Rapid communications

Enhanced influenza surveillance on Réunion Island (Southern Hemisphere) in the context of the emergence of influenza A(H1N1)v

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With the winter season on the southern hemisphere that starts in Réunion Island in June seasonal influenza activity usually increases shortly afterwards. The new influenza A(H1N1)v virus is rapidly spreading worldwide and may reach the island during the coming winter season. We have therefore enhanced influenza surveillance to detect the introduction of influenza A(H1N1)v, monitor its spread and impact on public health and characterise potential viral changes, particularly if seasonal influenza A(H1N1), resistant to oseltamivir, co-circulates with A(H1N1)v.

Background
Influenza virus type A is associated with annual epidemics and occasional large-scale global pandemics. Both are characterised by increased morbidity and mortality [1]. In temperate regions, a clear seasonality exists in the influenza activity with a marked peak in cold winter months. In tropical regions however, where there is less fluctuation in seasonal temperature this is not noticeable to the same extent [2].

Réunion Island, a French overseas administrated territory with 800,000 inhabitants, is located in the southern hemisphere in the south-western Indian Ocean, 700 km east of Madagascar and 200 km south-west of Mauritius, at a longitude of 55°3 east and latitude of 21°5 south, above the Tropic of Capricorn. In Réunion Island, influenza activity has been monitored since 1996 [3], but influenza virus circulation remains poorly documented. Results of past monitoring suggest that annual influenza activity increases in June-July [4] and the last reported seasonal influenza epidemic occurred in August-October 2007 [5]. The island is presumed to have a double exposure to seasonal influenza, one from the southern hemisphere and the other one from the intense link with metropolitan France [4,6] (Figure 1).

Figure 1
Seasonal influenza activity on Réunion Island and in continental France, 2007-2009

*Influenza like illnesses
Source for continental France data: Réseau Sentinelle, France ; Source for Réunion Island data: Observatoire Régional de la Santé and réseau sentinelle, Réunion
In April 2009, a new strain of human influenza A(H1N1) virus, the influenza A(H1N1)v virus, was identified in USA and Mexico. As of 10 June 2009, a total of 74 countries reported 27,737 cases and 141 associated deaths to the World Health Organization (WHO) demonstrating the pandemic potential of the virus [8]. Anticipating the start of the influenza season in Réunion Island sometime in June (Figure 1), the Regional epidemiology unit of Reunion-Mayotte (Cellule interrégionale d'épidémiologie, Cire) of the French Institute for Public Health Surveillance (Institut de Veille Sanitaire, InVS) is implementing an enhanced surveillance system to face the likely introduction and spread of influenza A(H1N1)v during the coming winter months in Réunion. The aim of this system is to detect the introduction of influenza A(H1N1)v timely on the island, monitor its spread and impact on public health and characterise potential viral changes, particularly if seasonal A(H1N1) resistant to oseltamivir co-circulates with A(H1N1)v. Furthermore, the surveillance we describe here is an attempt to include the specific surveillance of influenza A(H1N1)v virus into the global influenza surveillance system. It could be an example for other countries in the tropics and results will provide useful data about the effectiveness and limits of such system. Our experience might guide northern hemisphere countries in how to adapt their surveillance system before the upcoming influenza season in the winter.

**Figure 2**

Organisation of the influenza surveillance on Réunion Island, 2009

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**Community surveillance**

**Sentinel practitioners network**

A sentinel network, consisting of 40 general practitioners (GP) and two paediatricians, scattered across the island conducts prospective influenza surveillance on Réunion Island [3,4]. On a weekly basis, they report the percentage of consultations for influenza-like illness (ILI) using the following case definition: sudden onset of fever > 38°C AND cough OR breathing difficulty. Every physician is expected to perform a nasal swab for each first patient of the week presenting with ILI symptoms that started within less than 48 hours.

