

# Is there still room for a new pizzeria in the city of Rome, Italy?

*A data study by Charlotte Marjolein Baas, MSc*

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## 1. Introduction

Having a restaurant in Rome, Italy is one of the biggest dreams of a pizza maker. However, starting one might not be the biggest challenge. In a place like Rome there are assumed to be pizzerias on about every corner of every busy street. The competition is huge if not killing or completely murderous.

I have been contacted by a pizza lover who wants to know if (and if so, then where) there is still room for a new pizzeria in the city of Rome. This pizza lover is aching to start his own pizza place in the best part of the city; however, he knows there is a lot of competition. He asked me to investigate where he stands the most chance of getting his new restaurant running, i.e. where the competition is the least 'killing' and people are still willing to try out his pizzas.

## 2. Data acquisition and cleaning

In order to answer the main question: Is there still room for a new pizzeria in the city of Rome, Italy, subdivisions (municipio) of Rome were scraped from wikipedia.org ([https://en.wikipedia.org/wiki/Administrative\\_subdivision\\_of\\_Rome](https://en.wikipedia.org/wiki/Administrative_subdivision_of_Rome)). This scraping resulted in a data frame containing the names of the fifteen municipio, their corresponding population, area in square kilometres and density in square kilometres. In addition, the coordinates of the different municipio were collected from [www.geonames.org](http://www.geonames.org). A csv-file was manually created with the corresponding latitude and longitude coordinates of each municipio (all were positioned on different pages on the site).

Data was further pre-processed merging both the data frame containing the information from wikipedia.org and the manually created csv-file with information from geonames.org.

The municipio of Rome were labelled on a map, showing their positions in the city.

With the use of the Foursquare API the venues of the fifteen municipio were explored per subdivision (within a range of 1500 meters from the coordinates of the subdivision, with a limit of 100 venues). The resulting venues were filtered, leaving anything out except for the categories 'pizza place' and 'Italian restaurant'. For every subdivision of the city, this resulted in a data frame containing the pizza places and Italian restaurants.

In order to come up with a meaningful answer to the main question, the number of relevant venues in each municipio was combined into a new data frame. The population density was taken into account during the search for the best place for a new pizzeria. Municipio containing the lowest amount of 'competitors' in combination with the highest population

density (and the closest location to the city centre) were considered to be the 'place to be' for a new pizzeria.

### 3. Methodology

#### 3.1. Subdivisions of Rome and its population/density

Subdivisions of Rome were found on Wikipedia.org (link is provided in 'Data'-section), including information about their population and population density (on December 31<sup>st</sup>, 2015) resulting in a data frame. This data frame was further processed in order to divide the names of the 'municipio'/subdivisions into two columns. For example: "Municipio I – Historical Center" was split into column one with the name "Municipio" and the value "I", and into column two with the name "Neighborhood" and the value "Historical Center".

#### 3.2. Finding appropriate coordinate information

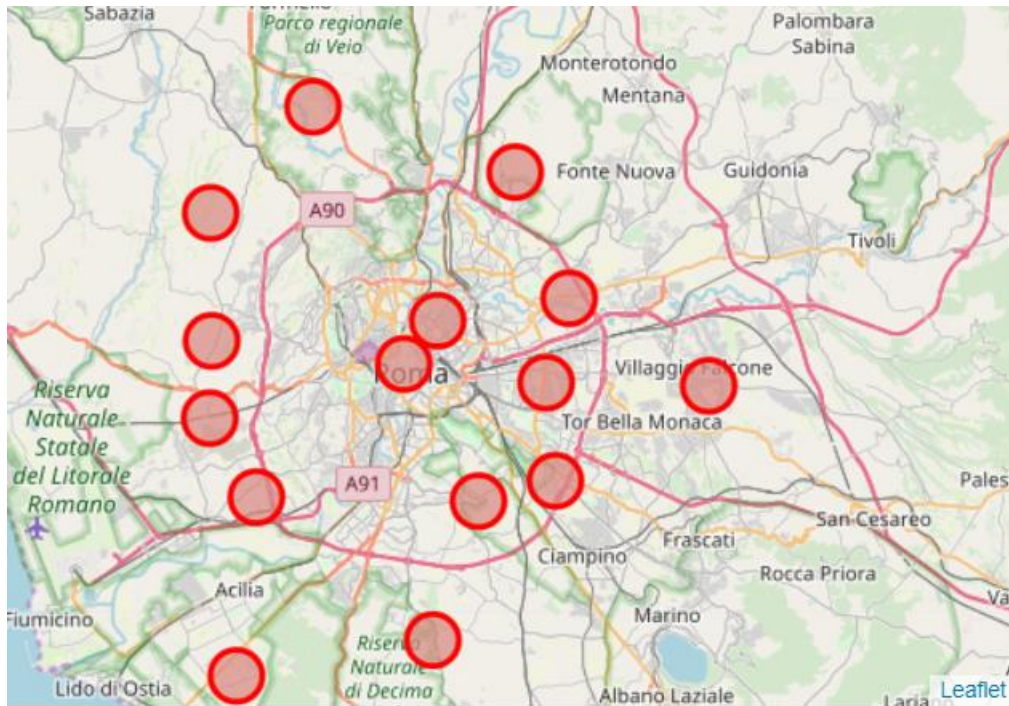
On Geonames.org the coordinates (latitude, longitude) of all fifteen subdivisions of Rome were found and manually stored into a csv-file (since it was not stored on one page). Information from this csv-file was uploaded into the notebook and combined with the first data frame, leading to the next data frame:

Municipio	Neighborhood	Population	Area	Density	Latitude	Longitude
I	Historical Center	186802	19.91	9382	41.89798	12.47813
II	Parioli/Nomentano	167736	19.60	8567	41.92006	12.50136
III	Monte Sacro	204514	97.82	2091	41.99579	12.55450
IV	Tiburtina	177084	49.15	3603	41.93151	12.59152
V	Prenestino/Centocelle	246471	27.00	9137	41.88846	12.57574
VI	Roma Delle Torri	256261	113.40	2261	41.88690	12.68729
VII	Appio-Latino/Tuscolano/Cinecittà	307607	46.80	6580	41.83840	12.58207
VIII	Appia Antica	131082	47.29	2772	41.82802	12.52934
IX	EUR	180511	183.17	985	41.75700	12.49799
X	Ostia/Acilia	230544	150.64	1530	41.73875	12.36328
XI	Arvalia/Portuense	154871	70.90	2185	41.83002	12.37696
XII	Monte Verde	140996	73.12	1928	41.87037	12.34497
XIII	Aurelia	133813	68.70	1949	41.90979	12.34630
XIV	Monte Mario	190513	131.30	1451	41.97501	12.34567
XV	Cassia/Flaminia	158561	186.70	849	42.02907	12.41586

*Population on December 31<sup>st</sup>, 2015; area in km<sup>2</sup>; density per km<sup>2</sup>*

#### 3.3. Explore venues per subdivision

In order to explore the venues per subdivision, a map of Rome was drawn showing each area in which the venues were searched. The range used around the coordinates was 1500 meters. Chosen to prevent any overlapping areas. The resulting map is shown below.



*Map of Rome showing areas searched for venues*

With the use of the coordinates and FourSquare API, the top 100 venues were selected for each 'search area' and the venues 'Pizza place' and 'Italian restaurant' were filtered to be included in this project. This was performed on every subdivision of Rome, resulting in a data frame per subdivision. All data frames were combined into one, where the number of pizza places and Italian restaurants were shown, including a column where the total of those venues were calculated per subdivision.

### **3.4. Combining venue information with population/density information**

The data frame mentioned above including the venues per subdivision was combined with the data frame including the population information. The data was sorted by the total of relevant venues and population density of the area, resulting in the following data frame:

	Neighborhood	Population	Area	Density	nr of Italian restaurants	nr of pizza places	total
<b>Municipio</b>							
II	Parioli/Nomentano	167736	19.60	8567	17.0	8.0	25.0
I	Historical Center	186802	19.91	9382	11.0	5.0	16.0
V	Prenestino/Centocelle	246471	27.00	9137	5.0	8.0	13.0
X	Ostia/Acilia	230544	150.64	1530	6.0	0.0	6.0
VII	Appio-Latino/Tuscolano/Cinecittà	307607	46.80	6580	3.0	2.0	5.0
IV	Tiburtina	177084	49.15	3603	1.0	2.0	3.0
VIII	Appia Antica	131082	47.29	2772	0.0	1.0	1.0
XI	Arvalia/Portuense	154871	70.90	2185	1.0	0.0	1.0
XV	Cassia/Flaminia	158561	186.70	849	1.0	0.0	1.0
VI	Roma Delle Torri	256261	113.40	2261	0.0	0.0	0.0
III	Monte Sacro	204514	97.82	2091	0.0	0.0	0.0
XIII	Aurelia	133813	68.70	1949	0.0	0.0	0.0
XII	Monte Verde	140996	73.12	1928	0.0	0.0	0.0
XIV	Monte Mario	190513	131.30	1451	0.0	0.0	0.0
IX	EUR	180511	183.17	985	0.0	0.0	0.0

