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1. Introduction

What is Syndromic Surveillance?

The purpose of syndromic surveillance is to protect the health of the community through public health interventions based on enhanced surveillance of emerging public health conditions and consolidation of health-related data statewide. Syndromic surveillance allows for early detection of abnormal disease patterns that could result in high morbidity and mortality. The basic functions of syndromic surveillance include early event detection, situational awareness, and retrospective analysis.

What is ESSENCE?

ESSENCE stands for Electronic Surveillance System for the Early Notification of Community-based Epidemics. It is a web-based disease surveillance information system developed to alert health authorities of infectious disease outbreaks, including possible bioterrorism attacks. It is the system Texas uses for syndromic surveillance.

History of ESSENCE

On September 11th, 2001 ESSENCE went from being a research project to a live operational system in Maryland. It began as a biosurveillance program, a collaborative project between Johns Hopkins University/Applied Physics Laboratory, the Maryland Emergency Management Agency and the Maryland Department of Health and Mental Hygiene. It is now used by the Centers for Disease Control and Prevention (CDC) and has iterations in more than 25 states and regions.

History of Syndromic Surveillance in Texas

In April 2011, Texas Department of State Health Services conducted a survey of existing syndromic surveillance systems in Texas. At that time, there were at least six different analysis systems being used in various parts of the state with no data sharing between them. Currently, only one of these syndromic surveillance systems remain in Texas: a system hosted by Tarrant County Public Health covering Public
Health Region 2/3. The Houston Syndromic Surveillance System began production in 2016 and covers Public Health Region 6/5S. The former Texas Association of Local Health Officials (TALHO) system was maintained by DSHS, but once the TALHO connections were successfully transferred to the Texas Syndromic Surveillance System (TxS2), the former TALHO system was turned off in 2019. TxS2 began production in 2017. In August 2019 TxS2 added EMS data and Poison Control data to the system.

The systems in Tarrant County, the City of Houston, and TxS2 work together to provide data and analysis to all hospitals, LHDs, and the public when appropriate. All hospitals in PHR 2/3 and 6/5S report to Tarrant and Houston, respectively. Tarrant and Houston send data to TxS2 for a full state view of data, and all three systems send data to the CDC’s National Syndromic Surveillance Program (NSSP).

**Strengths & Limitations**

A major strength of syndromic surveillance is that the data are timely, near real-time data. Hospitals in production with TxS2 are required to submit data at least once every 24 hours. Syndromic surveillance systems are also highly sensitive because laboratory confirmation is not needed. In addition, because the data are de-identified and patient consent is not necessary, it can allow for unobtrusive research.

In order to make accurate interpretations of the data, users must understand the limitations. This is particularly important with syndromic surveillance data because the focus of the surveillance is not necessarily on the specificity and completeness of the data. For example, the chief complaint may state “sick” or “feels bad” without mentioning any symptoms such as fever or vomiting. Variability in the chief complaint across health care facilities can sometimes make it difficult to measure the exact burden of illness or injury in a population. Similarly, when utilizing the free-text query feature, misspellings and variant terminology may prevent the user from finding all of the cases related to that chief complaint.

Best practices include getting to know your data. Free text query usefulness relies on your familiarity of the data, which can differ by hospital/location. It is also important to monitor the data quality daily for missing or incomplete data and to remain cognizant of the limitations of syndromic surveillance data.
EMS records contain no free-text fields, and are only available to LHD and DSHS users. The data available to LHD users encompasses their county, and immediately adjacent counties. However, this data provides a look at what condition patients are in when they are picked up by EMS, and information on patients that may never go to an emergency room, building on the ED information of the rest of Txs2.

Poison Control data is only available on an aggregate level, and therefore can only provide users with an overall, statewide view of trends. Additionally, it is only available to DSHS and LHD users. However, it provides a valuable metric to see how many people may have complications due to certain substances.

**Overview**

This User Guide supports ESSENCE v.1.21 and helps you access and navigate the system’s main features. There is no one “correct” method for using ESSENCE. The user is encouraged to further explore additional functions embedded within ESSENCE features. With frequent use and familiarity, over time, individuals often establish their preferred path(s) for viewing ESSENCE visualization and analysis outputs of interest.

It should be noted that access to certain features described in this guide are not available to all users. For example, hospital users may only view data for their hospital or hospital system and do not have access to the Event List.
2. Logging into ESSENCE

The secure website can be assessed at the following link:

https://txessence.dshs.texas.gov/

Click the ESSENCE-Texas hyperlink.
Enter your user ID and password and click the Log In button. After logging in for the first time you are prompted to change your password. Passwords should contain at least 5 characters, including at least one numeral, two capital letters, and 2 special characters. The box outline turns from red to green when the password meets all requirements.

Instructions for users to change their own password:

1. Once you are logged in to ESSENCE, in the top right corner there is a link to Edit Profile. This option is available for both Administrators and General Users.

2. After you select Edit Profile, the following box appears.

3. Select Change Password and the following box appears. Enter the current password, and then the new password twice and click Save.

NOTE: Create a new password each time the password is changed. You will be unable to log on using a previous password even if it appeared to change successfully.
The homepage provides access to the System Information section, which can contain announcements and information posted by the system administrators.
4. Alert List

The Alert List gives users the ability to drill down into ER data. The Summary Alert List is made up of 2 rows of asterisks in each Region Group/Syndrome Cell. The stars represent the last 9 days and are color coded. The top row represents the mathematical alerts from the Region/Syndrome Temporal Alerts page and the bottom row represents concern levels discussed by users in the Event List. To modify dates or the summary detector in the Summary Alert List chose **Configuration Options** in the right-hand corner.

