



INTRODUCTION

Intent

The aim of this group activity is to study Ciampino Airport, analysing its characteristics and issues.

Ciampino “G.B. Pastine” International Airport

Ciampino airport is a joint civilian, commercial and military airport located 12,1 km from the centre of Rome and moves nearly 6 million passengers a year. It is very small and serves mainly low-cost airlines, such as Ryanair and Wizzair. It is managed by the society Aeroporti di Roma (AdR), together with the intercontinental Leonardo Da Vinci airport located in Fiumicino, with which it forms the airport system of Rome.

Ciampino Airport was opened in 1916, it has been Rome's main airport until 1960, with traffic amounting to over 2 million passengers per year. After the opening of “Leonardo da Vinci-Fiumicino Airport”, Ciampino handled almost exclusively charter and executive flights for more than three decades. However, the terminal facilities were extended at the beginning of 2007 to accommodate the growing number of low-cost carrier operations.

Hypotheses

To investigate Ciampino airport we formulated two hypotheses:

1. The noise pollution caused by the airport has a negative impact on local people in a range of 15 km;
2. Ciampino airport is a secondary airport which operates flights mainly to EU destinations.

METHODOLOGY

Data collected

To investigate our hypotheses we have collected both primary and secondary data.

Primary data:

- a questionnaire about noise pollution, to investigate hypothesis 1 (sent out on social networks).
 - In English (translated from original)
https://docs.google.com/forms/d/e/1FAIpQLScXRbl1DnTC-AGjHFKDSq3EMyRkG9DaUFV0_oFN0wleAKzY9Q/viewform?usp=pp_url



Secondary data:

- reliable websites with
 - figures from investigations about Ciampino airport made by authorities (S.E.R.A, S.Am.Ba.)
 - articles about the issues investigated
 - the history of Ciampino airport.

The websites used as sources are found in the webliography section.

Why we chose these data

Due to the restriction orders imposed by the Italian Government to prevent the expansion of Covid-19, we could access only to a limited number of sources (secondary data), therefore, to collect even primary data we created a questionnaire with Google Forms (which we sent out on Social Networks).

We chose to create this questionnaire because we wanted to directly understand the impacts of noise pollution on the people, to have the possibility to analyse a wide and diversified number of data.

Since the questionnaire is our unique primary source data, we mainly focus on it to prove or disprove our first hypothesis.

