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Update: Follow-up study showing post-pandemic decline in hand sanitiser use, New Zealand, December 2009

S Manning[1], T Barry[1], N Wilson[1], M G Baker (michael.baker@otago.ac.nc)[1]
1. Department of Public Health, University of Otago, Wellington, New Zealand

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This study aimed to measure rates of hand sanitiser use in a hospital entrance foyer four months after a baseline study during New Zealand's influenza pandemic. Of the 743 people observed over one (summer) day in December 2009, 8.2% used the hand sanitiser, which was significantly lower (p<0.0001) than the 18.0% reported in the August (winter) study. Health authorities may need to intensify promotion of hand hygiene to reduce the impact of future influenza pandemic waves.

We previously published in *Eurosurveillance* an observational study on hand sanitiser use during the influenza A(H1N1) pandemic in the southern hemisphere winter of 2009 [1]. This study was on the public and hospital workers using a hand sanitiser station in the entrance foyer to the major hospital in New Zealand's capital city. Pandemic activity in this country subsequently declined dramatically [2-3], and there was very little media coverage of the pandemic during the spring and start of summer. The previous study was limited in that there was no pre-pandemic baseline data for hand sanitiser use by the public in New Zealand (NZ), and the extent to which hand hygiene behaviours have persisted in the post-pandemic period is unknown. Yet these behaviours are relevant given

Table

Hand sanitiser use in a hospital foyer entrance during summer, compared with the key results from a study in winter, New Zealand, December 2009

Characteristics	Follow-up study in summer (December 2009)				Initial study in winter (August 2009) [1]	
	Walked near hand sanitiser station (number)	Used hand sanitiser			Used hand sanitiser	
		Number	% usage (95% CI)	Risk ratio (95% CI)	% usage (95% CI)	Risk ratio (95% CI)
All observations	743		8.2 (6.4-10.4)	–	18.0 (16.6-9.6)	–
Direction of movement						
Entering the hospital	317	42	13.2	3.0 (1.8-5.2)	20.1	4.8 (2.8-8.1)
Leaving the hospital	411	18	4.4	Reference (1.0)	4.6	Reference (1.0)
Unclear "milling around"	15	1	6.7	–	–	–
Sex						
Female	425	46	10.8	2.3 (1.3-4.0)	14.2	Reference (1.0)
Male	318	15	4.7	Reference (1.0)	15	1.1 (0.7-1.5)
Age-group						
Children/teenagers combined (≤18 years)	27	5	18.5	2.4 (1.03-5.43)	0	Undefined (but significantly lower, p=0.031).
Adults (>18 years)	716	56	7.8	Reference (1.0)	15.1	Reference (1.0)
Time of day						
Morning (8.30-9.00)	172	29	16.9	2.9 (1.6-5.2)	12.8	1.09 (0.6-1.7)
Midday (12.50-13.20)	294	16	5.4	0.9 (0.5-1.8)	17.5	1.4 (0.9-2.1)
Afternoon (13.50-16.20)	277	16	5.8	Reference (1.0)	12.6	Reference (1.0)

CI: confidence interval.

that the country is anticipating future pandemic waves and planning an influenza vaccination programme and a supportive media campaign.

We repeated the same study as before [1], but for a working weekday in December 2009 (the first month of summer in NZ). Two observers (the first two authors) collected data, but inter-observer variation was not re-assessed as the previous study had shown this to be minimal. There were no apparent changes to the arrangement of the hand sanitiser station or its promotion since the initial study (despite recommendations to the relevant hospital authorities for this to be done [1]).

This follow-up study was based on 743 people observed in the hospital foyer over one day and found that the hand sanitiser was used by 8.2% (95% confidence interval (CI): 6.4% to 10.4, see Table). This proportion was significantly lower ($p<0.0001$) than the proportion reported in the earlier study of 18.0%. Usage was also significantly higher for females than for males, and higher in the morning, while neither of these differences had been significant in the initial study. The significantly higher use by children and teenagers relative to adults contrasts with the findings in the initial study. Significantly higher usage on entering the hospital (compared with leaving) was seen in both studies.

The lower level of hand sanitiser use (from 18% to 8%) could reflect an underlying seasonal pattern in hygiene behaviour by the public. But more likely is that there was a decline in awareness of the pandemic and associated hygiene behaviour over the four-month period between the two studies. This change could have been driven by reduced media reporting of the pandemic and lower public concern about this health threat (the pandemic was largely over by September 2009). Staff and regular hospital visitors may also have become habituated to hygiene messages and to the presence of the sanitiser and associated instructions in the foyer which may also have contributed to reduced use.

Female subjects were identified in this study as more conscientious regarding hand hygiene behaviour. The same result has been reported internationally (e.g. in a recent survey in Italy [4]) and also in a previous NZ study for both handwashing and soap use [5]. The higher hand sanitiser use by children in this follow-up study was a surprise finding and we noted that most of the children observed went to the sanitiser first and then the adults followed them. It is possible that hygiene education in schools during and since the pandemic may have contributed to this difference.

