

ABSTRACT

Biosurveillance applications for resource-limited settings: open ESSENCE and ESSENCE desktop edition

JS Coberly¹, RA Wojcik¹, JF Skora¹, AM Poku¹, ZC Whitley¹, TC Campbell¹, CJ Hodanics¹, SL Lewis¹, and DL Blazes²

¹The Johns Hopkins University Applied Physics Laboratory, Laurel, MD, USA; and ²Division of GEIS Operations, Armed Forces Health Surveillance Center, Silver Spring, MD, USA
 E-mail: jacqueline.coberly@jhuapl.edu

Objective

This paper describes the development and early implementation of two freely available electronic biosurveillance software applications: Open ESSENCE (OE), and ESSENCE Desktop Edition (EDE).

Introduction

More than a decade ago, in collaboration with the U.S. Department of Defense, the Johns Hopkins University Applied Physics Laboratory (JHU/APL) developed the Electronic Surveillance System for the Early Notification of Community-based Epidemics (Enterprise ESSENCE),¹ which is currently used by federal, state and local health authorities in the US. As emerging infections will most likely originate outside of the US (for example, SARS) the application of electronic biosurveillance is increasingly important in resource limited areas.² In addition, such systems help governments respond to the recently modified International Health Regulations.³ Leveraging the experience gained in the development of Enterprise ESSENCE, JHU/APL has developed two freely available electronic biosurveillance systems suitable for use in resource-limited areas: OE and EDE.

Methods

Biosurveillance is needed at all levels of public health, the local health clinic, as well as city, regional and national health authorities. The availability of computers and trained personnel varies considerably among these entities. OE and EDE were designed with this disparity in mind. OE is a web-based application designed to run on a system with internet or intranet access. It provides web-based data entry and data visualization to multiple users. EDE, on the other hand, is a stand-alone application designed to run on a single desktop or laptop computer. Both systems have much of the functionality found in the original Enterprise ESSENCE. They produce time series for the health data being analyzed, using both proprietary and open source alerting algorithms. Each also produces case-level data lists, pie and bar charts of any available variable, and alert or prevalence maps if appropriate geographical shape files are available. In addition,

all of the user interface components in OE are internationalized. Addition of a language table created by the user allows OE to function in any language. Although EDE is currently only available with an English-user interface, it can read and present data in English, as well as in character-based languages, such as Thai. The most notable difference between Enterprise ESSENCE, OE and EDE is the data repositories. Enterprise ESSENCE has an established database schema and the data must conform to its schema. OE and EDE were designed to be more flexible. OE connects and adapts to the user's database and schema and EDE connects to databases and text files in various user formats.

Results

OE is currently being piloted in Peru by the Peruvian Navy and Army in conjunction with the U.S. Naval Medical Research Center Detachment (NMRCDC). It was installed in 2009 and evaluation is ongoing. EDE is being piloted by the Cebu City Health Office in the Republic of the Philippines in conjunction with the Armed Forces Research Institute of Medical Sciences Virology Research Unit (PAVRU). Version 2.0 of EDE was installed early in 2010. An ongoing Simple Message Service (SMS) fever surveillance program will be used to pilot the application.

Conclusions

OE and EDE are freely available electronic biosurveillance applications, designed to facilitate surveillance at all levels of public health infrastructure. OE is web-based, and requires internet access for functionality, whereas EDE is a stand-alone desktop application designed for local users and emergency situations. Both applications provide an electronic surveillance capability, which can help countries conform to IHR 2005 regulations.

Acknowledgements

This paper was presented as a poster at the 2010 International Society for Disease Surveillance Conference, held in Park City, UT, USA on 1–2 December 2010.

References

- 1 Lombardo JS, Ross DA. Disease surveillance: a public health priority. In: Lombardo JS, Buckeridge DL (eds). *Disease surveillance: a public health informatics approach*. John Wiley & Sons, Inc: Hoboken, 2007.
- 2 Heymann D. The international response to the 2003 SARS outbreak. *Philos Trans R Soc Lond B Biol Sci* 2004;359:1127–9.
- 3 Rodier G. New rules on international public health security. *Bull World Health Organ* 2007;85:428–30.