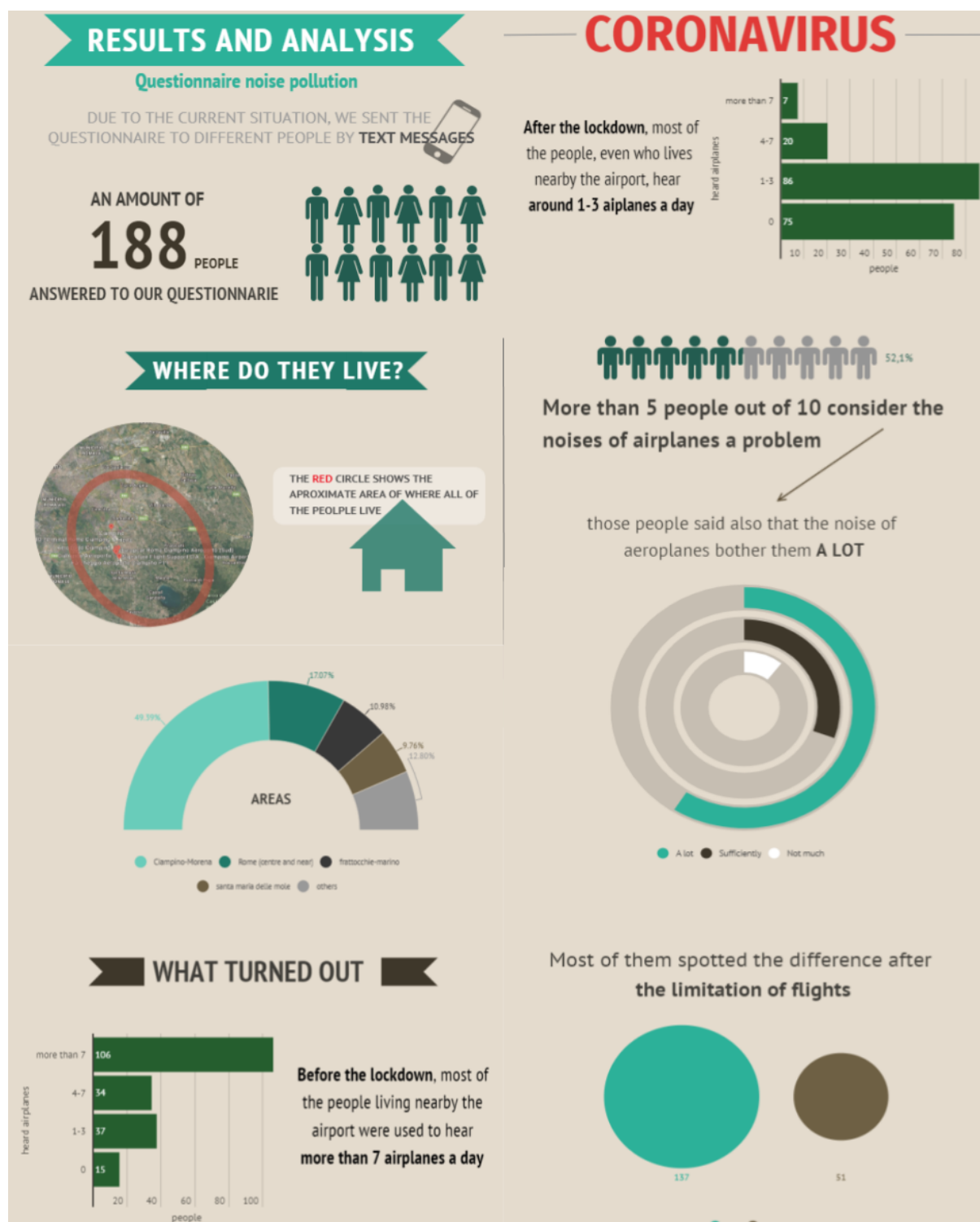


Hypothesis 1: The noise pollution caused by the airport has a negative impact on local people in a range of 15 km.

1.1.-Aeroplanes heard by people

To investigate the hypothesis, we have analysed primary data from the questionnaire we had created for the local people and secondary data from past articles and websites regarding the issue. Those are summarized in the following infographic:

<https://infogram.com/busy-charts-1h7g6kdv107o4oy?live>





We have interviewed around 188 people living in a range of 0-15 km from "G.B. Pastine International Airport", and divided the area covered in 7 ranges (0-2,3-4,4-5,5-6, 6-7, 8-10, 10-15 km) in order to study the different impacts that noise pollution has on people in relation with distance from the airport.

Firstly we asked people how many aeroplanes they were you used to hear from their house on a daily basis before the lockdown. Data has been collected in the map on the right (Fig. 1) basing on the modal value of each range. As we can see from the image in 5 ranges people usually heard more than 7 aeroplanes per day. ***From this, we can deduct that local inhabitants notice and pay attention to the passage of flights, which eventually bothers them during their activities.***

In spite of that, we noticed an incongruity in data: indeed, in ranges 5-6 and 8-10 km people stated that they heard a lower number of flights than other people located at a further distance from the airport.

This emerges even from Fig. 1.2.

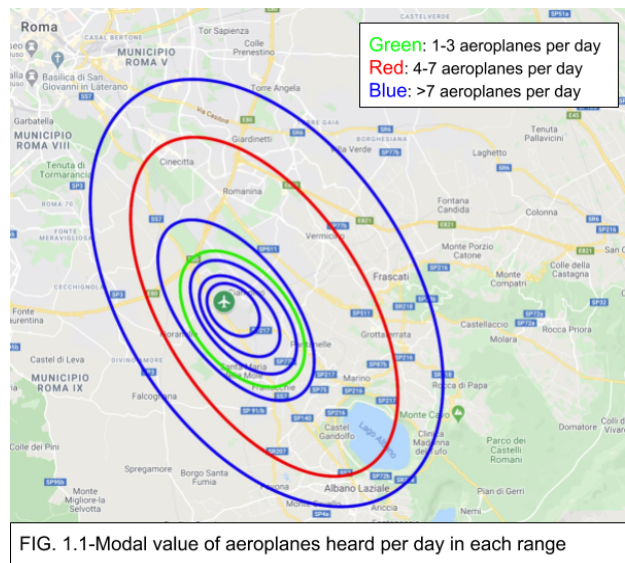
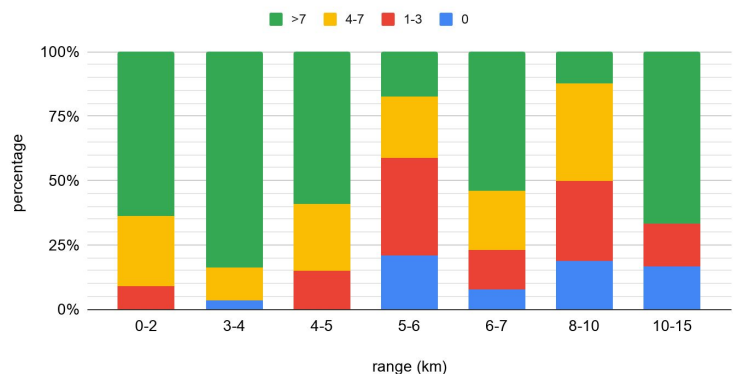


FIG. 1.2- Number of flights heard before lockdown per distance from the airport(percentage)





1.2- Is the noise pollution caused by aeroplanes a problem for you?

Regarding the impact that noise pollution caused by the airport has on the lives of local people, we also asked whether the noise from the passage of planes was a problem and how much it annoyed them.

Is the noise pollution caused by aeroplanes a problem for you?