This follow-up study, and also the initial study, show that it is feasible to systematically observe hand sanitiser use in a hospital setting. However the study has limitations. The sample size was small; there may have been confounding in the observed associations with age group, sex and time of day; the single location may not be particularly representative of hand sanitising activity by the public visiting hospitals in NZ; nor are two studies sufficient to demonstrate robust trends over time. Consequently, we plan to collect more data (including seasonal data) in the future.

In the meantime, this study suggests that in-hospital use of hand hygiene facilities by the public has declined in the post-pandemic period in NZ. This change implies that health authorities may need to intensify and sustain hygiene messages in media campaigns, especially if they wish to minimise the impact of future influenza pandemic waves that are widely anticipated. Such campaigns are also likely to be beneficial in reducing rates of other infectious diseases transmitted by person-to-person contact.

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School absence data for influenza surveillance: a pilot study in the United Kingdom

W P Schmidt (Wolf-Peter.Schmidt@lshtm.ac.uk)[1], R Pebody[2], P Mangtani[1]
1. Department of Infectious and Tropical Diseases, London School of Hygiene and Tropical Medicine, London, United Kingdom
2. Health Protection Agency, London, United Kingdom

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School-age children are at a high risk of acute respiratory virus infections including the 2009 pandemic influenza A(H1N1). School absence records have been suggested as a tool for influenza surveillance. We analysed absence records from six primary schools (children aged from around five to 11 years) in London during the years 2005 to 2007 in order to provide baseline epidemiological characteristics of illness-related school absence, and to correlate school absence with seasonal influenza. The daily average prevalence of absence due to illness was 2.9%. The incidence was 1.3% per person-day. The mean duration of absence was 1.8 days (SD 1.8). Over 60% of absence episodes lasted for one day. Absence prevalence did not differ by sex. Prevalence was highest in the youngest children and then declined slightly, but was again high again in the oldest. Absence was slightly higher on Mondays and Fridays. In general, peaks of absenteeism coincided with peaks of influenza A and B (laboratory reports) but several high peaks were not associated with influenza. There was a better correlation between absence and laboratory reports and prevalence compared to incidence. School absence data may be useful for the detection of localised school outbreaks and as an additional surveillance tool but are limited by lack of data on weekends and during holidays.

Introduction

School-age children are at high risk of acute respiratory virus infections, in particular influenza, and bear a substantial burden of influenza-related morbidity [1-3]. The 2009 pandemic influenza A(H1N1) virus has been shown to affect children stronger than adults in terms of attack rate and disease severity [4,5]. Furthermore, schools have been recognised as playing a major role in the spread of influenza during an epidemic, and are therefore of particular public health importance for the control of influenza [6-8]. Respiratory infections in general are the leading cause for school absence [9,10], records of which have been suggested as a suitable surveillance tool for influenza [11]. Epidemics of influenza A and B have led to large outbreaks with reported attack rates in one study ranging between 14% and 42% [11].

In the United Kingdom (UK), school absence data from a network of boarding schools (Medical Officers of Schools Association - MOSA) have long been used for influenza surveillance. UK state schools are legally required to keep a timely electronic record of school absence. The Health Protection Agency (HPA) has recognised this data source as a promising tool for influenza surveillance [12]. There is evidence that even large school outbreaks of respiratory and influenza-like illnesses can go undetected by other surveillance tools [11]. An HPA pilot study using UK school absence records for influenza surveillance from 11 schools, found that school absence peaked earlier than influenza activity estimated from other surveillance data sources, and is potentially a suitable early indicator of rising incidence [12].

The aim of this analysis was to provide a descriptive analysis of some of the epidemiological characteristics of school absence to inform about the general suitability of routine school absence data in the UK for influenza surveillance. A further aim was to explore whether incidence of school absenteeism is a better measure for surveillance than prevalence which is easier to collect.

Methods

Study population

We collected data from six primary schools from a large borough in east London. We contacted schools from a list of all 52 primary state schools in the area attended by children aged 5 to 12 years. Schools were purposively sampled to cover a wide range of ethnic and socio-economic backgrounds. Receiving free school meals was used as an indicator of socio-economic background of pupils of the respective institutions. A high proportion of pupils of individual schools receiving free school meals was considered as low socio-economic background. Around 60% of the schools contacted declined inclusion in the study. The final sample included six primary schools, of which four covered school years 1 to 6, while two schools were infant schools only (years 1 and 2).

Electronic absence records in the study area contain information on the date and duration of the absence episode as well as the general reason for absence. Detailed information on reasons for illness is not routinely collected or captured electronically. Illness and medical appointments are coded as separate categories. The category "medical appointment" largely refers to planned appointments, for example due to chronic illness. Only "illness" data were included in the analysis.

