



# Texas Department of State Health Services | Public Health Region 7 The Application of Syndromic Surveillance in a Disaster Response

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## Introduction

Syndromic surveillance is used as an early detection tool for disease outbreaks and other public health emergencies. The goal of syndromic surveillance is to better predict the needs and characterize issues within a community. The TxS2 system receives hospital data from across the state which can be utilized in a variety of ways. At DSHS Region 7, we foresee using the TxS2 system to assess chief complaint data using pre-made queries and key words during disasters to better understand the public health impacts on the community.

## Methods

During October 2018, Region 7 experienced severe flooding events throughout several counties. The extreme flooding resulted in boil water notices in Burnet, Llano and Travis Counties. As the local health department for Burnet and Llano Counties, the epidemiology program wanted to determine how the boil water notice might affect these counties. After receiving anecdotal reports of illness and due to the boil water notices, we wanted to see if there was an increase in GI illnesses within these counties and track any injuries resulting from the flooding or boiling water. Using the TxS2 system, we ran a query to filter hospital visits records to determine if there were any visits related to our search criteria.

With public health disasters being inevitable, the DSHS Region 7 epidemiology team has also created a list of public health emergencies we would most likely respond to so that we could determine which queries and keywords would be most useful in analyzing TxS2 data during said disaster.

Upon further analysis of correlating line lists produced from the query, the Region 7 epidemiology team was able to conclude that the graphs corresponded with baseline threshold rates of illness and injuries with no increase in incidence during the period of flooding and while boil water notices were in effect.

## Results

### Query used during October 2018 severe flooding:

(, ^rain, or, rain ^, or, ^rain ^, or, ^thunder storm ^, or, ^t storm ^, or, ^hail, or, ^mist, or, ^mist ^, or, ^fog, or, ^fog ^, or, ^precipitation ^, or, ^flood ^, or, ^lightning ^, or, ^rainwater ^, or, ^high water ^, or, ^downpour ^, or, ^torrent ^, or, ^flash flood ^, or, ^deluge ^, or, ^severe weather ^, or, ^wet roads ^, or, ^slick roads ^, or, ^wet conditions ^, or, ^road conditions ^,)

