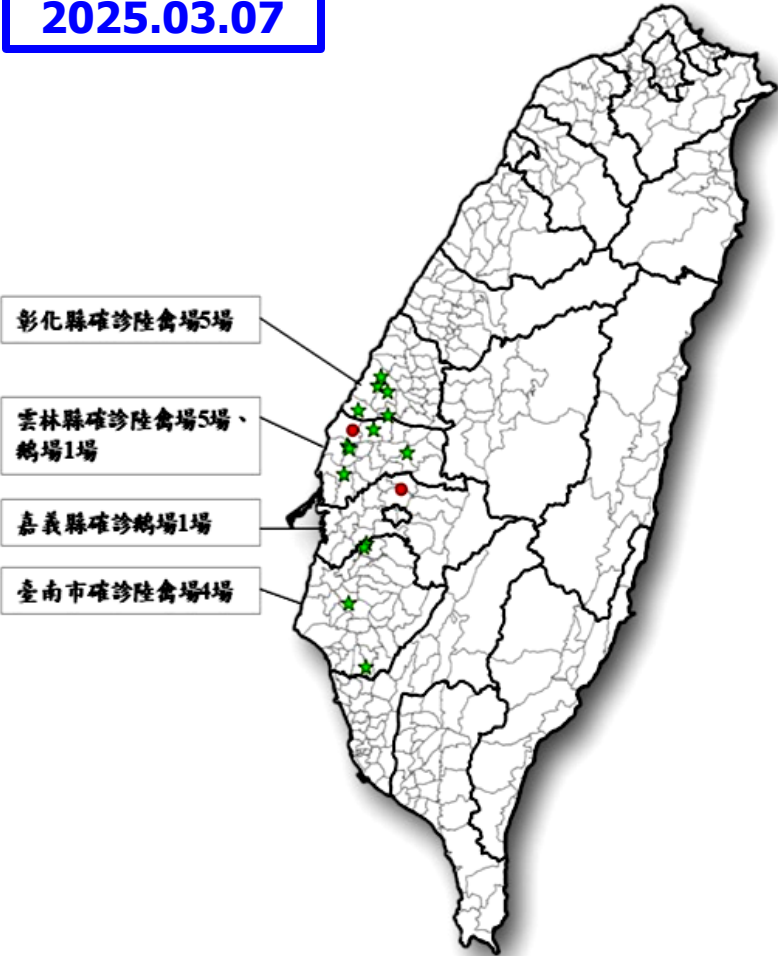




# 台灣家禽的禽流感監測

114年高病原性禽流感確診及撲殺養禽場分布圖

2025.03.07



|             |                                              |     |                            |     |              |           |      |           |        |           |                      |
|-------------|----------------------------------------------|-----|----------------------------|-----|--------------|-----------|------|-----------|--------|-----------|----------------------|
| 禽場          | 1                                            | 雲林縣 | 114.01.03                  | 東勢鄉 | 黑羽土雞         | 114.01.06 | H5N1 | 114.01.06 | 16,860 | 114.01.09 | 1.非開放式禽舍<br>2.業者主動通報 |
|             | 2                                            | 雲林縣 | 114.01.03                  | 崙背鄉 | 紅羽土雞         | 114.01.06 | H5N1 | 114.01.07 | 16,308 | 114.01.09 | 1.非開放式禽舍<br>2.業者主動通報 |
|             | 3                                            | 雲林縣 | 114.01.07                  | 東勢鄉 | 紅羽土雞         | 114.01.10 | H5N1 | 114.01.10 | 6,925  | 114.01.14 | 1.非開放式禽舍<br>2.業者主動通報 |
|             | 4                                            | 雲林縣 | 114.01.09                  | 麥寮鄉 | 肉鵝           | 114.01.12 | H5N1 | 114.01.13 | 402    | 114.01.20 | 1.非開放式禽舍<br>2.業者主動通報 |
|             | 5                                            | 臺南市 | 114.01.12                  | 麻豆區 | 古早雞          | 114.01.16 | H5N1 | 114.01.16 | 7,757  | 114.01.21 | 1.非開放式禽舍<br>2.業者主動通報 |
|             | 6                                            | 彰化縣 | 114.01.13                  | 竹塘鄉 | 蛋雞           | 114.01.16 | H5N1 | 114.01.18 | 41,842 | 114.02.12 | 1.開放式禽舍<br>2.業者主動通報  |
|             | 7                                            | 臺南市 | 114.01.15                  | 歸仁區 | 蛋中雞          | 114.01.18 | H5N1 | 114.01.19 | 71,775 | 114.02.06 | 1.密閉式禽舍<br>2.業者主動通報  |
|             | 8                                            | 臺南市 | 114.01.15                  | 後壁區 | 蛋雞、<br>蛋中雞   | 114.01.18 | H5N1 | 114.01.20 | 50,913 | 114.02.06 | 1.密閉式禽舍<br>2.業者主動通報  |
|             | 9                                            | 彰化縣 | 114.01.17                  | 芳苑鄉 | 蛋雞           | 114.01.20 | H5N1 | 114.01.21 | 17,000 | 114.02.12 | 1.非開放式禽舍<br>2.業者主動通報 |
|             | 10                                           | 雲林縣 | 114.01.22                  | 四湖鄉 | 黑羽土雞         | 114.01.24 | H5N1 | 114.01.24 | 9,006  | 114.01.25 | 1.非開放式禽舍<br>2.業者主動通報 |
|             | 11                                           | 臺南市 | 114.01.27                  | 後壁區 | 蛋雞           | 114.01.31 | H5N1 | 114.02.03 | 32,366 | 114.02.05 | 1.密閉式禽舍<br>2.業者主動通報  |
|             | 12                                           | 彰化縣 | 114.01.29                  | 芳苑鄉 | 蛋中雞          | 114.02.05 | H5N1 | 114.02.05 | 30,047 | 114.02.14 | 1.非開放式禽舍<br>2.業者主動通報 |
|             | 13                                           | 嘉義縣 | 114.02.06                  | 民雄鄉 | 肉鵝           | 114.02.09 | H5N1 | 114.02.10 | 544    | 114.02.21 | 1.非開放式禽舍<br>2.業者主動通報 |
|             | 14                                           | 彰化縣 | 114.02.10                  | 二林鎮 | 鵝鵝           | 114.02.13 | H5N1 | 114.02.13 | 64,300 | 114.02.27 | 1.非開放式禽舍<br>2.業者主動通報 |
|             | 15                                           | 彰化縣 | 114.02.24                  | 大城鄉 | 黑羽土雞、<br>皇金雞 | 114.02.27 | H5N1 | 114.02.27 | 28,441 |           | 1.非開放式禽舍<br>2.業者主動通報 |
|             | 16                                           | 雲林縣 | 114.03.04                  | 斗南鎮 | 紅羽土雞         | 114.03.07 | H5N1 | 114.03.07 | 13,486 |           | 1.非開放式禽舍<br>2.業者主動通報 |
| 禽場HPAI案例總計： |                                              |     | 4縣市，16禽場案例，撲殺總數 407,972 隻。 |     |              |           |      |           |        |           |                      |
| 其他          | 1月19日於臺南市關廟區拾獲草鴉案，經檢驗結果為H5N1 HPAI。           |     |                            |     |              |           |      |           |        |           |                      |
|             | 2月17日於雲林縣水林鄉民眾通報後院飼養禽隻異常死亡案，經檢驗結果為H5N1 HPAI。 |     |                            |     |              |           |      |           |        |           |                      |

# Update on human emerging respiratory pathogen public health events (as of Nov. 31, 2024)



| Novel influenza  | Cumulative Case Count | Deaths | Case Fatality Rate % | Date of Last Report  |
|------------------|-----------------------|--------|----------------------|----------------------|
| <b>Avian flu</b> |                       |        |                      |                      |
| A(H1N2)          | 2                     | 0      | 0%                   | January 2019         |
| A(H3N8)          | 3                     | 1      | 33%                  | March 2023           |
| A(H5NX)          | 34                    | 0      | 0%                   | <b>November 2024</b> |
| A(H5N1)          | 945                   | 470    | 50%                  | <b>November 2024</b> |
| A(H5N2)          | 1                     | 1      | 100%                 | May 2024             |
| A(H5N6)          | 93                    | 57     | 61%                  | July 2024            |
| A(H5N8)          | 7                     | 0      | 0%                   | February 2021        |
| A(H7N4)          | 1                     | 0      | 0%                   | February 2018        |
| A(H7N9)          | 1,568                 | 615    | 39%                  | April 2019           |
| A(H9N2)          | 141                   | 2      | 1%                   | <b>November 2024</b> |
| A(H10N3)         | 3                     | 0      | 0%                   | April 2024           |
| A(H10N5)         | 1                     | 1      | 100%                 | January 2024         |
| <b>Swin Flu</b>  | Cumulative Case Count | Deaths | Case Fatality Rate % | Date of Last Report  |
| A(H1N2)v         | 55                    | 0      | 0%                   | August 2024          |
| A(H3N2)v         | 451                   | 1      | <1%                  | September 2024       |





# 流感的診斷

- 臨床醫師應以患者之臨床症狀及流行病學依據逕行診斷，搭配年齡、潛在疾病、發病時間、疾病嚴重程度等給予適當處置。
- 即使病患已接種當季流感疫苗，不能因此排除流感診斷的可能。
- 是否進行實驗室診斷，需視檢驗結果是否影響臨床處置而定。若臨床與流行病學表現已足夠診斷，便應開始給予治療。
- 快速篩檢鼻咽部流感抗原檢驗的特異性很高，但敏感性有限，不建議用快速篩檢結果作為是否給予藥物的唯一依據。

**季節性流感防治工作手冊建議：**由於採檢時機、技術與檢驗工具敏感性之限制，於流感流行期間，即使快篩結果為陰性，仍不能排除流感，故不建議單以流感快篩結果，作為診斷及是否用藥之唯一依據



# 流行性感冒病毒感染的診斷

1. 流行季節(冬季)與區域的考慮
2. 接觸感染的考慮
3. 臨床表現：**"Flu" syndrome: Tw-CDC 類流感定義**
4. 一般血液常規檢查：低白血球, **CK/CKMB** 等
5. 血清抗體變化：**CF(S-Ag)、HI(V-Ag)、EIA**
6. 抗原偵測：**IFA (敏感性40%~80%)**
7. 病毒分離：**MDCK, MK2, PMK, Vero cell etc.**
8. 分生技術：聚合媒連鎖反應
9. 分型與鑑定：**CDC**



# 流感的治療



- ~ **Antiviral therapy**
- ~ **Symptomatic medication**



# 感冒的治療與預防

## 一般預防

疫苗接種

潛在疾病控制

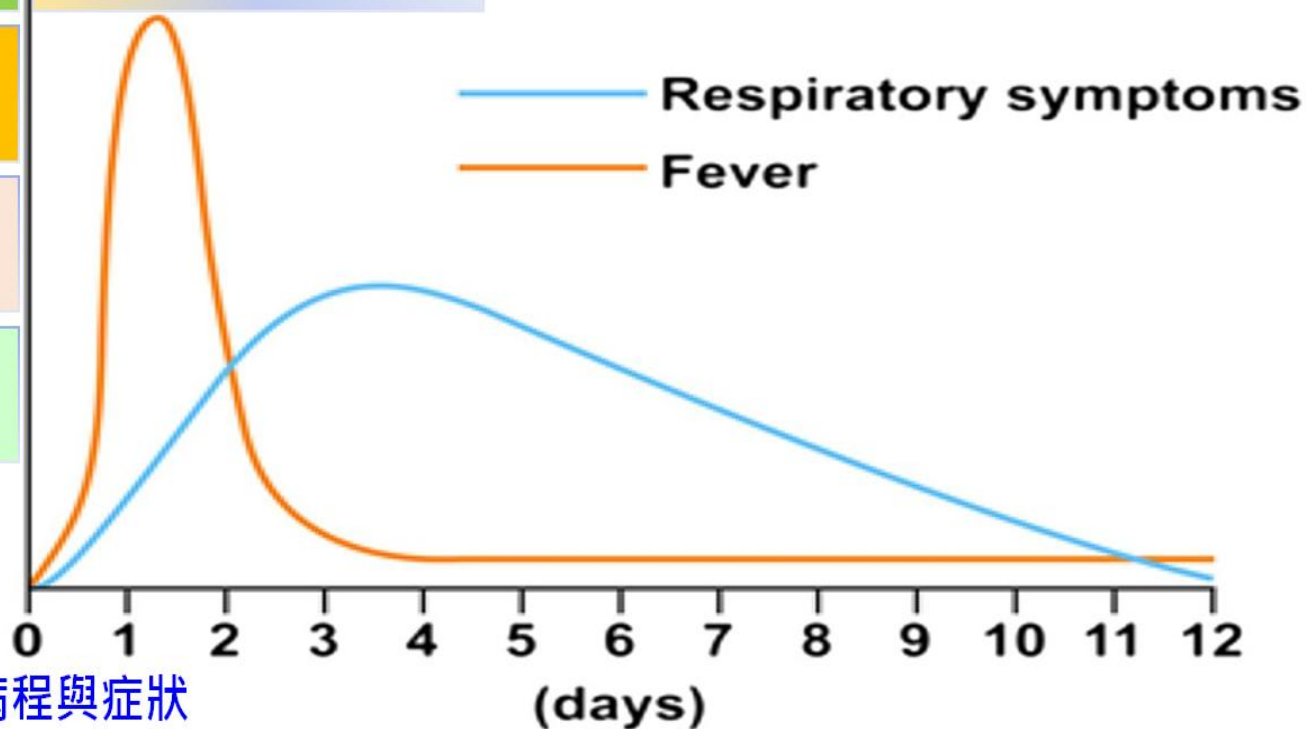
調整體質  
增加免疫

流行疫情監測

## 症狀治療

避免散播/感控

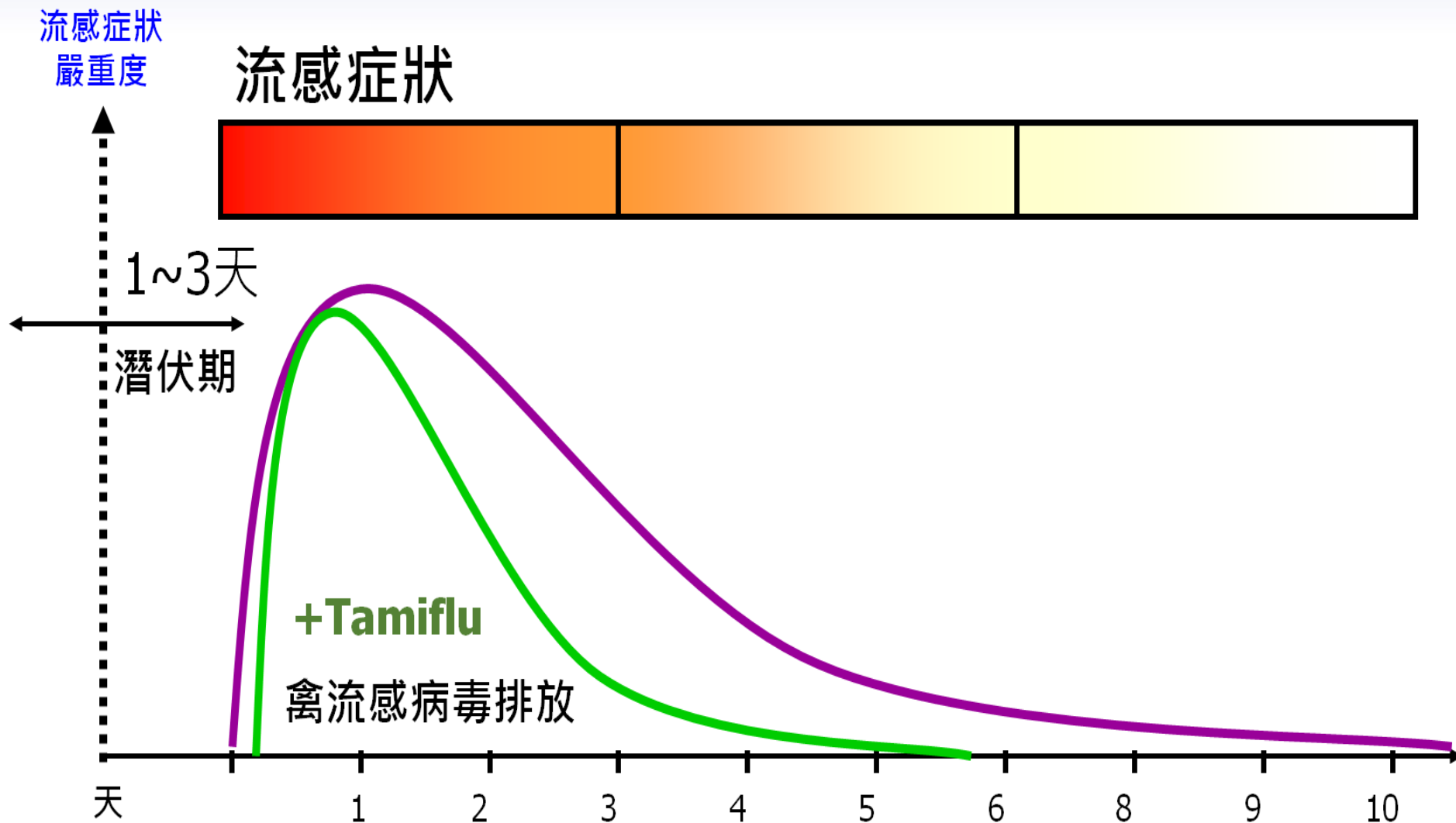
保養  
預防再感染



一般感冒的病程與症狀



# 克流感治療後的流感病程變化







# 感染流感是否一定要用抗病毒藥物？

- ~**Ease the Flu symptoms**
- ~**Timing:** As early as possible
- ~History of **seasonal Flu vaccination**
- ~**Risk of/get complication:** underlying medical condition
- ~**Risk of transmission:** Transmitter--Occupation
- ~**Risk of dissemination:** Transportation, place of work
- ~**Endemic/epidemic risk:** new virus strain
- ~**Travel/contact risk**



# 113流感疫情升溫，疾管署已擴大 公費流感抗病毒藥劑用藥措施至7月31日止

近期類流感疫情上升且處流行期，第26週(6/23-6/29)門急診類流感就診計10.1萬餘人次；近四週社區合約實驗室監測顯示**流感病毒以A型H1N1為多**，須留意疫情後續變化。為因應疫情升溫，已於6/26起再次擴大公費流感抗病毒藥劑(下稱公費藥劑)使用條件「有類流感症狀，且家人/同事/同班同學有類流感發病者」適用至7/31止。

上週(6/25-7/1)新增**68例流感併發重症(57例A型H1N1、5例A型H3N2、4例A未分型、2例B型)**，年齡介於未滿10歲至90多歲，其中**45例未接種流感疫苗**；另新增**16例死亡(14例A型H1N1、1例A型H3N2、1例A未分型)**，年齡介於未滿10歲至90多歲，其中**12例未接種流感疫苗**。本流感季自去(2023)年10/1起截至今年7/1累計1,212例流感併發重症，年齡層以65歲以上長者為多(占57%)；其中死亡230例，**重症病例及死亡個案均有75%(含)以上未接種流感疫苗**，呼籲民眾提高警覺，如出現呼吸困難、急促、發紺(缺氧)等危險徵兆，請儘速就醫，並配合醫師指示服藥，以降低併發重症發生風險。



# 近期類流感疫情趨緩，公費流感抗病毒藥劑 擴大使用條件措施，將於**114年3月31日**截止

近期類流感疫情趨緩，公費流感抗病毒藥劑(下稱公費藥劑)擴大使用條件「有類流感症狀，且家人/同事/同班同學有類流感發病者」，適用期限至今(114)年3月31日截止，恢復為流感併發重症通報病例、具流感高風險慢性病之類流感等病人，仍可使用公費藥劑。

目前公費藥劑配置於各縣市衛生局規劃之全國約4千家合約醫療機構(疾管署「流感新冠疫苗及流感藥劑地圖」網頁查詢<https://vaxmap.cdc.gov.tw/>)。類流感病人如有**危險徵兆**(如呼吸急促、呼吸困難、發紺、血痰、胸痛、意識改變、低血壓等)應儘速就醫，並由醫師依主訴與臨床判斷，評估是否符合公費藥劑用藥條件，倘經判斷符合條件者，不需流感快篩，即可開立公費藥劑，以把握用藥時機。另由於**目前流感抗病毒藥劑未列入健保給付項目**，公費用藥治療之時機及必要性，仍由醫師依病患狀況及臨床專業決定。

請民眾勿輕忽流感嚴重性，應落實勤洗手及注意咳嗽禮節等個人衛生防護措施，有呼吸道症狀時應佩戴口罩；打噴嚏時應用面紙或手帕遮住口鼻，或用衣袖代替；與他人交談時，儘可能保持1公尺以上。民眾如有類流感症狀，應就近就醫並充分休息，待痊癒後再上班、上學，以免病毒於同儕間傳播造成疫情發生。有關公費藥劑用藥條件、合約醫療機構名單及流感防治資訊，可至疾管署全球資訊網(<https://www.cdc.gov.tw>)，或撥打免付費防疫專線1922(或0800-001922)洽詢。

# 流感新藥口服一劑有效緩解症狀

the New England  
Journal of Stupid



新機轉流感核酸內切酶 (endonuclease) 抑制劑 Baloxavir marboxil (Xofluza)，症狀開始48小時內口服一劑有效治療流感。

**xofluza**<sup>TM</sup>  
(baloxavir marboxil) tablets 20mg  
40mg

**Tamiflu**<sup>®</sup>  
oseltamivir phosphate

NDC 0173-0881-01  
**RELENZA**<sup>®</sup>  
(ZANAMIVIR) INHALATION POWDER

**Rapivab**  
peramivir injection

| 成份   | Baloxavir  | Oseltamivir    | Zanamivir | Peramivir |
|------|------------|----------------|-----------|-----------|
| 機轉   | 流感核酸內切酶抑制劑 | 神經胺酶抑制劑 (NAIs) |           |           |
| 途徑   | 口服         | 口服             | 吸入        | 注射        |
| 治療劑量 | 40~80mg 一次 | 75mg 每天兩次      | 10mg每天兩次  | 300mg 一次  |
| 療程   | 1天         | 5天             | 5天        | 1天        |

資料來源：DailyMed Product Information



# 流感抗病毒藥物之比較表

|        | M2 蛋白抑制劑<br>(M2 protein inhibitor)                   |                             | 神經胺酸酶抑制劑<br>(Neuraminidase inhibitor)                    |                            |                                               | 核酸內切酶抑制劑<br>(Endonuclease inhibitor) |
|--------|------------------------------------------------------|-----------------------------|----------------------------------------------------------|----------------------------|-----------------------------------------------|--------------------------------------|
| 藥物學名   | Amantadine                                           | Rimantadine                 | <b>Oseltamivir</b>                                       | <b>Zanamivir</b>           | <b>Peramivir</b>                              | <b>Baloxavir</b>                     |
| 商品名    | Amantadin,<br>Amandin,<br>Amanta,<br>Amandine, Zneil | Flumadine                   | Tamiflu,<br>Eraflu                                       | Relenza                    | Rapiacta                                      | Xofluza                              |
| 對抗流感型別 | <b>A</b>                                             | <b>A</b>                    | <b>A及B</b>                                               | <b>A及B</b>                 | <b>A及B</b>                                    | <b>A及B</b>                           |
| 預防     | 可                                                    | 可                           | 可                                                        | 可                          | 非適應症                                          | 可                                    |
| 治療     | 不建議                                                  | 不建議                         | 可                                                        | 可                          | 可                                             | 可                                    |
| 病程縮短   | 約 <b>1</b> 天                                         | 約 <b>1</b> 天                | 約 <b>1~1.5</b> 天                                         | 約 <b>1~1.5</b> 天           | 約 <b>1</b> 天                                  | 約 <b>1</b> 天                         |
| 常見副作用  | 噁心、頭暈、<br>失眠( <b>5-10%</b> )                         | 噁心、頭暈、<br>失眠( <b>1-3%</b> ) | 噁心( <b>10%</b> )、<br>嘔吐( <b>8%</b> )、<br>頭痛( <b>2%</b> ) | 噁心、腹瀉、<br>鼻竇炎( <b>3%</b> ) | 腹瀉( <b>5-10%</b> )、<br>噁心、嘔吐<br>( <b>5%</b> ) | 腹瀉( <b>3%</b> )、氣管炎<br>( <b>2%</b> ) |
| 抗藥性    | 廣泛                                                   | 廣泛                          | 曾有報告                                                     | 曾有報告                       | 曾有報告                                          | 曾有報告                                 |
| 國內許可證  | 有                                                    |                             | 有                                                        | 有                          | 有                                             | 有                                    |



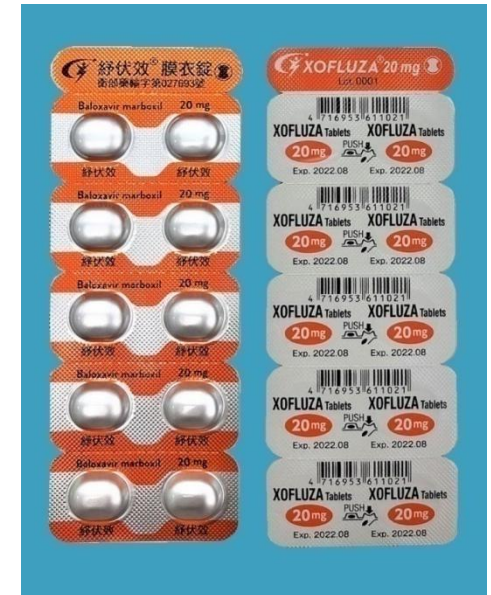
# Xofluza 用法用量

1. 一般成人及>12歲兒童為**20mg錠2錠(Baloxavir Marboxil 40mg)**單次口服給藥。但體重>80kg患者為**20mg錠4錠 (Baloxavir Marboxil 80mg)**單次口服給藥。



