InVS
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European Commission

A(H1N1)2009 in countries and regions of the Northern hemisphere
Data up till 17 July 2009

This note provides a summary of the available data (as of 17th July 2009) on epidemics caused by the novel influenza virus: *Pandemic A(H1N1)2009* (referred to as **A[H1N1]** in the text below) in countries and regions of the Northern hemisphere, most affected by the pandemic.

Mexico

- Mexico was the first country in the world, hit by the pandemic. The first case identified (confirmed retrospectively), had onset of symptoms on 24 February 2009 (cf. article BEH).
- During the first weeks of the epidemic, cases were mainly reported in the states of Distrito Federal (including Mexico City with a population of 20 millions inhabitants), San Luis Potosí, Mexico and Oaxaca (cf note DIT-InVS) before spreading progressively to the other states.
- After several weeks and following the implementation of important social distancing measures by authorities (closure of schools and recreational activities, limiting public gatherings and unessential activity), the number of cases decreased in those areas (Figure 1).
- By 16 July 2009, Mexico had reported 13 646 confirmed cases *of A[H1N1]*, including 125 deaths, in all 32 states. (cf. Figure 2).
- At the beginning of the epidemic, surveillance was essentially hospital-based. Since then, other surveillance approaches such as syndromic surveillance have been adopted. Nevertheless, the objective of the surveillance currently in place in Mexico is to identify trends in the evolution of the epidemic, rather than count cases exhaustively.
- Since mid-June, the total number of cases and the incidence (per 100 000 inhabitants) have increased significantly in Yucatán and Chiapas. These regions had initially reported very few cases because they are rather rural and less densely populated areas (cf. Figure 3).
- By 16 July 2009, the cumulative incidence was 87 and 51 / 100 000 in Yucatan and Chiapas respectively, compared to 9 and 13 / 100 000 respectively for the Distrito Federal, and the whole Mexican territory.

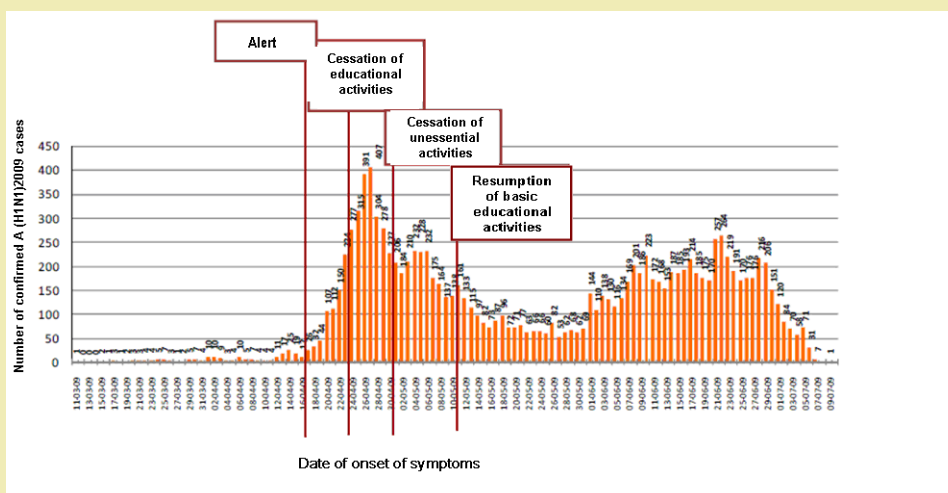**Figure 1: Confirmed cases of *A[H1N1]* by date of onset of symptoms; Mexico, 11/07/2009 (Source: MoH)**

Figure 2: Laboratory confirmed *A[H1N1] cases per state*; Mexico, 16/07/09 (MoH data)
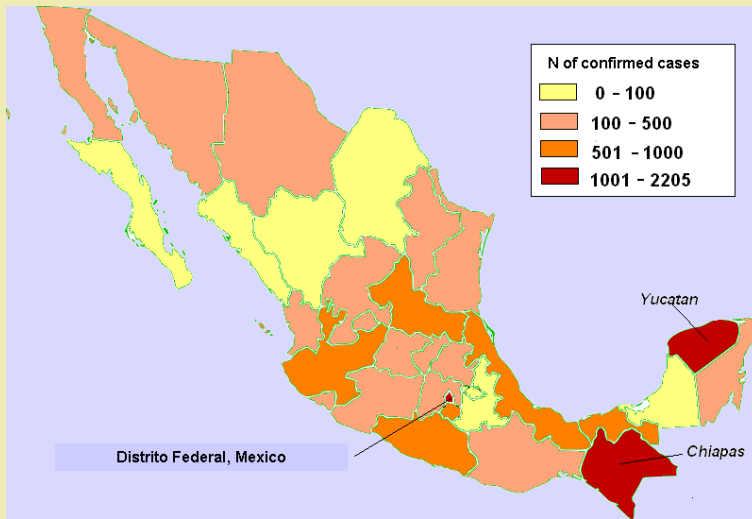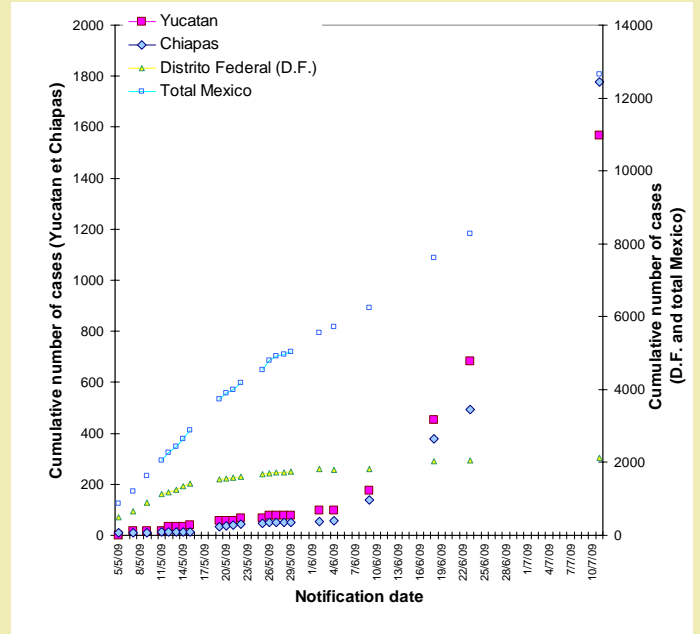

Figure 3: Cumulative number of confirmed *A[H1N1] cases* in Mexico, 16/07/09 (MoH data)

United States

Global situation for the United States (U.S.)