Clicking on an asterisk takes you to the Region/Syndrome Based Temporal Alerts page with a line listing of the data that make up the alert.

To modify dates or the summary detector in the Summary Alert List choose **Configuration Options** in the right-hand corner.
Alert List: Region/Syndrome Temporal Alerts

This page provides a listing of all data slices that are alerting over the past 7 days (or on the day you chose from the Summary Alert List).

The **Level** column contains the p-value and each column can be sorted.

If you would like to investigate an alert further click the **Time Series** link.

Alert List: Time of Arrival

To view Time of Arrival alerts, first choose your hospitals and subsyndromes of interest, then choose **Change Configuration**. All ToA alerts are then shown as red squares on the grid. If you click on any red square, a details table is created to show all ToA alerts that fell into that Hospital/Time window. From there you can click on **Data Details** or **Time Series** for more information.
5. myAlerts

The myAlerts function allows users to customize which stratifications of the ESSENCE ER or EMS data they are interested in monitoring for routine daily surveillance. It also enables users to set criteria for alerting that include statistical thresholds, minimum counts and consecutive days of alerting. Alerts can be created for the standard syndrome and subsyndrome categories, free text queries of the emergency department data as well as for any of the other data sources available in ESSENCE.

myAlerts includes two primary functions:

A. Enables the creation of custom alerts for syndromes, subsyndromes, or free-text queries by various stratifications or threshold criteria.
B. Enables creation of Records of Interest. The purpose of Records of Interest is to return any encounter details that match the query criteria.

1. To create a myAlert, run a query for your outcome of interest.
2. Go to Query Options and choose a name for the query.
3. After typing in a name select **Create myAlert**. A dialog box pops up and you are able to create the alert for **Records of Interest** or **Detection**.

![Image of Create myAlert dialog box]

**NOTE:** To create a Records of Interest myAlert, simply check Records of Interest and select Save myAlert.

4. To create a Detection alert, check the Detection box and choose the stratification and detector you want used, if desired.
   
   a. For Detection alerts you have the option to choose a minimum count, number of alerts in the past X days, or consecutive alerts.

5. If you would like to share your myAlerts with others, check the box next to their name.

6. Select **Save myAlert** after changes have been made.
### Alerts

#### Alerts Messages

<table>
<thead>
<tr>
<th>Alert Definition</th>
<th>Stratifications</th>
<th>Date</th>
<th>Data Source</th>
<th>Level</th>
<th>Count</th>
<th>Expected</th>
<th>Timeseries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Fever</td>
<td>Use Original</td>
<td>04Oct06</td>
<td>ER by Patient</td>
<td>0.005</td>
<td>420</td>
<td>363.36</td>
<td>Timeseries</td>
</tr>
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<td>ER by Patient</td>
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<td>415</td>
<td>360.39</td>
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<td>ER by Patient</td>
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<td>60.36</td>
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<td>ER by Hospital</td>
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<td>60.86</td>
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<td>ER by Hospital</td>
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<td>61.86</td>
<td>Timeseries</td>
</tr>
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<td>ER by Hospital</td>
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<td>Age Group: 5-17</td>
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<td>ER by Hospital</td>
<td>0.043</td>
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<td>10.82</td>
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### Records of Interest

#### Records of Interest Messages

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<tr>
<th>Alert Definition</th>
<th>Date</th>
<th>Geography</th>
<th>Facility</th>
<th>Medical Grouping</th>
<th>Age Group</th>
<th>Sex</th>
<th>Data Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Fever and Blood</td>
<td>09Oct06</td>
<td>PRINCE GEORGE'S</td>
<td>Hospital 19</td>
<td>CHEST PAIN FEVER BLOOD VMT</td>
<td>18-44</td>
<td>Female</td>
<td>Data Details</td>
</tr>
<tr>
<td>Daily Fever and Blood</td>
<td>09Oct06</td>
<td>PRINCE GEORGE'S</td>
<td>Hospital 19</td>
<td>CHEST PAIN FEVER BLOOD VMT</td>
<td>18-44</td>
<td>Female</td>
<td>Data Details</td>
</tr>
<tr>
<td>Daily Fever and Blood</td>
<td>09Oct06</td>
<td>PRINCE GEORGE'S</td>
<td>Hospital 19</td>
<td>CHEST PAIN FEVER BLOOD VMT</td>
<td>18-44</td>
<td>Female</td>
<td>Data Details</td>
</tr>
<tr>
<td>Daily Fever and Blood</td>
<td>10Oct06</td>
<td>OTHER REGION</td>
<td>Hospital 35</td>
<td>FEVER LOW BLOOD PRESSURE</td>
<td>45-64</td>
<td>Female</td>
<td>Data Details</td>
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<td>OTHER REGION</td>
<td>Hospital 35</td>
<td>FEVER LOW BLOOD PRESSURE</td>
<td>45-64</td>
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<td>09Oct06</td>
<td>OTHER REGION</td>
<td>Hospital 35</td>
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<td>45-64</td>
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<td>Hospital 35</td>
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<td>PRINCE WILLIAM</td>
<td>Hospital 28</td>
<td>COUGHING BLOOD FEVER</td>
<td>5-17</td>
<td>Female</td>
<td>Data Details</td>
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<tr>
<td>Daily Fever and Blood</td>
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<td>PRINCE WILLIAM</td>
<td>Hospital 28</td>
<td>COUGHING BLOOD FEVER</td>
<td>5-17</td>
<td>Female</td>
<td>Data Details</td>
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<tr>
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<td>WASHINGTON</td>
<td>Hospital 42</td>
<td>FEVER SPITTING BLOOD</td>
<td>65+</td>
<td>Male</td>
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<td>Daily Fever and Blood</td>
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<td>Hospital 42</td>
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<td>Hospital 05</td>
<td>MENINGITIS</td>
<td>18-44</td>
<td>Female</td>
<td>Data Details</td>
</tr>
</tbody>
</table>
6. myESSENCE

In myESSENCE users can create new tabs and add widgets from the Time Series, Data Details, and Overview pages. This feature allows users to copy and share dashboards with other users. Widgets can be reorganized by drag and drop.

