Analysis of Police related information

Analysis and Visualization of Big Data

MSc Physics of Complex Systems and Biophysics

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Introduction

Catalonia is divided in 9 different police regions, RP. In these regions, there is a different amount of:

- Missing People Reports

- Average daily police ("Mossos d'Esquadra") patrols

- Waiting time between entering in a police office to file a complaint and being attended and number of visits

- Hate crimes
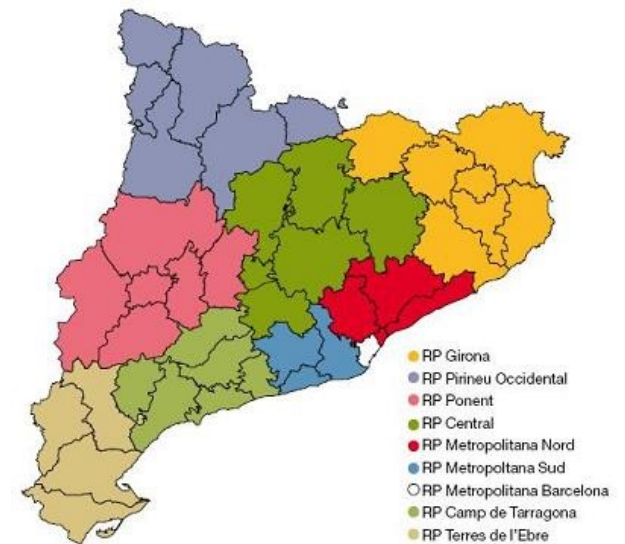
In this study, we want to find possible similarities between these factors.

The study is focused on the years 2020 and 2021.

Sources

- Dades obertes de Catalunya https://analisi.transparenciacatalunya.cat/

- Institut cartogràfic i geològic de Catalunya https://www.icgc.cat/ca/Descarregues/Cartografia-vectorial/Divisions-administratives

- Departament d'interior de la Generalitat de Catalunya and Nació digital https://www.naciodigital.cat/manresa/noticia/98203/denuncies-primer-estat-alarma-catalunya-pendents-tc)

- Institut d'Estadística de Catalunya https://www.idescat.cat/indicadors/?id=aec&n=15182

- AMB. Àrea metropolitana - municipis metropolitans, 2022 https://www.amb.cat/s/es/web/area-metropolitana/municipis-metropolitans.html
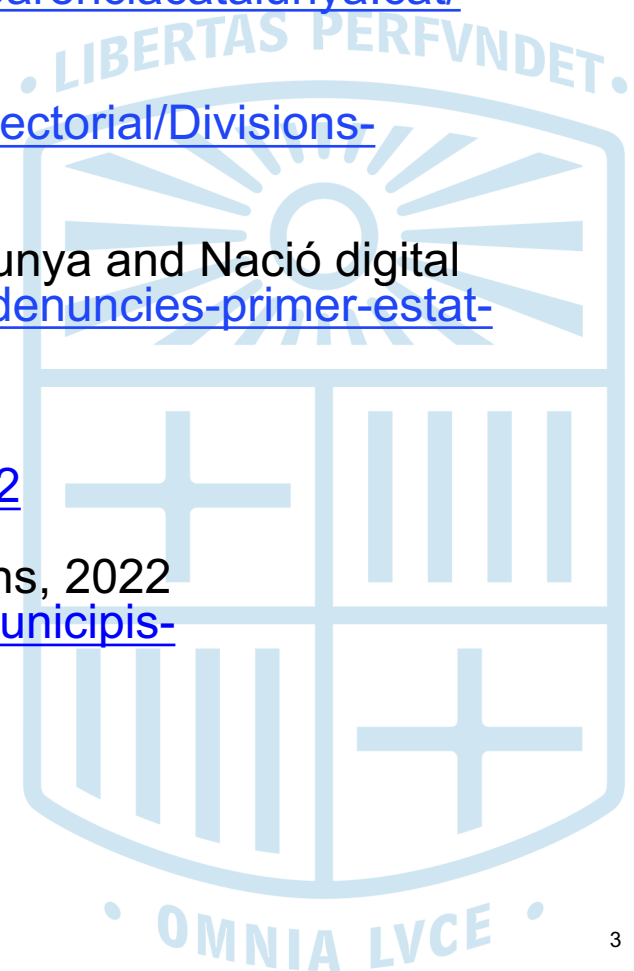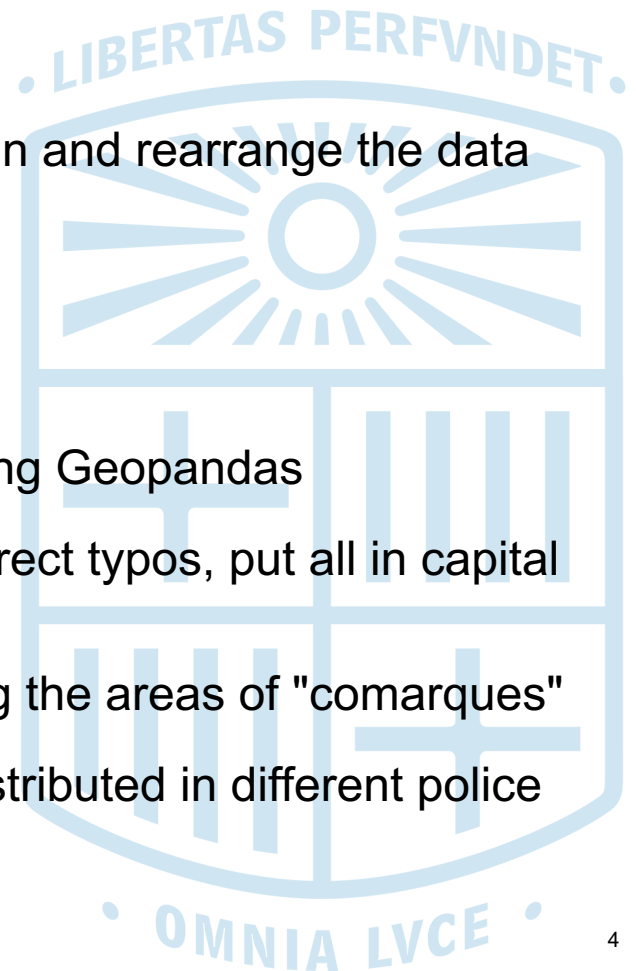
Methods

