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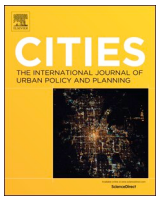

Health differences in an unequal city☆

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ABSTRACT

Cities have a significant influence on people's mental and physical health. City planning has the potential to change behaviors and incentivize a healthier lifestyle through the provision of public goods and urban infrastructure. The bulk of the evidence correlating city configuration and population health comes mostly from cities in the global north, with little evidence from cities in developing countries. This analysis seeks to contribute to bridging this evidence gap. This empirical analysis presents an insight into population health conditions (physical health and overweight-obesity) and its correlation with gender and socioeconomic conditions. Data comes from an extensive annual population survey conducted in Cali, Colombia. Results show that women and the poor report a higher probability of poor physical health and a higher number of days reporting poor mental health. Over-weight and obesity are slightly increasing in the city, particularly amongst women, but there is no clear pattern by socioeconomic conditions. Overweight and obese people are more common amongst married couples, with lower educational attainment and lack of physical activity. This analysis aims to provide insights that can better inform urban policies and city planners to contribute to the global agenda of the Sustainable Development Goals to make cities sustainable, equitable, and livable.

1. Introduction

The benefits of economic growth and the access to opportunities are mostly concentrated in cities. With the bourgeoning literature on city planning, urban policies, and urban sustainability, there is also a better understanding of the view that cities not only provide access to better economic opportunities, but the way they are planned and designed also have a broad impact on people's health (Jackson, 2003).

There is a proven link between people's health and the quality of public urban space (Hunter et al., 2015; Schüle & Bolte, 2015; Srinivasan, O'fallon, & Dearry, 2003). How the urban realm is designed and planned, and public goods and services are offered do matter and influence people's choices. City planning and the provision of public goods have the potential to contribute to public health concerns such as obesity, lack of physical activity, depression, and respiratory diseases (Mayne, Auchincloss, & Michael, 2015; Sallis et al., 2009; Sallis, Floyd, Rodríguez, & Saelens, 2012). Moreover, cities and their role in population health are at the top agenda of multilateral organizations. The United Nations has made an emphasis on the interconnection of health and urbanization. The Sustainable Development Goals (SDG's) seek to make cities inclusive, sustainable, and health promotion is at the heart of those objectives. Through the statement of SGS 3 (promotion of good health and well-being) and 11 (sustainable cities and communities), there is a global commitment to allocate efforts and resources to make cities more livable and promote well-being to foster sustainable growth (CEPAL, 2018). In line with the global agenda, the United Nations "Healthy Cities" initiative, prioritize cities for resolving development issues like health, inequalities, and access to public services (WHO, 2016a).

The bulk of the literature on health outcomes in urban contexts refers to how public health is affected by the availability of public services such as parks, bicycle lanes (Hunter et al., 2015; Jackson, 2003; Srinivasan et al., 2003; Witten, 2016). Yet, most studies on the link between health and the urban context has mostly been about cities in the global North, and this has created a knowledge gap. While there is much information on rich urban areas in the rich world, information for developing countries is scarce, even as they face more complex policy problems, limited resources, and constrained local government capacity (Glaeser & Henderson, 2017; Hunter et al., 2015).

In Latin America, there is a lack of information for a better-informed policy process and academic research. The debate of population health in the Americas is dominated by the policy issue of strengthening health systems through subsidized schemes to guarantee access to health services to the entire population, particularly to the poor (Horton & Das,

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2015). Since the 1990s, many countries in the region have adopted policies to provide universal health coverage, and much of policy design, government interventions, and resource allocation are directed to increase health access. While universal coverage is indispensable, it is not the only factor that promotes better health outcomes amongst the population. There are economic, geographic, and sociocultural factors that have a significant impact on people's health, and in the Americas, we still lack research and policy intervention to move forward with this discussion (PAHO, 2017).

The region is experiencing a shift from a high prevalence of infectious diseases to a high prevalence of noncommunicable diseases. The strengthening of the public health sector, accessibility to vaccination, and drinking water to the poor have made it feasible to eliminate and control some infectious diseases in the region (Schneider et al., 2011). However, noncommunicable diseases are rising, and obesity is one of the conditions increasing in the recent past (WHO, 2016a). These factors call for a larger body of evidence to monitor population health outcomes and to move forward in the discussion of health access.

Another factor that is also relevant in Latin American cities is the lack of data at the city level. While cities in developed countries have a sizable body of data to track and monitor health outcomes in urbanized settings, we are just starting in the Americas. The most promising intervention –SALURBAL project- was launched in 2017, and the process of data harmonization in 371 cities is an ongoing task (SALURBAL, 2018). There is a lack of information at city level to link the differences in socioeconomic conditions to health outcomes in Latin American towns. When governments seek to make informed decisions about urban policy and planning there is little information available.

