



**World Health
Organization**

REGIONAL OFFICE FOR **Europe**

Summary of the 2012–2013
influenza season in the WHO
European Region

Keywords

Communicable diseases and their control
Disease outbreaks - prevention and control
Influenza, human – epidemiology
Population surveillance
Sentinel surveillance

Address requests about publications of the WHO Regional Office for Europe to:

Publications

WHO Regional Office for Europe

UN City, Marmorvej 51

DK-2100 Copenhagen Ø, Denmark

Alternatively, complete an online request form for documentation, health information, or for permission to quote or translate, on the Regional Office web site (<http://www.euro.who.int/pubrequest>).

© World Health Organization 2013

All rights reserved. The Regional Office for Europe of the World Health Organization welcomes requests for permission to reproduce or translate its publications, in part or in full.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by the World Health Organization to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either express or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall the World Health Organization be liable for damages arising from its use. The views expressed by authors, editors, or expert groups do not necessarily represent the decisions or the stated policy of the World Health Organization.

CONTENTS

1. Key features of the 2012-2013 influenza season.....	4
2. Timing and geographic spread.....	4
3. Impact and severe disease.....	5
4. Virological analyses.....	7
a. Virus detections.....	7
b. Virus strain characterizations.....	8
c. Antiviral susceptibility.....	9
5. Outbreaks of severe respiratory infection: MERS-CoV and avian influenza A(H7N9).....	9
6. Description of influenza surveillance in the WHO European Region.....	10
7. Case definitions of influenza activity.....	11
8. Acknowledgements.....	11
9. Bibliography.....	11

1. Key features of the 2012-2013 influenza season

The 2012–2013 influenza season was of a slightly longer duration than the 2011–2012 season, starting around week 48/2012, peaking around week 5/2013 and lasting until week 16/2013. In general, influenza morbidity rates were higher than in the previous season. Influenza activity was reported as low or medium, with 11 countries reporting higher than usual levels of influenza activity at some point in time over the entire season, compared to 4 countries reporting higher than usual levels in the previous season.

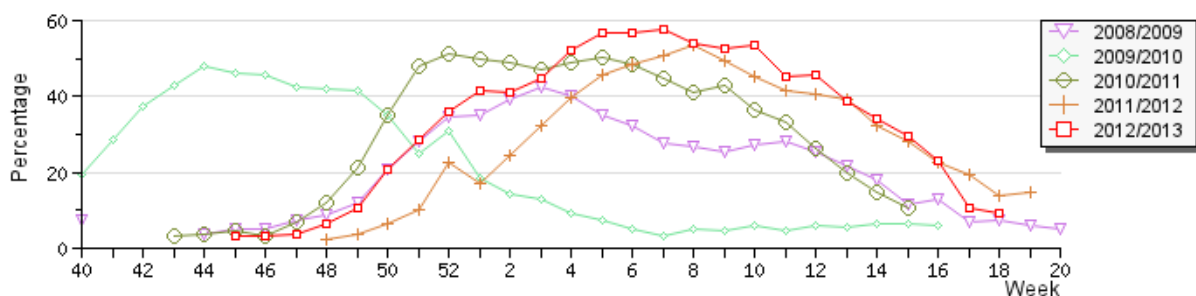
All 3 seasonal influenza viruses co-circulated this season, with, in general, influenza A viruses predominating early in the season followed by influenza B. Overall, 63% of viruses were influenza A and 37% influenza B and of the sub-typed influenza A viruses, about two thirds were A(H1N1)pdm09 and one third A(H3N2). Severe cases occurred mainly in those above 15 years of age and were due mainly to A(H1N1)pdm09 and influenza B. Excess pooled all-cause mortality as determined in up to 18 countries that participate in the European Mortality Monitoring Project (EuroMoMo) project was only observed in persons above 64 years of age and was comparable with the previous season.

