

This article is an early release of information from Inform'ACTION No. 31, which will be published very soon.

Description of Influenza A (H1N1) outbreak on the island of Moorea from August to October 2009

Moorea is 11 nautical miles from Tahiti, the main island of French Polynesia. It had a population of 17 000 habitants at the last census in 2007, but this number increases by 25 to 30% on weekends and holidays as Moorea is a favoured recreational destination for people living on Tahiti.

Moorea Hospital is a rural hospital with 15 beds. It has no operating theatre but does have a maternity centre and emergency unit. This small facility operates as part of a medical district providing public health and prevention services and a medico-social dispensary for the population of Moorea plus the small island of Maiao (population – 300). Maiao lies 40 nautical miles off Moorea and is accessible only by boat, which takes 5 hours sailing westward.

As described above, the hospital, emergency, and maternity centre functions are located together in the same facility as the dispensary, mother and child health section, school medical and dental services, health promotion and health education centre, and public health and hygiene centre.

This integrated, user-friendly and community-oriented health facility is staffed by 65 people, including three midwives, one dentist and six doctors. Ten private practitioners based at different locations around the island also offer their services.

Influenza surveillance in French Polynesia usually involves a sentinel network of doctors reporting influenza, dengue and diarrhoea cases on a weekly basis to the Health Department's 'Health Watch Office' using standardised case definitions. Dispensary visits at Moorea Hospital are part of the sentinel network. The case definition for an influenza-like illness for the sentinel network is as follows: sudden onset of fever $\geq 38^{\circ}5$ and myalgia or tiredness and respiratory signs or ENT signs.

In April 2009, the Health Department issued procedures for tackling a pandemic of Influenza A (H1N1) pdm* to all health professionals. Until 3 July, the definition for a suspected case of Influenza A (H1N1) pdm was: fever $> 38^{\circ}$ or muscle aches or fatigue and coughing or dyspnoea appearing within 7 days after returning from an area where human circulation of the virus has been identified.

This definition was broadened on 27 July to include all persons with the above symptoms returning from travel overseas, whatever the country visited. Every suspected case was to be hospitalised in isolation, confirmed by virus testing on a nasal specimen and given antiviral treatment. In addition, an investigation was to be carried out to identify and treat the close contacts.

** pdm stands for pandemic.

On 1 August, after identification of the first three cases of community transmission, including one on Moorea in week 32, an epidemic was officially declared in French Polynesia.

The definition for a suspected case remained the same except for the clause relating to overseas travel, which was dropped. At the same time, with the start of the new school year scheduled for 10 August, the procedure was supplemented by an arrangement to close schools when there were three suspected cases per class.

To cope with the heavy caseload during the peak of the outbreak, special arrangements were introduced at Moorea Hospital from week 34 to week 40.

(see document attached)

Epidemiological data

During the outbreak period, from week 32 to week 40 (3 August – 4 October 2009), 1094 suspected cases of Influenza A (H1N1) pdm were diagnosed in Moorea and Maiao public health facilities. During week 34, corresponding to the peak of the outbreak, the attack rate on the island of Moorea as a whole (public and private practitioners) was estimated at 16 cases/1000 inhabitants per day.

- 61% of cases (n = 669) diagnosed in public health service facilities were children in school or of pre-school age.
- 2.3 % of cases (n = 26) were hospitalised on Moorea for influenza complications.
- 6.4 % (n = 70) of cases involved pulmonary bacterial superinfection.
- 7 cases required medically supervised transfer to the main Tahiti hospital for specialist treatment.
- No fatalities have been reported.

