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ABSTRACT

Early Aberration Reporting System (EARS) update: present and future

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Objective

The objective of this poster is to highlight recent upgrades to the Early Aberration Reporting System (EARS) software (US Centers for Disease Control and Prevention, EARS Program, MS C-18, Atlanta, GA, USA), and identify features planned for future releases.

Introduction

Early Aberration Reporting System (EARS) is a freeware surveillance tool that can be downloaded from the Center for Disease Control and Prevention's website (http://emergency.cdc.gov/surveillance/ears/). It was designed for quick set-up and customization for automated monitoring of emergency department and other syndromic data sources, including, but not limited to, 911 calls, school absenteeism, and over-the-counter medication sales. The United States' city, county, state health departments, and various international public health organizations, use EARS software to conduct daily, near-real time surveillance of conditions easily defined by patient-reported complaints, and physician diagnoses (for example, influenza-like illness, gastroenteritis, asthma, heat-related illness). It is also used to conduct suspect case finding during outbreaks, natural disaster responses, verify that potential threats are not manifested in communities, and for supporting *ad hoc* analyses and research.

Figure 1 Screen example of the EARS-SAS version5.0 graphical user interface.

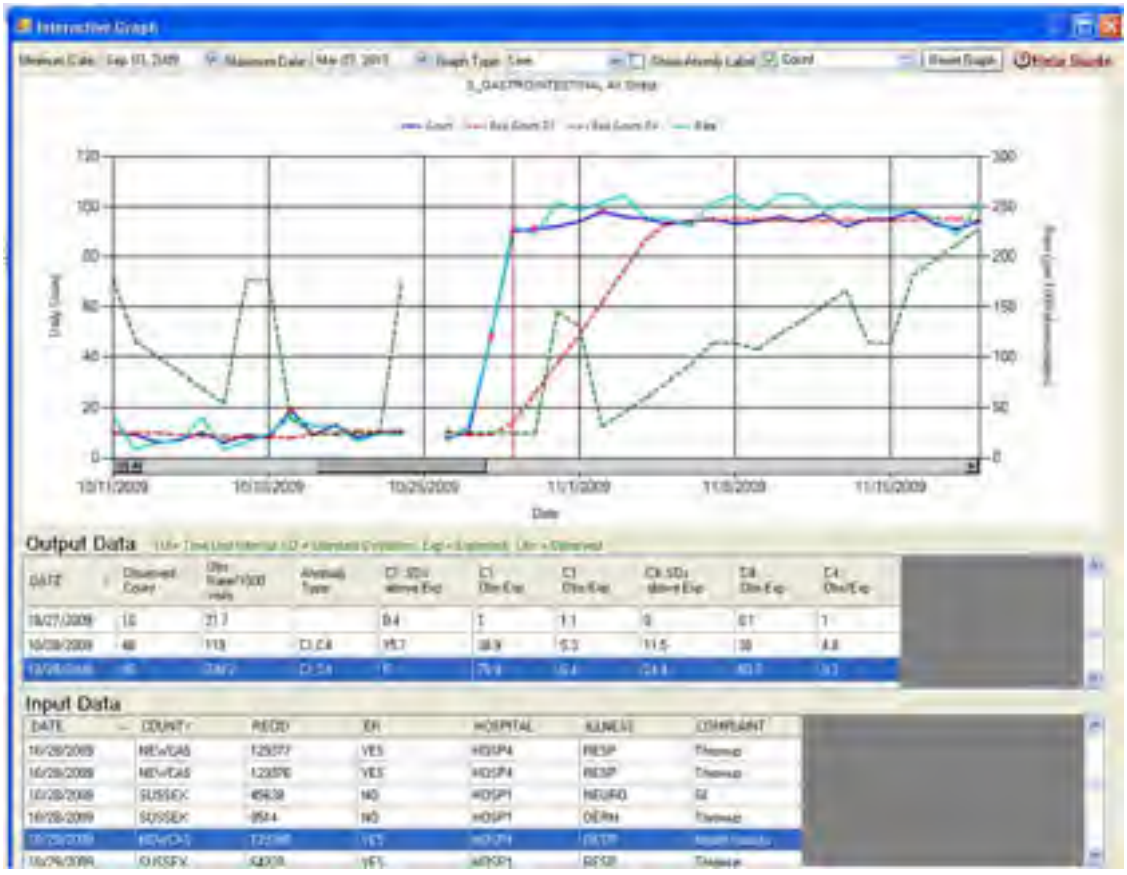

Figure 2 Screen example of the EARS-SAS version5.0 interactive graphs output.

Methods

EARS is undergoing significant changes focused on reducing processing times and expanding user-defined customization options. Installation and set-up have been simplified through the use of a 'wizard-like' graphical user interface that significantly restricts user-generated errors (Figure 1). Anomaly detection algorithms are being modified to increase both sensitivity and specificity (without increasing the alert rate) through use of a minimum standard deviation, a longer baseline/comparison period, an adjustment for total visits (or other denominator), and an option for stratifying expected value calculations by days of the week.[1] Output filtering options, based on both empirical and epidemiological criteria, are being added to allow the user to further manage the alert rate (Figure 2).

Results

Future enhancements include writing EARS in other languages to support an increasing international user-base. Rewrites will be on the basis of open-source tools that will not require Microsoft Excel (Microsoft Corporation, Redmond, WA, USA) or SAS (Institute Inc., Cary, NC, USA) to run. Optional plug-ins will enable users to format and automate submission of aggregate-level data summaries to other systems (for example, DiSTRIBuTE, http://www.isdsdistribute.org/). The EARS program plans to also explore increasing EARS compatibility with varying data types, such as diagnoses and laboratory data through data-specific modules (based on the design of the current EARS Indicator Processing feature).

Conclusions

The potential utility and access to electronic health records, and syndromic data sources are expected to continue to expand. The EARS tool continues to improve to keep up with this demand. Collaboration on EARS design, with state and local public health departments, is a crucial component to its continued successful development.

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Reference

1 Tokars JI, Burkom H, Xing J, English R, Bloom S, Cox K, *et al*. Enhancing time-series detection algorithms for automated biosurveillance. *Emerg Infect Dis* 2009;**15**:4.