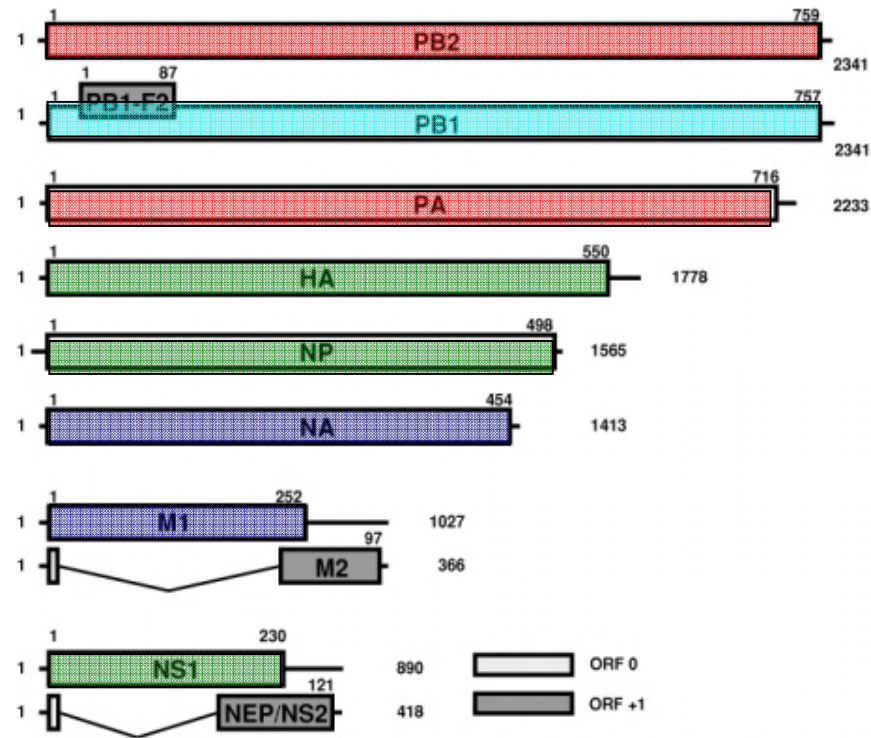


A microscopic image showing numerous spherical influenza A (H1N1) virus particles. The particles are bright green and have a distinct outer shell with surface proteins. They are scattered across the field of view against a dark background.

# The Influenza A (H1N1 Human Swine) Pandemic

## North America (A/Mexico/ /2009 [H1N1]), Influenza A virus, April 2009:

- H1N1 & H3N2 viruses are endemic among pig populations in many countries
- Reassortment H1N1: An unusual mix of genetic sequences
- 4 unique virus sources