This study uses Cali, the third-largest city in Colombia, as a case study to describe the pervasiveness of health disparities in cities in developing contexts. Cali is a good example of some of the most common characteristics of cities in Latin America: high population density, income inequality, poverty, and violence (Heilig, 2012). Using cross-sectional data from Cali, this study aims to analyze two health outcomes: self-reported health and overweight-obesity, and present its correlation with gender and socioeconomic conditions in the city. In particular, two questions will guide this analysis:

1. How self-reported health varies in function of socioeconomic conditions and gender?
2. How overweight-obesity varies in function of socioeconomic conditions and gender?

The focus on the differences in socioeconomic conditions is a response to the deep inequalities and high segregation in cities in the global South (Gwynne & Cristobal, 2014; Tsounta & Osueke, 2014). The motivation to study gender differences in health outcomes contributes to the discussion of how women are at greater risk of obesity, depression, and poor physical health (WHO, 2014).

This paper aims at contributing to a better-informed urban policy process in Cali, Colombia, and expects to inform mid-size cities in the region about the trends of noncommunicable conditions and its correlation with socioeconomic disparities and gender. This analysis is descriptive and provides new information about physical health and obesity-overweight. The information here has the potential to provide evidence for better policymaking and advocacy for a more just and fair urban realm.

2. Background

There is a significant body of research showing that city planning has a significant impact on people's health. Most of the findings provides a confirmation that the way cities and neighborhoods are designed and planned have a great impact on health conditions such as obesity, asthma, or depression and are also correlated with inequities and crime within cities (Hunter et al., 2015; Jackson, 2003; Meyer, Castro-Schilo, & Aguilar-Gaxiola, 2014; Srinivasan et al., 2003). Moreover, there is a call to plan cities based on the wellbeing provided to their habitants and the increase in quality of life (Barton, 2016). It has been shown that the environment in neighborhoods matters and influences the choices and behaviors of their inhabitants (Chetty, Hendren, & Katz, 2016; Rundle et al., 2016). Neighborhood design and the provision of public services incentivize physical activity when sidewalks, bicycle lanes, parks and green areas, and bus stations are near people's homes (Witten, 2016). In turn, major physical activity reduces obesity, stress, and depression and improves people's general health status (Brown & Cummins, 2013; Diez Roux & Mair, 2010; O. Ferdinand, Sen, Rahurkar, Engler, & Menachemi, 2012; Lee et al., 2012).

Cities and neighborhoods in the developing world are not equal and do not provide the same access to public goods and services to all citizens despite policy efforts to create better living environments (Pugh, 2013). Cities in Latin America are an example of the deep inequalities in the global South. Despite the economic growth in the region over the past decades, cities have grown more unequal and more segregated. Rich and poor live in separated spaces and have access to quite a different array of services (Gwynne & Cristobal, 2014; Tsounta & Osueke, 2014).

Changes in city composition (as a consequence of rural migration) and rapid urbanization in Latin America are affecting epidemiological profiles. Nowadays, chronic diseases, which are, to a large extent, preventable, are growing. Diabetes, respiratory diseases, obesity, land traffic accidents, and injuries related to criminal activity represent leading health problems in the region (PAHO, 2017).

2.1. Physical health

Socioeconomic inequalities have a large effect on physical health. The unequal distribution of income and access to health services makes the less advantaged populations more prone to suffer poor health and shorter lives. The vast literature on this subject shows a very strong association between low income and poor health outcomes such as short life expectancy, violent deaths, and early pregnancy (Kondo et al., 2009; Pickett & Wilkinson, 2015; Wilkinson, 2002). The literature on gender differences in physical health suggests that, generally speaking, women experience poorer health than males but this depends on the outcome evaluated. There is a higher representation of women in cases of chronic diseases such as anemia, thyroid problems, migraines, and arthritis, whereas males are more likely than women to smoke, consume alcohol, or have an imbalanced diet. In addition, women are less likely to be physically active, which in turn, affects their physical health (Denton, Prus, & Walters, 2004; Matud, 2017; Regitz-Zagrosek, 2012).

One common indicator to proxy for heath conditions is self-reported heath, which is a subjective global assessment of the perception that each individual has about his/her overall health. This indicator is generally included in epidemiological studies and has been linked with socioeconomic conditions and objective health measures such as hospitalizations (Nielsen, 2016). Generally speaking, there are no clear differences in terms between how males and females self-rate their own heath. It depends on the country and contextual variables such as employment, physical activity, or family history (Dahlin & Härkönen, 2003; Simon, De Boer, Joung, Bosma, & Mackenbach, 2005; Walid & Stock, 2016). In comparative studies across developed countries, women tend to rate their overall heath as being worse than that of males (Crimmins, Kim, & Solé-Auroó, 2010) but the bulk of the research shows mixed results.