- The first case of *A[H1N1]* detected in the U.S. (in California) presented symptoms on 30 March 2009 and was laboratory confirmed on 15 April 2009 (cf note DIT).
- The epidemic seemed to follow 2 trends:
  - first, a rapid and sharp rise in the number of cases, in a number of large cities and very urbanized states (California, New York, Illinois)
  - second, a delayed, slower increase in less populated states and rural areas such as Alabama or Minnesota (cf. Figure 4 and Figure 5).
- By 17 July 2009, 40 617 confirmed or probable cases had been reported to the U.S. Center for Diseases Control, including 263 deaths.
- Since 14 may 2009, the U.S. have moved to a surveillance approach based on their routine surveillance system. Systematic confirmation of suspect cases was dropped. Thus, total case counts no longer reflect the real evolution of the epidemic in the country.
- The overall number of consultations for influenza-like illness has started decreasing in the U.S. around week 24 2009 (cf. Figure 6).
- Since the beginning of May 2009, more than 90% of typed strains corresponded to the novel virus strain *A[H1N1]* (cf. Figure 7).

Figure 4: Rates of confirmed or probable cases of *A[H1N1]* per 100 000 inh. In the U.S.A, 09/07/09 (Source: CDC).
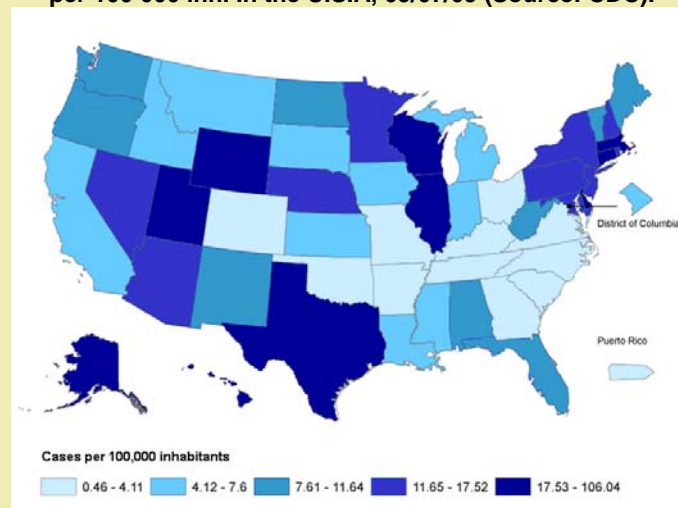

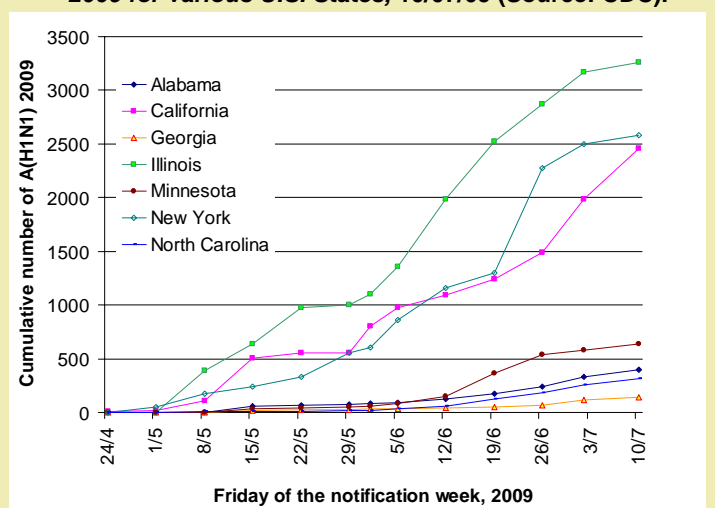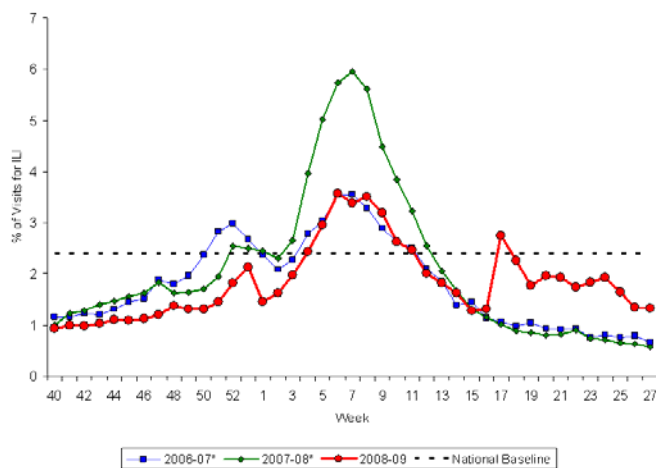**Figure 5: Cumulative number of confirmed cases of *A[H1N1]* 2009 for various U.S. States, 10/07/09 (Source: CDC).**

Figure 6: Percentage of consultations for Influenza-like illness reported in the ILINET* network; USA, week 27 2009. (Source CDC)	Figure 7: Positive influenza tests reported to CDC by national reference laboratories, USA week 27 (Source CDC)