North American  
Human Origin

North American  
Swine Origin

Eurasian Swine  
Origin

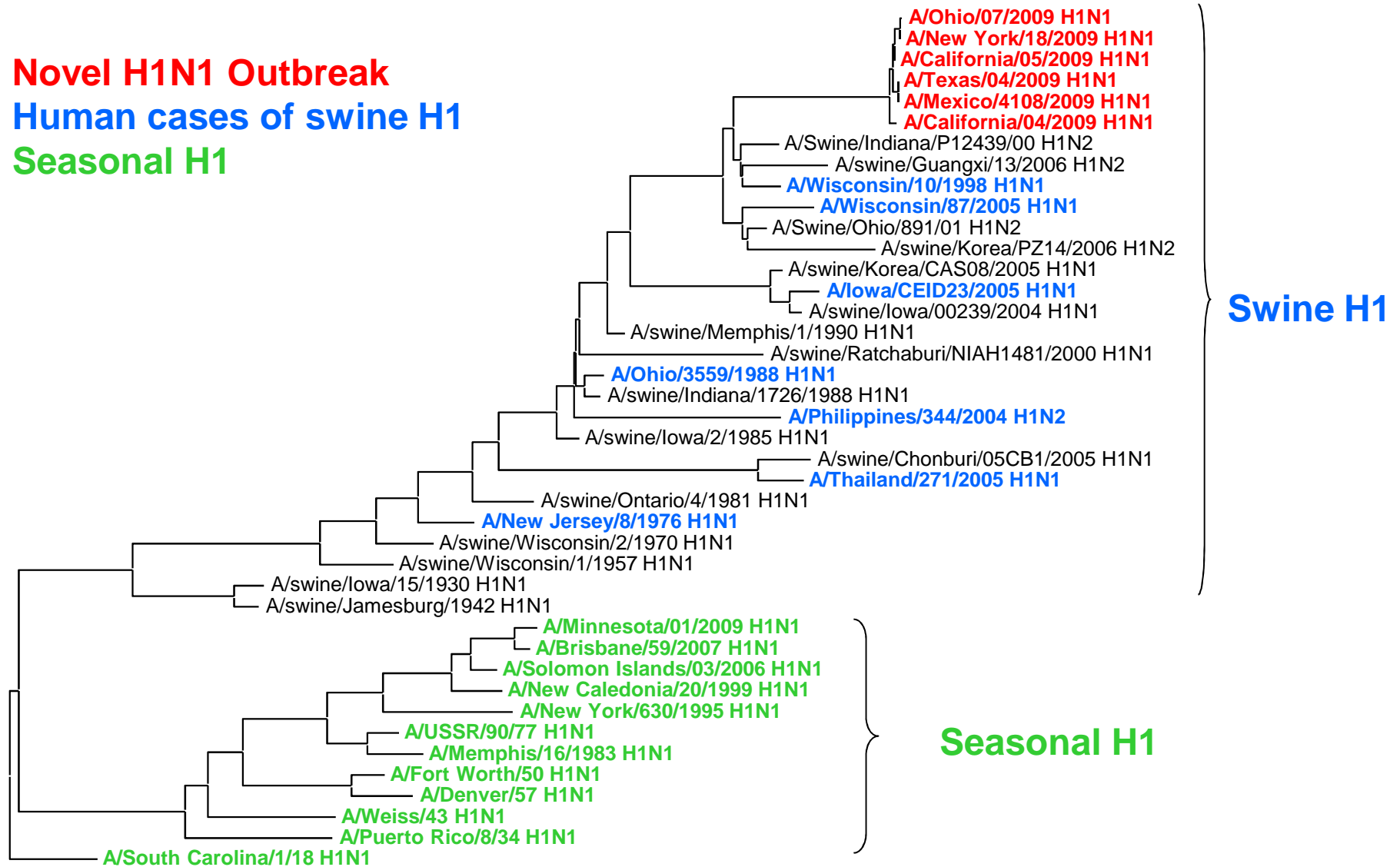
North American  
Avian Origin

# Phylogenetic Tree of Hemagglutinin H1: Swine vs. Seasonal

**Novel H1N1 Outbreak**

**Human cases of swine H1**

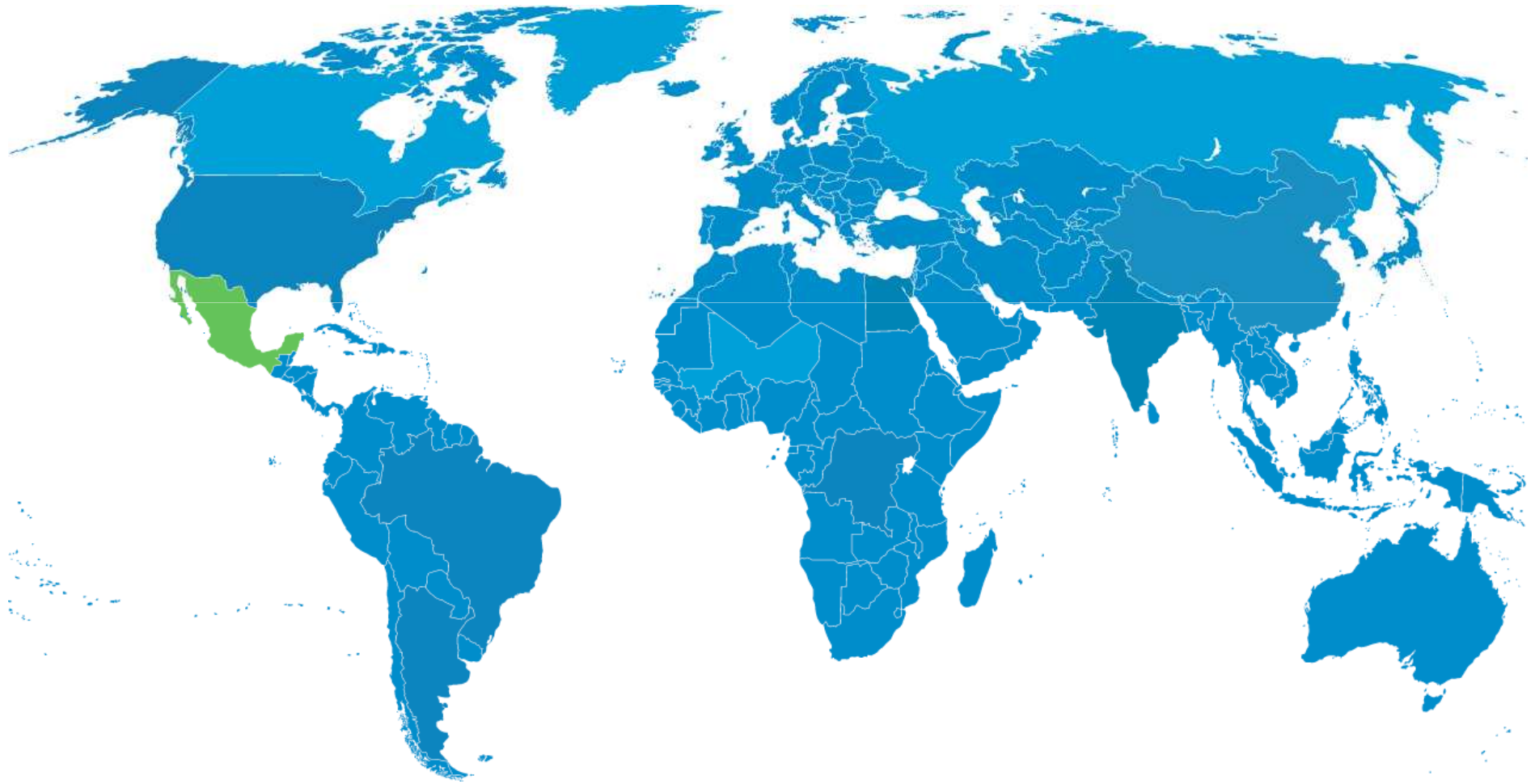
**Seasonal H1**



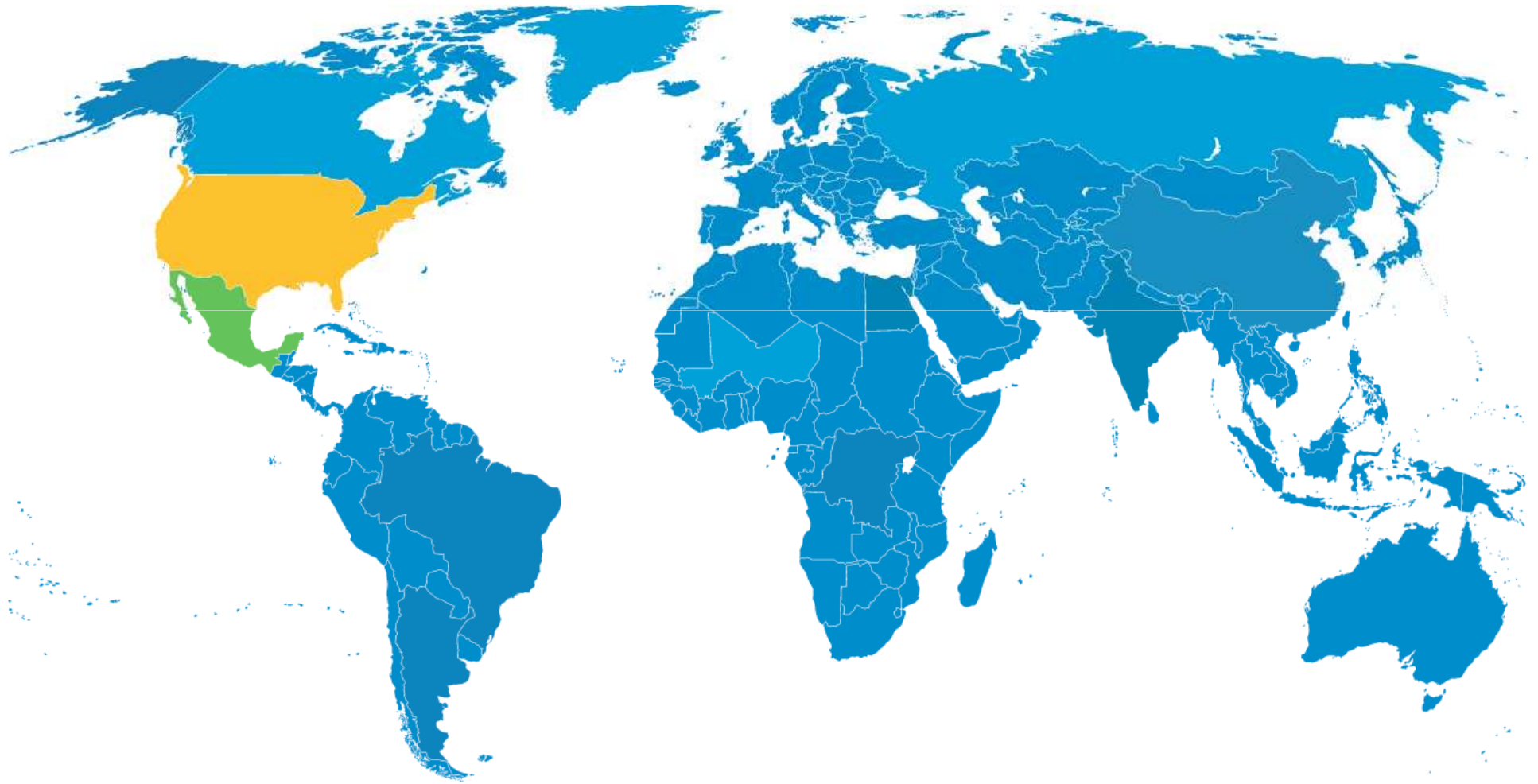
0.02

(Garten, et al Science 2009)