2.2. Overweight and obesity

In Latin America, overweight and obesity are increasing at an alarming pace (WHO, 2016b). Most countries are experiencing a “nutritional transition.” A few decades ago, malnutrition was one of the top

policy issues amongst the poor. Nowadays being overweight and obese are becoming one of the most pressing issues in public health (Cuevas, Alvarez, & Olivos, 2009; Filozof, Gonzalez, Sereday, Mazza, & Braguinsky, 2001; WHO, 2016b).

More than half of Latin Americans are overweight, and 23% of them are obese (WHO, 2016b). In developing countries, excessive weight and obesity tend to be reported more frequently amongst the poor and amongst women (Peña & Bacallao, 2000; Zukiewicz-Sobczak et al., 2014). There are at least two factors associated with this phenomenon. On the one hand is food insecurity, which refers to a poor-nutrient diet that low-income populations tend to consume, given their monetary constraints. On the other hand, it is the demographic and social changes in the population's structure that has shifted eating habits and increased sedentary lifestyle. The rapid urbanization in the region and the rising costs of food are tightly associated with this epidemic (Malik, Willett, & Hu, 2013). Excessive weight and obesity are highly correlated with poor physical health. Obesity can lead to chronic diseases such as diabetes, hypertension, cardiovascular diseases, asthma, chronic pain, and depression (Aschner, 2016). In Colombia, by 2015, more than half the adult population (56%) was overweight or obese and the prevalence of this problem was higher amongst women (59,6%) than men (52,7%) (Ministerio de Salud, 2017).

The bulk of the literature shows that poor health conditions (including physical health and obesity) are not distributed equally and that the poor and women face these conditions more often (WHO, 2014; Patel et al., 2010a, 2010b). The literature also shows that mental illness, obesity, and poor physical health are more prevalent in more unequal societies (Pickett & Wilkinson, 2010; Zukiewicz-Sobczak et al., 2014). Since most of the developing world's population now lives in cities, it is necessary to deepen the study of how the urban realm and the inequalities within cities affect people's health.

2.3. Mental health

The literature on mental health now increasingly reflects the discussion that reporting a mental health condition is not necessarily about a mental disorder, but instead could refer to good health and a state of well-being in which individuals can cope with the normal stress of life (Barry, 2009; WHO, 2013). There is a consensus that mental health is shaped by social conditions, which encompasses economic factors, inequalities, violence, crime, and poverty. It is also known that mental health is a function of gender, race, education, and income (WHO, 2014). There is good evidence that the vulnerable, the poor, and women suffer disproportionately common mental health disorders such as anxiety and depression (Lund et al., 2010; Melzer, Fryers, & Jenkins, 2004; Patel et al., 2010a, 2010b). Low socioeconomic conditions are usually correlated with higher rates of disabilities, less access to health services, and higher odds of depression (Lorant et al., 2003; Lorant et al., 2007). Women are also more prone to report risk factors associated with poor mental health outcomes. Depression and anxiety are correlated with gender roles such as responsibilities for the care of others, sexual and domestic violence, and lack of employment. Worldwide, depressive disorders account for about 42% of the disabilities from neuropsychiatric disorders amongst women compared with 29% amongst men (WHO, 2014).

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The underlying mechanisms by which the city configuration affects people's health, choices, and behaviors are complex and difficult to disentangle. However, the burgeoning body of research in this area shows that the services, infrastructure, and public goods available in the areas where people live do have an important correlation with their heath (Schüle & Bolte, 2015). Context matter and the differences in socioeconomic conditions where people live affects their mental health outcomes. In the context studied, it is found that the people who live in the most impoverished areas are more prone to report stress, anxiety or depression, and overall have lower subjective wellbeing (Martínez, Estrada, & Prada, 2019; Martínez, Prada, & Estrada, 2017). The differences in the places where people live can become a mechanism for inequality as the allocation of public goods and services is not equal within cities and between neighborhoods.

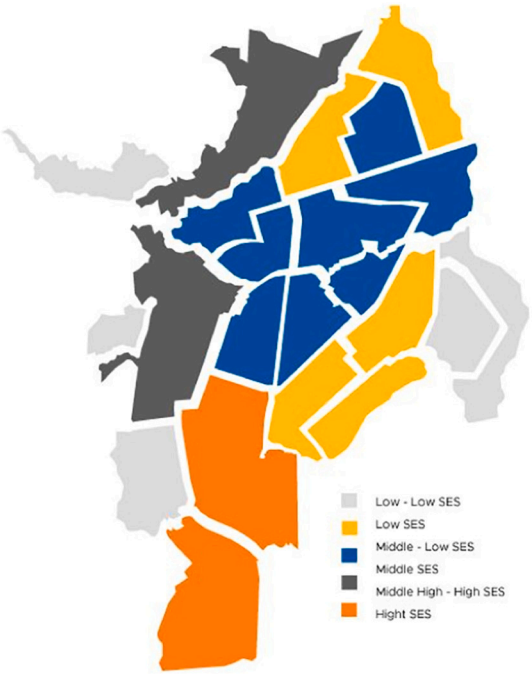
The underlying mechanisms by which the city configuration affects people's health, choices, and behaviors are complex and difficult to disentangle. However, the bourgeoning body of research in this area shows that the services, infrastructure, and public goods available in the areas where people live do have an important correlation with their heath (Schüle & Bolte, 2015). In the Latin American context, data from IPEN (international physical activity environment network) reports that the access to urban infrastructures like walkable street and parks, increase physical activity in Bogotá, Cuernavaca, and Curitiba (Salvo et al., 2017). This evidence provides support for the need to increase the availability and accessibility and quality of public and green areas in cities.

