

Sexual Assault on Mexico City

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1. Introduction

1.1. Background

On the last November the governor of Mexico City: PhD. Claudia Sheinbaum declared a state of emergency called: "Gender Violence Alert" due to the increasing sexual harassment around the entire city, although the big amount of information available the overlook it is not very intuitive to understand the magnitude of the situation.

1.2. Problem

In this project, we will try to unravel the data provided by the Mexico City (CDMX) government about the Sexual Assault on it and about the gender violence alert that the city is suffering through.

In the last 5 years it became more evident the increase of "violent sexual assault crimes on the streets" formally called as "Rape", we will navigate through the raw information and make it understandable and easy to assimilate for any concerned citizen aware of this severe problem and proportionate a fidelity map based on reliable source of information to graphically understand the problem.

2. Data acquisition and cleaning

2.1. Data source

- We obtained the data from the most reliable source in this matter, the public database of all the opened investigations by the Justice Department A.K.A "Procuraduria General de justicia".
- Geojson file with the exact location and delimitation of all the CDMX boroughs.
- Database of the reported crimes with known addresses and an aggregate of "Latitude" and "Longitude" obtained for the previous wrangled API consult.

2.2. Data cleaning

For consistency purposes, we will ignore the crime reports with a reported borough different from the 16 official Boroughs established on Mexico City, and for our "point map", we will either exclude the crime reports without Lat., Long. Data in other words with unknown location.

The consults were made one by one because they have different url, and we took in count only the data obtained since 2016 because that was the year that the open investigations became a digital reliable source.

We made two subdivisions per year, each year have a table grouped by Months of the year and a table grouped by boroughs.

In the scope of this project, we are considering crimes strictly categorized as "Rape", defined as "unlawful sexual activity and usually sexual intercourse carried out forcibly or under threat of injury against a person's will by violent means".

We will step aside the other crime categories like "Rape equivalent", " Sexual harassment", "familiar sexual harassment" because most of them are defined as injuries against a person's will or with a person who is beneath a certain age or incapable of valid consent because of mental illness or mental deficiency but not necessarily violent or committed by an unknown perpetrator.

1 :

	Month	Crime_rate_2016
0	Jan	49
1	Feb	49
2	Mar	30
3	Apr	25
4	May	45

	Alcaldia	Crime_rate_2016
0	ALVARO OBREGON	33
1	AZCAPOTZALCO	13
2	BENITO JUAREZ	15
3	COYOACAN	48
4	CUAJIMALPA DE MORELOS	5

Then we merge the eight tables of the four analyzed years into two tables, Months and Boroughs respectively.

	Crime_rate_2016	Crime_rate_2017	Crime_rate_2018	Crime_rate_2019
Month				
Jan	49	20	126	107
Feb	49	21	107	94
Mar	30	16	81	75
Apr	25	21	69	77
May	45	29	102	84
Jun	49	22	77	80
Jul	58	22	97	93
Aug	29	26	119	79
Sep	56	22	91	75
Oct	29	16	94	108
Nov	31	23	98	93
Dec	52	16	83	2

	Crime_rate_2016	Crime_rate_2017	Crime_rate_2018	Crime_rate_2019
Alcaldia				
ALVARO OBREGON	33	15	74	121
AZCAPOTZALCO	13	4	25	28
BENITO JUAREZ	15	12	26	32
COYOACAN	48	19	116	57
CUAJIMALPA DE MORELOS	5	7	14	28
CUAUHTEMOC	73	48	185	147
GUSTAVO A MADERO	36	32	122	92
IZTACALCO	17	9	40	28
IZTAPALAPA	107	30	265	169
LA MAGDALENA CONTRERAS	13	6	17	10
MIGUEL HIDALGO	24	10	33	51
MILPA ALTA	7	5	9	15
TLAHUAC	19	8	48	34
TLALPAN	43	18	60	63
VENUSTIANO CARRANZA	14	17	55	44
XOCHIMILCO	35	14	55	48