The electronic absence records of the schools included in the study were converted into Excel spreadsheets at class level and anonymised before saving them on a removable disk. We retained information on date of absence, school year, and sex and collated the data to obtain all absence records over time at the level of the individual child. From these data we calculated the daily prevalence of absence as well as the incidence of absence. Incidence was defined as new cases of absence among children at risk of being absent on a given day. For the calculation of incidence, children who were already ill the previous day were excluded from the denominator. Children reported ill on Friday and the following Monday were treated as having experienced one episode of absence. Children reported ill on the last day before and the first day after school holidays of one week or longer were treated as having experienced two separate episodes.

Influenza surveillance data for the seasons 2005-6 and 2006-7 were provided by the HPA in Colindale, London. For the analysis we included laboratory reports of confirmed influenza A and B cases in the regions London, Southwest England, Southeast England and East England.

The analysis was restricted to the school years 2005-6 and 2006-7 because most schools were unable to provide data prior to these years. We conducted descriptive statistics, and simple graphical descriptive analysis of the relationship between school absence and influenza laboratory reports. The correlation between daily influenza laboratory reports (A and B combined) and school absence at different lag times was explored using cross-correlation analysis. The analysis was done in STATA 10.

Results

Among the six participating schools, the mean number of children per school was 391 (range 187 to 660). The children in these schools were from various ethnic backgrounds (mainly South Asian, West African, Arabic, Eastern European, White British). The proportion of pupils receiving free school meals ranged from 8% and 30%.

Figure 1

Duration of absence in six selected schools, United Kingdom, school years 2005-6 and 2006-7

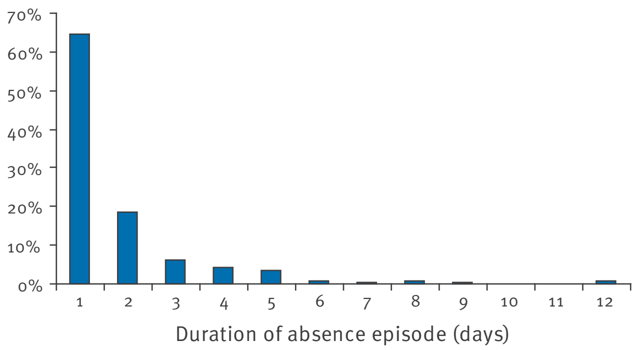


Figure 2

Absence prevalence in six selected schools by school year (class attended), United Kingdom, school years 2005-6 and 2006-7

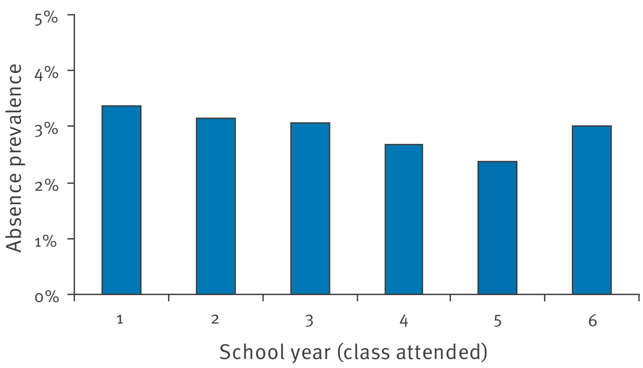


Figure 3

Absence prevalence in six selected schools by week day, United Kingdom, school years 2005-6 and 2006-7

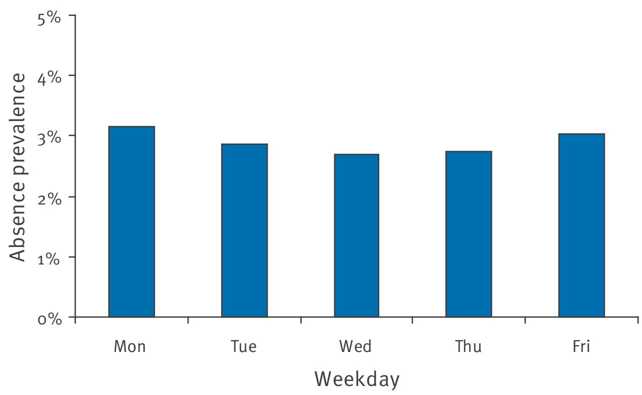
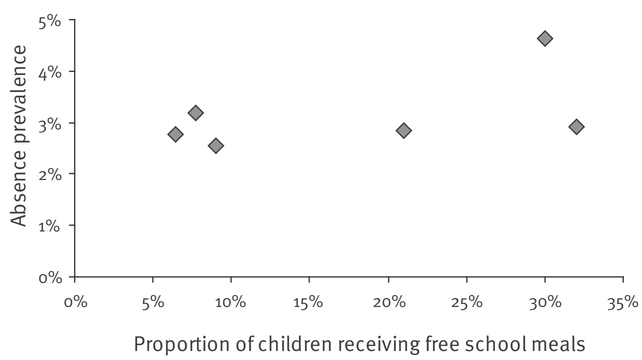


