

ECDC DAILY UPDATE

2009 influenza A (H1N1) pandemic

30 December 2009
14.00 CEST

Main developments in the past 24 hours

- France: Estimations of the numbers of persons infected with or immunised against 2009 (H1N1) – mid December.
- Documentation of changing transmissibility of the 1968 H3N2 influenza pandemic and a larger second winter wave.
- A total of 1 869 fatal cases in Europe and EFTA countries and 10 997 in the rest of the world have been reported up to date.

This report is based on official information provided by national public health websites or through other official communication channels. Reported number of confirmed 2009 pandemic influenza A (H1N1) cases admitted to hospitals and intensive care, by country, as of 30 December 2009, 14.00 CEST in EU and EFTA countries are in Table 1. An update on the number of confirmed fatal cases for the world and Europe is presented in Table 2.

Epidemiologic update

Officially Reported Deaths in the EU

All 27 EU and 4 EFTA countries are reporting cases of pandemic (H1N1) 2009 influenza. A total of 1 869 deaths have been reported since April 2009 (Table 2). From week 41 to 51 the numbers of deaths each had shown a steady increase almost doubling every fortnight over six weeks. The fall observed in week 52 was to be expected as it represents official reports placed on national web-sites and a number of Member States have not been doing this in what was a holiday week. A similar phenomenon can be expected for the coming weeks. While the most deaths have to date been in Western Europe there are increasing numbers of deaths being reported from Central and Eastern Europe. The reported cumulative fatal pandemic (H1N1) cases in the world have now passed 10 000 cases (Table 2). However, because of lack of laboratory confirmation and underreporting among other factors, this is likely to be a gross underestimation of the true number of fatalities associated with the pandemic. Available updates on hospital admissions, per Member State, can be found in Table 1.

France: Estimations of the numbers of persons infected with or immunised against 2009 (H1N1) – mid December

The French public health centre, the Institut de Veille Sanitaire has recently issued estimates of the numbers of persons who have been infected with the pandemic 2009(H1N1) in France as of December 17th. Using the results of two primary care sentinel systems and working back from these with these with assumptions concerning the proportions of those with symptoms that consult a doctor (51%) and the proportions of infections that are without symptoms (30%) they derived estimates that were around 7.9M or 14.8M persons depending on the base sentinel systems.(1) The population of Metropolitan France (the French mainland plus Corsica) was around 62.4M ([2009 provisional estimates for January 2009 from INSEE](#)) so this would translate to around 13% or 24% of the population. An opportunity for the validation of one of these estimates comes from seroepidemiological work undertaken by INVS with its collaborators who have been using residual blood specimens from pregnant women. the estimations were considered to be comparable with an estimate of the numbers of persons (men and women) aged 20-39 years infected to be around 1.05M (with confidence intervals 0.58M to 1.54M). The estimate for this age-group from the more system with the figure of 7.9M would have been around 0.95M. Hence the seroepidemiology results provided more validation for the lower 7.9M estimate. In the same publication INVS cite official estimates of the numbers of persons who have been immunised with at least one dose of a specific pandemic vaccine by December 13th of around 3.3M. Hence on this basis INVS considers that the maximum number of persons in France that have either been infected or immunised would be between 11.2M and 18.1M. These figures will be relevant for predicting the future number of infections and will be revised by INVS after the present wave of infection.

1) Institut de Veille Sanitaire Estimations du nombre d'infections de grippe A(H1N1)2009 en France métropolitaine au 17 décembre 2009

http://www.invs.sante.fr/surveillance/grippe_dossier/docs_professionnels/estimation_cas_graves_grippe_a_h1n1_171209.pdf

Changing transmissibility of the 1968 H3N2 influenza pandemic

Enquiries about what will happen next with the 2009 pandemic influenza A (H1N1) and inter-pandemic influenza in the approaching decade are important for public health reasons, notably in informing vaccine strategies. ECDC has been asked to consider possible scenarios and one useful source of information comes from reviewing previous pandemics and how they influenced the following pattern of seasonal influenza.(1) The general assumption is that pandemic viruses adapt to humans and settle down to become less serious with time. However there is also potential for the public health impact worsening with the second wave of the 1918 pandemic being more lethal than the first.(1,2) In comparison the 1957 H2N2 pandemic settled down quite quickly though in the UK and US there was a second lower peak in attributed mortality the second winter after the Christmas and New Year. (2-4)

