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Establishment of public-access syndromic surveillance system in Taipei City, Taiwan

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Objective

This study has two specific aims: (1) to establish a web-based, public-access infectious disease-reporting system (www.eid.url.tw), using newly designed public syndrome groups and based on computational and participatory epidemiology, (2) to evaluate this system by comparing the epidemiological patterns with national-wide electronic health-database and traditional passive surveillance systems from Taiwan-CDC.

Introduction

Taiwan had established a nation-wide emergency department (ED)-based syndromic surveillance system since 2004, with a mean detection sensitivity of 0.67 in 2004–2006 (1). However, this system may not represent the true epidemic situation of infectious disease in community, particularly those who do not seek medical care (2). Moreover, the epidemiological settings, sources of the infection and social network all together may still facilitate the transmissions. These rooted problems cannot be rapidly solved.

Methods

We present our web-based technical framework designed with social network theory. Using cloud computing technology, user only needs internet to access our system and webpage, and database was built by Joomla Framework, HTML, CSS, PHP and MySQL.

National Health Insurance Database (NHID), which has over 98% Taiwan citizen coverage rate in 2009, and National Notifiable Reporting System (NNRS) were used to evaluate our system; data of syndrome groups by ICD-9CM codes from these two systems during 2009, with pandemic influenza, were first analyzed.

Results

Daily symptoms can report into database, with time-spatial information. Statistic methods (e.g., CUSUM) were built in server (Fig. 1). The real-time data, with cloud-computing, can be calculated online. Also the system can gain a better feedback and sharing timely information among decision makers, health workers and citizens. User-interface (UI) of system, including main home page with Map-API, reporting entrance and latest news, was user-friendly.

Using the 2009 pandemic influenza, results of evaluation are shown (Fig. 2). Except the pattern of 'ILI' (Fig. 2C), other curves, using our easily understood definitions, show similar increase trend

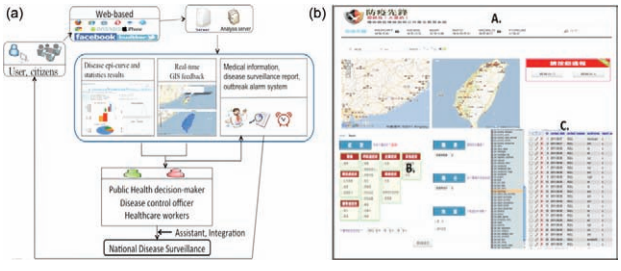

Fig. 1. (a) Technical structure of system. (b) Screen shot of system.

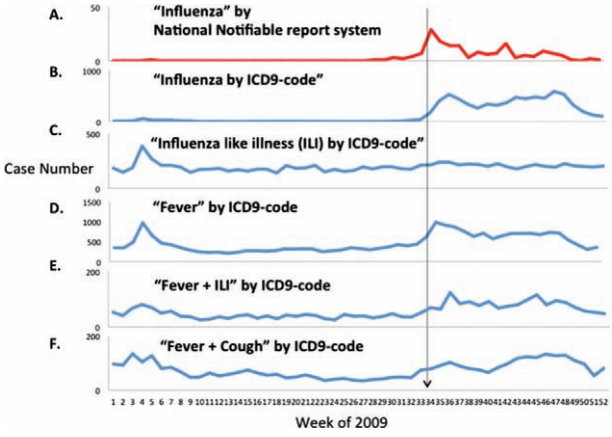

Fig. 2. Data in Influenza, 2009.

in week 34 with the gold standard (NNRS) (Fig. 2A), the first outbreak signal NNRS had detected. With CUSUM, case numbers did increase in week 34–35 and fell out thresholds in week 35–38, except 'Fever+Cough'.

Conclusions

In conclusion, easily defined syndrome groups for public surveillance is feasible and can complement with traditional passive surveillance systems. More potential case can be detected earlier, particularly those who do not seek medical care. Certainly, this newly developed and user-friendly surveillance system can be applied to study transmission of infectious disease within social-network and also to allow public's participating surveillance leading to public health efforts in disease prevention will be no longer limited to healthcare system and thus become more effective.

Keywords

Surveillance; infectious disease; epidemiology; health informatics; social network

References

1. Wu TS, Shih FY, Yen MY, Wu JS, Lu SW, Chang KC, et al. Establishing a nationwide emergency department-based syndromic surveillance system for better public health responses in Taiwan. BMC Public Health. 2008;8:18.
2. Hulth A, Rydevik G. GET WELL: an automated surveillance system for gaining new epidemiological knowledge. BMC Public Health. 2011;11:252.

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