1. To add a new widget from the myESSENCE page select **Add New Widget**.

   **TIP:** It is recommended to keep the first or ‘Home’ tab of myESSENCE blank. Each time you open myESSENCE, any widget located on the first tab will run and refresh which can be a load on the servers.

2. Choose the widget you would like to add.
3. A Widget Options dialog box appears that includes all of your saved queries.

![Widget Options dialog box]

4. Check the queries you would like to add as widgets and change the date if desired. Click **Submit**.

5. Refresh the page and your new widget appears.

Tabs can be shared by giving a copy to another user or “managed” sharing, which shares a read-only version of the tab that you remain in control of. A highlighted myESSENCE tab distinguishes tabs you share from tabs shared with you.
The Event List allows users to describe their findings or recommendations on alerts or other information that may warrant further attention. When this feature is utilized, users can view events within the Summary Alerts feature in the Alert List. These events show up in the second row of asterisks. As events are user created and not tied to actual data, clicking on any of these asterisks does not return data that can be analyzed. It can, however, provide a more accurate view of “actual” health events occurring at the state and regional level and individuals can monitor this to determine if they should be on heightened alert in their jurisdiction. It also provides a forum for discussing potential health events using the comment feature.

1. To create an Event select **Create Event**.

2. A dialog box appears.
   a. Select your data source of choice and the status of the event.
   b. Choose the region of the event and the category.
   c. Rank the event, select the medical grouping the event falls under, and select the age affected if necessary.
   d. Choose a start and end date and give the event a title. In the message box, type in the details of the event.
3. Select **Preview** to see if the information is correct. If so, select **Commit** and your event is posted.

Users have the capability to hide and edit events they create. After hiding an event it is no longer accessible so it is essentially deleted. Users can add comments or hide details to any event.

**Benefits of the Event List**

- Provides a great way to organize communications regarding Txs2 findings among users and a forum for discussing potential health events
- Most flags do not require public health investigation or intervention. However, the second tier of asterisks on the Summary Alerts page shows those flags that other Txs2 users have determined warrant further attention
- Provides a way for DSHS to track how Txs2 is used and can be improved
- Hospital users cannot view the Event List so public health officials can communicate freely without the possibility of hospitals reading notes about each other’s patients.
8. Query Portal

To run a basic query click on the **Query Portal** tab.

1. In the Query Wizard select your data source, dates, and syndrome or chief complaint.
   a. Datasource
      i. *ER data by Patient Location* – categorizes ED visits by the patient’s location. This option only displays ED data for patients who provided a ZIP code or county of residence within Texas when they visited the ED.
      ii. *ER Data by Hospital Location* – provides information on all ED visits regardless of patient ZIP code or county of residence. The option provides more complete data than the first.
      iii. *ER Limited View Data by Hospital Location (Aggregate)*
      iv. *EMS PreHospital Transport* - only available to public health staff
      v. *Poison Control* - only available in aggregate form
      vi. *Weather Data*
      vii. *Air Quality Data*
   b. Dates
      i. If dates are not selected, ESSENCE defaults to the previous 90 days with the end date being today.
   c. Geography System
      i. A region is a collection of ZIP codes that normally represent a county. As ZIP codes can cross county boundaries, this may not always be accurate.
      ii. Each Texas county is assigned to one of 11 public health regions. For administrative purposes there are eight regional public health offices.
   d. Medical Grouping Syndrome (ER Data Only)
      i. Syndrome – 13 preset syndromes, group of associated symptoms
      ii. Subsyndromes – a smaller, more specific group of associated symptoms
      iii. Chief Complaints – free text from data-provider Electronic Health Record
   e. EMS Datasource Grouping
      i. Many query-able fields in the EMS data can be used depending on the symptoms the user is looking for
1. Select the **Datasource** of choice.
2. Select the **Detector** of choice.
3. Select the desired **Date Range**
4. Select desired **Available Query Fields**
   a. Once the selections have been made they appear on the right side of the page.
5. Once you have all of your parameters, choose the ESSENCE feature you want to use your query definition in: **Table Builder**, **Time Series**, **Data Details**, **Graph Builder**, **Overview**, or **Explain Qry**. If a more complex query is required using and/or logic between parameters, you can choose the **Advanced Query Tool** option from this menu at any time.

MyFilter allows users to create and save a set of filter parameters. To create a MyFilter, select the specified parameters, put a name in the MyFilter box and select **Create**.

To apply the filter, select MyFilters under available query fields and use the drop down arrow or type in the saved filter name and press **Select**.

The saved filter automatically populates under the selected query fields.
Free Text Queries

Free text queries are only available for ER data and EMS data. To perform free text queries, choose the chief complaints parameter under the medical grouping system folder. The syntax for a chief complaint query is described in the help popup.