It has been noted that in a number of countries the last 1968 (Hong Kong) H3N2 pandemic occurred in two winter waves, with the second more severe than the first (Figure).(2,5,6) The increase in outbreak size and mortality between the first and second winters could be explained by a change in transmissibility. A recent publication reports on this following a systematic review of morbidity and serologic data of the first and second winters from the 1968 influenza pandemic from different settings, and basic and effective reproduction numbers for both waves of the were estimated. The overall data came from 15 countries (with multiple sites from a number of these). For ten pair of data sets comparable information was available for the two waves. (6)

The basic and effective reproduction numbers were estimated from 46 and 17 data sets for the first and second waves, respectively, based on the growth rate and/or final size of the epidemic. Estimates of the basic reproduction number (R₀) were in the range of 1.06–2.06 for the first wave and, assuming cross-protection, 1.21–3.58 in the second. Within each wave, there was little geographic variation in transmissibility. In the 10 settings for which data were available for both waves, R₀ was estimated to be higher during the second wave than during the first. This might partly explain the larger and more lethal outbreaks in the second wave as compared with the first. There is no information on any changes in the virological characteristics of the virus paralleling its seeming change in behaviour. This potential for change in viral behaviour will have consequences for future pandemic mitigation strategies and the authors also conclude that it is possible that the 2009 Pandemic Influenza A (H1N1) will cause a second wave, and the results of this study indicates that pandemic influenza virus may become more transmissible between successive waves. However, they also state that it is difficult to predict if the 2009 Pandemic Influenza A (H1N1) virus will continue to behave as it has done up to now.(6) What will be available for the 2009 pandemic now and was scarcely available in previous pandemics is serology indicating the proportions of the population that are immune from either infection or immunisation. However even that cannot allow for changes in the behaviour of the pandemic such as seems to have happened in 1968.

1) Kilbourne ED. Influenza pandemics of the 20th century. Emerg Infect Dis. 2006 12 No.1 Jan Available from: <http://www.cdc.gov/ncidod/EID/vol12no01/05-1254.htm>

2) ECDC Visual presentations of previous pandemics in one country. ECDC web presentation 2009

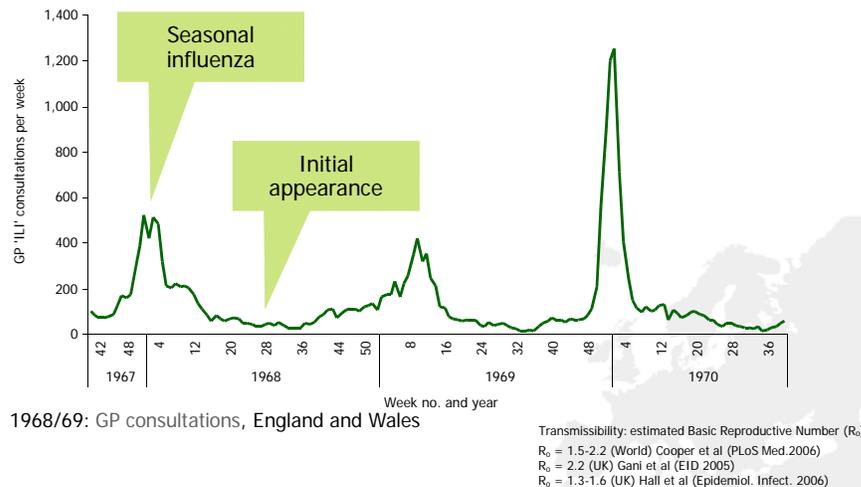
3) Henderson DA Courtney B, Inglesby TV, Toner E, Nuzzo JB Public Health and Medical Responses to the 1957-58 Influenza Pandemic [Biosecurity and Bioterrorism, Volume 7, Number 3, 2009](#)

4) ECDC Comparison between the 1957 and 2009 pandemics – a close but imperfect fit [ECDC Scientific Advance October 1st 2009](#)

5) Rizzo C, Bella A, Viboud C, Simonsen L, Miller MA, Rota MC, et al. Trends for influenza-related deaths during pandemic and epidemic seasons, Italy, 1969–2001. *Emerg Infect Dis.* 2007 13 No. 5. May Available from: <http://www.cdc.gov/EID/content/13/5/694.htm>

