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ORIGINAL ARTICLE / *ARTIGO ORIGINAL*

Prevalence of hypertension in adults in the city of São Paulo and associated factors

Prevalência de hipertensão arterial em adultos no município de São Paulo e fatores associados

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ABSTRACT: ***Objective:*** To analyze the behavior of the prevalence of hypertension in the city of São Paulo and its associated factors. ***Methods:*** The present study used data from the Health Survey in the Municipality of São Paulo (ISA Capital), a population-based cross-sectional study conducted in São Paulo. Data from 1,667 and 3,184 individuals were analyzed in 2003 and 2015, respectively, aged 20 years and over. Descriptive analyzes of the prevalence of hypertension were performed with 95% confidence intervals. Simple and multiple analyzes were performed to analyze the possible associations with socioeconomic, demographic and lifestyle variables by Poisson regression. ***Results:*** The prevalence of hypertension increased from 17.2% in 2003 to 23.2% in 2015. The associated variables with hypertension were: gender (females); age (60 years old and over); marital status (married, separated and widowed); having a religion; low education level; being born in the state of São Paulo (except capital); nutritional status (low weight, overweight and obesity); former smokers. ***Conclusion:*** The prevalence of self-reported hypertension increased significantly in the study period. Considering this disease's impact on society, knowing its current prevalence and identifying its main associated factors, the need to intensify the efforts to prevent it disease is evident in order to mitigate damage to individuals and impact on public expenditure.

Keywords: Epidemiology. Hypertension. Risk factors. Self-report.

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RESUMO: ***Objetivo:*** Analisar o comportamento da prevalência de hipertensão arterial no município de São Paulo e seus fatores associados. ***Métodos:*** O presente trabalho utilizou os dados do Inquérito de Saúde no Município de São Paulo (ISA Capital), estudo transversal de base populacional executado no município de São Paulo. Foram utilizados dados de 1.667 e de 3.184 indivíduos em 2003 e 2015, respectivamente, com idade de 20 anos e mais. Fizeram-se análises descritivas das prevalências de hipertensão arterial com respectivos intervalos de 95% de confiança. Análises simples e múltiplas foram realizadas para analisar possíveis associações com as variáveis socioeconômicas, demográficas e de estilo de vida por meio de regressão de Poisson. ***Resultados:*** A prevalência de hipertensão arterial passou de 17,2% em 2003 para 23,2% em 2015. Os fatores associados à hipertensão foram: sexo feminino; idade (60 anos e mais); situação conjugal (casados, separados e viúvos); ter religião; baixa escolaridade; ter nascido no estado de São Paulo (exceto capital); estado nutricional (baixo peso, sobrepeso e obesidade); e ex-fumantes. ***Conclusão:*** A prevalência de hipertensão autorreferida aumentou significativamente no período estudado em São Paulo. Considerando o impacto dessa doença na sociedade, conhecendo sua atual prevalência e identificando seus principais fatores associados, evidencia-se a necessidade de intensificar atividades que contribuam para a prevenção desse agravo, atenuando os danos aos indivíduos e gastos públicos.

Palavras-chave: Epidemiologia. Hipertensão. Fatores de risco. Autorrelato.

INTRODUCTION

Arterial hypertension is a chronic multifactorial condition characterized by sustained elevation of blood pressure levels, with systolic pressure ≥ 140 mmHg and/or diastolic pressure ≥ 90 mmHg. It constitutes one of the most important known and controllable risk factors for the development of cardiovascular diseases, such as infarction, chronic renal failure and stroke[1]. Cardiovascular diseases are the leading cause of death in the world, accounting for 30% of all deaths, with an increasing burden in developing countries[2]. Hypertension is the cause of at least 45% of deaths from heart disease and 51% of deaths from stroke worldwide[3].

Because of the high morbidity and mortality and of the chronic condition profile related to hypertension, and because it remains asymptomatic for many years, the issue becomes a permanent challenge for health systems worldwide, justifying efforts for its early detection and adequate control, which aim to reduce its cardiac, cerebrovascular, renal and peripheral arterial complications[4,5].

According to the World Health Organization (WHO), hypertension affects 20 to 40% of the adult population[6], with the highest prevalence among men and in middle and low-income countries[7].

In Brazil, according to data from the National Health Survey (*Pesquisa Nacional de Saúde* – PNS), the prevalence of hypertension in 2013 was 21.4%, with 24.2% among women and 18.3% among men. This prevalence was higher according to age: 20.6% among adults aged 30 to 59 years, 44.4% among elderly people aged 60 to 64 years and 52.7% among those aged 65 to 74 years[8]. The prevalence of hypertension was also higher in people with low education levels, living in urban areas and in southeastern Brazil[9].