## Results (cont.)

Table 1: Query Results based on a Facility Location Data Source of Burnet County

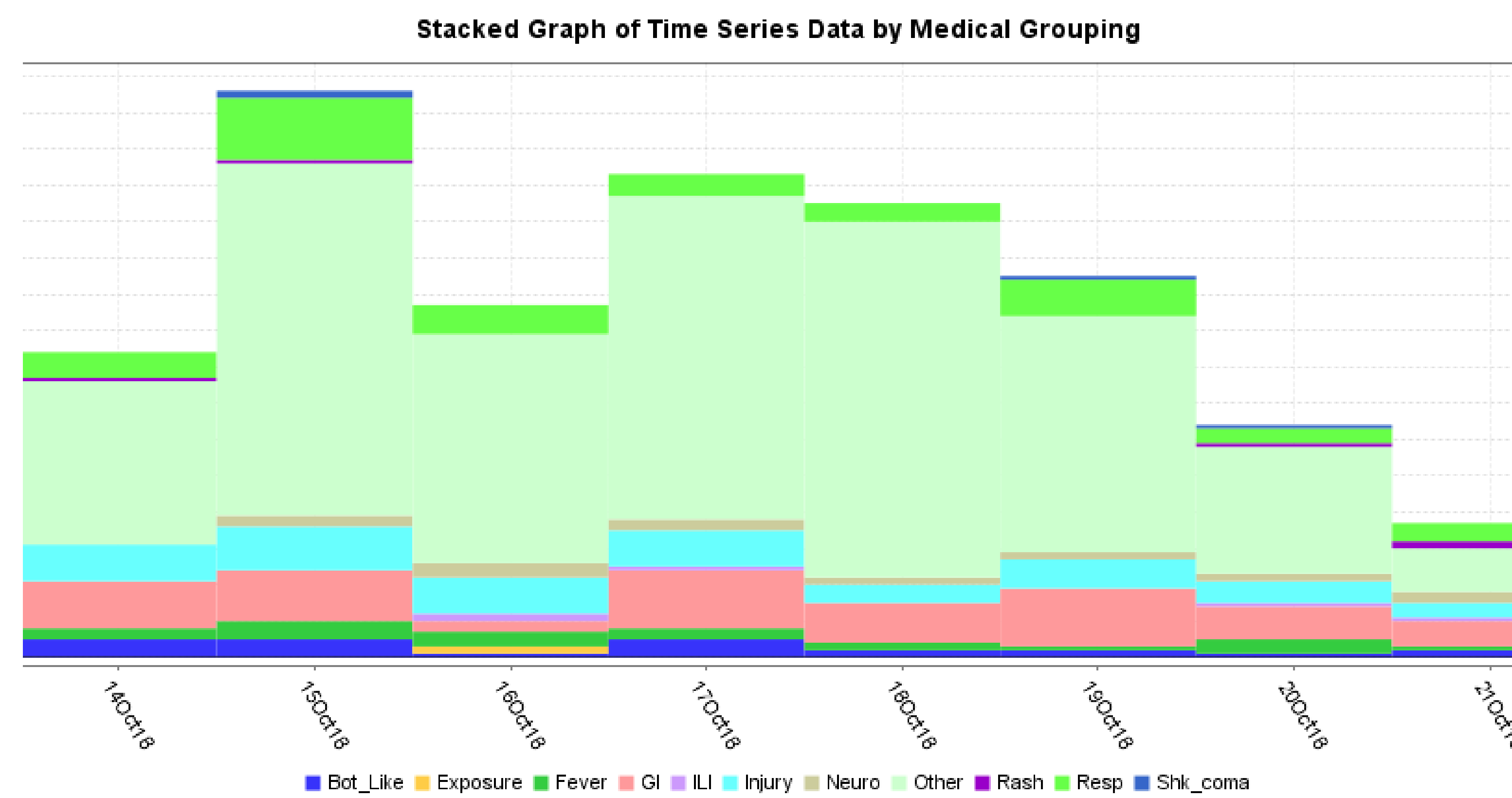
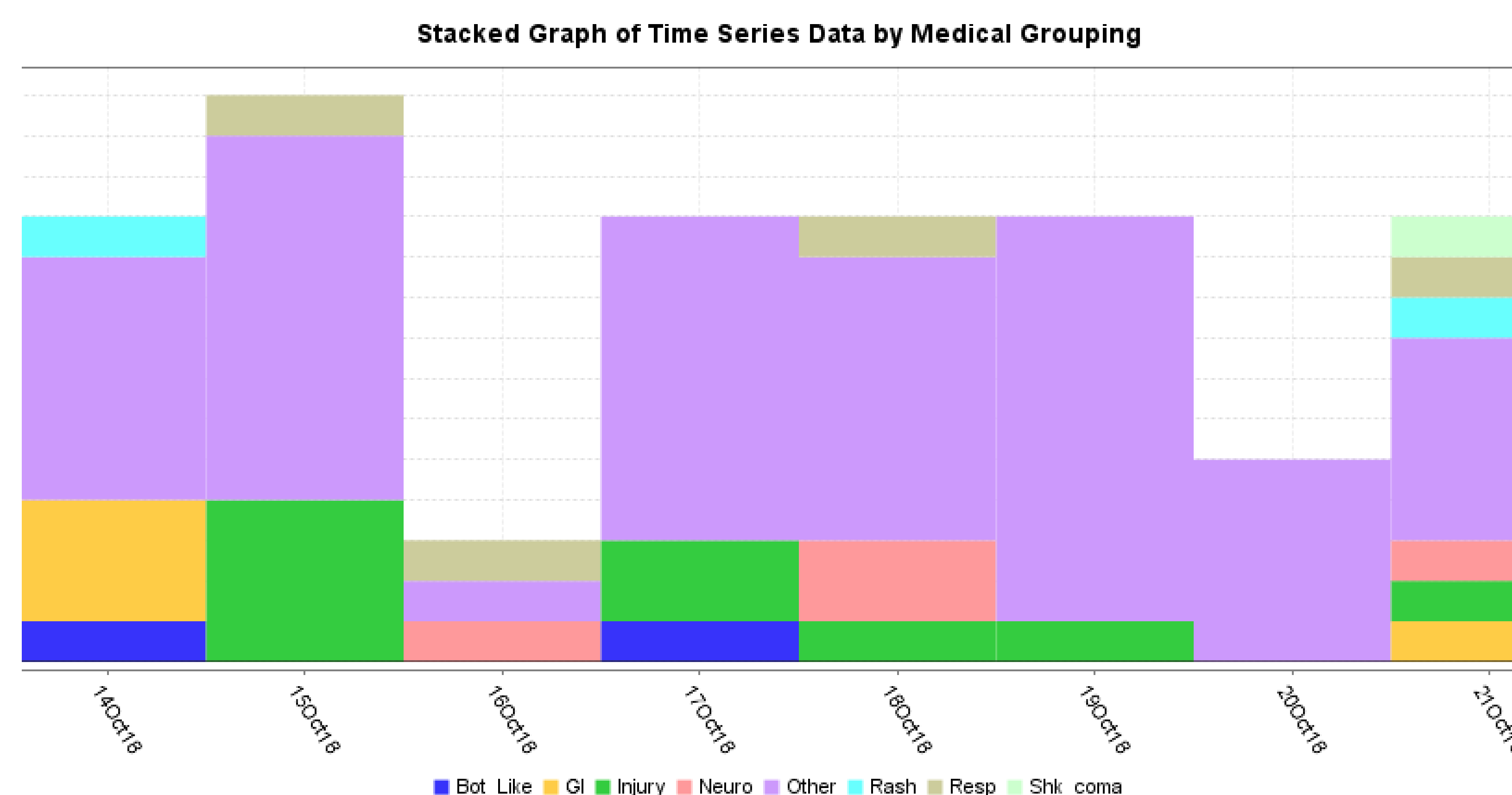