In addition to the help popup, you can also use a subset of regular expressions in the queries. For example:

- **alpha**: `^hea[a-z]^`
  - results can include heat and head and hear
- **numeric**: `^H[0-9]N[0-9]^`
  - results can include H1N1 or H3N2
- **specific characters**: `^her[oi][oi]n^`
  - results can include heroin or herion

Type in your free text query, then choose the **Select** button to move it into the query definition. A free text query behaves like any other query. Examples of free text queries can be found in the Appendix.
**Explain Query**

The Explain Query button is a feature that explains a query in more detail for users to better understand what filters are being applied and how.

![Query Example](image1)

The query is all visits with the specified chief complaints, age group, and public health region by patient location.

**Query Builder**

The Query Builder is a function that builds a graphical user interface to help create free text queries. It has the ability to add new groups and rules and automatically arranges the query in the correct format and paste in the free text window.

![Query Builder](image2)
From the Time Series page you can also view the data from the query in the Data Table including the count, expected value from the detector, and detector output. You can view popup graphs showing stacked graphs, weekly views, and detector comparisons plots. The Time Series image allows you to mouse over each data point to get more information on a specific day.

In addition, users can perform an overlay query and apply it directly to an existing graph. The query/time series can be saved for use in myAlerts, myESSENCE, or the Query Manager.
**Data Series Options**

The stratification option allows users to stratify queries under the **Data Series Options** to view a breakdown of parameters, such as age group or geographic region.

1. Select **Data Series Options** from the Time Series page
2. Choose your options for **Within** and/or **Across Graph(s) Stratification**
3. Select Multiple Graphs for each stratifications on a different graph or Single Graph for all stratifications on one graph.
   a. There are also options for composite detection, removing zero series and putting each year as its own series. The composite feature runs detection on the sum of the data from each series based on a predefined stratification. It removes any series from the sum that contains one or more zero values. This includes any zero in the entire baseline plus the additional time prior to the start date used to warm up the detectors (~40 days).
4. Select **Update**.
Single Graph

Multiple Graphs
Overlay

The overlay option allows you to create a new query and overlay it on top of the existing original query that was performed. More detail on how to perform an overlay can be found in the Weather and Environmental Data section.

In the overlay configuration window, you can choose single or multiple graphs and date alignment. Under the denominator parameters sections, you can decide if you want to have one of the queries divided by the other.

You can also display the overlay and/or the original query on the same or different axis. Multiple overlay graphs can be added onto the same time series graph. Currently the data table below the graph only represents the original query. This may be updated in the future to include both the original and the overlay.
Add Event

The Add Event button gives the option to choose either a date or a threshold to highlight on the time series based on the date(s) or threshold(s) chosen.

Event

1. To create an Event, select **Add Event** on the Time Series graph.
2. Choose either Single Date Event or Ranged Date Event and click **Next**.
3. Choose an Event Name, a date/date range and color.
4. Click **Submit**.
**Threshold**

1. To create an Event, select **Add Event** on the Time Series graph.
2. Choose either Single Threshold or Ranged Threshold and click **Next**.
3. Choose an Event Name, a threshold start/end range and color.
4. Click **Submit**.

---

**Weather and Environmental Data**

Air quality observations from AirNow and weather observations from the National Weather Service are integrated in the Texas Syndromic Surveillance as additional data sources. Weather and air quality monitors are not always placed in ideal locations for public health surveillance purposes. It is not recommended to aggregate values from multiple monitors in ESSENCE; users should select a station that is closest to their population of concern.

<table>
<thead>
<tr>
<th><strong>Weather Factors</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category</strong></td>
</tr>
<tr>
<td>Temperature</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Precipitation</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Wind</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
## Air Quality Parameters

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Definition</th>
<th>Health Effects &amp; Examples</th>
<th>Measure</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM2.5</td>
<td>Fine inhalable particles with diameters that are generally 2.5 micrometers and smaller</td>
<td>combustion particles, organic compounds, metals, emissions from vehicles and industrial facilities etc.</td>
<td>microgram per cubic meter (µg/m3)</td>
<td>24 hour</td>
</tr>
<tr>
<td>PM10</td>
<td>Coarse inhalable particles with diameters that are generally 10 micrometers and smaller</td>
<td>Pollen, mold, dust from roads, farms, dry riverbeds, constructions sites and mines</td>
<td>microgram per cubic meter (µg/m3)</td>
<td>24 hour</td>
</tr>
<tr>
<td>Ozone</td>
<td>Composed of three atoms of oxygen (O3), bad ozone is created by chemical reactions between oxides of nitrogen and volatile organic compounds (VOC)</td>
<td>main ingredient of urban smog; harmful to breathe and damages crops, trees and other vegetation</td>
<td>parts per billion</td>
<td>1 or 8 hour</td>
</tr>
</tbody>
</table>

ESSENCE contains air quality observations. These values are **not** equivalent to Air Quality Index (AQI) values.

