

PRELIMINARY ANALYSIS OF THE PANDEMIC H1N1 INFLUENZA ON RÉUNION ISLAND (INDIAN OCEAN): SURVEILLANCE TRENDS (JULY TO MID-SEPTEMBER 2009)

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First infections with the 2009 pandemic H1N1 influenza virus were identified on Réunion Island in July 2009. By the end of July, sustained community transmission of the virus was established. Pandemic H1N1 influenza activity peaked during week 35 (24 to 30 August), five weeks after the beginning of the epidemic and has been declining since week 36. We report preliminary epidemiological characteristics of the pandemic on Réunion Island in 2009 until week 37 ending September 13.

Introduction

On 21 April 2009 (week 17), the United States Centers for Diseases Control and Prevention (US CDC) published a report about first cases of so-called 'swine influenza A(H1N1)' infection in two children in southern California [1]. On 24 April 2009 (week 17), the World Health Organization (WHO) informed about an epidemic caused by what was then called 'new swine-origin influenza A(H1N1) virus' originating from Mexico, and declared a public health emergency of international concern. In response to the threat of emergence and spread of the pandemic influenza A(H1N1)v virus, the Regional Office (Cire Réunion-Mayotte) of the French Institute for Public Health Surveillance (InVS) on Réunion Island implemented enhanced influenza surveillance in May 2009 to detect the introduction of the pandemic H1N1 influenza and monitor its spread and impact on public health [2]. On 5 July 2009 (week 27), while seasonal influenza was already reported on the island, the first imported case of pandemic H1N1 influenza was detected on Réunion Island in a traveller returning from

Australia [3]. From 5 to 23 July, no evidence of local transmission of pandemic H1N1 influenza was detected, all laboratory-confirmed cases were considered as imported or having an epidemiological link with another imported laboratory-confirmed case. From 23 July (week 30), there was evidence of local transmission, and the individual surveillance was shifted to a population-based surveillance, according to French procedures [4]. In this preliminary analysis, we report the epidemiological characteristics of influenza on Réunion Island in 2009 until week 37 ending September 13.

Methods

On Réunion Island, enhanced influenza surveillance, set up in May 2009 and previously described [2], has been modified after evidence of local transmission and rapid spread of the 2009 pandemic H1N1 influenza virus. The objective of the previous surveillance was to detect and to confirm all infected travellers arriving from countries where autochthonous transmission of pandemic H1N1 influenza virus was known to occur while the aim of the ongoing surveillance is to describe the trends of the influenza epidemic in the population and to characterise the dynamics of virus spread on the island. On 23 July, the new surveillance procedure was introduced using a range of indicators available from surveillance systems implemented before the emergence of the epidemic.

These systems include (for details see reference [2]):

- Surveillance of influenza-like illness (ILI) by the network of sentinel practitioners' including 24 general practitioner and three paediatricians scattered across the island to collect and provide timely information on influenza activity and the rate of ILI among their patients; these physicians reported on a weekly basis the number of ILI and their total number of consultants.
- Virological surveillance, to collect and provide detailed and timely information on circulating influenza virus strains;
- Surveillance of the activity of hospital emergency departments to collect and provide information from the four emergency departments of the four hospitals of Réunion;
- Surveillance of severe and fatal cases related to the pandemic H1N1 influenza virus, to better monitor the severity of the pandemic, to detect changes in the population groups affected by severe outcomes that may justify more robust public health measures, and to monitor deaths. A severe case was defined as a person with a laboratory-confirmed pandemic H1N1 influenza infection and admitted to an intensive care unit.

Results

Surveillance of ILI by sentinel practitioners' network

Weekly ILI consultation rates in 2009 were compared with the rates observed in the same period in the previous five years (2004-2008). From week 23 (starting 1 June) to week 30 (starting 20 July) 2009, the weekly ILI consultation rates remained below the 2004-2008 mean for the same period. Starting with the end of July (week 31) the ILI rate exceeded the 2004-2008 mean and increased sharply until week 35 2009 (starting 24 August). During this peak week, the rate of ILI reported by sentinel practitioners represented 20.6% of their consultations. This rate was the highest observed in Réunion in the past five years of influenza surveillance (Figure 1). During this peak week, 65% of nasal swabs performed by sentinel network physicians were positive for influenza A(H1N1)v.

