

HPA Surveillance Systems: Swine Influenza (H1N1swl)

The current swine influenza (H1N1swl) situation is monitored in England through a range of surveillance systems and specific epidemiological studies e.g. of clusters occurring in schools. This briefing provides an overview of the surveillance systems that have been used since the outset of the epidemic in the UK, in April 2009.

The systems in use represent an amalgam of generic systems used for wider infectious disease surveillance, systems used for monitoring seasonal influenza, and systems that have been implemented specifically as part of the UK's pandemic preparedness plans.

Generic surveillance systems

- National laboratory reporting scheme
- Royal College of General Practitioners Weekly Returns Service
- NHS Direct
- Mortality monitoring
- Hospital admissions

Seasonal influenza surveillance systems

- QFLU (as a component of Q-Surveillance)
- Virology testing component to Royal College of General Practitioners Weekly Returns Service
- HPA Regional Microbiology Network/Cfl spotter practice scheme
- HPA Antiviral Resistance Monitoring and Viral Sequencing of Influenza
- Medical Officers of Schools Association (MOSA) and HPA scheme

Pandemic Preparedness Systems

- Enhanced Surveillance of H1N1swl
- First Few Hundred (FF100) Cases Surveillance System

These systems have been designed and implemented to provide epidemic intelligence that can inform public health action and policy decisions. The pandemic preparedness systems provide detailed information about the evolving epidemiology, the spectrum of clinical disease, and the transmission characteristics of H1N1swl. The seasonal influenza surveillance systems provide a mechanism for detecting spread of infection outside the initial risk groups (i.e. travellers returning from affected areas and contacts of confirmed cases) and, as the epidemic develops, will provide the main source of information on trends and distribution of disease. The 'generic' systems will also provide insight into spread outside the initial risk groups, but will also provide important information on the burden of disease, such as the impact on the NHS, numbers of severe illnesses and/or cases of secondary bacterial infection, and deaths.

The following pages summarise the key surveillance systems, in terms of the sources of data used, the 'case definitions' or criteria used to determine which cases/individuals are reported, the data that are collected about those cases, the denominator or target population within which cases are identified, the frequency with which cases or statistics are reported to the surveillance hub, and the types of analysis and/or outputs produced, with a few examples of the graphical tabular outputs.

UK Surveillance Systems: Swine Influenza (H1N1swl)

Enhanced Surveillance of H1N1swl (Case Finding)

Data sources: HPA Health Protection Unit and Regional Microbiology Network clinical and laboratory reports of possible, probable and confirmed cases of H1N1swl, Cfl RVU.

Reporting case definition:

Possible – Any person meeting the clinical and epidemiological criteriaⁱ

Probable – Any person meeting the clinical and epidemiological criteria AND with a positive influenza A infection but without a positive test for H1 or H3 influenza

Confirmed – Any person with a laboratory confirmation

Discarded – Any suspect case initially in the possible or probable category which tested negative for swine-lineage H1N1

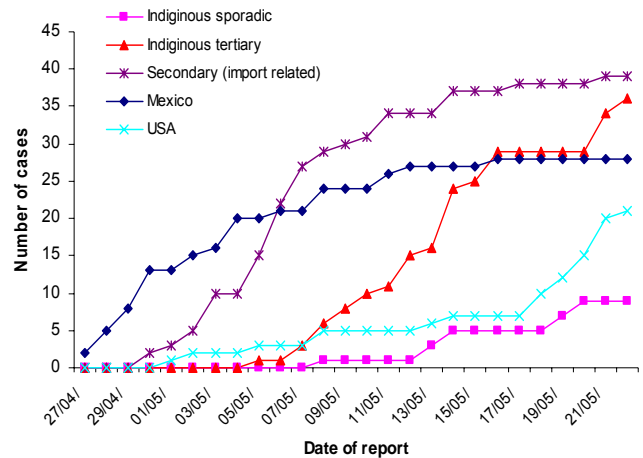
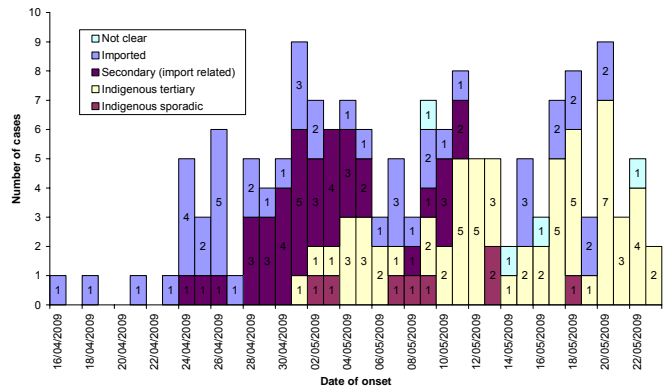
Data collected: demographic, clinical, antiviral treatment, and exposure data