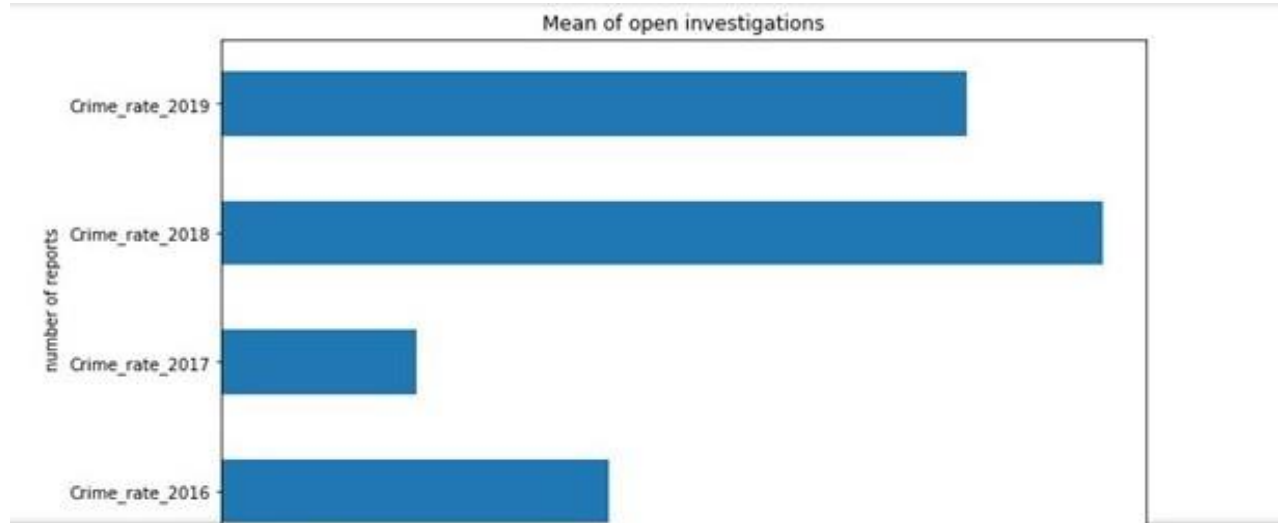
In addition, we checked the statistics of the occurrence by Month.

	index	mean	min	max
Crime_rate_2016	41.833333	25.0	58.0	
Crime_rate_2017	21.166667	16.0	29.0	
Crime_rate_2018	95.333333	69.0	126.0	
Crime_rate_2019	80.583333	2.0	108.0	