Figure 4

Absence prevalence in six selected schools by proportion of children receiving free school meals, United Kingdom, school years 2005-6 and 2006-7

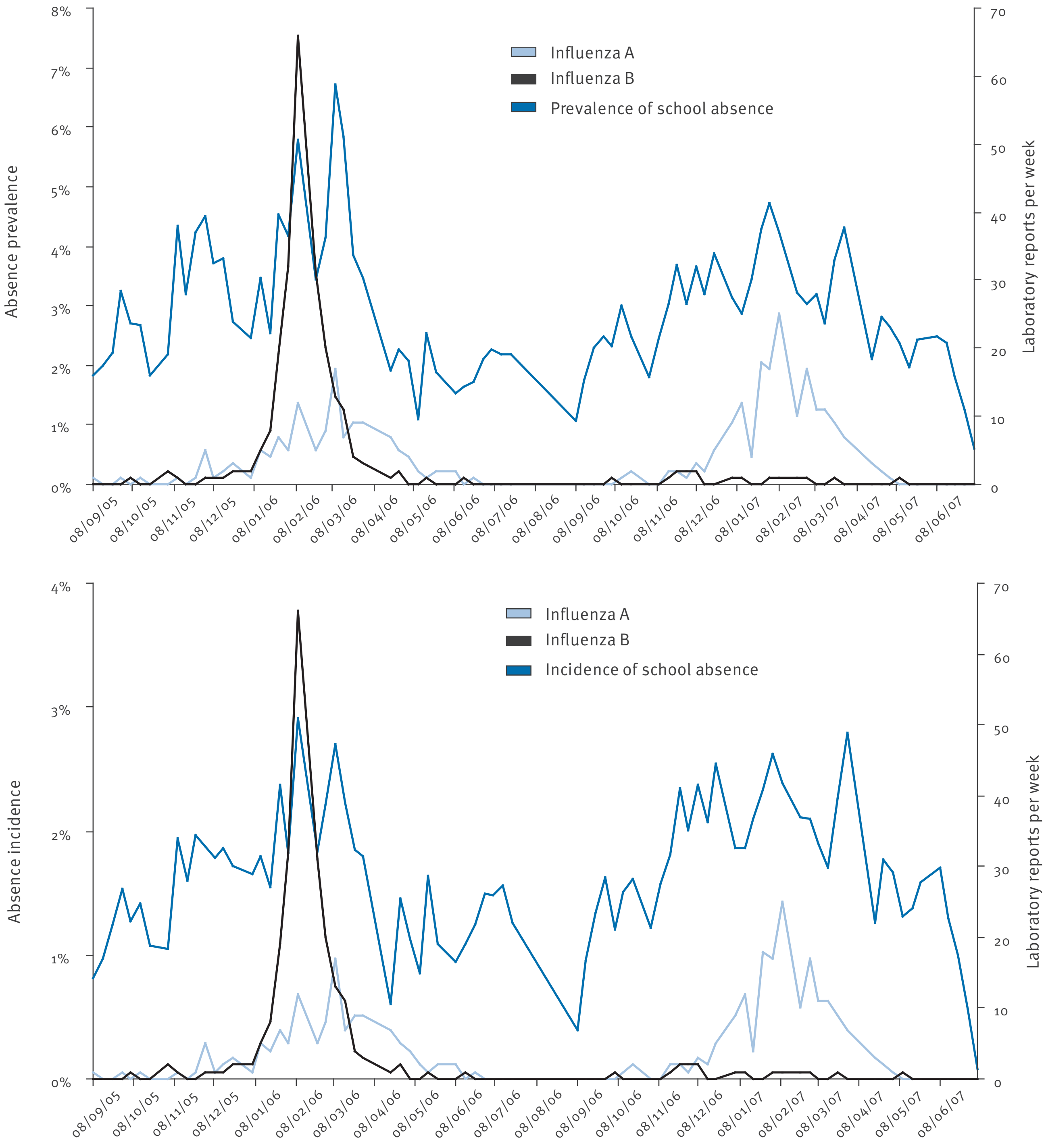


Overall, the prevalence of school absence due to illness per day was 2.9% (inter-school range 2.5% to 4.6%). The incidence of school absence was 1.3% per person-day. The mean duration of absence was 1.8 days (standard deviation 1.8). Most absence episodes (>60%) lasted for only one day (Figure 1). Absence prevalence did not differ by gender (girls 2.8%, boys 2.9%, p=0.2). The prevalence of school absence was highest in year 1 and then declined slightly, but was again high in year 6 (Figure 2). Prevalence of absence also varied by weekday, with absence being slightly higher on Mondays and Fridays (Figure 3).

