Living conditions, health services use and neighborhood perception at a survey of Brasília´s suburb

Condições de saúde, uso de serviços e percepções da vizinhança. Inquérito no entorno de Brasília

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ABSTRACT

Method: Probabilistic population based survey describing living conditions, health services utilization and neighborhood perception in north suburb of Brasilia.

Results: 1619 dwellers were available predominantly young low schooled, mostly unemployed (60%), living in brick house with piped water and electricity (>98%); 29% had sewage system; 85% of dwellers always use the same public health facility. Sexual assaults (7%); armed fights (32%); robbery (41%) and gang fights (25%) were perceived in neighborhoods that were seen as noisy (32%), dirty (40%), with few healthy food stores (34%) and sports/leisure areas (66%).

Conclusion: public policies in the capital´s suburb must be strengthened.

Keywords: Social conditions; Health services coverage; Residence characteristics; violence; Employment; Brasilia

RESUMO

Método: Este é um estudo transversal, com base em uma população probabilística para descrever as condições de vida na parte norte da rede integrada de desenvolvimento econômico do Distrito Federal.

Resultados: Encontramos uma população jovem (terceiro quartil em 41 anos) e educação relativamente baixa (5,1% de analfabetismo, com apenas 4,7% com ensino superior). Resultados sobre escolaridade, situação de emprego, uso de serviços de saúde, percepção de violência e outras características mostraram diferenças em relação ao Distrito Federal, mas comparáveis a áreas metropolitanas próximas a outras capitais federais.

Conclusão: São necessários fortalecimentos das políticas de saúde na região.

INTRODUCTION

In Brazil, most metropolitan areas have grown slowly over the past 200 to 460 years, becoming large conurbations with many social and economic problems that affect public health. The Federal District (FD), and Brazilian capital city, Brasilia, was planned and built recently and was founded in 1960 in the Midwest region of the country, as the smallest unit of the Federation with 5,801 km[2]. Initial estimates pointed to a population of 500 thousand by the year 2000. However, Brasilia actually reached a population of 2.051.146 by that year, according to the Brazilian Institute of Geography and Statistics (IBGE in the original Portuguese)[1], and 3.015.268 by 2019. Among Brazilian states, the FD has the highest Human Development Index (HDI) (0.824) and the highest income *per capita* (R$ 3788, approximately US$ 902.00 per month), as well as the lowest rate of illiteracy (3.25%)[1].

Regardless its short history, the FD has exerted a large influence in surrounding areas belonging to the states of Goiás and Minas Gerais, whose populations were previously scarce and mostly rural. Part of the municipalities in the surrounding areas became dependent on the FD, especially regarding human services, and some of them have become dormitory towns for workers who commute daily to Brasilia.

The FD and surrounding areas assumed the characteristics of a conurbation. In 1998, an initiative of the Ministry of National Integration created the Integrated Region of Development of the Federal District and Surroundings (RIDE-DF in the original Portuguese). This region included until 2018: the FD, three municipalities in the state of Minas Gerais and 19 municipalities in the state of Goiás (Figure 1). RIDE-DF is divided according to geographical criteria resulting in four regions: Unai (three municipalities in Minas Gerais State),

Pirineus (seven municipalities in Goias), North Surrounding Area (five municipalities in Goias) and South Surrounding Area (seven municipalities in Goias) (Figure 1). The FD surroundings have a population of 1,398,022, which added to the FD population results in 4,413,290 inhabitants RIDE-DF became a strategic region with an interstate development plan to treat the significant problems associated with its fast growth and inequities among its cities[2]. In fact, although its relatively recent creation, many problems which are typical of large metropolitan areas in Brazil have been detected in this region[3].

Some groups study large urban centers in Brazil as a way to compare characteristics and strategic public policies. Eventually, they propose different classifications for RIDE-DF geographical areas, but they always acknowledge its importance as a metropolitan urban region[4-5].

The assessment of life conditions, as an integral part of the health situation in a given territory is highly relevant. It helps managers in the decision-making process regarding the provision of health and social services. IBGE official studies have provided partial information about the RIDE-DF situation, but there is need for broader research focusing on household and neighborhood characteristics, as well as population health.

In this study, we present characteristics of dwellers, households and neighborhoods from the North Surrounding Region of RIDE-DF. We emphasize neighborhood social environment perception and health care services utilization.

MATERIALS AND METHODS

This is a population-based cross-sectional study using the instruments proposed for the Brazilian National Health Survey. We were sup-