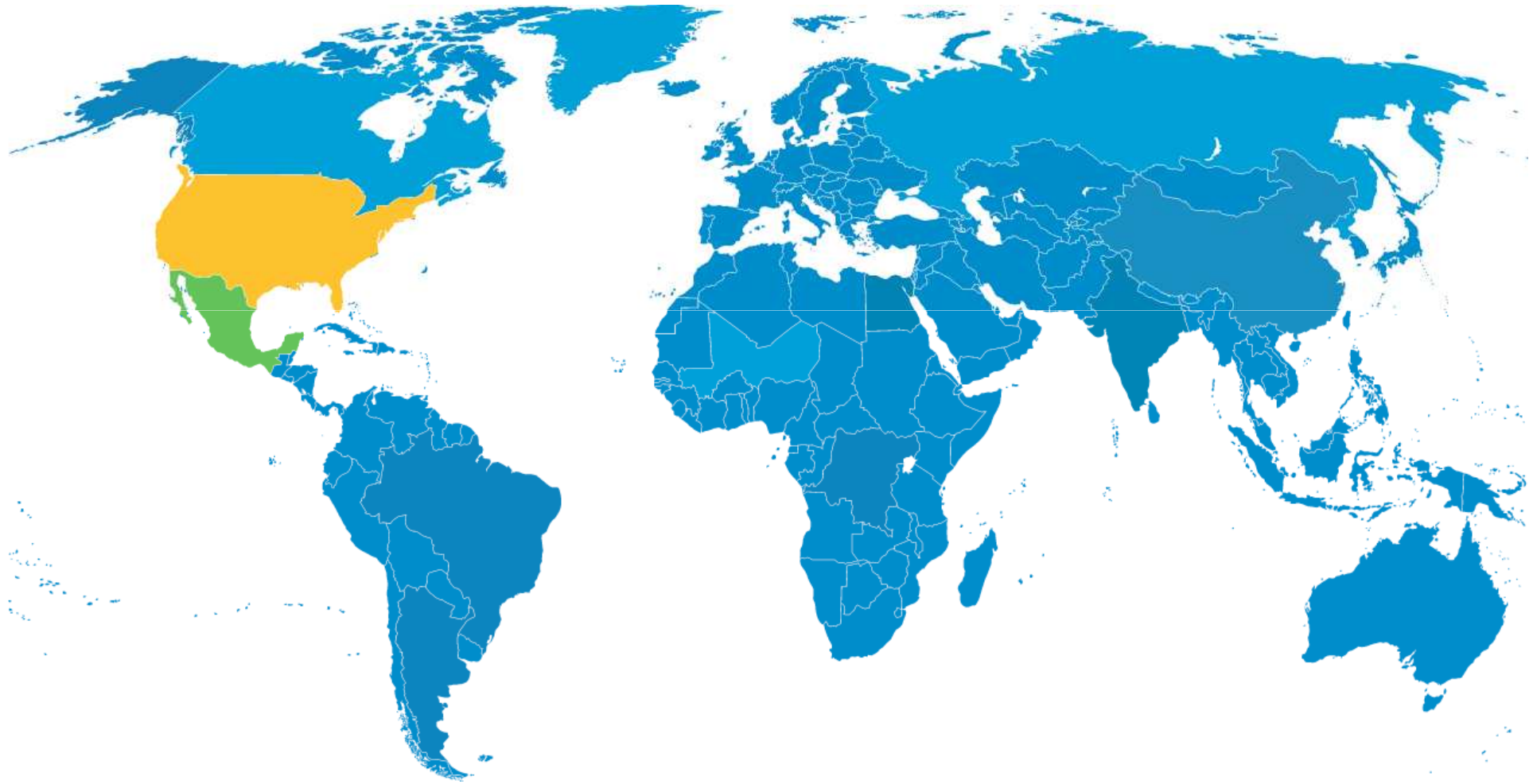
**April 14** First Death Due to Later Identified  
**H1N1** in Mexico



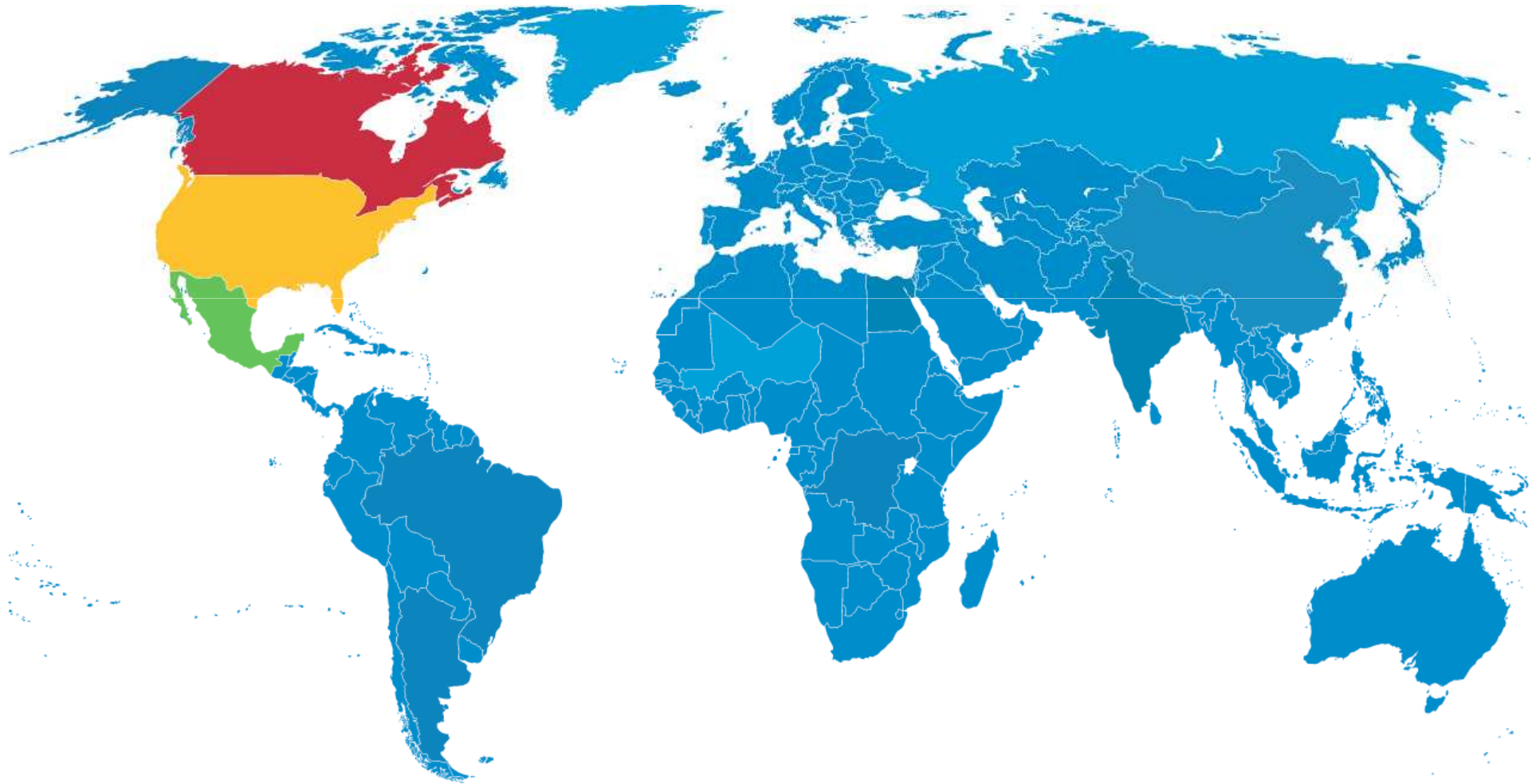
**April 15** First Cases of Novel **H1N1** Virus  
Recognized in California