6) Jackson C, Vynnycky E, Mangtani P. Estimates of the transmissibility of the 1968 (Hong Kong) Influenza Pandemic: Evidence of Increased Transmissibility Between Successive Waves. Department of Epidemiology and Population Health, London School of Hygiene and Tropical Medicine. In *American Journal of Epidemiology Advance Access* published online on December 10, 2009. Available from: <http://aje.oxfordjournals.org/cgi/content/full/kwp394>

1968/1969 pandemic: A(H3N2) — transmitted and affected all age groups



Courtesy of the Health Protection Agency, UK

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Figure available as [powerpoint from ECDC Downloadable Powerpoints](#) or as pdf from http://ecdc.europa.eu/en/healthtopics/Documents/0905_Pandemic_Influenza_Pandemics_of_Influenza.pdf

Table 1. Reported number of confirmed 2009 pandemic influenza A(H1N1) cases admitted to hospitals and intensive care, by country, as of 30 December 2009, 14.00 CEST in EU and EFTA countries.

Country (date of report)	Number of cases currently hospitalised	Cumulative number of cases admitted in hospitals	Number of cases currently in intensive care	Cumulative number of cases admitted to intensive care
Austria (17.12.)	172	-	-	-
Belgium (24.12.)	-	-	-	-
Bulgaria (13.12)	-	-	-	-
Cyprus(23.11)	-	-	-	6
Czech Republic (23.12.)	-	-	-	-
Denmark (30.12.)	-	-	2	70
Estonia (29.12.)	-	-	-	-
Finland (23.12.)	11	-	3	-
France (28.12.)	-	-	209	985
Germany (22.12.)	-	-	-	-
Greece (23.12.)	-	-	-	-
Hungary (23.12.)	-	-	-	-
Iceland (10.12.)	3	180	1	20
Ireland (23.12.)	150	1027	10	87
Italy (24.12.)	-	832	-	452
Latvia (17.12.)	-	-	-	-
Liechtenstein (23.12.)	-	-	-	-
Lithuania (21.12.)	-	-	-	-
Luxembourg (16.11.)	-	-	0	0
Malta (04.09.)	-	46	-	1
Netherlands (28.12.)	31	2156	6	209
Norway (23.12.)	5	1310	4	170
Poland (22.12.)	-	-	-	-
Portugal (23.12.)	95	-	20	-
Romania (21.12.)	-	-	-	-
Slovakia (22.12.)	51	260	18	94
Slovenia (17.12.)	76	-	-	-
Spain (23.12.)	-	-	-	-
Sweden (17.12.)	18	1169	-	-
Switzerland (23.12.)	11	389	-	72
United Kingdom* (24.12.)	454	-	103	-

Note: Data for the EU and EFTA countries correspond to the Ministry of Health or surveillance centre websites. New updates with changes in figures are highlighted in gray. (-) denotes no information readily available in official sources.

* Data includes information for England only. Other cumulative hospitalisations are: Scotland (1439), Wales (437) and Northern Ireland (574).

Table 2. Reported number of new and cumulative confirmed fatal 2009 pandemic influenza A(H1N1) cases in EU and EFTA countries, as 30 December 2009, 14.00 CEST, and in the rest of the world by country, as of 30 December 2009, 14.00 CEST.

Country	Number of new fatal cases since previous national update	Cumulative number of fatal cases
EU and EFTA countries		
Austria	-	3
Belgium	-	17
Bulgaria	-	35
Cyprus	-	3
Czech Republic	8	56
Denmark	1	26
Estonia	2	10
Finland	-	36
France	-	223*
Germany	-	132
Greece	-	59
Hungary	-	45
Iceland	-	2
Ireland	-	22
Italy	-	188
Latvia	-	27
Lithuania	-	16
Luxembourg	-	3
Malta	-	3
Netherlands	-	53
Norway	-	29
Poland	6	122
Portugal	13	70
Romania	4	53
Slovakia	-	30
Slovenia	-	13
Spain	-	256
Sweden	3	25
Switzerland	-	9
United Kingdom	-	303
Total	37	1869
Other European countries and central Asia		
Albania	-	6
Armenia	-	3
Belarus	-	20
Bosnia and Herzegovina	-	7
Croatia	-	23
Former Yugoslav Republic of Macedonia	-	14
Georgia	-	10
Kosovo	4	14
Moldova	-	25
Montenegro	-	5
Russia	-	19
Serbia	2	52
Ukraine	-	202
Total	6	400
Mediterranean and Middle-East		
Algeria	-	42
Bahrain	-	7
Egypt	-	109
Iran	-	147
Iraq	-	40
Israel	-	71
Jordan	-	16
Kuwait	-	27
Lebanon	-	5
Libya	-	1