Denominator: UK population

Frequency of reporting: Daily

Analysis/Outputs: Anonymised daily listings for modelling teams in HPA and partner organisations. Daily statistical updates to WHO and ECDC. Daily Situation Report outputs.

Laboratory confirmed H1N1swl by date of onset and assumed mode of transmission, 26 May 2009 (n=157**), UK



First Few Hundred Surveillance System (Detailed Case & Contact Analysis)

Data sources: Interviews of first 100-200 confirmed cases of H1N1swl. Interviews of contacts of cases. Interviews undertaken by HPA staff.

Reporting case definition: Laboratory confirmed identification of H1N1swl influenza virus infection and contacts of confirmed cases

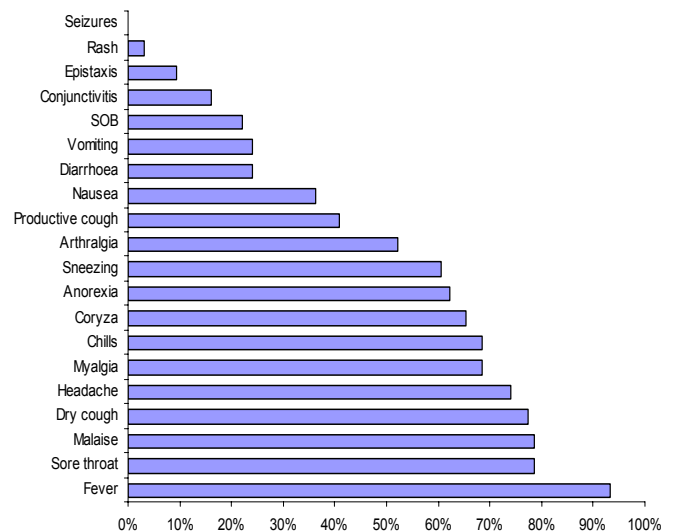
Data collected: demographic, clinical, antiviral treatment, vaccination history, exposure, outcome data

Denominator: UK population

Frequency of reporting: Daily

Analysis/Outputs: Anonymised daily listings for modelling teams in HPA and partner organisations. Anonymised listings for WHO and ECDC. Daily Situation Report outputs.

Clinical presentation of confirmed cases



UK Surveillance Systems: Swine Influenza (H1N1swl)

Royal College of General Practitioners Weekly Returns Service (England & Wales)

(Sentinel Primary Care Surveillance with Virological Monitoring)

Data sources: 60-100 General Practices in England and Wales reporting to RCGP Research and Surveillance Centre. 45-50 practices submitting virology samples to HPA Centre for Infections

Reporting case definition: influenza-like illness, pneumonia, acute bronchitis

Data Collected: tabular summary of the number of patients seen each week categorised by gender, age group and diagnosis. Data on new episodes of illness are collected separately from data on ongoing or follow-up consultations. Age specific practice registered population. Swabs for virology for sample of patients with influenza-like illness (sub-set of practices)

Denominator: 650,000 general population (approx) for clinical reporting, 400,000 for virological sampling in England & Wales

Frequency of reporting: weekly/twice weekly

Analysis/Outputs: Incidence and prevalence rates of diseases by age, sex, region, and comparison against defined thresholds. Virus isolates and proportion by subtype

http://www.rcgp.org.uk/clinical_and_research/bru/weekly_data.aspx

Q-Surveillance (QFLU)

(Sentinel Primary Care Surveillance)