**Table**

Case definition and classification, influenza A(H1N1)v infection, France, 10 June, 2009

<table>
<thead>
<tr>
<th>Clinical criteria</th>
<th>Any person with an acute respiratory illness:</th>
</tr>
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<tbody>
<tr>
<td>- Fever (&gt;38°C) OR myalgia OR asthenia</td>
<td>- AND respiratory symptoms: cough OR dyspnoea</td>
</tr>
<tr>
<td>Epidemiological criteria</td>
<td>At least ONE of the following in the seven days prior to disease onset:</td>
</tr>
<tr>
<td>- Travel to an area where sustained human-to-human transmission of Influenza A(H1N1)v has occurred (as of 10 June 2009: Argentina, Australia, Canada, Chile, Dominican Republic, Japan, Mexico, Panama, United Kingdom, United States).</td>
<td>- Close contact to a possible, probable or confirmed case of Influenza A(H1N1)v infection while the case was contagious (24h prior to symptom onset until seven days after).</td>
</tr>
<tr>
<td>Close contact definition</td>
<td>At least one of the following:</td>
</tr>
<tr>
<td>- A person living with a case: family, roommate etc.</td>
<td>- A person who had direct contact with a case, within 1 m while the case was coughing, sneezing or talking; friend; close friend; classmate, working neighbour; plane or train neighbour</td>
</tr>
<tr>
<td>Case classification</td>
<td>1 - Possible case:</td>
</tr>
<tr>
<td>- Any person meeting the clinical and epidemiological criteria.</td>
<td>2 - Probable case:</td>
</tr>
<tr>
<td>- At least one of the following:</td>
<td>- Any possible case with a positive RT-PCR for Influenza A virus</td>
</tr>
<tr>
<td>- Any possible case with a severe symptomatology (acute respiratory distress syndrome or death with an acute respiratory infection)</td>
<td>- Any possible case which was a close contact to a probable or confirmed case while the case was contagious.</td>
</tr>
<tr>
<td>3 - Confirmed case:</td>
<td>Any possible case with a positive RT-PCR for Influenza A(H1N1)v virus.</td>
</tr>
<tr>
<td>- Any possible case which was a close contact to a possible, probable or confirmed case while the case was contagious.</td>
<td>4 - Excluded case:</td>
</tr>
<tr>
<td>- Any person who does not meet possible case criteria.</td>
<td>- Any possible case with a negative Influenza A virus RT-PCR</td>
</tr>
</tbody>
</table>
In order to prevent this from happening, reporting of outbreaks in such communities, particularly in the early phase of the influenza season, has been fostered and will lead to prompt investigation including virological testing. Furthermore, to improve self-notification of clusters, healthcare professionals have been informed on the relevance of such measures.

**Virological surveillance**

An enhanced virological surveillance will be implemented in order to identify and characterise circulating influenza viruses during the coming winter season in Réunion Island. Specimens will be collected by members of the sentinel network and hospitalised patients with ILI symptoms will also be tested. We estimate an average of 80 specimens to be tested weekly at the Laboratory of Virology of Saint-Denis Hospital, one of the 24 laboratories approved by the French Ministry of Health. Specimens will be tested for influenza A and B virus by RT-PCR. For positive influenza A specimens, specific RT-PCR for influenza A(H1N1)v will be performed. All positive influenza specimens (A(H1N1)v and others) will be sent for further viral isolation and complementary analysis, including oseltamivir resistance monitoring, to one of the two French National Reference Centres (NRC) for influenza.

**Discussion**

The beginning of the winter season in Réunion Island in June is usually followed by an increase of seasonal influenza activity shortly afterwards. As influenza A(H1N1)v is rapidly spreading worldwide, it can be expected that it emerges very soon in the upcoming winter season in the southern hemisphere (as it already has for example in Australia), including Réunion Island. Therefore, the surveillance of influenza on the island has been enhanced to be able to detect the introduction of influenza at an early stage and to monitor the spread and impact of the infections in order to guide the implementation of control measures foreseen in the French national pandemic plan. The usefulness of our enhanced surveillance will be guaranteed by a good collaboration between clinicians, virologists, epidemiologists and public health authorities. Close viral monitoring is of paramount importance since the circulation of seasonal influenza A(H1N1) resistant to oseltamivir with the A(H1N1)v virus is possible during the winter in the southern hemisphere. Such virological approach combined with epidemiologic description of a potential outbreak will assist local public health authorities to adapt control measures to limit the spread of the infection and mitigate the epidemic including use of information on the effectiveness of antivirals. Results of our enhanced surveillance, if an influenza epidemic occurs in Réunion Island, could provide relevant information for continental France or other European countries in preparation for the coming influenza season in the northern hemisphere.

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* Erratum: On 12 June 2009 Figure 2 was replaced and the titles in the References were translated into English.

References


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