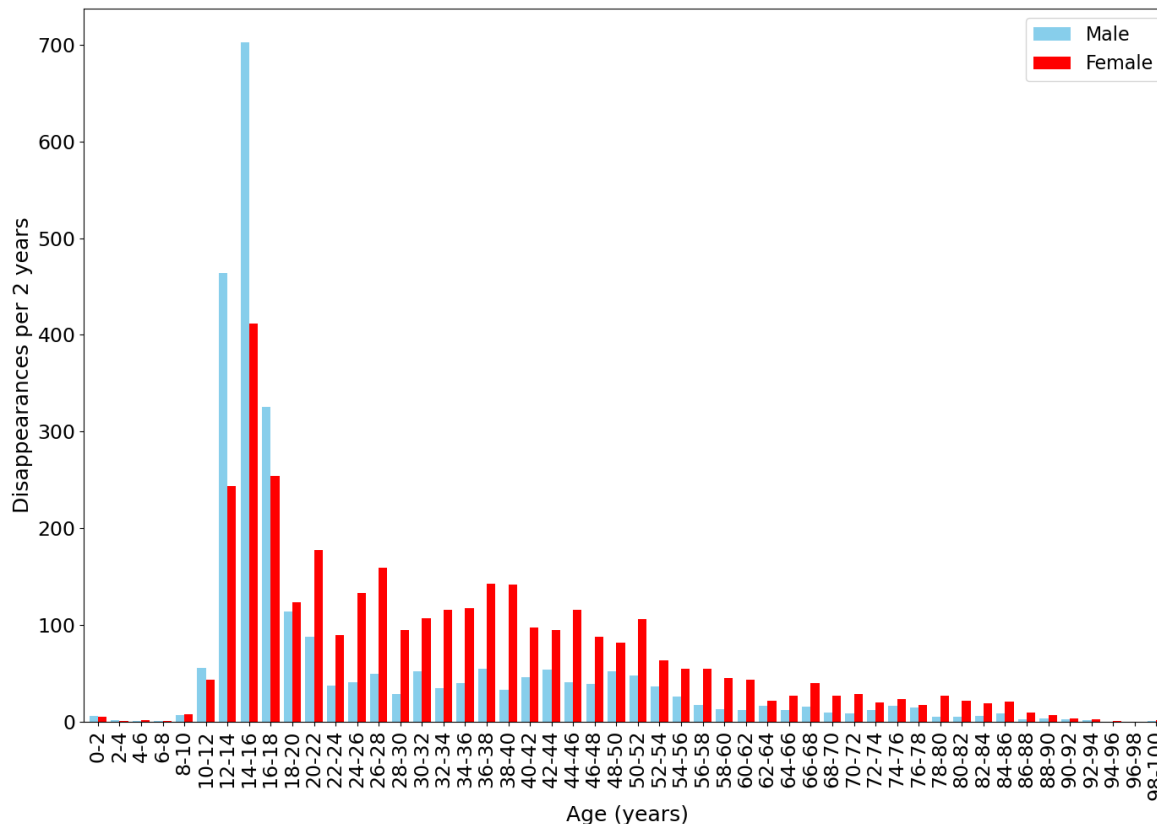Python Libraries used to analyse the data sets:

- Sodapy: To import the dataset from an online site

- Pandas & Geopandas: using Data Frames to contain and rearrange the data

- Matplotlib and seaborn: Plotting data

Data curation:

- Creating a new map of the Police Regions (RP) using Geopandas

- Convert all data into the same format and units: correct typos, put all in capital letters, have same measures of time.

- Create new data regarding the areas of RP by using the areas of "comarques"

- Consider that "Barcelonès" has its municipalities distributed in different police regions.

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Disappearance Reports

Data set:
- Date (2020-2021)
- **Police Region (RP)** ➡ Geopadas Data Frame
- **Gender**
- **Age** ➡ Bar plot: disappearances vs. age (women vs man)

Max at 14-16 years old for both genders

Adults (18-60):
- Women: 2273 disap.
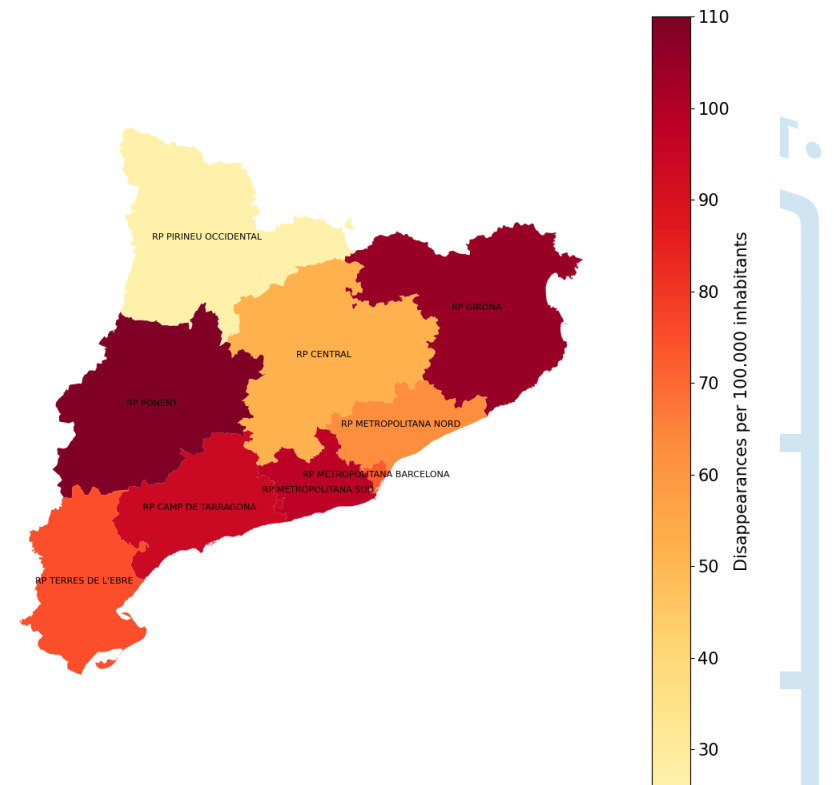- Men: 1026 disap.
- Gender violence?