The majority of influenza viruses that were characterized antigenically corresponded to those recommended by WHO for inclusion in the current northern hemisphere seasonal influenza vaccine, suggesting a good match of circulating viruses with the seasonal influenza vaccine. Monitoring of viruses for susceptibility to neuraminidase inhibitors showed no indication of increased resistance to these influenza antiviral drugs in circulating viruses this season. All viruses screened for susceptibility to adamantanes were found to be resistant.

2. Timing and geographic spread

Influenza activity started and peaked slightly earlier than the previous season and was of a longer duration, as indicated by virus detections from respiratory swabs collected by surveillance physicians. The per cent positivity of sentinel outpatient respiratory swabs was also slightly higher than in previous seasons, as indicated by Fig. 1.

Fig. 1. Percentage of sentinel influenza-like illness (ILI)/acute respiratory infections (ARI) specimens testing positive for influenza viruses per season (data from the Week 20/2013 EuroFlu Bulletin)

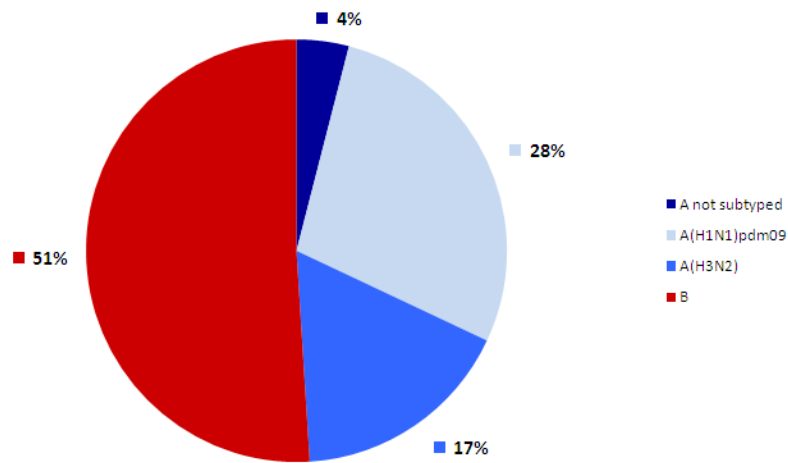


As indicated in Fig. 1, the influenza season started around week 48. At this time, France and the United Kingdom were the only countries to report a positivity rate of more than 10% when testing for 30 or more sentinel specimens. Germany, Spain (week 49), Belgium, Ireland, Poland and Sweden (week 50) reached this point soon after. This indicates that early activity occurred in the northwest part of the Region, but whether there was a particular geographic progression of influenza activity through the Region, as has been observed in some previous seasons, remains to be determined.