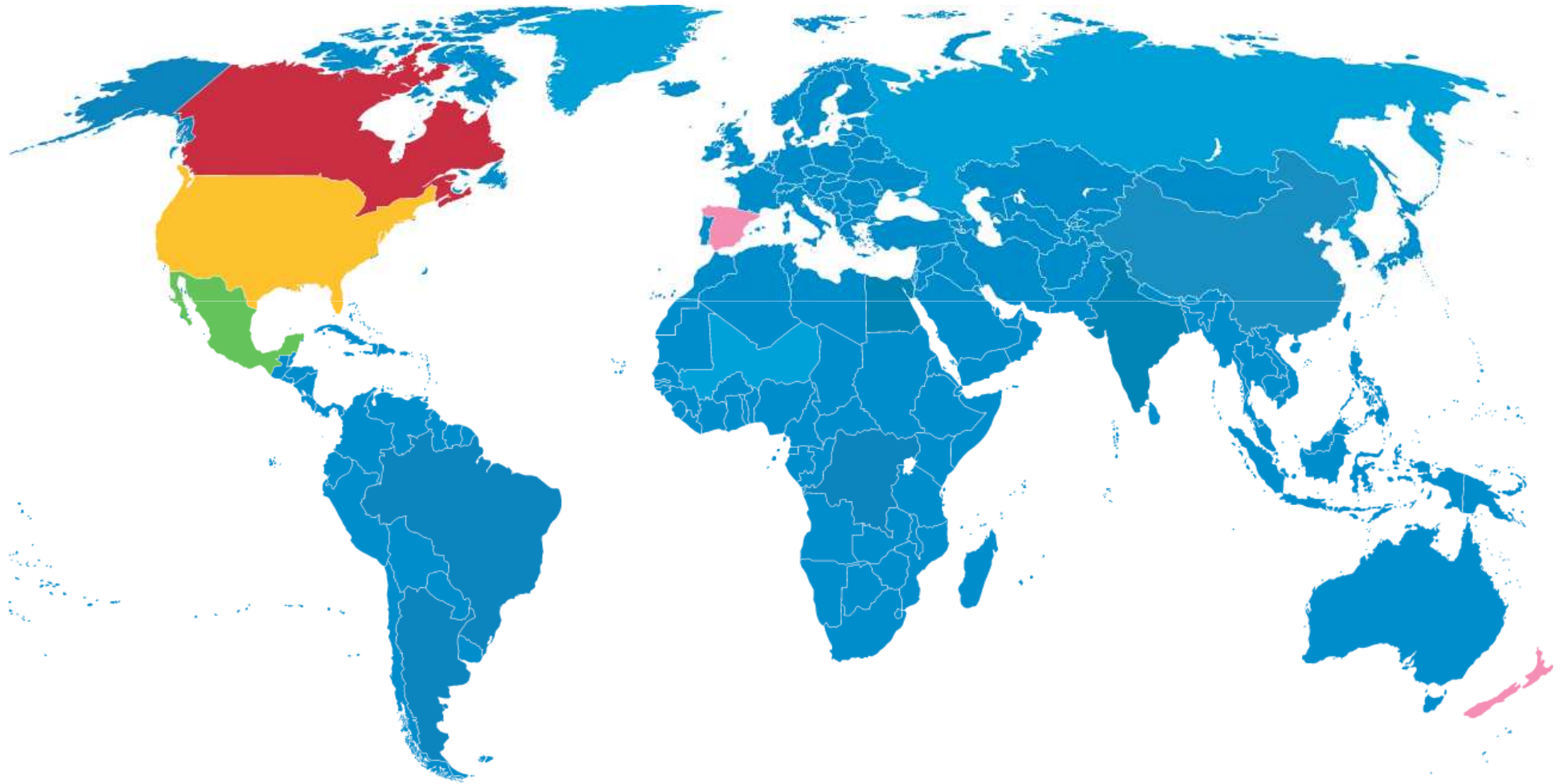
**April 23** Mexican Cases of Severe Respiratory Illness are Confirmed as **H1N1**



