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**Title:**

Slums and cities in Brazil: comparison for Belo Horizonte and Rio de Janeiro

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**Abstract**

This paper compares slums (subnormal clusters) with formal city to identify similarities and differences between these populations. The exercise is done for two Brazilian cities: Rio de Janeiro and Belo Horizonte, both with over 2 million inhabitants. In Rio de Janeiro 22% of population lives in 763 slums while in Belo Horizonte 13% of population lives in 211 slums spread throughout the city territory. The analysis consists of comparing the formal city with slums regarding individual demographic characteristics of the population such as age structure, composition by race / color as well as characteristics of households like access to basic sanitation, including access to potable water and waste disposal. Using data from the 2010 National Demographic Census, the results indicate that, in fact, there isn't a great disparity between slums and rest of the city with regard to the differences in attendance to basic services, being this difference was more pronounced with regard to the age structure of the population and social inequalities understood as differences in income and race/color. Finally, some recommendations are made for public policies aimed at the population living in slums.

**Keywords:** urbanization; slums; Brazilian data.

## **Urbanization and slum formation**

The urbanization process in Brazil, although late, occurred faster than more developed countries. This process began only in 1940, when the rural population still accounted for approximately 70% of the population (Martine and McGranahan, 2010) and after the 1960s the urbanization accelerated due to internal migration from the countryside to the cities. So in the second half of the twentieth century, the Brazilian population living in urban areas increased from 19 to 138 million (Brito, 2006) and in 1970, Brazil became an urban society, with over half its population living in cities, as revealed by national Census.

In 2010, the country reached the highest rate of urbanization in its history, with 84% of the population living in urban areas, with one quarter of this population living in cities with more than 1 million inhabitants. Over the last decades it was noted, not only an intense process of urbanization, but also a process of population concentration in large cities including Belo Horizonte and Rio de Janeiro. In the same time that the country was urbanized, poverty became essentially urban and metropolitan (Rocha, 2006).

The emergence of slums in Belo Horizonte and Rio de Janeiro dating from the late nineteenth century and intensified with the rapid and disordered urbanization in a period of high population growth. Nowadays, both cities have in common the fact that they have slums spread across all regions of the city embedded between upper-class neighborhoods, being densely populated and verticalized. There is a clear separation of the city: the formal city and the informal city, the opposite occurs, for example, in São Paulo, where the poorest neighborhoods and slums concentrate on the periphery of town away from the downtown and middle-class neighborhoods.

Considering the context of formation of metropolis and slum, and the relative growth of urban poverty the purpose of this paper is to identify some of the characteristics of households and the population living in slums in Belo Horizonte and Rio de Janeiro cities, comparing them with those in formal city. Working specifically with this sector of the population is justified by the fact that the growth rate of slum population is generally higher than the population as a whole and this is the population that more depends of specific public policies.

## **Data and Methodology**

The universe of analysis of this study includes all permanent households in the city of Rio de Janeiro and Belo Horizonte in 2010. The households was split in two groups as defined by the Brazilian Institute of Geography and Statistics (IBGE): household located in census tracts defined as “subnormal cluster”, and named here of slum, and the household located in the formal city, named here just city.

In 1950, IBGE first counted the slum population, but it was only in 1991 that the Institute created the concept of "subnormal clusters" to identify illegal occupations, with problems of urbanization and scarcity of public services. According to Preteceille and Valladares (1999), in the National Census of 1991, there was a consistency above 90% between slum and subnormal cluster in Rio de Janeiro.

Since then, the IBGE has been trying to improve the borders definition of subnormal cluster and slum. The limits of subnormal clusters in Census 2010 were redefined so as to prevent that different neighborhoods belonged to the same census tract. Yet, in spite of some differences and a possible underestimation of the population living in slums and low-income housing, subnormal cluster will be taken as a proxy of slums in this paper.

The data used refers to the questionnaire data base (universe) of the national Demographic Census of 2010 and are available in the database of Sidra<sup>1</sup> IBGE. The methodology used was descriptive analysis with results presented through comparative graphs.

### **Comparing slums and cities**

The following is made a characterization of the population and households in Belo Horizonte and Rio de Janeiro and a brief comparison between slum and the formal city in both metropolitan cities.