3. Impact and severe disease

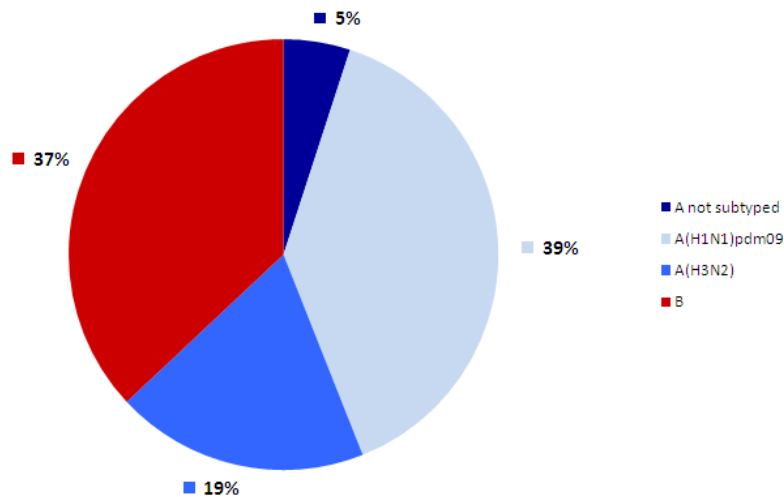
Influenza activity during the 2012–2013 season had a larger impact than during the previous season. In 15 of the 20 countries that report an ILI or ARI baseline, activity exceeded baseline levels for at least 2 weeks longer in the 2012–2013 season than in the 2011–2012 season. In these countries, as well as in several countries that do not report a baseline, the prolonged 2012–2013 season corresponded with co-circulation of influenza A (A(H1N1) and/or A(H3N2)) and B, with A being in general more prevalent early in the season and influenza B more prevalent later in the season. Compared with this season, relatively little influenza B was circulating in the somewhat shorter 2011–2012 season. Also, influenza morbidity rates for outpatient surveillance (ILI and ARI) were, in general, higher this season than in the year before. Thirty-six of 49 reporting countries had complete data on ILI rates in both the current and the previous season. Amongst these 36 countries, 21 countries had higher ILI rates compared to the previous season, 8 had similar rates and 7 had lower rates. Influenza activity was generally reported as low or medium, with 11 countries reporting higher than usual levels of influenza activity at some point in time over the entire season, compared to 4 countries in the previous season. However, only 3 out of 11 of these countries that reported high levels of intensity reported them for more than 10% of the time over the entire season. The highest outpatient consultation rates were observed, in 34 countries, in the 0–4 and 5–14 age groups similar to previous seasons. Of the sentinel specimens that were tested for influenza, 39.8% of outpatient specimens collected from ILI and ARI cases according to standard case definitions tested positive, compared with 29.9% in the previous season. The proportion of influenza virus types and subtypes from outpatient sentinel specimens throughout the season is shown in Fig. 2.

Fig. 2. Sentinel ILI/ARI specimens positive for influenza viruses A and B (data from week 40/2012 to week 20/2013)



27.2% of specimens from the 13 countries that perform inpatient sentinel surveillance for severe acute respiratory infection (SARI) tested positive for influenza, compared with 15.7% in the previous season, as shown in Fig. 3.

Fig. 3. Sentinel SARI specimens positive for influenza viruses A and B (data from week 40/2012 to week 20/2013)



An increase in the percentage of tests positive for influenza at inpatient sentinel sites occurred between weeks 5 and 13, which was accompanied in several countries by an increase in SARI cases in all age groups. The distribution of SARI cases among the different age groups during this peak period varied by country. Further analysis will determine if these differences correlate with differences in the prevalence of influenza A(H1N1)pdm09, A(H3N2) and influenza B viruses between countries.

In addition to the 13 countries that monitor SARI cases via inpatient sentinel sites, 8 countries within the EU report hospitalized laboratory-confirmed cases of influenza to ECDC. Across

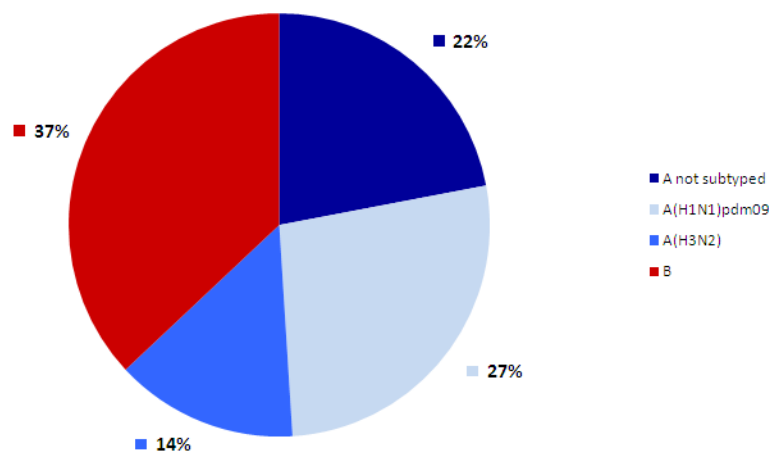
these 8 reporting countries (Belgium, France, Ireland, Romania, Slovakia, Spain, Sweden and the United Kingdom), there were 3273 cases during the 2012–2013 season. Influenza A accounted for 61% of these cases and influenza B accounted for 39% of cases. In the previous season, 7 countries reported 1820 cases, with influenza A accounting for 70% of these cases and 30% accounted for by influenza B. The main difference between the current and previous season is that during the 2011–2012 season, of the influenza A cases, A(H3N2) accounted for 61% of cases whereas during the 2012–2013 season, A(H1N1)pdm09 accounted for 68% of A cases.