Taking into account all ages:
- 57% disap. men
- 43% disap. women
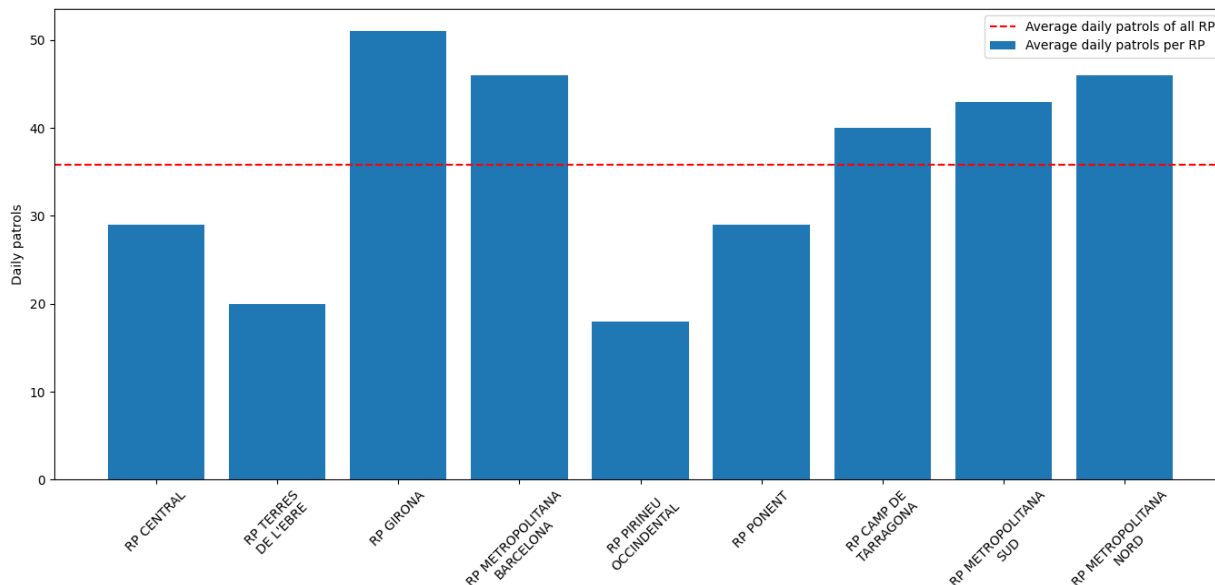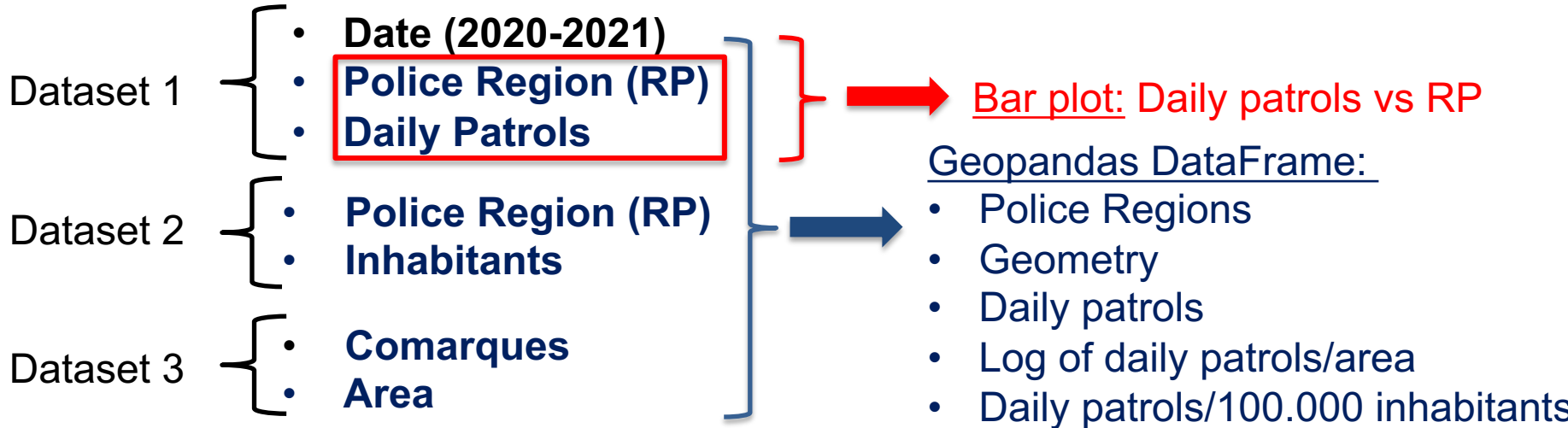
Disappearance Reports
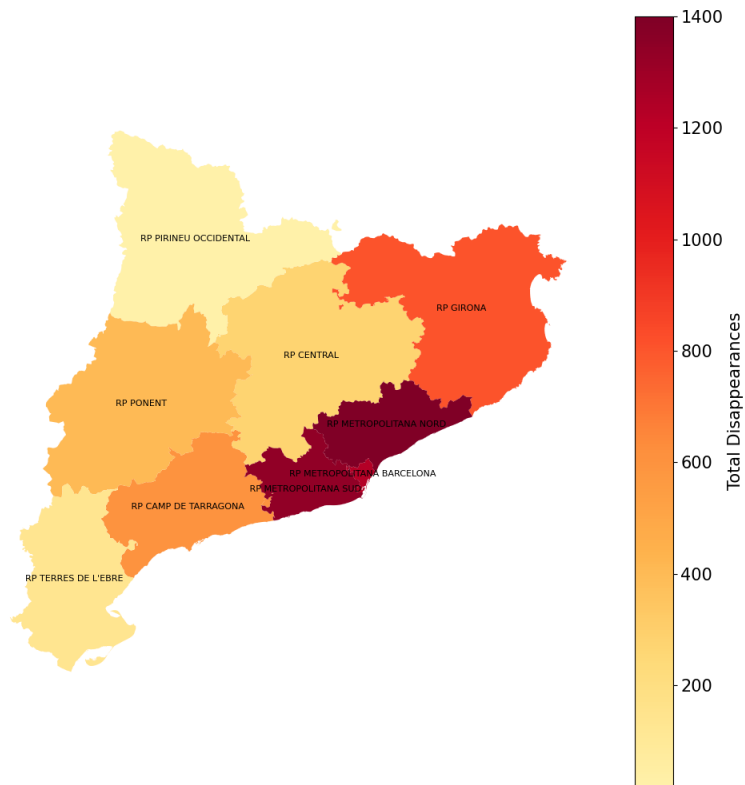
Most disappearances happen in Metropolitan areas of Barcelona (most crowded)