Country	Number of new fatal cases since previous national update	Cumulative number of fatal cases
Morocco	-	50
Occupied Palestinian Territory	-	23
Oman	-	30
Qatar	-	8
Saudi Arabia	-	97
Syria	-	110
Tunisia	3	18
Turkey	-	415
United Arab Emirates	-	6
Yemen	-	27
Total	3	1249
Africa		
Ghana	-	1
Madagascar	-	3
Mauritius	-	8
Mozambique	-	2
Namibia	-	1
Sao Tome & Principe	-	2
South Africa	-	93
Sudan	-	5
Tanzania	-	1
Total	-	116
North America		
Canada	-	401
Mexico	-	823
USA	-	2160
Total	-	3384
Central America and Caribbean		
Bahamas	-	4
Barbados	-	3
Cayman Islands	-	1
Costa Rica	-	47
Cuba	-	41
Dominican Republic	-	23
El Salvador	-	31
Guatemala	-	18
Honduras	-	16
Jamaica	1	7
Nicaragua	-	11
Panama	-	11
Saint Kitts and Nevis	-	2
Saint Lucia	-	1
Suriname	-	2
Trinidad-Tobago	-	5
Total	1	223
South America		
Argentina	-	617
Bolivia	-	58
Brazil	-	1632
Chile	-	150
Colombia	3	196
Ecuador	-	96
Paraguay	-	52
Peru	-	205
Uruguay	-	33
Venezuela	-	121
Total	3	3160
North-East and South Asia		
Afghanistan	-	17
Bangladesh	-	6
China (Mainland)	-	509

Country	Number of new fatal cases since previous national update	Cumulative number of fatal cases
Hong Kong SAR China	-	51
India	18	898
Japan	-	107
Macao SAR China	-	2
Maldives	-	1
Mongolia	-	26
Nepal	-	2
Pakistan	-	1
South Korea	22	170
Sri Lanka	-	35
Taiwan	-	35
Total	40	1860
South-East Asia		
Brunei Darussalam	-	1
Cambodia	-	6
Indonesia	-	10
Laos Peoples Democratic Republic	-	1
Malaysia	-	77
Philippines	-	30
Singapore	-	19
Thailand	-	191
Vietnam	-	53
Total	-	388
Australia and Pacific		
Australia	-	191
Cook Islands	-	1
Marshall Islands	-	1
New Zealand	-	20
Samoa	-	2
Solomon Islands	-	1
Tonga	-	1
Total	-	217
TOTAL	90	12866

* Deaths reported from France include 1 in Guyana, 9 in New Caledonia, 7 in the French Polynesia, 7 in La Réunion, 1 in Martinique, 2 in Mayotte, 5 in Guadeloupe and 191 in mainland France.

Figure 1. Number of confirmed deaths among 2009 pandemic influenza A(H1N1) cases by week of notification in EU and EFTA countries