The association between the proportion of children receiving free school meals and absence prevalence is shown in Figure 4. There was no clear correlation between proportion of free school meals and absence (r= 0.5, p= 0.29).

Figure 5

Illness-related school absence prevalence and laboratory reports of influenza (top panel) and absence incidence and laboratory reports of influenza (bottom panel), United Kingdom, school years 2005-6 and 2006-7



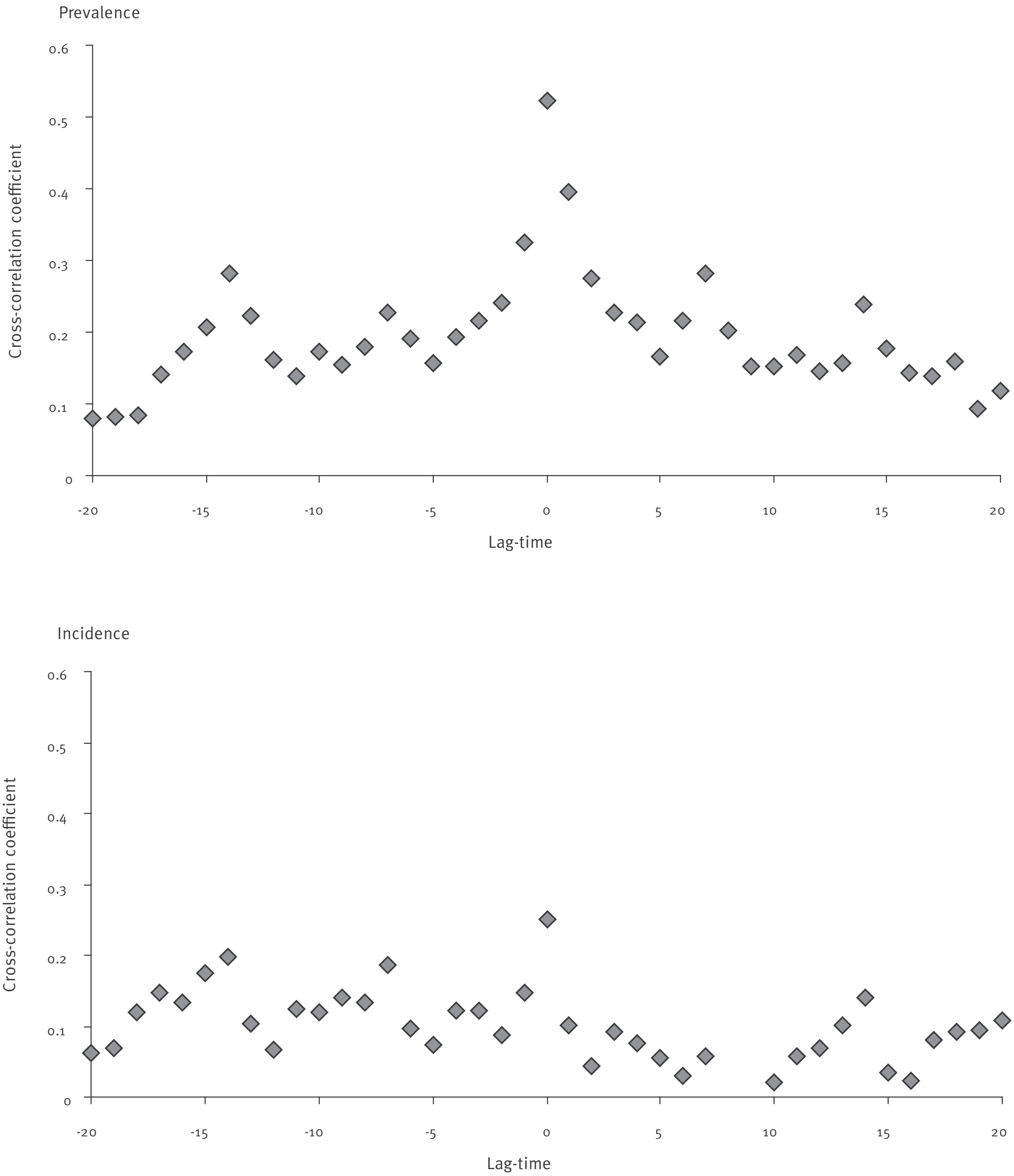
School absence and Influenza activity

The number of laboratory reports of influenza A and B in relation to absence prevalence and incidence over the study period is shown in Figure 5. To smoothen the graphs the number of laboratory reports and the absence data were collapsed at the level of the week. Both influenza seasons covered by the study period were relatively mild. There was a pronounced peak of influenza B in January in the season 2005-6. Influenza A activity was mild in both seasons.

