

Syndromic Surveillance and Heat Wave: Is it Working?

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OBJECTIVE

The objective of the study is to evaluate the value of a syndromic surveillance system during a heat wave and propose pertinent indicators

BACKGROUND

Most of the time, health consequences of heat waves are serious. Heat wave response plans were developed for reducing health effects but even if they are very efficient it is not possible to eliminate all health consequences. It is therefore necessary to develop a flexible health surveillance system capable of rapidly identifying the population health burden of elevated temperature. This study focused on the Year 2006 summer heat wave, which resulted in 2,000 deaths in a 2 week period. This study represents the first opportunity to test the capabilities of a syndromic surveillance system to provide pertinent information and define appropriate indicators.

METHODS

Data were transmitted automatically and daily by 49 emergency departments to the French Institute for Public Health Surveillance through the Internet. Items collected for each patient visit included the diagnosis code according to ICD10, patient outcome and age. A description of the system has been published.¹

Those hospitals represented 9.8% of the daily total patient census in emergency departments in France.

The studied period corresponded to the annual activation of the National Heat Wave Respond Plan (June 1st to August 31st). The heat wave occurred between the 11-28th of July, 2006 and officially considered as an "on alert period"

Several syndromes based on the discharge diagnosis were defined.^{2,3} For each syndrome, the daily mean was calculated for both periods and different age groups (< 14 yrs old, 15-74 yrs old, 75 and more). Based on the same age groups, the daily means of patient visits and hospitalized patients were calculated. The comparison of the daily means for both periods is based on Fisher's t-test.

RESULTS

The "on alert period" represented 18 days of the 92 days summer period. A total of 415,862 patients' visits were recorded. Among them, 82,040 (19.7%) occurred during the "on alert period".

During the "on alert period", 4,557 visits per day were recorded vs. 4,511 during the "off alert period". It corresponded to an increase of 1% (NS). However,

during the heat wave period, 476.7 visits/day of elderly (75 and more) were recorded vs. 446.2 visits/day for the "off alert period" ($p < 0.05$). For hospitalized patients, the increase was non significant (1.6%) with 1,012 hospitalization/days during the "on alert period" and 994 for the "off period alert". The number of hospitalized patients/day increased significantly among elderly during the "on alert" period (277.7/day vs 257.6/day, $p < 0.05$). The sex-ratio shown a predominance of male: 1.2 and was the same for both period.

Regarding specific illnesses, statistically significant increases of visits were observed during the "on alert period" for malaises (x1.3), hyponatremia (x2.9), dehydrations (x3.1), hyperthermia (x5.6) and kidney syndromes (x1.4) among the elderly. For adults under 75, statistically significant increases were recorded for malaises (x1.3), hyponatremia (x2.3), and dehydrations (x3.6). For children, a significant increase of hyperthermia (x2.1) was observed. No statistically significant increases of visits among other diseases were observed.

CONCLUSION

These results of the first employment of the syndromic surveillance system demonstrate the need for selecting the monitored variables with care. Only some of them show the health impact of heat. Based on our experience we recommend taking into account the following indicators: for elderly hyponatremia, dehydration and hyperthermia and for children hyperthermia. The number of visits per day must also be followed particularly for elderly patients.

This study shows the interest and capacity of a syndromic surveillance system to monitor environmental health impact. One of its main positive aspects is its capacity to monitor in real time the effect of a heat wave on the population as the health effects of a severe appear as quickly as the heat wave occurs. Additional research is needed to corroborate these initial findings.

REFERENCES

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