*Final data frame showing population/area/density information and relevant venues per 'municipio'*

## 4. Results

In the final data frame (shown above), one can see that there are still municipio/subdivisions in the city of Rome, Italy where no Italian restaurants or pizza places are situated. Therefore, the assumption that there are pizzerias on about every corner of every busy street is not true.

As one can also see in the 'nearby\_venues'-data frames per municipio (provided in the attached notebook), there are even still areas without any restaurants (apart from hotels maybe). For example municipio III: 'Monte Sacro'. When searching for the top 100 venues, only 4 were returned by the FourSquare API, of which one was a hotel, but the rest was 'pool', 'farm' and 'mobile phone shop'.

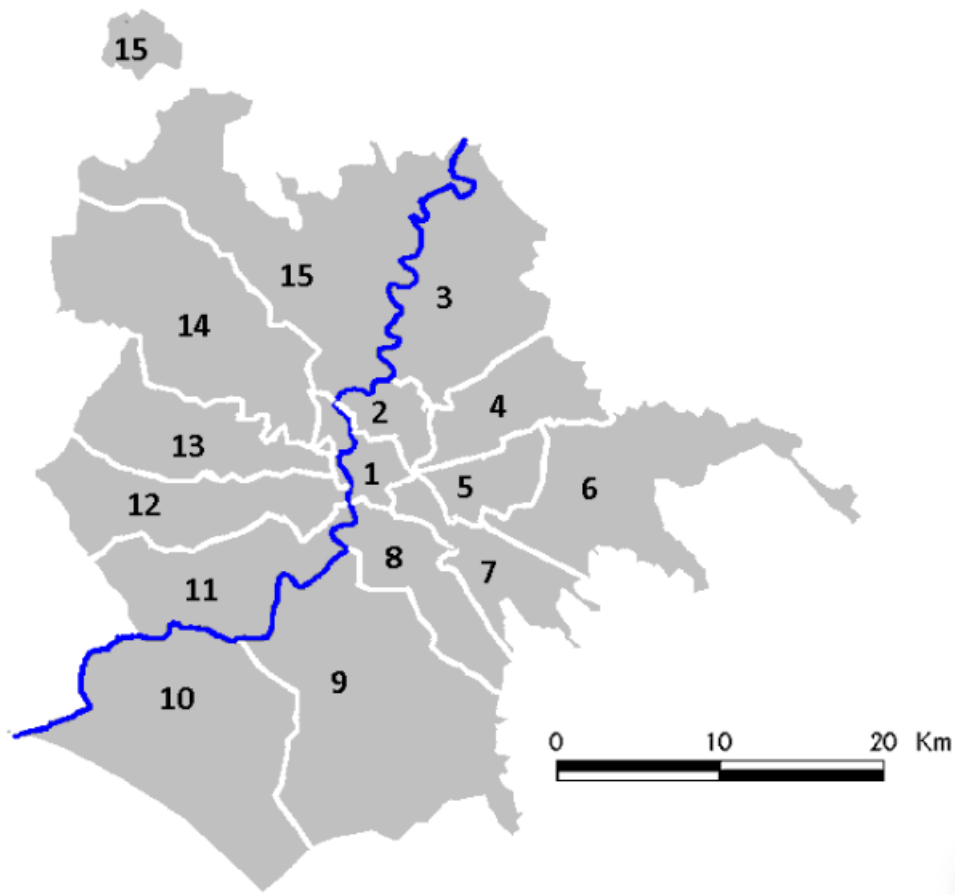
## 5. Discussion

This project aimed to find out whether there is still room for a new pizzeria in the city of Rome, Italy and, if that were the case, where the competition is the least 'killing' and people are still willing to try out his pizzas. In order to answer these questions, this section is divided in several smaller sections.