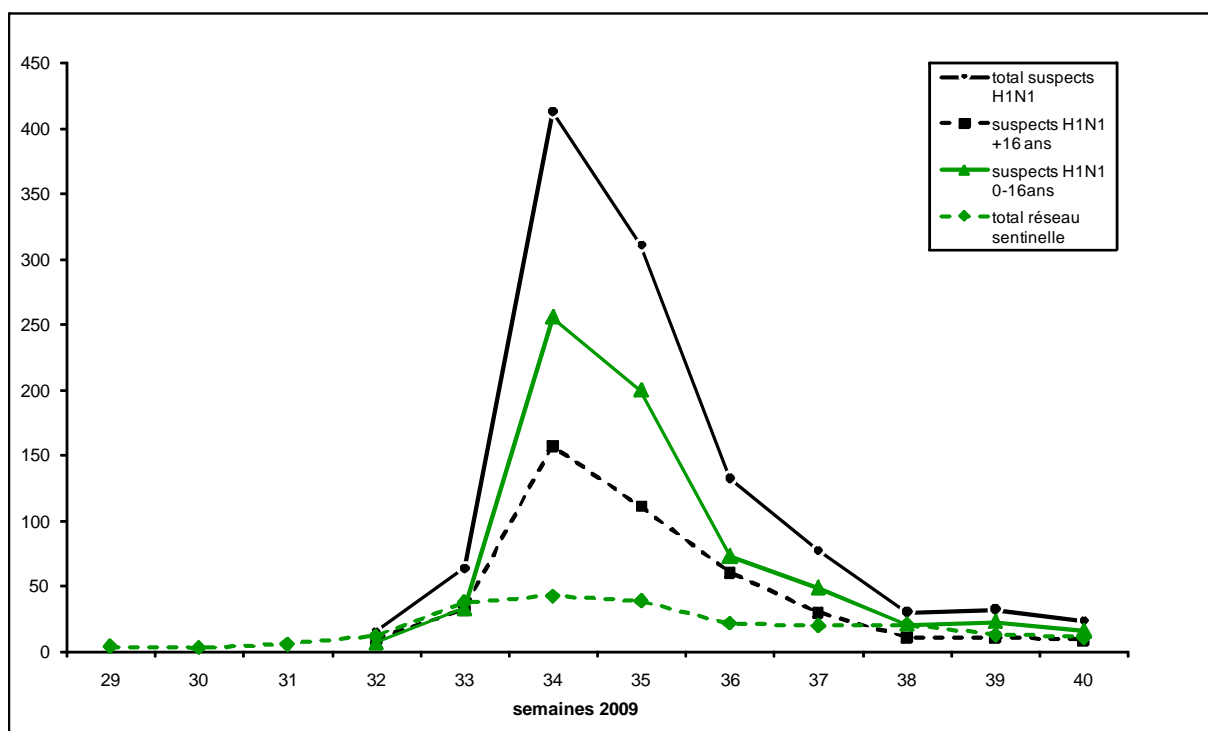


Figure 1. Number of suspected cases of influenza A (H1N1) by week number (2009) in Moorea Maiao health facilities.

Comments

Viral surveillance and case definitions

During the pre-outbreak period, viral surveillance by nasal sampling was applied only to suspected cases of A (H1N1) pdm, meaning only people coming back from overseas travel. Identification of the first 'indigenous' cases was therefore probably delayed. It is likely that community transmission began before week 32. Subsequently, for practical reasons, sample-taking was restricted to hospitalised cases, which did not permit an accurate assessment of the H1N1 positive rate in influenza-like illness cases (the positive rate during this period for the whole country was 50%).

The difference in the case definitions used for the sentinel network and the Influenza A (H1N1) pdm was a source of confusion for some health professionals. The sentinel network procedure requires fever to be diagnosed, whereas a fever diagnosis is optional in the A (H1N1) pdm case definition.

During the period between notification of circulation of the Influenza A (H1N1) pdm virus and the start of the outbreak peak (weeks 32 and 33), the most widely used case definition continued to be the conventional one adopted by the sentinel network; later, the slope of the A (H1N1) pdm outbreak curve was probably not accurately assessed, resulting in an underestimate.

Medical training

This outbreak revealed a lack of medical training regarding diagnosis and care of influenza cases, especially pediatric and severe forms. The physiopathology of influenza was also inadequately known (ref. 1). Health professionals' knowledge was in general limited to the idea of fever with coughing and myalgia, thus ignoring the many possible clinical manifestations of influenza (asymptomatic form, abdominal pain, rhino-pharyngitis, bronchitis, arthralgia, neurological disorders, acute respiratory distress syndrome, etc.).

Daily case studies and weekly training sessions at Moorea Hospital were therefore initiated and were found to be productive and worthwhile. The main references used for this clinical training were articles published since April 2009 by the United States CDC and the Australian Health Service.

School setting

In the school setting, we observed a clear gap between the hygiene measures recommended for limiting influenza transmission and resources actually available.

A comprehensive survey of all schools on Moorea carried out by our team early in the outbreak showed that none of the 15 schools had toilet blocks that met the relevant standards and that only five had enough hand basins for the number of students. Only six schools had enough equipment (soap and hand-towel dispensers) for effective hand-washing and consumables were not always regularly supplied. No school had rubbish bins with lids where used tissues could be disposed of safely.

Dynamics of the outbreak

As elsewhere in the country, the week following the start of the new school year (week 34) on Moorea featured a sudden and very marked increase in the number of suspected cases of Influenza A (H1N1) pdm. The outbreak lasted nine weeks, from week 32 to week 40.

This very abrupt and brief outbreak surprised the authorities, health professionals and the community. However, it can be partly explained by various social and epidemiological factors specific to French Polynesia:

- A number of outbreaks with the same characteristics (direct human transmission, high contagiousness, lack of, or low group immunity) have occurred in the country over the past 20 years. These outbreaks, probably typified by conjunctivitis outbreaks, are known to have had a very sudden onset with very high attack rates. Another less typical example is that of the very high attack rate recorded with a mumps outbreak on the island of Raivavae in 1988, before the start of compulsory vaccination against this disease. In a two-week period, seven to eight people were affected in each family home of approximately 10 members (personal data.)
- The behaviour of family groups in French Polynesia remains conducive to direct human transmission, i.e. many people living in the same home, no personal bedrooms, all family members gathering to sleep in the same large room, especially in the cool season, mobility of people between various houses, etc.
- Island geography and social behaviour make cases 'captive', i.e. they do not move far from the neighbourhood or island, increasing opportunities for transmission in a specific area.
- Family compliance with health advice issued in 'conventional European' ways – media, doctors – is in general fairly low.