Figure 1

Region of Development of the Federal District and Surroundings Map – RIDE-DF - 2012
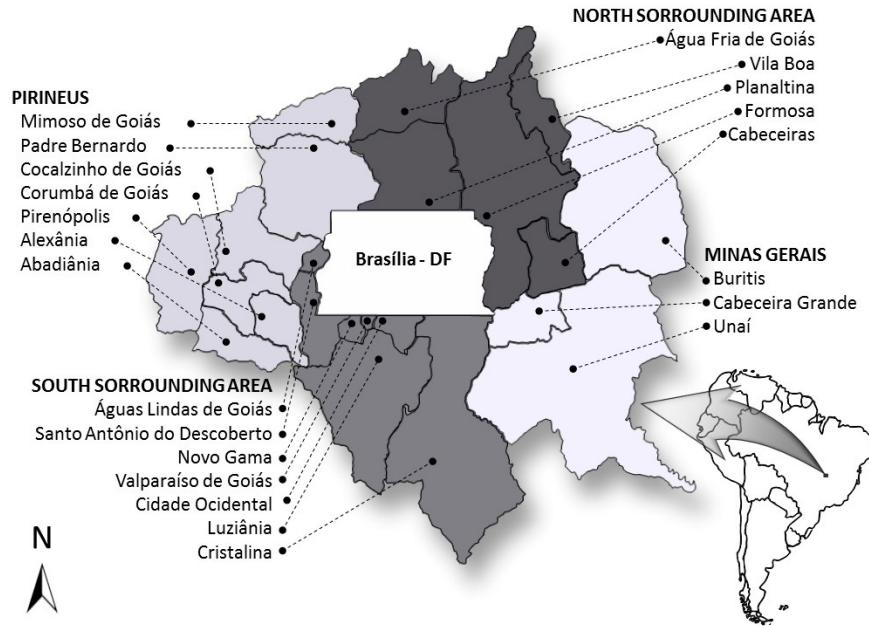
ported by Institute of Scientific and Technologic Communication and Information in Health of the Oswaldo Cruz Foundation (Fiocruz) for sample calculations and University of Brasília and Federal University of Goiás for data collection.

The present study covered the North Surround Area's municipalities: Água Fria de Goiás: 5,090 inhabitants; Vila Boa: 4,735 inhabitants; Planaltina: 81,649 inhabitants; Formosa: 100,085 inhabitants and Cabeceiras: 7,354 inhabitants, totalizing 198,913[3].

Sample size determination and sampling procedure

The estimated sample size to find proportions of 15% with random error of 0,3% with a confidence interval of 95%, a power of 80% and estimated a design effect of 1,3 corresponded to 720 individuals taking into account 20% of possible losses. Sample size is representative for the region.

We used a three-stage cluster sampling. The first stage was the population weight random selection of 40 census tracts of the region´s five municipalities, including urban and rural sectors, obtained from an official file with data taken from 2010 Census (IBGE). We excluded all census tracts with less than 30 private permanent households.

The second stage consisted of a selection of 18 households per census tract previously selected. The selection of the first household by random sampling within each census tract and calculation of a skip pattern from the first household enough to obtain 18 households in each census tract, following the standards to find the initial point of the census tract: beginning at the farthest point north and then walking on clockwise direction, keeping the houses to the right. We used only private permanent households occupied for at least 6 months.

The third stage was the selection of an adult (18 years old or over) among all adults living in the household by simple random sampling (with a random table).

Data collection

Fiocruz and Brazilian Ministry of Health experts developed the questionnaire. A preliminary version was available for public consultation and suggestions for 6 months. A pilot study carried out in the South Surrounding Region of Brasilia validated the questionnaire[6].

The questionnaire has two sections. The first addressed to the household, neighborhood and dwellers characteristics, as well as health services availability and utilization. Any adult member of the household could answer this part of the question-

naire. The second part or individual questionnaire had to be answered by the randomly selected adult dweller in private, without substitution. We made up to five attempts to contact absent selected dwellers. Interviews were performed inside the household, face-to-face using portable devices (HP™ handhelds)[7].

Data collectors participated in an extensive theoretical and practical training on the questionnaire and the main items of standardization of answers before starting fieldwork. Each working team consisted of two or three interviewers (nursing undergraduate students) and one supervisor (physicians, physiotherapists or nurses).

We collected data on weekends, when the dwellers usually stay home. Each working team had a team supervisor and a list of census tracts to course according to schedules made by a scout during the week to recognize census tracts and sensitize residents of selected households. A field coordinator directed all the activities for each workday according to the manual of procedures and its schedule.

The data from the portable devices was weekly exported to an MS-Excel™ 2010 spreadsheet. At the end of the workday, teams met to organize and correct input errors and missing data on supervisors and coordinators' notebooks.

Variables and categories

We selected questions from household questionnaire and for this article, we used the following variables:

In the first part of the questionnaire, for each household resident: gender (reported as male or female); age (reported in years); marital status (reported as never been married, married, separated, divorced or widow); schooling situation (reported as: illiterate, incomplete elementary, complete elementary and incomplete fundamental, complete fundamental and incomplete high school, complete high school and incomplete higher education and complete higher education or over); employment situation (reported as: government employee, formal worker, informal worker, familiar worker without payment, freelancer, self-employer without establishment, self-employer with establishment, employer with up to 5 permanent employees, employer with more than 5 permanent employees and not currently working); and reason for not working (reported as: devoted to household tasks, looking for but cannot find work, studying or training,

retired due to working time or age, retired due to illness or disability, away due to illness, away due to other reason and other reason).

For each household: house structure (reported as: brickwork, equipped wood, pug or clay, recycled wood, straw and other); piped water (answered as yes or no); water supply (reported as: from public grid, from well or other); power supply (reported as: from general electric grid, from oil or other); garbage disposal (reported as: official municipality regular collected, burned or buried, thrown into the river, sea or land and other ways); and bathroom drain (reported as: sewer, septic tank connected to the sewage system, septic tank not connected to the sewage system, rudimentary septic tanks, ditch, straight into the river, sea or lake and other ways).

For each household the dweller perception of violence in the neighborhood frequency (reported as: often, sometimes, rarely or never) of the following violent situations: fights with weapons answering the question: *In the last 6 months, was there any fight in which a weapon was used in your neighborhood?*, gangs fights answering the question: *In the last 6 months, was there any gang fight in your neighborhood?*); sexual violence answering the question: *In the last 6 months, was there any sexual assault or rape in your neighborhood?*; robbery or theft answering to the question: *In the last 6 months, was there any robbery or theft in your neighborhood?* and; perception of safety in neighborhood (reported as yes or no answering the question: *Feels safe walking in the neighborhood?*).

