Influenza A (H1N1) 2009 Surveillance in Belgium

Samia Hammadi

Introduction

On April 21, 2009, the Centers for Disease Control and Prevention (www.cdc.gov/h1n1flu) identified a new influenza A virus in two Californian children; it was also found in Mexican patients' samples retrospectively. Influenza caused by this virus was soon called «swine flu», although the virus genetic material contained swine, human and avian elements. The World Health Organization (WHO) named this new virus influenza A (H1N1)2009 (Epi-Scoop, 2009, No. 1).

On 25 April 2009, the WHO declared the outbreak of influenza A(H1N1)2009, a 'Public Health Event of International Concern' (PHEIC) under the International Health Regulations. To this end, Member States of WHO had an obligation to adapt their surveillance systems in order to notify and collect information relating to that event (www.who.int/csr/disease/swineflu/en/index.html).

As of the end of April 2009, Belgium adapted its influenza surveillance system. On the one hand, clinical and virological surveillance by the sentinel physicians’ network and the National Influenza Center (NIC) was maintained after the end of the influenza season. On the other hand, a system of active surveillance for influenza like illness (ILI), targeting travelers returning from areas affected by the virus and their contacts was established.

The Scientific Institute of Public Health (IPH), a body responsible for national surveillance of seasonal and pandemic influenza, as a partner of the Interministerial Influenza Coordinating Committee, took an active role in the response to the pandemic. Two sections of the IPH participated actively in this task: the section of virology, known as NIC at international level and the Unit of Epidemiology which coordinates, inter alia, the network of sentinel physicians.

On 12 May 2009, the NIC confirmed the first case of influenza A(H1N1)2009 in a person returning to Belgium from the US.

Objectives

Since the emergence of the pandemic influenza virus, two major operational phases were carried out in Europe:

a) A phase of containment
b) A phase of mitigation.

The phase of containment aims at preventing the spread of infection through:

• an active search of imported cases and their contacts,
• the implementation of measures to cut the chains of transmission of infection, such as early treatment and isolation of cases, prophylaxis and/or voluntary isolation of contacts.

During this containment period, the role of surveillance is to ensure the identification and confirmation of cases.

The mitigation phase aims at minimizing the number of people affected by the pandemic by reducing the transmission of the agent, ensuring timely access to appropriate healthcare, and identifying and protecting those most vulnerable.

During the mitigation phase, surveillance systems seek to monitor the virus circulation and to detect possible genetic changes. Clinical surveillance allows tracking the incidence of ILI and its complications (hospitalization, death).

Methods

Within the containment phase, identification of cases was based on the presence of influenza-like illness and the possibility of contamination either during a recent trip to an area where local transmission of the virus was known, either by close to a confirmed case (Table 1). The list of affected countries was updated and published on the site www.influenza.be on a daily basis. All confirmed cases were notified to the WHO and through the Early Warning and Response System (EWRS) to the European Centre for Disease Prevention and Con-
A person negative for influenza A

A person with influenza A(H1N1)2009 laboratory confirmation.

14 children aged between 10 and 18.

A person with:

- Fever (>38°C)
- One respiratory symptom (cough, dyspnoea)
- General discomfort

- History of travel to affected area
- History of close contact (<1 metre) with confirmed or symptomatic probable case

**Table 1: Case definitions used for the investigation and classification**

<table>
<thead>
<tr>
<th>Case definition for investigation</th>
<th>Case classification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Possible case</strong></td>
<td>A person with:</td>
</tr>
<tr>
<td></td>
<td>- All three clinical criteria AND</td>
</tr>
<tr>
<td></td>
<td>- At least one epidemiological criterion during the 7 days prior to onset of symptoms:</td>
</tr>
<tr>
<td><strong>Confirmed case</strong></td>
<td>A person with influenza A(H1N1)2009 laboratory confirmation.</td>
</tr>
<tr>
<td><strong>Non-case</strong></td>
<td>A person negative for influenza A or a person with a positive result for influenza A but negative for influenza A(H1N1)2009.</td>
</tr>
</tbody>
</table>

**Mitigation Phase**

From week 29 (July 12 to 19), a statistically significant increase in the incidence of ILI was observed. However this increase remained below the epidemic threshold. Extrapolating the clinical and virological results of the sentinel physicians network, the cumulative number of cases of (H1N1)2009 is estimated around 5066 by week 35 (August 24 to 30).

**DISCUSSION**

In Europe, detection of first cases depended heavily on the flow of passengers to and from affected countries. In Belgium, first cases were detected among travelers returning from the United States while those returning from Mexico were much less and thus more rarely investigated.

The clinical features of confirmed cases resemble those of seasonal influenza. This corresponds with the analysis of aggregate data of European cases of influenza A (H1N1)2009 by the ECDC.