3. City context

Cali is the third-largest city in Colombia with a population of 2.5 million inhabitants and is a major economic hub in the Pacific region. As in many cities in emerging countries, Cali's population growth in past decades has been characterized by increasing inequality and poor governance (Glaeser & Henderson, 2017). Cali is a segregated city. Poverty is acute in the outskirts where the displaced and the urban poor have settled in improvised housing units, some of which lack basic sanitation and potable water. Elsewhere, the city is characterized by urban development, the growth of the middle class, and the affluence of those in the upper income bracket. One of the most salient characteristics of the city is the high levels of crime. Between 2015 and 2018, the average of homicides per 100.000 inhabitants was over 50 homicides (Cali Como Vamos, 2019), which is a very high number, even for Latin Americans. To put the number in the context, in 2015 the average homicide rates per 100.000 habitants in Latin America was 25, and it represented four times the global average (Ardanaz, Corbacho, & Ruiz-Vega, 2014; Jaitman et al., 2017), Cali doubles the average rate in Latin America. Crime is ubiquitous in the city, street crime (assaults/robbery and cellphone theft) are steadily increasing. Between 2011 and 2017, assaults increased by 53%, cellphone thefts 22%, and over 64% of the residents felt unsafe (Cali Como Vamos, 2019). Unsafety and the fear of being a victim of any crime may constrain residents to use public spaces for leisure and exercise, having a negative association with their physical health.

Besides the high levels of crime, the city is characterized by its inequality. Over half of the population lives in the neediest neighbors and this population is restricted from access to public goods and services such as education, health, and public space. One possible explanation for these phenomena is the constrain of the public resources, which are mostly diverted to reduce crime and social protection programs such as universal health insurance, free education, and cash transfers for the poor. The allocation of resources for physical infrastructure and urban planning is low, given the need to fight crime and reduce poverty (Martínez, 2017a, 2017b).

The unequal distribution of public services within the city is shown in Map 1. 55% of the population lives in the most impoverished districts, and they have less access to health centers, bus stations, and effective public space. Moreover, they are heavily exposed to crime and violence, as shown in the column of homicides.



SES	Population (2018)*	Public transport stations (MIO) (2018)***	Health centers (2016)	Homicides per 100,000 inhabitants (2018)*	Effective public space per 100,000 inhabitants (2018)**	Public space for sports and recreation per 100,000 inhabitants (2018)**
	606445	8	34	397	1,58	15,82
	704960	11	48	389	1,83	26,36
	666115	26	66	270	1,37	22,45
	236380	8	311	37	4,78	18,2
	149475	8	16	31	9,66	30,04
	12044	2	6	6	44,08	58,48

* Mayor of Santiago de Cali
** Public space policy
*** Metro Cali

Map 1. Cali distribution by socioeconomic conditions and the provision of public services.

In the recent past, the local government of Cali has made important efforts in providing better services and public goods through different interventions to improve health outcomes in the population using the mechanisms of community-based physical activity promotion programs, but there is no data available to date to establish the impact of those interventions. Programs such as lighted parks in the poorest neighborhoods, ciclovia, and the increasing number of free and guided physical activity classes in public parks, may contribute to improve the population health. However, there is still a need to divert important resources to bridge the gap in terms of the access to public space, and public goods between the poor and the rich.

4. Data and methods

Data for this analysis comes from a large population survey conducted annually in the city. The survey, called CaliBRANDO is conducted by the Observatory of Public Policy–POLIS- of Universidad Icesi uninterruptedly since 2014. CaliBRANDO is a structured survey representative of the socioeconomic, gender, and racial/ethnic composition of the city with a margin error of 2.8% and confidence level of 95%. More than 1200 surveys are collected annually for a representative sample for the adult population in the city. The survey uses a multistage stratified sampling. First stage is the selection of 38 points around the city. The second stage, defines quotas according to socioeconomic strata, gender and race/ ethnicity. The third stage is the random selection of target population. The information collected in CaliBRANDO is unique to the Colombian context. To the best of our knowledge, there is not information available elsewhere in the county at city level that collects objective and subjective measures of population health with the frequency and statistical significance as this project.