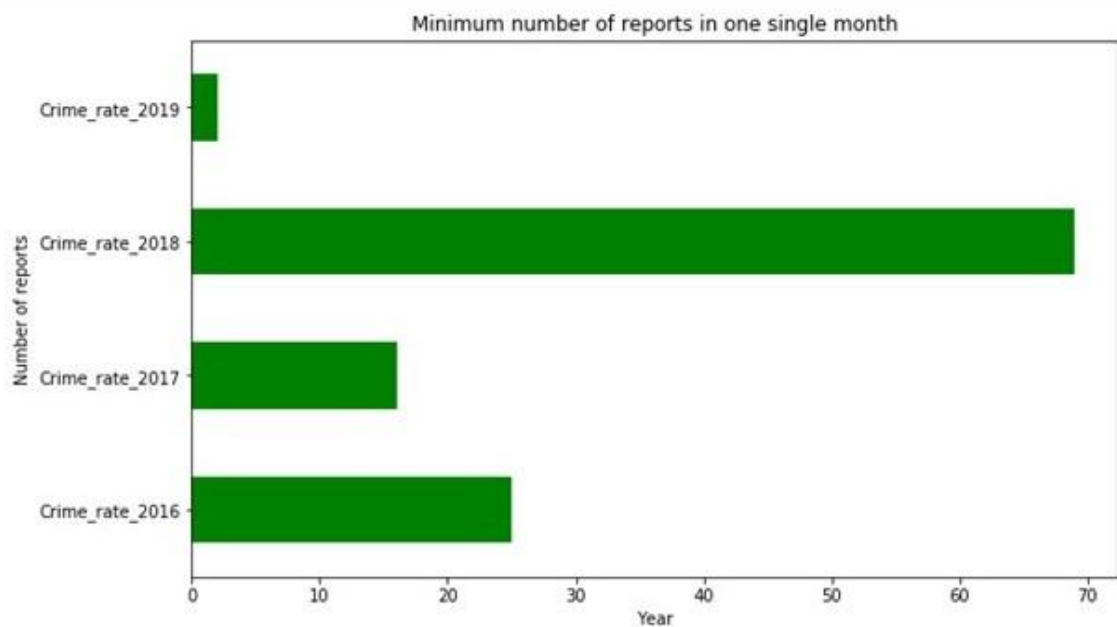
Visual Data Analysis

2.3. Data charts

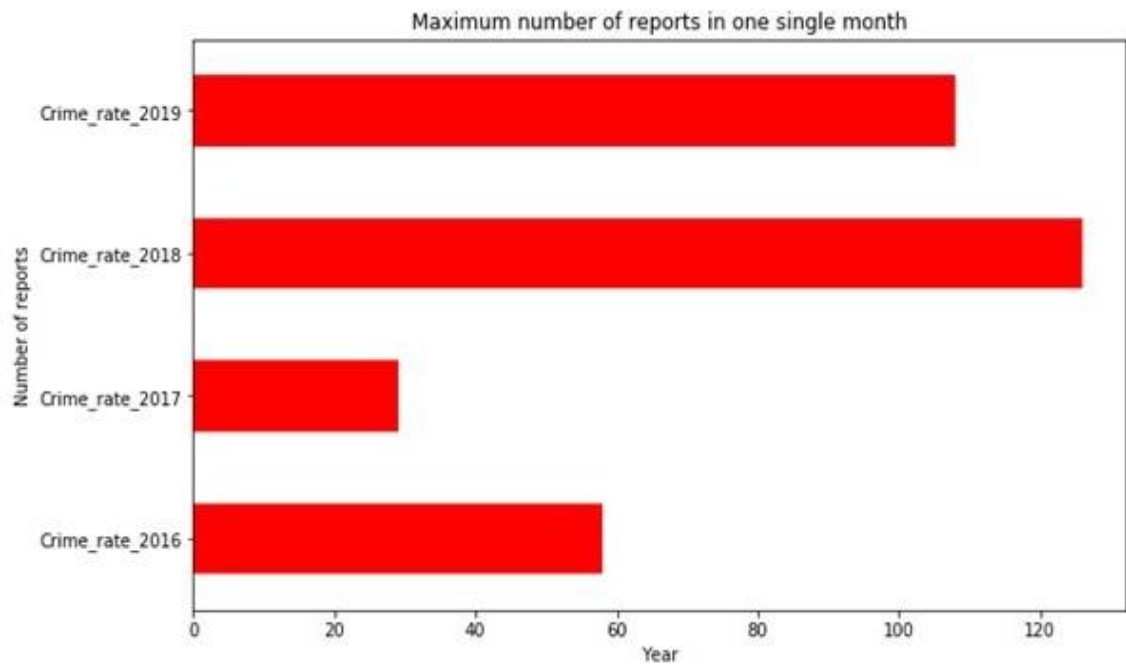
Mean of Sexual crime rate by year, the highest mean was from year 2018 with 95.33 open investigations on rape:



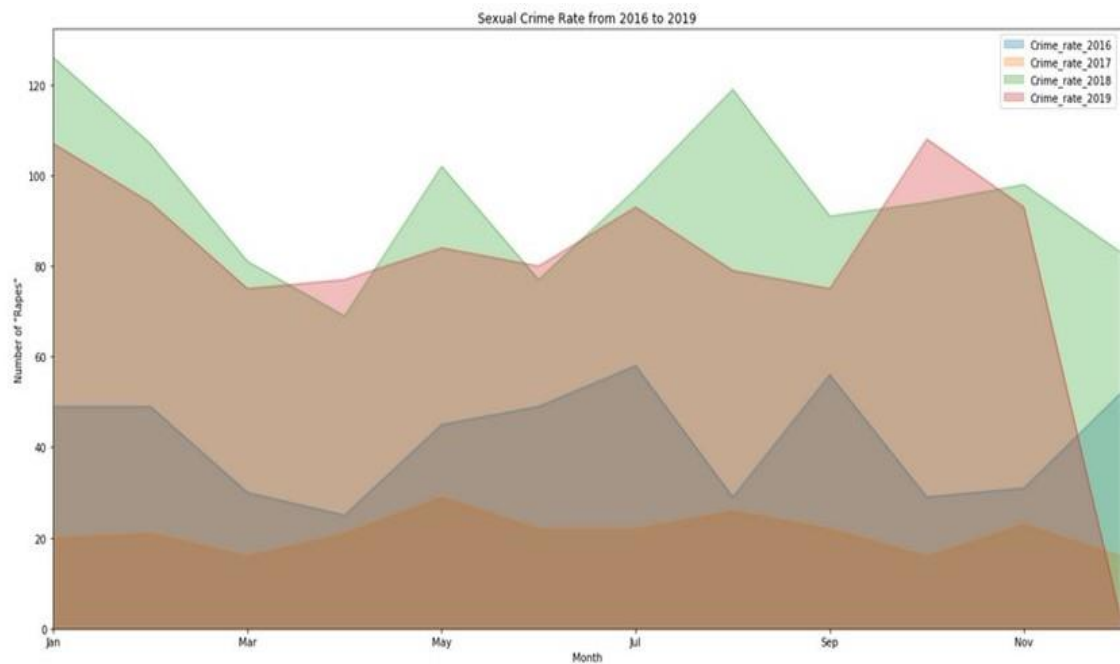
By the graph below, we can see that 2019 was the year with fewer reports on a single month, exactly on December 2019 with only 2 reports.