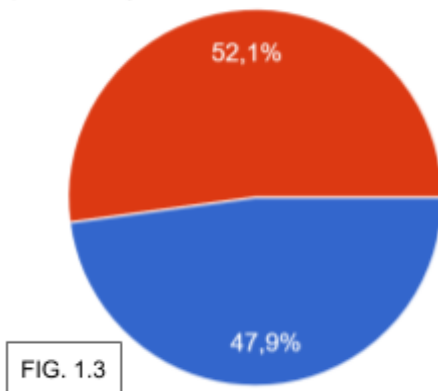
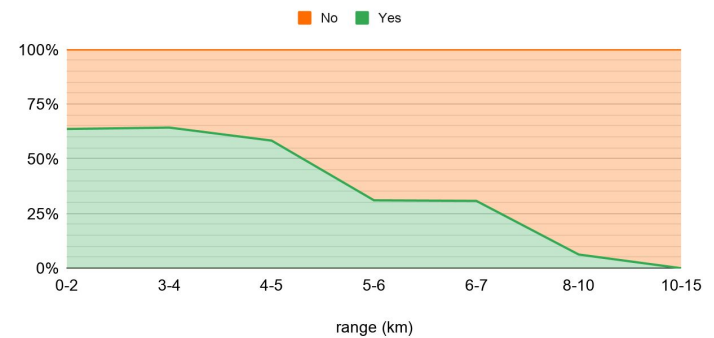


FIG. 1.4 -Number of answers for noise being a problem by range of (km)



On the whole, it emerged that for only 47.9% of the people the noise of the aeroplanes represents a problem (fig. 1.3). On the other hand, while we can notice that in the first three ranges more than half of the people are bothered by the noise, from a distance of more than 5 km from the airport the number “yes” answers decreases reaching 0% in 10-15 km.

A similar situation is registered also in the answers to the question “If yes, how much does the noise of aeroplanes bother you?”. Indeed, in the first three ranges, people are quite upset by this (mostly “A lot” and “Sufficiently” answers), and getting further from the airport people are generally less annoyed, apart from range 6-7 in which noise bothers 80% of the people “a lot” and “sufficiently”.

FIG 1.5- Answers to “If yes, how much does the noise of aeroplanes bother you?”

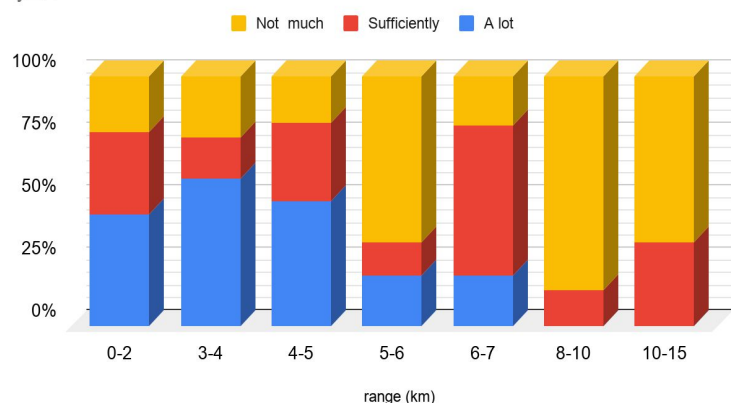


FIG. 1.6- Main direction of flights (red)





On the contrary, those who answered “no”, explained that noise wasn’t a problem for them as they had got used to it or they only heard a soft noise. This could be related to three main aspects:

- the direction of flights, mainly NNW and SSE with a wide turn to West(FIG. 1.6.);
- the presence of natural barriers such as hills or trees;
- the usage of soundproof windows and walls.

It is due to these aspects that we register some incongruities in data in FIG.1.1, 1.2, 1.5. As for the first two, in the ranges in discrepancy, the people interviewed live south-east from the airport (FIG. 1.7), where fewer aeroplanes fly and there are more natural barriers. For FIG. 1.5, the fact that 80% of the people in the range 6-7 km (more than in range 4-5) quite suffer from the noise is attributable to people interviewed living mainly in Tuscolana, Appio Claudio and Anagnina, all situated NNW from the airport, in the same direction of the aeroplanes routes.

On balance from these results, we deduce that the lower is the distance from the airport the higher is the impact on people’s lives.

1.3 Analysis of the kind of impact on people’s lives

To investigate in what way the noise from the passage of aeroplanes affects people, we both asked them about why noise bothered them or not and collected data from articles and websites about this issue.

Interviewed people mainly state that the noise of the aeroplanes causes them:

- concentration loss;
- irritability, high stress-level;
- sleep disturbances;
- hearing problems;
- difficulty in having conversations or phone calls.

Indeed, as we can see, not only does airport-related clamours influence people daily activities, such as working, studying and having phone calls, but also it deeply affects their physiological health, altering biological rhythms. Indeed people have revealed that the constant presence of high volume noises of the passage aeroplanes has made them more nervous and, more importantly, didn’t allow them to sleep appropriately throughout the night.

Furthermore, analysing data from official investigations(S.Am.Ba) it came out that the noise of the flights to and from the airport exceeds the maximum level of decibels during both day and night (although 50 dB and 40 dB are the maximum limits for



noise in the residential area near the airport (for day and night), the noise from the flights is in an annual mean of 67.6, “Arpa Lazio”). Besides, exposure to excessive noise is serious harm to people’s health, causing also cardiovascular disorders and hypertension(WHO).

The data about the main effects on people of this level of noise come from an official Investigation and from the World Health Organisation, very reliable and recognised sources.