Surveys are collected in face-to-face interviews by trained pollsters from randomly selected adults across different points in the city. Interviews take about 35 min. Respondents are approached explaining the purpose of the study and assuring confidentiality. No personal information that allows identification is collected such as names, address, contact information or national ID number. The survey contains queries about health outcomes, government performance, life satisfaction, employment, income, and satisfaction with the provision of public goods. For a full description of the survey, including questionnaire and use of the data see Martínez, 2017a, 2017b. This analysis uses data collected in 2016, 2017 and 2018 consisting of more than 3600 observations. CaliBRANDO is a survey fully financed by Universidad Icesi.

4.1. Variables of interest

4.1.1. Self-reported health

Respondents are asked: Would you say that in general your health is excellent, very good, good, fair, or poor? good health is classified as 1 when respondents report: excellent, very good, good. This question is taken from the Centers for Disease Control and Prevention (CDC) for measuring “healthy days” (CDC, 2002).

4.1.2. Overweight and obesity

Information about height and weight was collected to estimate overweight and obesity. To measure respondents, pollsters had portable scales and measurement tapes. Overweight and obesity are classified using this parameters: underweight (BMI $< 18.5\,kg/m^2$), normal ($18.5\,kg/m^2 \leq$ BMI $\leq 24.9\,kg/m^2$), overweight ($25\,kg/m^2 \leq$ BMI $\leq 29.9\,kg/m^2$), and obese (BMI $\geq 30\,kg/m$).

4.1.3. Socioeconomic conditions (SES)

In Colombia, households are classified on a socioeconomic scale from one to six. Households classified in the lower end of the scale are the poorest and those in the upper end are the richest. This strata classification has been in place since the 1960s as a mechanism to subsidize electricity, sanitation, and running water services to the poorest (DNP, 1997).

This strata classification is also used to classify neighborhoods and districts. In this analysis, we use districts to compare health differences between males and females. To conduct a district analysis, the district strata mode (classified by the local government) was used to classify districts into five categories: Low–low SES, Low SES, middle-low SES, middle SES, and middle high–High SES. Given the small percentage of middle–high SES and High SES households, those two categories were collapsed into one.

To proxy physical activity, respondents were asked: Do you engage in any physical activity such as jogging, walking, playing a sport, or

going to the gym? With a yes-no option. A mental health measure came from the question: Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good? This question is also taken from CDC for measuring “healthy days”. If a person reports having 14 days or more in this variable, it is coded as 1, 0. The threshold of 14 days was chosen because practitioners use a similar period for diagnosing mood disorders (Brown et al., 2003). Other factors are gender, age, minority (respondents self-identified as afro or indigenous), marriage (married or living in cohabitation), educational attainment (high school or less).

In order to estimate how obesity and self-reported good health correlates with the co-variates analyzed, a logit model is used given the binary nature of the dependent variables. To quantify the strength of the association between the dependent and independent variables, odds ratios are reported. Statistical analysis are computed using Stata 14. Results presented in this paper are descriptive and are not aimed at establishing any causal relation between health outcomes, gender, and socioeconomic conditions.

5. Results

Table 1 presents the descriptive statistics of the variables used in this analysis and gender differences. In this sample, males are older than females, are married in a higher proportion, are more overweigh-obese, and report conducting physical activity more often. Females, report less frequently that their health is good-excellent, and are more prone to declare that their mental health was not good for 14 days in the month previous to survey collection. More females live in low-low SES districts. All these differences are significant.

In the period-analyzed (2016 to 2018), self -reported health and overweight-obesity remain constant. Over 80% of the people surveyed declare that their physical health ranges from good to excellent. Overweight-obesity has remained over 45% in all years, very similar to national trends in urban settings (Ministerio de Salud, 2017). There are differences in socioeconomic conditions where people live, but variations are significant for self-reported health. As shown in Map 2, people living in districts with the lowest socioeconomic conditions, report less good or excellent health than their counterparts in most affluent districts. Overweigh-obesity, however, does not have a clear pattern in the correlation with socioeconomic conditions.

Table 1
Descriptive statistics CaliBRANDO survey, pooled data 2016–2018.

		N. observations	Gender differences	
			Male	Female
Male (%)	50,07	3681		–
Age - average	37,81	3687	36,49	38,09***
Minority (%)	32,34	3621	27,6	29,27
High school or less (%)	54,46	3601	55,26	53,64
Marriage (%)	45,64	3690	47,31	44,12*
Self-reported good health (%)	83,65	3663	85,91	78,82***
Overweight/obesity	48,83	3555	49,27	46,02*
Physical activity (%)	51,46	3690	59,84	42,95***
Mental health (14 days) (%)	8,93	3694	8,27	12,25***
Vehicle ownership (%)	35	3689	40,69	25,07***
District SES				
Low-Low SES (%)	25,75	3550	25,71	28,64*
Low SES (%)	29,66	3550	27,14	27,96**
Middle-Low (%)	25,07	3550	25,31	23,64
Middle SES (%)	11,13	3550	12,16	11,96
High-high SES (%)	8,39	3550	9,59	7,25

Level of significance.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

6. Self-reported health

Generally speaking, most of the respondents (over 75%) rated their health condition as good - excellent, regardless of gender and the district SES. However, as shown in Fig. 1, important differences arose by gender and district SES when is evaluated the declared general health condition. More of the respondents living in the most deprived areas of the city (low–low and low SES districts) declared that their health was fair or poor and those differences were statistically significant when compared with the responses of those living in the affluent districts. The same pattern was observed in terms of gender. As shown in Fig. 1, Women, particularly the poor, reported with higher frequency that their physical health was poor/fair during the past month. Both differences, by district SES and gender, revealed disparities.