2. 一般未滿12歲兒童的單次口服給藥用量如下：

| 體重           | 用量                                           |
|--------------|----------------------------------------------|
| >40kg        | <b>20mg錠2錠<br/>(Baloxavir Marboxil 40mg)</b> |
| 20kg ~ <40kg | <b>20mg錠1錠<br/>(Baloxavir Marboxil 20mg)</b> |
| 10kg ~ <20kg | <b>10mg錠1錠<br/>(Baloxavir Marboxil 10mg)</b> |



# 公費抗流感病毒藥劑使用對象

## 治療性用藥條件

- ✓ 流感併發重症通報病例(第四類)
- ✓ 新型A型流感通報病例(第五類)
- ✓ 孕婦經評估需及時用藥者
- ✓ 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
- ✓ 未滿5歲及65歲以上之類流感患者
- ✓ 確診或疑似罹患流感住院(含急診待床)之病患
- ✓ 肥胖之類流感患者( $BMI \geq 30$ )
- ✓ 擴大用藥期間：有類流感症狀，且家人/同事/同班同學有類流感發病者(自每年12月1日起至隔年3月31日止)

## 預防性用藥條件

需通報當地衛生局進行疫情調查，並經本署各區管制中心防疫醫師或傳染病防治醫療區正/副指揮官或其授權人員同意

- ✓ 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
- ✓ 新型A型流感極可能/確定病例之密切接觸者
- ✓ 動物流感發生場所撲殺清場工作人員





# 抗流感病毒藥物使用建議

- (一) 依台灣感染症醫學會「抗流感病毒藥物使用建議」，臨床醫師在評估病患是否有流感時，應以患者之**臨床症狀及流行病學**依據逕行診斷，搭配年齡、潛在疾病、發病時間、疾病嚴重程度等條件給予適當處置，**不得以實驗室檢驗，特別是流感快篩的結果，作為診斷及用藥依據。**
- (二) 經臨床醫師判斷需使用流感抗病毒藥物之病患，若為**流感併發重症/新型A型流感通報病例及其接觸者**，以及感染流感後易併發重症/群聚事件之**流感高危險群**等公費用藥對象，**不須快篩，即可使用公費藥物。**
- (三) **流感與SARS-CoV-2共同流行時：**
  - 1. 感染SARS-CoV-2與流感之**症狀相似**，需經檢驗才能確認感染何種病原體。臨床醫師可依**以上原則儘早給予**流感抗病毒藥物治療，尤其是易引起併發症之高風險病患。
  - 2. 病患可能**同時感染**流感與SARS-CoV-2，故SARS-CoV-2檢驗陽性，無法排除感染流感之可能性；流感檢驗陽性，亦無法排除感染SARS-CoV-2之可能性。必要時需同時檢驗兩種病原體。
  - 3. 流感病患無論是否合併SARS-CoV-2感染，其流感抗病毒藥物治療均相同。
  - 4. 關於SARS-CoV-2和流感病毒同時傳播時的流感檢測和治療，可參考美國疾病管制中心臨床檢測指南





# 輕症 / 門診病患之治療

- 若非屬重症高風險族群或高傳播族群，以支持性療法為主，大多數人可自行痊癒而不需使用抗流感病毒藥物。
- 高風險族群建議於症狀出現**48**小時內盡速給予抗病毒藥物治療。
- 高傳播族群可考慮於症狀出現**48**小時內給予抗病毒藥物治療。
- 高風險族群，或病程快速進展之流感病患，建議給予抗病毒藥物治療。
- 容易併發重症的高風險兒童，建議給予抗病毒藥物治療。
- 病程快速進展，出現危險病徵者，建議給予抗病毒藥物治療。
- 無危險徵兆之原本健康兒童，若希望縮短病程，可考慮給予治療。

**並非所有輕症病患都需要抗病毒藥物治療**



# 住院/重症病患之治療

□建議立即給予抗病毒藥物治療。

□任何因流感住院病患，不論疫苗接種史或發病時間，建議立即給予抗病毒藥物治療。

□所有疑似流感住院兒童，均應立即給予抗病毒藥物治療。

**住院/重症病患，不需等待確診，不論發病時間，  
均應立即給予抗病毒藥物治療**





# 預防性投藥

- 發生群聚之人口密集場所(醫療院所、護理之家或長照機構等)，針對密切接觸者，可根據個別狀況(暴露時間長短、是否屬高風險族群、是否已接種流感疫苗等因素)，評估投與流感預防性藥物之必要性。
- 為避免藥物濫用與產生抗藥性，一般情形下抗流感藥物不建議用於預防性治療。若為機構或院內群聚感染、感染動物流感或新型流感、流感高危險群兒童，可考慮給予預防性用藥10天，使用一半劑量。

群聚時是否給予預防性投藥須個案評估



# 兒童抗流感藥物建議用法

**2009年之前流行的H1N1 A型流感株對oseltamivir幾乎均有抗藥性。自2009年 H1N1 大流行以後的新H1N1 A型流感毒株(即 pH1N1)，均具有感受性。至 2024 年止，多數流行的 H1N1 A型、H3N2 A型流感和B型流感病毒大多保持對 oseltamivir 和 zanamivir 的敏感性，但偶爾會出現一些抗藥性病例。Baloxavir marboxil (Xofluza)作用機轉與其他三者不同，至2024年，baloxavir marboxil對大多數流行的流感病毒株均有效。**

| 抗流感藥物       | 對象            | 治療                          |                | 預防                        |        |
|-------------|---------------|-----------------------------|----------------|---------------------------|--------|
|             |               | 使用劑量                        | 時間             | 使用劑量                      | 時間     |
| Oseltamivir | < 12月嬰兒       | 3 mg/kg b.i.d.              | 口服5天           | ≥3 月；3 mg/kg q.d.         | 口服7天   |
|             | ≥ 12月兒童       |                             |                |                           |        |
|             | 體重 ≤ 15 kg    | 30 mg (0.4#) b.i.d.         | 口服5天           | 30 mg (0.4#) q.d.         | 口服7天   |
|             | 體重 > 15~23 kg | 45 mg (0.6#) b.i.d.         | 口服5天           | 45 mg (0.6#) q.d.         | 口服7天   |
|             | 體重 > 23~40 kg | 60 mg (0.8#) b.i.d.         | 口服5天           | 60 mg (0.8#) q.d.         | 口服7天   |
|             | 體重 > 40 kg    | 75 mg (1#) b.i.d.           | 口服5天           | 75 mg (1#) q.d.           | 口服7天   |
| Zanamivir   | ≥ 5 歲兒童       | 10 mg (每次吸入2孔各5 mg藥片)b.i.d. | 經口吸入5天         | 10 mg (每次吸入2孔各5 mg藥片)q.d. | 經口吸入7天 |
| Peramivir   | <18 歲         | 10 – 12 mg/kg · max 600 mg  | 點滴靜脈1次 · 滴注15分 | 不建議                       |        |
| Baloxavir   | ≥ 5歲兒童        |                             |                |                           |        |
|             | 體重 <20 kg     | 20 mg once                  | 口服1次           | 20 mg once                | 口服1次   |
|             | 體重 20~80 kg   | 40 mg once                  | 口服1次           | 40 mg once                | 口服1次   |
|             | 體重 > 80 kg    | 80 mg once                  | 口服1次           | 80 mg once                | 口服1次   |



# 兒童抗流感藥物建議用法

## ✓ **Peramivir** 仿單的建議治療劑量如下：

- **台灣**：>1個月~18歲兒童及青少年單次10 mg/kg，最多600 mg，18歲(含)以上單次300 mg，最多600 mg。
- **日本**：成人單次300 mg，因併發症等可能有惡化之虞的病患，則為1天單次600 mg，可依症狀連續多日反覆投藥；兒童10 mg/kg，最多600 mg。
- **美國**：6個月~12歲，12 mg/kg最多600 mg；≥ 13歲 600 mg。
- **歐盟**：1)2~12歲且< 50公斤，12 mg/kg；2)≥ 50公斤，600 mg；3)≥ 13歲 600 mg。

- ✓ 一些專家建議，對於**極重度病患**(例如腦炎病患)，可以考慮將 **oseltamivir** 的劑量加倍，或延長抗流感藥物的使用時間，但這類建議尚未有充分的臨床研究支持。
- ✓ 對於**極重度病患**，靜脈注射 **Peramivir** 可考慮連續使用5天，根據病情需要可能需要延長使用時間(例如，治療後仍持續檢測到病毒存在)。
- ✓ 為避免藥物濫用與產生抗藥性，一般情形下抗流感藥物不建議用於**預防性治療**。若為流感高危險群兒童，且年紀在三個月大以上，因任何原因沒有完整施打疫苗者，可考慮在暴露流感後給予預防性用藥。不滿三個月嬰兒，使用好處不見得大於安全性考慮，故不建議預防性使用。可預防使用的藥物為**Oseltamivir, Zanamivir & Baloxavir**，
- ✓ **Oseltamivir & Zanamivir** 預防性使用時劑量減半，即每天使用一次共7天；**Baloxavir**預防性使用時劑量不變，單次使用。



# 兒童抗流感藥物建議用法

快速篩檢鼻咽部流感抗原檢驗的特異性很高，但敏感度有限，不建議用快速篩檢結果作為是否給予藥物的唯一依據。兒童類流感的診斷線索為發燒與呼吸道症狀伴隨肌肉酸痛、頭痛、極度倦怠、食慾大幅減退等嚴重症狀，加上家族或學校的群聚現象。不具高危因子的患者，醫師可以根據臨床判斷，考慮家庭接觸者是否為6個月以下或重症高危兒童(表二)等因素，在發作48小時內給予經驗性抗流感藥物。除了政府衛生單位所建議的藥物使用對象與時機之外，下列兒童優先建議給予抗流感藥物：

## □所有疑似或確診流感且需住院兒童：

- ✓有嚴重、複雜性、持續惡化的疾病
- ✓出現下列危險病徵者：
  - 未發燒時呼吸急促、呼吸困難
  - 有肋下凹陷等呼吸窘迫現象
  - 呼吸暫停、發紺、血痰、胸痛
  - 意識改變、低血壓
  - 不易喚醒、活動力嚴重下降
  - 脫水(皮膚乾燥、尿量減少、眼淚減少、體重減輕等)

## □疑似動物流感病毒或新型A型流感病毒感染

## □慢性照顧機構兒童

- 慢性照顧機構包括安養機構、養護機構、長期照護機構、護理之家、身心障礙福利服務機構、呼吸照護中心、精神復健機構之康復之家、居家護理。

## □容易發生併發症的高危險兒童(表二)，無論病情之輕重



# 流感流行高峰期的防治作為~1

## ■ 流感疫情高峰期應變作戰計畫

- 擴大公費流感抗病毒藥劑適用對象
- 各地方政府衛生局須有效掌握轄區藥劑之配置情形
- 精確掌握轄區衛生局實際使用及庫存量，必要時協助跨縣市調度
- 強化與交通部觀光局、機場公司、航空公司等相關單位溝通協調，加強出/入境旅客之衛教溝通及健康異常通報
- 加強醫界溝通，不定期發布醫界通函，加強與專業醫護人員溝通
- 多元管道，加強民眾之衛教溝通，適時發布新聞稿、警訊，以及旅遊疫情建議

擴大公費流感  
抗病毒藥劑適  
用對象及增設  
藥劑配置點

提升流感疫  
情監測效能

- 加強國內流感流行趨勢/病毒活動監測
- 強化入境旅客健康監測

急重症醫療  
照護品質及  
資源調度

- 維持緊急及地方醫療服務量能
- 監測醫療量能及協調資源調度
- 公布春節期間醫療院所開診名單等相關資訊，並向民眾宣導
- 地方政府督導醫療院所妥善規劃門急診病患就診分流或紓解機制

加強風險溝  
通與衛教





# 美國醫療工作人員的防治流感建議

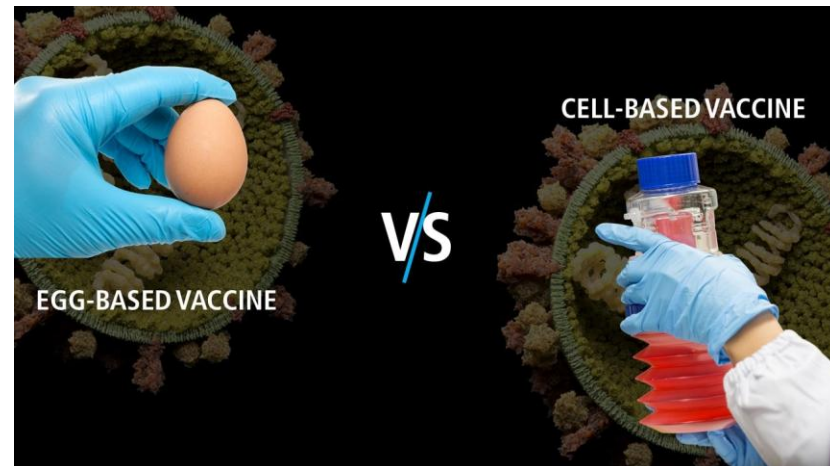
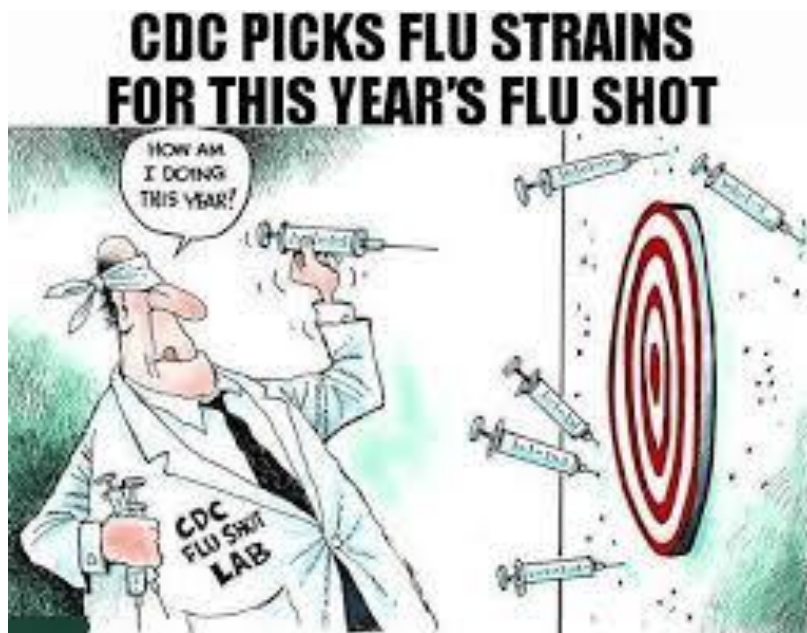
## CDC Prevention Recommendations for health care worker

**Influenza produces such serious symptoms, CDC issued these prevention recommendations:**

- ~Take time to get **flu vaccinations**.
- ~Take **every-day preventative actions**:
  - Try to **avoid close contact** with sick people.
  - While sick with the flu, **limit contact** with others as much as possible to keep from infecting them.
  - When sick with flu-like illness, **stay home for at least 24 hours after your fever is gone** except to get medical care or for other necessities. (Your fever should be gone for 24 hours without the use of a fever-reducing medicine.)
  - Cover your nose and mouth** with a tissue when you cough or sneeze; throw the tissue in the trash after you use it.
  - Wash your hands** often with soap and water. If soap and water are not available, use an alcohol-based hand rub.
  - Avoid touching** your eyes, nose, and mouth; germs spread this way.
  - Clean & disinfect surfaces & objects** that may be contaminated with germs like the flu.
- ~Take flu **antiviral drugs** if recommended by a primary care provider.
- ~If an **outbreak** of flu occurs in your area, follow the advice given by public health officials. Such information may include how to increase **distance** between people and other measures.  
(CDC, 2018d)



# 流感疫苗接種政策與實務

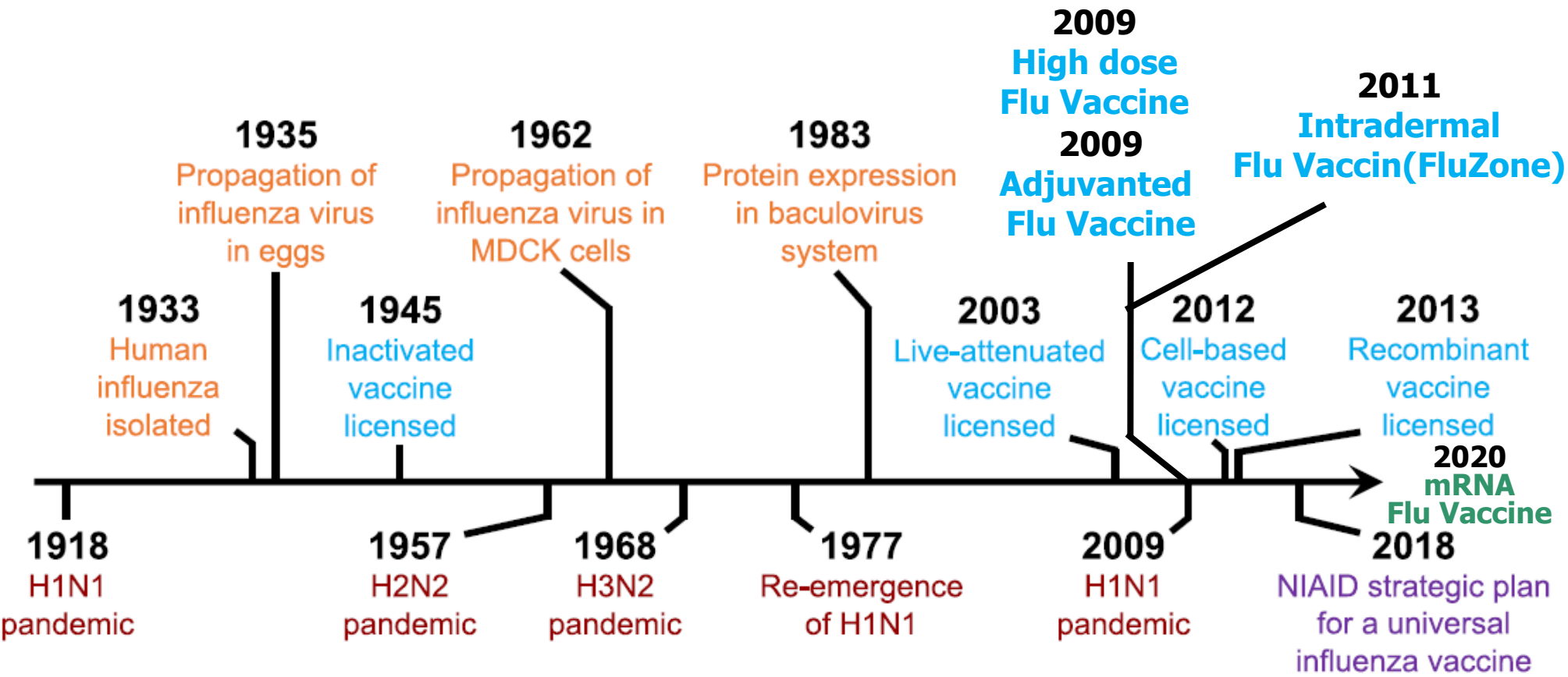


臺中榮民總醫院感管中心/兒童感染科 陳伯彥



# 流感疫苗發展的重要里程碑

Key events in the history of influenza vaccine development





當疫苗株與當季流行病毒株吻合，疫苗  
能使族群中感染的風險降低40-60%

## Vaccine Effectiveness: How Well Do the Flu Vaccines Work?

### Questions & Answers



Getting a flu vaccine is more important than ever during 2020-2021 to protect yourself and the people around you from flu, and to help reduce the strain on healthcare systems responding to the COVID-19 pandemic.

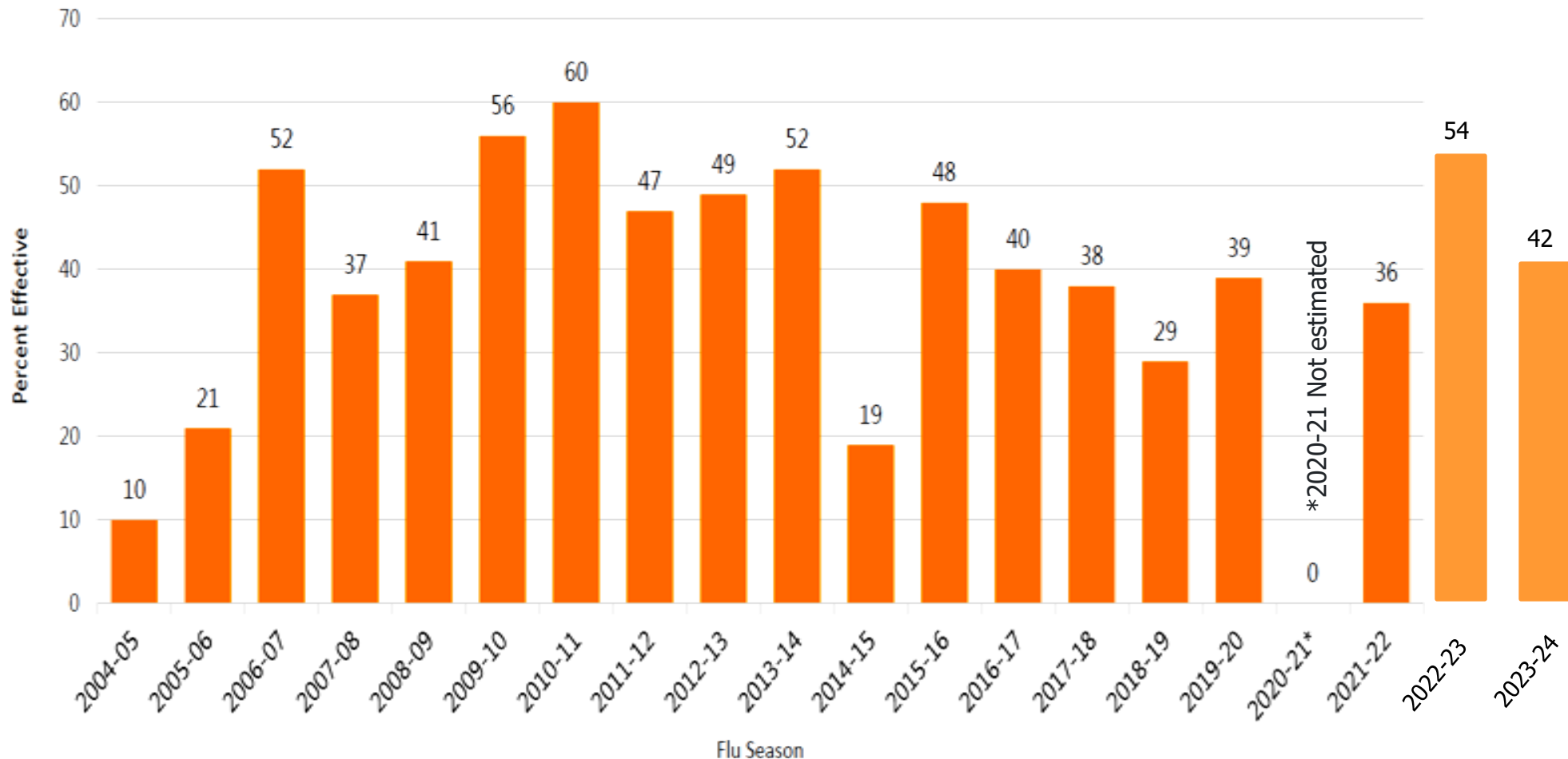
### How effective is the flu vaccine?

CDC conducts studies each year to determine how well the influenza (flu) vaccine protects against flu illness. While vaccine effectiveness (VE) can vary, recent studies show that flu vaccination reduces the risk of flu illness by between 40% and 60% among the overall population during seasons when most circulating flu viruses are well-matched to the flu vaccine. In general, current flu vaccines tend to work better against influenza B and influenza A(H1N1) viruses and offer lower protection against influenza A(H3N2) viruses. See “Does flu vaccine effectiveness vary by type or subtype?” and “Why is flu vaccine typically less effective against influenza A H3N2 viruses?” for more information.



# 流感疫苗保護力

Effectiveness of Seasonal Flu Vaccines from the 2005 –2022Flu Seasons in the US



2023年疾病管制署流感防治與疫苗接種政策

<https://www.cdc.gov/flu/professionals/vaccination/effectiveness-studies.htm>





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能使族群中感染的風險降低40-60%

## Vaccine Effectiveness: How Well Do the Flu Vaccines Work?

Questions & Answers



Getting a flu vaccine is more important than ever due to the risk of flu, and to help reduce the strain on healthcare.

### Factors:

1. Strains matched or not?
2. Duration of protection after vac shot?
3. Immune response of recipient?
4. Type of flu vaccines?