* US *Outpatient influenza like Illness surveillance Network*
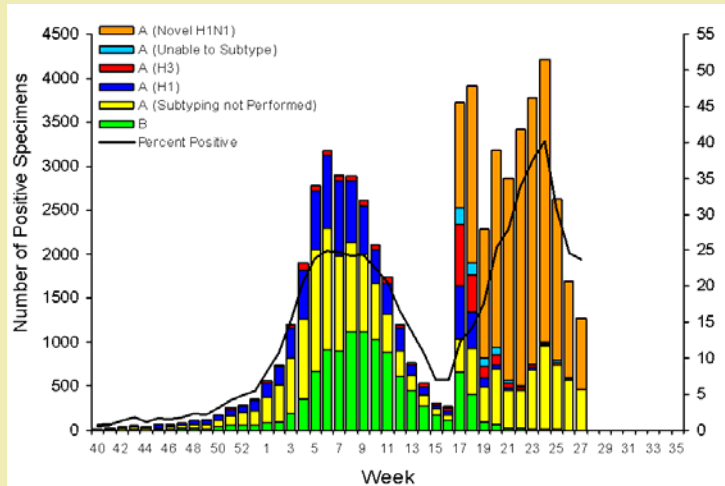
Situation in New York City

- ■ The first cases in New York were detected in a school in Queens in April 2009 (cf EpiSouth note on New-York).
  - • Symptoms in the first suspect cases from the school, started on 09 April 2009 (documented retrospectively).
  - • The first cases were biologically confirmed on 15 April 2009.
  - • By 29 April, 659 of 1 966 (33%) students interviewed and 23 of 228 (11%) teachers and other school staff had been classified as suspect cases.
  - • 86% (44/51) of samples taken at the end of April were positive for *A[H1N1].*
  - • On 17 may 2009, an assistant school principal in Queens, confirmed for *A[H1N1]* infection, died after being hospitalized.

- ■ On 08 July 2009, the epidemiological situation for New York counted (source NYCDHMH):
  - • 1,291 confirmed cases,
  - • 909 hospitalisations,
  - • 47 deaths, 70% of them presenting underlying conditions.

- ■ From 20 to 27 May 2009, the health authorities of New York City conducted a phone survey among a random sample of New-York residents. It estimated that 7% of interviewees had presented flu symptoms during the first 3 weeks of May 2009. The extrapolation of the results to the population of New York, estimated that between 400 000 and 500 000 cases of flu (not necessarily H1N1) may have occurred in New York City (source NYCDHMH).

- ■ Data collected through syndromic surveillance implemented in 50 hospitals (95% of hospitals in the city) show that the number of visits to emergency services is currently decreasing along with the number of hospitalizations for *A[H1N1]* infection (cf. Figure 8).

- ■ The age-groups mostly affected by the virus are the 0-17 year group (cf. Figure 9).(InVS note on epidemiological characteristic of the A(H1N) cases)

- ■ Generally, data obtained from patients' visits to emergency departments are subject to biases such as media-driven population panic or inequalities in access to healthcare. However, they provide an indicator of trends, which is much more reliable than counts of confirmed cases in the absence of systematic laboratory confirmation.

- ■ The latest information thus indicates that the epidemic in New York City is very likely to be in its declining phase.

Figure 8 : Hospitalisations of confirmed A[H1N1] cases and visits to emergency departments for influenza-like illness in 50 hospitals of the city of New York, 26/04 – 06/07/09 (NYCDHMH)
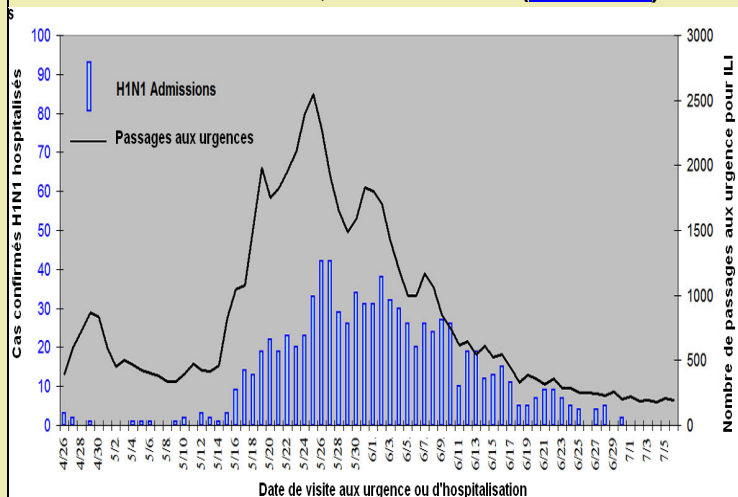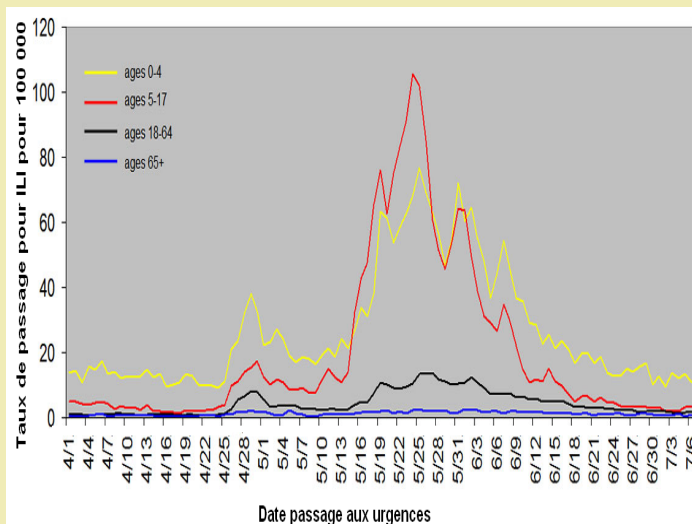

Figure 9 : Rate of Influenza like illness syndrome visits to emergency departments. by age groups New York City , 01/04 – 06/07/09 (NYCDHMH)

Situation in the State of New York

- The situation in the New York City is not, however, representative of the evolution of the epidemic in the rest of the state of New York.