Table 2, presents the logit model results for self-reported good-excellent health. Similar to other studies (Denton et al., 2004; Matud, 2017; Regitz-Zagrosek, 2012), males report better health than females and in the context studied, the probability that males experience better physical health than females is 55% (OR = 1,55). As expected, an increase in age, decreases the probably of reporting good health. Education also plays a role on health, the lower the educational attainment, the lower the rate on health condition.

People who exercised tended to report better health outcomes (Warburton & Bredin, 2017). In the survey, respondents were asked whether they engaged in any physical activity (jogging, walking, playing a sport, or going to the gym). Overall, 60% reported engaging in some physical activity, but males reported this in a higher proportion (59% males vs. 40% females). When district SES was taken into account, it was observed that fewer of the urban poor, on average, declared they engaged in any physical activity. Table 2, also shows that people who exercises have 24% more probability to report a good health condition (OR = 1,24). People who reported having more than 14 days of stress, depression or anxiety (mental health) report poorer on their physical health. District socioeconomic condition also has an important correlation with physical health, the higher the socioeconomic strata of the district where people live, the better residents report their physical health.

7. Overweight and obesity

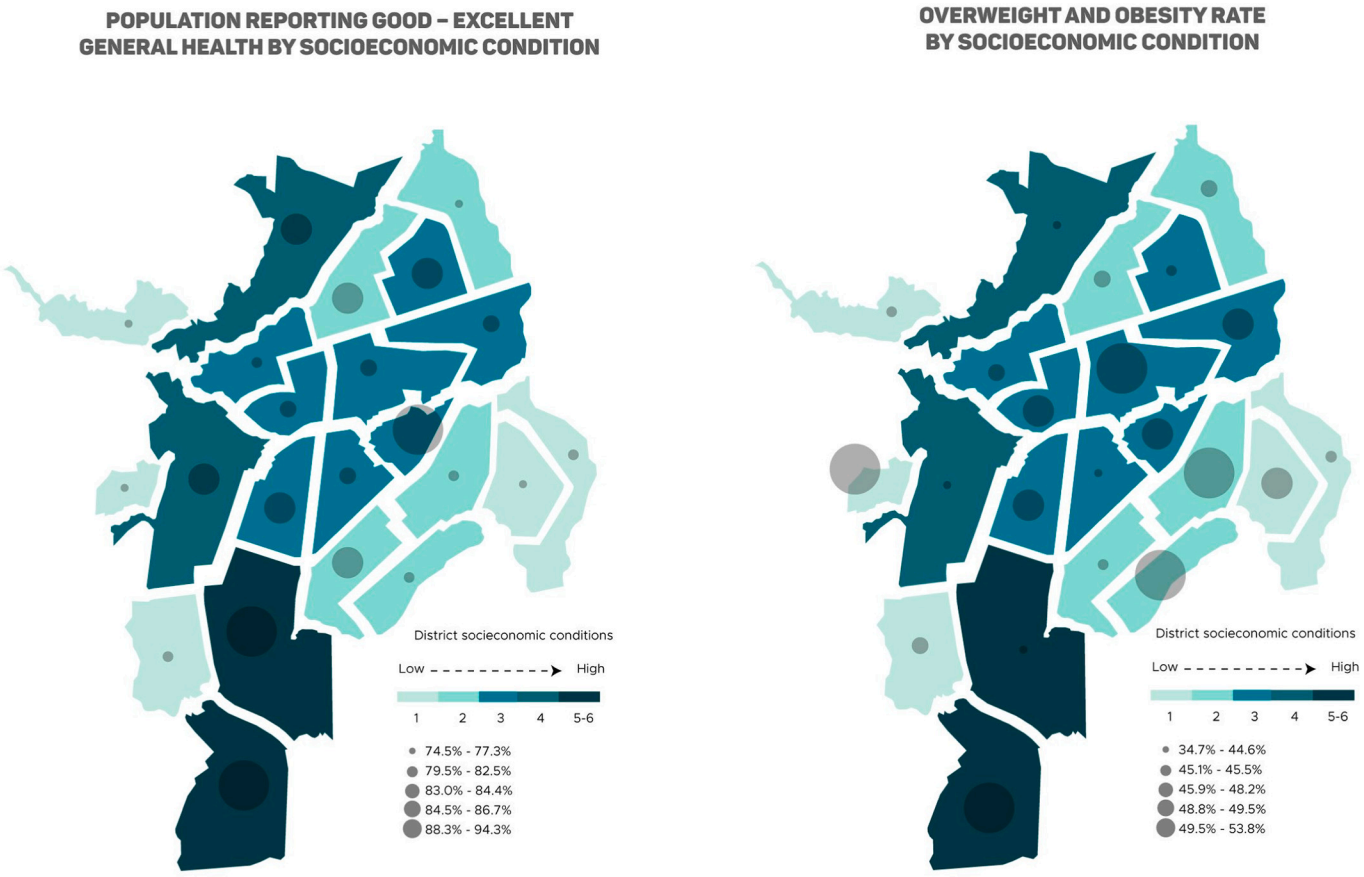
Similar to national trends (Ministerio de Salud, 2017), excessive weight and obesity are reported for almost half the adult population and is slightly higher for those living in the poorest areas of the city. Overall, differences by gender (51,3% for males and 48,6% for females) are not significant; however, district SES presents differences, particularly for females. The CaliBRANDO data reveals that education is correlated with obesity, but shows a different trajectory when gender is taken into account. Educated woman (in the higher SES districts) present lower rates of overweight and obesity, whereas the higher the educational attainment of males, the higher is their proportion of excessive weight and obesity (Fig. 2).