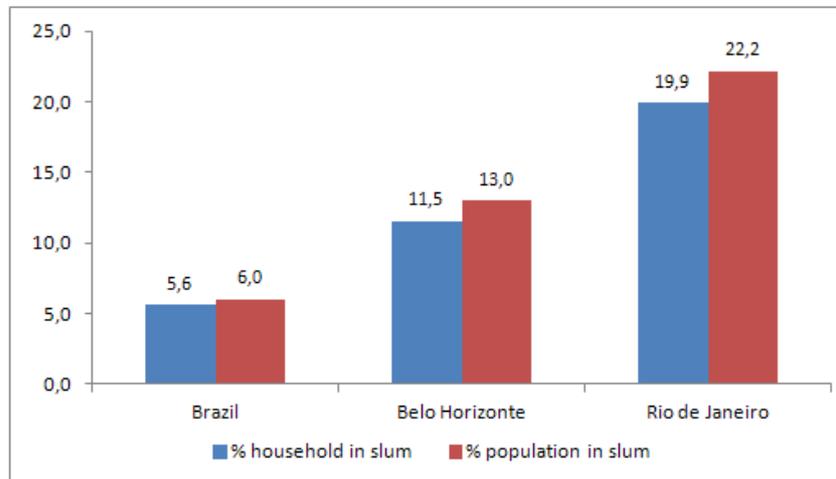
In Graph 1, it is observed that the proportion of households and residents in slum in Belo Horizonte is twice that observed for Brazil, and in Rio de Janeiro is four times more than Brazil. This leads us to think in clear association between metropolis and this form of settlement. According to the last census survey, there were 88000 households in slum in Belo Horizonte whose resident population was 307,038 people. This data puts Belo Horizonte from 20 municipalities with the highest number of households in slums in Brazil, almost 12% of

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<sup>1</sup> IBGE Automatic System Recovery. Available in: <http://www.sidra.ibge.gov.br/>

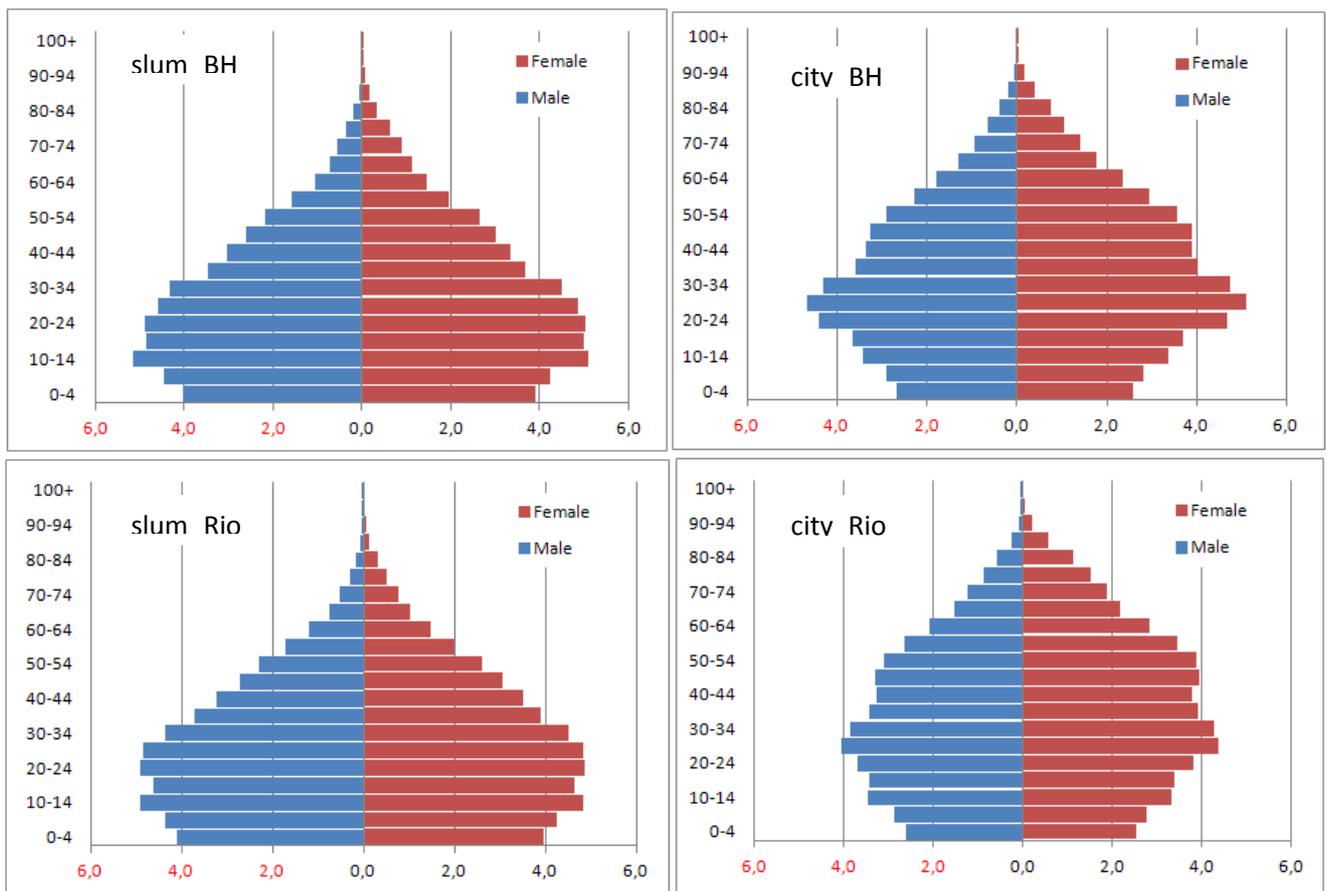
total households. In terms of population amounts means 13% of inhabitants living in slum in Belo Horizonte. In Rio de Janeiro there are 427,000 slum households to 1.4 million residents that mean 1 in 5 people in Rio de Janeiro lives in slums.