There is some indication that school absence is correlated with influenza laboratory reports. The peak of influenza B in 2005-6 coincided with the peak in absence incidence and was also associated with a peak in absence prevalence. Further, the two peaks of influenza A in the two seasons studied are reflected by peaks in absence incidence. Figure 6 shows the cross-correlation analysis of daily school absence and daily counts of laboratory reports (influenza A and B

Figure 6

Cross-correlation between laboratory reports of influenza and absence prevalence (top panel) and absence incidence (bottom panel), United Kingdom, influenza seasons 2005-6 and 2006-7



collapsed). For both absence prevalence and incidence there was no apparent lag time in the correlation with influenza laboratory reports. At lag= 0 the correlation between influenza and prevalence was moderate at 0.52 (p<0.001). For incidence, the coefficient was lower at 0.25 (p<0.001). There was some evidence that during the four weeks of peak Influenza activity, the duration of absence episodes was slightly longer than outside the influenza season (mean absence duration 1.9 days versus 1.8 days outside Influenza activity period, p=0.09).

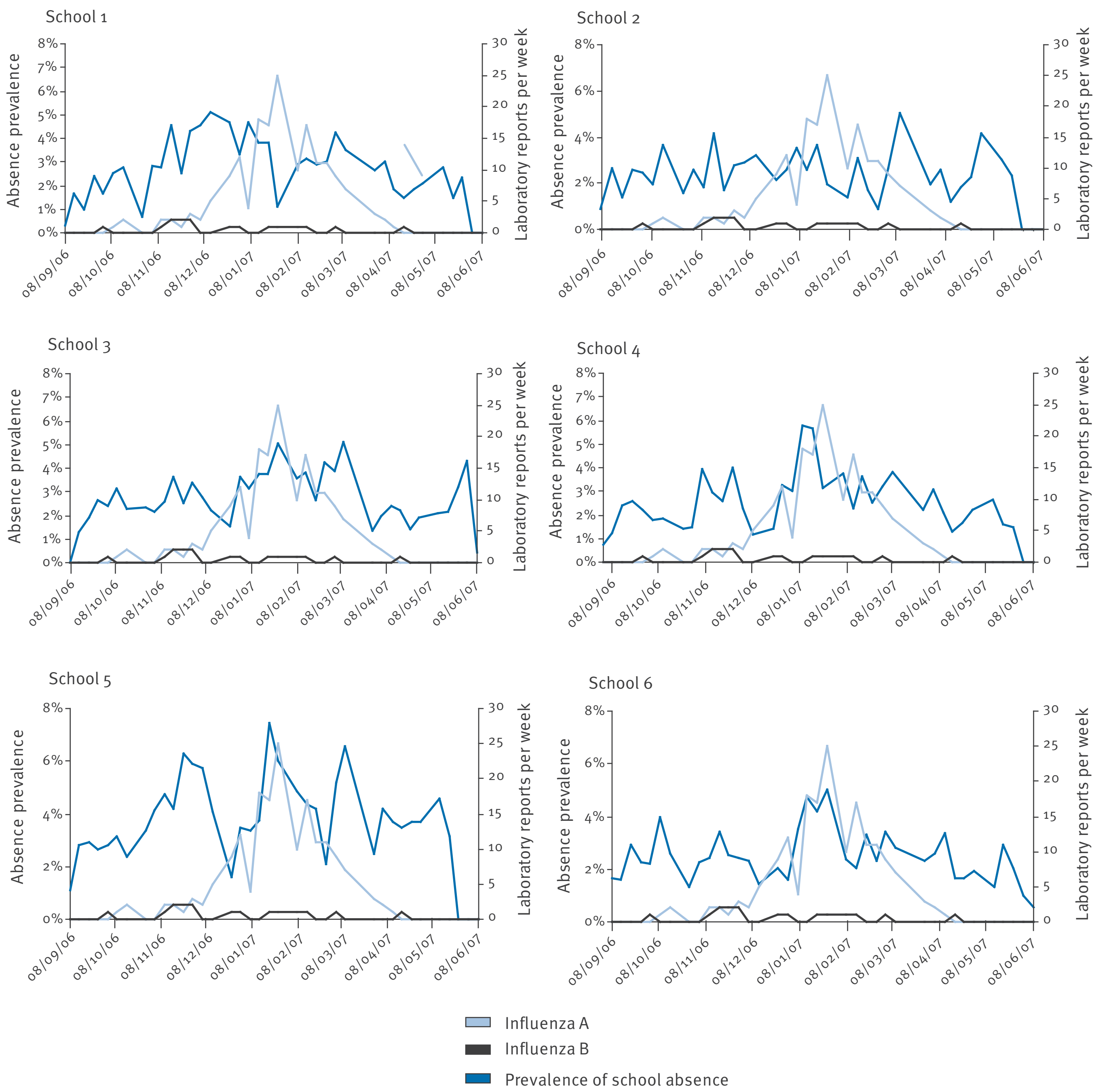
Figure 7 shows the temporal relationship between laboratory reports and school absence, restricted to prevalence data for the year 2006-7, for each of the six individual schools. The peak of influenza A activity is well reflected in the absence prevalence in schools 3 to 6 but not apparent in schools 1 and 2.