### 5.1. Is there still room for a new pizzeria?

Investigation focussed on this question, comprised of evaluating whether there are still areas in Rome where there are few or no pizzerias or Italian restaurants. The latter was included because these restaurants often have pizzas on their menus. All other venues were excluded from this research. The search for postal code information on Rome led to a Wikipedia-page

where fifteen administrative subdivisions or “Municipio” of Rome were described (see figure below).



*Picture of the locations of the municipio in Rome*

Geonames.org used the same Municipio and was helpful to provide the latitude and longitude per subdivision. With this information, a map of Rome was created with a range of 1500 meters around the coordinates of each Municipio (“map\_rome”; already shown in the Methods-section), showing in which areas the next step was performed: calling the FourSquare API to find the top 100 venues within each area. (Top 1000 of venues was also performed, but the API did not exceed past 100 venues.)

With the information of the found venues, a selection was made to only include the categories ‘Pizza place’ and ‘Italian restaurant’. A data frame was created combining the relevant results of all Municipio and a total of relevant venues was calculated. This final data frame “rome\_data” showed that six out of fifteen subdivisions of Rome did not have a relevant venue, and 3 had only 1 (either a pizza place or an Italian restaurant). This answers the first question: yes, there is still room for a new pizzeria.

## **5.2. Where would be the best place for a new pizzeria?**

As previously stated, there are still areas in Rome with no (or very few) pizza selling restaurant(s). Additional information about these areas (such as population, area in km<sup>2</sup>, and density in km<sup>2</sup>) were also provided in the final data frame "rome\_data". The most dense Municipio (as in, having the largest population per square kilometre) already own more than three places selling pizzas. These areas were Historical Center, Parioli/Nomentano, Prenestino/Centocelle, Ostia/Acilia, Appio-Latino/Tuscolano/Cinecittà and Tiburtina. I would recommend staying away from those Municipio as a new starting pizza place/restaurant. However, subdivisions like Monte Sacro having a density of 2091 people per square kilometre, might be a very nice place to start. Although a bit far from the city centre (and probably the most tourist), its citizens might be craving for a pizza. Another example: Municipio VIII or "Appia Antica" is relatively close to the centre of Rome and also doesn't own a pizza selling place. Its density is not far from that of Monte Sacro (1949 people per square kilometre).

Answering this question can be done in three manners: (1) choosing the closest area to the city centre with the least competition, or (2) choosing the area with the largest density and the least competition. Finally, (3) one can take the touristic places into account when picking the most popular place out of those without any pizza selling places. This latter method might seem the same as the first, however, there are touristic places that are not necessarily in or around the historical city centre. Within this research, though, I will only look at method 1 and 2, since that can be answered with the provided information within the Method-section. Tourism of a city is a whole other aspect.

So, using method 1 (closest area to city centre), I would recommend Municipio VIII / "Appia Antica" as an area to start a new pizzeria. Although owning 1 Italian restaurant, the addition of a pizzeria might be profitable.

Using method 2 (choosing area with largest density), Appia Antica also comes up as the best place in town (2772 people per square kilometre, with 1 competitor), with Roma Delle Tori (municipio VI) as first runner up with 2261 people per square kilometre and zero competitors.

## **5.3. Points for improvement for future research on this topic**

Within this project, a 1500 meter range was drawn around the coordinates of each municipio (as was shown in "map\_rome"), making sure no areas overlapped with each other. This range excluded all possible venues that were situated within the area, but outside of the 1500 meter range. For future research, it could be more useful to find a way to include all venues within the complete municipio.

In addition, the FourSquare API returned only the top 100 venues per input. It is possible that within the search areas, there are more venues that were not included in this project.

Finally, touristic information was not included within this research as it was 'out of scope'. In order to investigate whether the third method described in the section above leads to another result/recommendation than the first two, this will be useful.

## **6. Conclusion**

After investigating whether there is still room for a new pizzeria in Rome, Italy, and if so, where the best place would be, both described methods in the 'Discussion'-section lead to the same 'winning' area. Appia Antica is the municipio closest to the city centre with only one competitor and relatively many people per square kilometre. Therefore, this would be the area I recommend for a new pizzeria.