Virological surveillance

Influenza B virus was first detected in week 23 (starting 1 June) and was the only strain found during the following four weeks. Few influenza A(H3N2) viruses were detected during week 30 to 32. As already mentioned, influenza A(H1N1)v virus was first detected in week 27 (starting 29 June). In weeks 27 and 38 (starting 14 September), 716 influenza A(H1N1)v viruses were isolated. In week 31 (starting 27 July), the pandemic virus became the dominant circulating strain on the island and reached 95% of all influenza-positive strains on week 34 (Figure 2). Some of the influenza A viruses that have not yet been not subtyped by the local laboratories have been sent to the French National Reference Centre for Influenza for complementary analysis.

Surveillance of hospital emergency department activity

From week 27 to week 30, the number of emergency department visits, regardless of the diagnosis (including the number of consultations for ILI), remained stable. In week 31, the visits increased rapidly. The total number of visits to emergency departments reached the highest value in week 33, while the total number of emergency department visits for ILI reached a peak in week 35. Since week 36, emergency department visits for ILI symptoms have been decreasing (Figure 3).

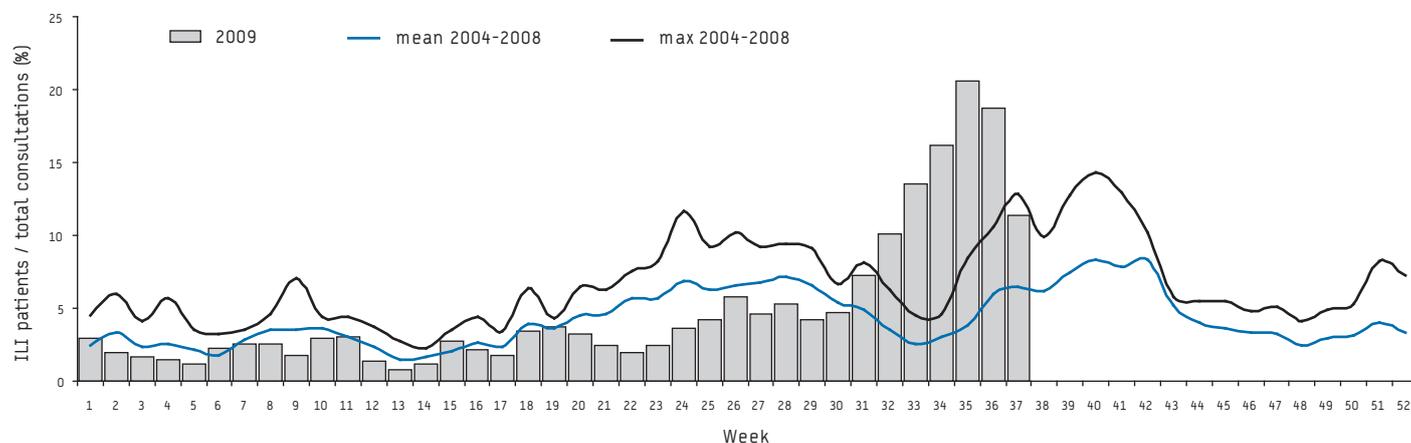
Surveillance of severe and fatal cases

Between 5 July and 13 September, 255 patients with laboratory-confirmed pandemic H1N1 influenza were hospitalised, including 119 who presented with a pre-existing comorbidity (Table). Nineteen of these 255 patients were hospitalised in an intensive care unit and were considered as severe cases (Figure 4).

On average, approximately 10 death certificates mentioning 'influenza' are received each year on Réunion. Between week 35 and 38, four women (5, 18, 28 and 78 years-old) and two men (32 and 69 years-old) infected with pandemic H1N1 influenza virus died. All of them had presented with comorbidity except for the 32 year-old man for whom only alcohol consumption without liver dysfunction was reported.

FIGURE 1

Consultation rates for influenza-like illness reported from the sentinel practitioner network, by week, Réunion Island, 2009



ILI: influenza-like illness.