Data sources: 3,300 general practices spread throughout the UK (reporting to QResearch in Nottingham University)

Reporting case definition: influenza-like illness, URTI, LRTI

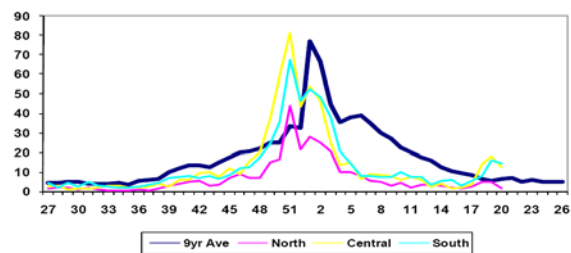
Data collected: new cases, patients requiring/receiving flu vaccinations, hospital admissions, deaths, deaths for patients with flu, patients prescribed antivirals, patients with a new diagnosis of pneumonia. Practice registered population

Denominator: 22 million patients (> 25% of the UK population)

Frequency of reporting: Daily/weekly

Analysis/Outputs: analyses relate to activity within the preceding 24 hours or preceding week

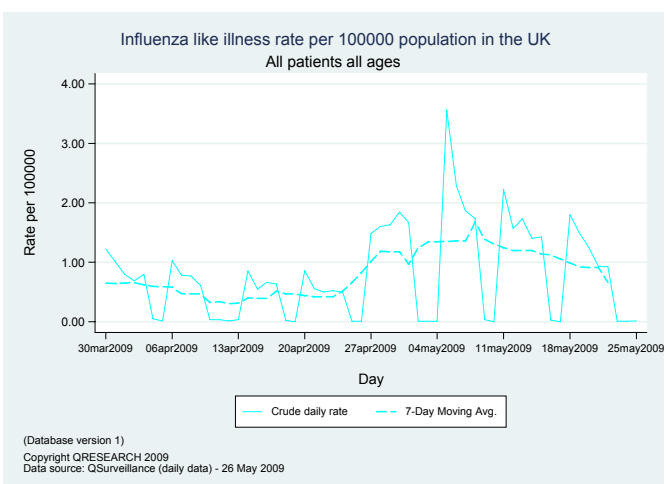
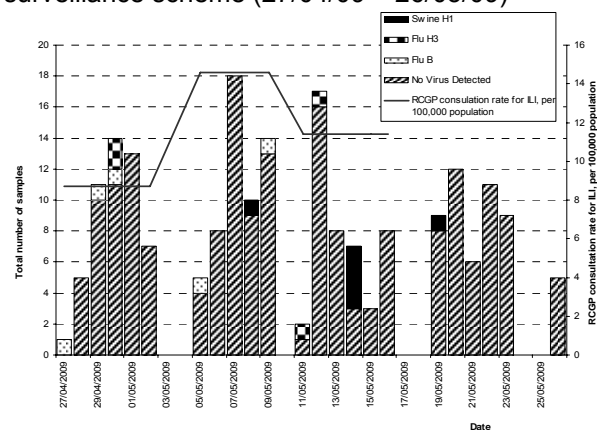
(B) Influenza-like illness: regional incidence rates 2008/09 against a 9 year average (1999-2007)



Weekly influenza and influenza-like illness incidence rates per 100,000 persons

All Regions			Regional	
	Influenza-like illness	Bronchitis	North	South
0-4	5.29	95.16	1.75	
5-14	14.50	30.32	12.46	
15-44	15.00	33.38		14.19
45-64	10.44	59.72		
65+	3.80	151.91		
All Ages	11.40	62.45		

Samples submitted from the RCGP community based surveillance scheme (27/04/09 – 26/05/09)



UK Surveillance Systems: Swine Influenza (H1N1swl)

<http://www.hpa.org.uk/hpr/infections/Oresearch.pdf>

NHS Direct (England & Wales)

(Community Syndromic Surveillance)

Data sources: 22 Nurse-led telephone help-line call centres in England and Wales

Reporting case definition: Colds/flu, Fever

Data collected: Data, including age, region, and PCT of caller, on 10 symptoms/syndromes