Most disappearance per 100.000 inhabitants in RP Ponent and RP Girona

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Daily Patrols

Dataset 1
- **Date (2020-2021)**
- **Police Region (RP)**
- **Daily Patrols**

→ Bar plot: Daily patrols vs RP

Dataset 2
- **Police Region (RP)**
- **Inhabitants**

Geopandas DataFrame:
- Police Regions
- Geometry
- Daily patrols
- Log of daily patrols/area
- Daily patrols/100.000 inhabitants

Dataset 3
- **Comarques**
- **Area**

Big differences between RP.

- Min.: RP Pirineu Occidental
- Max.: RP Girona

Daily Patrols
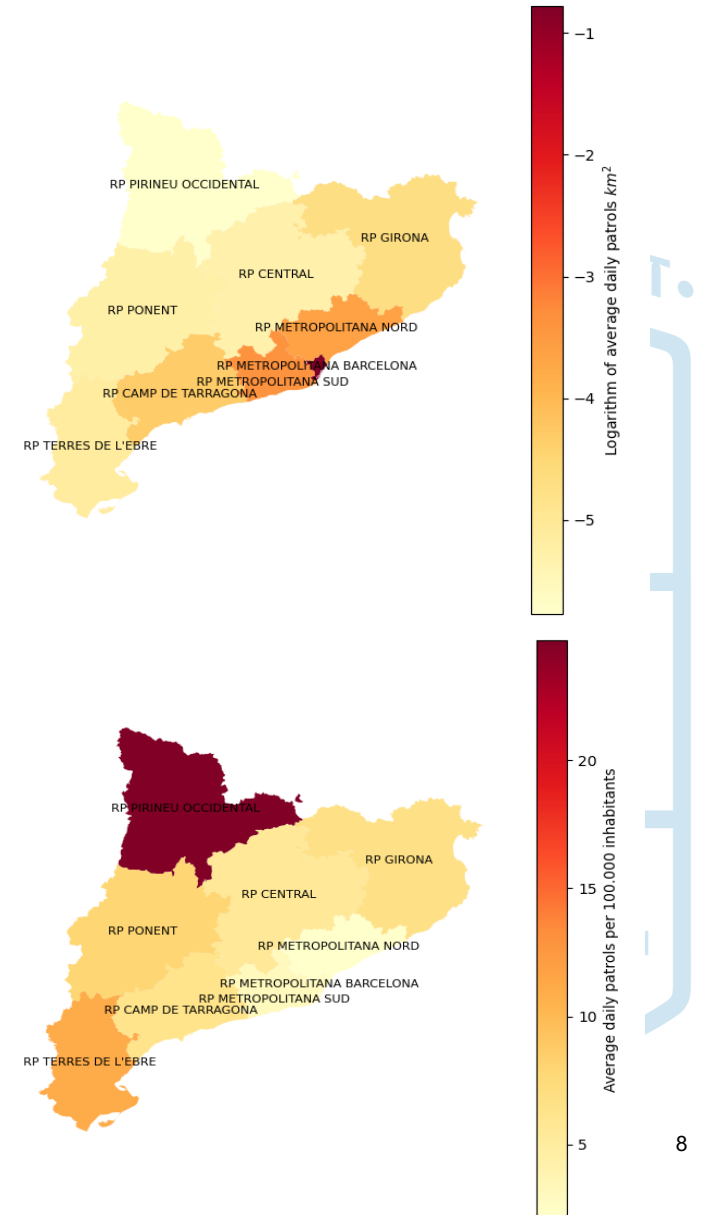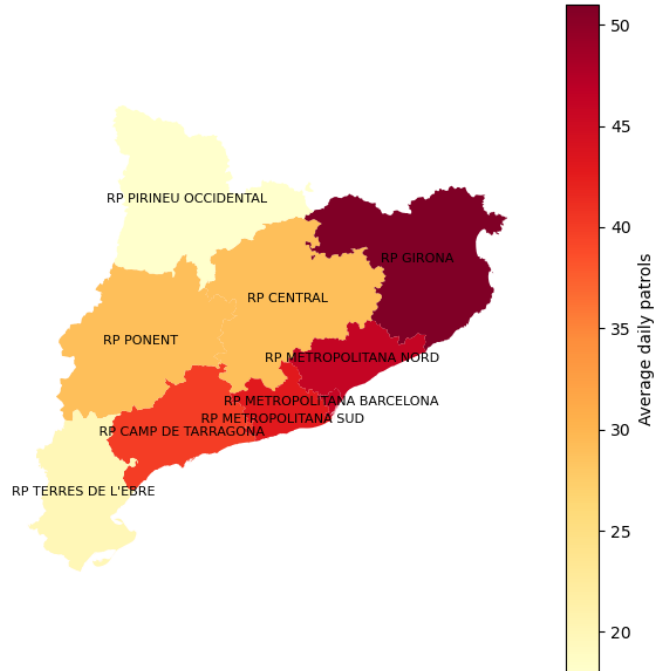
Daily patrols distributed differently between RP
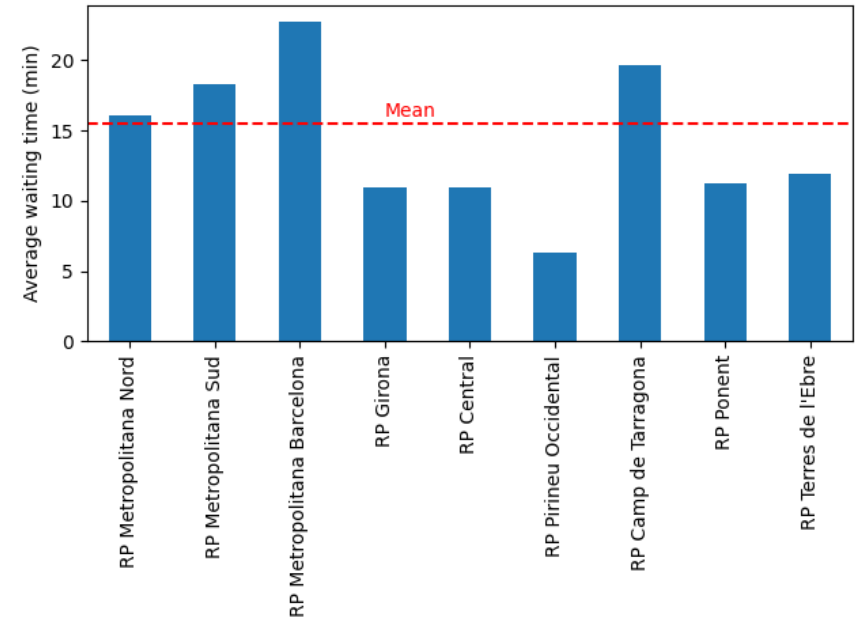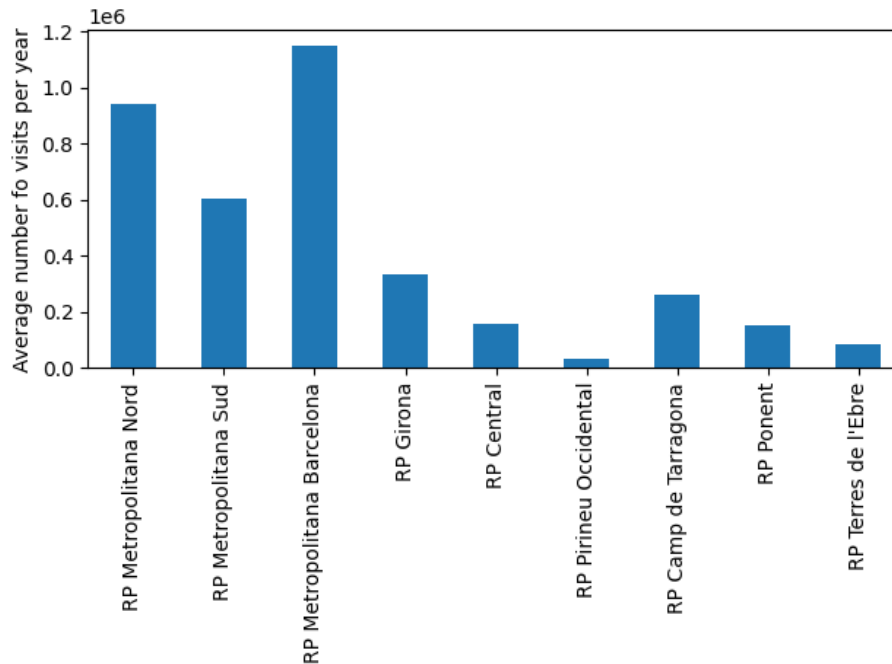Taking into account:

- **Area:**
  - <u>Most daily patrols:</u> RP Metropolitana BCN
  - <u>Less daily patrols:</u> RP Pirineu Occidental
- **Inhabitants:**
  - <u>Most daily patrols:</u> RP Pirineu Occidental
  - <u>Less daily patrols</u>: RP Metropolitanes
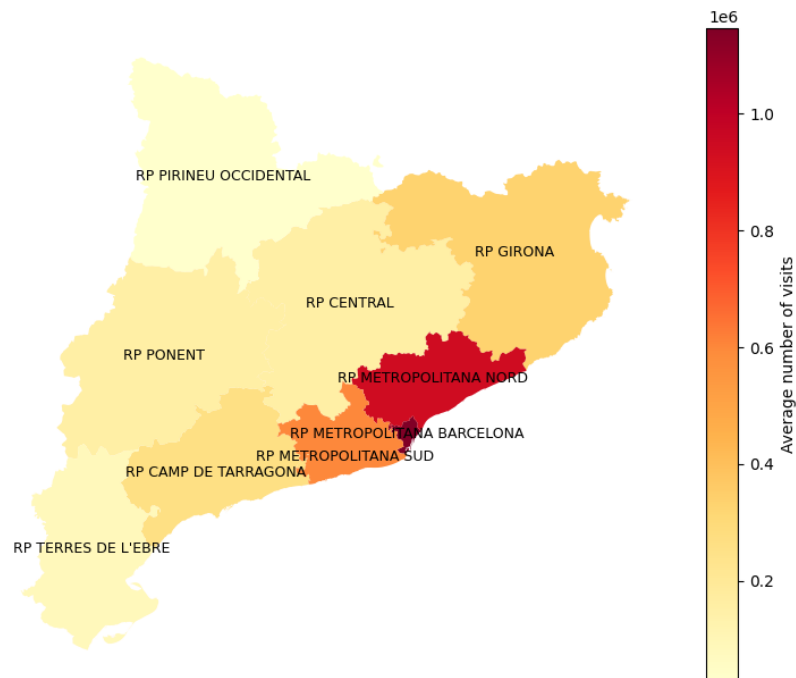
Number of visits and waiting time

