

# Use of Informatics for Understanding Disease Activity in Community

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## OBJECTIVE

This paper describes how the Centre for Health Protection (CHP) of Hong Kong designed and deployed an online interactive system that uses the data from Emergency Departments (ED) for syndromic surveillance.

## BACKGROUND

CHP plans to conduct a pilot project in developing a syndromic surveillance system using data from ED in Hong Kong. This is part of the Communicable Disease Information System initiative, which aims at enhancing the capability of Hong Kong in the control and prevention of communicable diseases.

## METHODS

References to other syndromic systems were taken, and opinion of disease modeling specialist was consulted. Calculations were simulated offline in Microsoft Excel 2003.

## RESULTS

The provisional diagnoses in ED, coded in ICD-9-CM (International Classification of Diseases, 9th Revision, Clinical Modification) format, are re-grouped into 10 syndrome groups according to the ESSENCE (1) for subsequent calculation of syndrome activities. For syndromes with moderate to high level of activities, a temporal filter is applied to improve aberration detection. Data are also aggregated at the hospital, cluster, and overall levels, aiming to detect localized as well as community-wide outbreak.

Since the primary objective of the project is to detect recent trends of infectious diseases, the non-historical cumulative sums (2) and the exponentially weighted moving average control chart (3) were used. These methods are chosen because of their advantage of quick detection of unexpected or unprecedented events and requiring short reference baselines, which are best fit for a newly available data source.

An aberration detection report page provides a one glance summary page of aberration signals. The date in the summary table indicates the last time an aberration signal was generated. Fresh signal that was generated the day before will be highlighted with a red background. The aberration chart shows the activities of an individual syndrome group. The exact aberration signals generated are also shown.

CHP had conducted a trial run of the pilot system recently, and developed a set of workflow procedure to review the aberration signals generated daily. In brief, some additional offline automated analyses are performed to further filter the generated aberration signals. A daily report summarizing the finding is also compiled.

## CONCLUSION

The experience learnt during the trial run would be valuable to develop the pilot system.

## REFERENCES

- [1] Electronic Surveillance System for the Early Notification of Community-based Epidemics  
<http://www.geis.fhp.osd.mil/GEIS/SurveillanceActivities/ESSENCE/ESSENCE.asp>
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- [3] Hogan WR, *et al.* Detection of pediatric respiratory and diarrheal outbreaks from sales of over-the-counter electrolyte products. *J Am Med Inform Assoc.* 2003 Nov-Dec;10(6):555-62. Epub 2003 Aug 4.

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