<table>
<thead>
<tr>
<th>Category</th>
<th>AQI</th>
<th>Ozone [ppb] [8 hour]</th>
<th>Ozone [ppb] [1 hour]</th>
<th>PM2.5 [24 hour]</th>
<th>PM10 [24 hour]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>Up to 50</td>
<td>0-54</td>
<td>-</td>
<td>0-12</td>
<td>0-54</td>
</tr>
<tr>
<td>Moderate</td>
<td>51-100</td>
<td>55-70</td>
<td>-</td>
<td>12.1-35.4</td>
<td>55-154</td>
</tr>
<tr>
<td>Unhealthy for Sensitive Groups</td>
<td>101-150</td>
<td>71-85</td>
<td>125-164</td>
<td>35.5-55.4</td>
<td>155-254</td>
</tr>
<tr>
<td>Unhealthy</td>
<td>151-200</td>
<td>86-105</td>
<td>165-204</td>
<td>55.5-150.4</td>
<td>255-354</td>
</tr>
<tr>
<td>Very Unhealthy</td>
<td>201-300</td>
<td>106-200</td>
<td>205-404</td>
<td>150.5-250.4</td>
<td>355-424</td>
</tr>
<tr>
<td>Hazardous</td>
<td>301-500</td>
<td>201+</td>
<td>405-604</td>
<td>250.5-500.4</td>
<td>425-604</td>
</tr>
</tbody>
</table>

### Weather Overlay

1. Run a query and create a Time Series graph for the outcome of interest.
2. Select the **Add Overlay** button below the graph and this prompts a new Query Wizard to appear.

3. Select **Datasource**: Weather Data

4. Select **Detector** = No Detection
   a. It is recommended that “No Detection” is chosen as none of the available detectors in ESSENCE can display reliable alert information for weather.

5. Selected desired **Dates**
   a. It is recommended to match the overlay timeframe with the timeframe used on the initial query.

6. Select **Weather Factor** (Weather Factor Table)
7. Select appropriate **Weather Monitor**
8. Select **Add Overlay**

9. Configure overlay display
   a. Select **Denominator Parameters**
      i. Selecting the same axis makes the y-axis measurement the same for both the original query and the overlay graph. This is not recommended for a weather overlay.
   b. Select **Date Alignment**

10. Select **Display Overlay**

11. Save Visualization
   a. Select **Download** to save as a PNG file or save the Time Series to myESSENCE.
Air Quality Overlay

1. Run a query and create a Time Series graph for the outcome of interest.

   ![Example: Asthma-like Query](image)

2. Select the **Add Overlay** button below the graph and this prompts a new Query Wizard to appear.

   ![Example: Daily PM$_{2.5}$ using Austin air quality monitor.](image)

3. Select **Datasource**: Air Quality Data
4. Select **Detector** = No Detection
   a. It is recommended that “No Detection” is chosen as none of the available detectors in ESSENCE can display reliable alert information for air quality.
5. Select desired **Dates**
a. It is recommended to match the overlay timeframe with the timeframe used on the initial query.

6. Select **Air Quality Parameter** (see Air Quality Parameters Table)
7. Select appropriate **Air Quality Monitor**
8. Select **Add Overlay**

![Configure Overlay](image)

9. Configure overlay display
   a. Select **Denominator Parameters**
      i. Selecting the same axis makes the y-axis measurement the same for both the original query and the overlay graph. This is not recommended for an air quality overlay.
   b. Select **Date Alignment**

10. Select **Display Overlay**
11. Save Visualization
   a. Select **Download** to save as a PNG file or save the Time Series to myESSENCE.

**Summary Statistics**

Summary Statistics is a feature that displays the statistics of the query performed.

![Stats Across Time Series](image)

It displays the number of hospitals and the total number of counties/regions reporting each day.
The most common 50 words in the Chief Complaint Parsed field of the query are also shown.

**Data Details**

The data details table provides the line listing information for the query performed. What a user can see is dependent upon user type. Hospitals users can only see line listing information from their facility and Local Health Department users can only see line listing information from their region or jurisdiction for ER data, as well as line listing information for their county and contiguous counties for EMS data. All users can see aggregate statewide data via a time series graph.

Scroll left or right to view all the information provided by a data source and select pie or bar charts to view a breakdown of individual parameters. The data details user interface allows frozen column headers, multi-level sorting, per-column filtering, and row and multi-row section with copy options.
Users can control which columns are visible to the account in the data details table configuration and sort by clicking the column header.

The data details table can be downloaded to CSV and Excel formats.

**Map View**

After clicking **Map View** from the Time Series page, a Map Options dialog box appears. The Map View can also be accessed from the Map Portal tab but the most common way to access the mapping feature is through the Time Series page. This is because the default map from the Map Portal displays statistical alerts, not counts by region.

The map view allows you to zoom in on any part of the map. You can make layers visible by checking the Show box next to the layer’s name. You can do the same with labels. The active layer is the layer that will be selected if using any selection tools. If you cannot see a layer it may be hidden underneath another already visible layer. Click the active button to bring it to the top.
The tools in the upper right corner allow you to save a map to be used in a report. There is also a tool to allow you to create an animated movie of the map over time.

The bottom of the map displays information about the query or what is currently selected.
Advanced Query Tool

The Advanced Query Tool allows you to create very complex queries. You can use the forms at the bottom to choose variables, operators, and values. Once chosen, you can add the expression to put the expression into the query window or type your query directly into the window.

You can save your expression privately with the Save Private Expression option or publicly with the Save Public Expression option. At the bottom of the variable list, you can choose private, public and administrator saved expressions.

Once you choose the execute button, your query is performed as a time series.
9. Overview Portal

The Overview Portal can be accessed two ways: Overview Portal menu option or from a Query Wizard. If you enter the overview portal from the menu button you get the default options for the data source you choose. If you enter from the Query Wizard you can choose the parameters you want pre-defined before entering the overview portal.