The sentinel physicians’ network allows real-time monitoring of virus circulation in the population. Until early September, it remained low. As for the increase in the number of consultations for influenza-like symptoms, it can be explained by the effect of media and the fear engendered by this new virus.

**CONCLUSIONS**

During the summer of 2009, surveillance of influenza A(H1N1)2009 was assured by the sentinel physicians network. In order to better monitor the impact of the pandemics in the Belgian population, during the winter 2009/2010, additional surveillance systems will provide complete data. Hence a hospital based system, established in September 2009, monitors severe acute respiratory infections (SARI); besides of hospitalization rate, this system can track deaths among hospitalized people. Surveillance of absenteeism due to illness is followed in some companies and sentinel pediatricians are also involved in syndromic and virological surveillance.

In case of serious crisis, all GPs will be asked to monitor influenza like illness (ILI).

Results of these different surveillance systems are published weekly at the NIC website (www.iph.fgov.be / flu) and are used for the operational management of the Pandemics.

**RESULTS**

**Containment phase**

From 633 samples tested by July 14 2009, 130 cases of influenza A (H1N1)2009 were confirmed by the NIC. An episode of clustered cases was recorded in a language summer school, affecting 14 children aged between 10 and 18.

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The tasks of the antibiotic policy groups are defined by Royal Decree (Belgisch Staatsblad/Moniteur belge 28/03/2008, p. 17240), and monitored by the Belgian Antibiotic Policy Coordination Committee (BAPCOC). To enable close follow-up of AMD use, all hospitals are from 2008 onwards obliged to report their AMD use. Data published in this article concern the pilot-group of hospitals that participated on a voluntary basis (data 2006) and the hospitals that were obliged to participate in 2007 because they already received financing (data 2007). Data had to be reported to BAPCOC, and the IPH’s Unit of Epidemiology ensured the scientific support for this surveillance.

**SYSTEMIC ANTIMICROBIAL DRUG USE IN BELGIAN HOSPITALS**

The introduction of systemic antimicrobial drug use in Belgian hospitals is a growing public health concern. Belgium has one of the highest suicide mortality rates in Western Europe, with a crude mortality rate of 21/100,000 in 1997. Attempted suicide is reckoned to be five to twenty times the number of deaths, but figures for Belgium are scarce. Hence, questions on suicidal behaviour (i.e. thoughts and attempts) were included in the national Health Interview Survey (HIS), which is organised by the Epidemiology Unit of IPH (Epi-Scoop 2006, nr. 3).

**OBJECTIVES**

The aim of this study is twofold: it sets to estimate the prevalence of suicidal behaviour in the Belgian adult population and to identify socio-demographic features that might lead to an elevated risk for this behaviour. Attention was devoted to the household composition, as well as equivalent income, social support and employment status.

**METHODS**

**Sample**

Cross-sectional data from the Belgian HIS carried out in 2004 were used. A representative sample of the general population was drawn from the population register using a multistage stratified sampling scheme. The participation rate among the contacted households (including replacement households in case the original household was non-participating) was 61.4%. A total of 12,945 people took part in the survey from January to December 2004. This study was limited to respondents aged 25 years and older (N=9,964; 48.1% male).

**Measures**

Data on suicidal behaviour were appraised in a self-completed questionnaire by asking whether respondents had ever seriously thought of ending their life and whether they had ever attempted to do so. Social support was assessed with a question regarding how satisfied respondents were about their social contacts. Socio-demographic characteristics were categorised into «single» (one-person household), «monoparental» (households where all additional members were reported as being children and being reliant of the household head, that is, either under 16 years old, or under 30 and being daytime students or unemployed) and «other» (households that did not meet the criteria for single and monoparental taxonomy, i.e. couples with or without children, cohabitants). Equivalent income was based on the total monthly household income adjusted to the size and the composition of the households as suggested in the OECD-modified equivalence scale. Employment status included 3 categories: in a paid job, temporarily off work and unemployed.

**Analysis**

Multivariate logistic regression models were used to estimate the likelihood of engaging in suicidal behaviour according to different household settings, controlling for gender and age, and further, adjusting for potential explanatory variables such as income level, social support and employment status.

**RESULTS**

Lifetime suicide thoughts (11.8%) and attempts (3.8%) are more frequent in women (respectively 13% and 4.8%) than in men (10.5% and 2.8%). As to age, there is a decreasing trend in suicidal behaviour from younger (25-44 years) to older (65+) age groups. Prevalence of suicide thoughts and attempts is higher in single (16% and 6%) and monoparental (29% and 13%) households compared to other compositions (10% and 3%). Multivariate analyses show that, after adjustment for age and gender, but also income, employment status and social support, the odds of suicide thoughts are still significantly higher in single (OR=2.1; 95%CI=1.7-2.6) and monoparental households (OR=2.4; 95%CI=1.5-3.6) compared to other types of households. The same results hold for suicide attempts as regards single households (OR=2.0; 95%CI=1.4-3.1) and monoparental households (OR=2.8; 95%CI=1.5-5.3).

