



# ESSENCE Desktop Edition: A Self-Contained Disease Surveillance Application

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## Background

### Objective

The ESSENCE Desktop Edition (EDE) was created to offer a disease surveillance tool that can be efficiently deployed on a stand-alone computer in diverse settings.

The original web-based version of ESSENCE (Electronic Surveillance System for the Early Notification of Community-based Epidemics) is used to monitor the health of populations and detect disease outbreaks early in order to prevent their spread [1].

ESSENCE collects pre-computerized health surrogate data including, among others, hospital admissions, doctor visits, and over-the-counter (OTC) drug sales. It uses anomaly detection algorithms that flag unusually high counts of disease indicators which may suggest a possible disease outbreak. Users can view alerts and the demographic details and geography of reported cases causing the alerts.

Electronic biosurveillance is potentially useful during crisis situations and in resource-poor areas of the world with limited computer expertise. But the web-based nature of the original ESSENCE limits its use to areas with reliable internet connectivity.

EDE mimics the flow, functionality and analytic power [1] of web-based ESSENCE but can be used anywhere a single desktop or laptop computer can function.

## Methods

EDE uses the Eclipse Rich Client Platform (RCP), a customizable application framework built with software units called 'plugins.'

The Eclipse RCP is a well supported and scalable framework providing a wide set of features and continued application growth [2]. EDE utilizes the Java [a] programming language and the Eclipse Rich Client.

Plugins allow developers to add functionality, upgrade features, and deploy bug fixes without redistributing the entire application.

The EDE consists of the following plugins:

- Desktop Core
  - Provides the main user interfaces including *query* building, *graph* visualization, and *mapping* capabilities.
- Desktop Data Core
  - Provides underlying data query mechanism to support multiple databases.
- Detector Temporal Core
  - Provides temporal detection algorithm interfaces for analysis of data.

Releases of the EDE will be able to provide additional features and customizations including unique mapping support and database connections.

[a] Sun Microsystems's Java Platform, Standard Edition

## Results

The initial deployment of EDE was named the Surveillance Tool for Analysis, Management, and Reporting data (STAMR).

It will be used as an add-in application to the EpiInfo™ [3] based national disease surveillance system of the Department of Health of the Republic of the Philippines.

Officials at the National Epidemiology Center will use STAMR to monitor the temporal trends of diseases that are officially notifiable in the Philippines.



STAMR will work closely with such tools as the EpiInfo™ data entry and EpiInfo's™ EpiMap mapping application to support user needs 'out of the box' such as:

- Configuration of datasources including Microsoft Access (.mdb) files which EpiInfo™ uses for data storage.
- User defined and savable queries.
- Visual results including graphs, charts, and detailed data on individual illness reports.
- Export of query results including detection and count data to EpiInfo™ EpiMap.

## ESSENCE Desktop Edition Flow

The flow of the ESSENCE Desktop Edition: STAMR release is as follows:

### 1. Creating a DataSource

A DataSource can be created, saved, and used multiple times for future queries

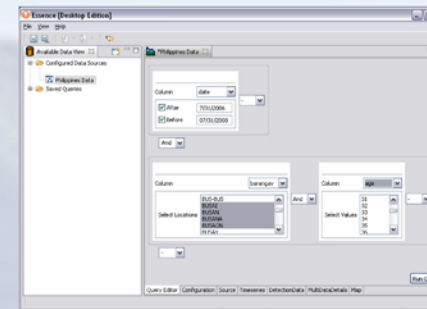
In this wizard you can configure a DataSource to connect to a table or view in a database.



### 2. Creating a Query

A new query can be created from a DataSource.

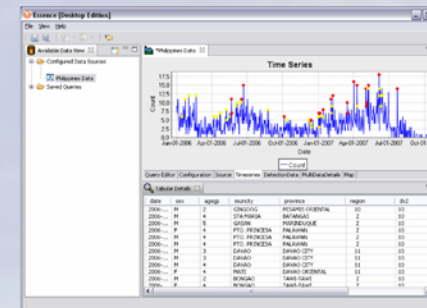
This interface is dynamic and allows you to graphically build and save a query.



### 3. Executing a Query

Execution of a query returns results in several ways including:

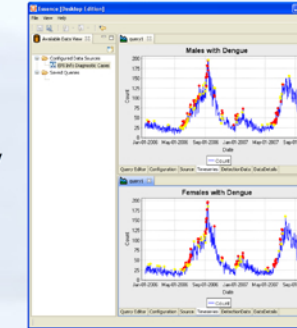
- Time series
- Bar charts
- Pie charts
- Tabular listings



### 4. Compare Results

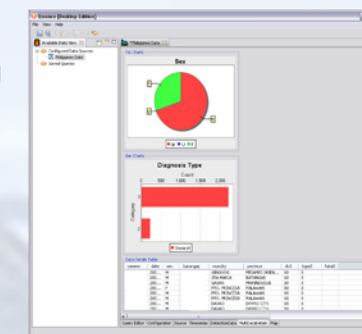
Multiple queries can be executed and displayed simultaneously for comparison.

The time series have the capability to zoom and create images.



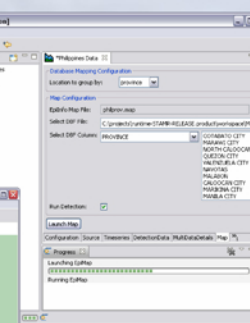
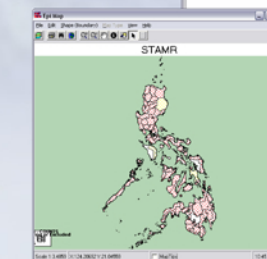
### 5. Details View

Users can create exportable pie charts and bar graphs for further analysis of any executed query.



### 6. Map Configuration

STAMR can export query results into DBF files and launch programs such as EpiMap™ that will produce maps displaying this data.



## Conclusions

EDE is an easily deployable, upgradeable and extensible desktop application that provides similar functionality to the current web deployment of ESSENCE.

EDE users can configure the system specifically for the variables included in their database, thereby enabling access to a robust core set of features that can be extended and upgraded by future developers.

## References

- [1] Lombardo, J. et al., "A Systems Overview of the Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE II)," Journal of Urban Health, Vol. 80, No. 2, Supplement 1, 2003, pp. i31-i41, [http://jurban.oupjournals.org/cgi/reprint/80/suppl\\_1/i32.pdf](http://jurban.oupjournals.org/cgi/reprint/80/suppl_1/i32.pdf)
- [2] Vogel, L (2008, June 15). Rich Client Platform – Eclipsepedia. Retrieved July 31, 2008 [http://wiki.eclipse.org/index.php/Rich\\_Client\\_Platform](http://wiki.eclipse.org/index.php/Rich_Client_Platform)
- [3] "Epi Info" is a trademark of the Centers for Disease Control and Prevention (CDC)



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