Discussion

The present analysis provides a basic epidemiological description of school absence for a better understanding of this potential surveillance tool. By analysing data at day-level we were able to calculate figures on school absence prevalence, incidence and episode

Figure 7

Illness-related school absence prevalence for each of the six individual schools in relation to influenza activity, United Kingdom, school year 2006-7



duration. A surprising result was that absence varied relatively little by age, since we had expected the younger years to be absent more frequently due to a presumed higher susceptibility to respiratory infections including influenza [4,5]. The duration of absence episodes was slightly longer during the influenza season, and this effect may well have been stronger had influenza activity been greater in the years under study [13]. Absence prevalence may therefore be a more specific proxy for influenza activity because prevalence is affected by absence duration whereas incidence is not. In this analysis we found a much stronger correlation between prevalence and influenza activity than for absence incidence. Respiratory infections caused by a wide range of viruses are very common among school-aged children. Therefore school absence data may have an equally low specificity as other syndromic surveillance tools such as data from the public helpline of the National Health Service, NHS direct, in the UK which records the number of calls due to respiratory symptoms. As shown in Figure 5, there were several high peaks in absence prevalence and incidence in our data that were not associated with influenza A and B laboratory reports. However, Zaho *et al.* showed that peaks of absenteeism in individual schools may be due to outbreaks of influenza unnoticed by other surveillance tools [11]. As shown in Figure 7, absenteeism over time can vary considerably between schools even if they are located in the same area. In contrast to Mook *et al*. we found no evidence that aggregated absence data peak earlier than influenza laboratory reports [12].

Apart from immediacy, school absence records have the advantage that the data are already recorded at school level for legal reasons in the UK. In many countries school attendance is a legal requirement and in those countries school absence data in general are a very complete data source. Absence data provide a denominator of children at risk, which in contrast to many other surveillance tools allows not only to monitor trends, but also to calculate population based prevalence data which can be used to assess the economic and educational impact of influenza. The obvious drawback is that no data are recorded on weekends and during school holidays.

In conclusion, school absence data for influenza surveillance have limitations compared to surveillance tools that provide a continuous data record. Primarily, they may be useful for the early detection of localised school outbreaks and to estimate the socio-economic and educational impact of influenza [12].

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The vaccination campaign against 2009 pandemic influenza A(H1N1) and its continued importance in view of the uncertainty surrounding the risk associated with the pandemic

S Tsiodras (tsiodras@med.uoa.gr)[1,2], V Sypsa[3], A Hatzakis[3]
1. Hellenic Centre for Disease Control and Prevention, Athens, Greece
2. Fourth Department of Internal Medicine, Athens University Medical School, Athens, Greece
3. Department of Hygiene, Epidemiology and Medical Statistics, Athens University Medical School, Athens, Greece

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To the editor: Low rates of vaccine uptake have been observed during the national immunisation campaign against the 2009 pandemic influenza A(H1N1) in Greece. Data from the national influenza A(H1N1) immunisation programme that started on 16 November 2009 in Greece reveal that as of 8 January 2010 approximately 360,000 persons have been vaccinated (3.2% of the population). Of these approximately 8% were aged 65 and older. A significant part of the population of high risk individuals has not been vaccinated yet. Unfortunately, the vast majority of the population (approximately 80%) does not intend to get vaccinated against the pandemic influenza, largely due to perceived safety concerns regarding the vaccine [1,2]. We comment on the current risk assessment of the evolution of the pandemic over the next few months and the potential benefits of improving the vaccination coverage.

According to a risk assessment of the pandemic situation published by the European Centre for Disease Prevention and Control, it is currently impossible to predict the exact number of pandemic waves and the time when they will develop in an individual country [3]. This depends on factors such as the level of symptomatic and asymptomatic infections. The clinical attack rate for seasonal influenza usually ranges between 5% and 10%, whereas the reasonable worst-case scenario for the clinical attack rate for the 2009 pandemic influenza is estimated to be approximately 20% [3]. Other important factors potentially affecting the evolution of this pandemic include the level of pre-existing immunity in the population, social factors (e.g. national holidays) and last but not least the rate of immunised individuals.

Carefully designed sero-epidemiological surveys may accurately describe the epidemic evolution although they usually come late. Mathematical models can be also used to estimate the approximate number of infected people [4]. We have recently described the use of telephone surveys in assisting in such estimations [1]. Using data from an ongoing telephone survey on influenza-like illness in Greek households [2] and the laboratory surveillance of the influenza pandemic in Greece [5] we estimated a clinical attack rate of 11.6% (range of sensitivity analysis: 5.3-20.9%) for the Greek population and an overall attack rate (including asymptomatic infections) of 17.3% until week 52 of 2009. The clinical attack rates for individuals aged 0-17, 18-64 and ≥65 years were estimated at 31.0%, 8.2% and 5.1%, respectively. The corresponding age-specific attack rates, including asymptomatic infections, were estimated at 46.5%, 12.4% and 7.7%, respectively. As evident from the data, the attack rate is significantly higher in the younger ages (children and adolescents). Given the widespread transmission and development of immunity in this age group the pandemic may not have a chance to spread further due to herd immunity. However, this is only partially true firstly, because a complete barrier does not exist even with a level of immunity of 50% and secondly, because nobody can exclude the possibility of genetic mutation of the virus.

