

ENHANCED SURVEILLANCE OF INFLUENZA A(H1N1)v IN GREECE DURING THE CONTAINMENT PHASE

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Following the emergence of a novel influenza virus (influenza A(H1N1)v) with pandemic potential in late April 2009, public health measures were put in place in an effort to contain disease spread in Greece. These included enhanced surveillance of infections due to influenza A(H1N1)v virus, in order to continuously ascertain the situation and guide further public health action. On 15 July, Greece moved to mitigation phase. This report summarises surveillance findings in Greece during the delaying (or “containment”) phase, from 30 April to 14 July 2009.

Introduction

In late April, a number of human cases of influenza due to a novel swine-origin virus strain were identified in Mexico and the United States. This prompted the World Health Organization to declare a “public health emergency of international concern” [1], advising national public health authorities to enhance surveillance activities for influenza. As community transmission of influenza A(H1N1)v virus began to be established around the world, a phase 6 pandemic was declared on 11 June 2009 [2]. As of 19 July the number of confirmed cases worldwide was 137,232 with 779 deaths [3]. On 15 July, Greece moved to mitigation phase. We herein report surveillance findings for cases reported until 14 July.

Public health measures

In Greece, an enhanced surveillance system for influenza A(H1N1)v was set up by 30 April 2009. The main target was travellers coming back from affected areas and their contacts. Information was disseminated to the public through the media, the internet, and by posters and leaflets distributed at international points of entry. Thermal imaging cameras were installed at airports in order to screen incoming travellers for fever. A telephone hotline was used to provide information and guidance to the public, advise health professionals, and guide cases under investigation for influenza A(H1N1)v to designated reference hospitals for clinical evaluation and nasopharyngeal swab collection. Specimens were sent to one of two reference laboratories, one in Athens (Hellenic Pasteur Institute) covering southern Greece and one in Thessaloniki (Aristotle University of Thessaloniki, Second Microbiology Laboratory) covering northern Greece. The diagnosis was confirmed with real-time PCR. In early July a third laboratory was introduced into the system (University of Athens School of Medicine, Department of Microbiology).

All cases under investigation for influenza A(H1N1)v were managed in the reference hospitals; they were referred there by primary care physicians, from non-reference hospitals, from other healthcare facilities such as airport medical offices, or they could present to the emergency department of a reference hospital on their own. This applied to both Greek and foreign citizens, regardless of insurance status.

Guidelines for case and contact management and for infection control were prepared by the Hellenic Centre for Disease Control and Prevention (KEELPNO). These were sent to hospitals and published on the KEELPNO website (<http://www.keelpno.gr/articles/topic/?id=994>).

Methods

A case definition was adopted, which closely matches the case definition that was agreed upon on the European level [4]. A “case under investigation” was defined as a person meeting clinical criteria (fever >38°C plus symptoms of acute respiratory infection such as cough, dyspnoea, sore throat, etc.) and epidemiological criteria (in the week before onset of symptoms: history of travel to an affected area or history of close contact with a confirmed case during his/her infectious period). A “probable case” was defined as a person meeting clinical and epidemiological criteria plus a positive laboratory result for influenza A of an unsubtypeable type. A “confirmed case” was defined as a person tested positive for influenza A(H1N1)v.

However, due to the rapidly changing nature of the pandemic, clinicians were allowed at their discretion to submit samples from patients not fitting the case definition, particularly in regard to the affected areas which were no longer easy to define as more and more countries reported community transmission.

All cases investigated for influenza A(H1N1)v were notified directly to KEELPNO on an individual basis, both by hospital clinicians and by the reference laboratories.

Results

On 18 May, the first case of influenza A(H1N1)v was detected in a 19-year-old male, who had returned from New York city two days earlier. On 26 and 27 May the second and third cases were

detected in two students returning from the United Kingdom. These were the first cases imported from another European Union country [5].

By Tuesday 14 July 2009, 1,258 cases had been investigated and a total of 312 (25%) laboratory-confirmed cases had been reported, of whom 208 (66.6%) described a history of recent travel abroad. Of the remaining, i.e. domestically-acquired cases, 23 (7.4%) had been in direct contact with a traveller, 53 (17.0%) had no well-defined epidemiological link to another case, 25 (8.0%) were linked to other non-traveller cases, and for three (1.0%) the mode of transmission could not be ascertained. Figure 1 shows the epidemic curve. A definite increase in the numbers of reported cases with symptom onset from 30 June onwards was observed. Before this date 23% of cases (25 out of 107) were domestic; from 30 June onwards 37% (73 out of 196) were domestic including 23% (46 out of 196) for whom no epidemiological link to another case could be identified.