Table 3 presents the logit model results for overweight-obesity. Age, racial/ethnic minority, lower educational attainment (high school or less) and marriage all increases the probability of overweight and obesity. Marriage and lower educational attainment have a greater incidence with obesity (OR = 1,47 and OR = 1,25 respectively).

As expected, the lack of physical activity increases the probability of obesity. An interesting finding in these results is that overweight-obese respondents do not associate obesity with poor health. Over 80% of overweight-obese individuals report good-excellent health. Unlike the results reported in Table 2 (logit model for physical health), obesity does not correlate with poor mental health.

8. Discussion

This analysis responded to two questions: a) how self-reported



Map 2. Self-reported good-excellent health and overweigh-obesity by socioeconomic condition 2016–2018.

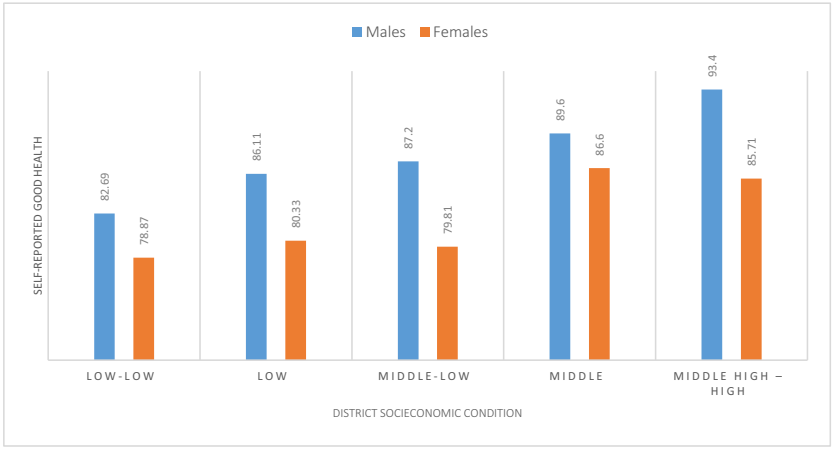


Fig. 1. Self-reported good-excellent health by gender and district socioeconomic condition.

health varies in function of socioeconomic conditions and gender; and b) how overweight-obesity varies in function of socioeconomic conditions and gender. The questions were answered using data from a mid-size city in Latin America, where crime and inequality are prevalent. The evidence presented here seeks to contribute to the literature of health and inequality in urban contexts. The global agenda that calls for making cities sustainable by promoting the good health and well-being of the population is the principal motivation of this work.

The variables for this analysis refers to physical health: self-reported health and overweigh-obesity. Whereas overweigh-obesity is an objective measure, self-reported health refers to the perceptions individuals have about their health, which may not be the best measure and is a limitation of this analysis. However, in the absence of better measures, self-reported health is the proxy used.

In line with the bulk of the literature, we found that women and the poor report higher odds of physical distress. Differences by socioeconomic conditions and gender on overweight-obesity leads to mixed results. Obesity reporting is similar in all SES districts and for males and females. However, it varies with respect to education. Educated females are less likely to be overweight-obese, whereas education may increase obesity amongst males.

This analysis uses data at city level that is rare in Latin America. Most of the literature available in this strand of research is heavily concentrated on rich countries, but there is lack of evidence in cities in

Table 2
Logit model and odds ratio – self reported good health.