For each household the dweller perception of the following environment characteristics in neighborhood: presence of dirt (reported as yes or no as answer to the question: *Is there much garbage or rubbish on the streets of your neighborhood?*); noise (reported as yes or *no* answering the question: *Is your neighborhood too noisy?*); recreational areas (reported as yes or *no* answering the question: *Is there any recreational area, for sports and do walk at your neighborhood?*); availability of healthy food (reported as yes or no as answer to the question: *Is there any place in the neighborhood where you can buy fruits and vegetables?*).

For each household, concerned the health care usage profile: government family health program coverage (reported as *yes*, *no* or *do not know* answering the question: *Is your household covered by family health strategy program?*); regular health facility used when they needed and the coverage

of private health care services (reported as *yes*, *no* or *do not know* answering the questions: usually goes to the same place, same doctor or same health service when need health care? and *do the dweller have any health insurance?*).

Data Analysis

We calculate initial crude rates and after Fiocruz statistician adjusted data bank for design effect; we analyzed the data using IBM SPSS-20™ statistical software (complex sample analysis). Absolute and weighted relative frequencies were calculated with corresponding 95% confidence intervals. Relative frequency of people economically active was estimated for dwellers with age between 18 and 60 years.

Ethical Considerations

The Faculty of Health Sciences Research Ethics Board of University of Brasilia approved this project under protocol 074/10. All respondents provided informed consent. We referred all people with vulnerabilities found to the appropriate government agencies of their cities as provided in this research manual of procedures.

RESULTS

### Household and participant characteristics

We assessed 508 households in 40 census tracts in the North Surrounding Area, with 1,727 dwellers, corresponding to 70.6% of the originally planned sample. Ultimately, we had complete data sets for 482 households, with 1,619 dwellers. Only two census tracts were situated in rural areas.

We found households with a number of dwellers between 1 and 11, median of 3 and mean of 3.4 (3.3 - 3.5). The mean number of children less than 12 years old per household was 0.8 (0.7 - 0.9), with a median of 0, and a 3rd interquartile ranging between 1 and 5 children (Data not shown).

There were a slightly higher proportion of males (52.5% CI 50.2 - 54.8) than females in this region. The population was essentially young with a median age of 26 years and a 3rd quartile value of 41 years of age, and only 7.8% (CI 6.5 - 9.1) of the individuals were older than 60, which is the threshold age for the elderly population in Brazil. Children, 10 years or younger, represented 16.6% (14.9 – 18.3%) of the population. (Figure 2).

Figure 2

Population pyramid and age boxplot - Federal District North Surrounding Region – RIDE-DF – 2012
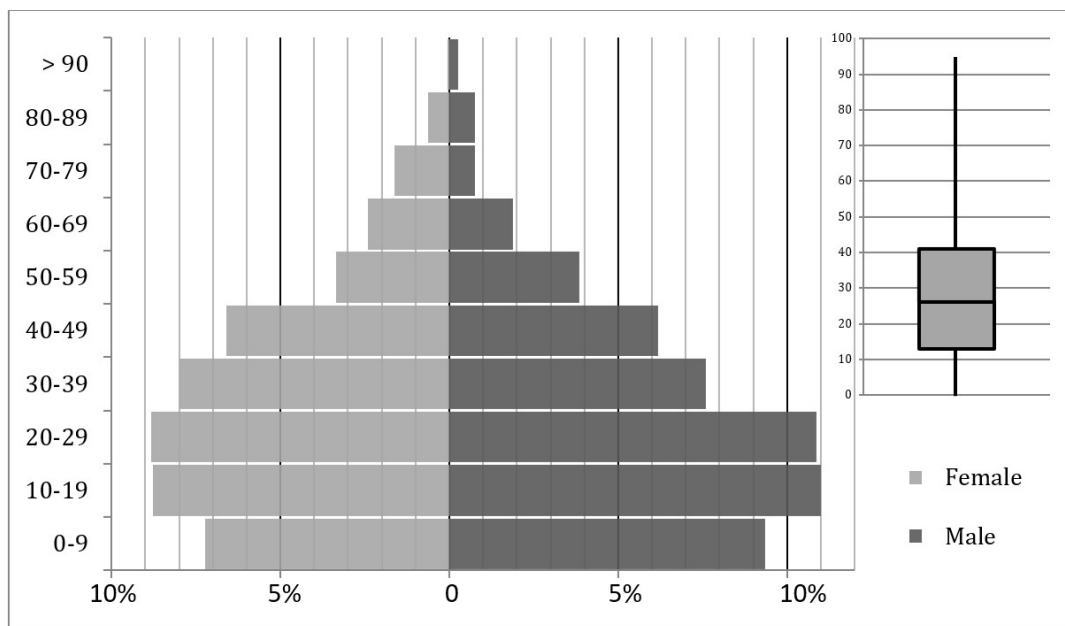
n = 1619

Approximately half of the adult population was formally or informally married (51.7% CI 48.9 - 54.5), another 35.6% (CI 32.9 - 38.3) was single. Formally or informally separated individuals corresponded to 7.2% (CI 5.8 - 8.6) of the populations, and widowers to only 5.4% (CI 4.1 - 6.7) (Data not shown).