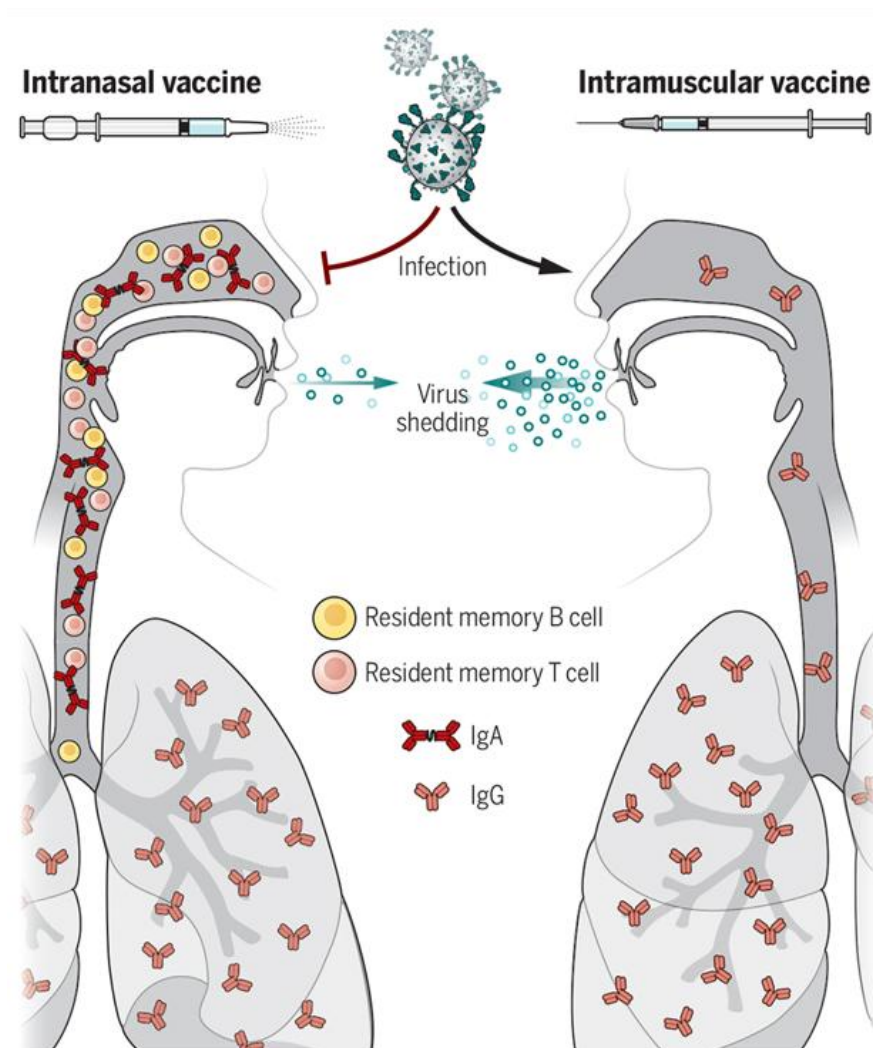
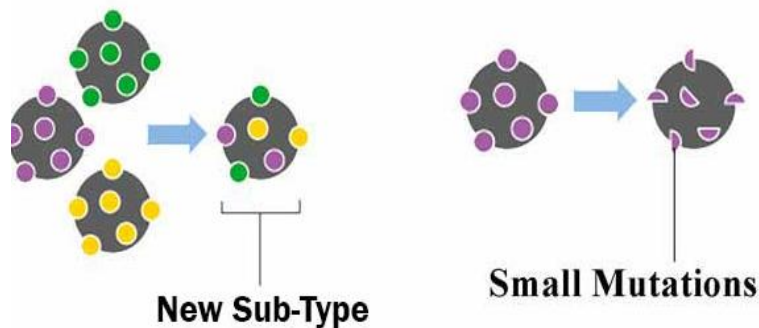
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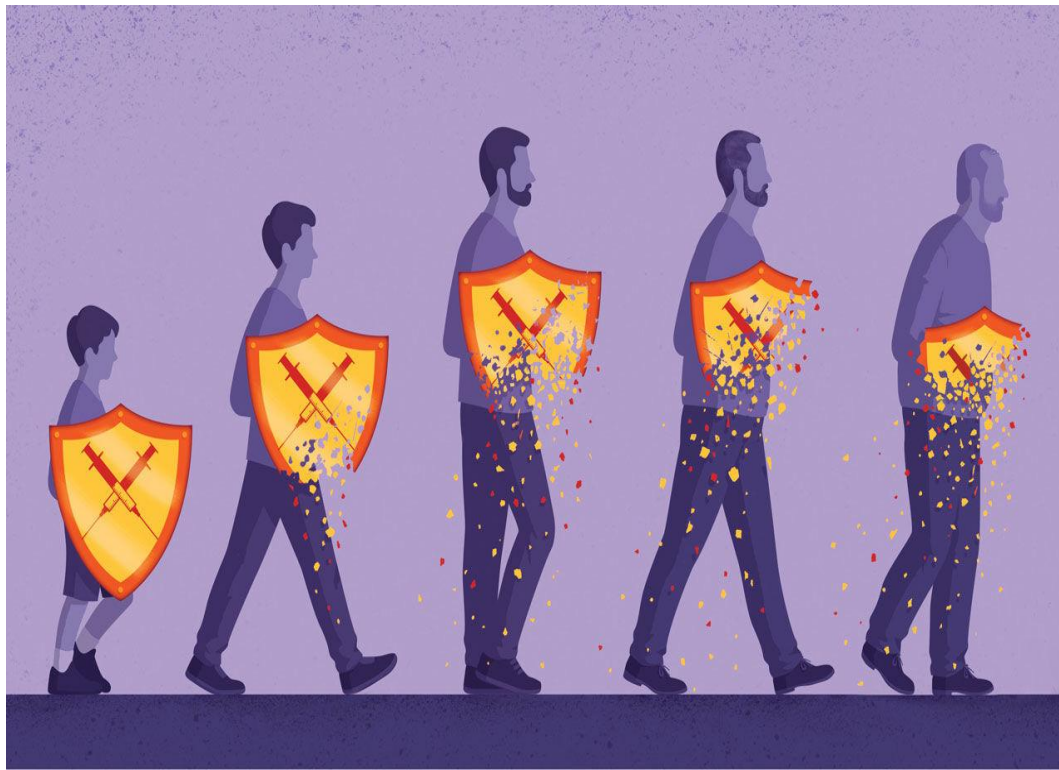
# 為什麼每年都要接種流感疫苗？

- 流感病毒極易產生變異，幾乎每年流行的病毒株都會稍有不同，原施打疫苗對不同抗原型之病毒保護效果減低
- 即使病毒未發生變異，疫苗接種4~6個月後保護效果即可能下降，保護力一般不超過1年
- WHO建議每年均須接種1劑流感疫苗，是全球一致性的作法



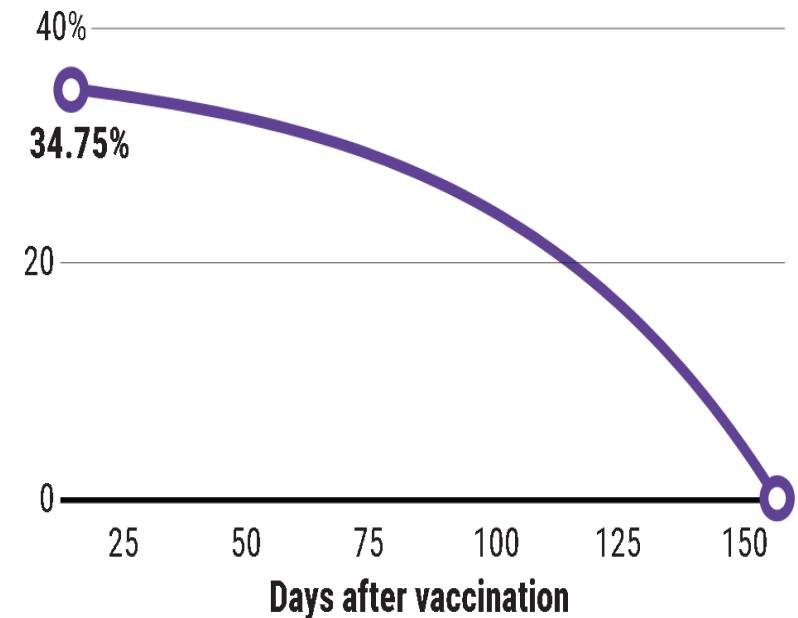


# How long do vaccines last? The surprising answers may help protect people longer



## Influenza vaccine effectiveness

### Influenza vaccine effectiveness

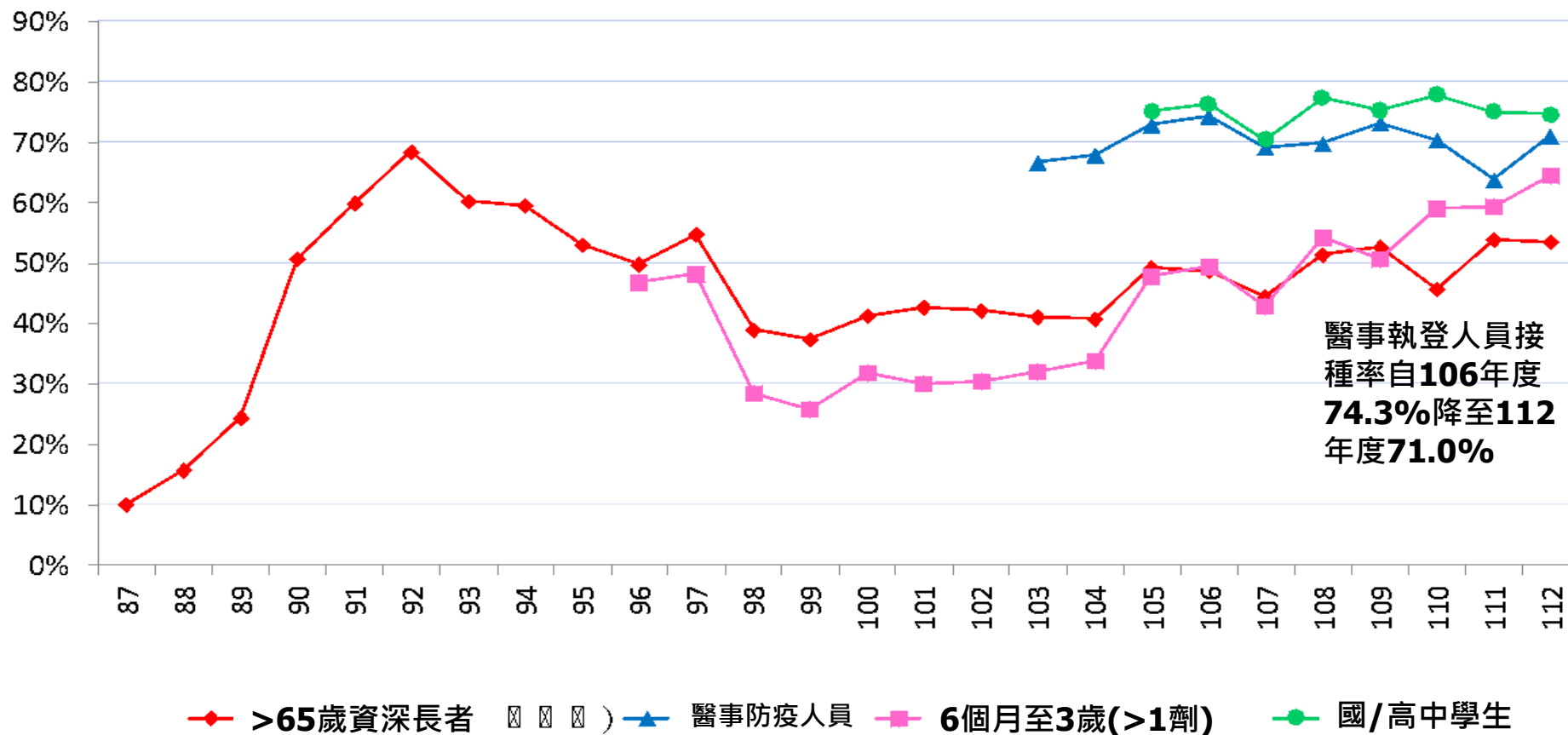


J. FERDINANDS ET AL., CLINICAL INFECTIOUS DISEASES, VOL. 64, 544, 2017

<https://www.sciencemag.org/news/2019/04/how-long-do-vaccines-last-surprising-answers-may-help-protect-people-longer>



# 歷年台灣各類對象流感疫苗接種率



註1：流感季定義：每年10月1日至隔年9月30日期間。

註2：112年度資料截至113/6/17。

註3：103年起改以執業登記人數為分母統計接種率。





# Vaccines to Prevent Infectious Diseases in Older Population: Immunological Challenges & Future Perspectives







# 流感疫苗不只抗流感 這些病死亡率跟著降

每年秋冬流感季，許多人會接種流感疫苗來防範流感，但可能不知道，這針流感疫苗不僅預防流感，**還能降低中老年人因中風、腎臟病、糖尿病、肺炎等疾病的死亡風險。**

法國賽諾菲藥廠日前邀請各國記者前往法國盧昂近郊的流感疫苗廠參訪，並與英國、印度等國的醫學專家會談。

英國諾丁漢大學臨床檢驗科學所病毒學博士霍琳沃絲(Rosalind C. Hollingsworth)表示，感染流感不僅會直接影響到呼吸系統，導致氣喘、慢性阻塞性肺病病情加重，還可能引發耳朵及鼻竇感染以及肺炎、支氣管炎等疾病。

同時，也會對多種器官造成危害，例如急性心肌梗塞、缺血性心臟病、腦血管疾病或中風，甚至導致腎臟病、糖尿病的病情加劇。

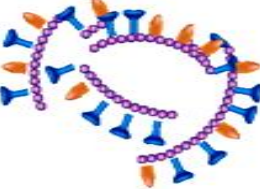
她統計台灣**10.2萬名**老年人數據，發現接種流感疫苗除了可預防流感，還能降低多種疾病死亡率，**以中風死亡率降低65%最多，其次依序為腎臟病60%、糖尿病55%、肺炎53%、慢性阻塞性肺疾病45%。**不過，由於個人的年齡、病史、施打後的免疫反應都不同，加上流感病毒隨時都可能出現變異，因此流感疫苗保護力最多僅能達到**70%**，若是「猜錯」疫苗，保護力也將大打折扣。

許多人可能不解，**為何疫苗會有「猜錯」的問題。**霍琳沃絲解釋，目前常見的流感疫苗分為對抗**3種病毒**的「三價疫苗」，正是台灣及部分國家使用的公費疫苗，另外還有一種可對抗**4種病毒**的「四價疫苗」。



# 流感疫苗種類演進

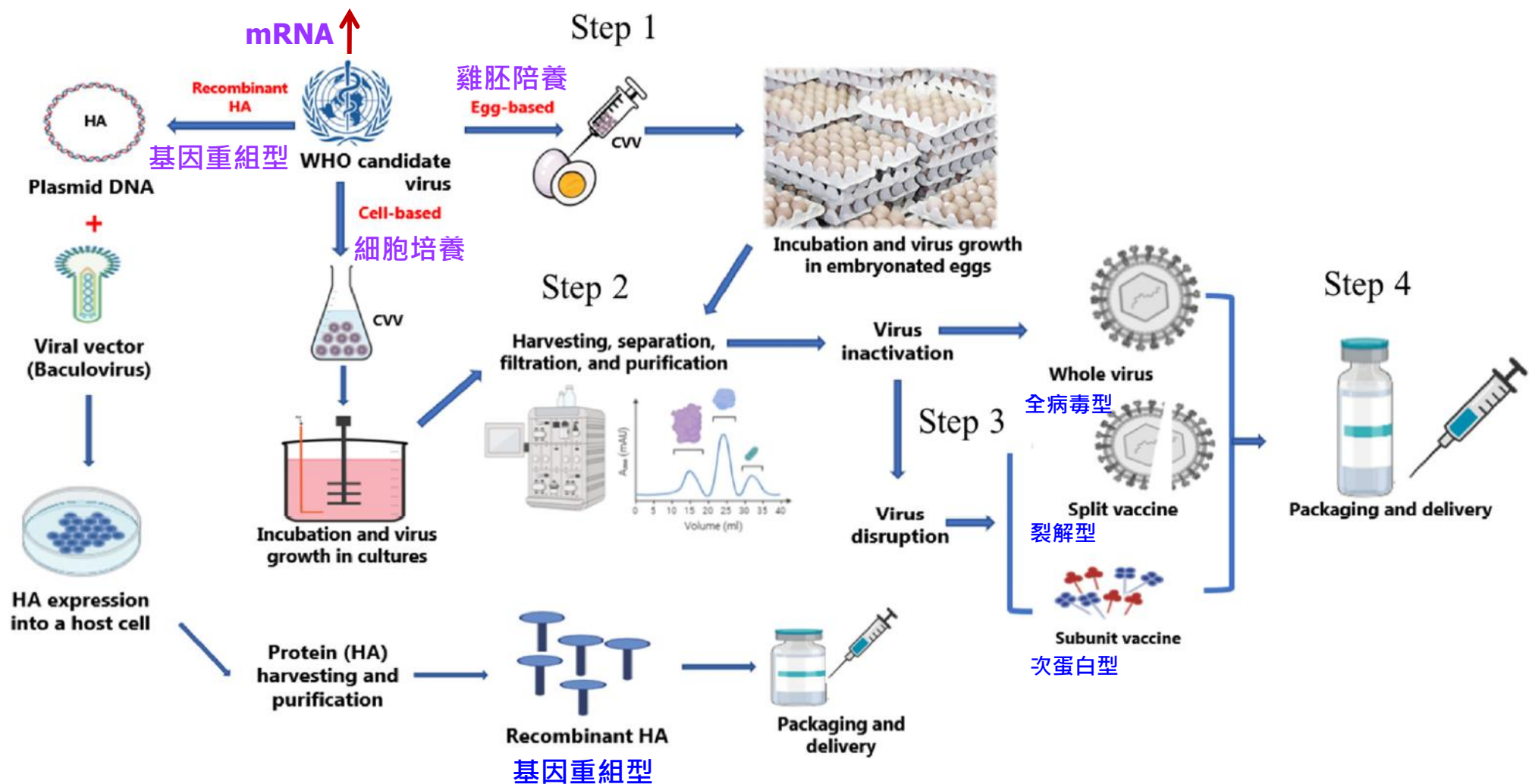
## Evolution of Influenza vaccine types

| Vaccine types                                                                                                 | Main Characteristics                                                                                                                                                                               | Immunogenicity<br>Reactogenicity |
|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Stage I<br><b>whole-virion</b><br><small>(live and inactivated)</small><br><b>全病毒疫苗</b>                       | <br>Virus inactivation and minor cleanup                                                                          | <b>High<br/>High</b>             |
| Stage II<br><b>SPLIT</b><br><small>(split vaccines)</small><br><b>裂解型疫苗</b>                                   | <br>Contains 15 µg of each strain of influenza virus and reactogenic lipoproteins of the virus wall              | <b>High<br/>Medium</b>           |
| Stage III<br><b>subunit</b><br><b>成份型疫苗</b>                                                                   | <br>Contain 15 µg of influenza virus antigens (hemagglutinin and neuraminidase)                                  | <b>Medium<br/>Below average</b>  |
| Stage IV<br><b>subunit adjuvanted</b><br><small>(Grippol Plus, Grippol Quadrivalent)</small><br><b>成份佐劑疫苗</b> | <br>Contains reduced amounts of influenza virus antigens: 5 µg per strain and 500 µg of Polyoxidonium adjuvant. | <b>High<br/>Low</b>              |



# 流感疫苗製造流程

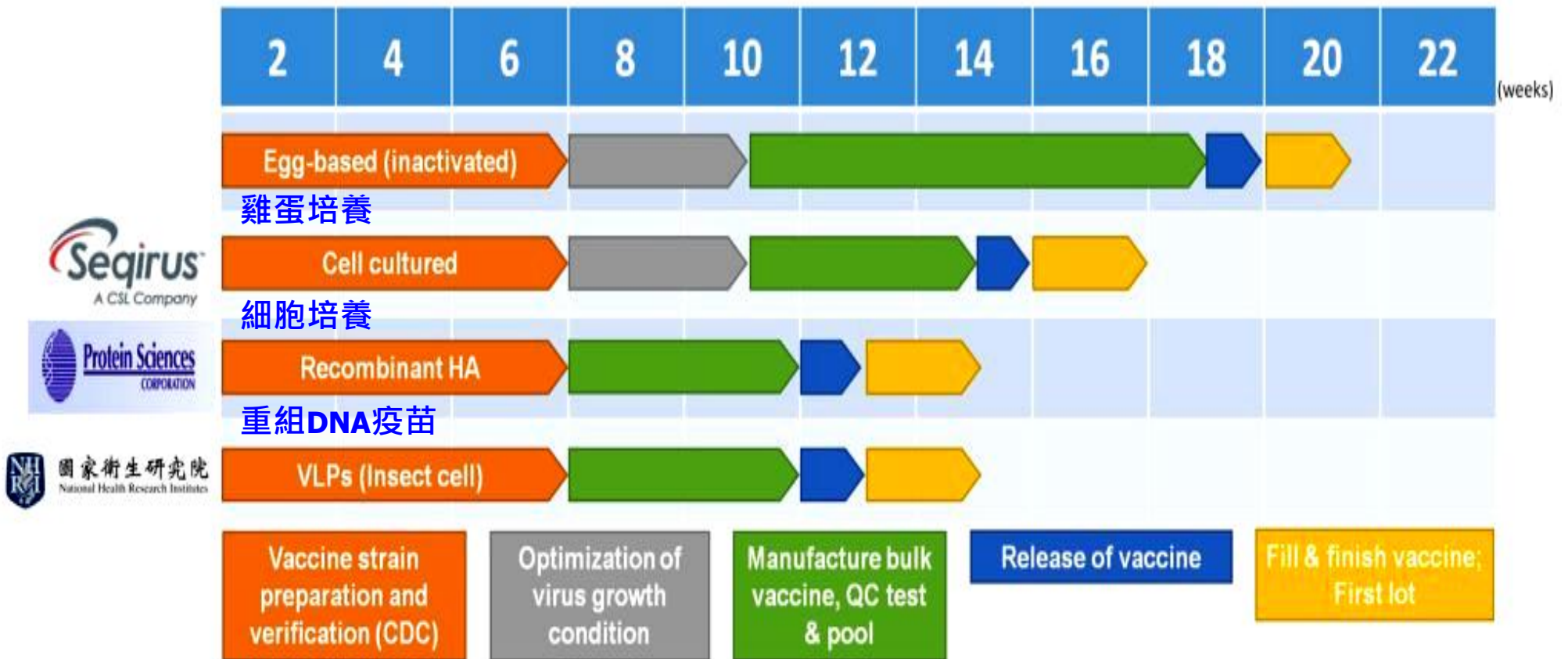
## Influenza vaccine manufacturing processes





# 流感疫苗製作的差異與時程

Influenza vaccine production timelines and the preparation time of vaccine strains

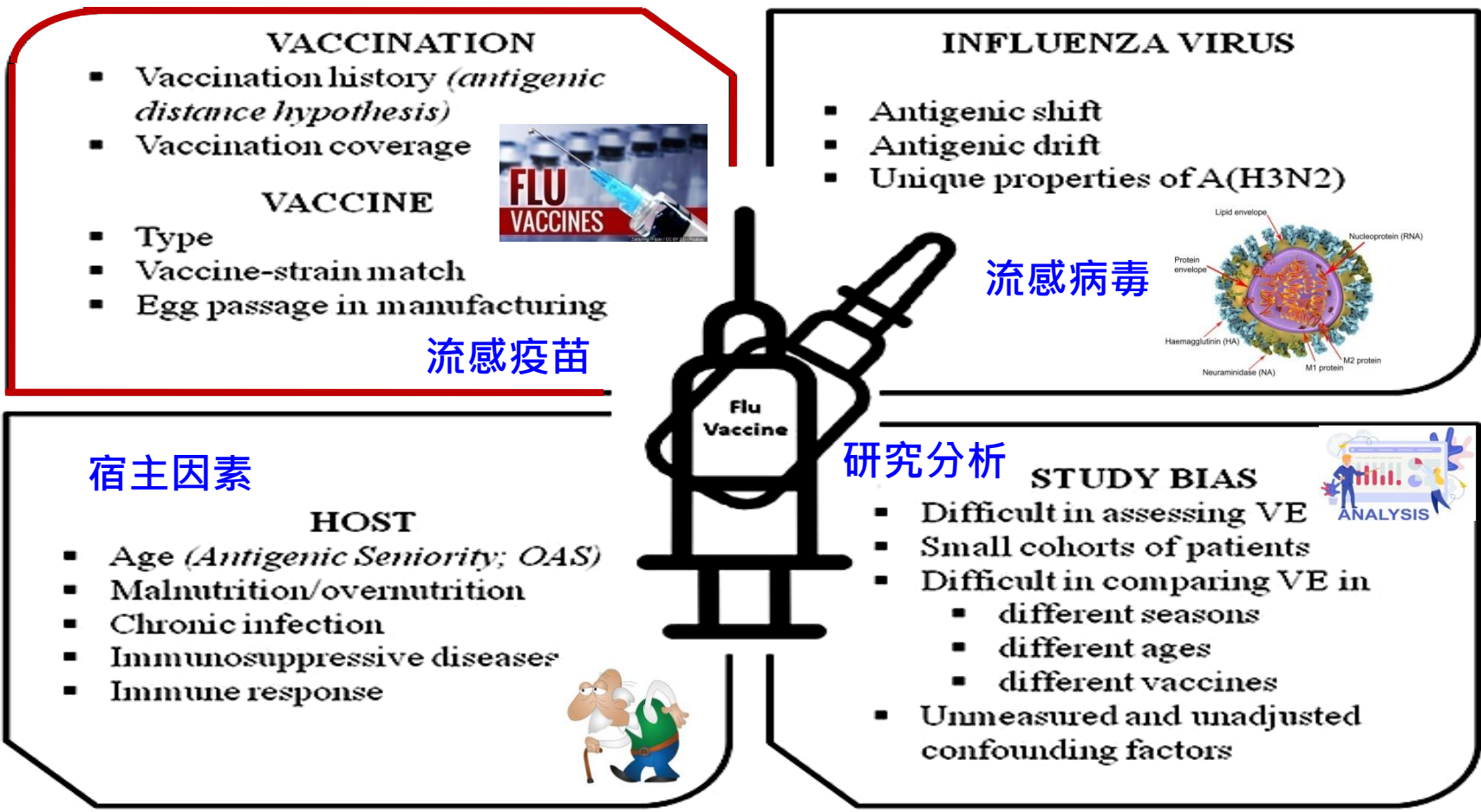






# 影響流感疫苗效果的可能原因及狀況

## Factors and conditions affecting Influenza Vaccine Effectiveness (VE)



**抗原原罪 (Original Antigenic Sin)**，又稱**霍斯金現象 (Hoskins effect)**，是指身體免疫系統在遭遇到與初次感染有些微不同的外來物(如：病毒或細菌)時，傾向利用初次產生的免疫記憶，而非再次產生免疫反應的一種特性。這會使免疫系統「受制於」初次抗原引起的免疫反應，而不能針對之後的抗原感染產生最有效的反應(前提是兩次接觸的不同抗原僅能有些許差異)。抗原原罪的現象被認為與流感病毒、登革熱、人類免疫缺陷病毒(HIV)和其餘一些病毒有關。