The mean time from symptom onset to diagnosis of influenza A(H1N1)v infection was 2.8 days (SD 1.6 days). The most frequent countries of travel for travel-associated cases were the United States, the United Kingdom and Australia (in descending order). This probably reflects the high number of people travelling to and from these countries, mainly foreign tourists and Greeks living abroad.

The age distribution was not significantly different between travel-associated and domestically-acquired cases. The mean age was 23.6 years (SD 14.0) and 26.4 years (SD 13.6) respectively. No significant differences were identified between sexes; of the

total 312 cases reported, 170 were male (54.5%) and 142 were female (45.5%).

The clinical features of the described influenza A(H1N1)v cases were very similar to those observed in seasonal influenza patients. In the vast majority of cases the illness was mild, and the most prevalent symptoms were fever and a dry cough reported by more than 80% of cases. Sore throat, rhinorrhoea, muscle pain and headache were each reported by about half of the cases. The frequency of diarrhoea and vomiting was low, under 10% of cases, contrary to some reports [6], but consistent with the epidemiological picture across Europe [7]. Hospitalisation is not representative of disease severity, because initially it was used as a means of isolation. No deaths were reported.

Of those reporting fever, 30% had a temperature lower than or equal to 38°C. Thus we estimate that only about 60% of our cases initially fulfilled the clinical criterion of fever >38°C specified in the case definition.

A number of clusters were identified. These included a cluster of five Americans and an Italian guide from a group of tourists visiting Athens in mid-June, and a cluster of 14 American students who fell ill while on a visit in Thessaloniki in early July. There were also clusters of domestic transmission, for example a woman returning from the US who transmitted the virus to her family (four cases) and a hospital employee with no known exposure to an infectious case who transmitted the virus to his family and one colleague (five cases). Also, a complex cluster of seven cases was detected, starting from an 18-year-old male who had returned from London (Figure 4). One case highly publicised by the media was that of

FIGURE 1

Cases of laboratory-confirmed influenza A(H1N1)v reported in Greece until 14 July 2009, by day of symptom onset and type of transmission, (n=300, missing data for 12 cases)

