Beyond the influenza-like illness surveillance: The need for real-time virological data

J S Casalegno (jean-sebastien.casalegno@chu-lyon.fr)¹, E Frobert¹, V Escuret¹, M Bouscambert-Duchamp¹, G Billaud¹, Y Mekki¹, I Schuffenecker¹, B Lina¹, F Morfin¹, M Valette¹

¹. Hospices Civils de Lyon, National Influenza Centre, Laboratory of Virology, Lyon, France

Citation style for this article:

Casalegno JS, Frobert E, Escuret V, Bouscambert-Duchamp M, Billaud G, Mekki Y, Schuffenecker I, Lina B, Morfin F, Valette M. Beyond the influenza-like illness surveillance: The need for real-time virological data. *Euro Surveill.* 2011;16(1):pii=19756. Available online: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19756>

Article published on 6 January 2011

To the editor: We read with great interest your special issue on the Experiences with the pandemic in Europe (Vol. 15, issue 49, 9 December 2010). The reports in that issue clearly highlight the importance of surveillance and monitoring of both emergence and spread of influenza outbreaks through syndromic and laboratory surveillance networks [1]. We would however like to highlight that, in medical practice, it is hardly possible to determine the aetiology of viral respiratory infections by using only clinical symptoms as a basis for diagnosis. For example the correlation between the influenza and influenza-like illnesses (ILI) presentation and the diagnosis of influenza may vary considerably depending on the definition of ILI, the accuracy of the clinician, the epidemiological context, and the presence of co-circulating confounding respiratory viruses. Collecting virological data is mandatory for such networks.

The early phase of the A(H1N1)2009 pandemic in France is an interesting example of this risk of confusion. In France, two independent surveillance networks are involved in influenza surveillance: the 'réseau sentinelle' or sentinel network and the Groupes Régionaux d'Observation de la Grippe (GROG). The sentinel network [2] declared the A(H1N1)2009 pandemic in France the first week of September 2009 (week 36), based on the increase in ILI reports. At the same time, GROG [3] and the laboratory network linked to the National Influenza Centre reported a low incidence of pandemic influenza A(H1N1)2009 [4]. From week 36 to week 43, the GROG network reported a limited pandemic influenza A(H1N1)2009 activity. The pandemic started only mid-October (week 44), according to clinical and virological data. This discrepancy is explained by the difference in the surveillance methods of the two networks. The sentinel network uses clinical surveillance

TABLE

Percentage of clinical symptoms observed in paediatric patients with a positive influenza or rhinovirus laboratory-confirmed nasal sample, week 36 to 46, France 2009^a (n=415)

Symptom	Influenza A(H1N1)	Rhinovirus	Odds ratio, 95% confidence interval	p
Cough	87,9	59,2	(0,12;0,32)	p<0,001
Asthenia	24,6	13,8	(0,29;0,81)	p<0,001
Myalgia	22,2	6,4	(0,11;0,47)	p<0,001
Diarrhoea	9,8	5,3	(0,90;4,10)	Not significant
Vomiting	21,8	15,7	(0,40;1,10)	Not significant
Hyperthermia	81,7	79,2	(0,50;1,38)	Not significant
Temperature ≥ 39,5°C	28	25,3	(0,53;1,51)	Not significant
Swollen lymph nodes	12,1	11,8	(0,53;1,76)	Not significant
Nasal secretion	36,1	45,1	(0,98;2,16)	p<0,05
Bronchitis	3,4	5,4	(0,62;4,30)	Not significant
Dyspnoea	8,2	24,1	(17,7;41,30)	p<0,001
Otitis	8,2	2,5	(0,10;0,78)	p<0,01
Pharyngitis	32,2	8,7	(0,11;0,35)	p<0,001
Cutaneous rash	7,8	4,9	(0,27;1,39)	Not significant
ILI diagnosed	36,5	35	(0,62;1,39)	Not significant

^a Results are presented as the likelihood of the presence of symptoms and rhinovirus detection (Odds ratio, 95% confidence interval)

of ILI based on reports from general practitioners (GPs), whereas the GROG network associates virological diagnoses to the clinical surveillance of ILI reported by GPs. The latter network could ascertain that non-influenza respiratory viruses, mainly rhinoviruses and other respiratory viruses such as parainfluenza viruses, were responsible for the increase in reported ILI from week 36 to week 43 [4,5].

To investigate this point further, we reviewed 415 emergency paediatric medical records collected between week 36 and week 46 (mean age 4.8 years $\pm$ 7.1 standard deviation). We compared the clinical symptoms of 208 laboratory-confirmed A(H1N1)2009 influenza virus-positive and 207 rhinovirus-positive patients (Table). It was clear that there were differences between the clinical presentations. Cough, asthenia, myalgia, pharyngitis and otitis were more frequent in the A(H1N1)2009 influenza group whereas nasal secretion and dyspnea were more frequent in the rhinovirus group. However, all these symptoms were noticed in both groups. Temperature did not differ significantly between the A(H1N1)2009 influenza and rhinovirus groups. The conclusion of ILI in the emergency paediatric medical report was not predictive for either laboratory-confirmed influenza or rhinovirus cases. The pandemic context, the expectation of influenza to spread with the start of the school year in September, massive media coverage of the pandemic and the general level of anxiety made the presumptive clinical diagnosis of influenza a real challenge in the early pandemic phase.

These data highlight the fact that viral respiratory infections can easily be clinically confused. It is important to keep in mind these limitations and that ILI and other respiratory symptoms can account for the presence of different respiratory viruses. As reported by Thomson and Nicoll [1], clinical surveillance of upper respiratory tract infection is required but the link of non-specific surveillance data (including surveillance of ILI, schools or work absenteeism, analysis of search engine query data) with a reliable virus surveillance system is mandatory for optimal surveillance and epidemic or pandemic management

References

1. Thomson G, Nicoll A. Responding to new severe diseases – the case for routine hospital surveillance and clinical networks in Europe. *Euro Surveill.* 2010;15(49):pii=19745. Available from: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19745>
2. Carrat F, Flahault A, Boussard E, Farran N, Dangoumau L, Valleron AJ. Surveillance of influenza-like illness in France. The example of the 1995/1996 epidemic. *J Epidemiol Community Health.* 1998;52 Suppl 1:32S-38S.
3. Lina B, Valette M, Foray S, Luciani J, Stagnara J, See DM, et al. Surveillance of community-acquired viral infections due to respiratory viruses in Rhone-Alpes (France) during winter 1994 to 1995. *J Clin Microbiol.* 1996;34(12):3007-11.
4. Casalegno JS, Ottmann M, Duchamp MB, Escuret V, Billaud G, Frobert E, et al. Rhinoviruses delayed the circulation of the pandemic influenza A (H1N1) 2009 virus in France. *Clin Microbiol Infect.* 2010;16(4):326-9.
5. Linde A, Rotzén-Östlund M, Zwegberg-Wirgart B, Rubinova S, Brytting M. Does viral interference affect spread of influenza?. *Euro Surveill.* 2009;14(40):pii=19354. Available from: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19354>