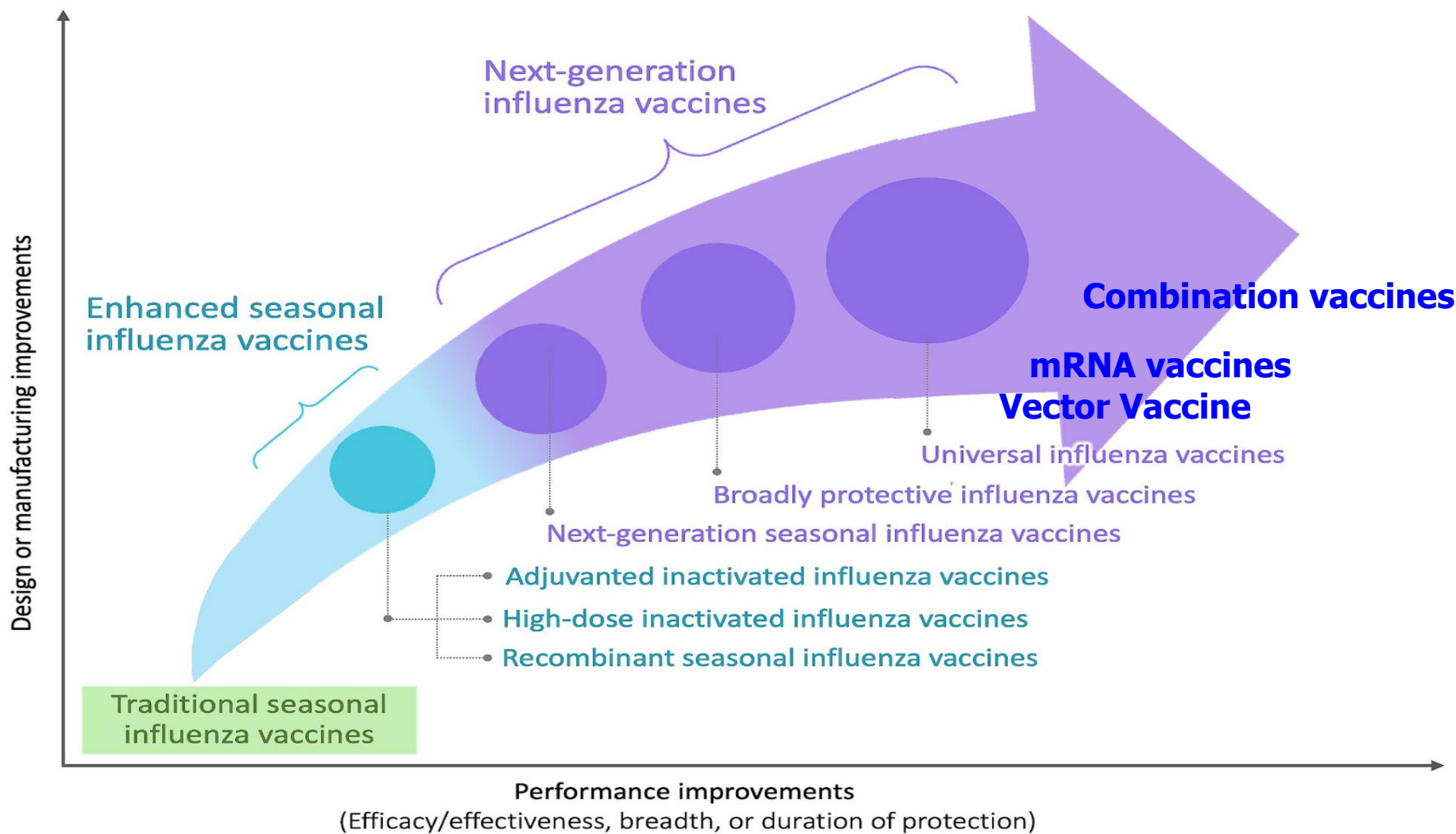
# 製造流感疫苗的挑戰





# 如何增進流感疫苗的效果

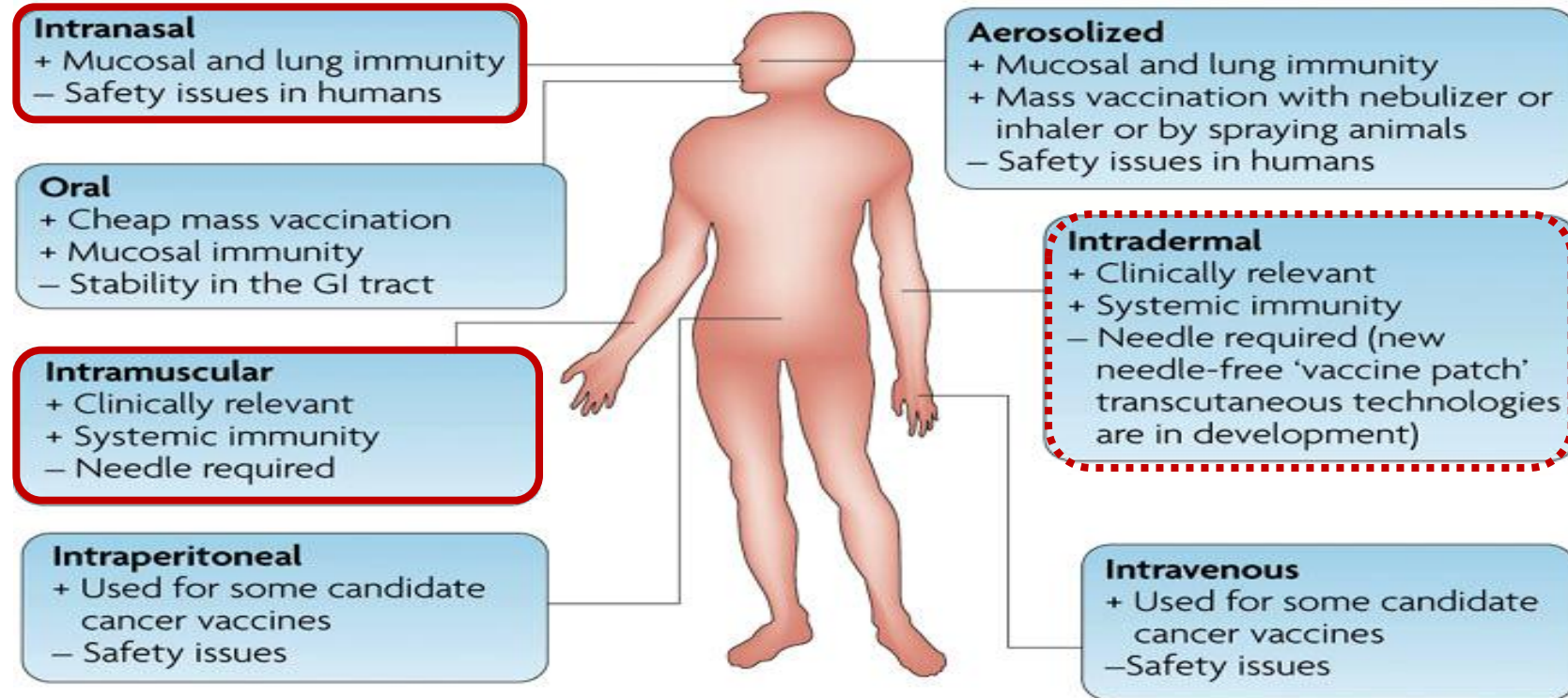
## Framework of improving influenza vaccines





# 疫苗接種途徑

**a**



**b**





# Licensed seasonal influenza vaccines available in the US (the northern hemisphere) & Australia (the southern hemisphere)

| No                                                                                       | Tradename                     | Manufacturer                        | Age Group                  | Country   |
|------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------|----------------------------|-----------|
| 雞胚不活化流感疫苗 <i>Inactivated Influenza Vaccine, Split Virion, Egg-Based</i>                  |                               |                                     |                            |           |
| 1                                                                                        | Afluria Quadrivalent          | Seqirus Pty. Ltd.                   | Six months and over        | US        |
| 2                                                                                        | Fluarix Quadrivalent          | GlaxoSmithKline Biologicals         | Six months and over        | US        |
| 3                                                                                        | FluLaval Quadrivalent         | ID Biomedical Corporation of Quebec | Six months and over        | US        |
| 4                                                                                        | Fluzone Highdose Quadrivalent | Sanofi Pasteur, Inc.                | 65 years and over          | US        |
| 5                                                                                        | Fluzone Quadrivalent          | Sanofi Pasteur, Inc.                | Six months and over        | US        |
| 6                                                                                        | FluQuadri                     | Sanofi-Aventis Australia            | Six months and over        | Australia |
| 7                                                                                        | Vaxigrip Tetra                | Sanofi-Aventis Australia            | Six months and over        | Australia |
| 8                                                                                        | Fluarix Tetra                 | GlaxoSmithKline Biologicals         | Six months and over        | Australia |
| 9                                                                                        | Afluria Quadrivalent          | Seqirus Pty. Ltd.                   | Five years and over        | Australia |
| 10                                                                                       | Influvac Tetra                | Mylan Health                        | Three years and over       | Australia |
| 雞胚不活化佐劑流感疫苗 <i>Inactivated Influenza Vaccine, Surface Antigen, Adjuvanted, Egg-Based</i> |                               |                                     |                            |           |
| 11                                                                                       | Fluad                         | Seqirus, Inc.                       | 65 years and over          | US        |
| 12                                                                                       | Fluad Quadrivalent            | Seqirus, Inc.                       | 65 years and over          | US        |
| 13                                                                                       | Fluad Quad                    | Seqirus, Inc.                       | 65 years and over          | Australia |
| 基因重組流感疫苗 <i>Recombinant Vaccine</i>                                                      |                               |                                     |                            |           |
| 14                                                                                       | Flublok Quadrivalent          | Sanofi Pasteur, Inc.                | 18 years and over          | US        |
| 細胞培養不活化流感疫苗 <i>Inactivated Subunit Influenza Vaccine, Cell Culture-Based</i>             |                               |                                     |                            |           |
| 15                                                                                       | Flucelvax Quadrivalent        | Seqirus, Inc.                       | Four years and over        | US        |
| 雞胚活性減毒流感疫苗 <i>Live Attenuated Influenza Vaccine</i>                                      |                               |                                     |                            |           |
| 16                                                                                       | FluMist Quadrivalent          | MedImmune, LLC                      | Two years through 49 years | US        |





# 英國流感疫苗種類2024~2025

## Comparative characteristics of selected seasonal influenza vaccines

### 年齡/流感疫苗建議接種種類

| 6 months to less than 2 years<br>in a clinical risk group <sup>(i)</sup>                                                                        | 2 years to less than 18 years<br>in eligible year groups or in a clinical risk group <sup>(i)</sup>                |                                                                                                                                                                                                                               | 18 years to less than 60 years<br>in a clinical risk group <sup>(ii)</sup> and pregnant women                                                   | 60 years to less than 65 years <sup>(iv)</sup><br>in a clinical risk group                                                                                                                                                            | 65 years <sup>(iv)</sup><br>and over                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>QIVc</b> (Cell-based quadrivalent influenza vaccine)<br><br><b>or QIVe</b> (Quadrivalent influenza vaccine, egg grown) if QIVc not available | <b>No contraindications to LAIV</b><br><br><b>LAIV</b> (Live attenuated influenza vaccine, nasal spray suspension) | <b>If LAIV contraindicated or otherwise unsuitable<sup>(iii)</sup></b><br><br><b>QIVc</b> (Cell-based quadrivalent influenza vaccine)<br><br><b>or QIVe</b> (Quadrivalent influenza vaccine, egg grown) if QIVc not available | <b>QIVc</b> (Cell-based quadrivalent influenza vaccine)<br><br><b>or QIVe</b> (Quadrivalent influenza vaccine, egg grown) if QIVc not available | <b>QIVc</b> (Cell-based quadrivalent influenza vaccine)<br><br><b>QIV-HD</b> (High-dose quadrivalent influenza vaccine, egg grown)<br><br><b>or QIVe</b> (Quadrivalent influenza vaccine, egg grown) if QIVc and QIV-HD not available | <b>aQIV</b> (Adjuvanted egg-grown quadrivalent influenza vaccine) <sup>(vi)</sup><br><br><b>QIV-HD</b> (High dose quadrivalent influenza vaccine, egg grown)<br><br><b>or QIVc</b> (Cell-based quadrivalent influenza vaccine) if aQIV or QIV-HD not available |
| 1 <sup>(i)</sup> or 3 <sup>(ii)</sup> 4 <sup>(iii)</sup>                                                                                        | 2 <sup>(i)</sup>                                                                                                   | 1 <sup>(ii)</sup> or 3 <sup>(iii)</sup> 4 <sup>(iii)</sup>                                                                                                                                                                    | 1 or 3 4                                                                                                                                        | 1 5 or 3 4                                                                                                                                                                                                                            | 6 5 or 1                                                                                                                                                                                                                                                       |

|                                                                                                                                                         |                                                                                                                                      |                                                                                                                          |                                                                                                                |                                                                                                                                          |                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Cell-based Quadrivalent Influenza Vaccine ▼</b><br/>CSL Seqirus</p> <p><b>QIVc</b><br/>Egg-free</p> <p>1</p> <p>licensed from 6 months of age</p> | <p><b>Fluenz</b><br/>AstraZeneca</p> <p><b>LAIV</b></p> <p>2</p> <p>10</p> <p>licensed from 2 years to less than 18 years of age</p> | <p><b>Quadrivalent Influenza Vaccine</b><br/>Sanofi</p> <p><b>QIVe</b></p> <p>3</p> <p>licensed from 6 months of age</p> | <p><b>Influenza Tetra MYL</b><br/>Viatris</p> <p><b>QIVe</b></p> <p>4</p> <p>licensed from 6 months of age</p> | <p><b>Quadrivalent Influenza Vaccine – High Dose ▼</b><br/>Sanofi</p> <p><b>QIV-HD</b></p> <p>5</p> <p>licensed from 60 years of age</p> | <p><b>Adjuvanted Quadrivalent Influenza Vaccine ▼</b><br/>CSL Seqirus</p> <p><b>aQIV</b></p> <p>6</p> <p>licensed from 65 years of age</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|





# 去活化流感疫苗分類

| 中文品名                           | 英文品名                                              | 製造商/<br>代理商 | 適用年齡   | 公費/<br>自費 | 保護效果                                                                                                                                                                           |
|--------------------------------|---------------------------------------------------|-------------|--------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I. 雞蛋培養                        |                                                   |             |        |           |                                                                                                                                                                                |
| 標準劑量                           |                                                   |             |        |           |                                                                                                                                                                                |
| 安定伏裂解型                         | AdimFlu-S (QIS)                                   | 國光          | 3 歲以上  | 公費/<br>自費 | 尚無研究顯示不同廠牌的流感疫苗保護效力或安全性有顯著差異。                                                                                                                                                  |
| 高端                             | MVC FLU Quadrivalent pre-filled syringe injection | 高端          | 3 歲以上  |           |                                                                                                                                                                                |
| 菲流達                            | Vaxigrip Tetra                                    | 賽諾菲         | 6 個月以上 |           |                                                                                                                                                                                |
| 伏適流                            | Fluarix Tetra                                     | 葛蘭素史克       | 6 個月以上 |           |                                                                                                                                                                                |
| 標準劑量 (含佐劑)                     |                                                   |             |        |           |                                                                                                                                                                                |
| 輔流安                            | FLUAD TETRA                                       | 東洋          | 65 歲以上 | 自費        | 由於佐劑有刺激免疫反應之效果，添加佐劑之流感疫苗相較無佐劑之流感疫苗在 65 歲以上長者能顯著降低因流感就醫、至急診就醫、以及住院之風險 ( 附錄表一 )                                                                                                  |
| 3. 高劑量 <sup>註</sup>            |                                                   |             |        |           |                                                                                                                                                                                |
| II. 細胞培養 (標準劑量)                |                                                   |             |        |           |                                                                                                                                                                                |
| 輔流威適                           | FLUCELVAX QUAD                                    | 東洋          | 6 個月以上 | 公費/<br>自費 | 雞蛋培養疫苗在製造過程中，有可能因病毒在雞胚胎繁殖時為了適應雞胚而出現抗原變異(adaptation)，產生的抗體無法有效中和原始疫苗株；而細胞培養疫苗是取哺乳類動物的細胞來培養，疫苗抗原不易突變。部分研究顯示細胞培養疫苗相較雞蛋培養疫苗，對 18-64 歲族群因流感就醫、至急診就醫、以及住院之風險，有較好之相對保護效益 ( 附錄表二、表三 )。 |
| III. 重組蛋白合成 (高劑量) <sup>註</sup> |                                                   |             |        |           |                                                                                                                                                                                |



# 感染流感與不同製程流感疫苗的免疫反應

## Antibody responses induced by natural influenza virus infection and vaccination

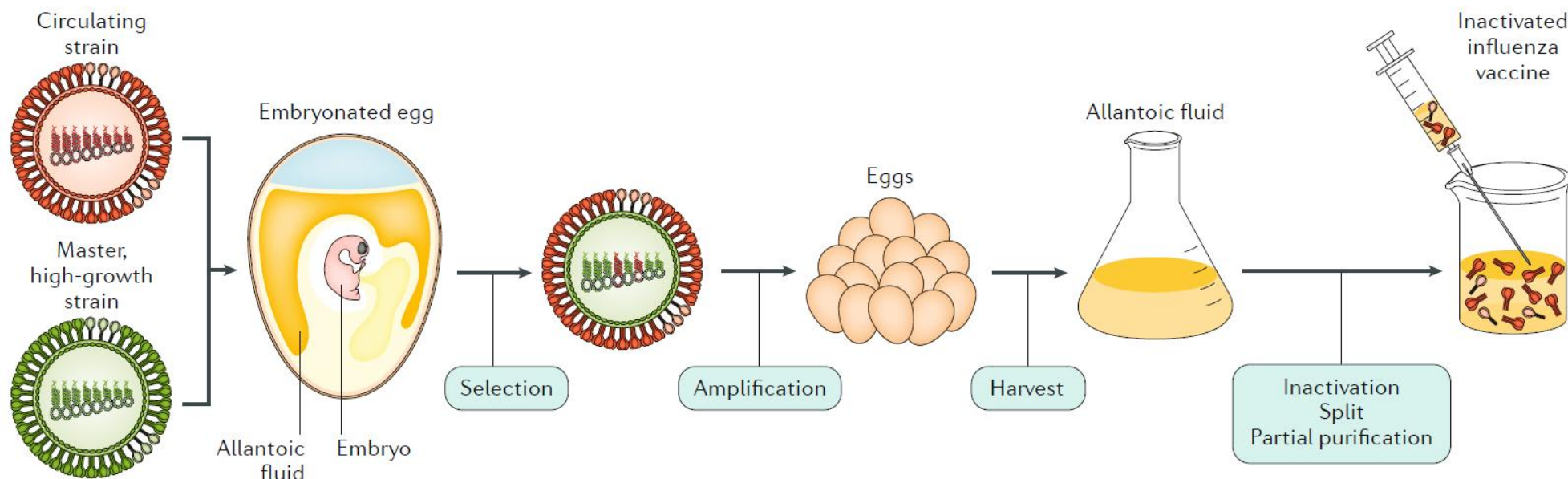
| Antibody response type              | Natural influenza virus infection<br>自然感染 | LAIV<br>鼻噴減毒疫苗                 | Whole inactivated virus vaccine<br>全細胞不活化疫苗 | Split virus or subunit vaccine<br>裂解/次單元疫苗 | Recombinant HA-based vaccine<br>HA基因重組疫苗 |
|-------------------------------------|-------------------------------------------|--------------------------------|---------------------------------------------|--------------------------------------------|------------------------------------------|
| Serum antibody response<br>血清抗體反應   | Strong                                    | Moderate induction in children | Strong                                      | Strong                                     | Strong                                   |
| Mucosal antibody response<br>黏膜抗體反應 | Strong                                    | Moderate induction in children | Weak or none                                | Weak or none                               | Weak or none                             |
| HA-specific response                | Strong                                    | Moderate                       | Strong                                      | Strong                                     | Strong                                   |
| NA-specific response                | Strong                                    | Weak                           | Moderate                                    | Weak                                       | None                                     |
| Antibodies to M2                    | Detectable                                | Unclear                        | Unclear; probably none                      | Unclear; probably none                     | None                                     |
| Antibodies to internal proteins     | Detectable                                | Unclear                        | Detectable                                  | Detectable                                 | None                                     |
| Longevity<br>抗體保護持久性                | Very long-lived or lifelong               | Moderate                       | Most likely short                           | Short                                      | Short                                    |
| Breadth<br>保護廣泛性                    | Moderate                                  | Some breadth                   | Narrow                                      | Narrow                                     | Some breadth                             |

HA, haemagglutinin; LAIV, live-attenuated influenza virus vaccine; M2, influenza A virus ion channel; NA, neuraminidase.