**April 25** First Cases of the new Influenza A  
**H1N1** Virus Recognized in Canada

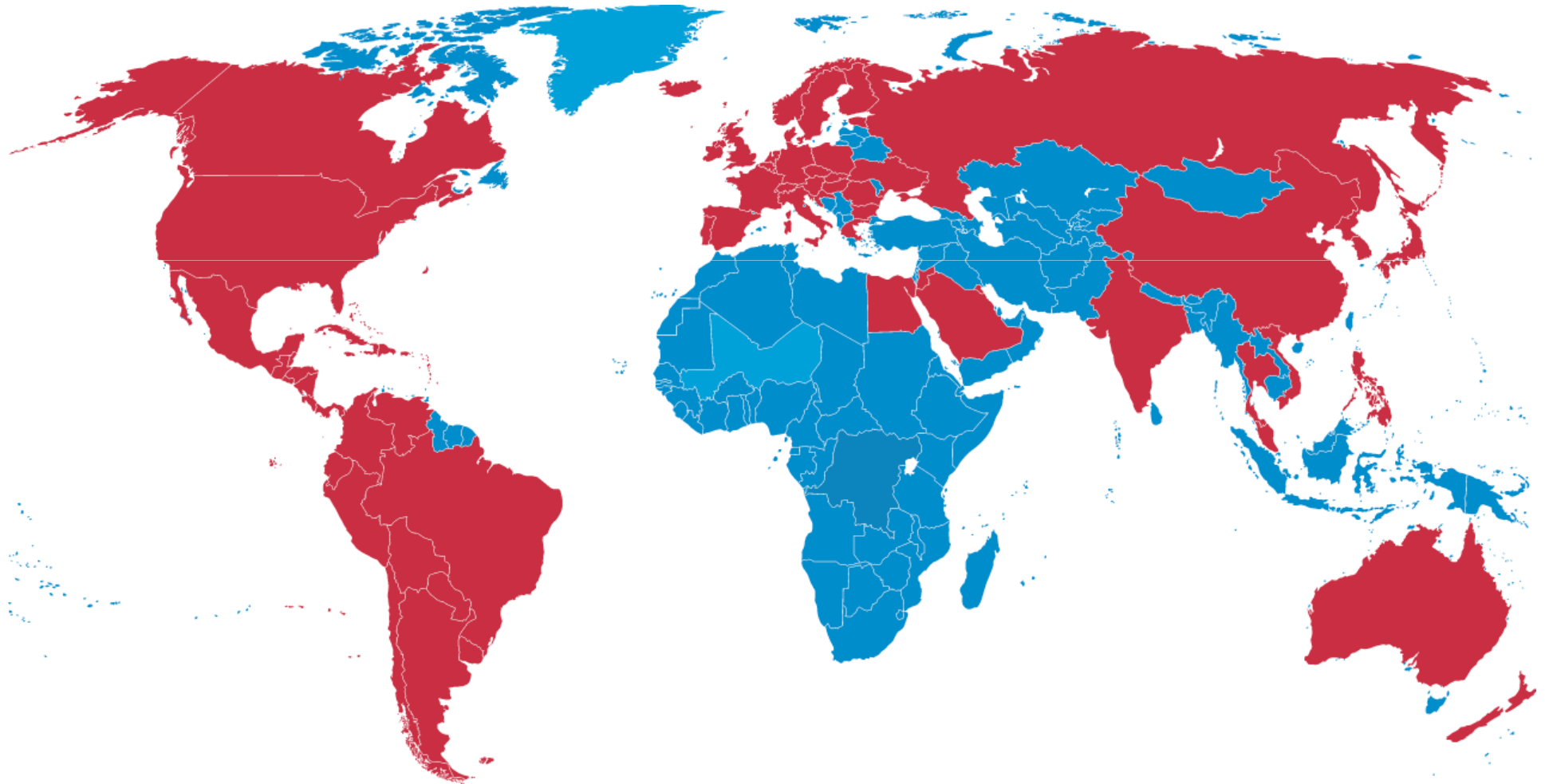


**April 25** First Cases of the new Influenza A  
**H1N1** Virus Recognized Outside of North  
America

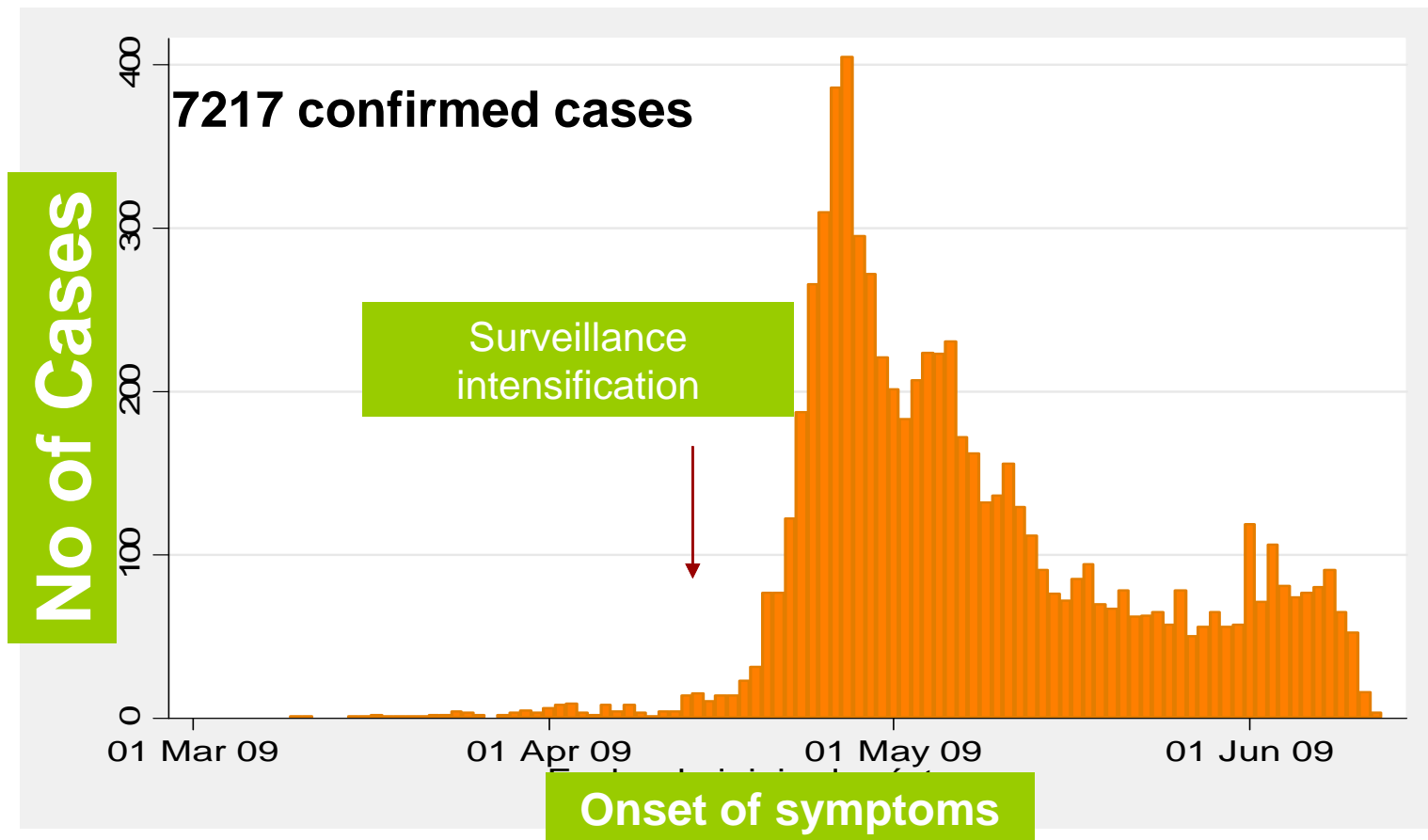




**June 11** WHO Declares **Phase 6** Level  
of Pandemic Influenza Alert



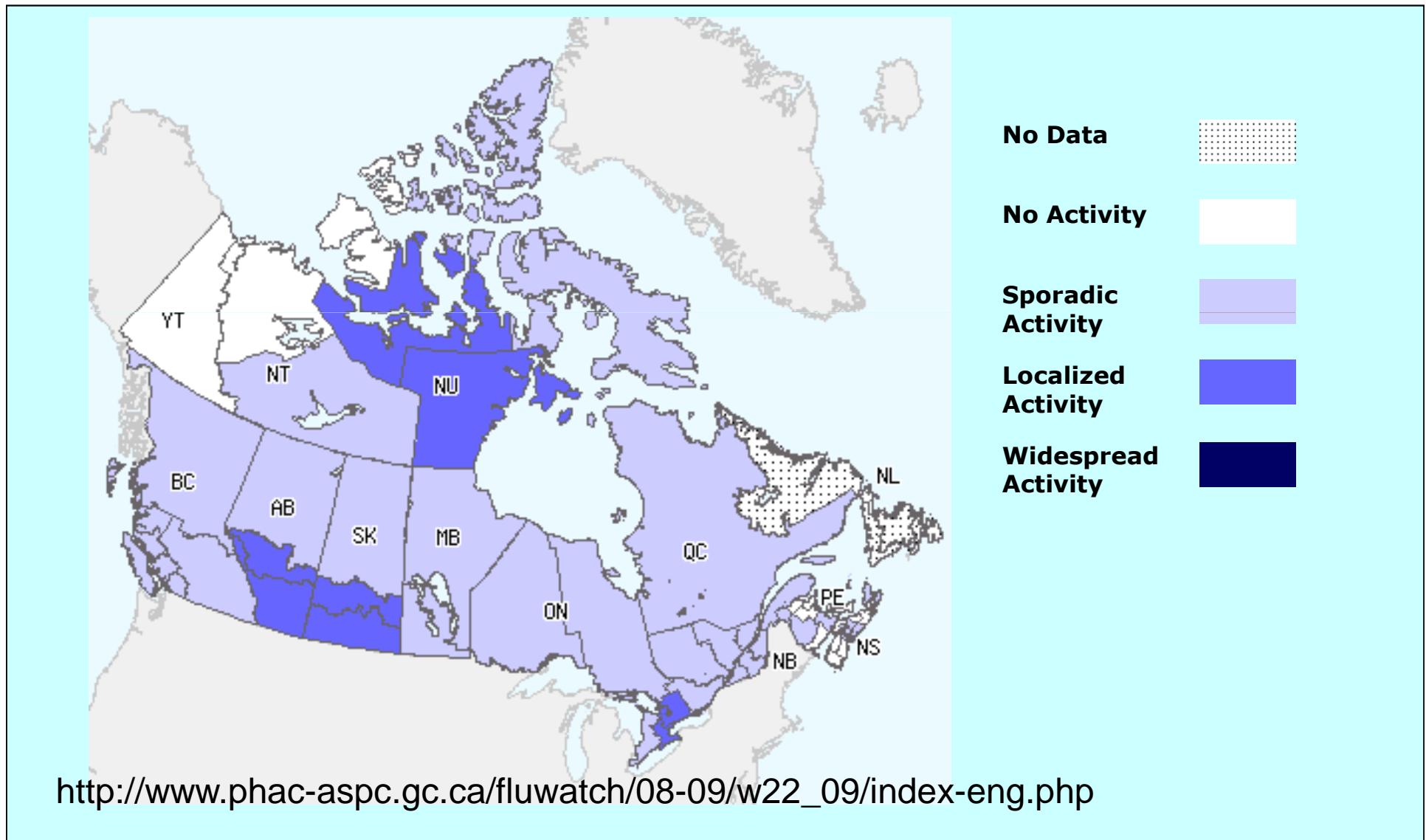