4. Virological analyses

a. Virus detections

Fig. 4 illustrates the total number of detections in the Region this season. Compared to last season, this season had a higher proportion of B (37% versus 6.1%) and A(H1N1)pdm09 (27% versus 9.2%) but a lower proportion of A(H3N2) (14% versus 79.6%). Overall, influenza A viruses dominated over B, with A(H1N1)pdm09 dominating amongst the A viruses.

Fig. 4. Combined sentinel and non-sentinel specimens positive for influenza A and B (data are from week40/2012 to week 20/2013)



In general, A viruses dominated early in the season, but later in the season influenza B became the dominant virus, as illustrated in Fig. 5.

Fig. 5. Combined sentinel and non-sentinel specimens positive for influenza A and B per week (data accessed from the week 20/2013 EuroFlu Bulletin)

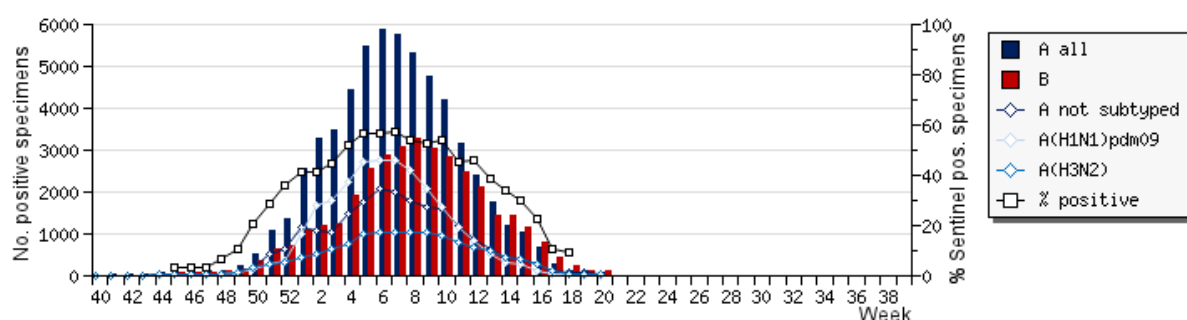


Table 1 shows a breakdown of the proportion of influenza A and influenza B viruses, as well as the A subtypes, that contribute to each of ILI/ARI and SARI, with 49 countries performing ILI/ARI surveillance and 13 countries performing SARI surveillance. SARI specimens showed a higher relative proportion of influenza A and a lower relative proportion of B than ILI/ARI specimens.

Table 1. Virus detections in sentinel specimens (cumulative for ILI, ARI and SARI since week 40/2012; data are from the week 20/2013 EuroFlu Bulletin)

	ILI/ARI	SARI
Total number of sentinel specimens tested	45490	7310
Specimens positive for influenza	18114 (40%)	1987 (27%)
Influenza A viruses detected	8960 (49%)	1250 (63%)
Influenza B viruses detected	9154 (51%)	737 (37%)
Influenza A subtyped	8148	1155
A (H1N1)pdm09	5097 (63%)	768 (66%)
A (H3N2)	3051 (37%)	386 (33%)

b. Virus strain characterizations

The twice-yearly update of virus strains suitable for inclusion in seasonal influenza vaccines is necessary due to the constant evolution of circulating influenza viruses. Match of the vaccine with circulating virus strains is an important factor for the effectiveness of the vaccine. WHO monitors the evolution of influenza viruses through analysis of viruses shared by National Influenza Centres (NIC) with the WHO collaborating centres (WHO CC) for reference and research on influenza and through analysis performed by the NICs themselves. Based on antigenic characterization of a large number of influenza viruses (N=6315) performed by NICs in 17 Member States, the vast majority of characterized viruses matched well with the viruses recommended by WHO for inclusion in the seasonal influenza vaccine for the 2012–2013 season in the northern hemisphere.