# 傳統雞胚流感疫苗(不活化)的製作流程

## Inactivated influenza A virus vaccine manufacture



**High- growth influenza  
A/Puerto Rico/8/1934  
(PR8) virus strain**

**5 WHO Collaborating Centres  
for Reference & Research on  
Influenza, which are located in**

- 1.the United States**
- 2.the United Kingdom**
- 3.Australia**
- 4.Japan**
- 5.China**

# Inactivated influenza vaccines primarily contain hemagglutinin from influenza viruses that have been inactivated and broken apart



**IIVs are non-replicative and are made up of viral components derived from whole viruses<sup>1</sup>**

## Inactivation process<sup>3</sup>

### The virus is inactivated by:

- Chemical compounds (formaldehyde or  $\beta$ -propiolactone)
- Physical manipulation (ultraviolet radiation or gamma-irradiation)

## Route of Administration



## Intramuscular injection<sup>2</sup>

## Types

- ❑ 3 types of IIV; whole-virus, split-virus and subunit inactivated vaccines
- ❑ Both split-virus and subunit vaccines are chemically disrupted
- ❑ Subunit vaccines go through further purification processes

## Mode of action

- ❑ Serum antibody (IgG) responses
- ❑ Limited mucosal responses and cell-mediated immunity

1. Nuwarda RF. Vaccines. 2021;17;9(9):1032;

3. Sabbaghi A. Rev Med Virol. 2019;29(6):e2074;

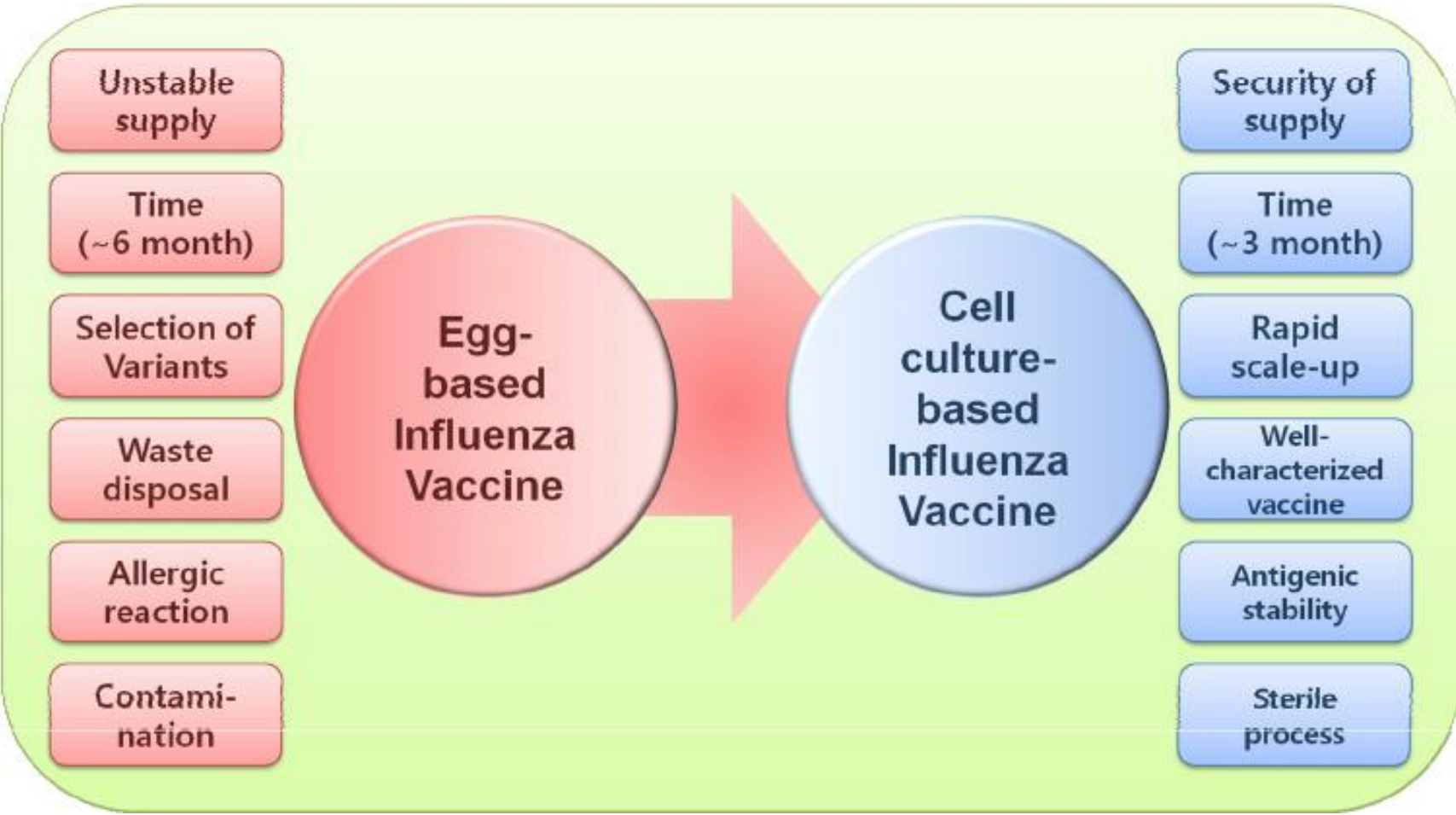
2. Houser K. Cell Host Microbe. 2015;17(3):295–300;

4. Cox RJ. Scand. J. Immunol. 2004;59(1):1-5.





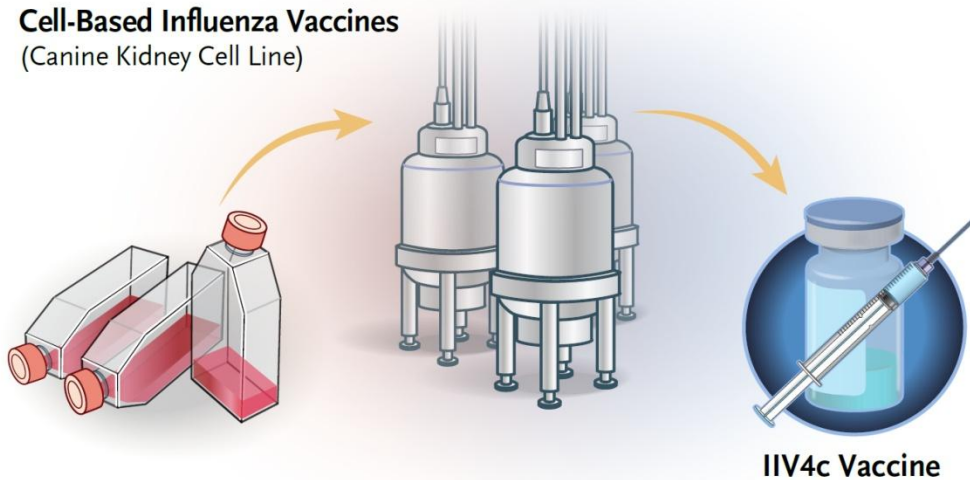
# 細胞培養比雞蛋培養流感疫苗的優點



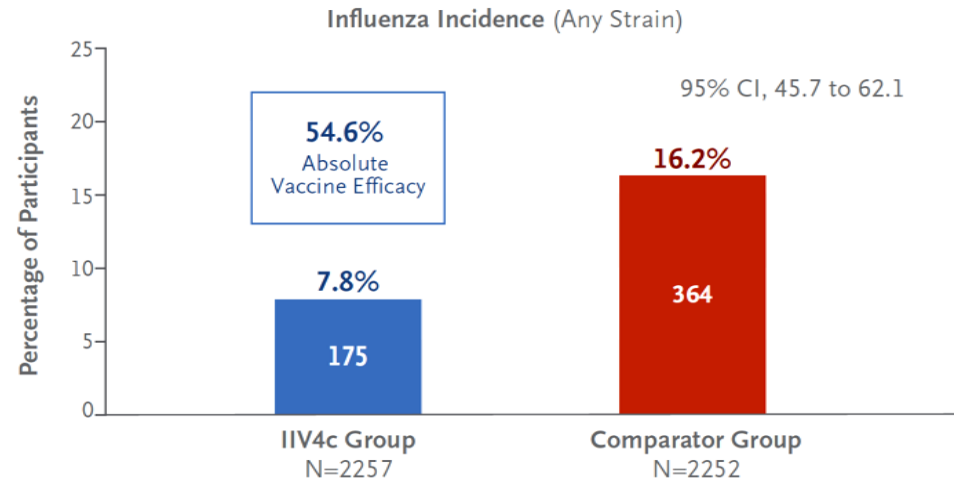
# Efficacy of a Cell-Culture–Derived Quadrivalent Influenza Vaccine in Children



Cell-Based Influenza Vaccines  
(Canine Kidney Cell Line)



Laboratory-Confirmed Influenza and Vaccine Efficacy  
in Children and Adolescents 2 to <18 Yr of Age



## CONCLUSIONS:

Cell-culture–derived influenza vaccine IIV4c was effective over three influenza seasons in healthy children and adolescents with or without previous influenza vaccination.

## Limitations

- ❑ Lack of an influenza vaccine comparator precluded direct comparison of vaccine efficacy.
- ❑ Vaccine efficacy was lower against influenza A/H3N2 than against other types.

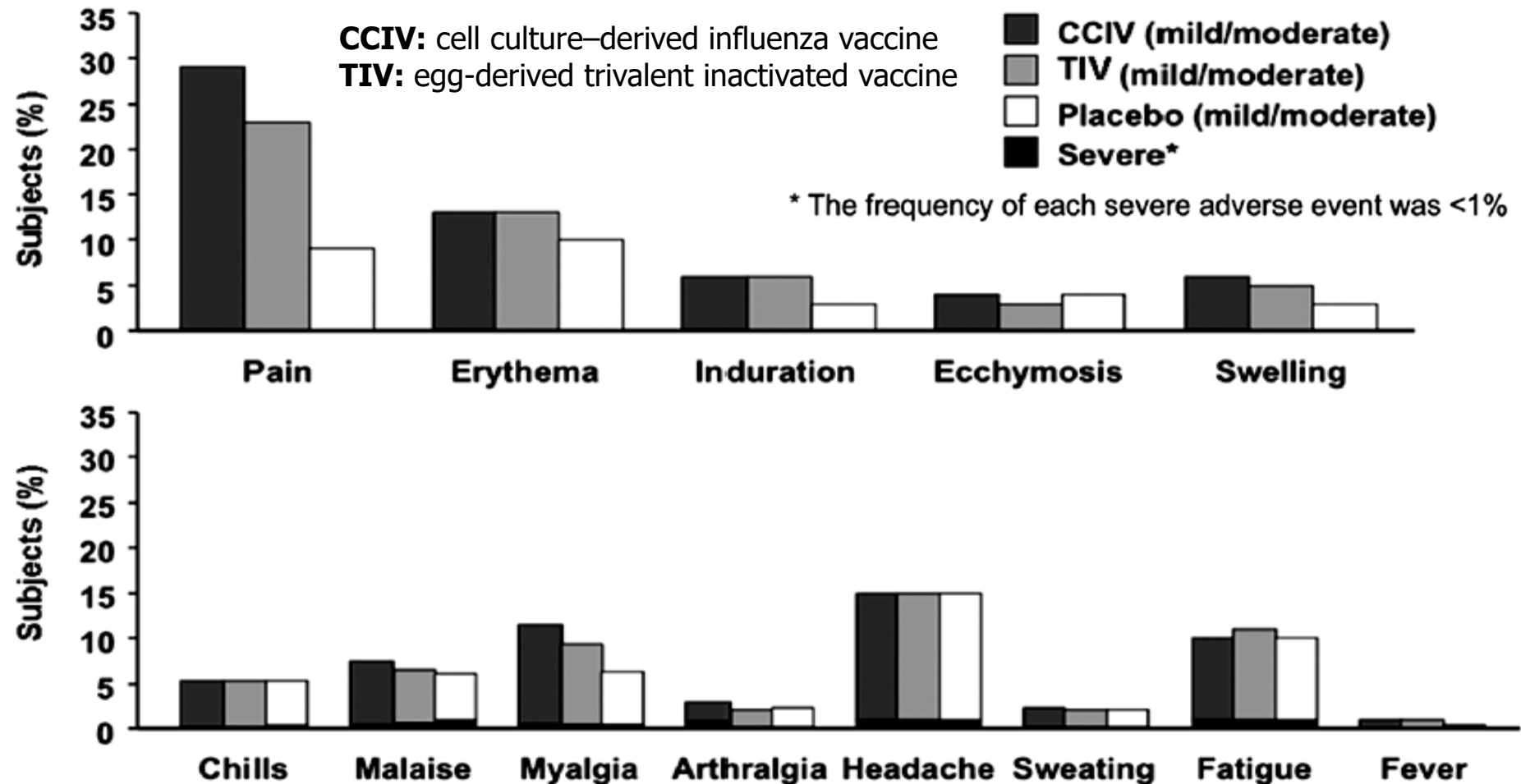
## Solicited and Unsolicited Adverse Events

|                                                                   | IIV4c Group | Comparator Group |
|-------------------------------------------------------------------|-------------|------------------|
|                                                                   | no. (%)     |                  |
| Solicited adverse event within 30 min after vaccination           | 214 (9.5)   | 165 (7.3)        |
| Solicited adverse event between 6 hr and 7 days after vaccination | 1159 (51.4) | 1096 (48.6)      |
| Unsolicited adverse event from day 1 to day 22 or 50              | 633 (28.0)  | 630 (27.9)       |
| Vaccine-related adverse event                                     | 97 (4.3)    | 89 (3.9)         |
| Serious adverse event                                             | 25 (1.1)    | 30 (1.3)         |

# 細胞型流感疫苗與雞胚型流感疫苗接種反應比較(7天)

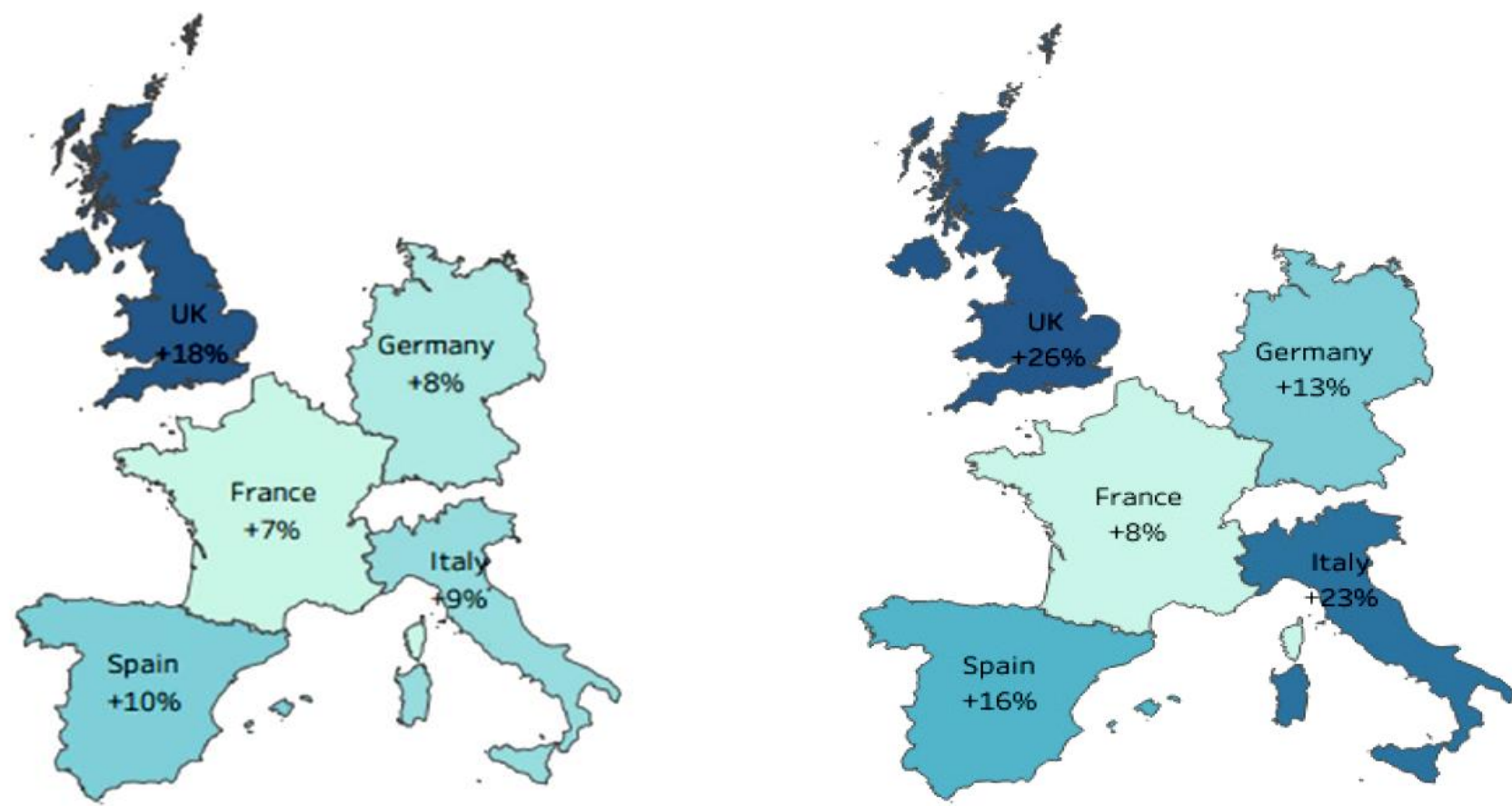


## Solicited local and systemic reactions in the 7 days after vaccination





# Mean estimates of the increase in IVE in the absence of egg adaptations



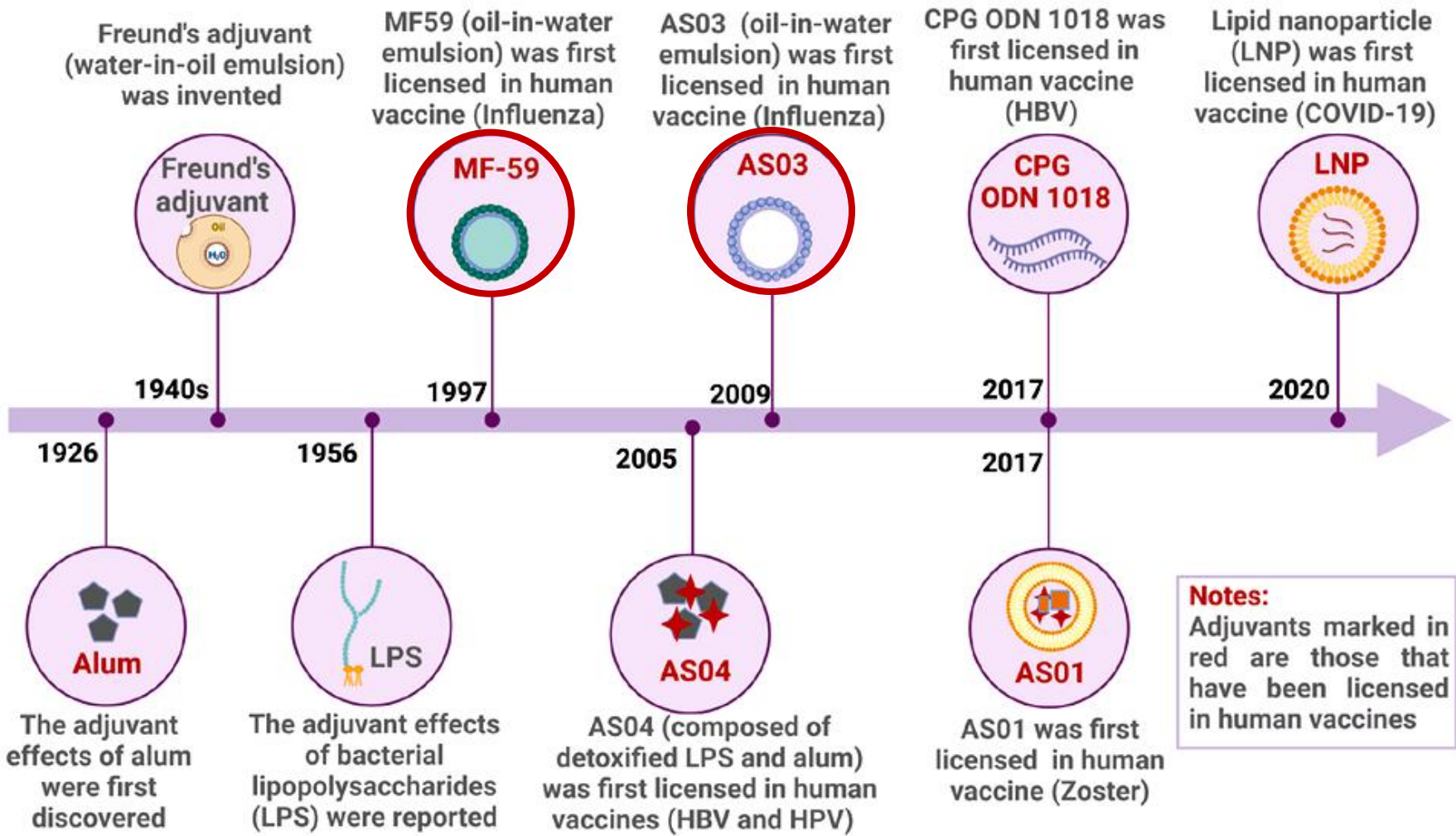
For **all strains** per country (TIV & QIV only)    for **A (H3N2)** per country (TIV & QIV only)





# 疫苗佐劑的研發歷程

Timeline of major events in the research history of vaccine adjuvants

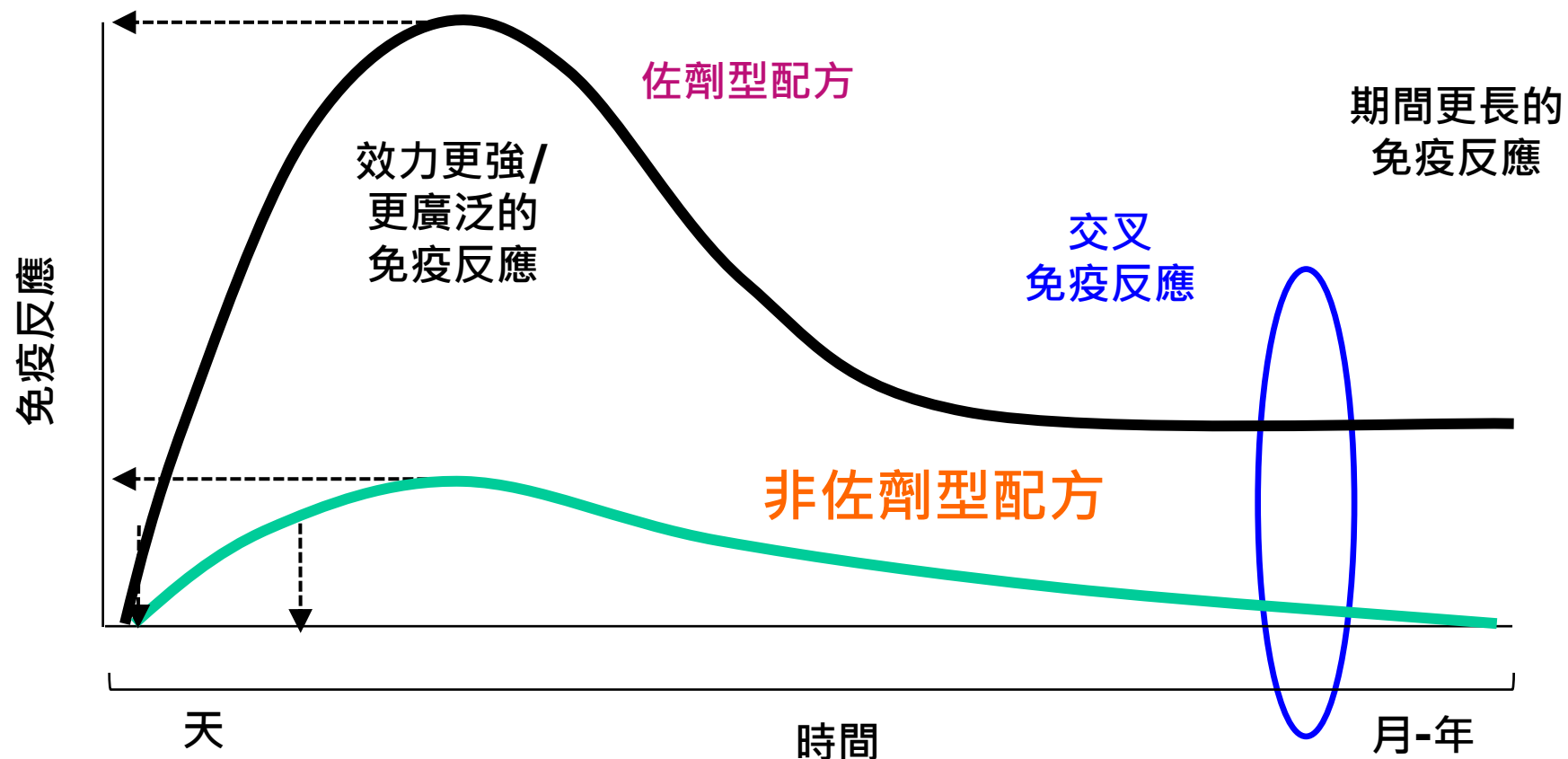






# 佐劑系統強化針對疫苗的免疫反應

早期和短暫反應之後是高精度且持久的免疫專一性反應<sup>2</sup>





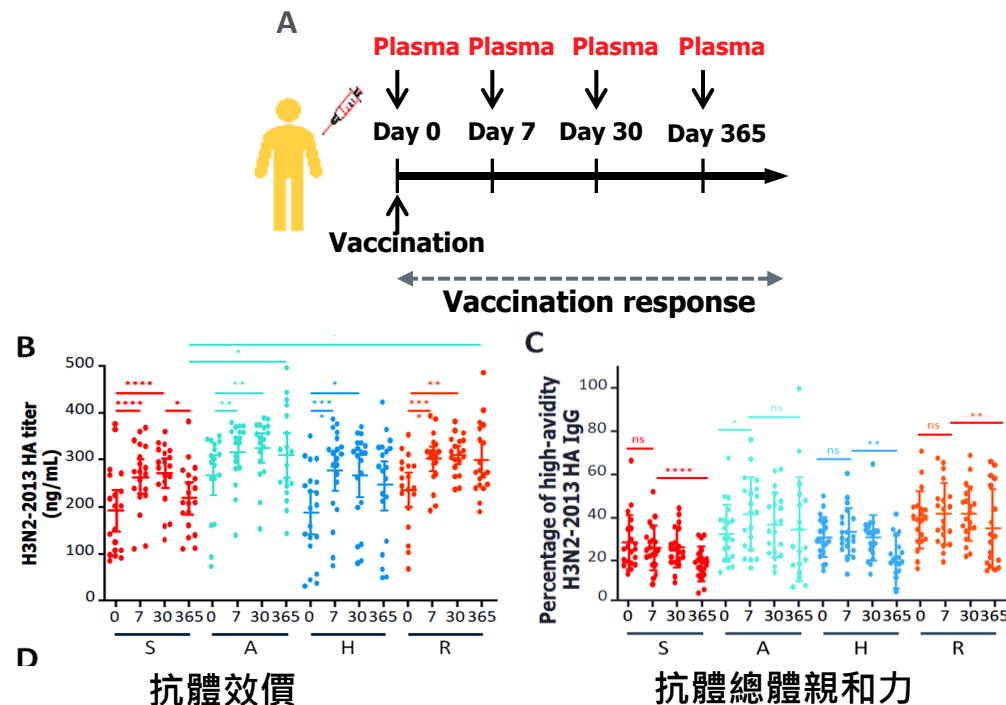
# 佐劑流感疫苗可提高抗體持續達一年

## 實驗設計:

- ✓設計：隨機試驗，**NH2017/18疫苗**
- ✓研究疫苗：傳統疫苗/佐劑疫苗/高劑量/基因重組疫苗
- ✓研究對象：香港社區的老年人（**65~82 歲**）
- ✓研究終點：**H3N2-2013**（代表性病毒株）免疫生成力（**抗Ha抗體效價與親和力**）

## 結果:

- ✓佐劑流感疫**H3N2 IgG**抗體，長期免疫記憶達**1年(p<0.05)**



**Adjuvant vaccine induces high-avidity H3-2013 in humans. A randomized clinical trial to assess eIIV immunogenicity compared with S-IIV** sampled blood plasma at Days 0 (baseline), 7, 30, and 365 after vaccination (A). H3N2-2013 HA titers (B), high-avidity H3N2-2013 HA (C) IgG responses were measured by ELISA.