Regarding education levels, a higher proportion of young individuals had incomplete or complete elementary schooling in comparison to older individuals. Moreover, the prevalence of illiteracy increased with age. However, levels of complete high school and undergraduate education were similar for the age ranges 20 and above (Table 1)

Table 1

Schooling of population - Federal District North Surrounding Region – RIDE-DF – 2012

Schooling / Educational Age group	6-14 yo	15-19 yo	20-39 yo	40-59 yo	50-79 yo	> 80 yo	Total
Illiterate	3.1% (1.2 - 5.0%)	2.4% (1.0 - 2.8%)	2.3% (1.4 - 3.2%)	3.9% (2.9 - 4.9%)	6.5% (5.3 - 7.7%)	7.8% (6.5 - 9.1%)	5.2% (4.7 - 5.7%)
Incomplete elementary	74.3% (69.5 - 79.1%)	54.9% (50.4 - 59.4%)	38.8% (35.9 - 41.7%)	40.5% (37.9 - 43.1%)	40.2% (37.8 - 42.6%)	39.9% (37.5 - 42.3%)	42.9% (41.7 - 44.1%)
Complete elementary	21.2% (16.7 - 25.7%)	30.1% (26.0 - 34.2%)	24.6% (22.0 - 27.2%)	21.5% (19.4 - 23.6%)	20.6% (18.6 - 22.6%)	20.3% (18.3 - 22.3%)	22.0% (21.0 - 23.0%)
Complete high school	1.4% (0.1 - 2.7%)	12.6% (9.6 - 15.6%)	30.2% (27.5 - 32.9%)	28.3% (26.0 - 30.6%)	27.0% (24.8 - 29.2%)	26.6% (24.4 - 28.8%)	25.3% (24.2 - 26.4%)
Complete higher education	0.0%	0.0%	4.2% (3.0 - 5.4%)	5.7% (4.5 - 6.9%)	5.6% (4.4 - 6.8%)	5.5% (4.4 - 6.6%)	4.7% (4.2 - 5.2%)

n = 1619 ; Confidence interval = 95%.

Work force corresponds to 58.1% (CI 55.7 - 60.5) of 563 adult dwellers in the economically active population age span (18 to 60 years of age). Only 24.9% (CI 22.3 - 27.5) of this group had formal employment; 9.8% (CI 8.0 – 11.6) of them reported informal jobs; 4.2% (CI 3.0 - 5.4) were self-employed with an establishment and just 0.3% (CI 0.1 – 0.5) were employers, all of them, women. (Data not shown)

Among all 629 adults included in the sample, almost 40.0% were working by the time of data collection. Men were more likely to be working and most of them as formal private employees. The remaining subjects (60.2%, CI 58.1 - 62.3) were not working by the time of data collection (55.8%, CI 52.8 - 58.8 of adults in economically active age). 33.7% (CI 29.1 - 38.3) of adults were involved in domestic tasks; 24.4% (CI 20.2 - 28.6) were retired; 6.5% (CI 4.1 - 8.9) were studying or in training and 15.2% (CI 11.7 - 18.7) of total or 21.6% (CI 19.8 - 26.4) of economically active adults were trying to find a job (Table 2).

Almost all households, 99.2% (CI 98.5 - 99.9), were made of brickwork. The remaining houses in the area were mostly made of wood 0.6% (CI 0.0 - 1.3). Among all households, 98.8% (CI 97.8 - 99.8) had piped water from the public grid and electric power; 0.4% (CI 0.0 - 0.9) used well and oil lighting (Data not shown). Most households, 91.3% (CI 88.8 - 93.8), had scheduled garbage collection; 8.1% (CI 5.8 - 10.4) burned or buried garbage and 0.2% (CI 0.0 - 0.6) threw garbage in the river, stream or land (Data not shown). Septic tanks with no connection to the public sewage system were the most common disposal systems for bathroom waste (51.4%, CI 47.1 - 55.7), followed by public sewage (28.7%, CI 24.8 - 32.6). There were also septic tanks connected to the sewage system (13.2%, CI 10.3 - 16.1), rudimentary septic tanks (6.3%, 4.2 - 8.4%) and ditches (0.2%, CI 0.0 - 0.6) (Data not shown).

Table 2

Employment situation of adult dwellers in Federal District North Surrounding Region – RIDE-DF – 2012