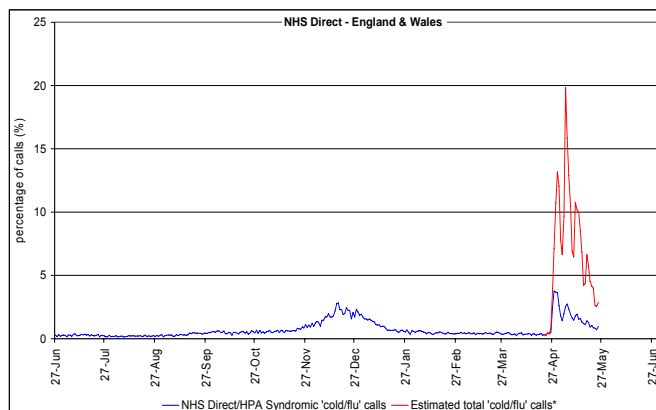
Denominator: England & Wales population

Frequency of reporting: Daily/weekly

Analysis/Outputs: Age-group specific trends and HPA Region specific trends for individual symptoms/ syndromes. National Influenza Report

http://www.hpa.org.uk/hpr/infections/NHS_Direct_Bulletin.pdf

Daily NHS Direct/HPA Syndromic Surveillance System cold/flu calls 2008-2009 and daily NHS Direct adjusted total 'cold/flu' calls*.



*Adjusted total 'cold/flu' calls calculated by adding NHS Direct/HPA Syndromic 'cold/flu' calls to NHS Direct 'swine flu' algorithm 'cold/flu' calls (and calculating percentage using all NHS Direct calls as the denominator).

HPA Regional Microbiology Network/Cfl spotter practice scheme

(Sentinel Primary Care Surveillance with Virological Monitoring)

Data sources: 65 general practices submitting swabs to HPA Regional Microbiology laboratories in England

Reporting case definition: Patients included for sampling should fall into one of the two categories of acute respiratory illness: 'influenza-like illness' or 'acute bronchitis', presenting within five days of onset of illness'

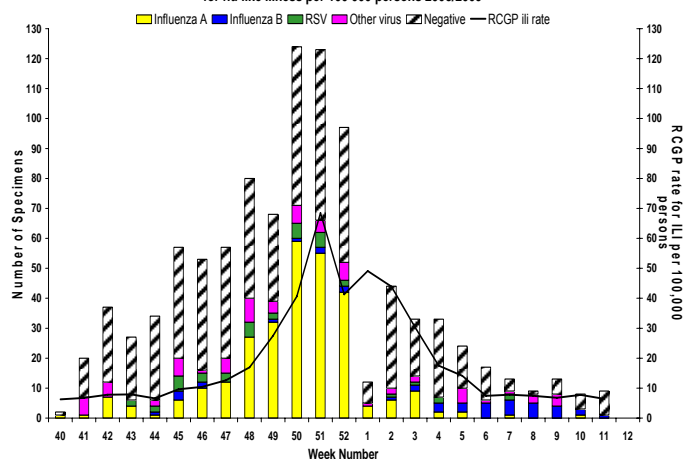
Data collected: Age, sex, seasonal flu vaccination, anti-viral drugs in the last 14 days. Specimens are examined mainly by PCR at collaborating laboratories. Specimens positive for influenza are sent to the Virus Reference Department for subtyping and antigenic characterisation

Denominator: 400,000 general population England

Frequency of reporting: Daily

Analysis/Outputs: Age-group specific trends and HPA Region specific trends for individual symptoms/ syndromes. National Influenza Report

Figure 1
Total number of reports positive for influenza type A and B, RSV and other respiratory viruses and total number of specimens negative by week and the RCGP rate for flu-like illness per 100 000 persons 2008/2009



UK Surveillance Systems: Swine Influenza (H1N1swl)

National Laboratory Reporting Scheme

(Laboratory Surveillance)

Data sources: NHS, HPA and some independent sector laboratories in England (approximately 230 in total). These laboratories report on patients from community and hospital settings.