The functionality of the overview portal has been almost entirely replaced by the stratification system on the Time Series page. The last remaining feature that has not been duplicated is the ability to add all the overview graphs to a myESSENCE dashboard with a single click. If you wish to perform an overview by hospital or region, it is best to select the parameters in the query portal first to minimize the amount of querying the system must do to create graphs for every region or every hospital across the entire state.
10. Report Manager

By viewing the sample template a Microsoft Word document is downloaded. The sample contains instructions on how to edit and save a new report.

1. In order to save a picture, right-click on the image and select the format picture. In the Alt-Text section, replace <!@@SI_Death Query@@> with the exact name of the query you want embedded. For example, <!@@Monthly Fever Query@@>.

2. Then save the MS word document which can be uploaded as a new report.

3. Choose the desired date range, then click Submit to run the report.

A MS word document is created with the embedded graphs or maps in the document.
11. Query Manager

Saved queries can be viewed with the originally saved dates or with the start date/end date shifted so that the end date is the same as today using the Show (Today) link.

The Query Manager allows users to save and manage queries from sessions in the query portal. This saves the user from having to rewrite chief complaint free text queries should it become necessary to rerun the same query or a similar one. Query Manager is similar to bookmarks, but it also has other useful features that are not available in bookmarks. For example, you can create your myAlerts in the Query Manager. If you choose multiple saved queries you can create a multi-series time series graph.

Multi-Series Time Series Graphs

Multi-series time series graphs allow a user to overlay trend lines from different time series graphs, including from different data sources. For example, to compare trends in influenza-like illness (ILI) activity for two counties, two separate time series graphs can be generated in ESSENCE, one for each county. From the two graphs, a single multi-series time series graph can be produced in ESSENCE to compare trends in ILI activity for the two counties.

The chart below is an example of a multi-series time series graph comparing animal bites to other types of bites. Separate queries were run to generate two time series graphs, and the multi-series time series graph was created by going into Query Manager, selecting the queries of interest, and proceeding as described above to create the below graph.
Intersecting Time Series Graphs

Intersecting time series takes two queries and finds all records that positively or negatively match between the two queries.
12. Stat Table

The Stat Table provides pre-built reporting capabilities. Choose a report and complete the required form. The stat table is then created and available for view in Excel or in the web page.
The Data Quality portal has a few different options, but only for ER data. These include the percent completeness, the percent mapped to known values, and the percent received within 24 hours for any data source that has been Data Quality configured.

**How to Check Data Quality**

1. Click the **Data Quality** tab
2. Select **Data Source** — Facility Location
3. Select **Quality Factor** — Percent Completeness, Percent Mapped to Known Values, or the Percent Received Within 24 Hours
4. Select **Time Resolution** — the default is Daily
5. Select the hospitals you would like to see
6. Select **All Parameters**
7. Select start date of interest: Previous week/month
8. Select end date: typically, the current date
9. Click **Submit**
The results are displayed in a color coded table. Gray/green indicates positive results, yellow indicates caution, and orange/red indicates significant problems with completeness of the data.

Data Quality Alerts show any factor that has changed (+/-) 10%.

Data Quality Frequencies allow you to choose a text based parameter and view the top 10 most common results.
14. More

Provides useful information such as the history of ESSENCE, definition of syndromic surveillance, detector algorithms, FAQs, user’s guide, etc.
15. Appendix

Free Text Query Examples

Paste the following into the "Chief Complaint" or other free text fields to see visits related to the following topics.

**Carbon monoxide query**
^;T58^,or,(,^carbon^,and,(,^expos^,or,^pois^,)),or,^carbon mon^

**Rabies query (people visiting the ER for rabies shots)**
^rabies^

**Animal Bite query**
(^,^cat^,or,^cat,or,cat
^or,^kitten^,or,^puppy^,or,^dog^,or,^bull^,or,^animal^,or,^raccoon^,or,^racco
on^,or,^fox^,or,^bobcat^,or,^bat^,or,^rodent^,or,^rat^,or,rat
^or,^hamster^,or,^monkey^,and,(,^bit^,),),andnot,(,^scratch^,)

**Insect Bite query**
(^,^bug^,or,^insect^,or,^spider^,or,^bee^,or,^tick^,or,^mosquito^,or,^wasp^,o
r,^flea^,or,^recluse^,or,^hornet^,or,^ant^,or,^yellow[j
]^,^),and,(,^st[ui]ng^,or,^bit^,)

**Food poisoning query**
^food pois^,or,^foodborne^,or,(,^food^,and,^contaminat^,)

**Skin infection query**
^MRSA^,or,^staph^,or,^staff infec^,or,^spider bite^,or,^skin
lesion^,or,^cellulitis^,or,^-impetigo^,or,^scabies^,or,^shingles^

**Fever and Rash query**
(^,^rash^,and,^-fever^),or,^chickenpox^,or,^chicken pox^,or,^-measles^

**Fireworks query**
^;W39^,or,^;E9230^,or,^sparkler^,or,^-roman
candle^,or,(,(,^-fire^,),and,(,^-work^,or,^-cracker^,),),andnot,(,^-work[ei]^,)

**Heat related illness query**
^;T67^,or,^heat^,or,^-haet^,or,^-heet^,or,^-too hot^,or,^-sun^,andnot,^-sunday^
Vaping related illness query