Overall, taking into account all the data considered regarding the topic, we can assume that the noise caused by the aeroplanes interferes with people’s daily activities and leisure time, even damaging their health conditions.

1.4 Comparison before and after Lockdown.

As a result of the Covid-19 outbreak, flights bans have been imposed, therefore we wondered whether after coronavirus the situation changed and whether people felt the difference. Therefore we asked people how many aeroplanes they hear now and if they felt the difference after the flights’ ban.

FIG. 1.2- Number of flights heard before lockdown per distance from the airport(percentage)

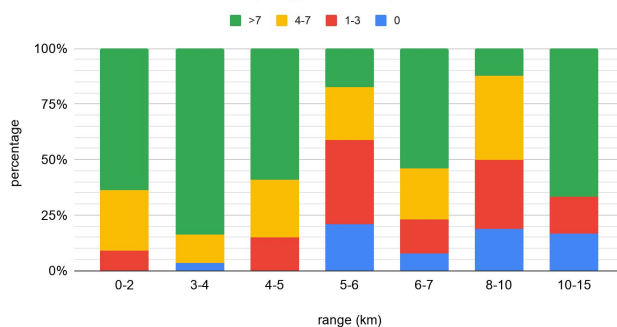
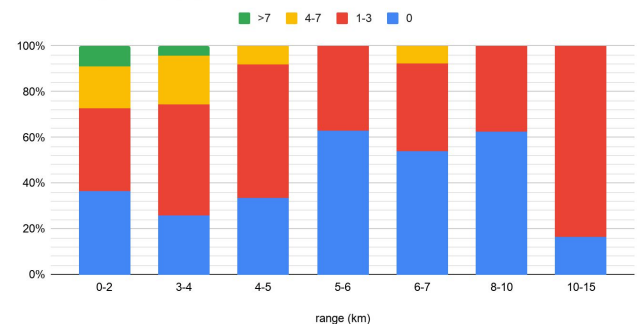


FIG. 1.8 -Number of flights heard daily per range after beginning of lockdown(percentage)



Comparing FIG. 1.8 with FIG. 1.2, we can see that people effectively hear and notice a lower number of flights per day, as in most ranges most people detect a maximum of 7 flights after lockdown (while before >7).

The pie chart on the right shows that the majority of people interviewed (72.9%) spotted the difference after flights’ limitation, therefore, even though not everyone is bothered by the noise, most of the people pay attention to it.

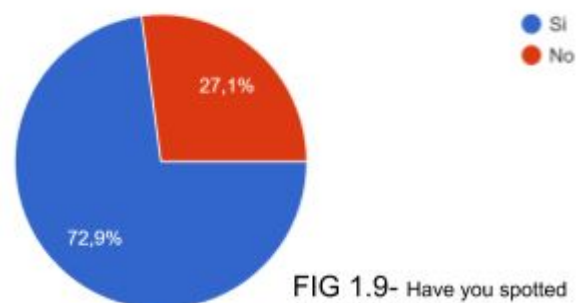


FIG 1.9- Have you spotted the difference after the limitation of flights?



So noise is enough loud to be noticed by people to the extent that they spot if there are no aeroplanes flying over their head.

Regarding the 27,1% of the people who answered “No”, this could be related to the fact that either people are still affected from the noise (very improbable, seen that the number of flights per day is much lower) or that they weren’t bothered by it in the first place.

1.5- Conclusions of Hypothesis 1

Considering all the deductions made from the analysis each kind of data, and its related graphs, we can state that our hypothesis is partially true.

Actually, although all the people interviewed in a range of 15 km can hear the planes passing by, from more than 6 km (in distance) from the airport almost all the people are no longer bothered by the noise.

This is because the intensity of the noise is inversely proportional with distance. Indeed the lower the distance with the airport the more the physiological problems stated before and interferences with daily activities are registered in people.

This is also demonstrable by the fact that 72.9% of the people felt the difference after the stop of flights. Even though this seems to contrast with the conclusion made, by looking at the graph on the right, we realize that 78.8% of the people interviewed live from 0 to 6 km from the airport.

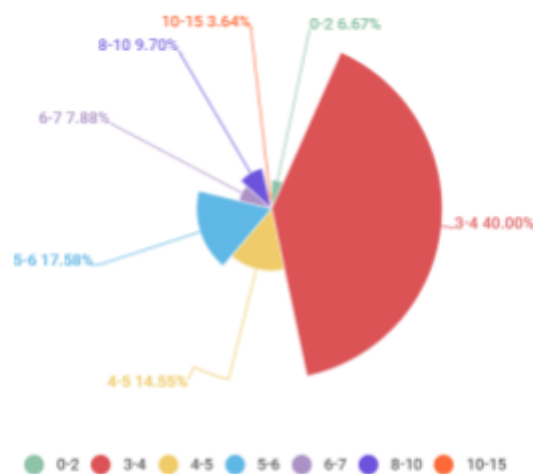


FIG. 1.10- People interviewed per range

In conclusion, we can say that we proved our first hypothesis partly true as the noise pollution caused by the airport has a negative impact on local people in a range of 6 km.



Fiumicino

Rome - Fiumicino International Airport “Leonardo Da Vinci” is an international airport in Rome and the major airport in Italy. It is located 30 km west away from the city centre and it occupies an area of 14,63 km² and a perimeter of 24,74 km.