WHO has recommended that trivalent vaccines for use in the 2013–2014 influenza season (northern hemisphere winter) contain the following:

- an A/California/7/2009 (H1N1)pdm09-like virus;
- an A(H3N2) virus antigenically like the cell-propagated prototype virus A/Victoria/361/2011;
- a B/Massachusetts/2/2012-like virus (Yamagata lineage).

It is recommended that A/Texas/50/2012 is used as the A(H3N2) vaccine component because of antigenic changes in earlier A/Victoria/361/2011-like vaccine viruses (such as IVR-165) resulting from adaptation to propagation in eggs.

c. Antiviral susceptibility

Based on antiviral susceptibility data provided by 14 Member States, there was no indication of the spread of neuraminidase-inhibitor-resistant influenza viruses during the winter of 2012–2013.

However, all influenza viruses that were screened for susceptibility to adamantanes were found to be resistant. WHO guidance recommends that an antiviral should not be used for treatment when the infecting virus type/subtype is known to be, or is highly likely to be, resistant to that antiviral. These data indicate that clinicians should continue to include the use of neuraminidase inhibitors in their clinical management of all patients with moderate or severe disease suspected, or confirmed, to be due to influenza.

A total of 1834 influenza A(H3N2), A(H1N1)pdm09 and B viruses were screened for susceptibility to the neuraminidase inhibitors oseltamivir and zanamivir. Of the 952 A(H1N1)pdm09 viruses tested, 935 showed susceptibility to both drugs while 15 viruses (1%) were resistant to oseltamivir and 2 viruses were resistant to both oseltamivir and zanamivir, based on genetic analyses. Of these 17 viruses, only 2 viruses were detected in outpatients through a sentinel surveillance system. The 436 influenza A(H3N2) viruses tested showed susceptibility to both drugs. Of the 446 influenza B viruses tested, 445 showed susceptibility to both drugs.

All 129 A(H1N1)pdm09 and 55 A(H3N2) viruses that were screened for susceptibility to adamantanes were found to be resistant.

5. Outbreaks of severe respiratory infection: MERS-CoV and avian influenza A(H7N9)

During this season, two new pathogens have emerged: the Middle East respiratory syndrome coronavirus (MERS-CoV) first detected in September 2012 in Saudi Arabia, and avian influenza A(H7N9) first detected in March 2013 in China. As of 22 July 2013, WHO has been notified of 90 laboratory-confirmed cases of human infection with MERS-CoV, including 45 deaths, and 134 laboratory-confirmed cases of human infection of avian influenza A(H7N9) including 43 deaths. These two events constitute an unusual global situation; although unrelated, both viruses are highly pathogenic, are considered to have potential to evolve and spread globally, and have already caused frequent severe respiratory

disease and fatalities. Much, including the reservoir, source of infection, and transmission route, is still unknown about both viruses, and global investigations are ongoing.

Based on the current situation and available information, WHO encourages all Member States to continue their surveillance for severe acute respiratory infections (SARI) and to strengthen preparedness to detect, assess and investigate cases and outbreaks of severe acute respiratory infections. In particular, Member States of the WHO European Region have responded by rapidly establishing the capacity to confirm cases in the laboratory: about 70% of countries for MERS-CoV and 78% for A(H7N9).