(, (, (^vap[ie]^, andnot, (^vicks^, or, ^vapif^,)), or, (^ ecig ^, or, ^ e cig^, or, ^e
cig^, andnot, (^cigna^,)), or, ^electronic cig^, or, ^pod mod^, or, ^e liquid^, or, ^e
liquid^, or, ^eliquid^, or, ^e pipe^, or, ^e hook^, or, ^e huka^, or, ^e pipe^, or, ^e
hook^, or, ^e huka^, or, ^vape pen^, or, ^weed pen^, or, ^dab pen^, or, ^dank
pen^, or, ^wax pen^, or, ^g pen^, or, ^g pen^, or, ^G pen^, or, ^G pen^, or, ^shatter
wax^, or, ^tank system^, or, (^e juice^, or, ^e-
juice^, or, ^ejuce^, andnot, (^prune^, or, ^orange^, or, ^apple^,)), or, ^electronic
nicotine^, or, (, (^smok^, or, ^vap[ie]^,)), and, (, (^juice^, or, ^liquid^, or, ^pen^, or,
pen^, or, ^pen^, or, ^oil^, or, ^oil^, or, ^oil^, or, ^oil^, or, ^oils^, or, ^oil^, or, ^oils^, or,
^oils^, or, ^oils^, or, ^cartri^, or, ^cannabinol^, or, ^cannadidol^,)), or, ^black
Magic^, or, ^Black Diamond^, or, (^YOLO^, andnot, ^co^,)), or, ^Triple
X^, or, ^Juul^, or, ^Vuse^, or, ^NJOY
^, or, ^NJOY^, or, ^MarkTen^, or, ^Eonsmoke^, or, ^21st century
smoke^, or, ^Wismec^, or, ^Vaporesso^, or, ^Joyetech^, or, ^Innokin^, or, ^Eleaf
^, or, ^Eleaf^, or, ^Eleaf^, or, ^Eleaf^, or, ^Lost
vape^, or, ^Sigelei^, or, ^Kangertech^, or, ^Smoant^, or, ^Suorin^, or, ^PHIX^, or,
^phix^, or, ^phix^, or, ^Pax Era^, or, (, (^vap[ie]^,)), and, (^k2^, or, ^k2^, or, ^K2
^, or, ^serenity^, or, ^fake weed^, or, ^fake mari^, or, ^synthetic can^, or, ^spice
^,), andnot, (^cook^, or, ^for serenity^, or, ^at serenity^, or, ^to serenity^, or, ^from
serenity^, or, ^serenity house^, or, ^cummin spice^, or, ^cumin spice^, or, ^spice
shop^, or, ^with a spice^, or, ^pumpkin^, or, ^serenity called^, or, ^serenity
clearance^, or, ^serenity doctor^, or, ^old spice^, or, ^requires serenity^, or, ^wants
serenity^, or, ^serenity place^, or, ^serenity rehab^, or, ^by serenity^, or, ^spice
curry^, or, ^spice bottle^, or, ^tumeric^, )), andnot, (^bl[eo]w
up^, or, ^explod^, or, ^explo^, or, ^fire^, or, ^broke^, or, ^burns to^, or, ^facial
burn^, or, ^ingest^, or, ^sw[ao]ll^, or, ^police^, or, ^police^, or, ^police^, or, ^vapor
rub^, or, ^vaporrub^, or, ^prostate^, or, ^quit^, )
### Syndromes and Subsyndromes

<table>
<thead>
<tr>
<th>ESSENCE Abbreviation</th>
<th>Syndrome</th>
<th>Subsyndrome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bot_like</td>
<td>Botulism-like</td>
<td>BlurredVision or DifficultyFocusing or DifficultySpeaking or DifficultySwallowing or DilatedPupils or DoubleVision or DryMouth or MuscleWeakness or Ptosis</td>
</tr>
<tr>
<td>Exposure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fever</td>
<td>Fever</td>
<td>Chills or FeverPlus or Sepsis or QFever or RockyMountain or YellowFever or Dengue or Malaria</td>
</tr>
<tr>
<td>GI</td>
<td>Gastrointestinal Illness</td>
<td>AbdominalPain or Bloating or Gastroenteritis or GIBleeding or LossOfAppetite or NVD or FoodPoisoning</td>
</tr>
<tr>
<td>Hemr_ill</td>
<td>Hemorrhagic Illness</td>
<td>FeverOrChills and (AcuteBloodAbnormalities or BleedingGums or DisseminatedIntravascularCoagulation or GI Bleeding or Hematemesis orHemoptysis or Nosebleed or Petechiae or StrawberryTongue)</td>
</tr>
<tr>
<td>ILI</td>
<td>Influenza-like Illness</td>
<td>Influenza or (FeverPlus and (Cough or SoreThroat) and not NonILIFevers)</td>
</tr>
<tr>
<td>Injury</td>
<td>Injury</td>
<td>(BiteOrSting OR CutOrPierce OR DrowningOrSubmersion OR Electrocut OR ExcessiveHeat OR Fall OR FireBurnExplosives OR MotorVehicle OROccupational OR Overexertion OR Poisoning OR StruckBy OR ToolsOrMachinery OR Firearm OR NonMotorVehicle OR Suffocation OR Assault ORForeignBody OR SuicideOrSelfInflicted OR Watercraft OR SportsOrExerciseRelated)</td>
</tr>
<tr>
<td>Neuro</td>
<td>Neurological</td>
<td>AlteredMentalStatus or Dizziness or Drowsiness or Encephalitis or (Headache and FeverPlus) or ProjectileVomiting or Prostration or Seizure or SidedWeakness</td>
</tr>
<tr>
<td>Rash</td>
<td>Rash</td>
<td>Flushing or Rash or Sores or Smallpox or ChickenPox or Measles or Rubella or RockyMountain</td>
</tr>
<tr>
<td>RecordsOfInterest</td>
<td>Reportable Disease</td>
<td>Cryptosporidiosis or Cyclosporiasis or Encephalitis or Botulism or Smallpox or Shigellosis or Salmonellosis or InfectiousHepatitis or Anthrax or Ciguatera or Dengue or Malaria or Measles or Mumps or ChickenPox or LeadPoisoning or Pertussis or Campylobacteriosis or Cholera or CreutzfeldtJakob or Diphtheria or Ehrlichiosis or EscherichiaColi or Glanders or Haemophilus or Leprosy or Hansen or Hantavirus or Legionnaires or Leptospirosis or Listeriosis or Lyme or Melioidosis or Meningitis or Meningococcemia or MercuryPoisoning or PesticidePoisoning or Plague or Polio or Psittacosis or QFever or Rabies or RockyMountain or Rubella or Toxoplasmosis or Trichinosis or Tularemia or Typhoid or Typhus or Vibrio or YellowFever or Brucellosis or COPoisoning or Eschar</td>
</tr>
<tr>
<td>Resp</td>
<td>Respiratory</td>
<td>AcuteBronchitis or ChestCongestion or Cough or DifficultyBreathing or Hemoptysis or Laryngitis or LowerRespiratoryInfection or NasalCongestion or OtitisMedia or Pneumonia or ShortnessOfBreath or SoreThroat or UpperRespiratoryInfection or Wheezing or AcuteRespDistress</td>
</tr>
<tr>
<td>Shk_coma</td>
<td>Shock/Coma</td>
<td>Coma or LossOfConsciousness or SepticShock or Shock</td>
</tr>
</tbody>
</table>
## Data Elements