與傳統疫苗相比，接種佐劑疫苗，1年後H3N2 IgG抗體反應仍高，顯示長期免疫記憶已獲增強

✓A, adjuvant vaccine; aTIV, adjuvanted trivalent influenza vaccine; eIIV, enhanced inactivated influenza vaccine; ELISA, enzyme-linked immunosorbent assay; HA, hemagglutinin; HD-TIV, high-dose trivalent influenza vaccine; IgG, immunoglobulin G; R, recombinant; rQIV, recombinant quadrivalent influenza vaccine; S, standard vaccine.  
✓Kavian et al. 2020. Assessment of enhanced influenza vaccination finds that FluAd conveys an advantage in mice and older adults. Clin Transl Immunol 9:E1107.

# 佐劑流感疫苗：一項Meta分析非疫苗涵蓋型別病毒株 (主要是 H<sub>3</sub>N<sub>2</sub>) 的 GMT (抗體效價) 明顯比傳統疫苗更高

aTIV vs. TIV: significantly greater GMT ratios for heterologous strains, mainly H3N2, in a meta-analysis



## Study Design:

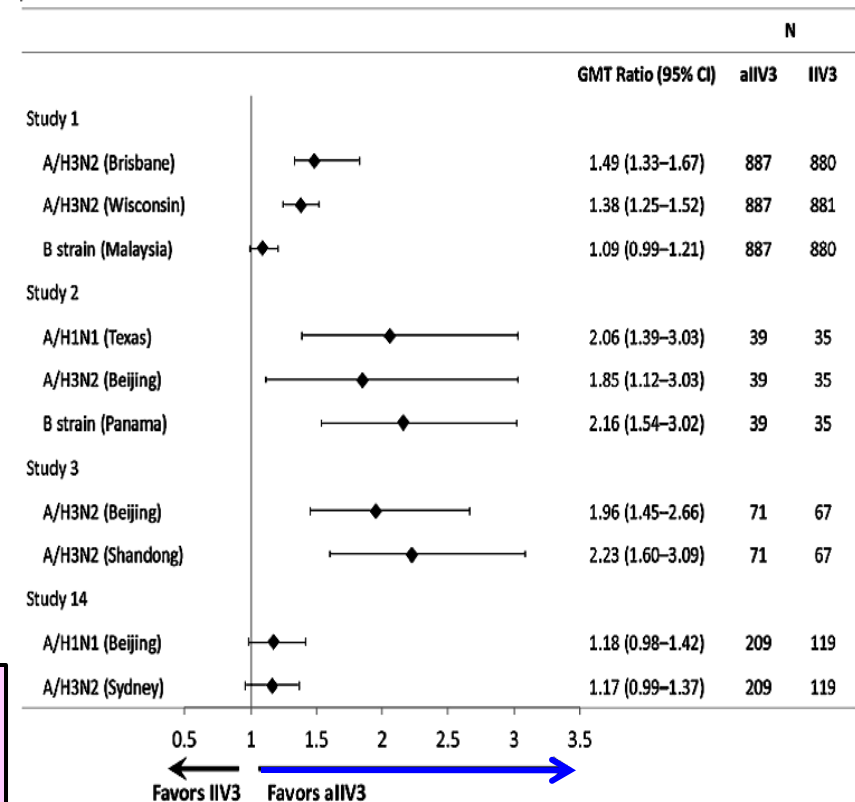
- ✓ Meta-analysis from 23 Phase I through III trials (1992-2013)
- ✓ aTIV vs. TIV
- ✓ 11,105 subjects ≥65 years old

## Results:

- ✓ Antibody vs. heterologous strains significantly greater for aTIV in 7 out of 10 strains (5x H3N2, 1x B, 1x H1N1)

MF59 associations with increased **breadth** of immune response suggest potential for greater protection against vaccine-**mismatched** virus strains

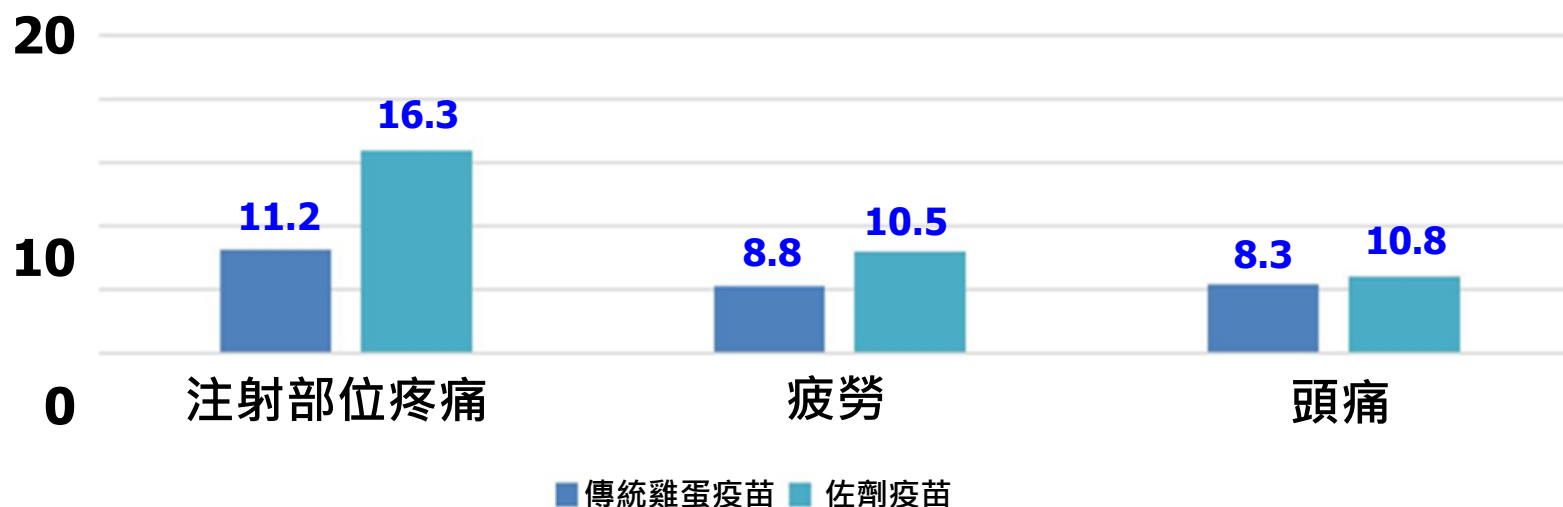
A) GMT Ratios





# Fluad® Tetra 安全性

- ✓ 兩項臨床研究中對**4,269** 名年齡**≥65** 歲的受試者進行安全性評估，收集疫苗接種**7** 天後局部和全身不良反應事件，**多數是輕度或中度的不良反應，且 3 天內會恢復。**
- ✓ 在兩項研究中，發生率(**≥10%**)，最常通報的不良反應：





# 哪一種流感疫苗保護力比較好？

- 不同劑型流感疫苗保護力或有不同，可能受流型株與病毒株抗原吻合度、抗原含量、佐劑使用與否與接種者本身免疫力影響
- 已核准使用的流感疫苗，均有實證支持其對預防罹病、重症與死亡的效果與安全性
- 分眾接種策略或可讓不同族群都獲得最佳的保護力，但最重要的還是提升接種率

| 疫苗種類         | 和雞蛋培養疫苗較之相對保護力(18 歲以上成人) |                        |
|--------------|--------------------------|------------------------|
|              | 實驗室確診流感感染                | 實驗室確診流感住院              |
| 含佐劑疫苗(MF 59) | 無差異(-30~88)              | <b>59.2(14.6~80.5)</b> |
| 高劑量疫苗        | <b>24(11~36)</b>         | <b>27(-1~48)</b>       |
| 細胞培養疫苗       | 無差異(-5.8~21.4)           | 無差異(-75.9~52.3)        |
| 重組疫苗         | <b>30 (10~47)</b>        | 無資料                    |





# 佐劑疫苗與非佐劑流感疫苗 之相對保護效益比較(≥65歲)

| 研究               | 流感季       | 國家 | 病毒株  | 佐劑疫苗研究<br>樣本數 | 非佐劑疫苗研<br>究樣本數 | 研究目標          | 研究結果相對保護效益 <sup>註</sup>      |
|------------------|-----------|----|------|---------------|----------------|---------------|------------------------------|
| Domnich A 2022   | 2018-2022 | 義  | A, B | 337           | 175            | 嚴重急性呼吸道<br>感染 | 59.2% (95% CI, 14.6-80.5)    |
| Izurieta HS 2021 | 2019/2020 | 美  | A, B | 2,565,513     | 1,584,451      | 住院或急診         | 8.2% (95% CI, 4.2-12.0)      |
| Boikos C 2021    | 2017/2018 | 美  | A, B | 524,223       | 917,609        | 因流感就醫         | 18.2% (95% CI, 15.8-20.5)    |
|                  | 2018/2019 | 美  | A, B | 1,031,145     | 915,380        | 因流感就醫         | 27.8% (95% CI, 25.7-29.9)    |
| Pebody R 2020    | 2018/2019 | 英  | A, B | 818           | 21             | 感染            | 29.6% (95% CI, -83.4-73.0)   |
|                  |           |    | H1N1 | 659           | 16             |               | 2.8% (95% CI, -358.1-79.4)   |
|                  |           |    | H3N2 | 683           | 17             |               | 42.5% (95% CI, -133.7, 85.8) |
| Izurieta HS 2020 | 2018/2019 | 美  | A, B | 2,101,606     | 1,455,254      | 住院或急診         | 7.7% (95% CI, 3.9-11.4)      |
| Pelton SI 2020   | 2017/2018 | 美  | A, B | 234,351       | 212,120        | 因流感就醫         | 36.3% (95% CI, 31.0-41.2)    |
|                  |           |    |      |               |                | 住院或急診         | 8.6% (95% CI, 1.2-15.6)      |
| Cocchio S 2020   | 2011-2017 | 義  | A, B | 68,660        | 410,737        | 因肺炎住院         | 33.0% (95% CI, 25-41)        |
| Lapi F 2019      | 2002-2016 | 義  | A, B | 28,454        | 14,546         | 住院            | 39% (95% CI, 4-61)           |



# 細胞培養疫苗與雞蛋培養流感疫苗相對 保護效益比較(18-64歲)

| 研究                     | 流感季       | 國家 | 病毒株  | 細胞培養疫苗研究  | 雞蛋培養疫苗研究  | 研究目標   | 研究結果相對保護效益 <sup>註</sup>    |
|------------------------|-----------|----|------|-----------|-----------|--------|----------------------------|
|                        |           |    |      | 樣本數       | 樣本數       |        |                            |
| Stein AN 2024*         | 2017/2018 | 美  | A, B | 3,115     | 28,709    | 感染     | 14.8% (95% CI, 7.0-22.0)   |
|                        | 2018/2019 | 美  | A, B | 3,426     | 29,962    | 感染     | 12.5% (95% CI, 4.7-19.6)   |
|                        | 2019/2020 | 美  | A, B | 3,890     | 30,508    | 感染     | 10.0% (95% CI, 2.7-16.7)   |
| Divino V 2022*         | 2019/2020 | 美  | A, B | 1,150,134 | 3,924,819 | 住院或急診  | 5.3% (95% CI, 0.5-9.9)     |
| Imran M 2022           | 2019/2020 | 美  | A, B | 1,144,427 | 3,427,818 | 就醫     | 11.9% (95% CI, 10.2-13.6)  |
| Boikos C 2021          | 2018/2019 | 美  | A, B | 1,529,189 | 5,344,922 | 就醫     | 6.5% (95% CI, 5.2-7.9)     |
| Krishnarajah G<br>2020 | 2018/2019 | 美  | A, B | 590,705   | 2,223,435 | 住院或急診  | 4.9% (95% CI, -2.8-12.1)   |
| Boikos C 2020          | 2017/2018 | 美  | A, B | 55,104    | 69,3014   | 類流感疾病碼 | 26.8% (95% CI, 14.1-37.6)  |
| Divino V 2020          | 2017/2018 | 美  | A, B | 499,156   | 1,730,403 | 住院或急診  | 13.1% (95% CI, 6.8-19)     |
| Klein NP 2020          | 2017/2018 | 美  | A    | 40,685    | 712,126   | 就醫     | -5.8% (95% CI, -36.1-17.7) |
|                        |           |    | B    | 40,685    | 712,126   | 就醫     | 21.4% (95% CI, -7.3-42.4)  |

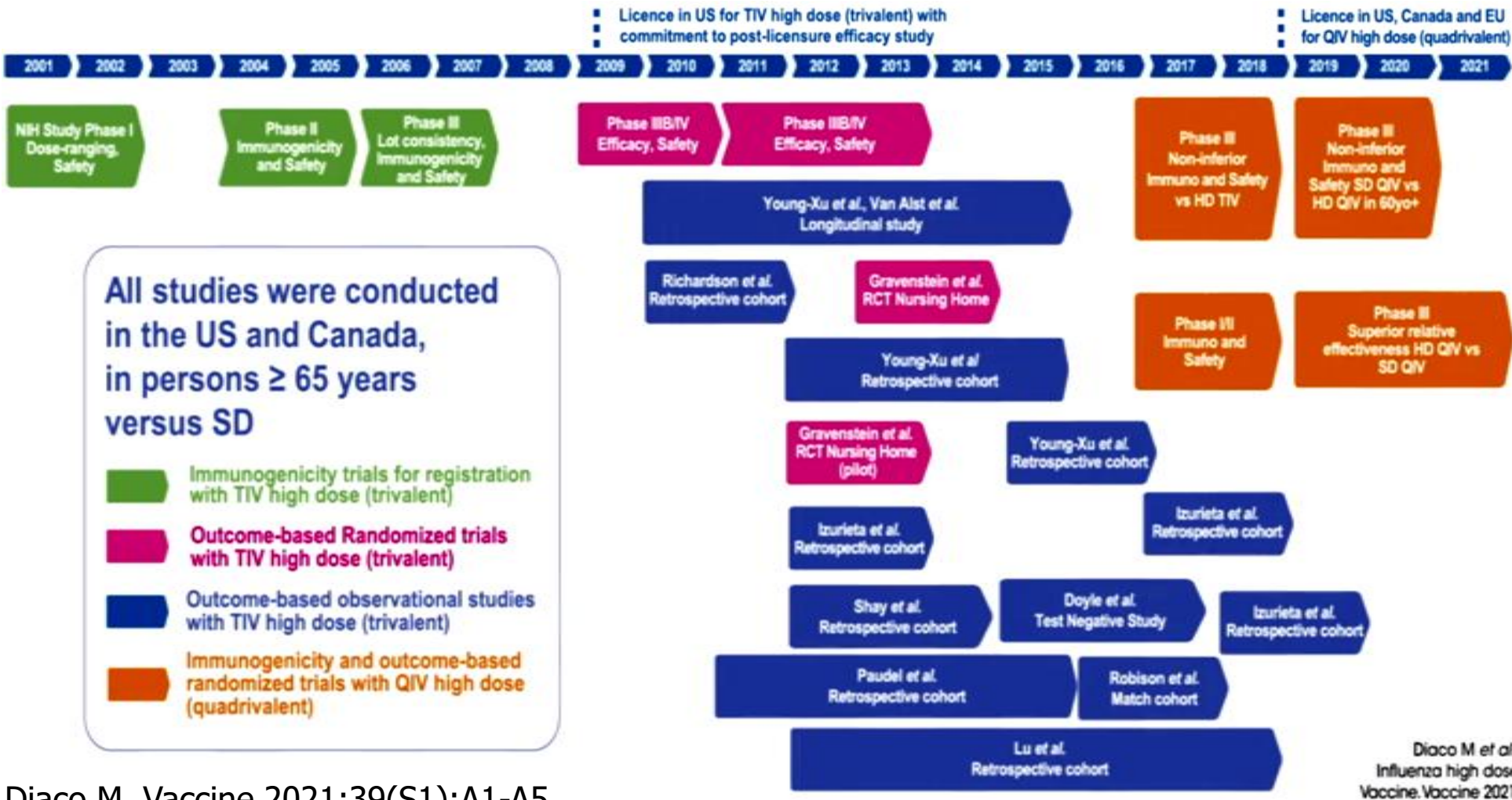


# 細胞培養疫苗與雞蛋培養流感疫苗之相對保護效益比較(≥65歲)

| 研究                | 流感季       | 國家 | 病毒株  | 細胞培養疫苗研究<br>樣本數 | 雞蛋培養疫苗研究<br>樣本數 | 研究目標   | 研究結果相對保護效益 <sup>註</sup>    |
|-------------------|-----------|----|------|-----------------|-----------------|--------|----------------------------|
| Imran M 2022      | 2019/2020 | 美  | A, B | 354,788         | 689,455         | 就醫     | -9.4% (95% CI, -14.2-4.7)  |
| Izurieta HS 2021  | 2019/2020 | 美  | A, B | 824,264         | 1,584,451       | 住院或急診  | 2.5% (95% CI, -2.8-7.6)    |
| Boikos C 2021     | 2018/2019 | 美  | A, B | 517,639         | 987,943         | 就醫     | -2.2% (95% CI, -5.4-0.9)   |
| Izurieta HS 2020  | 2018/2019 | 美  | A, B | 752,613         | 1,455,254       | 住院或急診  | 2.5% (95% CI, -2.4-7.3)    |
| Boikos C 2020     | 2017/2018 | 美  | A, B | 29,618          | 164,151         | 類流感疾病碼 | -7.3% (95% CI, -51.6-24.0) |
| Bruxvoort KJ 2019 | 2017/2018 | 美  | A, B | 157             | 3,498           | 住院     | 6% (95% CI, -46-39)        |
| Izurieta HS 2019  | 2017/2018 | 美  | A, B | 4,370           | 14,417          | 醫院就醫   | 11.0% (95% CI, 7.9-14.0)   |



# Study of High dose Influenza vaccine



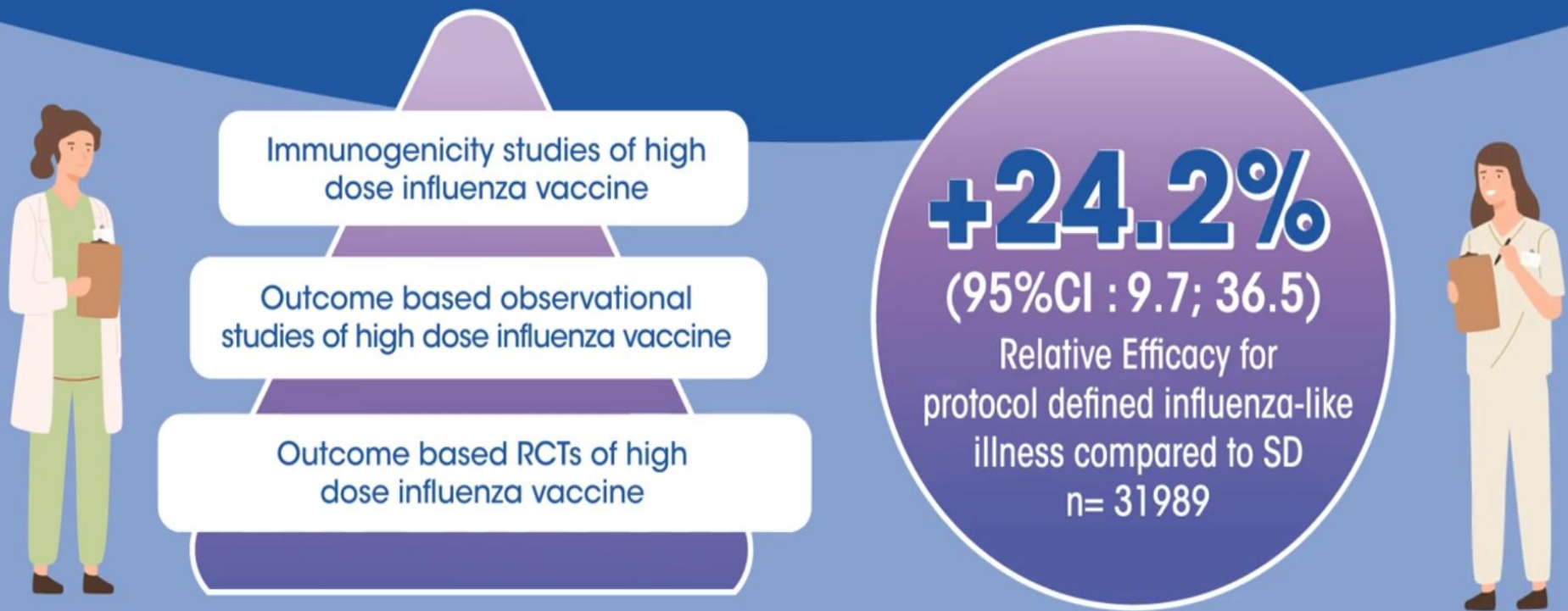
Diaco M. Vaccine 2021;39(S1):A1-A5

<https://www.sciencedirect.com/science/article/pii/S0264410X20311476>





Randomized Clinical Trials are the gold standard of clinical research. Superior relative efficacy was established: trivalent high-dose vaccine was **24.2%** (95%CI: 9.7 to 36.5) more effective than standard-dose influenza vaccine in preventing lab-confirmed influenza in adults  $\geq 65$  years of age.



DiazGranados, C.A., *et al.*, Efficacy of high-dose versus standard-dose influenza vaccine in older adults. *N Engl J Med*, 2014. 371(7): p. 635-45.





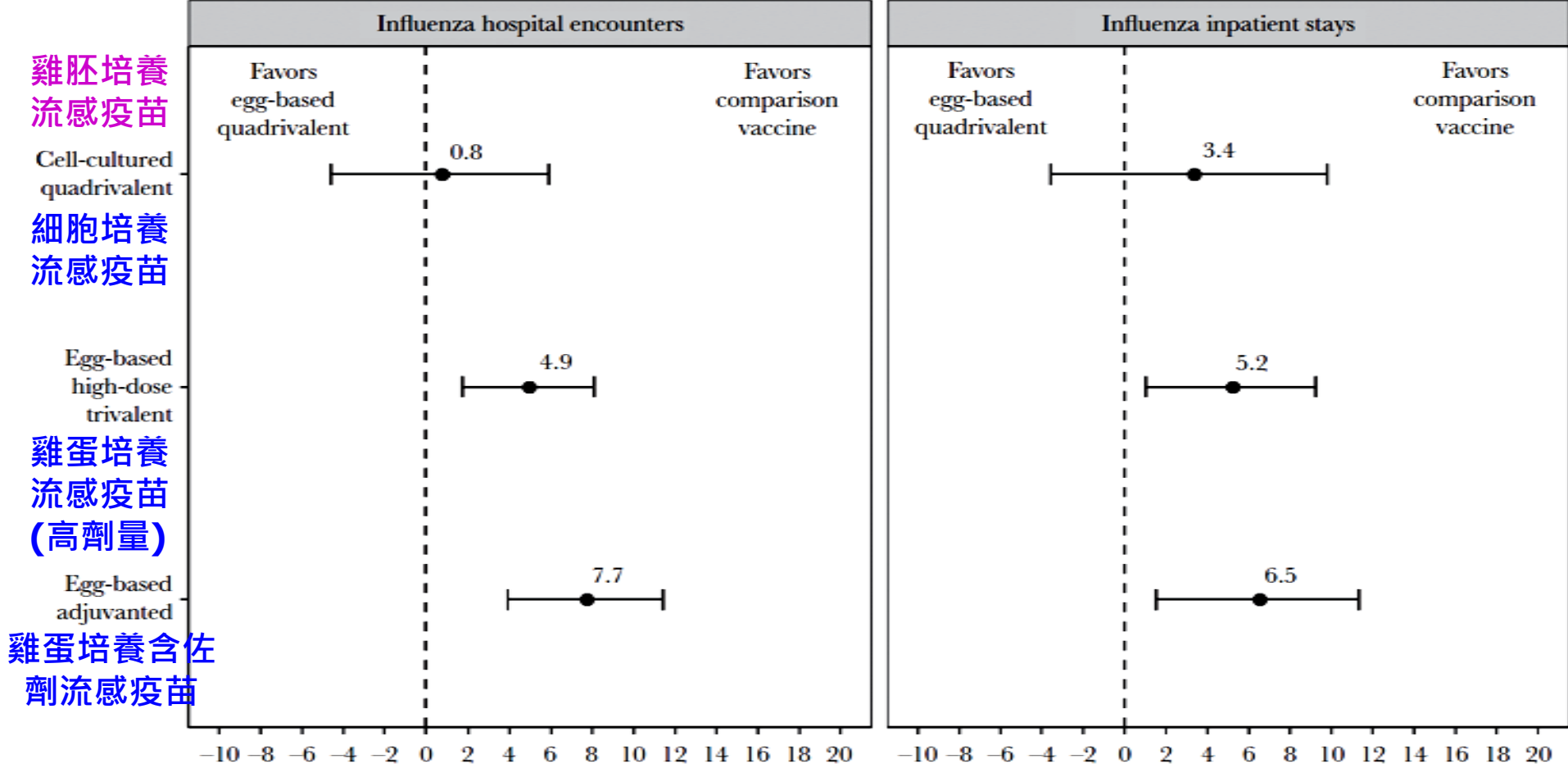
## Demonstrated safety with fluzone high-dose vaccine for adults 65+ in a phase III trial

| 高劑量流感疫苗                  |          | HIGH-DOSE VACCINE<br>(N <sup>d</sup> = 2569-2572) % | Standard Flu VACCINE<br>(N <sup>d</sup> = 1258-1260) % |
|--------------------------|----------|-----------------------------------------------------|--------------------------------------------------------|
| SYSTEMIC                 | MYALGIA  | 21.4                                                | 18.3                                                   |
|                          | MALAISE  | 18.0                                                | 14.0                                                   |
|                          | HEADACHE | 16.8                                                | 14.4                                                   |
|                          | FEVER    | 3.6                                                 | 2.3                                                    |
| INJECTION-SITE REACTIONS | PAIN     | 35.6                                                | 24.3                                                   |
|                          | ERYTHEMA | 14.9                                                | 10.8                                                   |
|                          | SWELLING | 8.9                                                 | 5.8                                                    |