# Laboratory confirmed cases of Influenza A H1N1 March/11-June 16



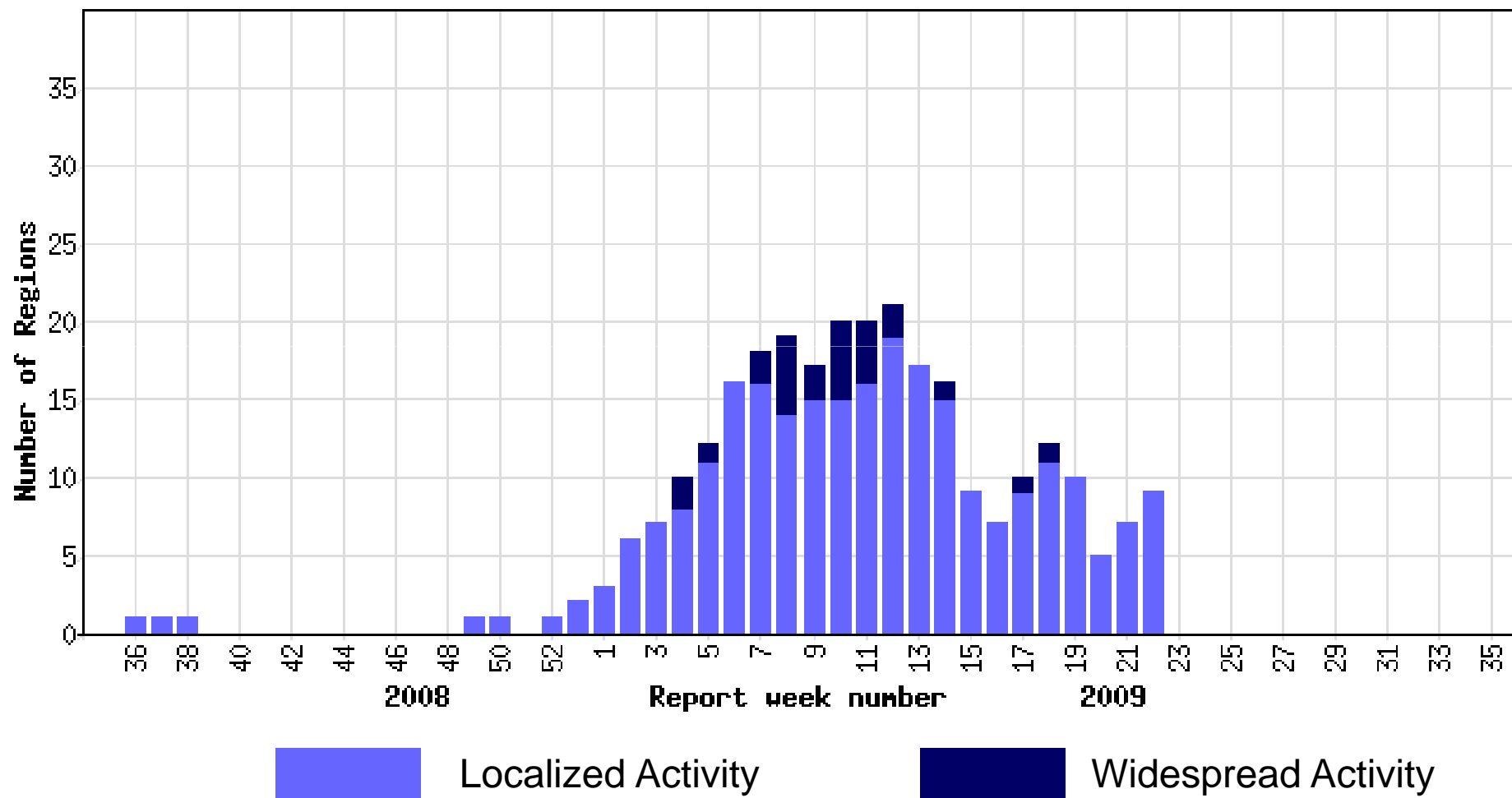
| June 18th    | AH1/sw      | FluA        | Neg A        | Repeat     | Total samples |
|--------------|-------------|-------------|--------------|------------|---------------|
| <b>Total</b> | <b>7847</b> | <b>4269</b> | <b>18718</b> | <b>337</b> | <b>31171</b>  |