The airport is provided with several services and facilities:



Fig. 2.3 Fiumicino airport satellite picture

- Two terminals for passengers (T1 and T3)
- Requalification of terminal 3 and new boarding area E11-24
- 297 check-in desks
- 86 boarding gates
- 50 gates with loading bridge
- 4 runways
- Modern boarding bridges
- Comfortable seats
- Info-points equipped with a fax and a photocopier
- Terminal manager
- Eat&Drink guide
- Shopping gallery
- Free luggage trolley service
- Personal shopper service
- More than 50 toilets
- More than 30 restaurants

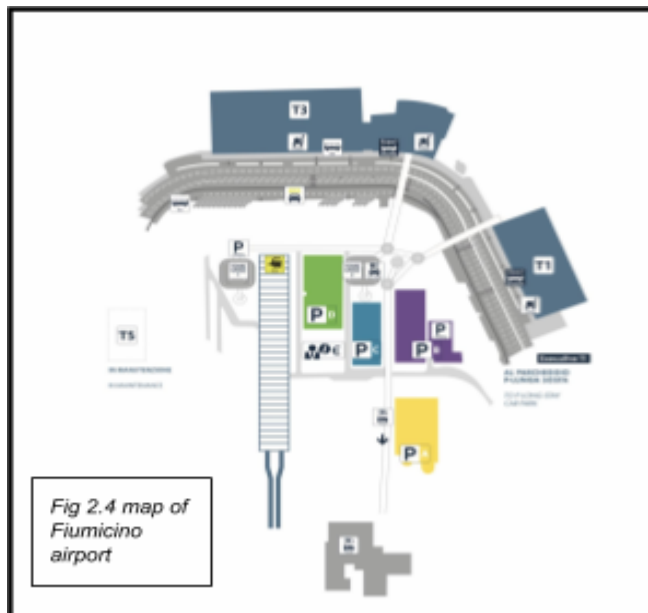


Fig 2.4 map of Fiumicino airport

There are about 100 companies that operate in Fiumicino airport, both low cost and high cost, that fly all over the world.



Comparison between the features of the two airports of Rome

The table below shows the main features of the two airports

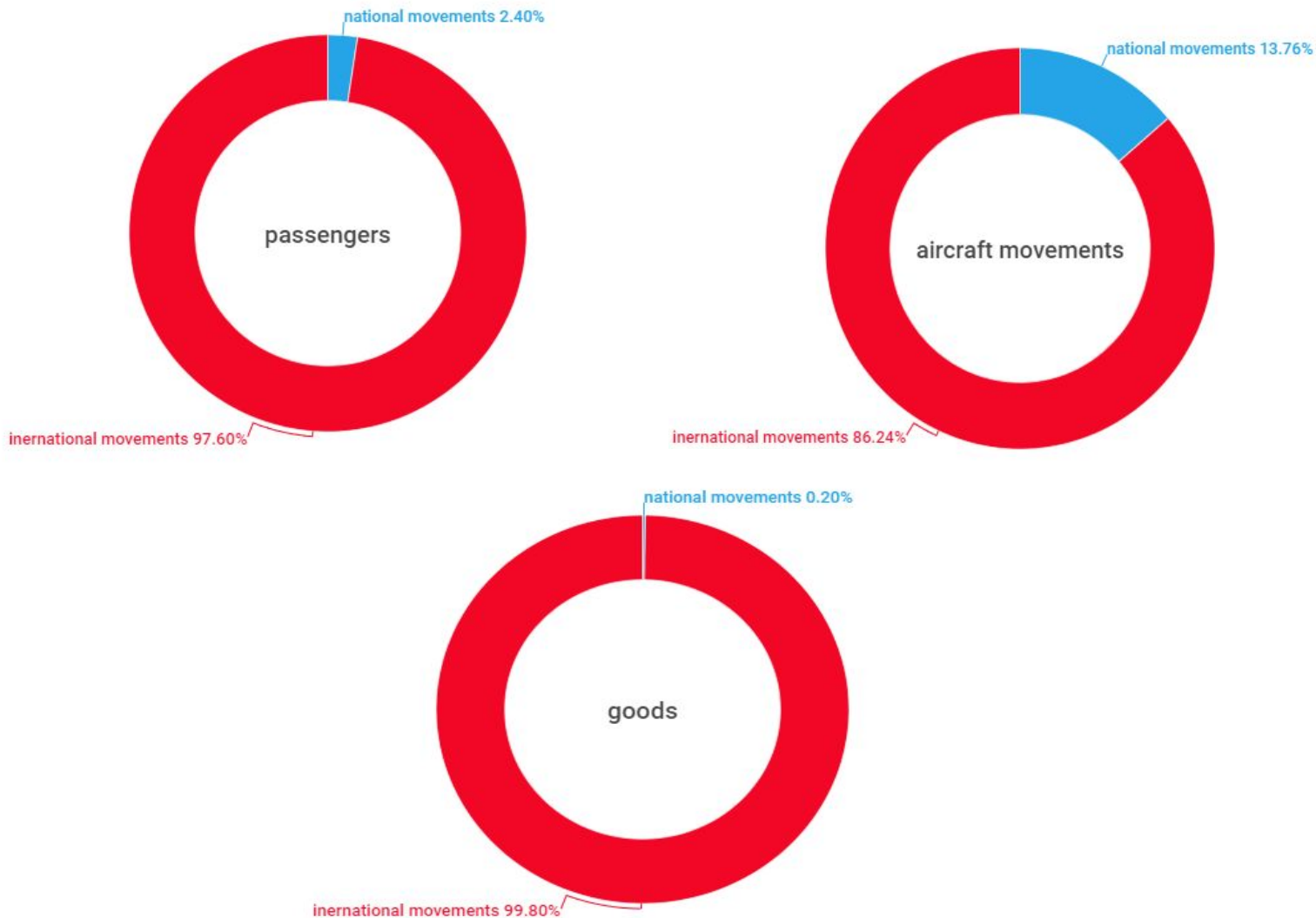
	CIAMPINO	FIUMICINO
TERMINALS	1	2+1(maintenance)
GATES	18	136
RUNWAYS	1	4
CHECK-IN DESKS	21	297
SHOPS	4	SHOPPING GALLERY
RESTAURANTS	3	>30
TOILETS	10	50
CAR PARKS	1700	20100
AREA	2km ²	15km ²
PERIMETER	6,8 km	24 km
COMPANIES	2	>100