Source: Observatoire régional de la Santé and réseau sentinelle, Réunion.

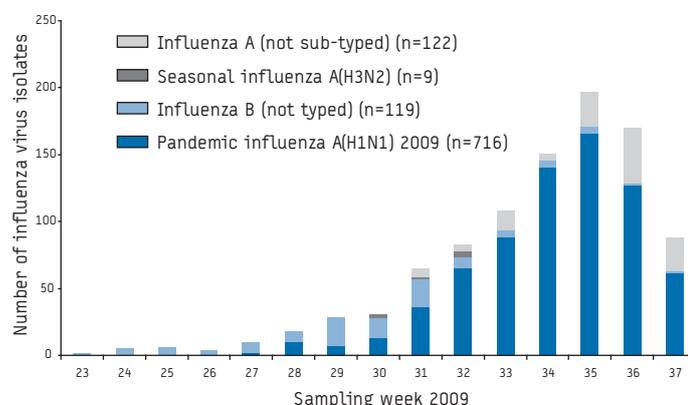
Discussion

First infections with the 2009 pandemic H1N1 influenza virus were identified on Réunion Island on July 2009. By the end of July, sustained community transmission of the virus was established. Pandemic H1N1 influenza activity peaked during week 35 (24 to 30 August), five weeks after the beginning of the epidemic and has been declining since week 36.

Data concerning comorbidities should be interpreted with caution, particularly for pregnant women. Indeed, healthcare providers might be more likely to admit a pregnant woman than a non-pregnant woman with similar findings, which could lead to an exaggerated percentage of pregnant women among hospitalised patients. We believe that mass media communication could have increased public anxiety and could have had an impact on the number of consultations for ILI, but this paper analysed only symptomatic cases reported through the sentinel network.

FIGURE 2

Isolated influenza viruses, Réunion Island, 5 July-13 September 2009 (n=966)



Source: Microbiology laboratories (Saint Denis Hospital, Saint-Pierre Hospital), Réunion.

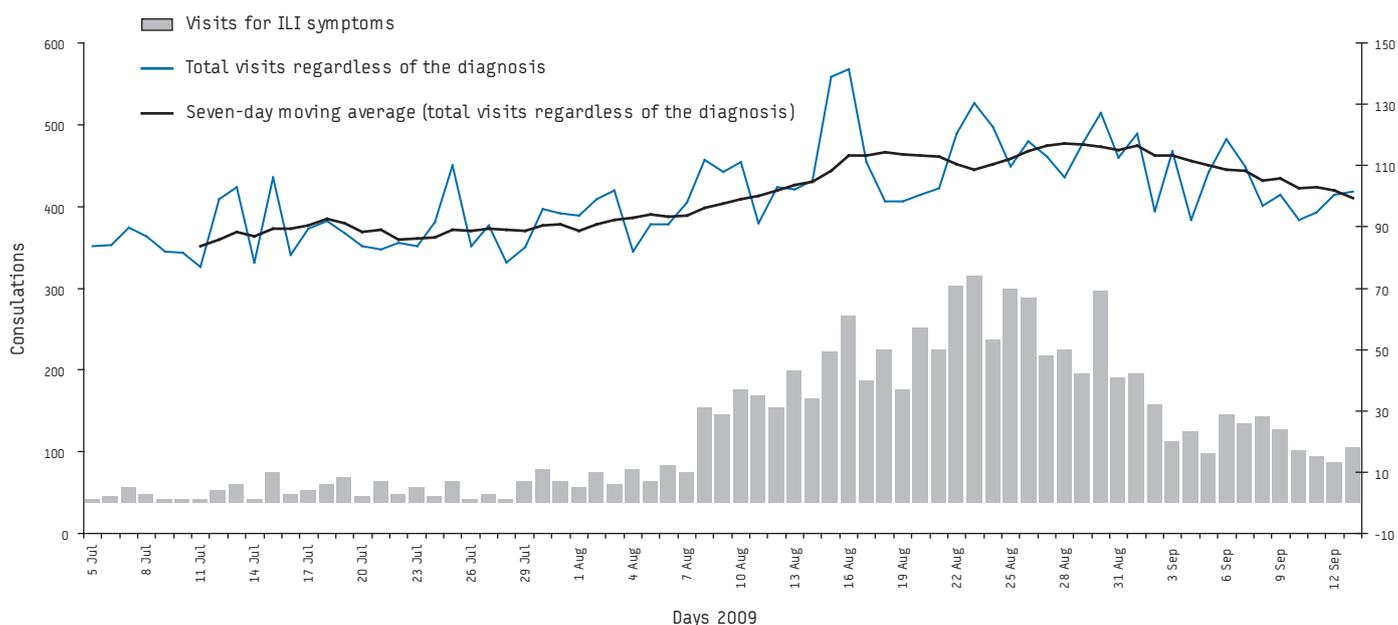
Like other countries in the southern hemisphere, the influenza season on Réunion began with cocirculation of the seasonal as well as the pandemic influenza A(H1N1) strain [5,6]. The pandemic virus became the predominant circulating influenza virus on Réunion within the four weeks following its first detection. A similar delay of four weeks was also observed in New Zealand [7]. Overall, the pandemic appears to have been remarkably similar in Australia, New Zealand and Réunion [5,6].