Dataset:
- Data from 2011 to 2021, updated every month
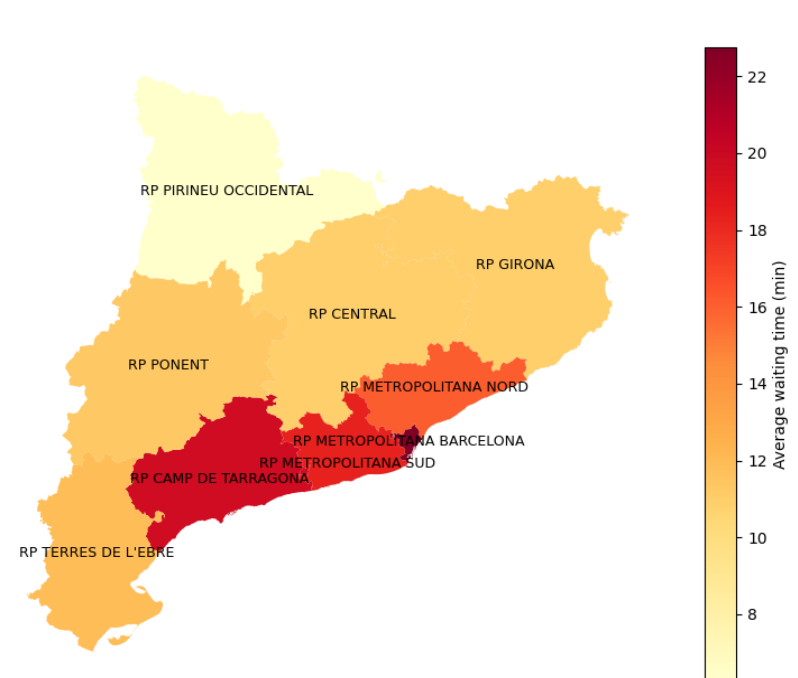- Number of visits
- Waiting time → Two bar plots for RP

- RP Metropolitana Barcelona has the highest number of visits and waiting time.
- RP Camp de Tarragona has big differences between its plots.
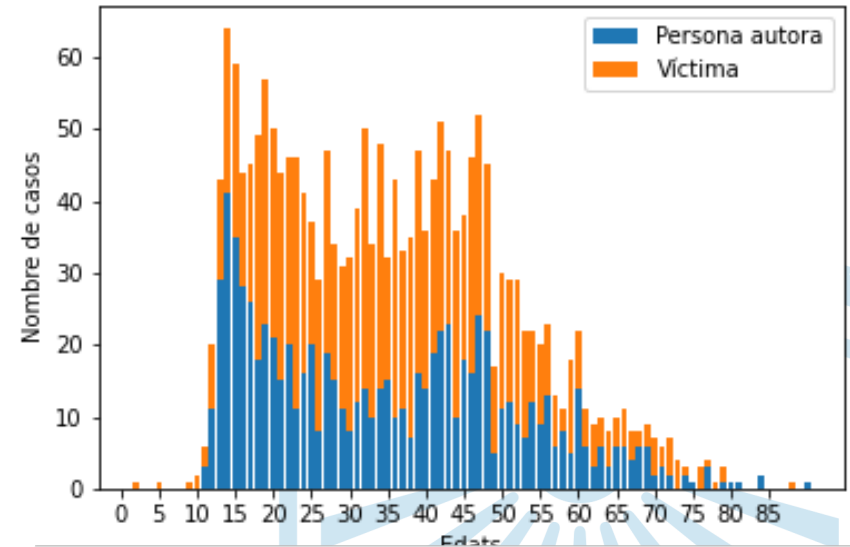
9