Table 2: Query Results based on a Facility Location Data Source of Llano County



### Queries and Keywords for Disaster-related Syndromic Surveillance

#### Hurricane

Query: (^ (hurricane'sname) ^, or, ^hurricane ^, or, ^storm ^, or, ^evac ^, or, ^flood ^, or, ^tornado ^, or, ^thunderstorm ^, or, ^wind ^, or, ^rain ^, or, ^lightning ^, or, ^chemical spill ^, or, ^chemical ^, or, ^contact with fungi ^, or, ^carbon monoxide ^, or, ^explosion ^, or, ^explode ^, or, ^fire ^)

#### Explosion

Keywords: Explosion, name of facility/town, Injuries- hearing loss, ringing, concussion, traumatic brain injury, cuts, amputation, fracture, glass, Respiratory- smoke inhalation, chemical

#### Flood

Query: (^rain, or, ^rain ^, or, ^thunder storm ^, or, ^t storm ^, or, ^hail, or, ^mist, or, ^mist ^, or, ^fog, or, ^fog ^, or, ^precipitation ^, or, ^flood ^, or, ^lightning ^, or, ^rainwater ^, or, ^high water ^, or, ^downpour ^, or, ^torrent ^, or, ^flash flood ^, or, ^deluge ^, or, ^severe weather ^, or, ^wet roads ^, or, ^slick roads ^, or, ^wet conditions ^, or, ^road conditions ^)

#### Ice storm/Severe cold weather

Query: (^ice ^, or, ^icy ^, or, ^snow ^, or, ^winter ^, or, ^freeze ^, or, ^freezing ^, or, ^frozen ^, or, ^frostbit ^, or, ^frost bit ^, or, ^hypothermi ^, or, ^cold exposure ^, ) andnot, (, ^lice ^, or, ^voice ^, or, ^jaundice ^, or, ^practice ^, or, ^twice ^, or, ^notice ^, or, ^office ^, or, ^bic ^, or, ^vice ^, or, ^spi ^, or, ^juice ^, or, ^rice ^, or, ^pak ^, or, ^pack ^, or, ^applied ^, or, ^cream ^, or, ^peice ^, or, ^freezer ^, or, ^cyclo ^, or, ^omnicef ^, or, ^peice ^, )

#### Tornado

Query: (^tornado ^, or, ^wind, or, ^wind ^, or, ^thunder ^, or, ^lightning ^, or, ^storm ^, ) andnot, (, ^wind knocked out ^, or, ^knocked wind out ^, or, ^asthma ^, or, ^thyroid ^)

#### Wildfire

Keywords: Injury- burns, clean up, tetanus, cut, abrasion Respiratory – smoke, inhalation, carbon monoxide, chemical

## Discussion

By using the flood query, we were able to determine that there were no GI illnesses or injuries related to the October 2018 severe flooding incident and boil water notice. Because no illness or injuries were found, we were able to determine that no additional public health needs would be necessary related to these issues. The October 2018 severe flooding event was our first chance to utilize the TxS2 system and it helped to learn how it can be used related to public health emergencies. We have therefore created a list of other queries and keywords correlating to different public health disasters so that we will be better prepared for future incidents. The TxS2 system is yet another tool to help enhance traditional surveillance methods following disasters. By using this system, we are able to better understand the impact on public health and determine what help is needed within our communities.