Reporting case definition: confirmed identification of influenza virus infection

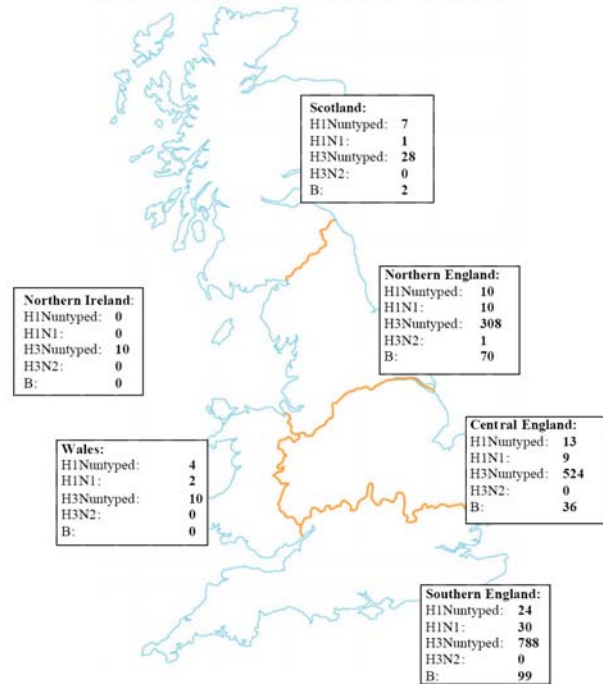
Data collected: age, sex, region, and PCT of patient, and specimen type and method of identification, virus subtype

Denominator: England population

Frequency of reporting: Weekly

Analysis/Outputs: Cumulative totals, age-group specific totals, regional totals by subtype. National Influenza Report

Influenza detections (PCR detections/isolates) characterised by ERNVL 2008/09
Cumulative total to date from week 40/2008 – week 20/2009



N.B. All data are provisional and are subject to change.

Antiviral Resistance Monitoring and Viral Sequencing

(Reference Laboratory Monitoring)

Data sources: HPA Centre for Infections Respiratory Virus Unit

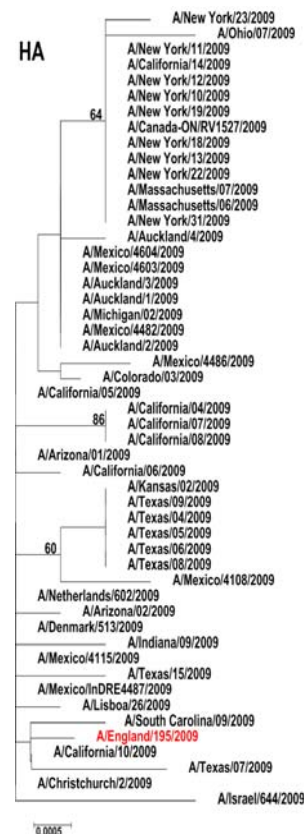
Reporting case definition: laboratory confirmed H1N1swl (and seasonal influenza)

Data collected: demographic and clinical information, antiviral susceptibility testing results, genetic and antigenic characterisation data

Denominator: All laboratory confirmed cases

Frequency of reporting: Daily/weekly

Analysis/Outputs: Antiviral resistance rates, genetic/antigenic analysis (phylogenetic trees).



UK Surveillance Systems: Swine Influenza (H1N1swl)

Hospital Admissions

(Virological Monitoring of Hospital Admissions)

Data sources: Acute hospital trusts in England

Reporting case definition: all patients admitted to hospital with severe respiratory illness

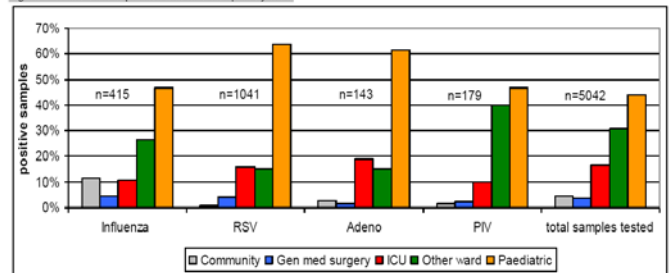
Data collected: demographic data, results of virology testing

Denominator: Population of England

Frequency of reporting: Daily/weekly

Analysis/Outputs: incidence of hospital admissions due to respiratory disease with H1N1swl infection. National Influenza Report.