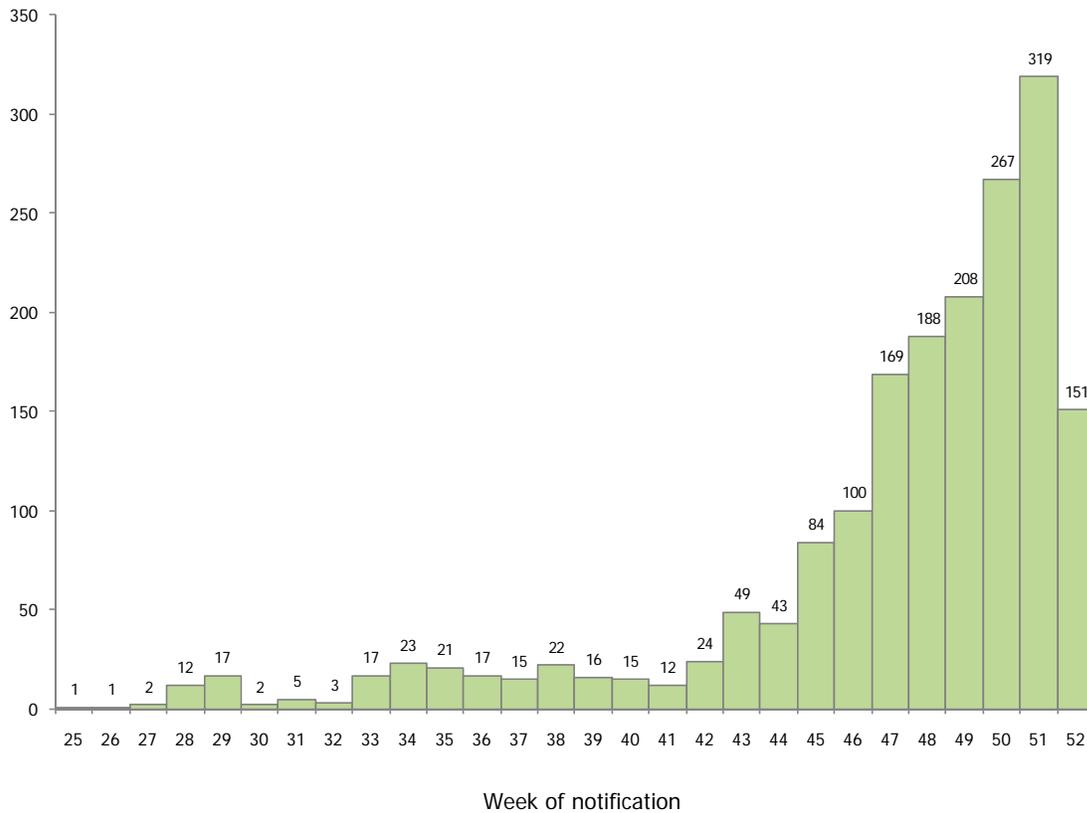
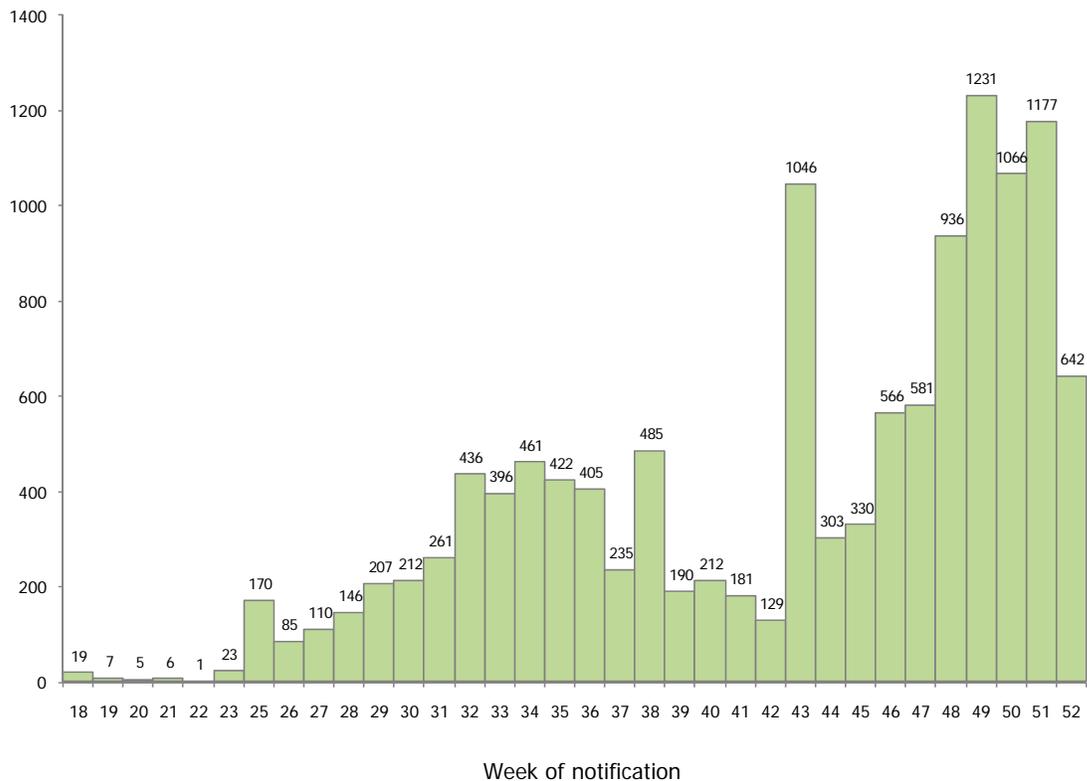


