Sensibility and specificity of syndromic system for influenza based on general practitioners network in Gironde, France

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OBJECTIVE

To determine sensitivity and specificity of syndromic surveillance of influenza based on data from SOS Médecins, a healthcare network of emergency general practitioners (GP) in Bordeaux, France.

BACKGROUND

The heat wave occurred in Europe in august 2003 have shown the need for readily available information to guide health service response and public health decision making. That is why the French national institute for public health developed syndromic surveillance system [1]. In collaboration with SOS Médecins Bordeaux [2], an association of GP from the area of Bordeaux, a south-western city in region Aquitaine, the Interregional Epidemiology Unit (Cellule Inter-régionale d'épidemiologie, Cire) developed a monitoring system to detect outbreaks and unusual health events. Data were transmitted automatically on a daily basis and information on visits were analysed every day by epidemiologists of the Cire.

METHODS

An indicator of influenza syndromes was obtained by regroupement of five diagnoses: influenza, flu-like symptoms, fever, febrile symptoms and virosis. This definition was established on time trends of diagnosis according to GP of SOS Médecins Bordeaux. The study covered the period from April 1999 to the first of April 2007. We analysed data categorised by week, for the Bordeaux area, compared to data from the Sentinel network (Reseau Sentinelles) which is the reference for studying influenza in France [3]. A correlation coefficient was estimated between these two datasets. Epidemic and non epidemic periods were identified by statistical process of Sentinel network, considered as the gold standard. To assess the ability of SOS Médecins system to identify outbreaks, the sensitivity, specificity, positive and negative predictive values were evaluated for different threshold simulated and a threshold epidemic was identified by computing receiver operating characteristics curve. The beginning and the duration of outbreaks obtained from both sources were compared.

RESULTS

Over the study period, 81,143 GP's visits for influenza syndrome were recorded in the area of Bordeaux with an average of 51 visits per day in winter, and 941,191 cases were declared from the Sentinel network in the whole Aquitaine. There was a relationship between the number of visits for influenza from SOS Médecins and number of influenza cases from the Sentinel network; data from the two systems were highly correlated (coefficient of correlation: 0.87).

Threshold	Outbreaks		No outbreaks			
	Number of epidemics weeks identified	Se (%)	Number of non epidemics weeks identified	Sp (%)	VPP (%)	VPN (%)
50	46	100	18	5	12	100
100	46	100	105	28	15	100
150	46	100	261	70	29	100
200	43	93	328	88	50	99
230	43	93	344	93	61	99
250	42	91	349	94	66	99
300	39	85	360	97	78	98
400	29	63	369	99	94	96
500	22	48	371	100	100	94

Table 1: Sensibility (Se), specificity (Sp), predictive positive value (VPP) and negative value (VPN) of SOS Médecins system for the detection of influenza outbreaks according to the threshold based on weekly numbers of influenza syndromes visits. Gold standard: Sentinel network.

When the threshold was fixed at 230 visits per week, 93% of epidemics weeks and 93% of non epidemics weeks identify by the Sentinel system were detected by SOS Médecins system. The predictive positive and negative values were respectively 61% and 99%. Over the study period, eight epidemics were identified from SOS Médecins data, this identification occurred about two weeks and half before outbreak detection from Sentinel network.

CONCLUSION

Surveillance of influenza syndromes from SOS Médecins allowed following seasonal trends and identifying influenza outbreaks. Sensitivity and specificity of SOS Médecins system for early detection of outbreaks showed the useful of these data in monitoring influenza activity.

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