- The number of cases in the state (excluding New York City) is still increasing (cf. Figure 10) :
  - On 04 May 2009, 81% (73/90) of confirmed *A[H1N1]* cases in the state, were exclusively from the city of New York.
  - On 03 July 2009, 56% (1262 / 2253) of confirmed *A[H1N1]* cases in the state belonged to New York City.

Figure 10 : Cumulative number of confirmed A[H1N1] cases per county, State of New York on 04/05/09 (left) and on 03/07/09 (right) (Source NYSDH).
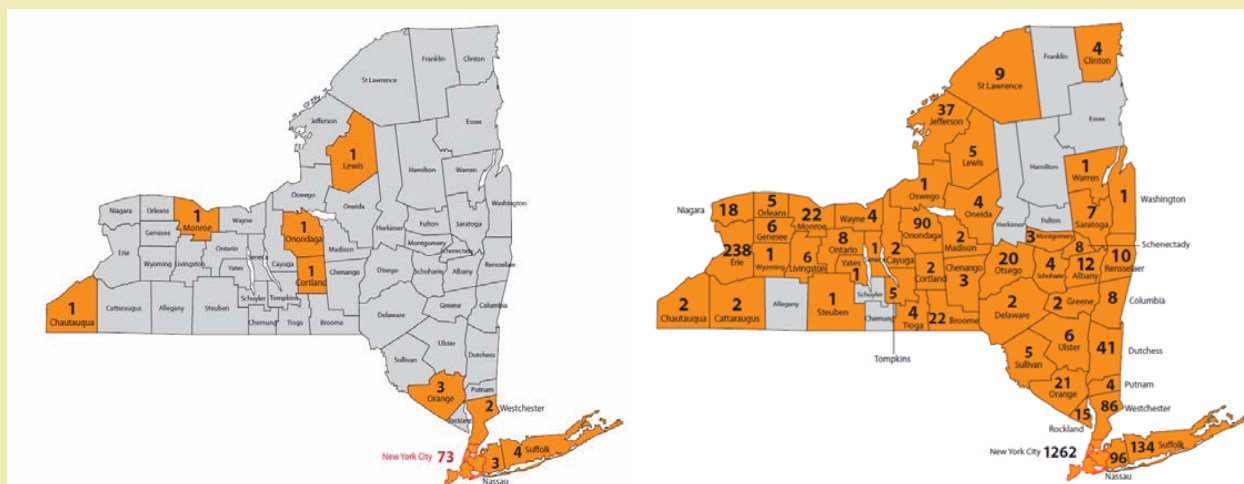
Canada

- The first suspect cases (returning from Mexico) were notified on 24 April 2009.
- The first cases, imported from Mexico into Nova Scotia, were confirmed on 26 April 2009.
- On 15 July 2009, the total of confirmed cases was 11 156, of which 45 died (cf. Table 1). All provinces and territories were affected (cf. Figure 11).
- The overall flu activity remains high for this period of the year. However, it has dropped in comparison with the previous weeks.

Table 1: Confirmed *A[H1N1] cases*, hospitalizations and deaths; Canada, 15/07/09 (adapted from Phac-Aspc).

Province / Territory	Confirmed cases	Hospitalized cases[1]	Deaths	Cases per 100 000	Hospitalizations/ cases	Deaths/ cases
Alberta	1 348	87	3	39	7%	0.2%
British Columbia	382	14	1	9	4%	0.3%
Prince Edward Island	5	1	0	4	20%	-
Manitoba	2 015	831	6	170	41%	0.3%
New Brunswick	42	1	0	6	2%	-
Nova Scotia	330	8	0	35	2%	-
Nunavut	405	38	0	1 301	9%	-
Ontario	3 636	266	15	28	7%	0.4%
Québec[2]	2 259	488	17	29	22%	0.8%
Saskatchewan	859	11	3	86	1%	0.3%
Newfoundland and Labrador	44	0	0	9	0%	-
Northwest Territoires	14	0	0	33	0%	-
Yukon	1	0	0	3	0%	-
Total	11 340	1 745	45	31	15%	0.4%

[1] Hospitalizations are not reported before investigation forms are collected which can result in a delay in the number of hospitalized cases.
[2] In Québec, it is recommended to screen hospitalized patients with influenza-like symptoms for influenza H1N1 virus. This could explain the high number of cases in this province.