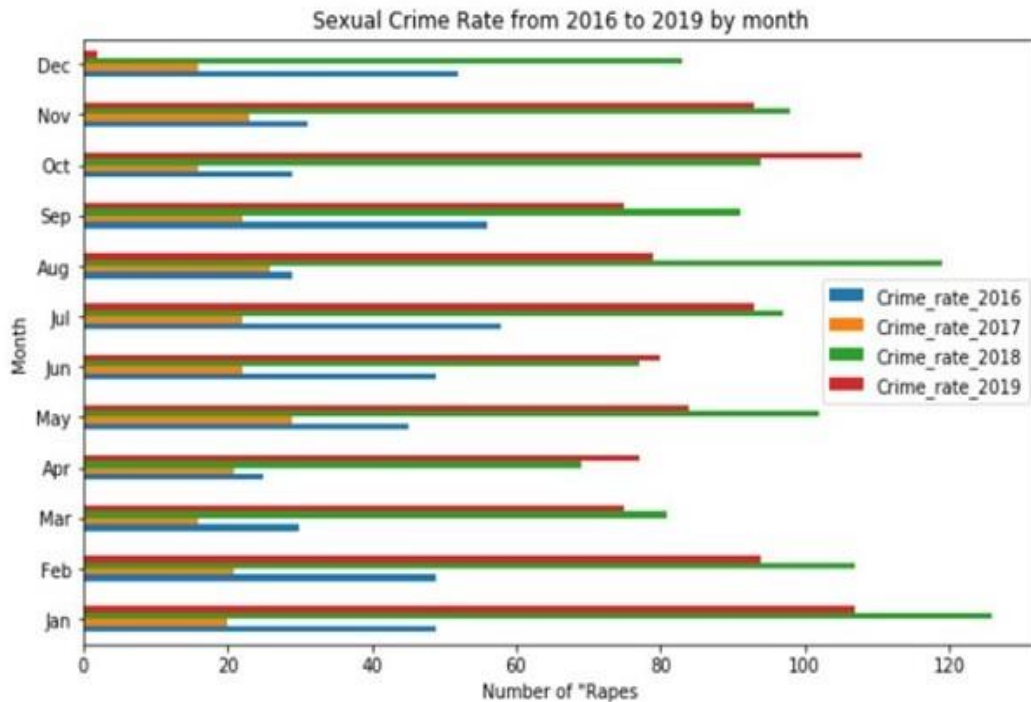
By the graph below, we can see that 2018 was the year with the highest number of reports on a single month, exactly on January 2018 with 126 reports.



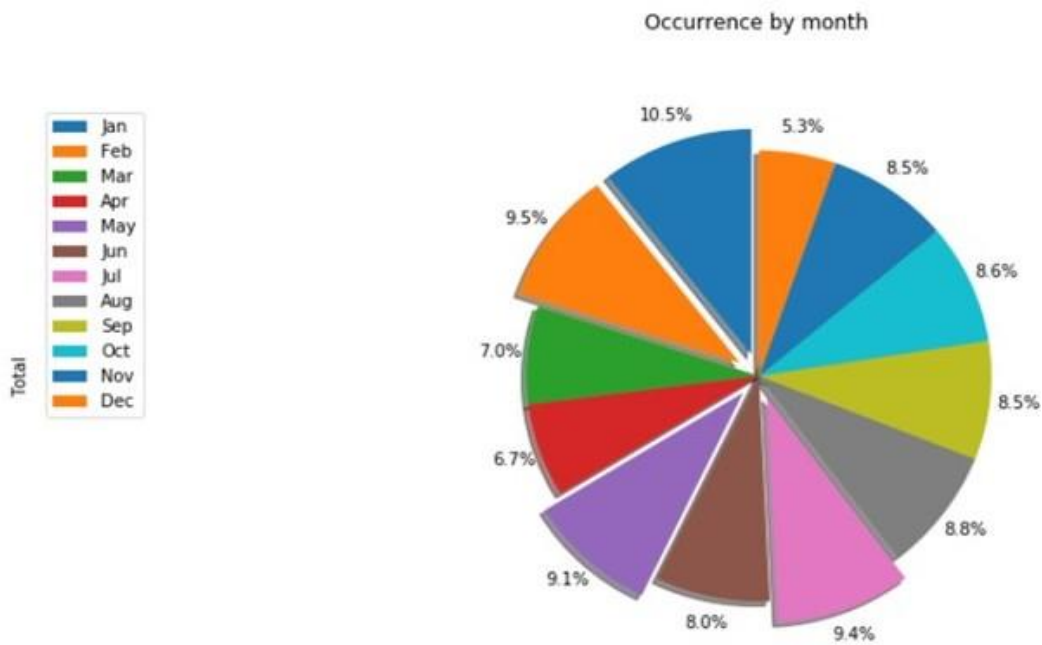
The graph below shows the behavior of the reported sexual crimes respect time, during the past 4 years we can see significant peaks on years 2016 and 2018 respectively.