Number of visits and waiting time

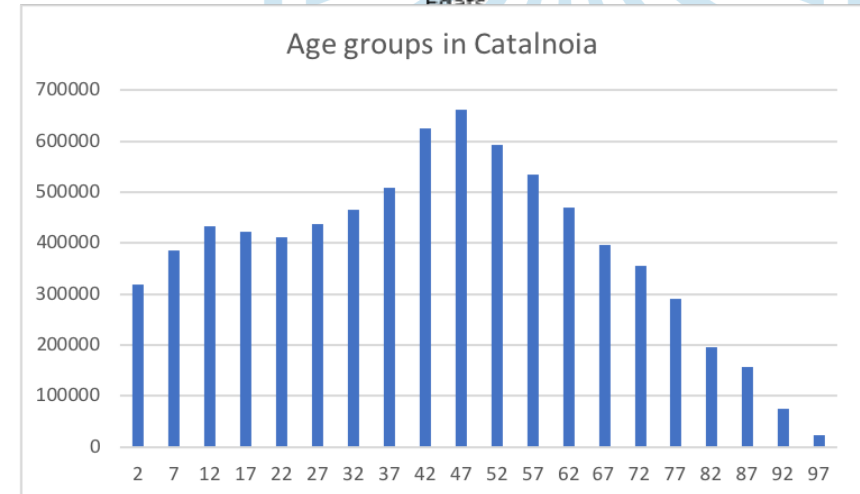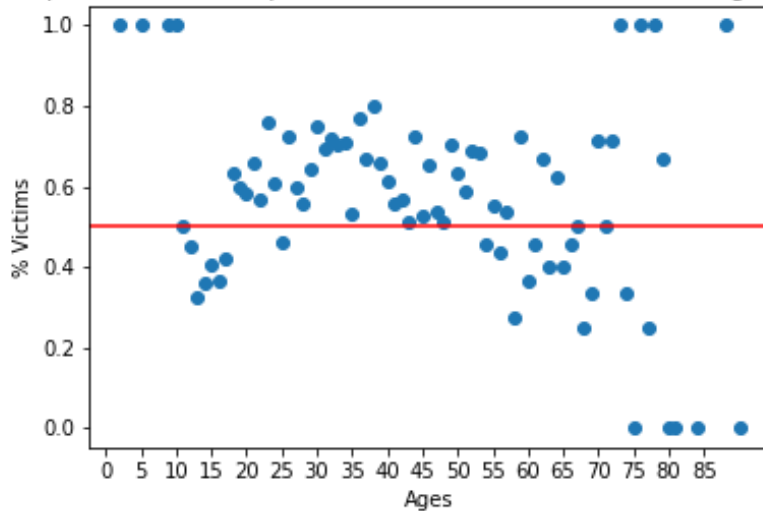High number of visits in Zona Metropolitana RPs.

High waiting time in Zona Metropolitana and Camp de Tarragona RPs.

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Hate Crimes

Dataset 1
- **Age**
- **Gender**
- **Agressor or Victim**
- **Police Region (RP)**

Dataset 2
- **Police Region (RP)**
- **Inhabitants**

Dataset 3
- ***Comarques***
- **Area**

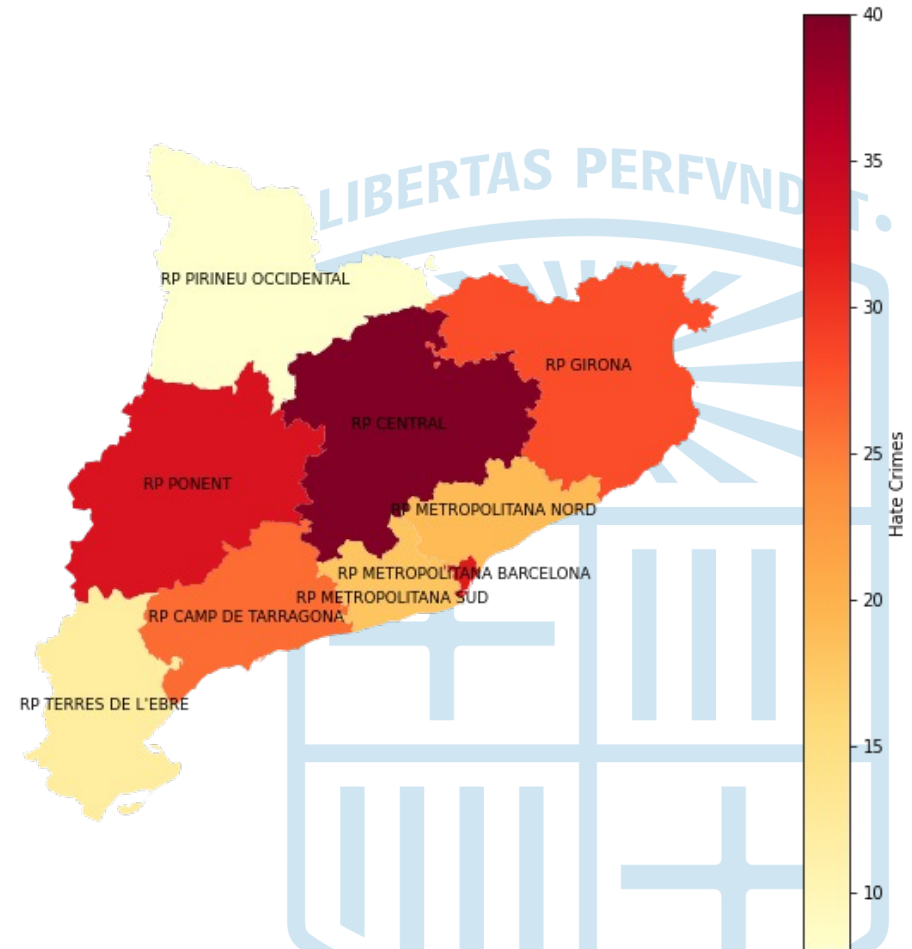Proportion of victims per total number of hate crimes on a given age