Figure 11: Evolution of the epidemic of flu-like illness in Canada, 26/04 - 09/07/09 (Source : Phac-Aspc).
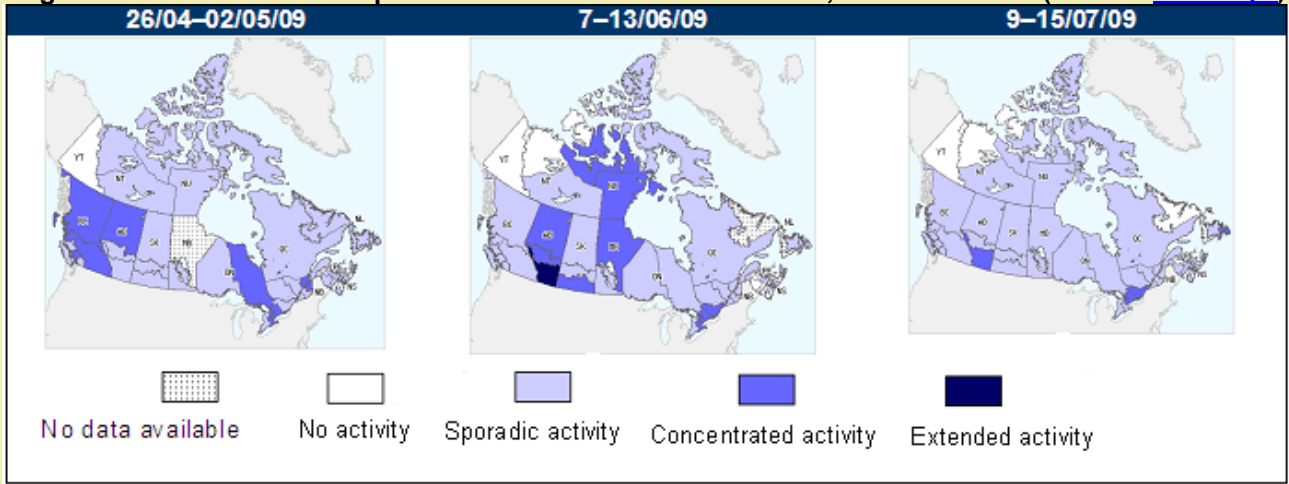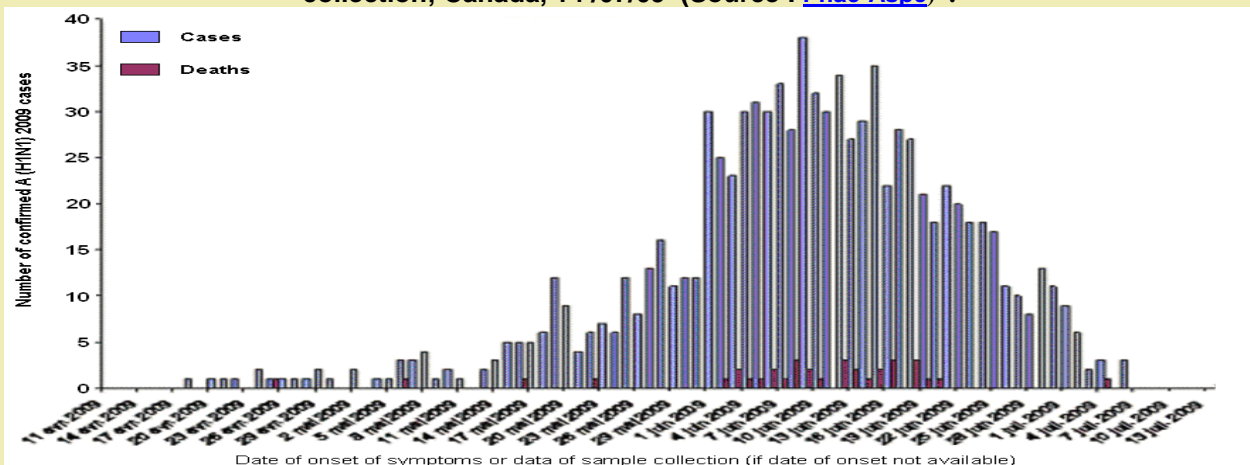

Figure 12: Hospitalized cases of A[H1N1] and deaths by date of onset of symptoms or sample collection; Canada, 14 /07/09 (Source : Phac-Aspc)*.


*The date of onset of symptoms or sample collection, is available for 35/45 deaths and 927/1,115 hospitalized cases.

Québec Province

- In a federal state such as Canada, case definitions and case management guidelines vary according to the provinces. Detailed data from Québec are presented below for illustration purposes.
- On 20 June 2009, Quebec authorities issued recommendations to restrict laboratory confirmation of *A[H1N1]* to hospitalized cases only.
- From that date on, a decrease was observed, in the number of cases confirmed by the Public Health Laboratory of Québec (LSPQ) (cf. Figure 3).
- The change in the case definition on 20 June and the delay in case notification from laboratories largely contribute to this drop. Thus, this case count is no longer a reliable indicator of the evolution of the outbreak.
- As for other countries, surveillance is based on the analysis of complementary data such as :
  - Data from the network of laboratories and sentinel practitioners.
  - Surveillance of hospitalizations and emergency services presentations including paediatric emergency departments (paediatric network IMPACT)
- The analysis of those data (MSSS) indicates that the *A[H1N1]* virus circulation is ongoing. However, the dynamics of the epidemic remain difficult to assess.

Figure 13: Positive tests for influenza A by date of sample collection; Québec province, 6/07/09 (N=2 170) (adapted from MSSS)

* Admission= hospitalized+emergency department admissions lasting ≥ 24 hrs.
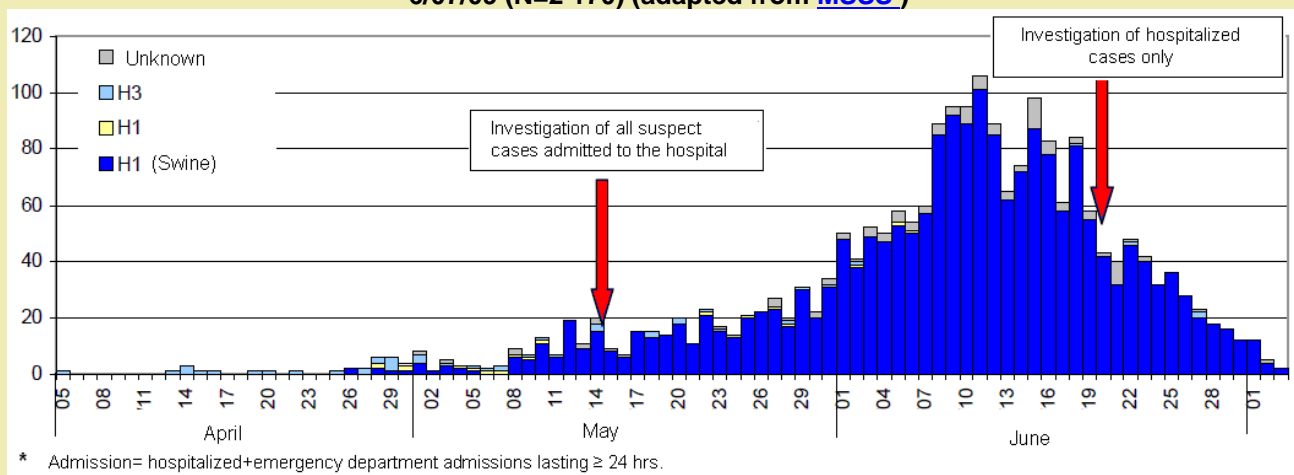
Specific characteristics of Amerindian populations ("First Nations") and Inuits in Canada