# Inverse probability of treatment weighted (IPTW)-adjusted relative vaccine effectiveness (RVE) estimates for primary outcome analyses

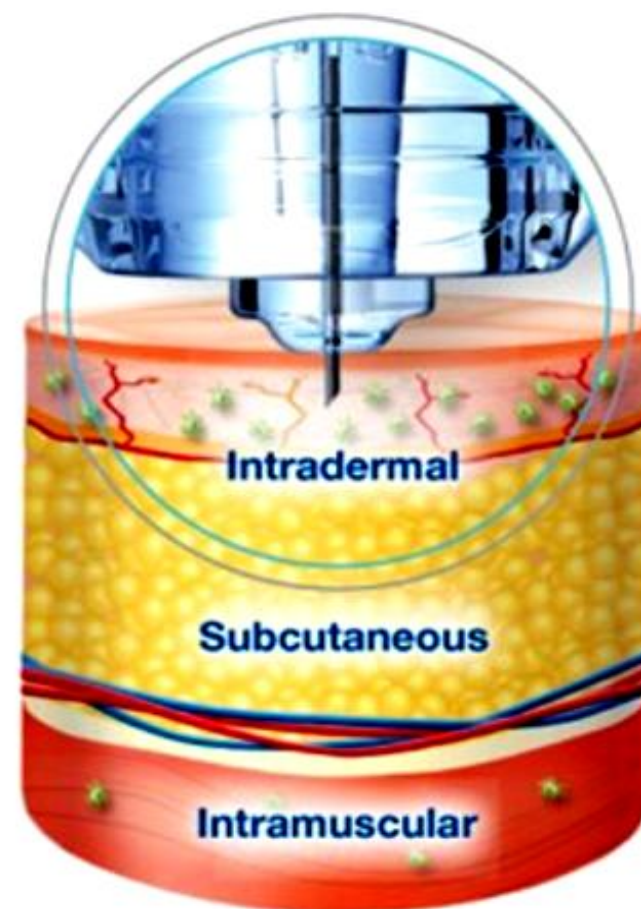
Four-vaccine comparison



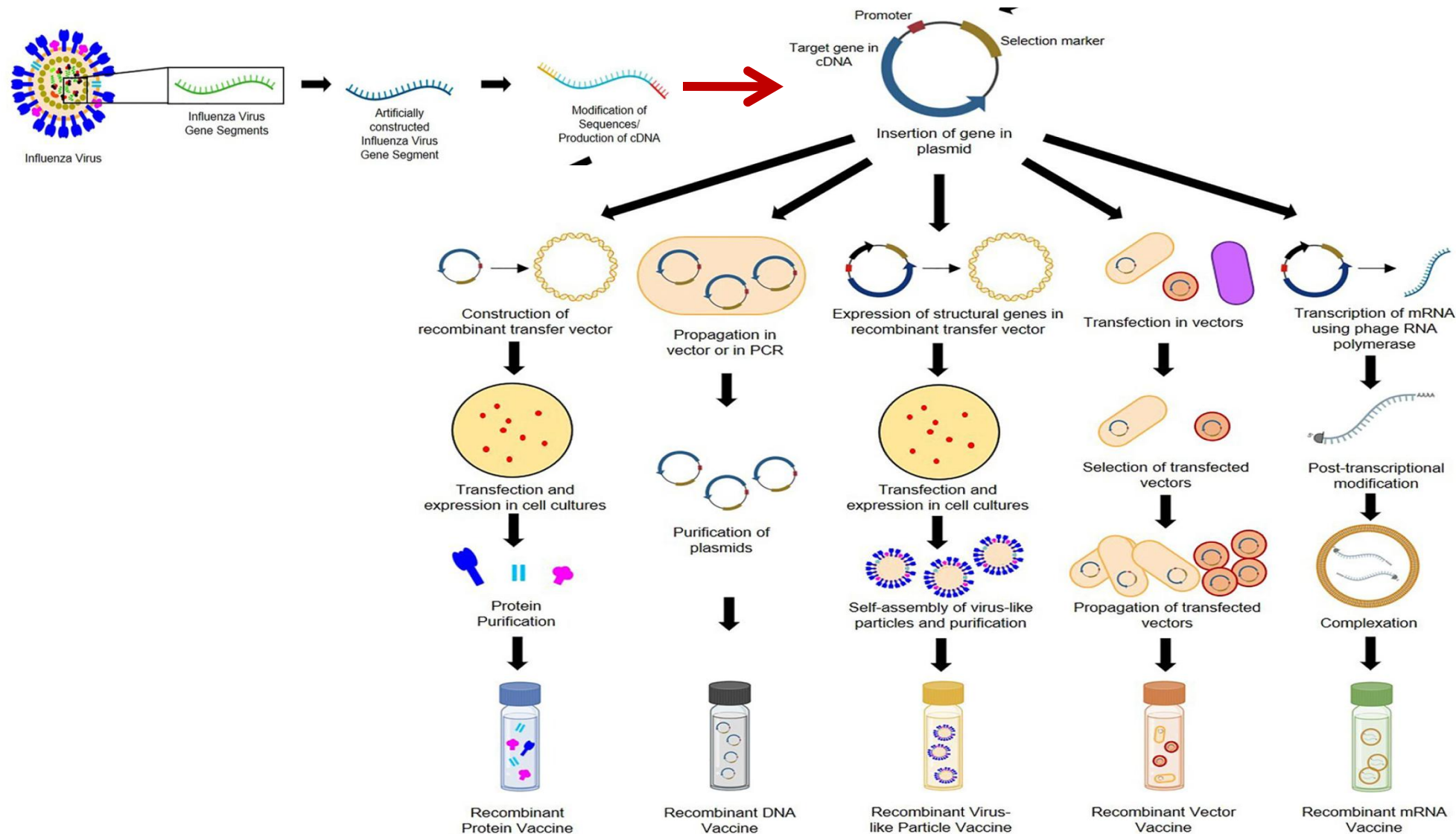


# Intradermal Influenza vaccine

- Indicated for **persons 18 through 64 years of age**
- Contraindications
  - Severe egg allergy
- Associated with **higher rates of injection site reactions** (erythema, induration, swelling, and pruritus, but not pain) than the IM inactivated influenza vaccines
  - Erythema (>75%)
  - Induration (>50%)
  - Swelling (>50%)
  - Pain (>50%)
  - Pruritus (>40%)



# General construction process of recombinant protein, DNA, VLP, vector-based, and mRNA influenza vaccines





# Recombinant influenza vaccines contain viral hemagglutinin



**Recombinant vaccines: are non-replicative and made up of influenza HA proteins, produced in insect cells<sup>1</sup>**

## Inactivation process<sup>3</sup>

- ❑ Recombinant vaccines are made using insect cells to express the influenza virus' surface protein from small pieces of DNA encoding HA
- ❑ These proteins are extracted and purified for use in the vaccine

## Route of Administration



**Intramuscular injection<sup>2</sup>**

## Types

- ❑ Recombinant hemagglutinin (HA) vaccine

## Mode of action

- ❑ Recombinant HA vaccine and IIV have a similar mechanism of action

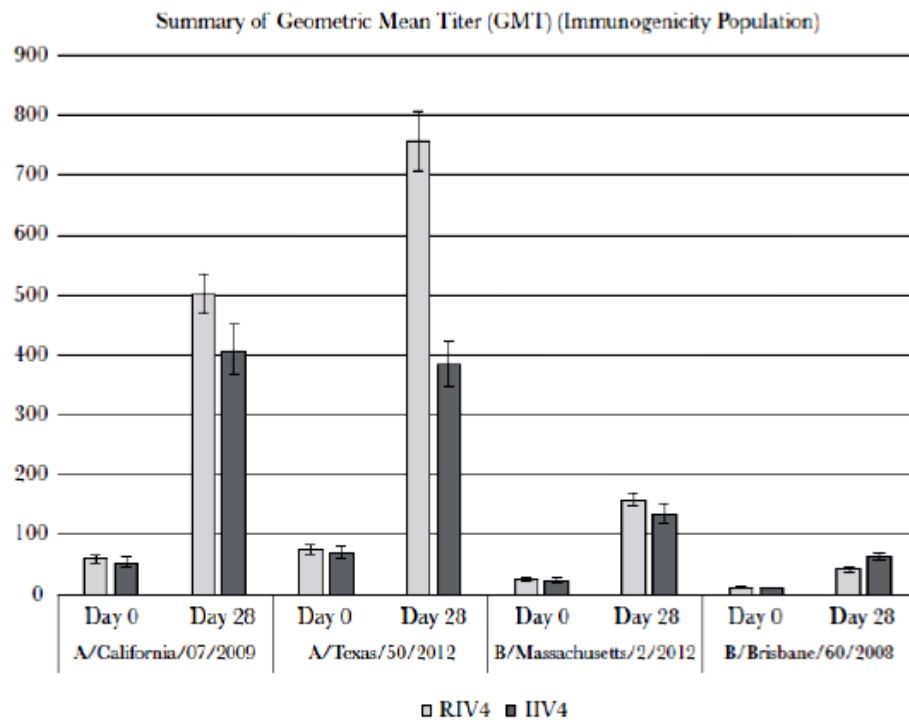
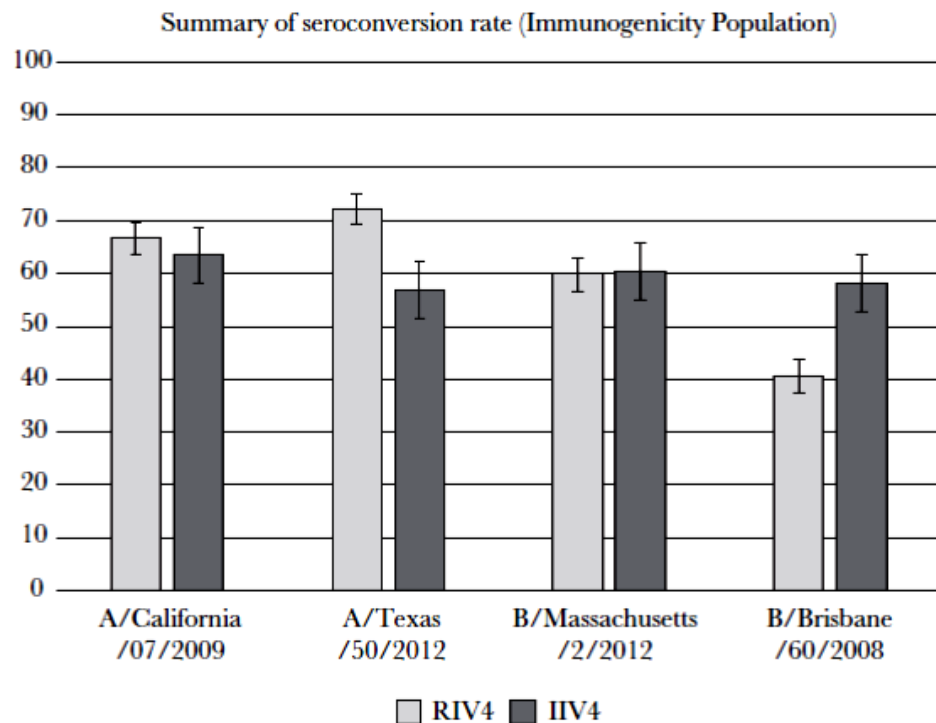
1. Nuwarda RF. *Vaccines*. 2021;17;9(9):1032;

2. Cox M. FluBlok, a recombinant hemagglutinin influenza vaccine. *Influenza other respir viruses*. 2008; 2(6):211-9.





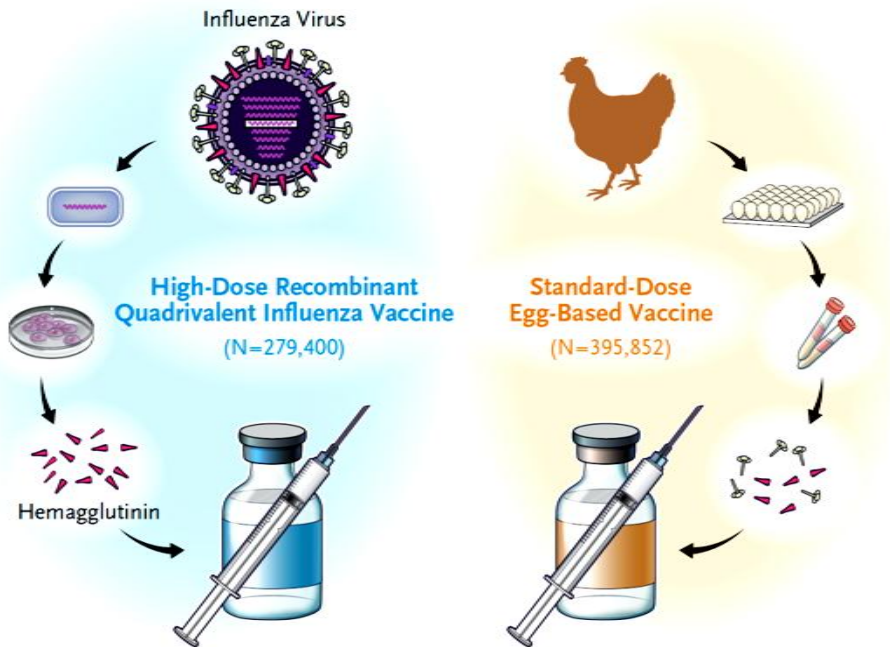
# 18~49歲成人接種Flublok(RIV4)後之抗體反應(與雞蛋培養疫苗相比)



~接種Flublok後之對A/H1N1, A/H3N2與B/Massachusetts (Yamagata-lineage)抗體反應不劣於(non-inferior to)雞蛋培養疫苗。

~接種Flublok與雞蛋培養疫苗後，對B/Brisbane (Victoria-lineage)抗體反應均較差，無法做出有意義的比較。

# Recombinant or Standard-Dose Influenza Vaccine in Adults under 65 Years of Age

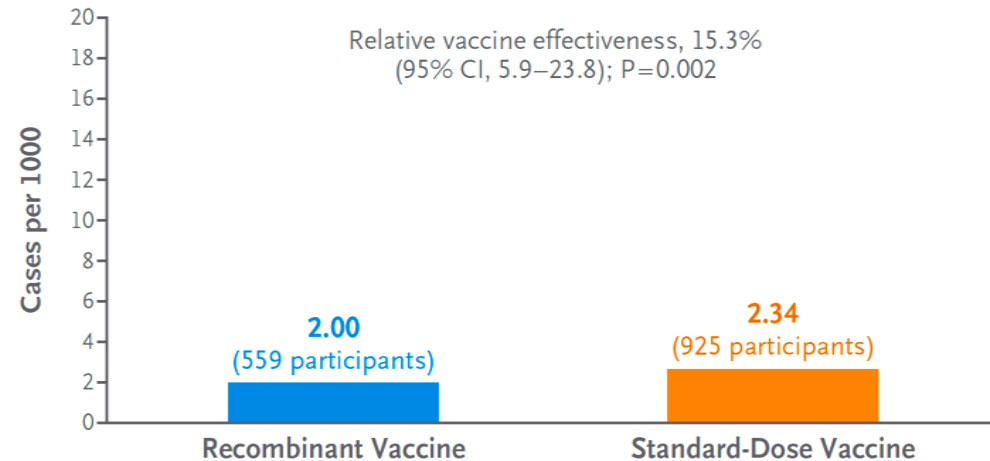


## CONCLUSIONS:

The high-dose 4-valent recombinant influenza vaccine was more effective than an egg-based standard-dose vaccine in preventing PCR-confirmed influenza among adults between 50 and 64 years of age over two influenza seasons.

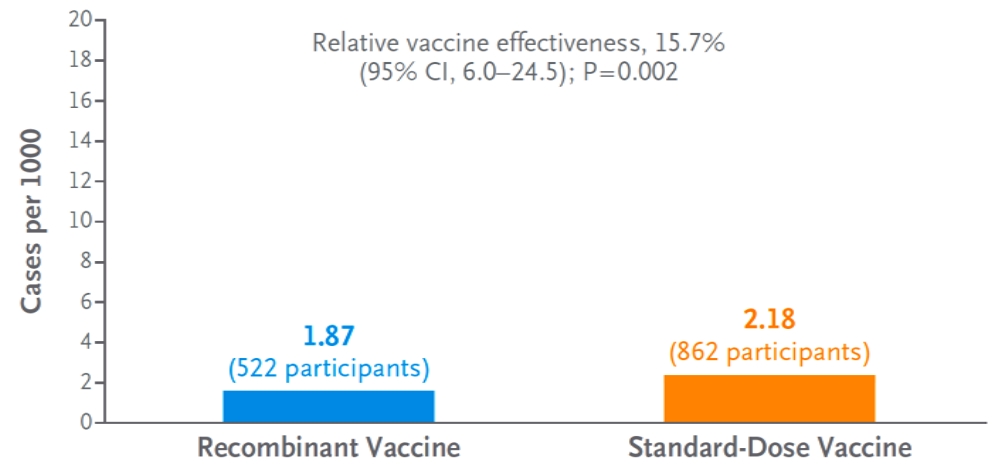
### PCR-Confirmed Influenza

Relative vaccine effectiveness, 15.3%  
(95% CI, 5.9–23.8);  $P=0.002$



### PCR-Confirmed Influenza A

Relative vaccine effectiveness, 15.7%  
(95% CI, 6.0–24.5);  $P=0.002$





# 重組型疫苗之疫苗保護力(VE)證據摘要

|                | 與安慰劑相比之疫苗保護力 <sup>1</sup>                           | 與雞蛋培養疫苗相比之疫苗保護力 <sup>2</sup>              |
|----------------|-----------------------------------------------------|-------------------------------------------|
| 流感季            | 2007-08                                             | 2014-15                                   |
| 整體 VE (95% CI) | VE 44.6% (18.8-62.6)                                | rVE=30% (10-47)                           |
| 樣本數            | 4648，隨機對照試驗                                         | 8604，隨機對照試驗                               |
| 年齡             | 18-55 歲, 平均 32.5 歲                                  | ≥ 50 歲, 平均 63 歲                           |
| 評估指標           | 類流感                                                 | 實驗室確診流感                                   |
| 分層分析           |                                                     |                                           |
| 不同病毒型別分析       | flu A= 54.4% (26.1-72.5)<br>flu B= 23.1% (-49-60.9) | flu A= 36% (14-53)<br>flu B= 4% (-72-46)  |
| 不同年齡層分析        |                                                     | 50-64歲= 42% (15-61)<br>>64歲= 17 (-20-43%) |

- ❑  $rVE=1-(\text{attack rate in rIV group}/\text{attack rate in eIV group})$
- ❑ 重組型疫苗有較好的疫苗保護力，可能因減少病毒在雞蛋培養過程中產生的變異，或因抗原含量較高所致。
- ❑ 因抗原含量較高，重組型疫苗對抗原性不符合的病毒株，可能有少部分交叉保護效果。

1. Treanor JJ, El Sahly H, King J, Graham I, Izikson R, Kohberger R, et al. Protective efficacy of a trivalent recombinant hemagglutinin protein vaccine (FluBlok®) against influenza in healthy adults: a randomized, placebo-controlled trial. Vaccine. 2011;29(44):7733-9.
2. Dunkle LM, Izikson R, Patriarca P, Goldenthal KL, Muse D, Callahan J, et al. Efficacy of recombinant influenza vaccine in adults 50 years of age or older. New England Journal of Medicine. 2017;376(25):2427-36.



# Flublok (重組型流感疫苗)接種後副作用

|                   |        | 重組型疫苗 (rIV)                                                              |
|-------------------|--------|--------------------------------------------------------------------------|
| 仿單資料              | <18歲   | 無相關資料<br>(目前報告均為18歲以上成人，僅有一篇為15-49歲，缺15歲以下副作用資料)                         |
|                   | 18-49歲 | 壓痛 (48%)<br>疼痛 (37%)<br>頭痛 (20%)<br>倦怠 (17%)<br>肌肉痠痛 (13%)<br>關節疼痛 (10%) |
| 副作用發生率: 與雞蛋培養疫苗相比 | 局部性    | 任一種局部副作用發生機率較低<br>(RR=0.94, 0.90-0.98)                                   |
|                   | 全身性    | 寒顫發生機率較高<br>(RR=1.33, 1.03-1.72)                                         |

1.Flublok美國仿單

2.Systematic review of the efficacy, effectiveness and safety of newer and enhanced seasonal influenza vaccines for the prevention of laboratory-confirmed influenza in individuals aged 18 years and over. ECDC

# Live attenuated influenza vaccines contain attenuated viruses similar to wild-type, but which do not cause influenza illness



LAIV are made up of attenuated viruses containing HA and NA from circulating viruses. Vaccine viruses rely on replication to drive protection<sup>2,6</sup>

## Attenuation process

- ❑ The virus is **attenuated, cold-adapted & temperature sensitive**<sup>2</sup>
- ❑ Donor viruses have undergone several passages with gradual reduction in temperature to **25°C**<sup>2,6</sup>

## Route of Administration



Intranasal  
Spray

## Types

- ❑ Vaccine viruses have **reduced** replicative function, replicate optimally in the nasal passages, and are **unable to replicate in the lung**<sup>2,3,6</sup>

## Mode of action

- ❑ Immune response similar to wild-type (natural influenza); does not cause illness<sup>2-6</sup>
- ❑ **Mucosal secretory antibody** response at site of potential virus infection<sup>3,5</sup>
- ❑ **Serum IgG response and cell-mediated immunity**<sup>3,4</sup>

1. World Health Organization (WHO). Types of seasonal influenza vaccine. WHO Europe website. May 13, 2010;

2. Nuwarda RF et al. *Vaccines*. 2021;17;9(9):1032;

4. Hoft et al. *J Infect Dis*. 2011;204(6):845–853;

6. FluMist. Prescribing Information. August, 2024.

3. Mohn KG et al. *Hum Vaccin Immunother*. 2018;14(3):571–578;

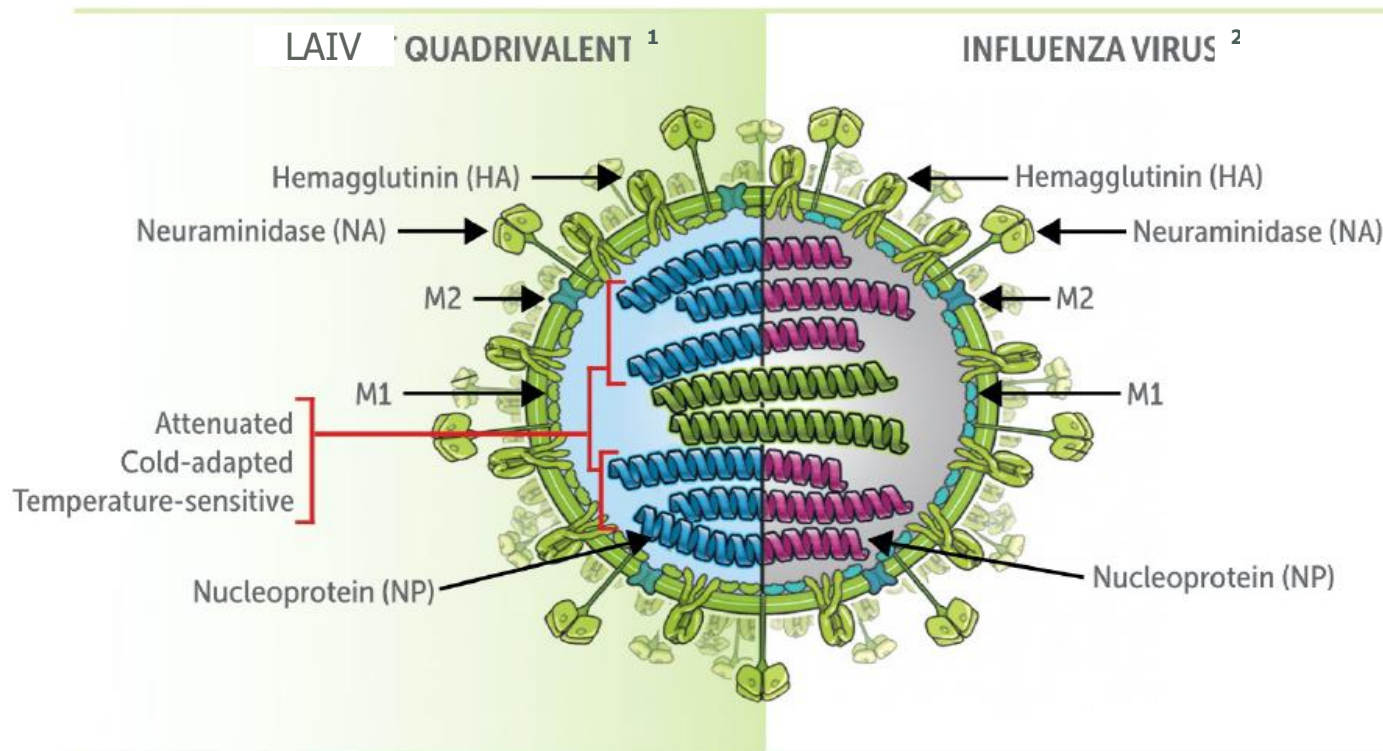
5. Beyer et al. *Vaccine*. 2002;20(9–10):1340–1353;





# LAIV Expresses the Same Surface Antigens as the Influenza Virus<sup>1,2</sup>

The vaccine virus strains express the surface proteins of hemagglutinin and neuraminidase from the wild-type viruses identified by the WHO that are expected to circulate during the season<sup>1,2,3</sup>



**A live attenuated vaccine is designed to help stimulate a natural immune response<sup>4-8</sup>**

1. FLUMIST QUADRIVALENT prescribing information. August 2023; 2. Hayden FG and Palese P. *Clinical Virology*. 4th ed. New York: Churchill Livingstone Inc; 2017:1009–1058; 3. World Health Organization. The immunological basis for immunization series; 4. Hoft DF et al. *J Infect Dis*. 2011;204(6):845–853; 5. He XS et al. *J Virol*. 2006;80(23):11756–11766; 6. Basha S et al. *Hum Immunol*. 2011;72(6):463–469; 7. Kreijtz JH et al. *Virus Res*. 2011;162(1–2):19–30; 8. Mohn KG et al. *Hum Vaccin Immunother*. 2018;14(3):571–578.