With this background, there is merit in attempting to compare the epidemiological data for Influenza A (H1N1) pdm in 2009 and the mortality data available for the outbreak of Spanish influenza on Tahiti in 1918 (Fig. 2; ref. 2). The epidemic curves for these two events, which are very different in terms of seriousness, nevertheless develop in a similar way.

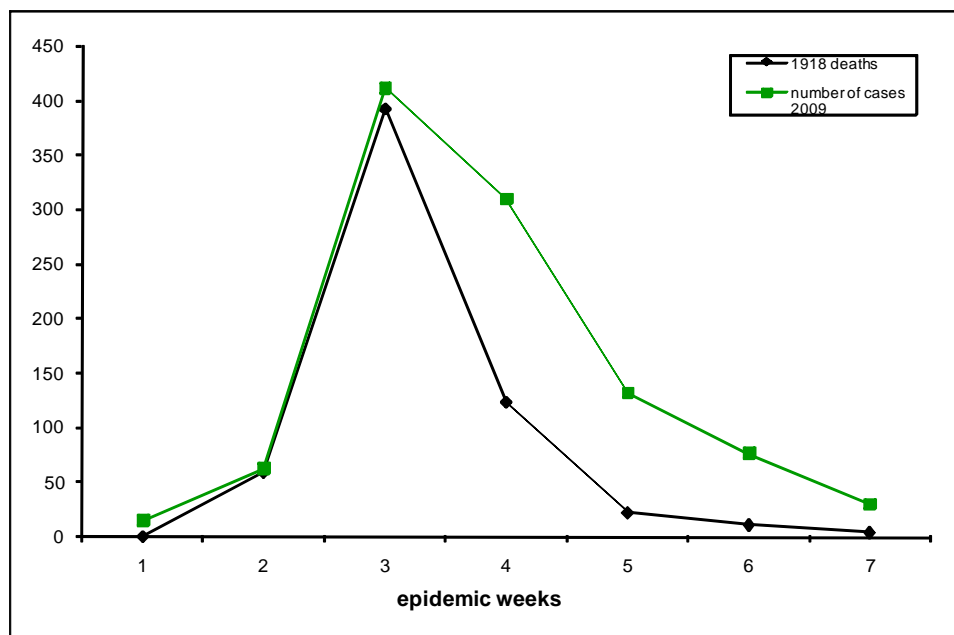


Figure 2. Number of deaths from influenza in 1918 in Papeete, and number of suspected cases of influenza A (H1N1) pdm diagnosed at Moorea Maiao public health facilities in 2009.

These data – as if there is any need – remind us of the extreme severity of the Spanish influenza epidemic that caused 1250 deaths on the island of Tahiti alone, out of a population of 7000, in only six weeks between the end of November 1918 and beginning of January 1919.

It now remains to be seen how this outbreak of Influenza A (H1N1) pdm will develop in the future. Are we entering a low-noise transmission phase lasting a few months followed by the disappearance of the event, or is this the calm before the emergence of a possible second wave? What degree of group immunity to this virus has the population acquired?

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(A copy of this report is available at 'Service des archives territoriales de la Polynésie française', Papeete, under reference BH B4° 32).

INFLUENZA OUTBREAK – ORGANISATION OF WORK AT MOOREA MAIAO HEALTH FACILITIES

1. Increase in patient handling capacity at Moorea Hospital:

- Expand from 45 patients per day treatment rate in normal circumstances to 80 patients per day
- No drop in preventive medicine and MCH activity rates
- Suspension of school health activities
- Total dispensary- typical handling capacity: 115 patients per day

2. Geographical modifications to medical activities

- Transfer MCH activities to a protected and isolated area
- Establish a specific suspicion-of-influenza holding area, with health education and educational tasting of local fruits

3. Introduction of reception and nurse triage procedures

- Reception, orientation and health education by dedicated staff in waiting areas
- Triage performed by nurses (adult and children's nurses). Cases with severe signs directed to the emergency unit or for priority attention from a doctor.

4. Establishment of a hospital area protected against influenza for hospitalisation of obstetric/high-risk cases

5. Introduction of an ongoing medical and paramedical influenza training programme:

- Medical file assessment every morning at 7 am
- Ongoing medical influenza training every Friday at 1 pm

6. Establishment of an influenza-specific stock of medicines with daily control and checks

7. Optimisation of human resources

- Table of leave and work absences
- Fast-tracking of current recruitment procedures
- Recall duty of offering a broad range of skills, prepare a plan in the event of a deterioration in the quality of activities and a schedule of internal transfers as needed

8. Daily call to Maiao Island to offer moral and logistical support

9. Set up daily influenza data record in Excel spreadsheet

10. Introduce a programme of daily visits to schools by a prevention/hygiene team

- Advice to teachers
- Check of equipment and hygiene procedures
- Influenza health education for pupils and teachers

All these procedures are managed by supervisory staff, who attend a daily debriefing after work in the late afternoon.