- The epidemic seems particularly active among Amerindian and Inuit populations, more specifically in 3 provinces of West Canada with high proportions of Amerindians and Inuits: Nunavut, Saskatchewan and Manitoba, with 1301, 86 and 170 cases per 100,000 respectively (cf. Table 1).
- Nevertheless, among Amerindians and Inuits, the incidence of infectious and chronic diseases is much higher than in the rest of the population (Santé Canada). In fact, in 2000, the rates of hospitalization (standardized for age) for seasonal flu were 4 times higher in Amerindians. Moreover, the Amerindian population structure differs significantly from the remaining Western Canadian population (a much younger population, cf. Santé Canada).
- Apart from possible biases relating to surveillance or access to health care, the age distribution and prevalence of chronic diseases in Amerindian populations could partly explain the high numbers of *A[H1N1]* cases observed in this group.

United Kingdom (UK)

- The first case reported in the UK (imported from Mexico), presented symptoms on 16 April 2009 (cf. Figure 14).
- On 16 July 2009, the total number of cases in the UK was 10 649, of which 26 were deaths.

Figure 14: Laboratory confirmed H1N1swi by date of onset and assumed mode of transmission (n=157*), UK, 26/05/09 (Source HPA)
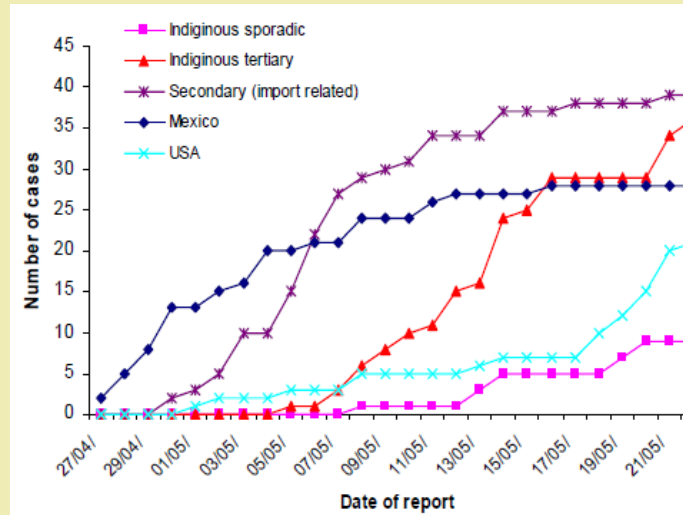
- On 2 July 2009, British health authorities adopted a new case management strategy. The diagnosis made by General Practitioners (GP) would be based on clinical evidence and not solely on laboratory confirmation. Suspect cases were encouraged to stay at home and only severe cases were subject to testing for biological confirmation.
- Consequently, the weekly number of confirmed cases dramatically decreased after week 28 (cf. Figure 15).

Figure 15: The number (and percentage) of samples testing positive for influenza, by subtype and week of specimen; UK, 16/07/09 (Source: HPA)
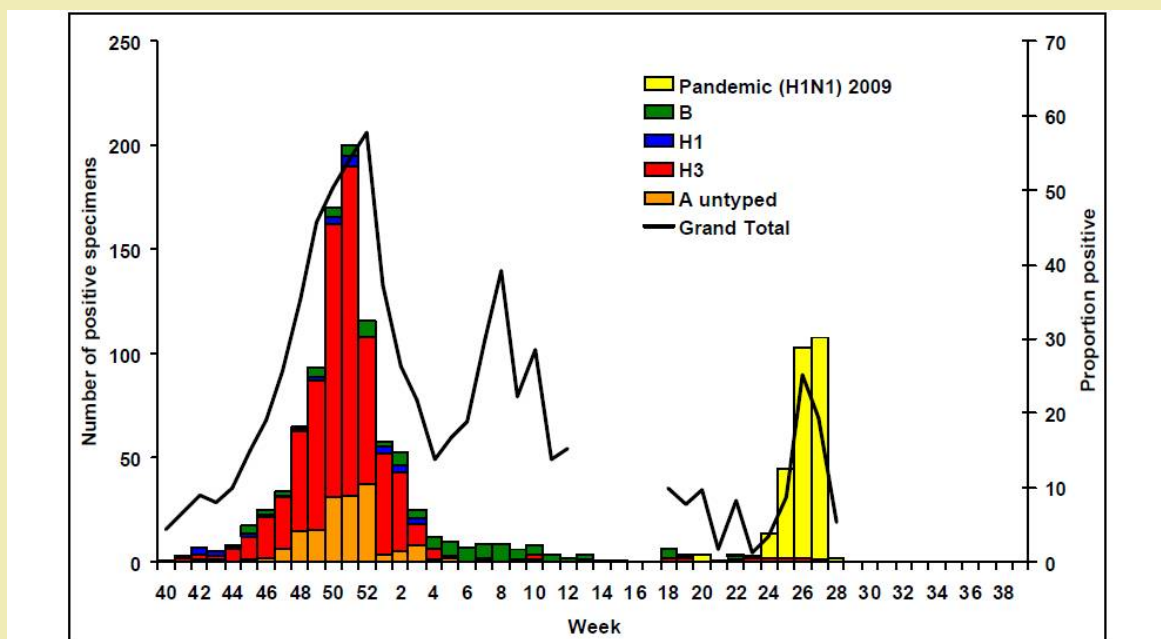

NB. Proportion positive omitted when fewer than 10 specimens reported; NHS Direct scheme started in week 21 so number positive in recent weeks cannot be directly compared to the number seen in the winter; data for the most recent weeks are subject to change due to reporting lag.