Employment situation	Gender			Age (years)		
	Male	Female	**All Adults**	18-39	40-59	>60
Currently working	50.5% (46.6 - 54.4%)	28.7% (25.1 - 32.3%)	**39.8% (37.1 - 42.5%)**	44.3% (40.7 - 47.9%)	43.8% (38.7 - 48.9%)	10.5% (5.1 - 15.9%)
Government employee	3.0% (1.7 - 4.3%)	3.4% (2.0 - 4.8%)	**3.2% (2.2 - 4.2%)**	2.0% (1.0 - 3.0%)	6.9% (4.3 - 9.5%)	0.0%
Formal private employee	25.8% (22.4 - 29.2%)	11.5% (8.9 - 14.1%)	**18.8% (16.6 - 21.0%)**	24.5% (21.4 – 27.6%)	14.5% (10.9 - 18.1%)	1.9% (0.0 - 4.3%)
Informal private employee	10.0% (7.6 - 12.4%)	7.4% (5.3 - 9.5%)	**8.8% (7.2 - 10.4%)**	11.7% (9.3 - 14.1%)	5.0% (2.7 - 7.3%)	4.4% (0.7 - 8.1%)
Familiar unpaid employee	0.2% (0.0 - 0.6%)	0.3% (0.0 - 0.8%)	**0.3% (0.0 - 0.6%)**	0.3% (0.0 - 0.7%)	0.4% (0.0 - 1.0%)	0.0%
Self-employed with establishment	4.3% (2.7 - 5.9%)	3.6% (2.1 - 5.1%)	**4.0% (2.9 - 5.1%)**	2.5% (1.4 - 3.6%)	7.5% (4.8 - 10.2%)	3.0% (0.0 - 6.0%)
Freelancer	7.2% (5.2 - 9.2%)	2.1% (0.9 - 3.3%)	**4.7% (3.5 - 5.9%)**	3.4% (2.1 - 4.7%)	9.1% (6.1 - 12.1%)	1.1% (0.0 - 3.0%)
Employer	0.0%	0.3% (0.0 - 0.7%)	**0.1% (0.0 - 0.3%)**	0.0%	0.5% (0.0 - 1.2%)	0.0%
Not currently working	49.5% (45.6 - 53.4%)	71.3% (67.7 - 74.9%)	**60.2% (57.5 - 62.9%)**	55.7% (52.1 - 59.3%)	56.2% (51.1 - 61.3%)	89.5% (84.1 - 94.9%)
Reasons for not working						
Devoted to household tasks	3.2% (0.3 - 6.1%)	49.9% (43.8 – 56.0%)	**33.7% (29.1 - 38.3%)**	36.2% (29.2 - 43.2%)	56.1% (46.4 - 65.8%)	11.0% (5.4 - 16.6%)
Looking for, but cannot find work	22.4% (15.4 - 29.4%)	11.3% (7.5 - 15.1%)	**15.2% (11.7 - 18.7%)**	26.3% (19.9 – 32.7%)	13.0% (6.4 - 19.6%)	0.0%
Studies / training	9.9% (4.9 - 14.9%)	4.8% (2.2 - 7.4%)	**6.5% (4.1 - 7.9%)**	13.5% (8.5 - 18.5%)	1.7% (0.0 - 4.2%)	0.0%
Retired due to working time or age	25.9% (18.6 - 33.2%)	15.7% (11.3 - 20.1%)	**19.2% (15.3 - 23.1%)**	0.0%	5.8% (1.2 - 10.4%)	59.7% (50.9 – 68.5%)
Retired due to illness / disability	9.4% (4.5 - 14.3%)	3.0% (0.9 - 5.1%)	**5.2% (3.0 - 7.4%)**	2.4% (0.2 - 4.6%)	1.5% (0.0 - 3.9%)	12.6% (6.6 - 18.6%)
Away due to illness	10.8% (5.6 - 16.0%)	6.1% (3.2. - 9.0%)	**7.7% (5.1 - 10.3%)**	5.0% (1.8 - 8.2%)	10.3% (4.3 - 16.3%)	9.8% (4.5 - 15.1%)
Away due to other reason	2.6% (0.0 - 5.3%)	0.8% (0.0 - 1.9%)	**1.4% (0.2 - 2.6%)**	0.4% (0.0 - 1.3%)	2.0% (0.0 - 4.8%)	2.4% (0.0 - 5.1%)
Other reason	15.8% (9.7 - 21.9%)	8.5% (5.1. - 11.9%)	**11.0% (7.9 - 14.1%)**	16.1% (10.7. - 21.5%)	9.6% (3.8. - 15.4%)	4.5% (0.8 - 8.2%)

n = 1054. Confidence interval = 95%

Perceptions about the neighborhood

Representatives of each household answered questions about safety. Participants perceived the neighborhood as unsafe: more than half of the respondents (52.8%, CI 48.5 - 57.1) stated that they did not feel safe walking in the neighborhood (Data not shown).

The occurrence of sexual assaults in the six months prior to the interview was reported by 6.7% (CI 4.5 - 8.9) of dwellers; 31.9% (CI 27.8 - 36.0) reported armed fights; 40.6% (CI 36.3 - 44.9) reported robbery or theft; and 25.2% (CI 21.4 - 29.0). reported gang fights (Data not shown).

Nearly one third of dwellers perceived the neighborhood as noisy (30.9%, CI 26.9 - 34.9); 40.2% (CI 36.0 - 44.4) considered their neighborhood dirty. Interviewees did not identify enough places where they could buy healthy food in 33.5% (CI 29.4 - 37.6) of cases; and 65.7% (CI 61.6 - 69.8) of them said their neighborhood did not have places to practice sports or leisure activities. (Data not shown)

Health Services Utilization

Only 12.3% (CI 10.8 - 13.8) of the study population was covered by any kind of private health insurance, the majority depended on public health services. This finding is consistent with the proportion of people who say they usually seek public institutions for health care, 85.3% (CI 83.4 - 87.2), and who usually seek the same health facility or service when in need of health care (Table 3). Household coverage with Family Health Strategy, the official primary health care policy, corresponded to 66.4% (CI 62.3 - 70.5), however, 7.8% did not know how to answer this question (Data not shown).

