ESSENCE: Desktop Edition
A Self-Contained Disease Surveillance Application

Charles Hodanics
Johns Hopkins Applied Physics Laboratory, Laurel, MD
EDE – Background

- EDE is based on Enterprise ESSENCE

- Enterprise ESSENCE is the Electronic Surveillance System for the Early Notification of Community-based Epidemics
  - Web-based tool
  - Collects and analyzes health data
  - Uses anomaly detection algorithms
  - Flags unusually high disease indicator counts
  - Designed for areas with pre-collected health data
  - Users view, segment, and map results

- Enterprise ESSENCE is best suited to areas with stable internet
EDE – Why

- Electronic biosurveillance
  - Useful during crisis situations
  - Resource-limited areas
  - Need for a complete surveillance solution

- ESSENCE Desktop Edition
  - Remove the need for internet connectivity
  - Reduce the need of large systems
  - Provide a well featured tool set for biosurveillance
  - Provide the basic functionality and analytics of Enterprise ESSENCE
EDE – Objective

- Create a disease surveillance tool that:
  - Runs on a stand-alone computer
  - Operates as a self-contained application
  - Deploys easily/efficiently
  - Functions in diverse settings
  - Supports open development and extensibility
EDE – Methods

- EDE uses the Eclipse Rich Client Platform (RCP)
  - Customizable application framework
  - Built with software units called “plugins.”
- RCP
  - Well supported
  - Continued application growth
  - Scalable framework
  - Provides a wide set of features
- Plugins allow developers
  - To add functionality
  - Upgrade features
  - Deploy bug fixes
EDE – Implementation

- EDE consists of the following plugins:
  - Desktop Core
    - Provides the main user interfaces
  - Desktop Data Core
    - Provides underlying data query mechanism
  - Detector Temporal Core
    - Provides temporal detection algorithm interfaces

- Releases of EDE
  - Bug fixes
  - Additional features
  - Customizations
Department of Health of the Republic of the Philippines (RP)
- Add-in module to the EpilInfo™ based national disease surveillance system

Cebu City, RP Health Office
- A free-standing application
EDE – How

- National Epidemiology Center
  - Monitor trends for officially notifiable diseases

- Centers utilize EDE’s compatibility features
  - EpilInfo™ data entry
  - EpilInfo’s™ EpiMap
EDE – Results

- EDE supports user needs “out of the box”:
  - Configuration to data
  - User queries
    - User-created, performed and savable queries
  - Results visualization
    - Graphs, charts, and detailed data
  - Results export
    - Detection results and count data export to EpiInfo™ EpiMap
Create a Datasource to use for future queries

Wizard configures the Datasource to meet your database schema

Supports multiple databases

- Microsoft Access Databases
- Derby Databases
- Microsoft SQL Server Databases
- Delimited text files
EDE – Creating a Query

- Create a query from a Datasource
- Graphically build a query with a capable dynamic interface
- Save query and configurations
EDE – Executing a Query

- Execute a query to return results
  - Timeseries Graph
  - Detection Data
  - Detailed Data
  - Data Slices
  - Geographical Data
EDE – Compare Results

- Execute multiple queries simultaneously
- Compare results
- Zoom on specific areas
- Create custom images
Detection algorithms supported

- EWMA
- Gstat
- Linear Regression
- Poisson
- Ears CDC 1, 2, 3

Developers can add other algorithms
Select specific slices of data

Drill down from the original query

Create exportable pie charts and bar graphs
EDE – Map Configuration

- EDE exports query results for locations
- Launches EpilInfo’s™ EpiMap for display
EDE – Conclusion

- EDE
  - Easily deployable, Upgradeable, Extendable
  - Self-contained desktop application
  - Similar functionality to Enterprise ESSENCE
- Users
  - Customizable desktop solution
  - Configurable to user data
  - Well supported framework
  - Robust core set of features
- Future
  - Internal GIS mapping, Integrated Help, Internal Updates
EDE – Team

- JHU APL Contributors
  - Charles Hodanics
  - Joshua Suereth
  - Zarna Mistry
  - Timothy Campbell
  - Richard Wojcik
  - Jacqueline S. Coberly
  - Sheri Lewis

- AFHSC
  - David Blazes
  - Ron Burke

- AFRIMS
  - Agnes Tomayo
  - John Mark Velasco
  - Inkyu Yoon

- NEC
  - Marlow Niñal
EDE – Acknowledgements

- Funded by Armed Forces Health Surveillance Center (AFHSC)

- Sponsored by Response System and supported by the Armed Forces Research Institute of Medical Sciences (AFRIMS)

- Further Information: charles.hodanics@jhuapl.edu