- Follow-up of the situation in the UK is based on a range of indicators collected through several surveillance sources (Source : HPA):
  - The Royal College of General Practitioners (RCGP) is a sentinel system involving around one hundred GPs covering a total population of nearly 900 000 residents in England and Wales.
  - Similar governmental systems exist in Scotland (Health Protection Scotland, HPS), Northern Ireland (Communicable Disease Surveillance Centre Northern Ireland, CDSCNI) and Wales (GP Surveillance of Infections Scheme, GPSIS).
  - A syndromic system in 22 hospitals of the National Health Services (NHS).
  - A sentinel system runs by a private operator (Q Surveillance).
  - Mortality surveillance of the NHS.

- Throughout the past weeks, GP consultations for flu like illness have generally increased in the UK (Table 2 and Figure 16).
  - In England, the number of cases has exceeded epidemic threshold 2 weeks ago.
  - Consultations are on the rise in Wales and Northern Ireland.
  - On the other hand, consultation rates in Scotland are stable.
- In the light of the above data, health authorities have agreed to activate on 24 July 2009 the pandemic flu preparedness plan (National Pandemic Flu Service). It includes a first triage by telephone or internet: an assessment of symptoms and treatment indication. Upon assessment, only persons presenting risk factors would proceed to GP consultations.

Table 2: Weekly rates (per 100 000) of consultations for flu-like illness, epidemiological weeks 23-28, 2009, UK, (source: HPA).

Region	Network	Epidemic threshold (for 100 000)	w23	w24	w25	w26	w27	w28
England	(RCGP)	30	6.2	6.8	11.2	29.6	51.9	73.4
Northern Ireland	(CDSCNI)	N/A	7.9	18.1	12.7	20.5	25.4	34.9
Scotland	(HPS)	50	10	15	32	27	15	25
Wales	(GPSIS)	25	0.3	0.4	1.7	1.4	5.1	15.8
UK	(QSurveillance)	N/A	4.4	5.8	8.9	17.4	30.4	86.8

**Figure 16: Daily consultation rate for influenza-like illness in the UK (all ages) in 2008 and 2009, Q surveillance network;
UK (except Scotland), 16/07/09 (Source : HPA)**
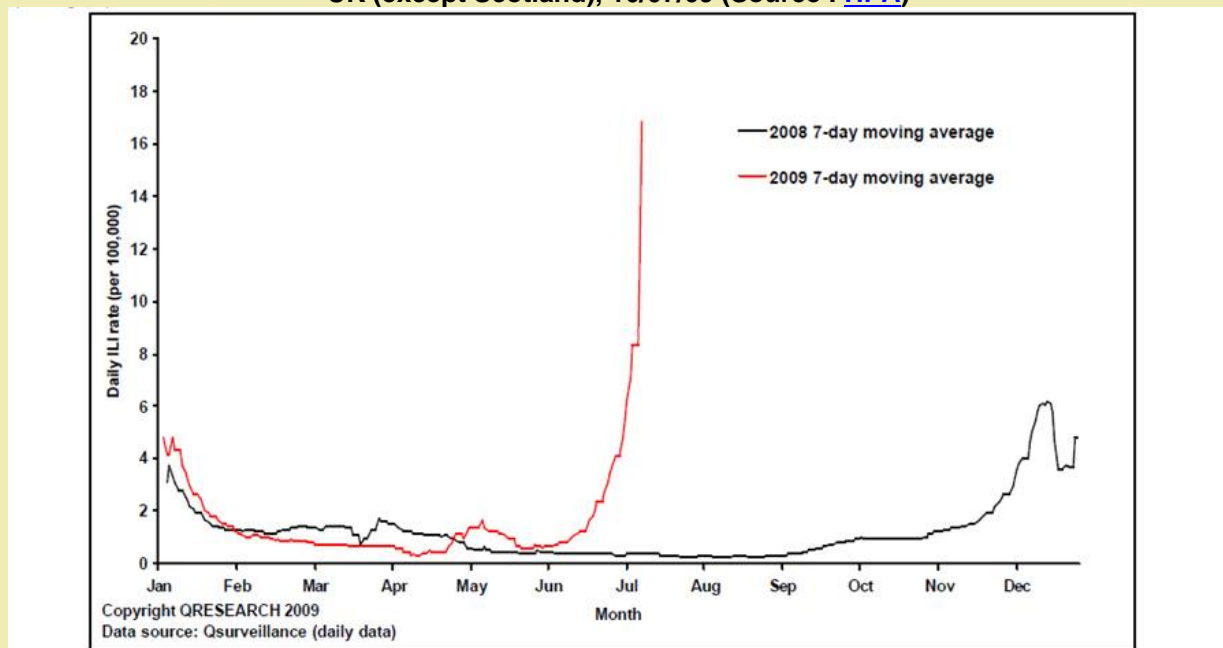
* based on data from 43% of England's populations, 10% of the population in Wales, 17% in Northern Ireland and 0% in Scotland; ** due to a change in coding in week 28 recent data will be an under-estimate of ILI consultation rates.

Japan

- The first cases in Japan (imported from Canada) were declared on 10 May 2009.
- The epidemic initially hit large cities. The first clusters were essentially school students, returning from the U.S. and Canada.
- Thus, the outbreak was very much influenced by a scholastic component and later spread to the general population.

- On 17 July 2009, the total of confirmed cases was 3 638 (no deaths).
- The number of laboratory confirmed cases continues to increase (cf. Figure 17).
- Nevertheless, no significant increase in the number of consultations for flu-like illness was observed (cf. Figure 18). At country level, this could indicate that virus circulation in the community is still limited.
- The epidemic is concentrated in some provinces (cf. Figure 19), however, the potential for spread to other areas remains important.