# Key Attributes of Live Attenuated Influenza Vaccine

**Live Attenuated Influenza Vaccine – for the prevention of influenza**

□ **Cold-adaptation resulted in LAIV master strains with a defined phenotype<sup>1</sup>:**



✓ **Attenuated (att):** Weakened so as not to cause influenza disease (non-virulent in ferrets)



✓ **Cold-adapted (ca):** Replicates efficiently in cooler areas of the nasopharynx (efficient growth at 25°C)



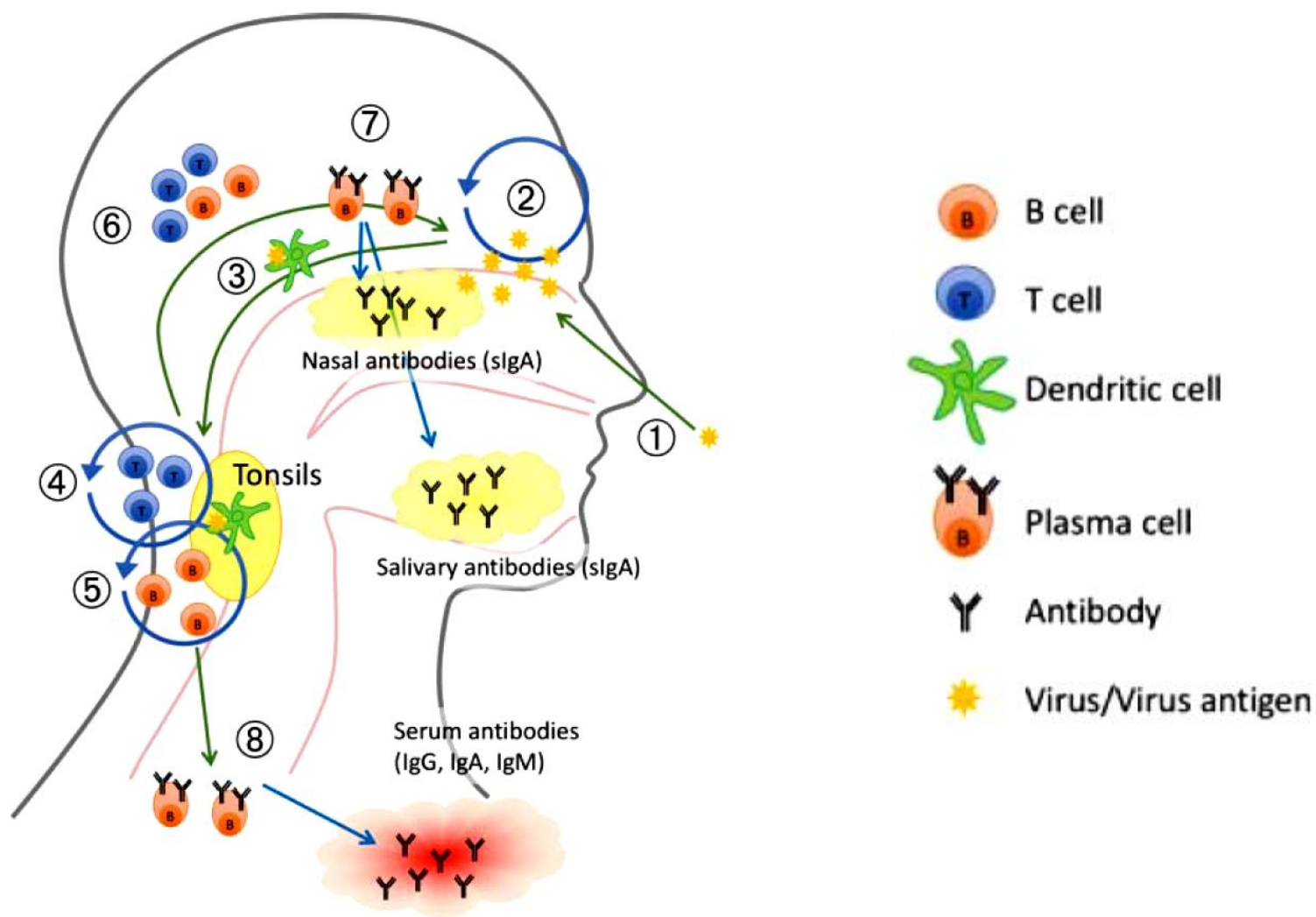
✓ **Temperature-sensitive (ts):** Does not replicate efficiently in the warmer areas of the lower respiratory tract (restricted growth at 37–39°C, which is permissive for many wild-type viruses)

□ **Phenotype is controlled by multiple loci in multiple genes (genetic stability)**





A suggested working model of how live attenuated influenza vaccine (LAIV) elicits immune response





# 感染與流感疫苗的免疫機轉比較

A comparison of the immune responses after natural infection, and immunisation with inactivated influenza vaccine (IIV) or live attenuated influenza vaccine (LAIV)

| Immune response           | Natural infection | IIV | LAIV |
|---------------------------|-------------------|-----|------|
| Serum Ab response (HI)    | ++                | +++ | +    |
| Antibody secreting cells  | ++                | ++  | +    |
| Memory B cells            | ++                | +   | ++   |
| Nasal IgA                 | ++                | -/+ | +++  |
| CD4 T-cells               | ++                | ++  | +++  |
| CD8 T-cells               | ++                | -   | +    |
| Cross protective immunity | +++               | -/+ | ++   |

# LAIV is the recommended vaccine in many countries for use in children



## Recommendations for 2024/25 season (except where indicated otherwise)

| Country                           | Population                    | Age range           | Market type                      |
|-----------------------------------|-------------------------------|---------------------|----------------------------------|
| Spain <sup>1</sup> (2023/24)      | N/A                           | >2 years            | Public and private <sup>2</sup>  |
| UK <sup>3-7</sup>                 | Healthy <sup>a</sup> children | >2 years            | Public                           |
| Austria <sup>8</sup>              | Healthy <sup>a</sup> children | 2–18 years          | Public                           |
| Denmark <sup>9</sup> (2023/24)    | Healthy <sup>a</sup> children | 2–6 years           | Public                           |
| France <sup>10</sup> (2023/24)    | Healthy <sup>a</sup> children | 2–17 years          | Public                           |
| Bulgaria <sup>11</sup> (2022/23)  | N/A                           | >6 months           | Public                           |
| Ireland <sup>12</sup> (2023/24)   | Healthy <sup>a</sup> children | 2–17 years          | Public                           |
| Poland <sup>13,14</sup> (2022/23) | At-risk children              | >6 months           | Private                          |
| Israel <sup>b,15</sup>            | Healthy <sup>a</sup> children | 2-17 years          | Public and private               |
| US <sup>16</sup>                  | Healthy <sup>a</sup> children | ≥2 years            | Public and private               |
| Finland <sup>17</sup> (2023/24)   | Healthy <sup>a</sup> children | 2–6 years           | Public                           |
| Germany <sup>18</sup>             | Healthy <sup>a</sup> children | 2–17 years          | Private <sup>19</sup>            |
| Norway <sup>20</sup>              | N/A                           | 2–17 years          | Public and private <sup>21</sup> |
| Hong Kong <sup>22</sup>           | N/A                           | ≥2 years            | Public and private <sup>23</sup> |
| Italy <sup>24</sup>               | Healthy <sup>a</sup> children | 6 months – 6 years  | Public                           |
| Slovakia <sup>25</sup> (2023/24)  | Healthy <sup>a</sup> children | 6 months – 12 years | Public <sup>26</sup>             |

**LAIV is  
preferential  
recommendation**

**LAIV and IIV  
recommended at  
parity within  
indicated  
populations**



# LAIV is Approved for Use in the US



❑ LAIV is approved for use in persons aged **2~49 years**

## Contraindications



- ❑ Severe allergic reaction to any component of LAIV, including egg protein, or after a previous dose of any other vaccine
- ❑ Concomitant aspirin therapy in children and adolescents

## Warnings and precautions



- ❑ **Children <2 years** may have an increased risk of hospitalization or wheezing following FluMist administration
- ❑ **Children <5 years with recurrent wheezing** and persons of any age with asthma may be at increased risk of wheezing following the administration
- ❑ If **Guillain–Barre syndrome** has occurred within 6 weeks of any prior influenza vaccination, the decision to give LAIV should be based on careful consideration of the potential benefits and risks
- ❑ LAIV has not been studied in **immunocompromised** individuals

# LAIV is Approved for Use in the Taiwan on April 2<sup>nd</sup> 2025 by TFDA



LAIV is approved for use in children & adolescents aged **24 months ~ 17 years**

## Contraindications



- ❑ **Severe allergic reaction** to any component of LAIV, including egg protein, or after a previous dose of any other vaccine
- ❑ **Concomitant aspirin** therapy in children and adolescents
- ❑ **Severe immunocompromised** children/adolescent such as acute and chronic leukaemias, lymphoma, symptomatic HIV infection, cellular immune deficiencies, and high-dose corticosteroids

## Warnings and precautions



- ❑ Children **<5 years with recurrent wheezing** and persons of any age with asthma may be at increased risk of wheezing following the administration
- ❑ If **Guillain–Barre syndrome** has occurred within 6 weeks of any prior influenza vaccination, the decision to give LAIV should be based on careful consideration of the potential benefits and risks
- ❑ LAIV has **not** been studied in **immunocompromised** individuals
- ❑ Prevent to **close contact** with severe immunocompromised patients



# Summary of LAIV



**Influenza has a substantial burden of disease in the US<sup>1</sup>**



**Annual vaccination is the most important step in preventing influenza-associated illness, hospitalization, and death<sup>2,3</sup>**



**Providing alternative influenza vaccine formulation options may increase vaccination coverage<sup>4</sup>**

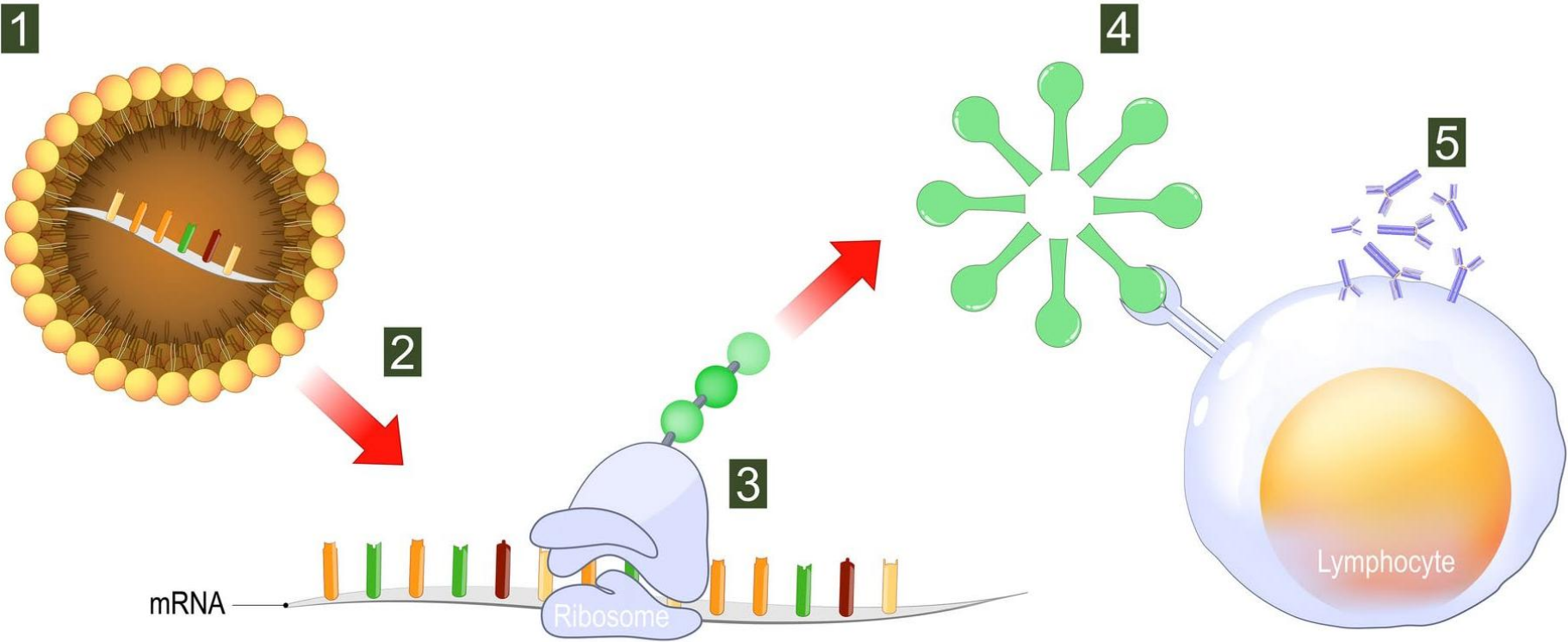


**LAIV induces a broad immune response that closely resembles natural immunity to influenza<sup>7</sup>**



**Intranasally administered LAIV is an effective and important vaccine option<sup>4,8,9</sup>**

# mRNA Vaccine



1. The encapsulation of a mRNA into a lipid nanoparticle

2. Messenger RNA (mRNA) delivery into target cells

3. Ribosomes read the mRNA and produce antigens

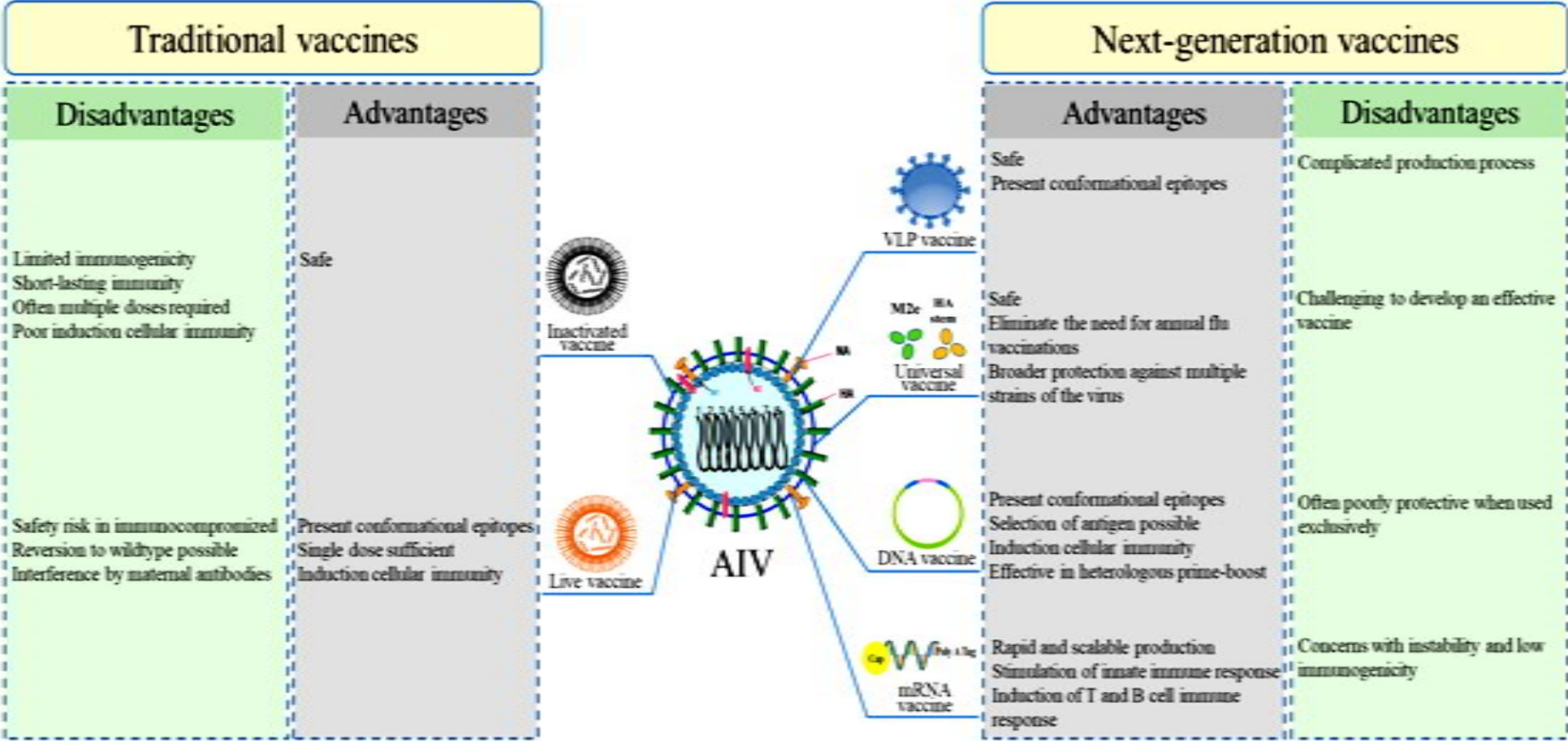
4. Antigens presented to T-cells and B cells

5. Antigens stimulate cellular immunity, and humoral immunity



# 各種流感疫苗的優缺點

Advantages and disadvantages of traditional and next-generation influenza vaccines.







# 2024~2025 台灣流感疫苗種類



| 廠牌    | 法國賽諾菲                 | 國光                        | 台灣東洋                      | GSK葛蘭素               | 台灣東洋        | 高端    |
|-------|-----------------------|---------------------------|---------------------------|----------------------|-------------|-------|
| 名稱    | 巴斯德<br>Vaxigrip Tetra | 安定伏<br>AdimFlu-S<br>(QIS) | 輔流威適<br>FLUCELVAX<br>QUAD | 伏適流<br>Fluarix Tetra | Fluad Tetra |       |
| 製造產地  | 法國                    | 台灣                        | 德國                        | 德國                   | 英國          | 韓國    |
| 培養方式  | 雞蛋胚胎                  | 雞蛋胚胎                      | MDCK細胞培養                  | 雞蛋胚胎                 | 雞蛋胚胎        | 雞蛋胚胎  |
| 價數    | 4價                    | 4價                        | 4價                        | 4價                   | 4價          | 4價    |
| 施打對象  | 6個月以上                 | 3歲以上                      | 6個月以上                     | 6個月以上                | >65歲成人      | >3歲   |
| 公費/自費 | 公費/自費                 | 公費/自費                     | 公費/自費                     | 公費/自費                | 全自費         | 公費/自費 |

# WHO近期對B/Yamagata病毒株抗原成分 自流感疫苗移除建議之因應



- ❑ 自2020年3月以來，WHO未檢測到有自然發生的B/Yamagata株，評估B/Yamagata病毒已不再於人群中傳播，所造成之公衛威脅大幅下降。
- ❑ 製造和使用含有B/Yamagata病毒株的活性與非活性流感疫苗，理論上有風險導致該病毒株重新在人群流行，而將B/Yamagata病毒株移除，可去除此風險。
- ❑ 因此，WHO流感疫苗病毒株組成諮詢委員會認為，在流感疫苗中不再需要包含B/Yamagata病毒株的抗原，建議儘速自疫苗組成中移除。
- ❑ 各國主管機關應評估是否使用TIV/QIV及其相對效益。

## ❑ 藥政單位監管挑戰：

- ✓ 在不同地區，恢復到三價配方的藥政單位監管過程存在差異
- ✓ 在美國，所有四價疫苗的製造商最初都獲得了生產三價疫苗的許可
- ✓ 儘管目前有些三價疫苗仍然獲得許可，但目前處於「停產」狀態

❑ **製造挑戰：**國際上大多數流感疫苗製程已變更為QIV適用之製程，但各製造廠變更幅度與內容可能不同

## ❑ B/Yamagata 病毒再度出現的風險：

- ✓ 目前的監測系統足以監控B/Yamagata病毒株是否再次出現
- ✓ 保留QIV許可證將有助於提供適當的疫苗應變

# 2024~2026 流感季流感疫苗



| Table 1: Influenza Vaccine Composition Recommendations <sup>1,3</sup> |                                                      |                                                      |                                                      |                                                      |
|-----------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|
|                                                                       | 2025-26 Season                                       |                                                      | 2024-25 Season                                       |                                                      |
|                                                                       | Egg-Based Vaccines                                   | Cell – or Recombinant-Based Vaccines                 | Egg-Based Vaccines                                   | Cell – or Recombinant-Based Vaccines                 |
| Influenza A/H3N2<br><b>H3N2</b>                                       | A/Croatia/10136 RV/2023 (H3N2)-like virus            | A/District of Columbia/27/2023 (H3N2)-like virus     | A/Thailand/8/2022 (H3N2)-like virus                  | A/Massachusetts/18/2022 (H3N2)-like virus            |
| Influenza A/H1N1pd<br>m09-like virus<br><b>H1N1</b>                   | A/Victoria/4897/2022 (H1N1)pdm09-like virus          | A/Wisconsin/67/2022 (H1N1)pdm09-like virus           | A/Victoria/4897/2022 (H1N1)pdm09-like virus          | A/Wisconsin/67/2022 (H1N1)pdm09-like virus           |
| Influenza B/Victoria lineage<br><b>Bv</b>                             | B/Austria/13594/2021 (B/Victoria lineage)-like virus | B/Austria/13594/2021 (B/Victoria lineage)-like virus | B/Austria/13594/2021 (B/Victoria lineage)-like virus | B/Austria/13594/2021 (B/Victoria lineage)-like virus |



# 114年度公費三價流感疫苗採購作業及評選結果

因應今(114)年秋冬流感疫情整備，已於4月23日完成今年公費三價流感疫苗採購作業，考量高齡人口成長，以及因應疫情變化或民眾接種意願提升之額外下訂需求，總計採購**686萬4,910劑**，其中計畫實施對象**647萬9080劑**，較去年增加約**4.2萬劑**。本採購作業循例仍採適用最有利標、複數決標方式辦理，評選結果已於今日公告，由**5家廠商得標**，依合約規定於**9月下旬至10月中旬**分三批次交貨。

今年1月經傳染病防治諮詢會流感防治組及預防接種聯席會議決議，依WHO建議採購三價流感疫苗。目前國內**取得三價流感疫苗許可證廠商共有5家**，由於各家廠商疫苗之製程、核准適用年齡、單價及最大供貨量等均有差異，為確保廠商履約品質並順利供貨，保障國人健康，今年維持與113年相同採最有利標方式辦理，**5家領有流感疫苗許可證之廠商均有投標**，就其疫苗產品提出符合採購案需求之供應計畫及報價，經召開採購評選委員會會議，針對疫苗效益、價格、廠商履約能力、產品異常事件之因應處理原則、供貨時效/穩定性/回報完整性與透明度、額外供貨配合度及廠商企業社會責任等項目進行評選，擇定序位前5名為最有利標廠商，並依各序位之供貨比例決標，分別為**國光生物科技股份有限公司316萬5,830劑(占47.5%)**、**荷商葛蘭素史克藥廠股份有限公司台灣分公司(授權裕利股份有限公司投標及履約)174萬9,540劑(占26.3%)**、**台灣東洋藥品工業股份有限公司75萬2,300劑(占11.3%)**、**賽諾菲股份有限公司60萬8,320劑(占9.1%)**、**高端疫苗生物製劑股份有限公司38萬8,920劑(占5.8%)**，另視實際需求再額外下訂量為每家廠商各4萬劑。

今年度公費流感疫苗決標量共686萬4,910劑，包括確定採購量666萬4,910劑(含114年度流感疫苗接種計畫實施對象所需疫苗量647萬9,080劑、中央及地方委託代購量18萬5,830劑)，以及可視實際需求再額外下訂之數量20萬劑。相較去年決標量688萬8200劑雖略減約2.3萬劑，但今年度計畫實施對象647.9萬劑，實際較去年增加約4.2萬劑，以反映國內高齡人口成長趨勢。去年決標之計畫實施對象所需疫苗量為643萬6910劑，中央及地方委託代購量為20萬1290劑，可視實際需求再額外下訂之數量為25萬劑(去年11月實際下訂15萬劑)。





# 提升流感疫苗接種率之各項措施

## 幼兒或特定對象催注

- ✓勾稽**NIIS**或戶籍名冊，以明信片、簡訊、電話語音等通知
- ✓幼兒園入園接種

## 提升接種可近性

- ✓設置多元場域便民接種站，如捷運站、大賣場、職場、老福機構、矯正機關等
- ✓媒合縣市政府針對所屬機關尚未接種者，辦理集中接種
- ✓配合衛生所整合性篩檢活動或社區長者活動據點，設置社區接種站

## 盤點尚未接種權管族群催注

- ✓轄區重點醫院/基層診所之醫事人員
- ✓港埠**CIQS**、托育人員、安養機構、禽畜及動物防疫等其他計畫對象

## 提供接種誘因

- ✓增加轄區衛生所/健康服務中心行政誘因，如敘獎、考評加分等
- ✓憑簡訊免掛號費等
- ✓接種送獎品、或辦理抽獎等



# 謝謝！



*"Normally, I start with deep breathing to help relieve workplace stress, but in this case..."*

## Don't forget your flu shot!