**Graph 1 - Households and population living in slum - Brazil, Belo Horizonte and Rio de Janeiro (%).**



Source: Demographic Census 2010.

**Graph 2 - Population by age and sex in slum and city– Belo Horizonte and Rio de Janeiro (%).**



Source: Demographic Census 2010.

Observing Graphs 2, it is clear that people living in slums both in Belo Horizonte and in Rio de Janeiro have a young age structure compared to the age structure of the formal city, i.e. there are more children and less elderly in slum. The comparison between the age pyramids leads us to believe that the slums are at an earlier stage in the process of demographic transition, but have observed the decline in fertility rates, indicated by the narrowing of the base of the pyramid. On the other hand, it can be said that the life expectancy is lower in slum than the city, because the top of the pyramid remains narrow. Comparing both cities, it is noted that the Rio de Janeiro owned an older age structure than that of Belo Horizonte. In both there is an implicit increase of sex ratio with increasing age, indicating greater survival for the group of women.

The difference in the age structure of the population is reflected in the dependency ratio. This is an indicator to assess the relationship between the population potentially able to produce (15-64 years) and the dependent population (children and elderly). A lower ratio of total dependence means that more people are potentially able to produce and contribute to the generation of resources for your community. During the demographic transition, any population reaches a period in which that reason is as low as possible, known as demographic bonus. Inasmuch as the demographic transition progresses the dependence ratio increases again due to the proportional increase in the elderly.

**Tabela 1 – Dependency ratio and Aging index - Belo Horizonte and Rio de Janeiro 2010.**

		Dependency ratio (%)			Aging index
		Total	Children	Elderly	
Belo Horizonte	Slum	47,2	39,6	7,6	19,2
	City	36,8	24,3	12,5	51,4
Rio de Janeiro	Slum	45,0	38,3	6,7	17,4
	City	42,1	24,9	17,2	69,0

Source: Demographic Census 2010.

In Table 1, we note that in Belo Horizonte, the resident population in slum has a higher dependency ratio and typical of a society with young age structures (47 dependents per 100 adults). Already Rio de Janeiro the total dependency ratio shows little difference when comparing formal city (42.1) and slum (45.0), however, while the heavier dependency ratio in slum is due children (38.3), to the city, the most weight is in its aging population (17.2). The difference between the moment of demographic transition populations of the slum and the city can be confirmed also by the Aging Index that indicates 51.4 elderly for every 100 children in Belo Horizonte city

while in the slums this index is only 19.2 elderly per 100 children. In Rio de Janeiro, the difference becomes greater, respectively, 69.0 and 17.4 in the city and slum.