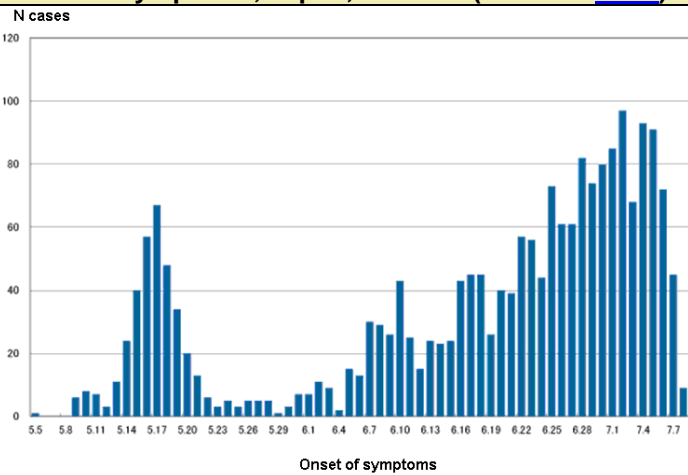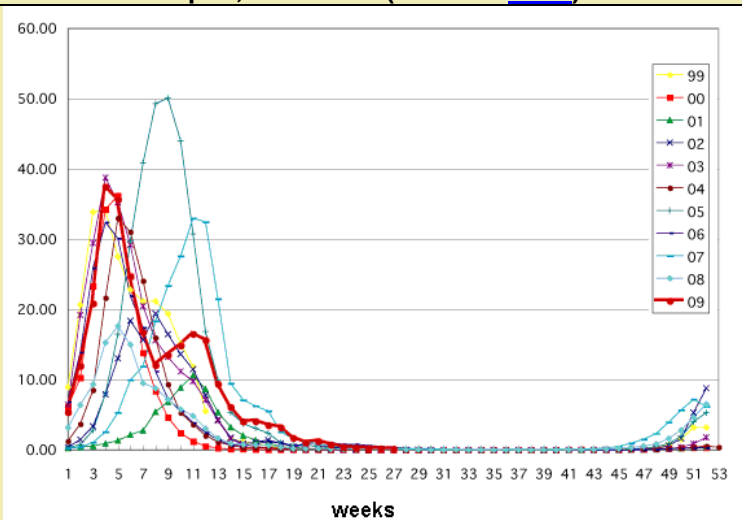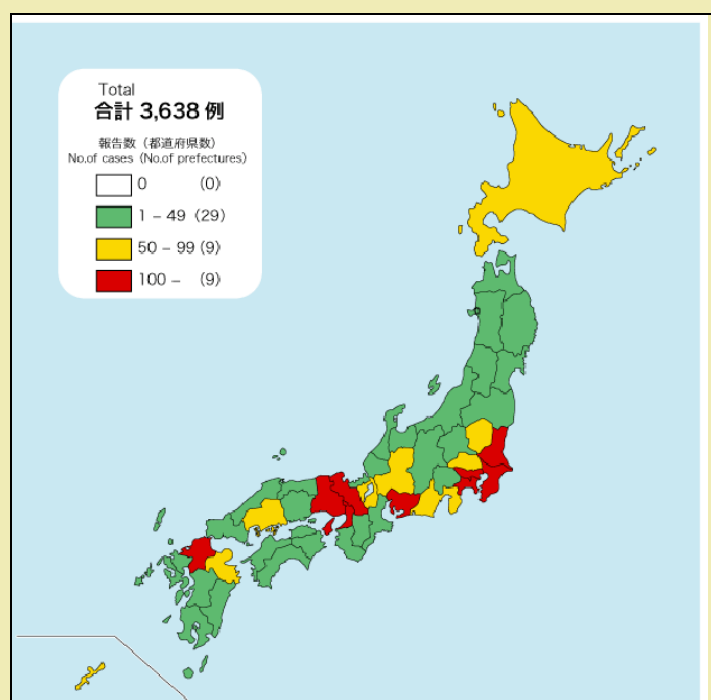| Figure 17: Confirmed cases of *A[H1N1]* by date of onset of symptoms; Japan, 10/07/09 (Source : IDSC)	Figure 18: Flu-like illness by week, Sentinel surveillance; Japan, 1999-2009 (Source : IDSC)

Figure 19: Districts affected by the *A[H1N1]* epidemic; Japan, 17/07/09 (Source : IDSC).

Conclusion

The implementation of control measures in most countries hit by the *A[H1N1]* pandemic in the Northern hemisphere probably contributed to delaying or limiting the establishment of community virus transmission. However, it is difficult to estimate the actual impact of the measures taken.

Considering that surveillance and case management strategies can vary largely between and sometimes within countries (note EpiSouth-Case-Management-15 May 2009), it is difficult to compare data from the different countries affected.

As recommended by WHO, most countries no longer count individual cases nor confirm all suspect cases systematically. The approach proposed, inspired by seasonal flu surveillance will rely on different complementary systems (sentinel surveillance of consultations for influenza-like illness, laboratory surveillance, investigation of clusters and severe cases requiring hospitalization, or cases with unusual clinical presentations). Laboratory confirmation is therefore, essentially prescribed for severe or clustered cases.

The evolution of the number of confirmed cases does not reflect the various evolutions of the epidemiological situations in the countries.

Nevertheless, at the global level, the available data on confirmed *A[H1N1]* cases and influenza-like illness show a contrasted situation in the Northern Hemisphere.

In certain regions of the U.S. (for instance New York) and Canada, available evidence supports the hypothesis of a slow, decreasing trend. However, the epidemic continues to progress in areas previously little affected, in the U.S., Japan and Mexico.

In the UK, the epidemic is spreading rapidly, except in Scotland where it seems to have stabilized.

The pandemic continues to progress in the Northern Hemisphere. However, available data do not allow anticipating the end of a first wave nor the beginning of a second wave.

Data from those countries show that despite unfavourable weather conditions for the virus propagation, the epidemic could spread rapidly in temperate climate settings of the Northern Hemisphere including Europe.