Looking forward, WHO/Europe in collaboration with international experts and partners will continue to support National Influenza Centres to establish the capacity to detect emerging respiratory pathogens. We will also organize a series of training workshops in central Asia and the Caucasus in the autumn of 2013 to strengthen capacities to detect, assess and respond to emerging pathogens such as A(H7N9) and MERS-CoV and to prepare countries to manage cases of severe acute respiratory infections.

6. Description of influenza surveillance in the WHO European Region

50 of the 53 Member States of the WHO European Region routinely conduct surveillance of influenza and the majority provide epidemiological and virological data to WHO through EuroFlu (21 countries) and ECDC (29 countries).

Most countries monitor influenza activity through outpatient sentinel surveillance of ILI and/or ARI. In addition, 13 countries conduct inpatient sentinel surveillance for SARI and 8 countries conduct inpatient surveillance of laboratory-confirmed influenza. Sentinel data come from a network of designated clinicians who routinely and systematically collect respiratory specimens from ILI, ARI or SARI cases according to standard case definitions. Virus detections in patients from non-sentinel sources, which include community outbreaks, general practitioners and hospitals that are not part of the sentinel surveillance system for influenza and which may not use a standard case definition for ILI, ARI or SARI, are also reported by countries throughout the European Region.

National Influenza Centres (NICs) in the European Region are part of the WHO Global Influenza Surveillance and Response System (GISRS). They conduct virological analyses as part of national surveillance and share viruses with WHO Collaborating Centres for Reference and Research on Influenza (WHO CC), to inform the seasonal influenza vaccine strain selection process as well as monitor antiviral susceptibility in circulating viruses. Virological data comes from laboratory analyses on specimens sent from outpatient sentinel, inpatient sentinel and non-sentinel sites. Analyses of these specimens yield a positive case count, as well as sub-type classification of the influenza viruses. In addition to influenza typing and sub-typing, many NICs also perform genetic and antigenic characterization of influenza viruses which supports the work of the WHO CC.

Data submitted to EuroFlu and ECDC are published in a weekly electronic bulletin for the WHO European Region which is available online in English and Russian (EuroFlu), and the Weekly Influenza Surveillance Overview for European Union and European Economic Area countries published by ECDC. The EuroFlu bulletin collates and interprets epidemiological and virological data from the different surveillance systems in the Region, to provide information on the timing of the influenza season, the spread of influenza, the prevalence and characteristics of circulating influenza viruses according to influenza type and subtype or lineage, and severity. In addition, influenza viruses are assessed each season for their antigenic and genetic characteristics, to determine the extent of their antigenic and genetic similarity to the viruses included in the seasonal influenza vaccine and the prevalence of mutations that affect pathogenicity or are associated with reduced susceptibility to antiviral drugs.

7. Case definitions of influenza activity

ILI is defined as an acute respiratory illness with onset during the last 7 days with a measured temperature of at least 38 degrees Celsius and cough. ARI is defined as acute onset of at least one of the following symptoms: cough, sore throat, shortness of breath and coryza.

SARI is defined as an acute respiratory illness with onset during the previous 7 days requiring overnight hospitalization that includes history of fever or measured fever of at least 38 degrees Celsius, cough and shortness of breath or difficulty breathing.

8. Acknowledgements

We gratefully acknowledge the Member States of the WHO European Region who provided the data upon which this report is based and the WHO Collaborating Centre for Reference and Research on Influenza at the National Institute for Medical Research in London, the United Kingdom.

9. Bibliography

Recommended composition of influenza virus vaccines for use in the 2013-14 northern hemisphere influenza season. Geneva, World Health Organization, 2013 (www.who.int/influenza/vaccines/virus/recommendations/2013_14_north/en/index.html, accessed 23 July 2013).

Overview of sentinel systems for hospitalized severe acute respiratory infections (SARI) represented in the weekly EuroFlu surveillance bulletin. Copenhagen, WHO Regional Office for Europe, 2013 (www.euro.who.int/en/what-we-do/health-topics/communicable-diseases/influenza/publications/2013/overview-of-sentinel-systems-for-hospitalized-severe-acute-respiratory-infections-sari-represented-in-the-weekly-euroflu-surveillance-bulletin, accessed 23 July 2013).