Table 3

Health care usage profile among dwellers of Federal District North Surrounding Region – RIDE-DF – 2012

	Gender		Age					
	Male	Female	0-19	18-39	40-59	60-79	≥80	Total
Do you usually go to the same place, health service or doctor when you need health care?								
Yes	70.5% (67.6 - 73.4%)	73.6% (70.6 - 76.6%)	74.4% (71.0 - 77.8%)	70.0% (66.4 - 73.6%)	70.8% (66.1 - 75.5%)	75.4% (67.7 – 83,1%)	65.2% (47.8 - 82.6%)	72.0% (69.9 - 74.1%)
No	29.5% (26.6 - 32.4%)	26.4% (23.4 - 29.4%)	25.6% (22.2 – 29.0%)	30.0% (26.4 - 33.6%)	29.2% (21.5 - 30.9%)	24.6% (16.9 - 32.3%)	34.8% (17.4 - 52.2%)	28.0% (25.9 - 30.1%)
Where do you usually go?								
public health center*	28.8% (25.3 - 32.3%)	29.6% (26.0 - 33.2%)	29.0% (25.0 - 33.0%)	30.1% (25.8 - 34.4%)	26.7% (21.3 - 32.1%)	31.7% (22.2 - 41.2%)	38.2% (16.2 - 60.2%)	29.2% (26.7 - 31.7%)
public emergency room	46.9% (43.1 - 40.7%)	45.2% (41.3 - 49.1%)	48.7% (44.2 - 53.2%)	47.0% (42.3 - 51.7%)	45.0% (38.9 - 51.1%)	34.2% (24.5 - 43.9%)	37.4% (15.5 - 59.3%)	46.1% (43.4 - 48.8%)
public outpatient clinic	4.4% (2.8 - 6.0%)	6.2% (4.3 - 8.1%)	3.2% (1.6 - 4.8%)	4.5% (2.6 - 7.4%)	8.2% (4.8 - 11.6%)	12.9% (6.0 - 19.8%)	0.0%	5.3% (4.1 - 6.5%)
private emergency room	11.1% (8.7 - 13.5%)	9.0% (6.8 - 11.2%)	10.2% (7.5 - 12.9%)	9.4% (6.7 - 12.1%)	9.8% (6.1 - 13.5%)	13.2% (6.2 - 20.2%)	0.0%	10.1% (8.5 - 11.7%)
private outpatient clinic	8.6% (6.5 - 10.7%)	10.0% (7.7 - 12.3%)	8.9% (6.4 - 11.4%)	9.1% (6.4 - 11.8%)	9.7% (6.1 - 13.3%)	8.0% (2.4 - 13.6%)	24.4% (5.0 - 43.8%)	9.2% (7.6 - 10.8%)

Others	0.2% (0.0 - 0.5%)	0.0%	0.0%	0.0%	0.5% (0.0 - 1.4%)	0.0%	0.0%	0.1% (0.0 - 0.3%)

Covered by any health insurance

Yes. obligatory by public institutions	4.4% (3.1 - 5.7%)	4.1% (2.8 - 5.4%)	3.8% (2.3 - 5.3%)	3.4% (2.0 - 4.8%)	7.1% (4.4 - 9.8%)	3.8% (0.4 - 7.2%)	2.1% (0.0 - 7.4%)	4.3% (3.4 - 5.2%)
Yes a private health insurance	6.8% (5.2 - 8.4%)	9.4% (7.4 - 11.4%)	6.6% (4.7 - 8.5%)	8.8% (6.6 - 11.0%)	7.5% (4.8 - 10.2%)	11.6% (5.9 - 17.3%)	15.3% (2.2 - 28.4%)	8.0% (6.7 - 9.3%)
No	88.8% (86.8 - 90.8%)	86.5% (84.2 - 88.7%)	89.6% (87.2 - 92.0%)	87.8% (85.2 - 90.4%)	85.4% (81.7 - 89.1%)	84.6% (78.2 - 91.0%)	82.5% (68.6 - 96.4%)	87.7% (86.2 - 89.2%)

How is health insurance paid?

Fully covered by employer	61.1% (51.8 - 70.4%)	57.5% (48.6 - 66.4%)	56.0% (44.2 - 67.8%)	51.0% (40.0 - 62.0%)	78.7% (67.6 - 89.8%)	54.4% (31.8 - 77.0%)	39.9% (0.0 - 82.7%)	59.2% (52.7 - 65.7%)
Partially covered by employer	18.7% (11.3 - 26.1%) ±7.4	20.2% (13.0 - 27.4%)	17.9% (8.8 - 27.0%)	29.1% (19.1 - 39.1%)	6.8% (0.0 - 13.6%)	16.6% (0.0 - 33.5%)	32.4% (0.0 - 73.3%)	19.4% (14.2 - 24.6%)
Fully paid by titular	10.5% (4.6 - 16.4%)	12.1% (6.2 - 18.0%)	12.4% (4.6 - 20.2%)	10.2% (3.5 - 16.9%)	6.3% (0.0 - 12.9%)	22.6% (3.6 - 41.6%)	27.6% (0.0 - 66.7%)	11.3% (7.1 - 15.5%)
Paid by another person	7.7% (2.6 - 12.8%)	6.0% (1.7 - 10.3%)	10.5% (3.2 - 17.8%)	6.1% (0.8 - 11.4%)	3.9% (0.0 - 9.1%)	6.4% (0.0 - 17.5%)	0.0%	6.8% (3.5 - 10.1%)
Do not know	2.1% (0.0 - 4.9%)	4.2% (0.6 - 7.8%)	3.2% (0.0 - 7.4%)	3.6% (0.0 - 7.7%)	4.3% (0.0 - 9.8%)	0.0%	0.0%	3.2% (0.9 - 5.5%)

n = 1619; Confidence interval = 95%; *public places for vaccination, basic attention consultations and simple diagnostic tests. †Among inhabitants covered by health security (n = 201).