Age groups in Catalnoia

Women: 2/3 victims
Men: 1/2 victims

11

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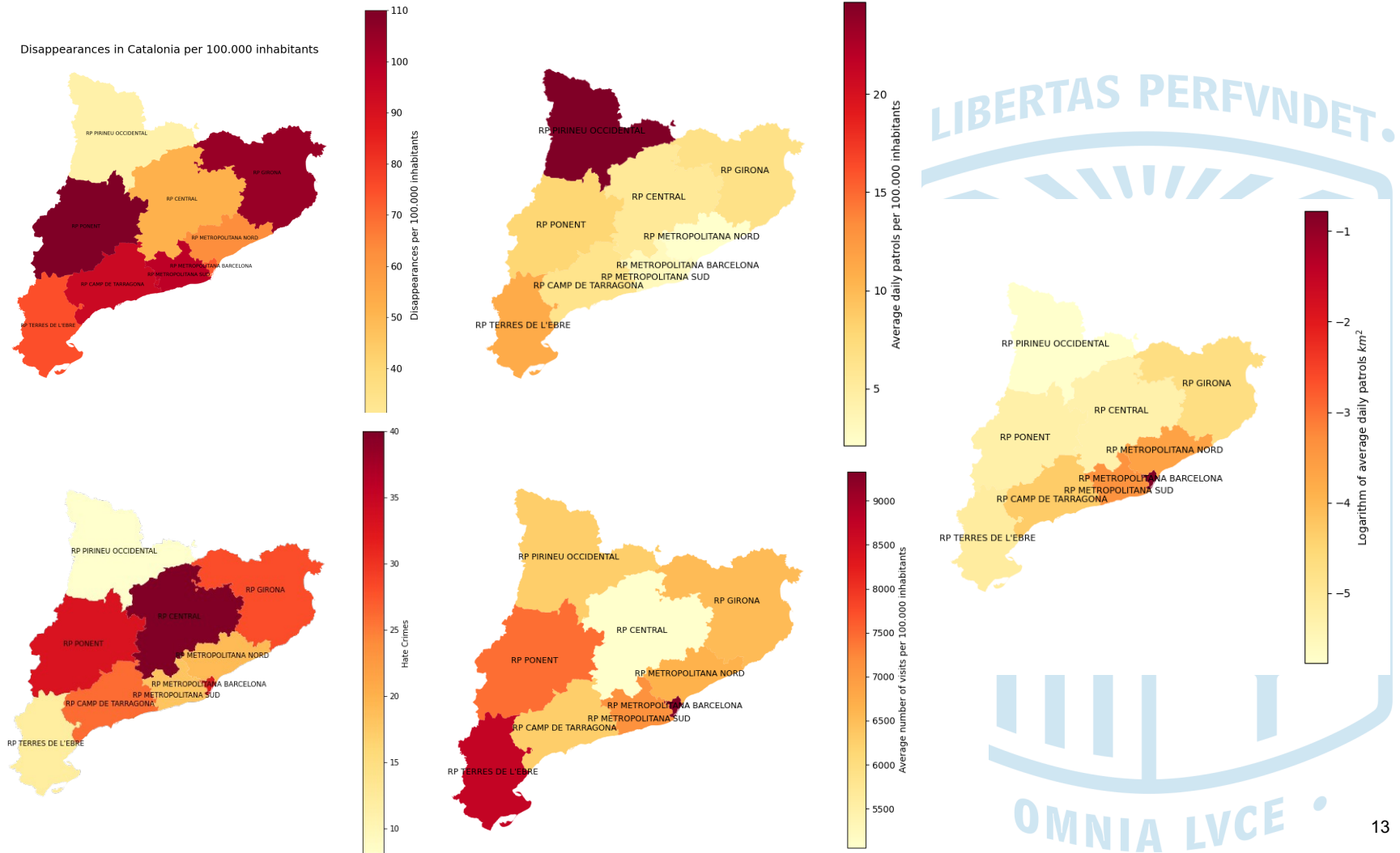
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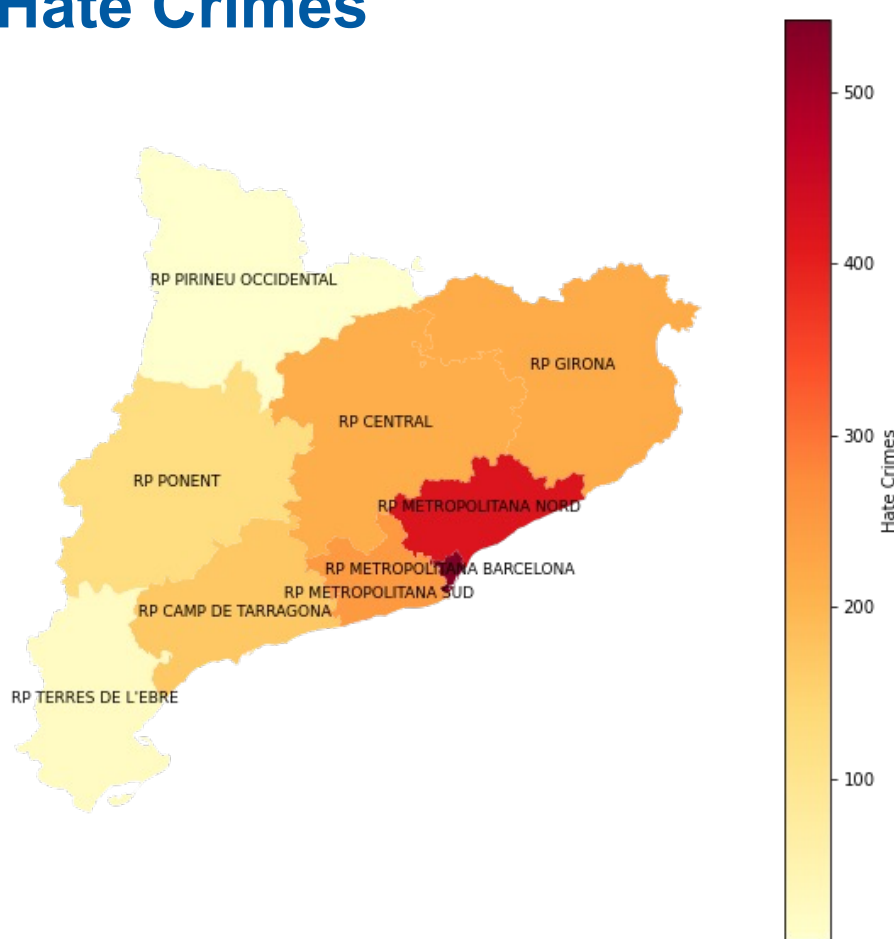
Hate Crimes

The RP with most hate crimes is RP Metropolitana BCN (most densely populated)

The RP with most hate crimes in ratio is RP Central followed by RP Oriental

Common results + Discussion

Disappearances in Catalonia per 100.000 inhabitants

Code and data availability

You can find the code and metadata in the project's GitHub repository:

https://github.com/robedamo/data_analysis_project

Thank you for your attention!!