Recommended composition of influenza virus vaccines for use in the 2012-2013 northern hemisphere influenza season. Geneva, World Health Organization, 2012 (www.who.int/influenza/vaccines/virus/recommendations/2012_13_north/en/index.html, accessed 23 July 2013).

WHO Regional Office for Europe guidance for sentinel influenza surveillance in humans. Copenhagen, WHO Regional Office for Europe, 2011 (www.euro.who.int/en/what-we-do/health-topics/communicable-diseases/influenza/publications/2009/who-regional-office-for-europe-guidance-for-sentinel-influenza-surveillance-in-humans, accessed 23 July 2013).

WHO Guidelines for Pharmacological Management of Pandemic Influenza A(H1N1) 2009 and other Influenza Viruses. Geneva, World Health Organization, 2010 (www.who.int/csr/resources/publications/swineflu/h1n1_guidelines_pharmaceutical_mngt.pdf, accessed 23 July 2013).

EuroFlu bulletin [online bulletin]. Copenhagen, WHO Regional Office for Europe (<http://www.euroflu.org/>, accessed 23 July 2013).

ECDC Weekly Influenza Surveillance Overview (WISO) [online bulletin] (www.ecdc.europa.eu/en/healthtopics/seasonal_influenza/epidemiological_data/pages/weekly_influenza_surveillance_overview.aspx, accessed 23 July 2013).

Global Influenza Surveillance and Response System (GISRS) [web site]. Geneva, World Health Organization (www.who.int/influenza/gisrs_laboratory/en/, accessed 23 July 2013).

EuroMoMo [web site]. European monitoring of excess mortality for public health action (www.euromomo.eu/index.html, accessed 23 July 2013).

Middle East respiratory syndrome coronavirus (MERS-CoV)

MERS-CoV updates [web site]. Copenhagen, WHO European Region (www.euro.who.int/en/what-we-do/health-topics/communicable-diseases/influenza/middle-east-respiratory-syndrome-coronavirus-mers-cov/mers-cov-updates-european-region, accessed 23 July 2013).

Coronavirus infections [web site]. Geneva, World Health Organization (www.who.int/csr/disease/coronavirus_infections/en/, accessed 23 July 2013).

Coronavirus infections [web site]. Stockholm, European Centre for Disease Prevention and Control (www.ecdc.europa.eu/en/healthtopics/coronavirus-infections/Pages/index.aspx, accessed 23 July 2013).

Influenza A(H7N9)

WHO/Europe updates on avian influenza A(H7N9) [web site]. Copenhagen, WHO Regional Office for Europe (www.euro.who.int/en/what-we-do/health-topics/communicable-diseases/influenza/avian-influenza/human-infection-with-avian-influenza-ah7n9/whoeurope-updates-on-avian-influenza-ah7n9, accessed 23 July 2013).

Avian influenza A(H7N9) virus [web site]. Geneva, World Health Organization (www.who.int/influenza/human_animal_interface/influenza_h7n9/en/, accessed 23 July 2013).

Avian influenza in humans. In focus: Avian influenza A(H7N9) virus [web site]. Stockholm, European Centre for Disease Prevention and Control (www.ecdc.europa.eu/en/healthtopics/avian_influenza/pages/index.aspx, accessed 23 July 2013).

Palm D et al. on behalf of the Joint ECDC-WHO Regional Office for Europe Novel Coronavirus Laboratory Survey participants; ECDC National Microbiology Focal Points, WHO European Region EuroFlu Network and European Network for Diagnostics of "Imported" Viral Diseases (ENIVD). Laboratory capability for molecular detection and confirmation of novel coronavirus in Europe, November 2012. *Euro Surveill.* 2012, 17(49):pii=20335 (www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20335, accessed 23 July 2013)