By analysing the table, we can notice how different are the services and the facilities that the two airports offer. Although Fiumicino airport is far from the city centre, it is bigger in size (15km²), and it is provided with services that make the building comfortable for the passengers, who have the possibility to relax by doing shopping or having a meal before the flight. In fact, while at Ciampino airport there are only about 3 restaurants and 4 shops, in Fiumicino airport we can find a real shopping gallery and over 30 restaurants that offer different types of food. Also, Ciampino airport has 1700 car parks, so fewer people can park there than in Fiumicino airport, where people can take advantage of 20100 car parks. Just two main low-cost companies operate in Ciampino and there is one runway, so the number of flights per day is less than the one in Fiumicino, where there are 4 runways and over 100 companies operate.



2.2-Flights and destinations

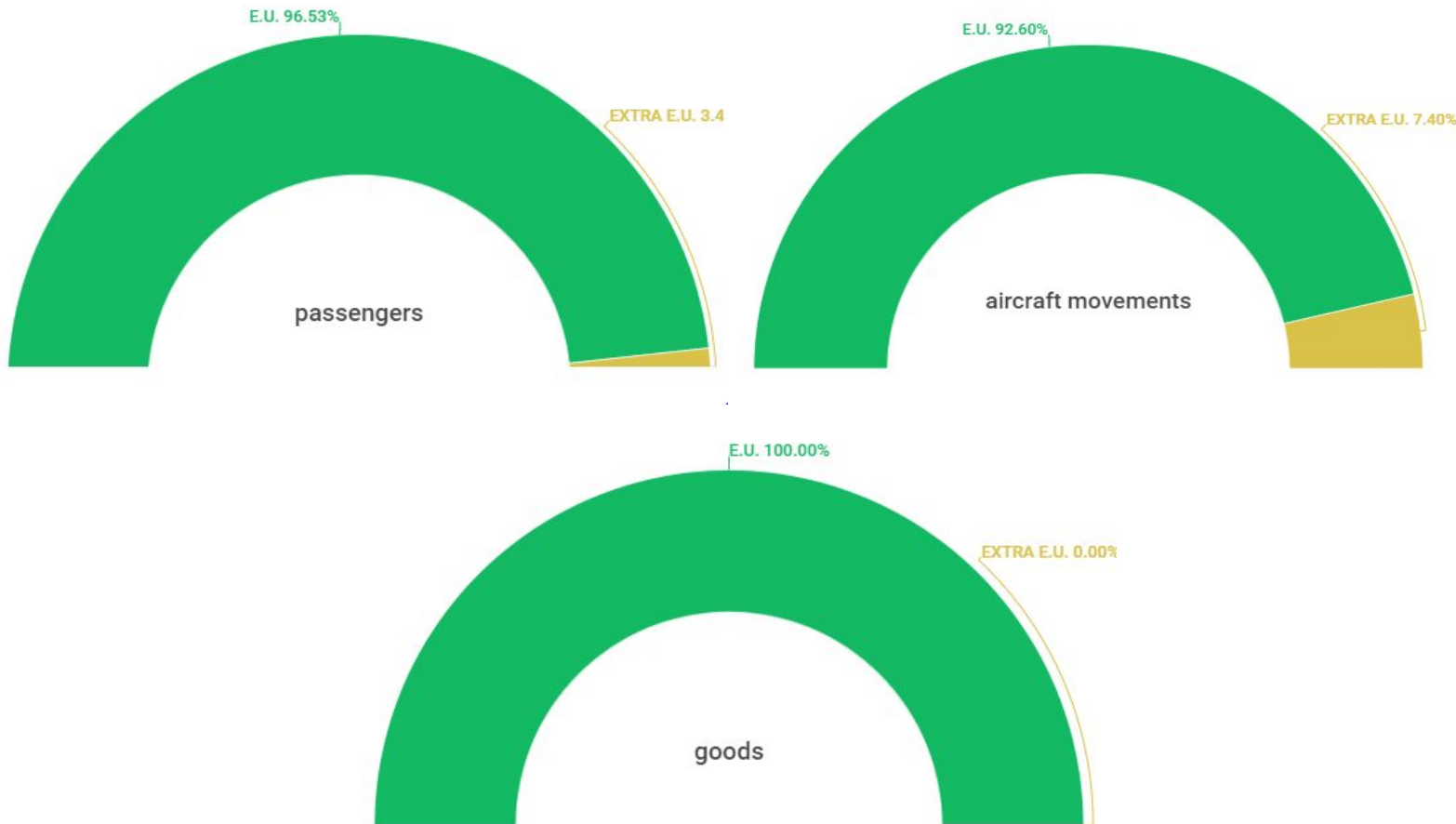
To analyse the number of national and international movements from Ciampino airport, we have created different graphs that represent the relationship between the data in January 2020.