Variable	Logit	*P* value	Odds ratio (OR)
Male	0,441958	***	1,55575
Age	−0,025095	***	0,9752173
Minority	−0,1284901		0,8794222
High school or less	−0,299417	*	0,7412502
Marriage	0,1004912		1,105714
Overweight/obesity	−0,1833709		0,8324593
Physical activity	0,2156311	*	1,240645
Mental health (14 days)	−0,9835042	***	0,3739982
District SES[a]			
Low-Low SES	−0,7589623	**	0,468152
Low SES	−0,5985563	*	0,5496045
Middle-Low	−0,4998881	*	0,6065985
Middle SES	−0,273722		0,7605435

Level of significance.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.
[a] Excluded variable in District SES: High - high SES.

Table 3
Logit model and odds ratio – overweight-obesity.

	Logit	P value	Odds ratio (OR)
Male	0,078		1,080668
Age	0,024	***	1,024065
Minority	0,173	*	1,189392
High school or less	0,226	**	1,253344
Marriage	0,392	***	1,479501
Self reported good health	−0,125		0,8825318
Physical activity	−0,346	***	0,7072012
Mental health (14 days)	0,148		1,159192
Low-Low SES[a]	0,036		1,037124
Low SES	−0,080		0,9226947
Middle-Low	−0,013		0,9875167
Middle SES	−0,388	*	0,6783889

Level of significance.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.
[a] Excluded variable in District SES: High - high SES.

this region of the word to help make better informed decisions about the provision of public goods and services and the possible implication for public health. Providing evidence in a mid-size city in the region is the major strength of this analysis. Even though this analysis is only descriptive, it indicates that people's health is influenced by the socio-economic conditions in which they live. The government can contribute greatly by providing alternatives and enabling conditions to incentivize a healthy lifestyle, in particular for those living in the most deprived districts. This is especially relevant given the inequalities in the city studied. According to official statistics, about 55% of the population in Cali live in impoverished districts. The poor areas of the city present the highest rates of homicides, have the lowest number of health facilities, the lowest number of mass transit stations, and a lower ratio of effective public space per habitant (DAPM, 2018). In line with this analysis, it has been shown that these conditions affect negatively the health outcomes of the population living in those deprived areas (Martínez et al., 2017).

This is a major call for local intervention. There is growing momentum to advocate and invest in sustainable, equal, and livable cities. Cali, and by extent, cities in Latin America are not the exception. Local decisions have significant implications in the wellbeing of the population. The investment in green infrastructure, safety, and access to quality services make a tremendous difference in people's health, particularly those who live in the most impoverished areas. There is a clear need to invest more in women. The disadvantages of physical and mental health reveal the disparities they are exposed. Women may exercise less because they are afraid of their safety when exercising in an open space. They may report higher on stress, depression, and anxiety because they are most exposed to crime in the public space and when moving around the city. City planning can significantly contribute to create safer spaces in parks and transportation to make women feel safer and, by extension, create the mechanisms to improve their physical and mental health outcomes. Health promotion is an underlying premise to build our societies, and the promotion of healthy environments is now a transversal element in all policy decisions.

The equal provision of the urban public space is a central component of just and equitable cities. Environmental and sustainable initiatives are essential to improve the population's health. In the past decade, more Latin American countries have invested in policy initiatives that use urban design to promote better health outcomes. In Brazil, community-based physical activity promotion programs and in Colombia the movement to reclaim the public space for physical activity promotion (ciclovia) are examples of how sustainable policies can be included in the policy agenda without a drain of significant public resources (Pratt, Orozco, Hernandez-Avila, Reis, & Sarmiento, 2014; Sarmiento et al., 2010). Latin American cities provide examples of the implementation of community preventive services that promote physical activity and have shown great potential to improve health. There is strong evidence to advocate for the implementation and maintenance of school physical, educational program outcomes (Hoehner et al., 2008). It is necessary to invest systematically in the evaluation of those interventions to make better allocation of resources.

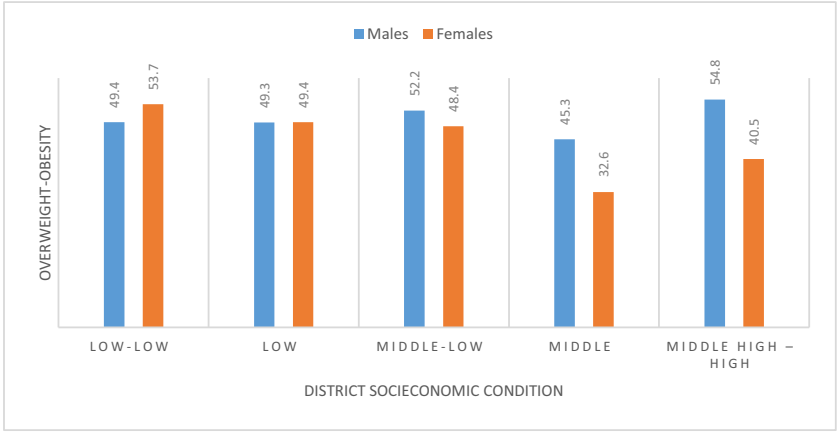


Fig. 2. Obesity and overweight by district SES and gender.

CRediT authorship contribution statement

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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