Réunion Island is presumed to have a double exposure to seasonal influenza, one from the southern hemisphere and the other one from the northern hemisphere given the intense links with continental France. As the winter influenza season started in continental France in week 38, persistent influenza activity on Réunion cannot be excluded. Ongoing surveillance will detect a second wave of the epidemic and continue to monitor and characterise potential changes in the virus.

These findings demonstrate the value of using integrated epidemiological, virological and hospital surveillance in order to monitor the scope of an influenza epidemic, identify circulating strains and provide guidance to public health control measures.

FIGURE 3

Total consultations and consultations for symptoms of influenza-like illness in emergency departments, Réunion Island, 5 July-13 September 2009



ILI: Influenza-like illness
Source: Oscour® network

These preliminary results could provide relevant information for European countries regarding their own management of the ongoing epidemic and control measures. A complete epidemiological, clinical and virological analysis at the end of the epidemic should be available within a few weeks.

Acknowledgements

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TABLE

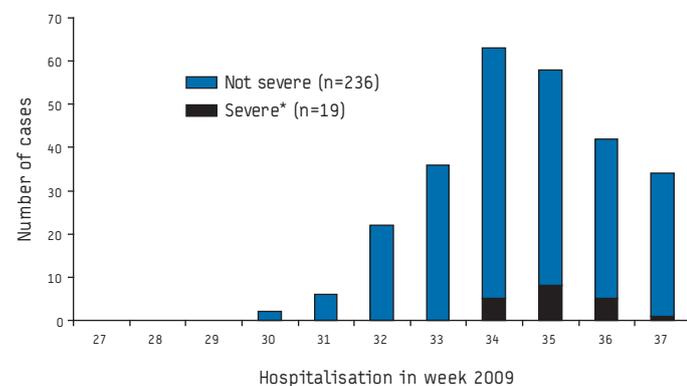
Frequency of risk factors in hospitalized patients infected with pandemic H1N1 influenza virus, Réunion Island, 2009 (n=119)

Comorbidities	n (%) [*]
Pregnancy	33 (28)
Children ≤ 1 year	30 (25)
Chronic respiratory disease	20 (17)
Diabetes	15 (13)
Cardiac insufficiency or severe valvulopathy	9 (7.6)
Congenital heart disorder	4 (3.4)
Immunodeficiency	4 (3.4)
Obesity	4 (3.4)
Long-lasting stay in a specialised establishment	3 (2.5)
Bronchopulmonary dysplasia	2 (1.7)
Sickle cell anaemia	2 (1.7)
Nephrotic syndrome	1 (0.8)
Cystic fibrosis	1 (0.8)
Child or teenager with long-lasting aspirin treatment	1 (0.8)

* Multiple answers were possible.

FIGURE 4

Hospitalisations of patients with laboratory-confirmed pandemic H1N1 influenza, Réunion Island, 5 July-13 September 2009 (n=255)



*A severe case was defined as a patient with laboratory-confirmed pandemic H1N1 influenza who was admitted to an intensive care unit or died.

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