### Summary

<table>
<thead>
<tr>
<th>Hospitals Submitting Data to TxS2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Emergency Department (ED) Visits</td>
</tr>
<tr>
<td>Number of Heat-Related Illness ED Visits</td>
</tr>
<tr>
<td>Percentage of Heat-Related Illness ED Visits</td>
</tr>
<tr>
<td>Number of Heat-Related Illness Visits to Date</td>
</tr>
<tr>
<td>Maximum Temperature Average</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data Element Name</th>
<th>Description of Field</th>
<th>Data Element Name</th>
<th>Description of Field</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diagnostic and Pre-Diagnostic</strong></td>
<td></td>
<td><strong>Vitals</strong></td>
<td></td>
</tr>
<tr>
<td>Procedure Code</td>
<td>Procedures administered to the patient</td>
<td>Initial Temperature</td>
<td>Initial temperature of the patient</td>
</tr>
<tr>
<td>Triage Notes</td>
<td>Triage notes for the patient visit</td>
<td>Initial Pulse Oximetry</td>
<td>1st recorded pulse oximetry value</td>
</tr>
<tr>
<td>Clinical Impression</td>
<td>Clinical impression (free text) of the diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pregnancy Status</td>
<td>Whether the patient is pregnant during the encounter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem List</td>
<td>Problem list of the patient condition(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medications List</td>
<td>Current medications entered as narrative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medications Prescribed or Dispensed</td>
<td>Current medications entered as standardized codes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
16. Glossary

Aggregate data – data collected from individual-level records that have been combined for statistical or analytical purposes and that are maintained in a form that does not permit the identification of individuals

Chief complaint – primary reason for seeking healthcare, as documented by caregiver e.g. abd pain

Count – actual number of visits

Data element - data content to be collected and exchanged

Drill down – access data in a detailed view from a general view

Emergency Room Data by Hospital Location – patient encounters at ER reported by location of hospital

Emergency Room Data by Patient Location – patient encounters at ER reported by ZIP code in which the patient resides

EMS Data- De-identified data from the DSHS EMS registry

ESSENCE Syndrome – clinically relevant groups into which diagnoses, chief complaints or drug classification are categorized by ESSENCE e.g. GI, Neuro, or Resp

Expected – statistically modeled expected count

Influenza like illness (ILI) – ICD 10 codes representing provider diagnosis of influenza like illness

Percent Emergency Room Data by Hospital Location – percentage of selected medical encounters as compared to all medical encounters by location of Emergency Rooms

P-value – statistical p-value output form spatial detector algorithm that indicates level of alert e.g. >0.05 = no alert; 0.01-0.05 = yellow warning; <0.01 = red alert
Poison Control Data- Data from the Texas Poison Center Network

Query - the primary mechanism for retrieving information from the database and is used to track impact in terms of time, geography and demography

Region – county or geographic area. Since ZIP codes can cross county lines, a ZIP code is included in a region based on where the centroid of the ZIP code is located

Syndrome- one of twelve predefined sets of chief complaint queries that are widely used by epidemiologists as part of syndromic surveillance

Subsyndromes - smaller groups of chief complaint terms that are grouped together to form syndromes, which define a range of symptoms
17. References

## Revision History

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Action</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/5/18</td>
<td>1</td>
<td>New guidance</td>
<td></td>
</tr>
<tr>
<td>8/1/18</td>
<td>2</td>
<td>Edited to reflect changes in v1.21</td>
<td>All</td>
</tr>
<tr>
<td>3/26/20</td>
<td>3</td>
<td>Minor edits, added vaping query, and added EMS and Poison data streams, as well as accessibility compliance</td>
<td>All</td>
</tr>
</tbody>
</table>

3/26/2020 Stock #54-15332