# Influenza Activity Level by Provincial and Territorial Influenza Surveillance Regions

Canada, May 31 to June 06, 2009 (Week 22)

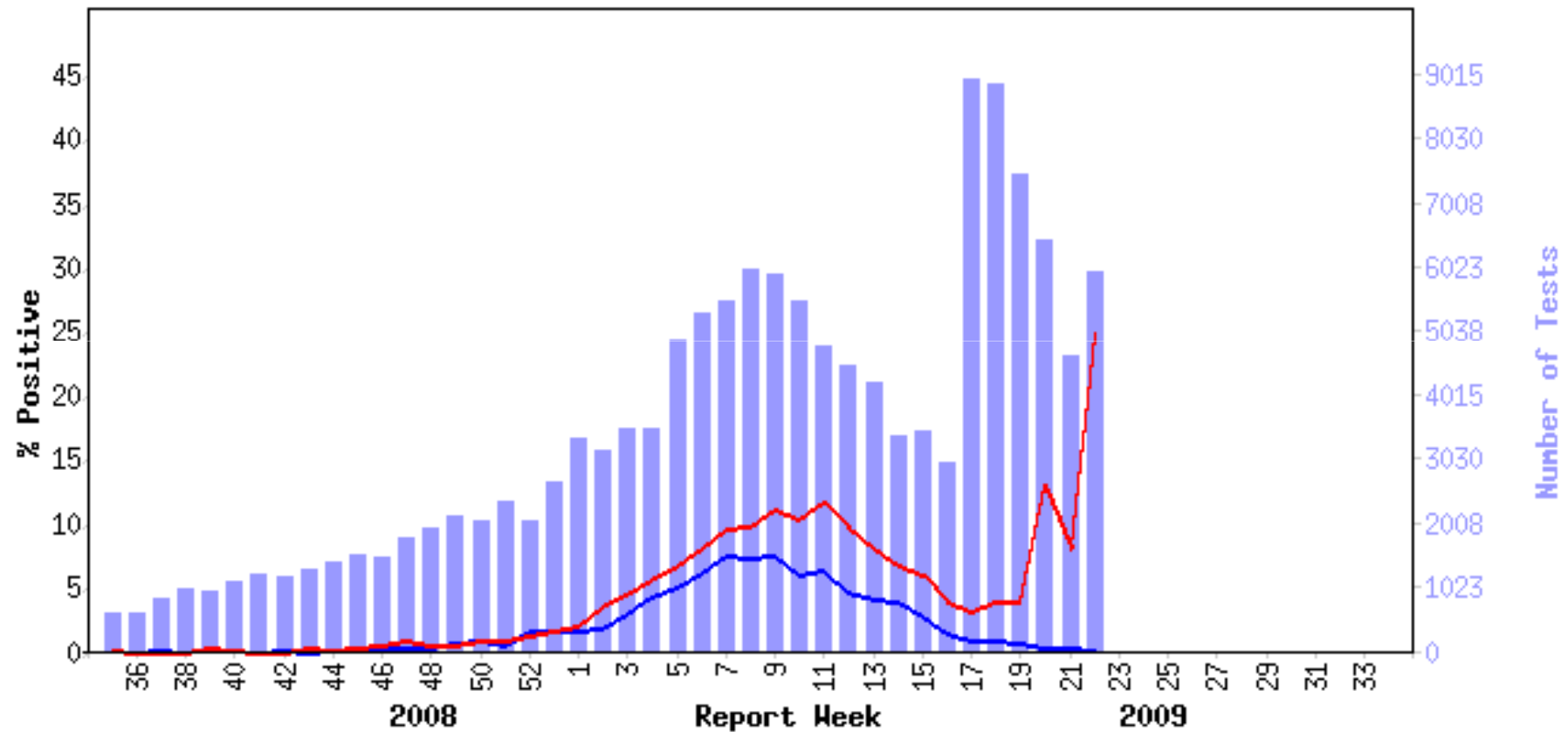


# Number of influenza surveillance regions reporting widespread or localized influenza activity, Canada, by report week, 2008-2009 (N=54)



[http://www.phac-aspc.gc.ca/fluwatch/08-09/w22\\_09/index-eng.php](http://www.phac-aspc.gc.ca/fluwatch/08-09/w22_09/index-eng.php)

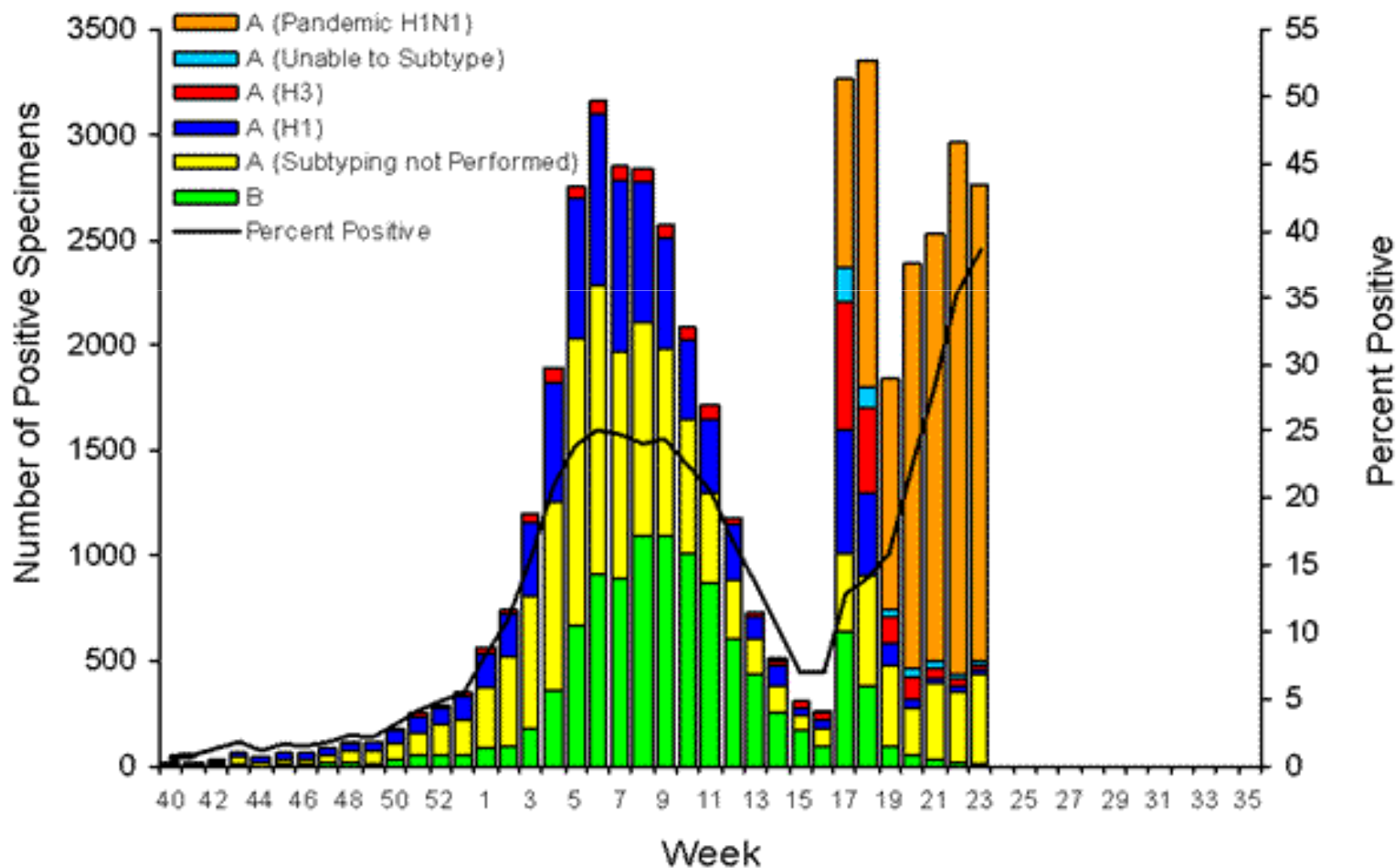
## Influenza tests reported and percentage of tests positive, Canada, by report week, 2008-2009



