

Syndromic surveillance and climate change, a possible use?

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OBJECTIVE

This paper assesses the possible interest of using of a syndromic surveillance system based on emergency departments (ED) and crude mortality for monitoring health effects of climate changes (CC).

BACKGROUND

The 2003 heat wave in France (15,000 extra deaths in 10 days) led to modify its public health surveillance system. Then, for the last four years, the French institute for public health surveillance developed a syndromic surveillance system based on three sources of data: ED, GPs' emergency associations and mortality. All data were gathered in real time. A complete description has been published (1). The objectives of this new system were: 1) to detect all early threats for public health; and 2) to measure the impact of an identified or not phenomena.

METHODS

The study covered the period from July 2004 to June 2008. Data were recorded from ED, for each logged in patient, age, reason for emergency admission, main medical diagnosis according to the physician at ED discharge based on the ICD-10, and whether patient was admitted for hospitalization after discharge. Mortality data were recorded from city-hall including for each death: age, gender, date and place of death.

Based on a review of literature, main health effects of CC were identified: asthma, heat related illness, weather disaster, vector-borne diseases patterns, enteric infections (EI), dengue fever...(2,3).

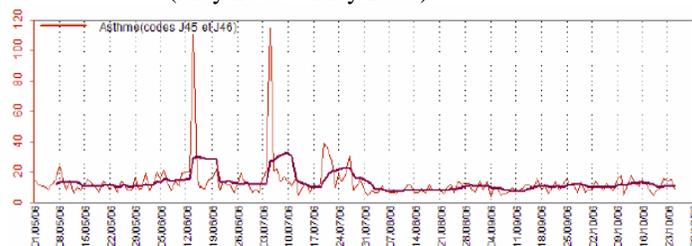
For ED data, corresponding ICD-10 codes to expected health effects of climate change were selected.

Then, time series of the diagnoses and mortality have been analyzed using different methods (cusum, historical means method...), in order to identify significant increases.

RESULTS

Among the most interesting results for ED data: 2 significant peaks of asthma in Paris area (Fig.1), 1 significant increase of heat health impact (4), 1 acute EI outbreak, several peaks of carbon monoxide were recognized. For mortality data 1 significant excess of death was identified during the 2006 heat wave and 1 during the chikungunya outbreak in La Réunion (2006). Expected outbreaks were also recorded (influenza, bronchiolitis, GIE...).

Fig1. Nb of cases of asthma per day in Paris area (May 2005 – May 2006)



CONCLUSION

Climate change has several effects on human health, and not all of them are well defined. Since the syndromic surveillance system implemented is more sensible than a specific surveillance system, it is able to recognize, quickly, numerous kinds of outbreaks or health events.

This ability is essential, the setting up of specific surveillance system for each adverse effect would be too expensive and would not be able to detect in a reactive way other adverse effects of CC which are not clearly identified at the current time.

Morbidity data were analyzed on the basis of diagnosis or diagnosis grouping. This fine graining is necessary because ED global activity is too important to observe those small events.

Our results indicate that a syndromic surveillance may be applicable to several public health concerns from infectious diseases to environmental health consequences. Syndromic surveillance has a strong potential to improve public health early warning systems in the context of climate change. Additional research on the system and public health outcomes are needed.

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