Greece and many other European countries with a slow response to their vaccination campaigns need to consider the following:

1. A significant proportion of the general adult population remains naïve to the infection at the current stage.
2. Independently of whether or not another pandemic wave will occur, it is anticipated that the virus will continue to circulate over the next months.
3. Clinical attack rates in the coming months may be higher in parts of the population that have not been heavily affected so far, i.e. among the over 18 year-olds.
4. Despite the presence of pre-existing immunity in a large part of the older population [6] a significant percentage remains susceptible to infection with the pandemic influenza strain. Given the fact that a considerable portion of this population has chronic health conditions, (over 40% of people aged 65 or older, according to our telephone survey) we expect such infections to be associated with higher rates of clinical complications and mortality [7,8]. Twenty-eight of 92 (30.4%) deaths

analysed in Greece so far concerned patients aged 65 years or older.

5. It is largely unclear how the virus will evolve. The transmissibility of the virus may increase as reported for the 1968 pandemic virus [9].

In conclusion, increasing the immunisation coverage is the only way to eliminate uncertainties about future wave(s) of pandemic influenza A(H1N1) and is anticipated to provide significant benefits in terms of protecting the health of individuals with high-risk conditions and older individuals. In view of the limited success of the vaccination campaigns in Greece and other European countries, considering new strategies to inform and persuade the public is necessary.

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Changes to Eurosurveillance in 2010

Eurosurveillance editorial team (eurosurveillance@ecdc.europa.eu)[1]
1. European Centre for Disease Prevention and Control, Stockholm, Sweden

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With the beginning of the new year we have reviewed our editorial policy and some of our procedures. Therefore, we take the opportunity to introduce several new features to our readers and authors and to remind them of old but maybe forgotten ones.

In the past, our print compilation contained all long articles and most of the rapid communications published in each quarter of the year. In view of the widespread availability and use of the internet and the online version of *Eurosurveillance* being the reference publication, we have decided to discontinue the regular print version. Instead, we will distribute hard copies of our special issues and further develop the print production of thematic compilations such as our recent collection of articles on the 2009 influenza A(H1N1) pandemic for which we have received very encouraging feedback. At the same time, we want to improve the appearance of the printed issues by replacing the old *Eurosurveillance* cover page with a picture or photograph illustrating the topic at hand. We encourage authors and readers who want to contribute potential cover images for such topical editions to contact the Editorial team.

One of the documents that have been updated is our copyright form, which we require all authors to sign before their article can be published. The form contains issues related directly to originality and copyright of the submitted material and statements on the appropriateness of the text and possible conflict of interest. Of particular importance for us was the addition of a passage on patient confidentiality. Our authors are asked to obtain informed consent from persons (or their legal representatives) whose details are described in a fashion that may lead to the identification of an individual. In exceptional circumstances where the importance for public health might override the need for protecting the individual will we accept the data without such consent. In those cases we will do our outmost to ensure that the data are anonymised as much as possible to prevent identification of the individual.

In addition, we would like to remind our authors that the article category “rapid communications” is intended for timely reports on ongoing outbreaks and significant findings in the area of communicable diseases where rapid dissemination of the information facilitates rapid public health action and could potentially lead to immediate change in an ongoing public health situation. These articles are generally peer-reviewed and edited within a few days of submission, sometimes within hours. To allow for such rapid processing it is important that a word limit of around 1,000 words is observed.

All supplementary material is subject to peer review. We therefore want to emphasise, as is now also stated clearly in our ‘For authors’ pages, that *Eurosurveillance* usually does not publish supplementary material. All necessary information should be integrated in the article, while observing the word limit. In exceptional cases, where compelling reasons preclude the inclusion of certain information within the body of the article, we can give the authors the option to make such material available on an independent website and to provide a link to this website in the article. Such material, however, is not edited by *Eurosurveillance* and *Eurosurveillance* is not responsible for the correctness of the content.

Last but not least, *Eurosurveillance* has been accredited by the Health on the Net (HON) Foundation (http://www.hon.ch) as adhering to the HON code of conduct (HONcode©). HON is a non-governmental, non-profit organisation with the purpose of supporting users to identify sound, reliable and trustworthy health information on the internet since 1995.

With all updates and changes described, we aim at further improving transparency and our editorial standards for the benefit of our readers and contributors.