Figure 8: Distribution of positive and total samples by ward



Mortality Monitoring

(Death Registrations)

Data sources: Death registrations, collated by the Office for National Statistics and General Register Office

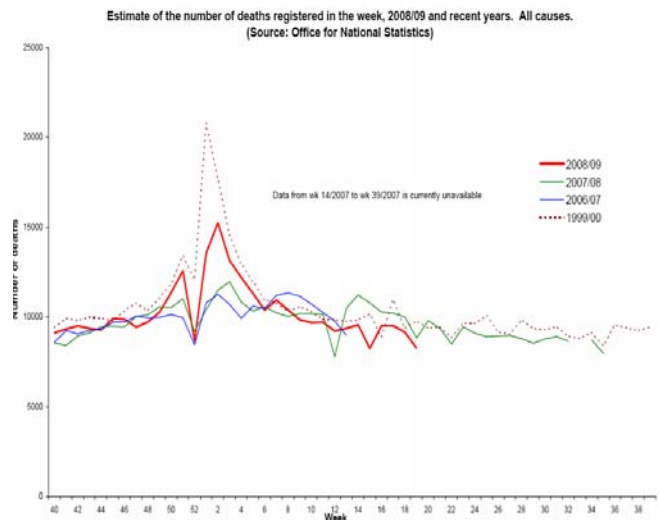
Reporting case definition: total deaths from all causes, total respiratory deaths

Data collected: Date of registration

Denominator: Population of England and Wales

Frequency of reporting: Daily/weekly

Analysis/Outputs: Estimation of all-cause mortality excess deaths. National Influenza Report.



UK Surveillance Systems: Swine Influenza (H1N1swl)

Medical Officers of Schools Association (MOSA) and HPA scheme

(Sentinel syndromic reporting)

Data sources: Boarding schools in the MOSA scheme

Reporting case definition: influenza-like illness

Data collected: demographic and clinical information, antiviral susceptibility testing results, genetic and antigenic characterisation data

Denominator: Up to 42 schools report covering a population of approximately 12,000 pupils. Most of the children are located in the southern half of England, with pupils aged between 5 and 18 years, the majority, however, are boys aged from 13 to 18 years

Frequency of reporting: Weekly each week during the school terms

Analysis/Outputs: Rates are calculated and relayed back to the schools. National Influenza Report.

HPA Weekly National Influenza Report

Summary of UK* surveillance of influenza and other seasonal respiratory illness



15 April 2009 (Week 16)

*Incorporating data from the Royal College of General Practitioners (RCGP) (England and Wales), The National Public Health Service for Wales (NPHS), Health Protection Scotland (HPS), Communicable Disease Surveillance Centre Northern Ireland (CDSC Northern Ireland), the Office for National Statistics (ONS) (England and Wales), Medical Officers of Schools Association (MOSA) (England), NHS Direct (England and Wales) and O Surveillance (England, Northern Ireland, Scotland and Wales).

Covered in this report:

Data, except that from ONS, MOSA and non-UK sources: 30/03/09 - 12/04/09 (Weeks 14 & 15, 2009)
Data from ONS, MOSA and non-UK sources: 23/03/09 - 05/04/09 (Weeks 13 & 14, 2009)

Summary

Influenza activity is low across the UK. In weeks 14 and 15/09 GP consultation rates decreased and remained below baseline levels in England and Wales. In Scotland the rate increased slightly but remains below baseline levels. In Northern Ireland the consultation rate remains at low levels, but thresholds have not yet been set. The proportions of cold/flu and fever calls to NHS direct in England and Wales remain low.

ⁱ Clinical and epidemiological criteria for a possible and probable case are as follows:

CLINICAL

Fever [$\geq 38^{\circ}\text{C}$] **OR** history of fever **AND EITHER** flu-like illness (two or more of the following symptoms: cough, sore throat, rhinorrhea, limb/joint pain, headache.)

OR

other severe/life-threatening illness suggestive of an infectious

EPIDEMIOLOGICAL

(a) GEOGRAPHICAL: Onset of symptoms within **seven** days of visiting areas where sustained human-to-human transmission of A/H1N1swl is occurring, currently Mexico and the United States

OR

(b) CONTACTS: Contacts of a probable or confirmed case