- In the first graph we are able to see the number of passengers who fly to national and international destinations. The national movements occupy only the 2,40% of the total, with 11271 passengers, while 459196 passengers fly to international destinations.
- The second graph shows the aircraft national and international movements. The first one occupy the 13,76% of the total, with 526 aircraft movements, while the aircraft international ones occupy the majority of the total, with 3298 movements
- In the third graph we can immediately see the difference between the national and international movements of goods. In fact, as far as the movement of goods is concerned, the national movements are only 0,20% of the total with 3,1 tons, while, internationally, 1473,5 tons of goods are moved.



In conclusion, we can assume that the amount of international movements is much bigger than national ones. However, the international movements include both the European and non-European ones, as it is shown in the graphs below, which represent the relationship between the movements in January 2020



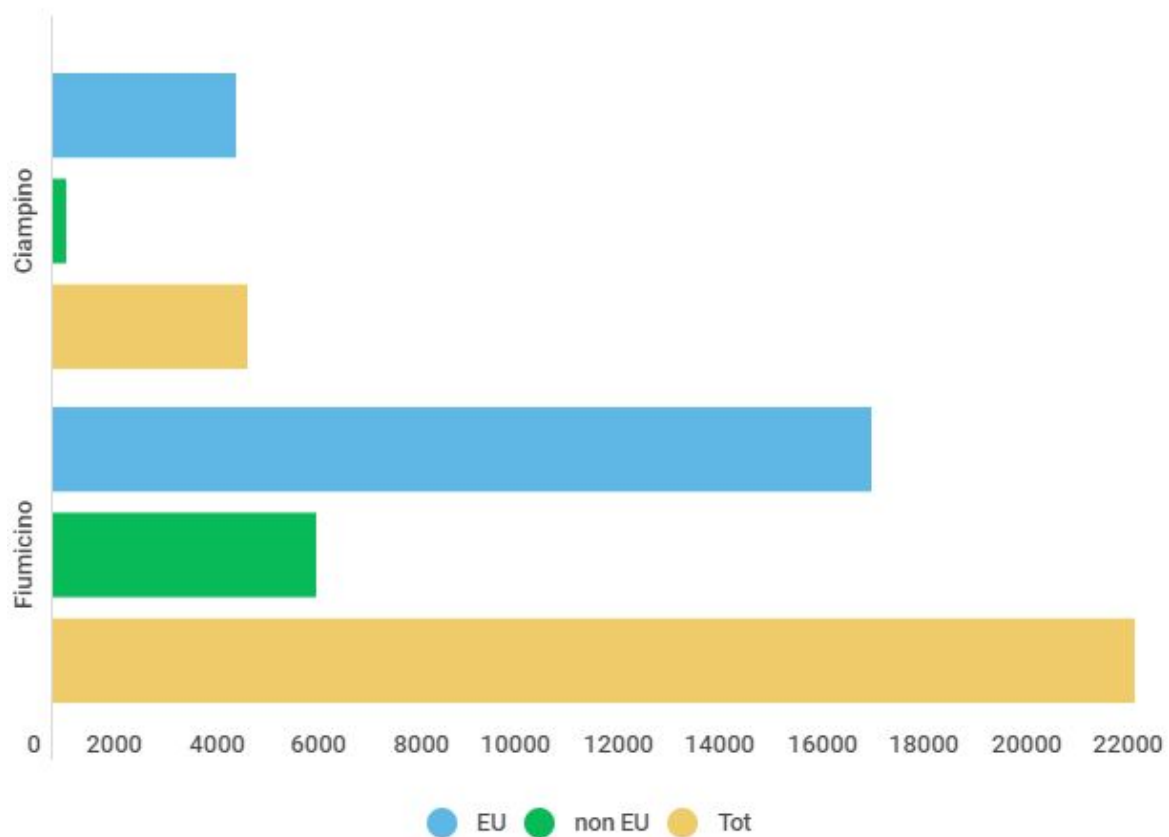
- The first graph shows the relationship between the passengers who fly to European and non-European destination. The 440373 passengers who fly to Europe represent 96,53% of the total, while the 15823 passengers that fly to non-European destinations are only 3.4%.
- In the second graph, we can see that the European aircraft movements are 92,60% of the total with 3054 movements, while the non-European ones are just 244.
- In the third graph, the difference between the movement of goods is incredibly big, as the European ones represent 100% of the total, with a number of 1473,4 tons.