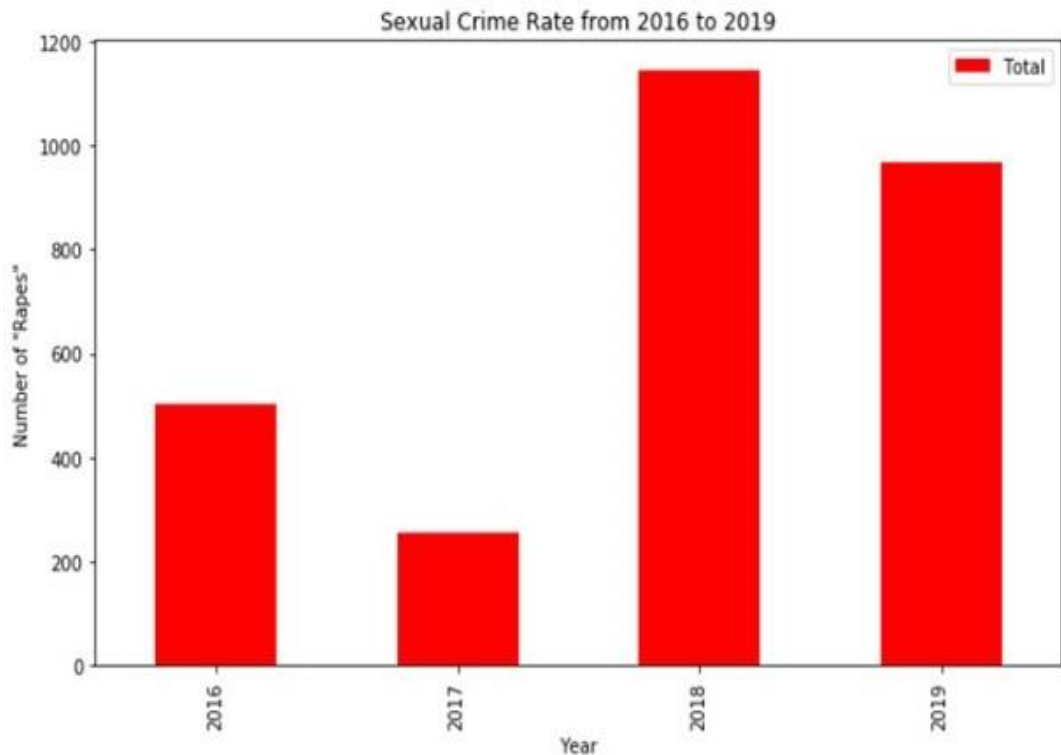
The graph below shows the behavior of the reported sexual crimes every month during the past 4 years it is another perspective for the area plot, here we can clearly see that January and August are both the most consistently dangerous months along the 4 years.



The pie chart below shows the crime occurrence by month being the most active ones: "January, February, May and July" with more than 9 percent of occurrence each.

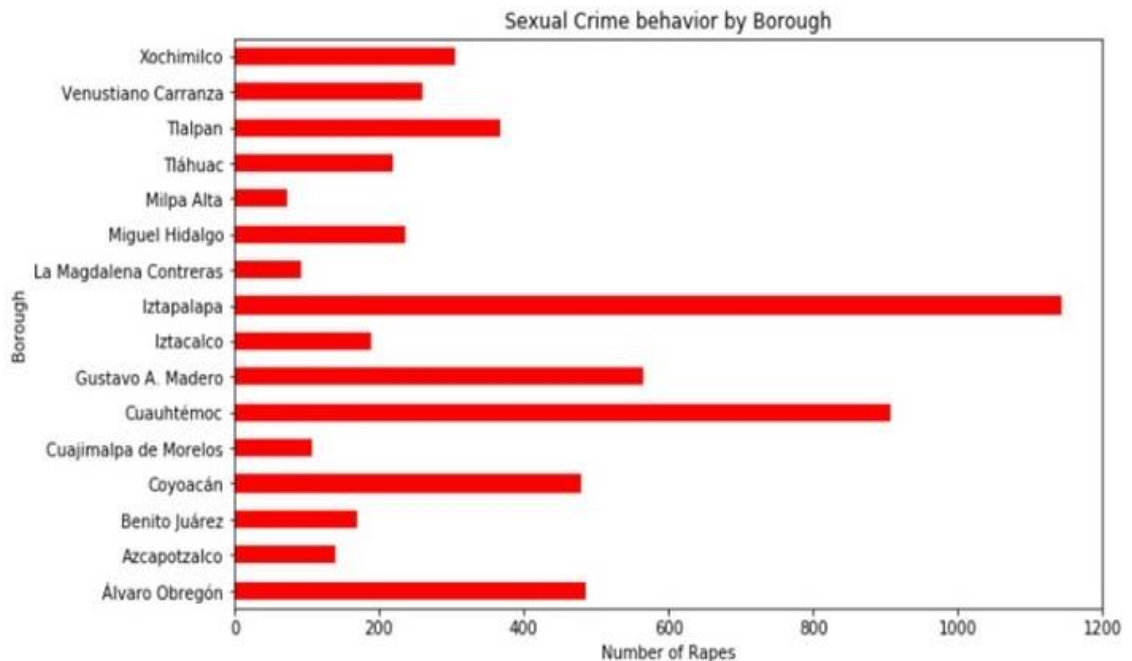


The graph above shows the behavior of the reported sexual crimes by year during the past 4 years, we can see that 2018 was the most dangerous year for women with 1144 reported Rapes.