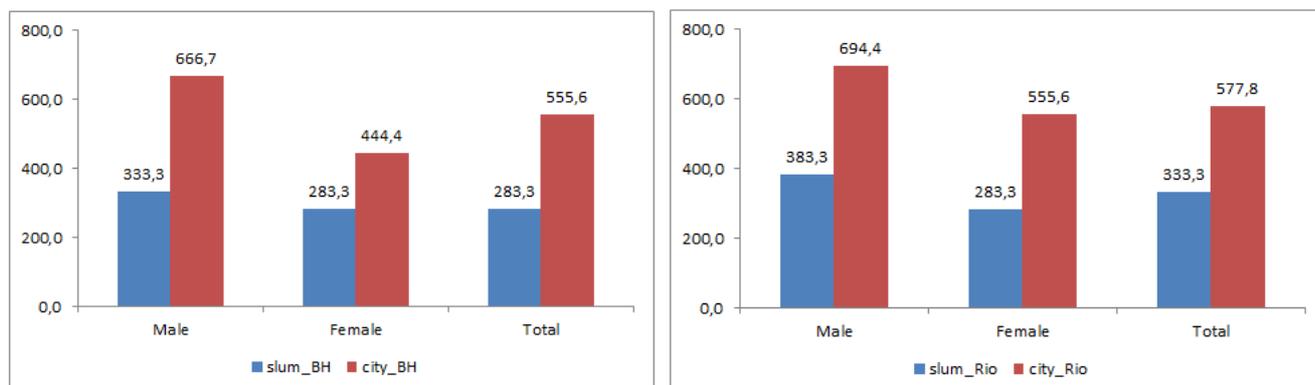
Table 2 shows a comparison by race / color in the populations studied. There are marked differences, because when we consider the population of the city of Belo Horizonte half have stated that was white and only 9% declare themselves black. For slum these values are 24% declared white and 18% black declares itself. The population declared brown is the most common in slum (56.6%) and corresponds to 40% of the remaining population of Belo Horizonte. A similar situation is found in Rio de Janeiro. It is known that in Brazil, social inequalities are accentuated by differential race / color, being that black and brown population presents demographic indicators worse than the white population. The population declared asian or indigenous represents less than 1% in the cases analyzed.

**Table 2 - Population by race / color, Belo Horizonte and Rio de Janeiro (%).**

	slum_BH	city_BH	slum_Rio	city_Rio
White	24,1	50,1	33,1	56,4
Black	17,8	9,0	16,3	10,0
Asian	1,4	1,0	0,9	0,7
Brown	56,6	39,7	49,5	32,8
Indigenous	0,2	0,1	0,1	0,1
Total	100,0	100,0	100,0	100,0

Source: Demographic Census 2010.

**Graph 3 - Median wage by sex, Belo Horizonte and Rio de Janeiro (US\$).**



Source: Demographic Census 2010.

Considering only those households which have income, once again we found disparities between the economic conditions of the population in slum and city. In Belo Horizonte, the median monthly income of employed

people in slum is US\$283,3 slightly more than half of US\$555,6 the city (Graph 3). In Rio de Janeiro, the salary of slum dwellers is about 55% of the salary received by a resident worker in formal city. We also note differential by sex, this gap is more pronounced among workers in formal city both in Belo Horizonte and in Rio de Janeiro.

Income inequality is demonstrated once again analyzing the household income per capita (Graph 4). In Belo Horizonte, the per capita income is 76% of slum residents in concentrates up to US\$282 while among residents in the formal city only 35% receive up to this amount. Very similar situation is found in Rio de Janeiro.

**Graph 4 - Household income per capita, Belo Horizonte and Rio de Janeiro (US\$).**

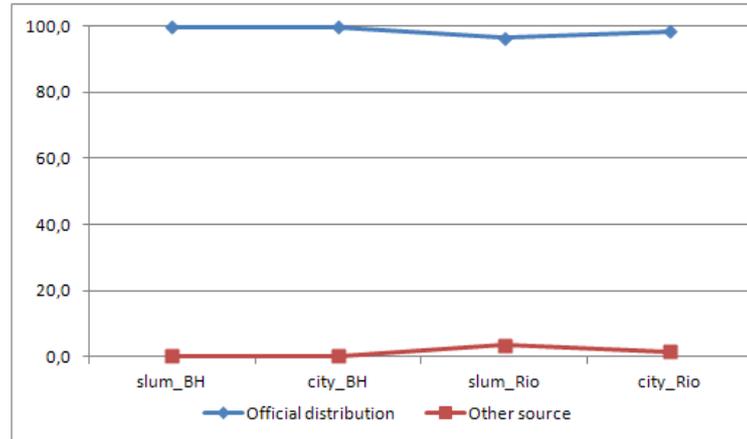


Source: Demographic Census 2010.