In conclusion, we can say that Ciampino operates flights mainly to international destinations, in particular to European ones.



Comparison between the destinations of the flights of the two airports of Rome

We compared the flight data of Ciampino airport with the ones of Fiumicino in a grouped bar graph, in order to show the differences between them.



	EU	non EU	Tot
Fiumicino	16033	5178	21211
Ciampino	3580	244	3824

As we can see from the graph, Fiumicino airport operates a big number of non-European flights, with a total of 5178 flights in January 2020, while Ciampino airport flights are concentrated in Europe, with a total number of 3580. However, the amount of all the flights from Fiumicino airport (21211) is much bigger than the one from Ciampino (3824).



2.3- Conclusions of Hypothesis 2

To sum up, after the analysis of all the sources, we can state that our hypothesis is true. Ciampino G.B Pastine International Airport can be considered a secondary airport, as it doesn't provide all those services and facilities that we can find in Fiumicino airport and that make the passengers feel comfortable. Furthermore, although it is closer to the centre of Rome than Fiumicino, it doesn't occupy a big area. Thanks to the last comparison that we have done, we can also assume that Ciampino monthly operates a lower number of flights than Fiumicino and there isn't a big variety of companies, so people can fly only to some destinations. In fact, we can state that also the second point of our hypothesis is true, as Ciampino airport operates flights internationally, but mainly to European destinations.



EVALUATION

What went well:

- Teamwork: we worked in a stimulating, warm and friendly environment.
- Organization: equal distribution of the work we had to do.
- Objectivity: we have analysed data with an objective perspective, investigating the hypothesis

What we should have improved:

- We should have interviewed people on a wider range to see whether the problem of noise pollution persists over 15 km.
- We should have collected data more accurately.
- Among the answers to the questionnaire, we should have selected the same number of answers for each range, to have answers evenly spread within the area considered, in order to study the phenomenon more easily.
- We should have used different kinds of graphs.
- Perhaps we should have written less, being more concise.

BIBLIOGRAPHY AND WEBLIOGRAPHY

Introduction:

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- https://it.wikipedia.org/wiki/Aeroporto_di_Roma-Ciampino
- https://en.wikipedia.org/wiki/Ciampino%E2%80%93B._Pastine_International_Airport

Data about Noise pollution:

- [Bollettino di informazione acustica](#)
- https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&ved=2ahUK_EwiX-a6B9YjpAhVIZxUIHRF6BSMQFjAEegQIBhAB&url=http%3A%2F%2Fwww.arpalazio.gov.it%2Fdownload%2F%3Fsez%3Dpubblicazioni%26pid%3Dfile%26fln%3Drumore_aeroportuale.pdf&authuser=3&usq=AOvVaw0wK8ZlxthQ8xt55q28TUvF
- [Noise](#)

Articles about Noise pollution:

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- <https://www.corriere.it/extra-per-voi/2016/03/21/ciampino-vince-contro-rumore-15-anni-lotte-l-aeroporto-dovra-ridurre-numero-voli-44d60334-ef6d-11e5-9957-88f22239b898.shtml>
- http://roma.corriere.it/roma/notizie/cronaca/12_dicembre_21/ciampino-inquinamento-acustico-2113257663189.shtml
- <https://comitatoaeroportoociampino.wordpress.com/>

Data About features of the airport and flights:

- http://www.aeroportoociampino.net/mappa_rotte_aeroporto_ciampino.htm
- <https://assaeroporti.com/statistiche/>
- [Dati di traffico Aeroporti di Roma Fiumicino e Ciampino - ADR.it - Aeroporti di Roma](#)
- <https://www.aeroporto.net/aeroporto-roma-fiumicino/terminal-aeroporto-roma-fiumicino/>
- <https://www.aeroporto.net/aeroporto-roma-ciampino/terminal-aeroporto-roma-ciampino/>
- <http://www.adr.it/pax-cia-compagnie-aeree1ciampino/>
- [Compagnie Aeree - Voli - Fiumicino - ADR.it](#)

Maps:

- <https://www.google.it/maps/place/Aeroporto+Internazionale+di+Roma%E2%80%90Ciampino+G.+B.+Pastine/@41.8002557,12.5279451,12z/data=!4m5!3m4!1s0x132588b6389de903:0xedb6061d8fc5510d!8m2!3d41.7991394!4d12.5928587?hl=it>

Questionnaire:

- https://docs.google.com/forms/d/e/1FAIpQLScXRbl1DnTC-AGjHFKDSq3EMyRkG9DaUFV0_oFN0wleAKzY9Q/viewform?usp=pp_url

Infographic:

- <https://infogram.com/busy-charts-1h7g6kdv107o4oy?live>

Graphs for Hypothesis 1:

- https://docs.google.com/spreadsheets/d/14MMvBrXHC8A1JbLM-88R_hozoy3iNGD4tIWckzCTnGI/edit#gid=0

Books:

Gary Cambers, Steve Sibley, Cambridge IGCSE Cambridge University Press - Second edition 2015

Gabriele Bungaro, Benedetta De Vincenzi, Giorgia Lanzillotta, Francesca Macali