Public Safety Data

Overview

EMS Data set:
This data set has Emergency Medical Services (2012 to current and still get updated once a week)

This includes:

- GCSD Guilford County Sheriff Department
- GCF Guilford County Fire Department
- EMS Emergency Medical Service
- ACO Animal Control

We are taking out the ACO nature that is Transport because it isn't very accurate, because some animals aren't always from Guilford County they maybe be brought from outside the county.
This data set include things Nature of the call, time. Service, agency, district, seconds until arrival, Seconds until dispatch and more seconds

Goals

The goals of the project are related to the major feature of the data, calls:

- Trending natures for calls and reasons for trending?
- Are the emergency resources used efficiently or poorly?
- Suggestion for improving the resources usage?

To get answers to the questions, here are the established goals:

- To find relationships between different natures of the calls and agencies.
- To find high call volumes and correlate that to events, areas, or agencies.
- To find relations between high call volumes and socio-economic factors

Data Description

- Datasets are available through: opendata.guilfordcounty.com
- Primary Dataset: Public Safety Calls for Service July 1, 2012 - Present
- Notable features:
  Call related: call-time, call-source, secs2di(Seconds to call dispatch)
  Location related: city, district, geoprox
  Reason for call: nature, priority
  Responsibility assigned to: agency -ACO/EMS/GCF/GCSD
- Most of the features are pre-established strings (not free form strings), the few others are seconds to call route, dispatch, first arrival, ...
- Geocoded (longitude, latitude) data is gonna be provided, however, a feature called geo-proximity is publicly available.

Data Description

Things worth mentioning:

- Natures names changed over time
- Nature has default priority value that can be modified by the dispatcher
- Filter out rows where certain features have certain values such as: cancellCall = True, etc

```
city : nulls =  854 , categories =  30
nature : nulls =  3 , categories =  263
nature2 : nulls =  1025079 , categories =  169
priority : nulls =  303 , categories =  10
rptonly : nulls =  0 , type =  bool
service : nulls =  3 , categories =  5
agency : nulls =  0 , categories =  4
district : nulls =  99597 , categories =  63
statbeat : nulls =  99594 , categories =  140
ra : nulls =  99601 , categories =  1163
gp : nulls =  102916 , categories =  861
primeunit : nulls =  19556 , categories =  1219
cancelled : nulls =  0 , type =  bool
closecode : nulls =  0 , categories =  57
timeclose : nulls =  0 , type =  datetime64[ns]
calldow : nulls =  0 , type =  int64
secs2rt : nulls =  0 , type =  int64
secs2di : nulls =  0 , type =  int64
secs2en : nulls =  0 , type =  int64
secs2ar : nulls =  0 , type =  int64
secs2tr : nulls =  0 , type =  int64
secs2lc : nulls =  0 , type =  int64
secsdi2en : nulls =  0 , type =  int64
secsdi2ar : nulls =  0 , type =  int64
secsar2tr : nulls =  0 , type =  int64
secsar2lc : nulls =  0 , type =  int64
secsrt2dsp : nulls =  0 , type =  int64
secstr2lc : nulls =  0 , type =  int64
firstdisp : nulls =  21184 , categories =  1133
```

Related Work or Works

1. **Why and when citizens call for emergency help: an observational study of 211,193 medical emergency calls** https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4632270/ - the study analyzes the major reasons for emergency calls along with the priorities assigned to each reason; they suggest improvements for conducting the phone calls to avoide unspecific call reasons
2. **The difficult medical emergency call: A register-based study of predictors and outcomes** https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5333377/ - the study uses logictic regression for identifyng predictors of emergency call categorization as “unclear problem”. Poisson regression analysis was implemented for examining the effect of categorization as “unclear problem” on mortality.
3. **Data Analysis Report Fire and Emergency Medical Services Hermosa Beach, California August 2013** http://www.hermosabch.org/modules/showdocument.aspx?documentid=3314 - the study analyzes EMS and Fire calls, put them into more specific categories, and evaluate the performance and the reaction of the public agencies.

Tasks for each Person

Data cleaning and manipulation

On the new dataset that has geo locations:

- Filter out where cancelled calls field = True, report only field = True, nature = Transport to Animal Shelter,
- Remove unnecessary fields related to location as: statbeat, ra
- Associate codes for text fields
- Manipulate calltime field: split into 2 fields: year, time

Topics/ Hypothesis

- Relationships between trending natures for calls and each agency; patterns between geographic area and leading calls' natures; identification of predictors of emergency call categorization as "sick person"-later on if time permits.**(Oana)**
- Correlate time of the c
- all with the nature of the call(Jason said this was a big interest for them)**(Saed)**
- Response reaction time based on nature(Jason said this was a big interest for them)**(Linh)**
- Nature and matching priority(priority always based on operator, is it over time changed)**(Daniel)**

Later - need more Data for these topics

- Geo location and natures(multiple people will probably work on this)
- Social economics and calls/ nature(not sure we want to do this topic)