**DISCUSSION AND CONCLUSIONS**

Results show a relatively high prevalence of lifetime suicide thoughts and attempts in the Belgian adult population. Single and especially single-parent households present increased risks for suicidal behaviour, even after controlling for potential explanatory factors such as low income, low social support and job interruption.

This abstract was presented at the 16th European Conference on Public Health, 5-8 November 2008, Lisbon (Portugal).

**LYDIA GISLE**
OBJECTIVES
The first objective is to provide a standardised tool for the hospitals that allows them to have a better view on their own AMD use and its evolution. In addition, it enables them to compare their own use with the national mean (benchmarking). A further objective is to monitor systemic AMD use in Belgian acute care hospitals and long term care facilities with more than 150 beds.

METHODS
First, the IPH developed the study protocol in 2006. To facilitate the reporting of the antimicrobial use by the hospitals, as well as to ensure a standardised format of reporting, a password protected web-based data upload module was developed by the NSIH team (National Surveillance of Infections in Hospitals) of the IPH. Participating hospitals uploaded AMD consumption data using a predefined list of Tarification Unit Codes of the National Institute of Sickness and Invalidity Insurance (RIZIV/INAMI). Denominator data (bed days, admissions, wards) were also entered by the hospitals.

Once the data were entered into the web module, it calculated the Defined Daily Dose (DDD) per 1000 bed days for each drug. The AMD were coded using the Anatomical Therapeutic Chemical Classification (ATC) codes of the WHO (http://www.whocc.no/atcddd/). The hospitals could then make an online comparison of their own use with the national mean and monitor the evolution of their own AMD use. Global data analysis is performed by the IPH.

RESULTS
In 2006 and 2007 a total of 28 and 55 hospitals participated respectively. The mean systemic AMD use was 537 DDD/1000 bed days in 2006 and 576 in 2007 (Table 1). Twenty-three hospitals participated in both 2006 and 2007. In these hospitals, an increase of 4% in AMD use was seen. Especially beta-lactam antibacterials and antimycotics for systemic use contributed to this effect. These figures are difficult to interpret as data for other countries are often not comparable due to differences in study approach. Hospitals can see the evolution in their own AMD use, but only a long-term follow-up will enable us to analyse the trends in AMD use in Belgian hospitals.

CONCLUSION
The web module makes it possible to collect data from different hospitals using a standardised method. AMD use can be compared between hospitals and between years. Further data collection will enable us to analyse trends. Moreover, this web module provides a useful tool to guide antibiotic policies in the individual hospitals.

The detailed results of this surveillance for 2006-2007 will be published later this year in a national report. In the future yearly reports will be published.

SOFIE VAERENBERG

Table 1. Overview of DDD/1000 bed days in participating Belgian hospitals

<table>
<thead>
<tr>
<th>Class</th>
<th>2006 (n=28)</th>
<th>2007 (n=55)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Range</td>
</tr>
<tr>
<td>Beta-lactam antibacterials, penicillins</td>
<td>234</td>
<td>168-375</td>
</tr>
<tr>
<td>Other beta-lactam antibacterials</td>
<td>109</td>
<td>39-175</td>
</tr>
<tr>
<td>Quinolone antibacterials</td>
<td>65</td>
<td>8-102</td>
</tr>
<tr>
<td>Other antibacterials*</td>
<td>35</td>
<td>12-61</td>
</tr>
<tr>
<td>Antimycotics for systemic use</td>
<td>25</td>
<td>0-72</td>
</tr>
<tr>
<td>Macrolides, lincosamides and streptogramins</td>
<td>23</td>
<td>8-38</td>
</tr>
<tr>
<td>Aminoglycoside antibacterials</td>
<td>14</td>
<td>1-38</td>
</tr>
<tr>
<td>Drugs for treatment of tuberculosis</td>
<td>12</td>
<td>0-132</td>
</tr>
<tr>
<td>Sulfonamides and trimethoprim</td>
<td>8</td>
<td>1-22</td>
</tr>
<tr>
<td>Agents against amoebiasis and protozoal diseases</td>
<td>4</td>
<td>0-7</td>
</tr>
<tr>
<td>Intestinal anti-infectives</td>
<td>3</td>
<td>0-21</td>
</tr>
<tr>
<td>Tetracyclines</td>
<td>3</td>
<td>0-13</td>
</tr>
<tr>
<td>Antifungals for systemic use</td>
<td>1</td>
<td>0-6</td>
</tr>
<tr>
<td>Amphenicols</td>
<td>0</td>
<td>0-1</td>
</tr>
<tr>
<td>Total</td>
<td>537</td>
<td>344-827</td>
</tr>
</tbody>
</table>

* Glycopeptide antibacterials, polymyxins, steroid antibacterials, imidazole derivates, nitrofuran derivates and others