DISCUSSION

The population in the North Surrounding Area is considered young in Brazil, with 8.4% of elderly people and 36.4% under the age of 20. In comparison, the Brazilian population has 12.1% of elderly and 32.0% under the age of 20. The FD population has a structure that resembles that of the study population: 8.4% of elderly and 31.2% under 20 years old according to the Brazilian National Research by Households Sample (PNAD in Portuguese acronym). The state of Goiás, where the North Surrounding Region is located, has 10.7% of elderly and 31.2% under the age of 20 years[8].

In our work, men were slightly overrepresented (52.5%). Most of surveys have a higher proportion of women: PNAD data show that women represent 51.5% of the Brazilian population[8], almost the same proportion found in the South Surrounding Region of RIDE-DF (51.4%)[9] and District Research by Households Sample (PDAD) for FD: 52.5%[2]. None of those differences were statistically significant.

Regarding educational level, we found relevant differences when comparing illiteracy in the FD at a level of 2.0 %[10], in Brazil, at 8.0%[8]; and in the study area where this proportion was 5.2%. There is a small percentage (1.4%) of adolescents (included in the age-span of 6 to 17 years old) with complete high school. This finding may reflect flaws in the survey instrument which leads to a misunderstanding of schooling levels. Regardless of possible flaws, we found an educational gap inside each age group, with a tendency to increase among the elderly. These findings are similar to those reported by Rocha (2013) showing that almost half of the South Surrounding Area population (47.5%

CI 40.4 - 54.7) had up to 8 years of schooling, and 30.8%(CI 24.7 - 37.6) over 12 years.

The educational policies of the Brazilian federal government have targeted the alphabetization of children under the age of 6 and encouraged enrollment in higher education. Clearly, these efforts have yet to yield consistent results.

The North Surrounding Area has a proportion of married adult dwellers (over 18 years old) of 51.7%, which is expected for a young population. The PNAD showed that 39.6% of Brazilians over the age of 15 are married, and 44.4% over 20 years old.[8] In the FD, the PDAD reveals a proportion of married people (50.2%), closer to the figure found in the present study. Widower status in the North Surrounding Area (5.5%) is apparently slightly lower than the Brazilian proportion (6.9%) and similar to the PDAD indicator (4.6%). The South Surrounding Region of RIDE-DF showed a proportion of 66.9% (CI 62.1 - 71.4) among adults[2].

The PNAD reveals that 48.0% of Brazilians are formally employed.[8] We found that this proportion is 35.3% in the North Surrounding Area. The value found by PDAD in the FD was 28.4%.[2] These figures support the view of the North Surrounding Area as partly composed of dormitory towns, whose inhabitants benefit from a part of the formal jobs available in the FD. In the South Surrounding Area, a region closer to the FD, 60.9% (CI 55.3 - 66.1) of the population was employed at the time of the survey[9].

Retired citizens represent 12.1% of the FD population according to PDAD[2]. We found 9.2% in North Surrounding. Also, 3.9% of the FD population is unemployed[2], a proportion that is similar to that of the North Surrounding: 5.1%. The North Surrounding has a very poor economy, supported by automated agribusiness, but with a lack of work opportunities, and very small activities generate employment. Employers represent only 1.0% of the population, and the young must thus seek work in the FD.

Brazil has a mean of 3.2 dwellers per household according to PNAD[8] very similar to the FD(3.3)[2]. and to the North Surrounding Area in the present study (3.4).

The North Surrounding has a structure of households that is very similar to the FD, according to the PDAD: houses made of brickwork (99.2%),

supplied with piped water from public grid (98.6%) and electric power (100%). The PDAD seems indicate that the FD collects slightly more garbage through the regular public system: 96%.

We did not survey 27.7% of the households in the original sample due to dwellers' refusal to participate, or because we could not find the dwellers even after five visits on different weekdays and hours. Refusals (10%) occurred mainly at census tracts in neighborhoods of Formosa City, but we found no expressive differences for characteristics like gender, age and schooling in these areas. This high rate may result in part from the concomitant occurrence of municipal elections. Dwellers frequently mistook research groups for candidate committees and refused interviews. Nevertheless, the survey yielded broad enough data for the analyses.

The indicators discussed below reflect the social conditions perceived by the population in their neighborhood, including violence, dirt, noise, lack of employment, insecurity and lack of spaces to practice sports, to engage in leisure activities and to buy healthy food.

In the South Surrounding Area, 29.9% (CI 25.4 – 34.8) of the individuals perceived the neighborhood as noisy, a proportion that closely resembled that of the North Surrounding Area. We observed greater differences in the perception of garbage on the streets, 59.3% (CI 52.6 - 65.7) in the South, and 40.2% in the North Surrounding Area. In the South, 55.5% (CI 46.8 - 63.9) of the population had access to healthy food and 22.8% to places for leisure activities in these proportions were 33.5% and 65.7%, respectively[9].

Half of the North Surrounding Area population does not feel safe walking on streets, in contrast to around three quarters (76% CI 70.7 - 80.7) in the South Surrounding Area. Other studies suggest that large urban growth areas may suffer the pressure of extreme appreciation of space with the ensuing social exclusion of some sections of society and the activities linked to them[11]. It may explain differences between the study region where, according to the Brazilian Ministry of Health, homicides affect $45.2/_{100,000 \text{ inhabitants}}$ and the FD, where this number is 30.6/100,000 inhabitants[1,12].