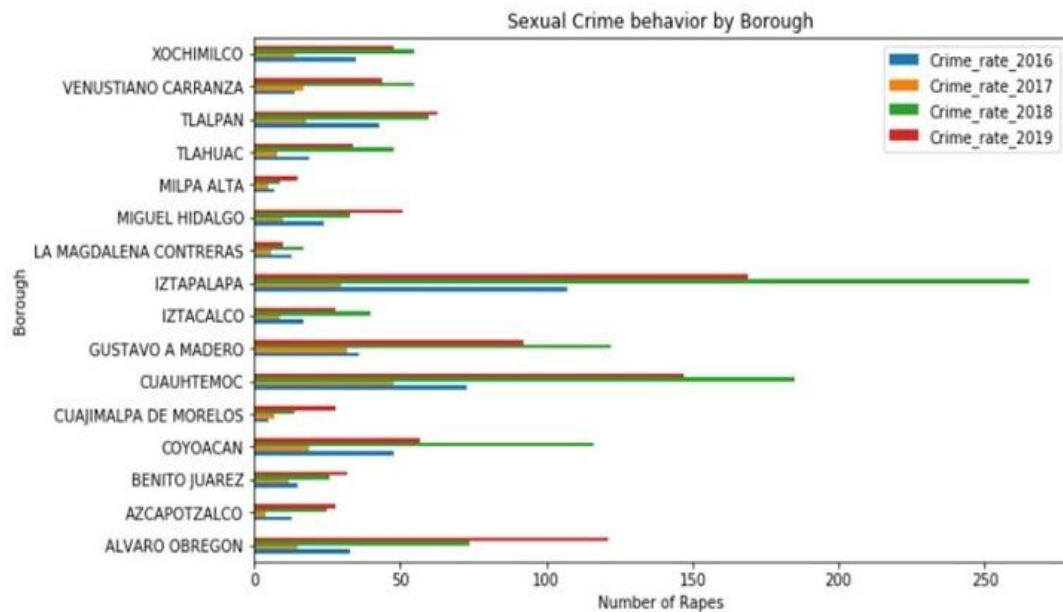


Now we present the charts by borough:

On the graph below, we can see that the most dangerous boroughs are Iztapalapa and Cuauhtémoc with 1142 and 906 open investigations respectively since 2016 to 2019.



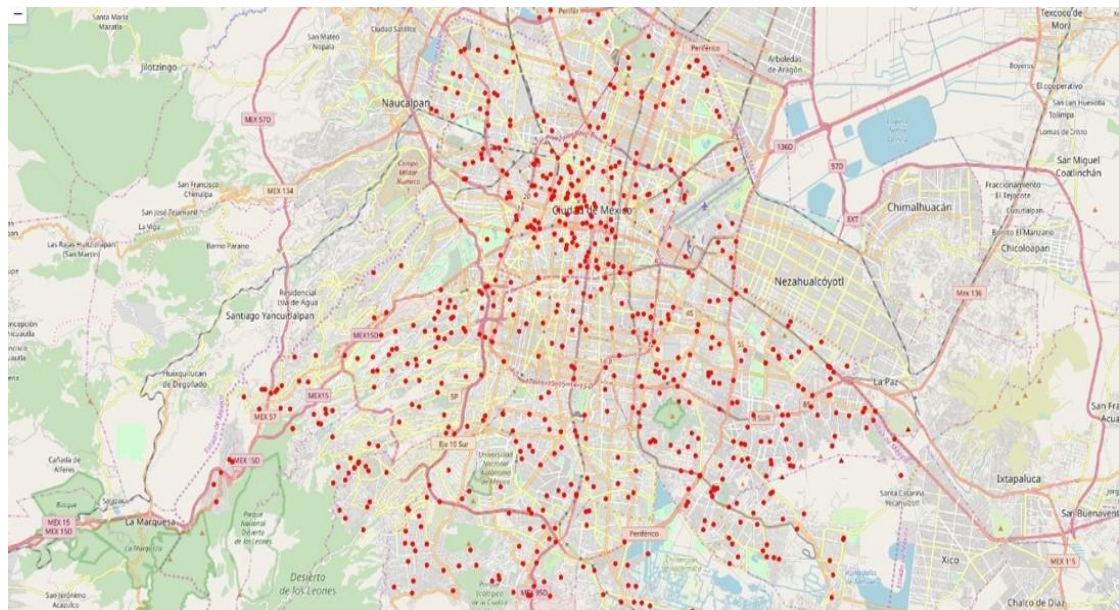
Even distributed by years individually, Iztapalapa and Cuauhtemoc keep the title of most dangerous zones both with significant peaks on year 2018 as the chart below shows:



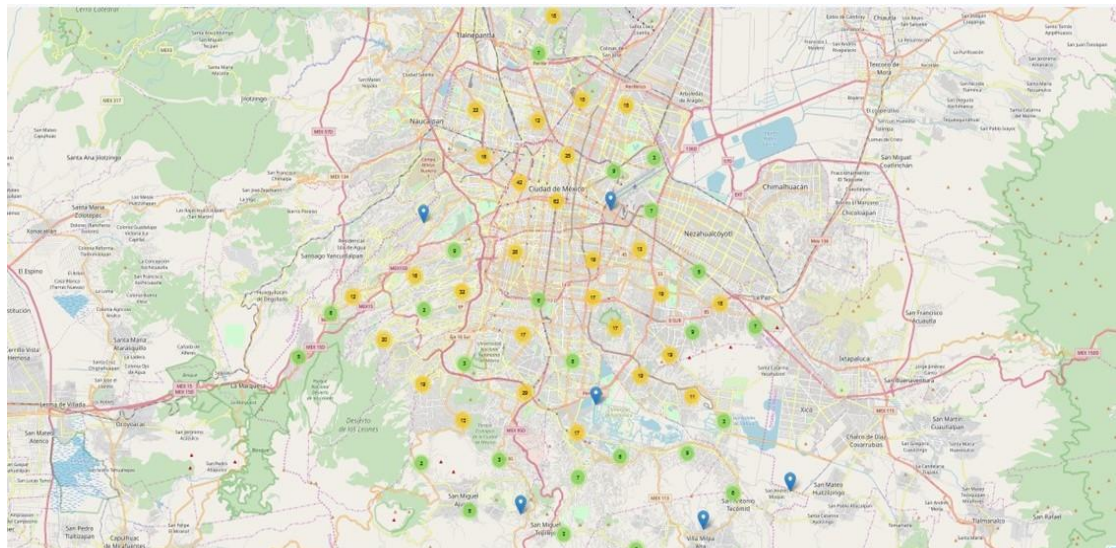
2.4. Location map

On year 2019, we have 1020 open investigations by sexual felonies but we only mapped 726 investigation with known address.

For this map below, we can overlook the occurrence around the city, each point represents a violent sexual attack, and almost every Borough contains a red dot; that's how a crisis looks like:

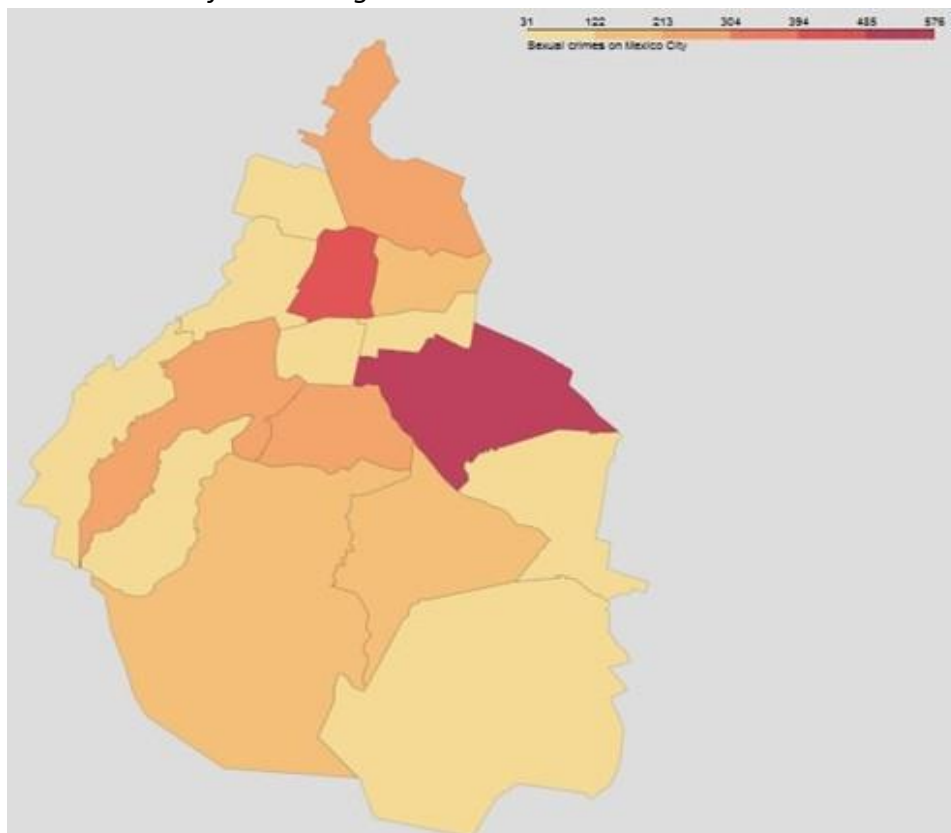


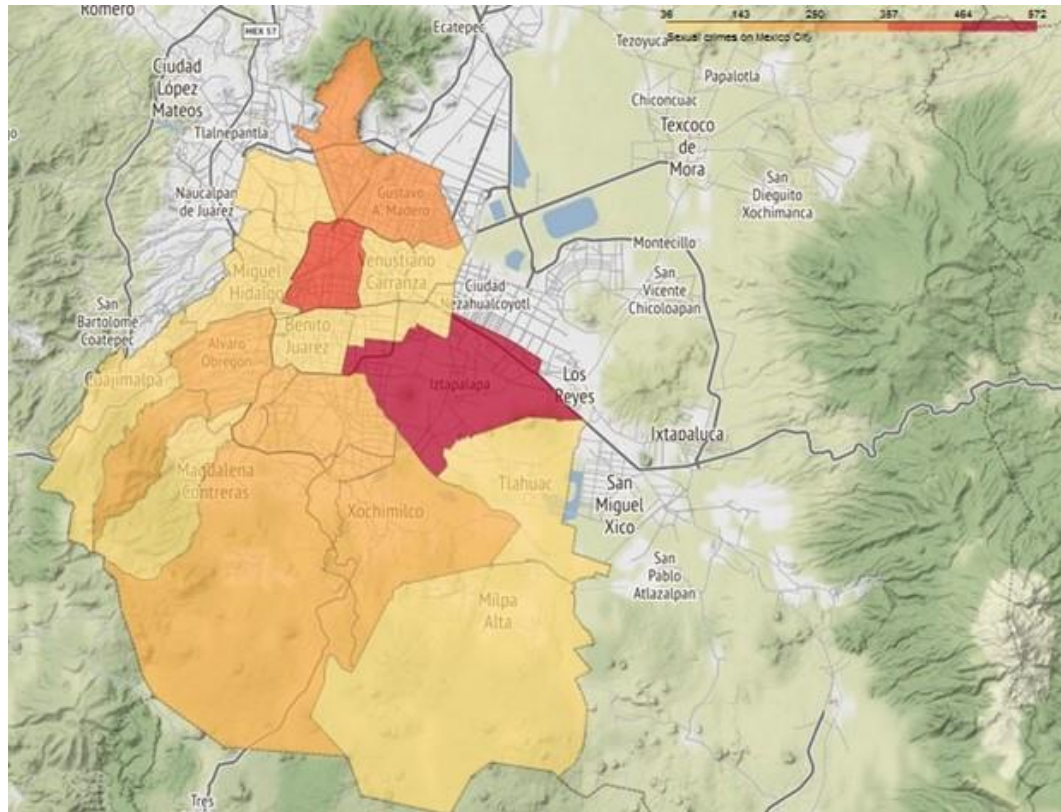
On this map below, we can overlook the occurrence around the city, each point represents a violent sexual attack, almost the entire city is covered with them and for aesthetic purposes, we have clustered the crimes.



2.5. Choropleth map

In contrast with the past map, to successfully fill a choropleth map we do not need an exact location point, only the Geojson file with the political divisions inside the city and the name of the borough where the crimes occurred.





3. Conclusions

Our analysis shows that the Sexual Assault crime has had a constant and continuous grow through the last 5 years.

We can see on charts that the year 2018 was by far the most dangerous year of the past lustrum, we now have clear insights that **"Iztapalapa", "Cuahutemoc and "Alvaro Obregon" are the 3 most dangerous "Boroughs" of the entire city**, it is not a coincidence that the 3 of them are on the northeast side of the city, adjoining "Estado de México" another well known "High risk Mexican state.

By plotting the "point" map, I personally felt concerned about that almost all Neighborhoods had at least one open investigation on Sexual assault speaking only of the past year 2019.

The past November the governor of Mexico City: PhD. **Claudia Sheinbaum** declared a state of emergency called: **"Gender Violence Alert"**, those actions in addition to many non-pacific protests around the city summoned by the pro-feminist groups, were immediately reflected in the numbers of December 2019 when only 2 open investigations were considered on the category of "rape".