# Motor Vehicle Accidents

The percentage of missing data in mv speed is 54%

There is no much correlation between the mv speed and the trauma level. The correlation coefficient is 0.20

95 % of those who suffered motor vehicle accident have GCS score.

In very few cases the patients were given level 1 treatment if airbag is deployed in a motor vehicle accident.

MV speed and fall height fall in different categories

There are no fatalities in a motor vehicle accidents.

Only 8 out of 101 patients were given level 1 treatment for those whose shock rate is less than 0.75.

The chances are slightly more for patients to come under level 1 if shock rate is more than 0.75. 20 out of 292.

In a motor vehicle accident most of the patient's field shock rate is above 0.75.

Almost 75%.

The trauma type is blunt for a motor vehicle accident.

Out of 72 passengers who are positioned in the front seat passenger only 2 are given level 1 treatment and 43 are given level 2 attention and every patient is alive after the treatment.

Out of 22 drivers who had a motor vehicle accident only 1 was given level 1 treatment and all the patients returned home alive.

Out of 211 patients who are in back seat in a motor vehicle accident only 10 were given level 1 treatment and 108 were given level 2 treatment. In the 10 cases only in two cases airbag is deployed.

Out of 37 bicyclists only 3 are given level 1 treatment and no one is dead in the accident.

There are very few cases for whom position is not specified. 6 cases in total in which one is given level 1 treatment.

# Assault Data Analysis

* The total number of people who suffered an assault from the given dataset are 64.
* The total number of people who suffered from a blunt assault are 42
* The total number of people who suffered from a penetration assault are 22
* All the patients who suffered an assault have a GCS score which implies that all the patients have suffered from some kind of head injury.
* The statistics for patients who suffered a trauma type of penetration in assault is as follows:
  + Level 1 patients: 10
  + Level 2 patients: 6
  + Level 3 patients: 2
  + Level N patients: 4
* The statistics for patients who suffered a trauma type of blunt in assault is as follows:
  + Level 1 patients: 1
  + Level 2 patients: 5
  + Level 3 patients: 6
  + Level N patients: 30

* There was one missing field each in transport\_type and transport\_mode for patient with tid = ‘18529’.
* Except one patient with tid = ‘18554’ who had a value = ‘D’ in the death column, all the other patients had a value = ‘L’. From this we can infer that very few people died if they have suffered an assault.
* The assault data did not contain any information regarding the following fields:
  + Airbag-deployment
  + Patient\_pos
  + Safety\_equip\_issues
  + child\_restraint
  + mv\_speed
  + Fall\_height

# Injury Comments

If a patient is intubated, most likely they fall under level 1 category.

A GCS level <10 usually implies a level 1 category.

Penetrating injury also has only level 1 category trauma

Very few cases of red trauma are seen, only 2 in the last 18 months - 1 was level 1 trauma and the other was level N.

If a patient is pulseless, it implies a level 1 trauma

Waxing and waning mental status does not give good indication about trauma level.

Respiratory distress may be level 1 or level N

If a patient is stabbed, in most cases it iis a level 2 trauma

A gunshot wound maybe anything from level 1 to level N

Hematoma is usually level 3

An unrestrained person in a vehicle usually is level 2

Most head injuries are not severe and fall under level 3 or level N

Same as above for skull fracture

# ICD Code Categorized and subcategorized analysis

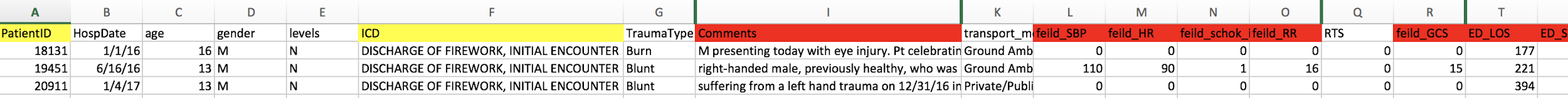
There are 3979 patient instances in the given dataset

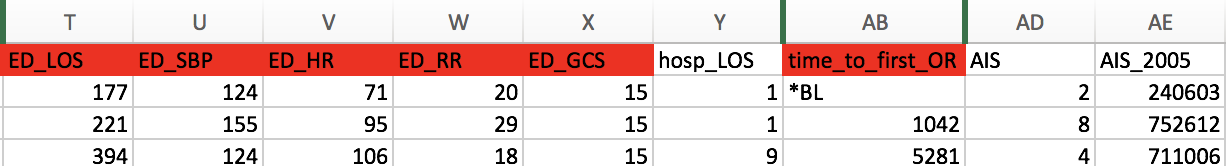
Categorizing the data based on ICD 10 codes:

**1.** **Discharge of firework, initial encounter:**

* There are only 3 instances of such type in the data set whose trauma levels are given N (assuming not known) .
* All the patients arrived from Referring hospital.
* The field scores for RR, SBP are missing – need to know about these values.
* ED scores for RR, SBP are available but hard to do a comparison because of missing field data

