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## EDUCATION AND ELDERLY INCOME: AN ANALYSIS OF THE FIVE BRAZILIAN MACROREGIONS

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### ABSTRACT

This study aimed at analyzing the relationship between education and income of the elderly in the five Brazilian macro-regions and its interlocation with development. It was used data from the National Health Survey (2013), with 23,815 elderly. It was realized logistic regression analysis. The most elderly are literate (75.5%), have completed the first four years of training (40.9%) and have an income below the minimum wage (56.5%). Elderly people from the Northeast and North have 3.52 and 2.81 ( $p < 0.001$ ), respectively, more likely to be illiterate compared to those from the South. Elderly from the North and Northeast regions were the ones with the lowest incomes, and those in the South and Southeast were the highest. Illiterate elderly people are 13.30 ( $p < 0.001$ ) more likely to have an income lower than the minimum wage compared to literate ones. It is concluded that there is a relationship between education and income of elderly Brazilians and the North and Northeast regions are the neediest in providing these social determinants.

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## INTRODUCTION

One of the great challenges for societies today is the phenomenon of population aging, which has shown a significant change in the demographic panorama of countries, requiring public policies and actions in different fields to meet the demand arising from this context. At an accelerated rate, developing countries have shown an increase in the population of individuals aged over 60 years. Data from the Brazilian Institute of Geography and Statistics – IBGE (2008) indicate that the Brazilian population grew by 10.5% in the period from 1997 to 2007, while, in the elderly population, this increase was 47.8%. Illiteracy is concentrated in the age group of 60 years or more, affecting 18.6% of people in this age group, a proportion that represents 6 million illiterate Brazilian elderly people. The illiteracy rate reflects regional inequalities, with the highest rates in the Northeast (13.9%) and North (8%), while in the Southeast it is 3.5% (BRASIL, 2017). Therefore, education becomes necessary and important for the promotion and maintenance of healthy aging. Discussions about the lifelong learning process and proposals for reflection on the offer of educational activities for the elderly in Brazil become essential in order to offer programs that provide

activities and stimuli for the elderly, enabling them to enjoy active aging, healthy and citizen. Furthermore, the more education there is, the greater the capacity for work, productivity, income (SACHS, J., 2015) and, consequently, the greater the opportunities. In this sense, education emerges as an essential factor for the development of society and the reduction of inequalities. Freire (2000, p. 04) highlights that

Education must be treated as a process of humanization of the subject, which contributes to the construction of policies that bring about improvements in the human condition. By ensuring the quality of education in the country, it seeks to promote the growth of society and reduce inequalities.

In this context, it is important to know the education of the elderly population in Brazil and their income condition so that it is possible to design public socioeconomic and cultural policies aimed at development, better quality of life and access to goods and services. In light of the above, based on one of the important themes developed in graduate program research in southern Brazil, the present study aims at analyzing the relationship between education and income of the elderly in the five Brazilian macro-regions and their interlocation

with development, aiming to provide subsidies for the promotion of assertive public policies for the elderly population.

## METHODS

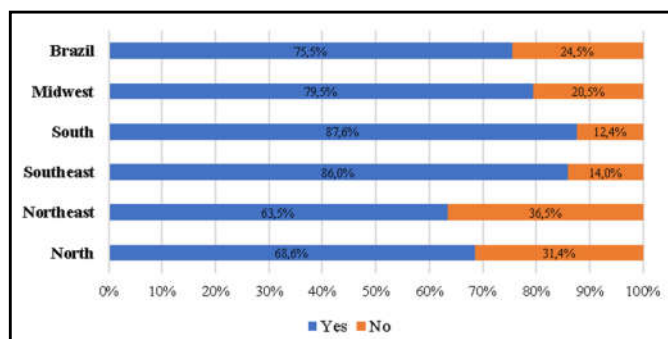
This is an observational, cross-sectional study with a quantitative approach that used data from the population-based survey – National Health Survey (NHS), developed in households throughout the Brazilian territory, considering the five Brazilian regions.