Figure 2. Number of confirmed deaths among 2009 pandemic influenza A(H1N1) 2009 influenza cases by week of notification in the rest of the world*.



* The apparent increase in the number of deaths in week 43 is due to the aggregate reporting of fatal cases from Brazil from weeks 37 to 40 and to our batch report of US fatal cases since 1 August 2009.

Figure 3. Reported cumulative number of confirmed fatal cases of 2009 pandemic influenza A(H1N1) in EU and EFTA countries, as of 30 December 2009, 14.00 CEST

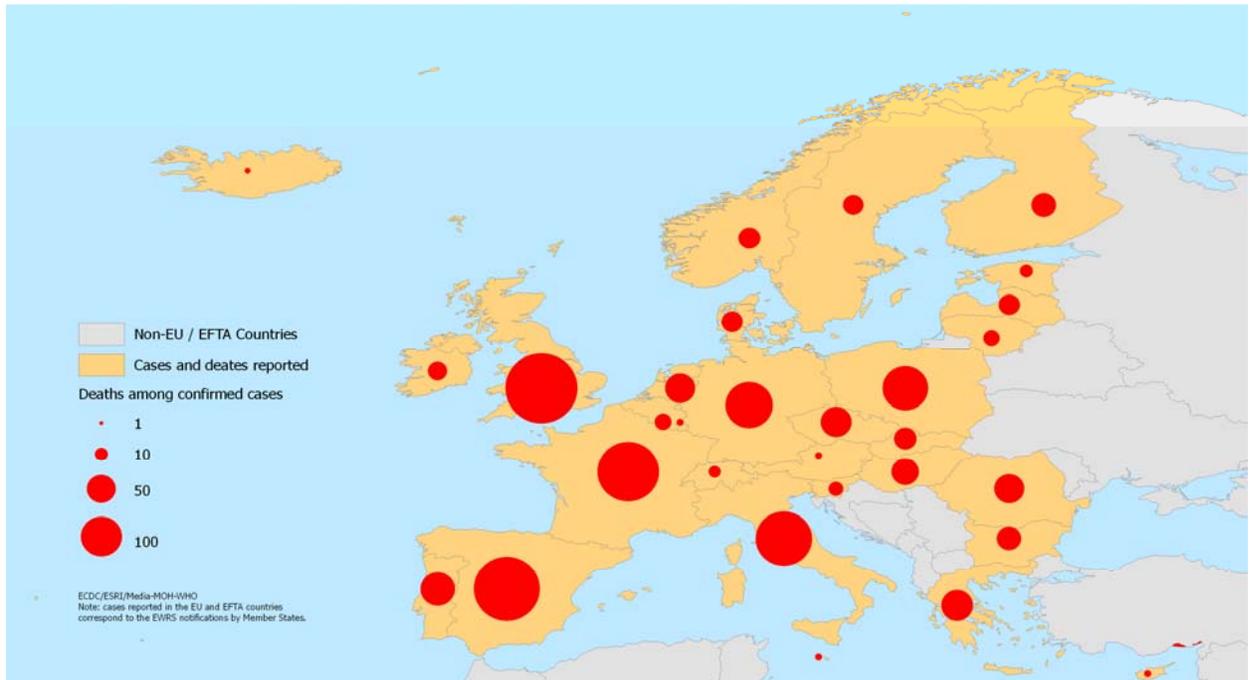


Figure 4. Reported cumulative number of confirmed fatal cases of 2009 pandemic influenza A(H1N1) and country status, by country, as of 30 December 2009, 14.00 CEST