**Conclusion: Even though it was evident from the injury comments that the patients suffered and there was damage, there are no trauma levels recorded**





**2.** **Driver and Passenger injured in Unknown Traffic Accident:**

* There are 27 such instances in the dataset
* Level 1 instances are 3 , Level 2 instances are 12, Level N instances are 12
* For all three levels Airbag deployment feature has lot of missing data (either NA or ND) especially for level 1 patients
* Levels are recorded as N for a referring hospital patients where the comments indicate she was categorized level 3. Tid : 20439
* Out of three patients from level 1 one of the patient seems to have misclassified as level 1, looking at his GCS, SBP, no brain injury, discharged home Tid: 21039
* Level 1 patients mostly transported via helicopter.
* Correctly classified instances mostly have brain injuries, high AIS and GCS < 12-10
* One instance in level -1 was provided with respiratory assistance who was recorded dead eventually
* All Level-2 patients have good GCS (15 or 14), no brain injury, less AIS. But only one instance has high AIS and sent to OR ( need to check if it was a miss classification Tid:18137)
* Only one death from level 1 and no death observed from the level 2 and level N

**3. Child Physical Abuse:**

* There are 148 patient instances of this type
* 9 patients were level 1 and out of 9 patients 4 of them died.
* 7 patients were level 2 and no one was dead
* 93 patients were level 3 and 2 patients died (i think they were mis classified (under triage))
* 39 patients were not categorized into any level and 2 patients dead
* Almost half of the patients were having brain injuries, to be precise 74 of them
* GCS scores of level 1 patients were less than 10
* Most of patients were disposition in either ICU or OR

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# SBP and RR

## **Missing Data Analysis:**

Clean rows- Rows without 0, nan, 9999, or other null values for SBP/RR  
# of df rows: 3983  
# of valid rr rows: 2564  
# of valid sbp rows: 2260  
# of invalid rr rows: 1419  
# of invalid sbp rows: 1723  
percentage of invalid rr rows: 35.626%  
percentage of invalid sbp rows: 43.259%

## **SBP analysis**

# of SBP rows in the following categories: low- 1216 (53.81%) norm- 837 (37.04%) high- 207 (9.15%)  
low SBP patients that have level 1 trauma: 100 (8.224%)  
low SBP patients that have level 2 trauma: 346 (28.454%)  
normal SBP patients that have level 1 trauma: 59 (7.049%)  
normal SBP patients that have level 2 trauma: 238 (28.435%)  
high SBP patients that have level 1 trauma: 16 (7.729%)  
high SBP patients that have level 2 trauma: 55 (26.570%)  
% of level 1 patients that have a SBP in a range that is: low: 57.143%, normal- 33.714%, high- 9.143%  
% of level 2 patients that have a SBP in a range that is: low: 54.147%, normal- 37.246%, high- 8.607%

## **RR analysis**

# of RR rows in the following categories: low- 7(0.27%) norm- 1442 (56.24%) high- 1115 (43.49%)  
low RR patients that have level 1 trauma: 4 (57.143%)  
low RR patients that have level 2 trauma: 1 (14.286%)  
normal RR patients that have level 1 trauma: 95 (6.588%)  
normal RR patients that have level 2 trauma: 395 (27.393%)  
high RR patients that have level 1 trauma: 82 (7.354%)  
high RR patients that have level 2 trauma: 280 (25.112%)  
% of level 1 patients that have a RR in a range that is: low: 2.210%, normal- 52.486%, high- 45.304%  
% of level 2 patients that have a RR in a range that is: low: 0.148%, normal- 58.432%, high- 41.420%

## **Conclusion:**

It is rare for any patient to have a high SBP (9%). It is very rare for any patient (lvl 1 or otherwise) to have a respiratory rate of under 12 (0.27%!). However, if a patient has a low RR, they are often level 1 (57% of all low rr patients are lvl 1). Both level 1 and level 2 patients tend to have low to normal sbp’s and normal to high rr’s. Level 2 patients are more likely to have normal SBP’s and RR’s than level 1 patients.

# Null values percentage in each column

There are several null values in the dataset. While analyzing the dataset, Calculation of the percentage of null values in each column of the dataset is important.

So if there are many null values in the dataset it is better to drop the column. Hence it is very much essential to find the null values in each column.

While considering the fall height, the count is taken for the number of NA, ND and BL values. The percentage of null values in fall height is then calculated eventually.

The percentage of null values in fall height is 27.199

The same process is followed for the other columns in the dataset and the null value percentage is calculated.

The null values percentage in trauma type is 0.0237.

The null values percentage in total vent days is 30.503.

The null values percentage in mv speed is 27.42.

The null values percentage in child restraint is 30.06.

The null values percentages in safety equipment issues is 29.792.

The percentage of null values in patient position is 23.642.

The percentage of null values in airbag deploy is 28.954.

The minor percentage of null values is noticed for few fields like the brain injury, field shock index, field HR, field SBP, transport mode and these cannot be discarded.