After to present characteristics of the population living is present characteristics of household to give an idea of the context in which this population is located. As regards the household density, the households in slum in Belo Horizonte had on average 3.5 residents while in formal city the average number of residents per household was 3.1. In Rio de Janeiro there are on average 3.3 residents per household in slum and 2.9 in the formal city. In this respect there is in both of cases little difference, however should investigate more accurately possible differences between the types of living arrangements in slum and the city's total.

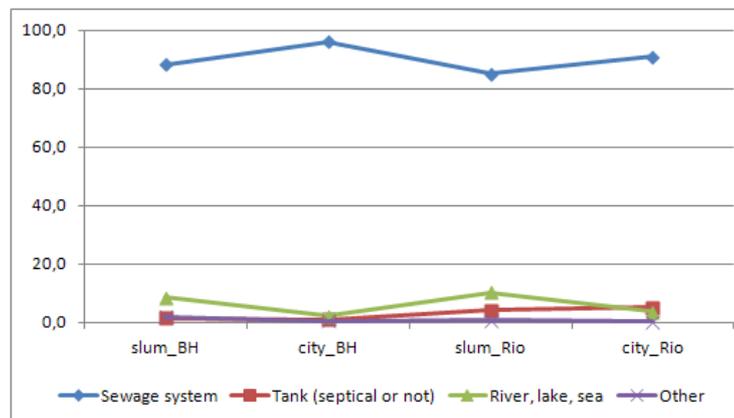
By Graph 5, we can say that in Belo Horizonte, water supply network for general distribution is universal, even in slum that 99.6% of households rely on this form of distribution. It is recalled that the fact the water is coming from general network doesn't mean that is provided by the official network. Since 2000, the IBGE already indicated water supply for general network being practically universal in 97.4% of slum households and 99.3% in Belo Horizonte formal city (Longo et al. 2004). The Rio de Janeiro has also a high level of water supply, being 98% in the formal city and 96% in the slums.

**Graph 5 - Households according to water supply, Belo Horizonte and Rio de Janeiro (%).**



Source: Demographic Census 2010.

**Graph 6 - Households according to sanitation, Belo Horizonte and Rio de Janeiro (%).**



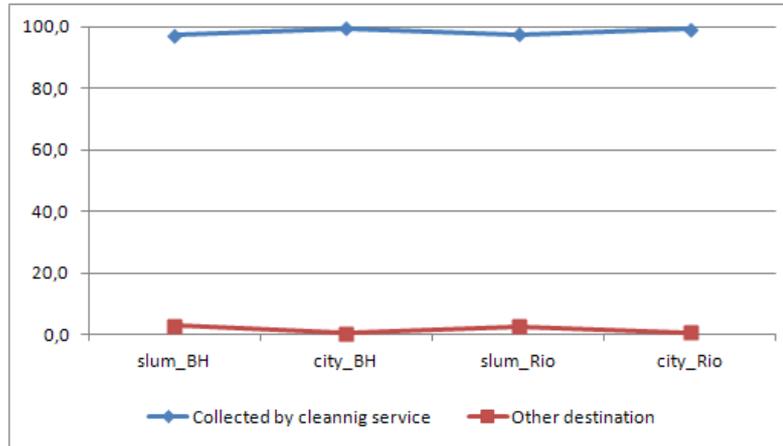
Source: Demographic Census 2010.

The sewage collection service presents some differences when analyzing the slum and formal city (Graph 6). In Belo Horizonte and in Rio de Janeiro the sewage in 88.2% and 85%, respectively of slum household is provided for general network, it isn't possible to differentiate whether a sewer network or rain network. Note that 8.4% of households in slum declared launch domestic sewage directly into the river or lake.