This population heavily depends on public health services because only 12.3% of dwellers are covered by any kind of health plan. In the South Surrounding Area 15% (CI 12.7 - 17.1) of the

adults are covered. Curiously, the Brazilian Health Ministry indicates that 38% of all health institutions in the North Surrounding Area are private unities, which may suggest an insufficient coverage of public services[12]. We found that the official family health program covered slightly more than 66.4% of households, a number that is lower than the official indicator for the region of 84.8%, but much larger than the official indicator for the FD of 17.6%[12].

Despite the location of this region in the surroundings of a planned capital city, and the creation of a council to promote development, its socio-spatial configuration resembled those found in any other urban agglomeration in Brazil[1]4. This study is subject to temporal ambiguity and survival bias inherent to this kind of work. Nevertheless, it provides an accurate picture of life conditions in the North Surrounding Region, which may be useful for comparisons with similar areas worldwide, and for the development of action plans involving health, economy, security and education.

FINAL CONSIDERATIONS

Since 1960, a metropolitan area with multiple administrative units has rapidly grown in the center of Brazil. Despite its short history, it already faces the problems that plague any other Brazilian metropolitan area. In addition, the fact that this region sprawls across three different federal units could hamper government efforts to build articulate integrated policies to solve these issues. In this sense, this situation is analogous to those of the Mexican and the Venezuelan Federal Districts and their surrounding areas (Mexico Valley Metropolitan Area and Caracas Metropolitan Area, respectively).

The RIDE-DF, as a managerial instrument, has potential to help understanding the area growth dynamics and the development of integrated policies. The North Surrounding Area, as a part of this region, displayed interesting characteristics that provided useful baseline data to monitor the results of public policies and address interventions. We suggest this region must be the focus of continued attention for the evaluation of government efforts over strategic areas like health, education, economy, social work, safety and other important areas, as well.

Finally, sharing managerial experiences with other federal countries could help to incentive new studies funding to measure local indicators and build responses to complex urban demands.

REFERENCES

1. IBGE. Brazilian institute of geography and statistics. http://www.ibge.gov.br. Accessed January 08, 2020.

2. CODEPLAN. Central highlands development company. Report of seminar of strategies for sustainable development of the Federal District and its surrounding areas, Brasília-DF. www.codeplan.df.gov.br/ publicações. Accessed December 6, 2014.

3. IBGE. Brazilian institute of geography and statistics. Municipalities. http://cidades.ibge.gov.br/xtras/home.php. Accessed December 16, 2014.

4. Ribeiro MG. Bem-estar urbano nas metrópoles brasileiras, 25 anos depois da promulgação da Constituição Cidadã. Revista Eletrônica de Estudos Urbanos Regionais. *Rev Eletrônica Estud Urbanos E Reg*. 2013;4(14):9-24.

5. De Queiroz Ribeiro LC, da Silva ÉT, Rodrigues JM. Metrópoles brasileiras: diversificação, concentração e dispersão. *Rev Parana Desenvolv*. 2011;(120):177-207. https://www.academia.edu/28752131/Metr%C3%B3poles_brasileiras_diversifica%C3%A7%C3%A3o_concentra%C3%A7%C3%A3o_e_dispers%C3%A3o. Accessed December 16, 2014

6. Proposição do Questionário da Pesquisa Nacional de Saúde. https://www.pns.icict.fiocruz.br/index.php?pag=proposicao. Accessed May 28, 2020.

7. Corporación Andina de Fomento. Desarrollo urbano y movilidad en America Latina. Bogota: CAF; 2011.

8. IBGE. Brazilian institute of geography and statistics. PNAD National Survey of households. 2011. http://www.ibge.gov.br/home/estatistica/populacao/trabalhoerendimento/pnad2011/sintese_defaultpdf_dados.shtm. Accessed January 27, 2015.

9. Rocha PRS. Situação de saúde de adultos residentes nos municípios do entorno sul da Região Integrada de Desenvolvimento do Distrito Federal e Entorno (RIDE-DF): inquérito de base populacional, 2010-2011. 2013. http://repositorio.unb.br/handle/10482/12000. Accessed June 10, 2015.

10. IBGE. Brazilian institute of geography and statistics. PNAD National survey of households 2013. http://www.ibge.gov.br/home/estatistica/populacao/trabalhoerendimento/pnad2013/sintese_defaultpdf_dados.shtm. Accessed March 4, 2015.

11. Ferreira IFCB, Penna NA. Território da violência: um olhar geográfico sobre a violência urbana. GEOUSP Espaço E Tempo. 2011;(18):155-168. DOI: https://doi.org/10.11606/issn.2179-0892.geousp.2005.73979.

12. SAGE. Support room to strategic management - Ministry of Health. http://189.28.128.178/sage/ Accessed April 24, 2015.

13. CNES. National Register of Health Facilities. Establishments query. http://cnes.datasus.gov.br/Mod_Ind_Unidade.asp. Accessed February 22, 2015.

14. Caiado MCS. Estruturação intra-urbana na região do Distrito Federal e entorno: a mobilidade e a segregação socioespacial da população. Rev Bras Estud Popul. 2013;22(1):55-88. http://cnes.datasus.gov.br/Mod_Ind_Unidade.asp. Accessed February 22, 2015. Accessed February 22, 2015.