**The Nhs-2013:** The NHS was conceived by the Ministry of Health and conducted by the IBGE in 2013, with the objective of estimating several health indicators with greater geographic coverage (BRASIL, 2014; SZWARCOWALD *et al.*, 2014), currently characterized as the most current version with nationwide data available. This is a cross-sectional, quantitative, household-based research, which used as a sampling plan a probabilistic sampling from conglomerates, subdivided into three interconnected stages: census sectors, households and residents aged 18 years or over (BRASIL, 2014). The NHS report presents, in detail, the sampling and weighting process (BRASIL, 2014), which at the end included information from 205,546 individuals residing in 60,900 households surveyed (BRASIL, 2014; SOUZA-JÚNIOR *et al.*, 2015; SZWARCOWALD *et al.*, 2014). The entire data collection step was performed by previously trained and calibrated researchers. Three forms were used to guide the interview: household, consistent with the characteristics of the household; one corresponding to all residents of the household; and an individual, which could be answered by a household resident over 18 years of age, chosen by drawing lots (BRASIL, 2014). In this study, the data used are those referring to elderly individuals (n=23.815), derived from the last two forms. The NHS was approved by the National Commission for Ethics in Research for Human Beings, of the Ministry of Health, under Opinion No. 328.159/2013. The data is in the public domain and can be accessed on the website: <<http://www.pns.icict.fiocruz.br/index.php?pa=resultados>>.

Southeast, South, Midwest) were used as independent variables. Data were presented in tabular form and in bar graphs, to facilitate the apprehension of differences. And analyzed using the chi-square test, which consists of a non-parametric test for comparing proportions, that is, possible divergences between the frequencies observed between illiterate and literate individuals; for this, a significance level of 5% was considered. Logistic regression analysis was also carried out to quantify the magnitude of the relationship between illiteracy in the provision of income for the elderly in Brazil and the difference in the contingent of illiterate elderly people in different regions of Brazil.

## RESULTS

Based on the findings of the NHS, it was found that 75.5% of the elderly Brazilian population is literate. However, when comparing the Brazilian macro-regions, there is a great difference in the number of elderly people who are literate. In the North and Northeast regions, respectively, only 68.6% and 63.5% of the elderly can read, while in the South and Southeast the values exceed 85% of the population, as can be seen in Figure 01, below. Table 01 shows the level of education attended by elderly Brazilians, according to macro-regions. It appears that of the elderly who studied, 40.9% completed only the first four years of training and 21.5% completed elementary school. Still, only 17.7% completed high school and 11.8% a graduation. It is noteworthy that of those who completed the studies, 3.2% were through Youth and Adult Education – UAE. When evaluating the Brazilian regions, again the North and Northeast were the ones with the largest shares (68.6% and 63.5%, respectively) of elderly people with only literacy training and the smallest with higher education. While the South and Southeast regions were the ones with the highest frequencies of higher education. Regarding to the formation of Elementary and High School, there were no great differences between the regions, as shown in Table 01, below.



Source: HNS data, 2013.

Figure 1. Proportion of literate elderly, according to the five Brazilian macro-regions. Brazil, 2013

Table 01. Distribution of elderly people according to education and Brazilian macro-regions. Brazil, 2013. HNS-2013 (n=23815)