[http://www.phac-aspc.gc.ca/fluwatch/08-09/w22\\_09/index-eng.php](http://www.phac-aspc.gc.ca/fluwatch/08-09/w22_09/index-eng.php)



# Influenza Positive Tests reported to CDC by US WHO/NREVSS Collaborating Laboratories, National Summary 2008-2009



# Cumulative number of laboratory-confirmed cases of Influenza A (H1N1) status as of June 17, 2009



Cumulative number of laboratory-confirmed cases of influenza A(H1N1)  
Status as of 17 June 2009, 12:00 GMT

Help

Cases

20,000



Click to view timeline reports

Cumulative up to:

- 17 June 2009, 12:00 GMT
- 15 June 2009, 17:00 GMT
- 12 June 2009, 07:00 GMT
- 11 June 2009, 14:00 GMT
- 10 June 2009, 06:00 GMT
- 8 June 2009, 06:00 GMT

| World  | New  | Cumulative |
|--------|------|------------|
| Deaths | 4    | 167        |
| Cases  | 3692 | 39620      |

As of 17 June 2009, Chinese Taipei has reported 58 confirmed cases of influenza A (H1N1) with 0 deaths. Cases from Chinese Taipei are included in the cumulative totals provided in the table above.

| Country, territory and area              | New cases since previous update | Cumulative total |
|--|---------------------------------|------------------|
| United Kingdom, Jersey, Crown Dependency | 1                               | 1                |
| United States of America                 | 0                               | 17855            |
| Uruguay                                  | 0                               | 36               |
| Venezuela (Bolivarian Republic of)       | 20                              | 45               |
| Viet Nam                                 | 2                               | 27               |
| West Bank and Gaza Strip                 | 0                               | 2                |
| <b>World Total</b>                       | <b>3692</b>                     | <b>39620</b>     |
| Yemen                                    | 1                               | 1                |



[Click here for latest Influenza A\(H1N1\) updates from WHO.](#)

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Use mouse to select data. Use Ctrl-key to make multiple selections. Click right mouse button to clear selections

<http://gamapservr.who.int/h1n1/atlas.html?select=ZZZ&filter=filter4,confirmed>

# Characteristics and Symptoms of the 642 Patients with Confirmed Swine-Origin Influenza A (H1N1)

**Table 1. Characteristics and Symptoms of the 642 Patients with Confirmed Swine-Origin Influenza A (H1N1).**

| Characteristic  | Value         |
|---|---------------|
| Male sex — no./total no. (%)                              | 302/592 (51)  |
| Age   |               |
| Median — yr   | 20            |
| Range — yr  | 3 mo to 81 yr |
| Age group — no./total no. (%)                             |               |
| 0–23 mo   | 14/532 (3)    |
| 2–4 yr  | 27/532 (5)    |
| 5–9 yr  | 65/532 (12)   |
| 10–18 yr  | 212/532 (40)  |
| 19–50 yr  | 187/532 (35)  |
| ≥51 yr  | 27/532 (5)    |
| Student in school outbreak — no./total no. (%)            | 104/642 (16)  |
| Recent history of travel to Mexico — no./total no. (%)*   | 68/381 (18)   |
| Clinical symptoms — no./total no. (%)                     |               |
| Fever   | 371/394 (94)  |
| Cough   | 365/397 (92)  |
| Sore throat   | 242/367 (66)  |
| Diarrhea  | 82/323 (25)   |
| Vomiting  | 74/295 (25)   |
| Hospitalization — no./total no. (%)                       |               |
| Total   | 36/399 (9)    |
| Had infiltrate on chest radiograph                        | 11/22 (50)    |
| Admitted to intensive care unit                           | 8/22 (36)     |
| Had respiratory failure requiring mechanical ventilation  | 4/22 (18)     |
| Treated with oseltamivir                                  | 14/19 (74)    |
| Had full recovery   | 18/22 (82)    |
| Vaccinated with influenza vaccine during 2008–2009 season | 3/19 (16)     |
| Died  | 2/36 (6)      |

51% Male

Age Range - 3 months to 81 years  
 •Between 10 and 18 years (40%)  
 •51 years of age or older (5%)

## Symptoms

- fever (94%)
- cough (92%)
- sore throat (66%).
- diarrhea (25%)
- vomiting (25%)

## Hospitalization

Total (9%)  
 Age Range - 19 months to 51 years  
 Admitted to ICU (36%)  
 Mechanical ventilation (18%)  
 Oseltamivir treatment (74%)  
 Mortality (6%)

\* A recent history was defined as travel to Mexico no more than 7 days before the onset of illness.



## **In Mexico there were two different clinical evolutions:**

### Very common

- Symptoms of varying intensity
- Up to half of the cases do not have high fever
- Behaves as seasonal influenza
- Complication rate similar to that expected in patients with co-morbidities

### Uncommon

- Viral pneumonia
- Breathlessness and early requirement for ventilatory support
- Prevalent in young adults without risk factors
- It is associated with high mortality rates

**Past two weeks a similar pattern is emerging in Canada**

# Questions For This Workshop

- Why do a small proportion of individuals have a severe outcome after infection with the pandemic Influenza A H1N1 virus?
- What research is needed to understand this difference in severity?
- Is there some way to predict who will have a severe outcome?
- How does this information on infrequent but severe outcomes influence mitigation strategies?