State High Schools in Rio de Janeiro

Coursera Capstone Project

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1. Introduction

In Brazil, the Federal Constitution of 1988 determines "the progressive universalization of free secondary education "(article 208, item II). Furthermore, the National Education Guidelines and Bases' Law, affects to the states the responsibility of "ensuring primary education and offering, with priority, secondary education "(article 10, section VI). This explains why, in 2008, almost 80% of all high school offers in the state of Rio de Janeiro (Rio) were provided by the state network (1).

Today, there is a real need to increase that offer, since in the last enrollment cycle – in February 2019 - twenty thousand students did not have their places ensured. To solve this problem the government estimates that more twenty-four schools need to be built in the whole state of Rio de Janeiro. The major demand being concentrated in its metropolitan region and, particularly, in the city of Rio (2).

In this sense, the present report aims to answer the question of which neighborhoods could beneficiate more from those new public high schools in the city of Rio de Janeiro. The main stakeholders are the Secretary of Education of the State and the citizens of the city, mostly the ones that do not have economic conditions for paying for private schools.

2. Data Sources

This is a complex problem that would need a lot of socioeconomic information together with real data from existing schools to know precisely the current offer and demand. Since all this data is not publicly available, the approach used here is a simplified one that considers three main aspects: (i) number of public high schools per neighborhood, (ii) total population per neighborhood and (iii) income level of each neighborhood. The sources used to gather that information are detailed below along with its limitations.

2.1. Data.Rio

The limits of each neighborhood in the city of Rio were taken from the website data.rio controlled by the city hall. Data containing neighborhoods ID, coordinates and names were provided in the GeoJSON format. An extract of this data is shown below.

CodBairro	Bairro	CodRA	CodRA_txt	RA	CodRP	CodAP	SHAPE.STArea()	Shape.STLength()
13	Paquetá	21	XXI	Ilha de Paquetá	1.1	1	1705689.1059570312	24841.459552701777
98	Freguesia (Ilha)	20	XX	Ilha do Governador	3.7	3	4056413.7377929688	18303.62078607362
97	Bancários	20	XX	Ilha do Governador	3.7	3	978049.2006835938	7758.791976756996
104	Galeão	20	XX	Ilha do Governador	3.7	3	18957473.399902344	21510.088153639095
101	Tauá	20	XX	Ilha do Governador	3.7	3	1672550.2749023438	8246.1206657609
103	Portuguesa	20	XX	Ilha do Governador	3.7	3	1186412.6459960938	5101.5301611907225
102	Moneró	20	XX	Ilha do Governador	3.7	3	520558.8798828125	3538.290160925653
144	Campo Grande	18	XVIII	Campo Grande	5.2	5	104445426.80908203	75083.75238014078
48	Vigário Geral	31	XXXI	Vigário Geral	3.5	3	3385317.2104492188	8077.093053600534
96	Cocotá	20	XX	Ilha do Governador	3.7	3	490103.73779296875	4799.078274444752

2.2. Foursquare and Escol.as

These two websites were used to find the location of state high schools in the city of Rio. It was possible to identify 250 out of 260 that currently exists. Data from escol.as were obtained by scraping the website and from foursquare the API was used to make requests that returned JSON files.

2.3. Brazilian Institute of Geography and Statistics (IBGE)

Demographic and economic information for each neighborhood were scraped from the IBGE (Brazilian Institute of Geography and Statistics) website. The most recent data available dates back to 2010 so it is important to note that some changes did take place in the meantime and are not covered here. There are neighborhoods that were officially created after 2010 which explains why they do not have data. In order to work around this problem, those neighborhoods were deleted from the analysis.

Since there is no data concerning the number of people in high school age or the demand per neighborhood, the total population will be used as a proxy. The assumption behind this hypothesis is that the proportion of people in high school do not vary significantly between neighborhoods and the interest here is to compare them, so the absolute number is not very important.

To account for economic differences between neighborhoods the Human Development Index – Income (HDI-I) was chosen. This indicator calculates income on the basis of GDP per capita in the area in dollars PPC (Purchasing Power Parity).

3. References

1. **MPRJ.** *Plano Estadual de Educacão do Rio de Janeiro.* Rio de Janeiro : Ministério Público do Rio de Janeiro.
2. **Melo, Maria Luisa de.** Falta de 20 mil vagas na rede estadual afeta alunos das zonas Oeste, Norte e interior. *O Dia.* [Online] O Dia, 21 de 02 de 2019. [Citado em: 19 de 07 de 2019.] https://odia.ig.com.br/rio-de-janeiro/2019/02/5621427-falta-de-20-mil-vagas-na-rede-estadual-afeta-alunos-das-zonas-oeste--norte-e-interior.html.