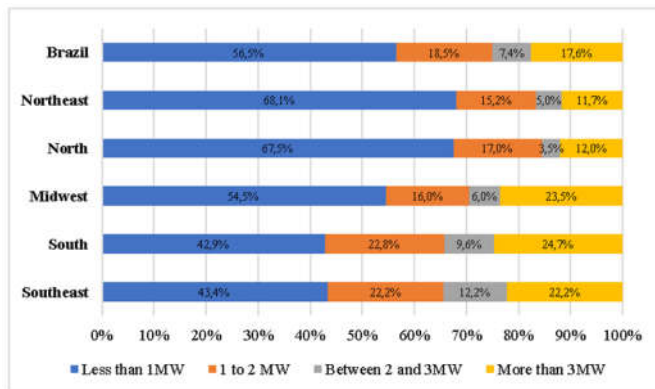
Education	Brazilian Macroregions					Total n(%)
	North n(%)	Northeast n(%)	Southeast n(%)	South n(%)	Midwest n(%)	
Literacy	199(7.3)	543(10.3)	116(2.1)	42(1.5)	94(4.6)	994(5.4)
Literacy for youth and adults	71(2.6)	147(2.8)	41(0.7)	17(0.6)	25(1.2)	301(1.6)
Old primary	959(35.0)	2006(38.2)	2343(42.5)	1339(48.5)	840(40.9)	7487(40.9)
Elementary School	764(27.9)	1070(20.4)	1052(19.1)	433(15.7)	450(21.9)	3769(20.6)
UAE or Elementary School Supplementary	35(1.3)	49(0.9)	40(0.7)	22(0.8)	19(0.9)	165(0.9)
High school	461(16.8)	849(16.2)	1038(18.8)	459(16.6)	315(15.3)	3122(17.0)
UAE or High School Supplementary	24(0.9)	19(0.4)	48(0.9)	26(0.9)	14(0.7)	131(0.7)
Superior – Graduation	209(7.6)	513(9.8)	780(14.1)	391(14.2)	269(13.1)	2162(11.8)
Postgraduate studies	17(0.6)	51(1.0)	55(1.0)	31(1.1)	27(1.3)	181(1.0)
Not informed	1328(32.7)	2126(28.8)	1024(15.7)	420(13.2)	605(22.8)	5503(23.1)

Source: HNS data, 2013.

**Data treatment and analysis:** For this research, only data from individuals aged 60 years or more were considered, making up a total sample of 23,815 elderly. For analysis, illiteracy was used as a dependent variable and income and macro-regions (North, Northeast,

Regarding to the distribution of the number of illiterate elderly people in the five Brazilian macro-regions, it is found that elderly people residing in the Northeast and North regions have 3.52 (95%CI=3.24-3.84; p<0.001) and 2.81 (95%CI=2.55-3.09; p<0.001), respectively,

more likely to be illiterate compared to elderly people in the South region (Table 02). Figure 02 points to the income distribution of the elderly population, according to the 05 Brazilian macro-regions. It is observed that the majority of the population has an income below one minimum wage (56.5%) and only 17.6% of the elderly population in Brazil has an income above 03 minimum wages. It is observed that the elderly in the North and Northeast regions had the lowest percentage of income, since 68.1% of the elderly population in the Northeast receives less than one minimum wage, a number similar to the population in the North (67.5%), while the elderly in the South and Southeast have the highest, while 24.7% and 22.2%, respectively, receive more than three minimum wages, as shown in Figure 02 below.



\*SM: Minimum wages  
Source: HNS data, 2013.

**Figure 2. Proportional distribution of the elderly population, according to income and the five Brazilian macro-regions. Brazil, 2013**

When comparing how much illiteracy influences the provision of income, it was found that illiterate elderly people are 13.30 ( $IC_{95\%}=11.24-15.75$ ;  $p<0.001$ ) more likely to have an income below the minimum wage compared to a literate elderly, as shown in Table 02, below.

**Table 2. Logistic regression analysis of illiteracy and macro-regions and illiteracy and income models. Brazil. 2013**

Variable	Illiteracy	
	OR <sub>bruta</sub> ( $IC_{95\%}$ )	p value
Macroregions*		
South	1.00	0.03
Southeast	1.15 (1.01-1.30)	
Midwest	1.82 (1.58-2.10)	
North	3.23(2.85-3.66)	
Northeast	4.06(3.62-4.56)	
Income**		
More than 3 MW	1.00	<0.001
Less than 1 MW***	13.30(11.24-15.75)	
1 to 2 MW	6.02(5.02-7.23)	
Between 2 and 3 MW	1.48(1.13-1.94)	

\* Model explanatory capacity of 75.5%.

\*\* Model explanatory capacity of 73.2%.

\*\*\* MW: Minimum Wages (value of R\$678.00, in 2013, year of data collection).

Source: HNS data, 2013.

