

Experimental Syndromic Surveillances in Japan Using Three Aspects: OTC, Outpatients Visits and Ambulance Transfer

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Objective

We started an experimental syndromic surveillance using 1) OTC and 2) outpatients visits, in the last year and included 3) ambulance transfer from this year so as to early detect bioterrorism attack (BTA).

Materials

1) We use the pharmaceutical sales data for a common cold from 600 pharmacies in all over Japan. This includes the data from November, 2002 to April, 2003, and from December, 2003 to April, 2004. 2) We start the analysis with using the data from one internal and pediatric clinic. Specifically, this initial data comes through electronically medical record from 1st January, 2003 to 27th June 2005, focusing on five types of symptoms, i.e. fever, respiratory symptoms, diarrhea, vomiting, and rash last year. 3) It is reported that 0.6 million cases are transferred by ambulance in a year. These cases are recorded electronically for 10 years from 1995 to 2004. From this data, we analyze fever only by 49 districts in Tokyo using the total cases in the whole of Tokyo as reference.

Methods

1) We apply EARS (Early Aberration Reporting System) to OTC sales data, since it does not have enough longitudinal data and so that we can compare it with influenza activity. 2,3) We estimate the baseline estimation prospectively, i.e. sample period is from January 1st 2003 to yesterday, and then apply the baseline estimation to today's number of cases. Three residual standard deviation is defined as threshold to detect outbreak. Sensitivity and specificity are checked by simulation technique which was added artificially to the data as the hypothetical BTA and

examine whether the system can detect the attack or not.

Results

1) We found that OTC sales precedes influenza activity by 2 to 4 weeks. 2) Sensitivity is 96% for BTA which infects ten cases of rash, 100% for twenty cases of diarrhea or vomiting respectively, but it remains as 73-78% even if BTA infected thirty cases for fever or respiratory symptoms. 3) We found alert in about 1% of the samples, which means about 40% of days. Though sensitivity for BTA with five cases is 74%, sensitivity goes up to 96% for ten cases and 99% for fifteen cases.

Discussion

1) OTC data has highest peak at the end of year, but it does not affect alert defined by EARS so much. 2) Syndromic surveillance for outpatients visits can detect BTA which infects about ten cases of diarrhea or vomiting, but cannot detect fever or respiratory symptoms, since it needs more than 30 cases at the minimum. 3) Ambulance transfer on Tokyo districts have an enough sensitivity and it can detect BTA which infects more than ten persons.

Conclusion

We will practically apply syndromic system of ambulance transfer as soon as possible as one of effective counter measures of infectious diseases in Tokyo local government. It will be the largest syndromic surveillance in the world. In order to raise its specificity, surveillance for OTC sales or for outpatients visit are also prompted.

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