

## MINI ARTICLE

# Waiting time between entering a police office and filling a complaint in Catalonia

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### Abstract

Police offices are necessary to help citizens file complaints, but the staff needs to be efficient. An study of the number of visits a police office receives is done to see the number of people that attend this buildings to file a report. Moreover, an study of the waiting time between entering the police department to file a complaint and actually being attended is done for the purpose of analysing police efficiency towards helping the citizen. The results were successfully analysed, but further research is necessary to complete the study.

**Keywords:** waiting time; complaints; police office; police efficiency

## 1. Background

The dataset analysed in this study has been extracted from *Dades obertes de Catalunya* [2]. It has been collected by the *Direcció General de Policia* from the *Departament d'Interior*, and it is still getting updated monthly since 2011. Every police office collects the data of the number of visits to file a complaint and the average waiting time between a person enters a police office and the complaint is actually attended. All this data is separated in different columns on the dataset alongside with the correspondent *Àrea Bàsica Policial*, the *Regió Policial* and the month when the data was taken. The methods applied to process the data are described in section 2.

I wanted to find if the police offices are efficient when filling a complaint, and compare the efficiency of the different RPs. When a person enters a police department to file a complaint, usually the situation is not comfortable and not desired, and probably the citizen wants to solve the issue as soon as possible. That is why we need workers committed to attend everyone efficiently. We are expecting to find a direct relationship between the number of visits and the waiting time, since the more inhabitants attend to police offices the higher should be the waiting time to being attended.

Also with my colleagues, we wanted to connect our respective studies in order to compare different aspects or issues in police administration and security in our country.

## 2. Methods

The dataset can be downloaded directly as a .csv file or importing the API in a code (as I did in this project). The Python code used to process and plot the data can be found inside my folder in the group's public GitHub repository ([https://github.com/robedamo/data\\_analysis\\_project](https://github.com/robedamo/data_analysis_project)) named as `code_data.py`, alongside the .png of the plots obtained and other necessary files. All the steps are well described and documented. The Python libraries needed were:

- **Socrata** from **Sodapy**: for importing the dataset into a variable directly from the API.
- **Numpy**: for array creation and some mathematical calculations.
- **Pandas**: for manipulating the data and working with a table-like object.
- **Geopandas**: for creating a heat map of the different RP.
- **Matplotlib**: for all the plotting.

The version of Python and the libraries are detailed in the group's repository.

The Catalanian territory can be separated in 59 different *Àrea Bàsica Policial* (ABP), and each one has at least one police office where citizens can attend in order to file a complaint. We grouped the different ABP (*Àrea Bàsica Policial*) into RPs (*Regió Policial*), that are listed and represented in [1].

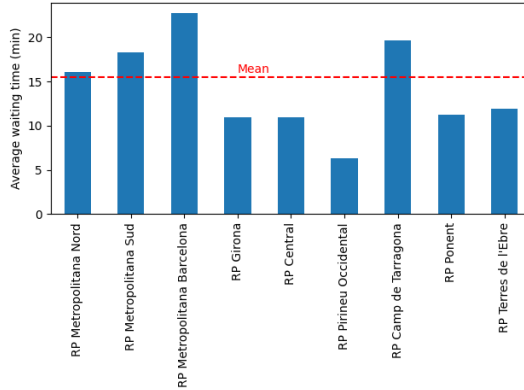
I performed some data transformations to obtain the desired results for the study. First, data from 2022 was deleted since I only wanted data from 2011 to 2021, and data from *Divisió de Transport* RP was erased, since it is not useful when comparing the data with my colleague's studies. Then, I corrected some typos regarding to how *RP Metropolitana Nord* was written and converted the waiting time into minutes. From here, I computed the mean of the number of visits and the waiting time for all years and for every RP and collected the data into a new dataframe. From there, using **Matplotlib** I created the bar plots shown in section 3.

Finally, I created a **Geopandas** dataframe to associate the data obtained to a certain geometry (the RP shapes). With this new dataframe I created two heat maps of Catalonia separated into the different police regions with the values of the average number of visits and waiting time, a more representative way of presenting the data.