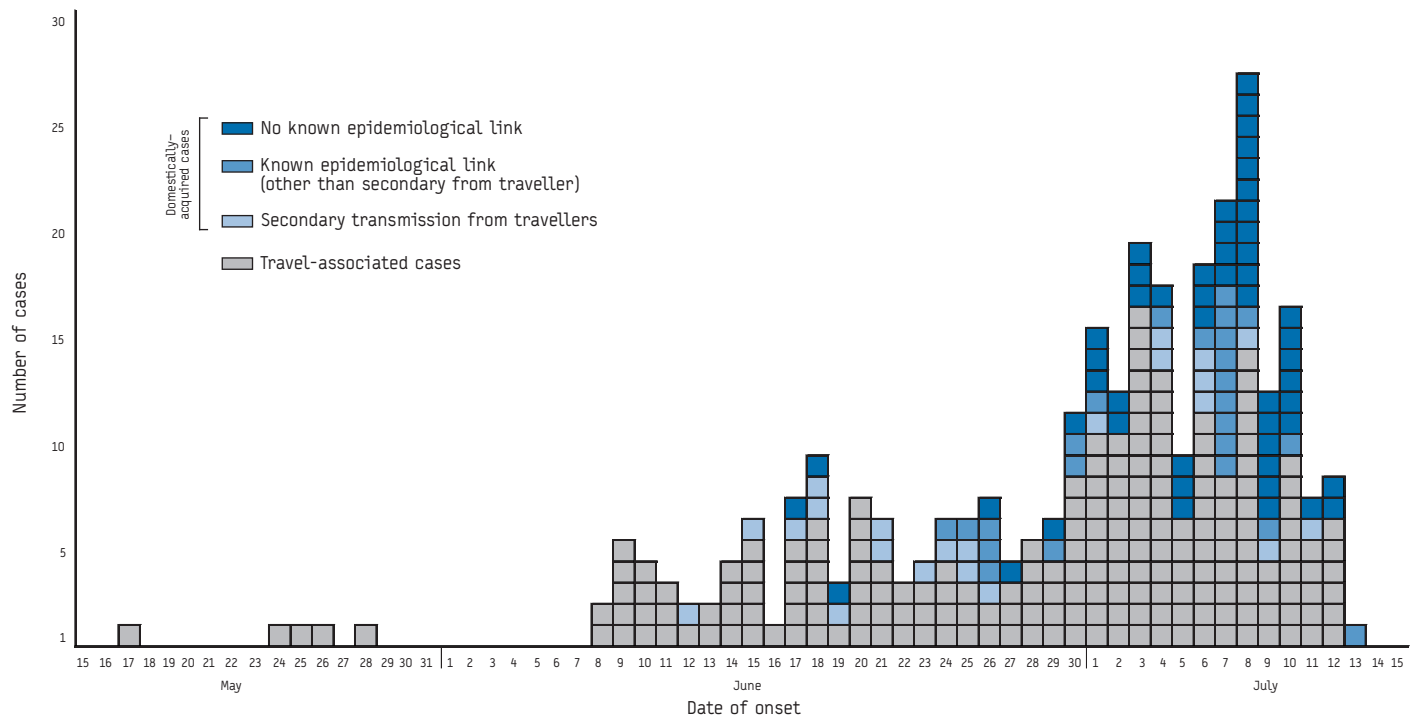


FIGURE 2

Travel-associated influenza A(H1N1)v cases reported in Greece until 14 July 2009, by country of travel (n=206)

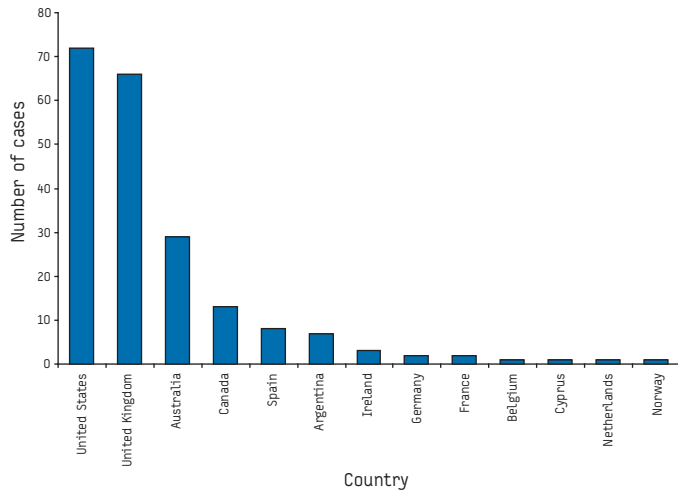
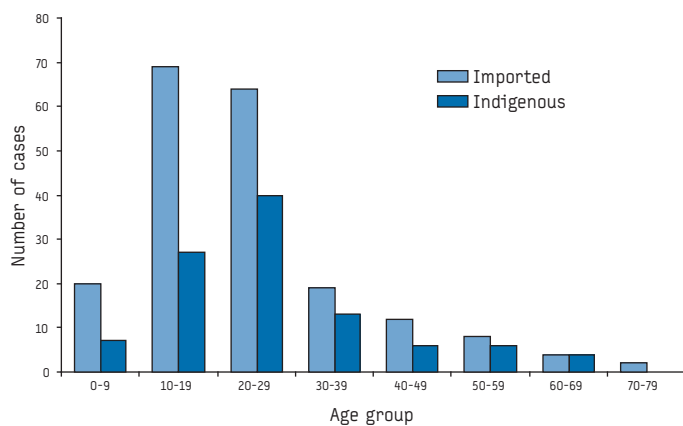


FIGURE 3

Age distribution of influenza A(H1N1)v cases reported in Greece until 14 July 2009, by type of transmission (n=301)



TABLE

Clinical features of laboratory-confirmed influenza A(H1N1)v cases in Greece, reported by 14 July 2009

Symptom	Cases with symptom / Cases for whom information was available	Percentage
Fever	235 / 277	85%
Cough	224 / 274	82%
Myalgia	137 / 262	52%
Headache	136 / 266	51%
Rhinorrhoea	134 / 270	50%
Sore throat	110 / 269	41%
Diarrohea	20 / 266	8%
Vomiting	14 / 263	5%
Dyspnoea	8 / 267	3%
Pneumonia	2 / 269	1%

a South American footballer, who plays for a Greek superleague team. He and his family (four cases) fell ill shortly after returning to Greece.

As already mentioned, of the 101 domestically-acquired cases of influenza A(H1N1)v, 53 had no well-defined epidemiological link to another probable or confirmed case. Of these, 13 were airport employees, two were hospital employees, seven worked in bars or restaurants in tourist areas, three worked in tourist-related occupations (a travel agent, a bus driver and a tour guide) and one was a taxi driver. This highlights the rapid spread of the virus and points to occupational exposure by specific risk groups.

However, no influenza A(H1N1)v cases have been identified from sentinel surveillance to date, indicating that overall the circulation of the A(H1N1)v virus in Greece is still limited.