That is, although having a high percentage of households provided with sanitary sewage service, part of the sewage isn't properly collected. No information about the treatment of sewage, however, this isn't a problem that reaches only the residents of slums. Despite the observed deficiency, it is considered an evolution of this indicator in the past decade, since the coverage of sanitation services by general network had reached 78.9% of households in slum and 92.7% households in formal city of Belo Horizonte in 2000, the according to Longo et

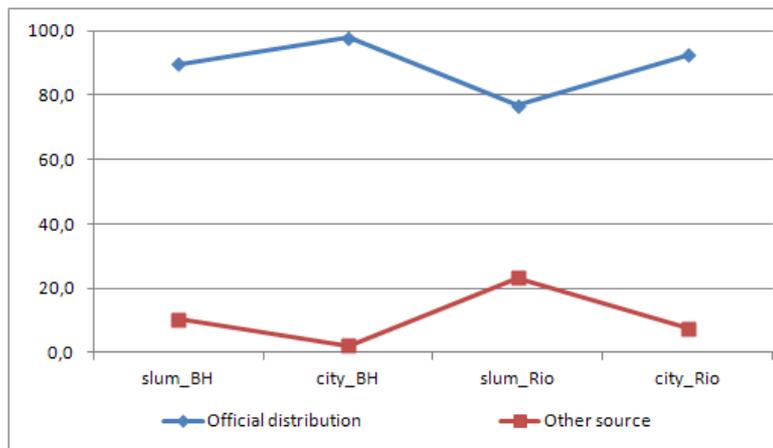
al. 2004. The sewage discharged in river, lake, sea was reduced by 8.4% and 2.3% for slum and city respectively.

**Graph 7 - Households according to disposal of garbage, Belo Horizonte Rio de Janeiro (%).**



Source: Demographic Census 2010.

**Graph 8 - Households according to electricity supply, Belo Horizonte and Rio de Janeiro (%).**



Source: Demographic Census 2010.

As seen in Graph 7, the garbage collection service (directly or through container) reaches more than 97% households in Belo Horizonte and in Rio de Janeiro both in slums and in formal city. Other forms of disposal of waste such as burn, bury, or throw away directly into the river or lake are used for approximately 3% of households. Despite this being a practically universal service cannot forget the quality of the service, as the number of days that the day is collected and distance between home until the place of deposit of garbage collection.

As regards access to electricity service (Graph 8), observes that in Belo Horizonte 90% of households in slum had this service provided by distribution company with measuring device. In the city this proportion is higher 98% of households. In Rio de Janeiro access to the official distribution of electricity is lower, especially in the slums, which is possibly due to a preference for alternative and lower cost sources

### **Final remarks**

Because of the intense urbanization of Brazilian society, great emphasis has been given by various agencies, governmental or otherwise, to the precarious settlement in general and particularly in slums. Knowing the characteristics of these settlements and its population is a critical point to the analysis and proposal of currently policies and it contributes to improve the quality of life of this population. However, few population studies are dedicated to this theme, which in part can be explained by the difficulty of obtaining representative data to this population through household surveys. This study aimed, therefore, to draw attention to studies on the slums and precarious settlement in large cities.

There are obvious indications that slums in Belo Horizonte and especially those of Rio de Janeiro are starting the process of demographic transition and already have considerable decline in the fertility rate. The economically dependent population in these places is still high, mainly due to the elevated number of children, since there are relatively few elderly people above 60 years. In both cases, the resident population in slums, if compared to those living in the formal city, has a higher proportion of black and brown people and lower incomes. These differences in socioeconomic conditions is reflecting other inequalities certainly remarkable that put the population living in slums disadvantaged in access to health, education and formal labor market. With regard to household characteristics such as household density and access to basic services, sanitation and lighting, the population living in slums has a relatively satisfactory service infrastructure, with indicators close to those observed in formal city. However, it is important mentioning a possible over numeration of information about official networks in slums, since this information is declared by the residents, themselves.

In regard to the limitations of this paper, it is worth mentioning a considerable under numeration of subnormal cluster in relation to the real universe of slum. In addition, sociodemographic brief overview of the situation of slums presented in this paper doesn't mitigate the lack for studies that consider the specific needs of each of these clusters, because they are certainly not homogeneous and markable differences can be found between

them. It also cannot be taken as synonymous with clusters worst poverty, because as noted by Preteceille and Valladares (1999), there are certainly census tracts outside the slums with similar or worse conditions.

In summary, some recommendations can be made to the public policies that aim the population living in slums. The first one is that policy makers take into account the demographic transition through which passes this population and the resulting changes in demand due to changing age profile of this population. For example, with the progressive reduction of fertility and of children, less need for construction of new facilities and early childhood public policies and the more need to improve the quality of this service, as well as policies aimed at young and elderly. Secondly, it is expected that these results are a reminder that the policies of urbanization in slums under way in both cities should pay more attention not only to the improvement of urban conditions but also to the promotion of social inclusion of people who reside in these places since the social and economic differences are more marked in this population when compared to the population of the city as a whole.

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