## DISCUSSION

It appears that a considerable portion of the Brazilian elderly population is illiterate, which is accentuated in the North and Northeast regions, where lower income is also measured. Still, of those with some degree of education, most studied for only 4 years, just enough time to be literate. These data indicate that many of these elderly people, when young or children, had to leave schools to work due to the family's financial condition and/or lack of access to the school institution given the lack of school transport or the incompatibility of work shifts. with the school.

Even when the elderly did not seek to become literate due to difficulties in adapting to the schooling process and shame. Ferraro (2009) highlights that the problem of illiteracy is projected, essentially, as a social issue that involves difficulties in accessing education, "a historical impasse in Brazil that has yet to be resolved, given the inexistence of public policies related to it" (p. 14). It also highlights that

the elderly population in the North and Northeast regions of Brazil has the lowest literacy rate in the country, which results from the difficulty of accessing school when young for reasons such as distance from school to home and work, from an early age, to help financially with expenses of the family (p. 22).

Regarding to the fact that they do not seek to become literate when they are elderly, Neri (2014) highlights that "elderly people may have more or less time available to dedicate themselves to studies, especially if they still have work commitments and, often, he gives up for fear of making mistakes and exposing his difficulty". In this regard, Leão and Prazeres (2012) point out the need to "reassess educational practices, in order to meet the needs, potentials and limits of the elderly who participate in them, making adjustments that contribute to their development" (p. 244). The data also show that only about 3% of the elderly population made use of UAE to continue their studies and for literacy purposes. This information indicates the need to expand the offer of UAE in the country and to encourage it among the elderly so that they perceive the constant need to learn and that there is no age for this, considering that "education has the potential to improve the quality of life and generate a more active participation of the elderly in society" (VERAS, 2009, p. 85). In this regard, Peres (2009) points out that illiteracy prevents any access to written culture and to a set of information necessary for the exercise of citizenship by the elderly, which makes literacy actions emergency.

Peres (2009, p. 15) argues that

the Law of Guidelines and Bases of National Education – LDBEN (Law 9394/96), does not even mention old age as a stage of human life that needs more attention from the State with regard to education and literacy. LDBEN also does not mention the term illiteracy throughout its 92 articles. The Elderly Statute (Law 10.741/03), in turn, despite having specific old age laws, does not address the problem of illiteracy that affects the elderly, in any of the items related to education (Chapter V, articles 20 to 25). On the contrary, it totally ignores it.

Still on the Elderly Statute, Peres (2009) points out that this document encourages the creation of universities open to the elderly,

which have an essentially elitist and palliative character, being mainly aimed at the development of sport and leisure activities, which aim at meeting the demands of an elderly elite and cannot, therefore, be considered as relevant initiatives in light of the illiteracy situation experienced by many elderly people. of the popular classes (p. 16).

For Neri (2014), knowing the interests of the aging population, ensuring their rights and enabling programs that are accessible to the majority is a social imperative, as

Population aging, the growing demand for educational activities and the accumulation of evidence that it is possible to educate for healthy aging constitute peremptory justifications for urgently promoting effective educational initiatives in old age (p. 58).

In this sense, it is important to rethink current legislation and public policies aimed at education and the elderly, bringing discussions, and above all, strategies that adequately meet this important social demand. After all, illiteracy brings countless consequences, in addition to the education construct, it implies in several fields of life for the elderly, such as poverty, lack of freedom, exclusion and fragile health. As can be seen in the present study, an illiterate elderly person

is 13 times more likely to have a low income, compared to a literate one. Freire (1996, p. 21) highlights that the “literate individual is the one who manages to think about their social condition and seeks to transform it”. The author argued that literacy emancipates subjects and gives them access to goods and services. For Sen (2010, p. 15), people who receive education obviously benefit from it, but beyond that, “a general expansion of education and literacy in a region can favor social change, in addition to helping to increase economic progress, which also benefits other people and favors development”. When literate, the individual's behavior is transformed and begins to benefit not only personal development, but also that of their community and region (NERI, 2014, p. 89), which is evidenced in the scenario of macro-regions, where the condition of income is much better in regions with higher levels of education. Furthermore, Sen (2000) presents a theory that highlights the importance of individuals' personal fulfillment and their happiness. The sources of deprivation of freedom must be removed, making the human being's freedom to act viable. “Education, among other social rights, generates the instruments and capacities for the exercise of autonomy and freedom, lifting the individual out of absolute poverty” (p. 88).