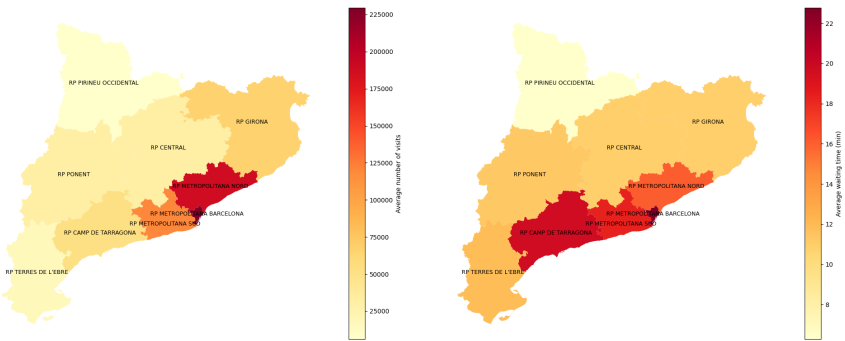
At the end of the code, the number of visits and waiting time are normalized to the population in each RP, but the results obtained were only shown in the group's presentation since they were created to relate our different studies.

### 3. Results

As we can see in Fig. 1, the average waiting time in every RP varies drastically. For RP Girona, Central, Ponent and Terres de l'Ebre the waiting time is almost the same. The higher waiting times are for RP Metropolitana Barcelona and Camp de Tarragona. Of course, the lower the waiting time the more satisfied a citizen that attends to a police department will be.



**Figure 1.** Average waiting time (in minutes) between entering a police office and filling a complaint for each police region (RP). The mean of all the values is shown as the red dashed line.



**Figure 2.** On the left, the average number of visits that every RP gets. On the right, the average waiting time between entering a police office and filling a complaint in every RP.

In the right plot in Fig. 2 I presented the same data as Fig. 1, but in a more representative way. The same police regions I mentioned before are more highlighted in red since their average waiting time is higher than in the other police regions. Now we can not see the mean of all RPs.

Comparing with the left plot in Fig. 2, the heat map almost looks the same as the right plot, but the police region of Camp de Tarragona is not as red-coloured as the three Metropolitana regions, showing that lots of citizens attend to a police department to file a complaint.

The number of inhabitants has a very high impact in these heat maps, since in regions like RP Metropolitana Barcelona the population density is very high, increasing this way the number of visits and the waiting time.

#### 4. Conclusions / Discussion

With respect to the results of Fig. 1, the three Metropolitana and Camp de Tarragona police regions could increase the number of police offices so the citizens would have more possibilities and there would be less accumulation of people waiting to be attended. This could maybe reduce the waiting time. Another possibility could be increasing the workforce and the staff that attends people when filling a complaint. The queues would be more fluid and the citizens would be more satisfied.

A possible way to analyse whether a police department is efficient is to compare the number of visits with the waiting time. If a police department has a low number of visits but a high average waiting time for being attended then we can consider that that police department is not efficient enough. This is exactly what we can see in Fig. 2 in RP Camp de Tarragona; it does not have a high number of visits, but the waiting time is of the same order or higher than in the Metropolitana police regions, which is concerning. Regarding the other RPs, the number of visits are very low (since the population density is lower) and the waiting time is under the whole Catalonia mean.

In conclusion, this study has compelling results that show us the regions where the police offices attend people faster although there is high number of visits, and thus attending more efficiently. A good time and situation management are essential to successfully help the citizen, that usually is in a victim and not desired situation.

For possible future research, It would be interesting to ask the citizens the satisfaction level of the visit to the police office, and whether the waiting time has helped someone to better deal with the complaint situation. This is a more psychological variable, but it would help to see if the general population is well satisfied when attending a police department to file a complaint.

In addition, this project has helped me develop new skills regarding coding and data analysis. *Pandas* is a *Python* library that I personally did not know that existed, and I found it quite useful and probably will use in my future projects. Moreover, *GitHub* is an amazing tool to keep your data and documents ordered in the internet, and my colleagues and I were able to help each other more easily.

#### References

- [1] GENCAT. Regions policials, 2022. [https://interior.gencat.cat/ca/el\\_departament/adreces-i-telefonos/regions\\_policials/](https://interior.gencat.cat/ca/el_departament/adreces-i-telefonos/regions_policials/).
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