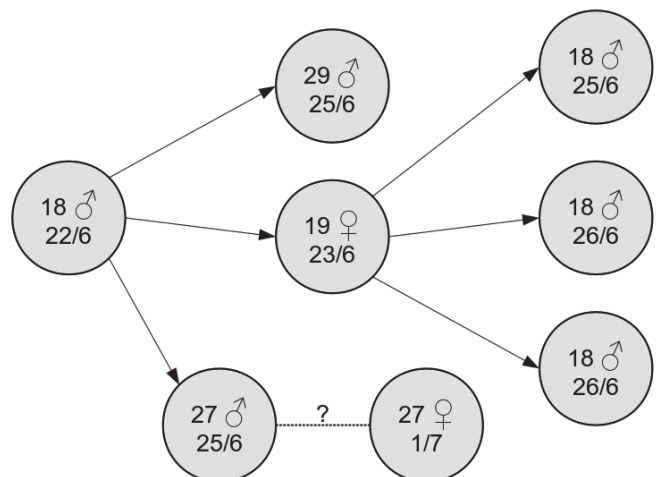
Discussion

These results support the importance of surveillance activities in order to monitor the epidemic and guide public health action by collecting data on epidemiological parameters and mechanisms of transmission in the community.

Several cases were identified during the first two and a half months of enhanced surveillance of A(H1N1)v influenza in Greece. Most of the identified cases concerned travellers from affected countries, especially those with community-wide sustained transmission, and about one in ten cases were secondary cases directly related to travellers. Furthermore, half of the cases without well-identified epidemiological link to another probable or confirmed case were persons related to the tourist industry in Greece. As the number of cases increased, we noticed a gradual increase in secondary and tertiary cases and eventually we identified domestic confirmed cases where no traceable link to a confirmed case was established. The increase in the number of reported cases observed from 30 June onwards might in part reflect the increased frequency of tourist visits to Greece in this period. This was accompanied by a high number of cases infected in the community during the same period.

FIGURE 4

Example cluster of in-country transmission (n=7). The age, sex and date of symptom onset are shown



A number of conclusions can be drawn from the surveillance results in Greece:

1. Many of the samples collected from clinicians did not fit the definition for “cases under investigation”, either in terms of clinical parameters or in terms of epidemiological criteria. Particularly the “affected areas” proved to be a fast-moving target, as cases were becoming identified from an ever increasing number of countries not previously declared as affected, and cases were tested and identified on the basis of clinical judgement exercised by astute clinicians. Ironically, the fact that clinicians did not abide by the case definition agreed at European and national level allowed us to have a better picture of the evolving epidemic, enabling the detection of the first cases imported from an EU country [5], as well as community-acquired cases.

2. Given the above mentioned shortcomings of the case definition, which tends to systematically ignore patients with local transmission unless contact with a probable or confirmed case can be documented, the actual proportion of domestic cases might be underestimated in our findings.

3. During the summer, a peak influx of tourists is anticipated from countries with higher prevalence of influenza A(H1N1)v to Greece and other southern European countries. Greece is expected to host 13-14 million tourists this year, which is more than the national population of 11 million. This is expected to introduce a large number of infected subjects, and might account for an earlier start of the next influenza season. Furthermore, the advice against travel when a person is ill is apparently not adhered to by the general public. For example, media reported of several tourists who having spent a significant amount on travel expenses were unwilling to delay or postpone their trip and travelled while symptomatic.

4. The continuation of enhanced surveillance of influenza A(H1N1)v, including contact tracing around cases, would be inadvisable as case counts increase. Under such circumstances it is exceedingly difficult to maintain this practice, and its public health benefit is doubtful [8].

In conclusion, we report the cases of influenza A(H1N1)v recorded in Greece during the containment phase, from 30 April to 14 July. In an effort to contain disease spread and in order to continuously ascertain the situation and guide further public health action several measures were taken. However, our results illustrate that the spread of this disease is rapid, transmission in the community could not be prevented, and we anticipate there may be evidence of wider community transmission in our country soon and out of season. In this evolving situation, healthcare and public health resources need to be managed efficiently and sparingly.

As a result, a decision was announced on 15 July to move public health measures in Greece to a mitigation phase, which was communicated as “patient protection phase”. In this phase, contact tracing was discontinued and the recommendation for chemoprophylaxis of all close contacts was withdrawn; chemoprophylaxis is now recommended for particularly vulnerable contacts, at the physician’s discretion. Criteria for testing mainly include severe cases requiring hospitalisation, and selected cases from clusters of influenza-like illness; testing can be also carried out in special situations according to clinical judgment. Treatment with antivirals is now recommended for cases with severe symptoms or belonging to high-risk groups. Surveillance shifted to: a) notification of laboratory-confirmed severe cases who are

hospitalised, b) laboratory reporting of influenza A(H1N1)v cases, c) sentinel surveillance of influenza-like illness, including a clinical and a laboratory component. Surveillance can contribute in an important way to public health decisions.

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