Sen (2000, p. 89), also states that “poverty is not simply a person's lack of income, but the deprivation of their potential”. The lack of capabilities makes individuals have reasons to feel humiliated and without hope of achieving the life they aspire to be happy. For this, people need to be literate, well nourished, part of community and civic life, express their thoughts, enjoy adequate living conditions and work opportunities, enjoy the possibility of cultural evolution and permanent learning (HERRLEIN JÚNIOR, 2014).

In this sense, Sen (2000, p. 18) points out that

Development requires removing the main sources of deprivation of liberty: poverty and tyranny, lack of economic opportunity and systematic social destitution, neglect of public services and intolerance or excessive interference by oppressive states.

Thus, for individuals to achieve the life that each one considers valuable, there should be no obstacles in this process, hence poverty must be seen “as a deprivation of basic capabilities rather than merely as a low level of income” (SEN, 2000, p. 109). In addition to the impact on income, there are studies that point to the fact that literacy reflects on the health of the elderly, since illiterate elderly people had greater chances of having health problems, greater fragility and functional dependence, to the detriment of the literate (BORDIN *et al.*, 2020; ZANESCO *et al.*, 2018), due to limited access to health information (ZANESCO *et al.*, 2018).

Still on the impact of illiteracy on the health of the elderly, Bordin *et al.* (2020, p. 453), highlight that

Illiteracy has a cumulative burden, as it reflects, throughout life, in less self-care and self-perception about their health status and in the understanding of diseases, inferring, therefore, in lesser search for health services, late diagnosis and treatment in a timely manner, increasing the worsening of diseases and resulting in more serious limitations, such as bedridden conditions. In addition, illiterate people have more unfavorable social determinants of health, a condition that equally weakens the individual and increases the chances of being bedridden.

Thus, the lack of education and provision directly impacts the life of the elderly. In this regard, Nazzari *et al.* (2004) emphasize that the State must offer citizens free public education and cannot leave the poorest in a situation of illiteracy that makes their escape from poverty unfeasible.

Still, the data from this study allow to reflect that if the elderly people have no income, they will not have access to goods and services in a citizen way and that if they have not had access to education, have difficulty in knowing what they are entitled to and, consequently, their capacity to fight for their rights is reduced.

In the context of the relationship between education and income, low-income people tend to continue in this condition, since there is a high cost to study until they reach the expected returns for higher levels of education, so "it's a function from the Government to expand the offer of public education, as well as to guarantee its quality, also making the option for entering and maintaining the school an attractive alternative" (ZAHIST; NAKABASHI; SALVATO, 2010, p. 25). For Pires (2005), education has several relevant implications for a country's economic growth. The ability to create opportunities for access to rights, citizenship and social development makes education a determining factor in the process of human development in the world today. In this way, discussions on the subject should be stimulated in all spheres of government and civil society so that mobilizations can take place that boost the promotion of assertive social and economic policies, with a view to guaranteeing healthy dignified aging and citizens in particular, for those who reside in the North and Northeast regions, where the demands are more poignant.

### Final Considerations

It is concluded that, for the most part, the elderly population in Brazil is literate, but has a low level of education, especially in the North and Northeast regions, where the concentration of illiterate elderly people was higher. In relation to income, most earn less than the minimum wage, as it is also accentuated in the North and Northeast regions. Furthermore, there is a relationship between education and income of the elderly in the Brazilian context, while illiterate elderly people are more likely to have a lower income to the detriment of literate people, which dialogues with SEN (2000, p. 98), when scoring that “education, among other social rights, generates the instruments and capacities for the exercise of autonomy and freedom, lifting the individual out of absolute poverty”. Furthermore, the study findings show that the relationship between education and income of elderly Brazilians can provide elements for the structuring of actions and public policies of a socioeconomic and cultural nature aimed at development, better quality of life and access to goods and services.

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