

Full Automatic Syndromic Surveillance System using Prescription in Japan

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OBJECTIVE

So that full automatic syndromic surveillance cover the whole of nation, we construct the system using the information of prescription.

BACKGROUND

In Medical services for outpatients are well developed due to universal public health insurance. Even patients who have mild symptoms can visit a clinic freely in Japan. Thus the monitoring of outpatients provides very timely information to detect unusual events. On the other hand, EMRs haven't had much penetration, less than 10% at clinics and 20% at hospitals. Moreover, almost nobody uses HL7 or other standards for EMRs. Therefore, it is very difficult to develop a syndromic surveillance system using EMRs like the U.S. We have to develop a system for each EMR and it has a heavy cost.

In Japan, there are about 40 thousand pharmacies and almost half of drugs prescribed are delivered through pharmacies. Almost all pharmacies record prescriptions electronically.

METHODS

The system was developed by the collaborated among National Institute of Infectious Disease and EM SYSTEMS Co.Ltd. which is the leading company of the systems for pharmacies and, especially, provides the Application Server Provider (ASP) system to more than 3000 pharmacies. It monitors drugs for relief of fever and pain, drugs for common colds, antiviral drugs, anti-influenza virus drugs (except for Amantazine), and anti-Varicella-Zoster virus drugs. The last two are classified by age: less than 15, 16 to 64, older than 65 years old.

The data collection and analysis are operated automatically at night and results are shown on the home page on the secure internet in the early morning.

Aberration is defined through the multiple regression model. Namely, we regress the number of patients in each type of drug on dummies for the week number(1-52,53), the day of the week (Sunday-Saturday), post-holiday, and time trends such that:

Number of cases $t = \alpha + \sum_i \beta_i (\text{Week No})_i + \sum_j \gamma_j (\text{Day-of-the-Week})_j + \eta (\text{the Day after Holiday}) + \theta t + \delta t^2 + \epsilon_t$

by using Poisson regression. Three criteria are used for aberration: low level: if the probability of the number of observed cases that occur is less than 2.5%, medium level: 1%, and high Level: 0.1%

We also provide the information from this surveillance to local government and local public health center so as to evaluate its usefulness for the control of infection diseases.

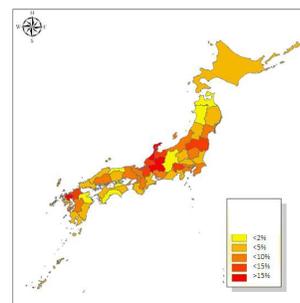
RESULTS

We succeeded to construct trial version of the system last year, then started to test the system since November 2007. After that, we extend the area and pharmacies which cooperate this trial. Until end of June 2008, 50 pharmacies cooperate the system. When the Hokkaido Toyako G8 summit meeting was held, 27 pharmacies in the surrounding area of Toyako cooperated in this surveillance.

CONCLUSIONS

By March 2009, all 3000 pharmacies will join this system which cover about 7% of all pharmacies. Figure shows the rate of penetration of potential cooperating pharmacies to the system in the whole of pharmacies in each prefecture in March 2008. The highest penetration rate is higher than 20%. It must be one of the most feasible solution for the syndromic surveillance which cover the whole of nation and full automatic. The number of cooperating pharmacies will rise in a few years.

Penetration of Potential Corporate Pharmacy to this System



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