Data from the Surveillance of Risk and Protection Factors for Chronic Diseases by Telephone Survey (Vigitel) in 2016 showed that the prevalence of hypertension in Brazil was 25.7%, varying between 16.9 and 31.7%. The prevalence was higher among women (27.5%) than among men (23.6%)[10].

The main factors associated with hypertension are: advanced age, being female, overweight, salt intake, excessive alcohol consumption, smoking, physical inactivity, low income and genetic factors[1].

The identification of the current prevalence of hypertension in the city of São Paulo and its associated factors, raised through household surveys, is important to assist in targeting interventions for the prevention and control of this disease, as it raises detailed information about the characteristics of the population.

In this sense, the Municipal Department of Health of São Paulo, in partnership with the Schools of Public Health and Medicine of Universidade de São Paulo (USP), Universidade Estadual de Campinas (Unicamp) and the Health Institute of the State Department of Health of the Government of São Paulo, held three editions of the Health Survey in the Municipality of São Paulo (ISA Capital), in 2003, 2008 and 2015. This survey was designed to learn about aspects of public health in the city that are not contained in routine information systems of the Unified Health System (SUS).

The present study aimed to analyze the evolution of the prevalence of arterial hypertension between 2003 and 2015 and the associated factors in 2015 among adults and the elderly in the capital of São Paulo.

METHODS

This study used data collected by ISA Capital. A total of 1,667 individuals in 2003 and 3,184 in 2015, all aged 20 years or over and residing in the city of São Paulo, were interviewed.

ISA Capital is a cross-sectional population-based study with probabilistic samples stratified by conglomerates in two stages, carried out in three periods. In the 2003 survey, the strata were built by grouping the census sectors into three groups, defined by the percentage of heads of households with a university degree, and eight domains grouped by gender and age were also identified. In the 2015 survey, to obtain data on regional health coordinators in the city of São Paulo, a division into five strata (Midwest, East, North, Southeast and South) and four domains by gender and age was used.

The information was obtained through questionnaires applied by interviewers visiting the households and answered directly by the drawn residents or by their mother or guardian, if the selected individual had any limitations or disabilities. The questionnaire was organized into thematic blocks, with most of the questions being closed and with predefined alternatives.

The dependent variable (outcome) was the prevalence of self-reported hypertension, through the question: Has any doctor already informed you that you have hypertension or high blood pressure? The independent variables related to socioeconomic and demographic information

were: gender, age group (20 to 59 years, 60 years and over), skin color (white, black, brown, other), marital status (single, married, separated, widowed), religion (yes, no), education (higher education, secondary education, intermediate education, primary education, no schooling) and place of birth (city of São Paulo, state of São Paulo, another state, another country).

In the marital status variable, the married category included individuals who reported that they lived with their partner and were in a stable relationship. The separated category involved the separated and the divorced individuals.

To assess physical activity, individuals who performed 150 minutes or more of physical activity per week were considered physically active.

The variables related to lifestyle were: physical activity (yes, no), nutritional status (eutrophy, underweight, overweight, obesity) and smoking (never smoked, smoker, ex-smoker). Nutritional status was classified by body mass index (BMI), which in turn was obtained by dividing weight (kg) by height (m) squared. For adults (20–59 years), the following cutoff points were adopted: low weight (BMI < 18.5 kg/m^2), eutrophy (BMI between 18.5 and 24.9 kg/m^2), overweight (BMI between 25 and 29.9 kg/m^2) and obesity (BMI ≥ 30 kg/m^2). For the elderly (aged 60 and over), the cutoff points were: low weight (BMI < 23 kg/m^2), eutrophy (BMI between 23 and 27.9 kg/m^2), overweight (BMI between 28 and 29.9 kg/m^2) and obesity (BMI ≥ 30 kg/m^2).

The data was encoded directly in the questionnaires and typed in an Epi Info mask in 2003. In 2015, the data was entered directly into tablets and the coding was done in the final bank in Excel.

For data analysis, descriptive analyzes were performed, calculating the estimates of prevalence for hypertension and 95% confidence intervals (95%CI). Then, associations with socioeconomic, demographic and lifestyle characteristics were verified using the confidence interval, considering the 5% significance level and complex sample design. Simple Poisson regression was performed, taking into account hypertension as a dependent variable and socioeconomic, demographic and lifestyle variables as independent variables. The variables that presented a significance level of $p < 0.20$ were subjected to the Poisson multiple regression analysis, and only variables with $p < 0.05$ remaining in the final model. The measure of association used was the prevalence ratio (PR).

In order to verify the behavior of the prevalence of arterial hypertension in the analyzed period, the survey banks were joined and Poisson regression techniques were used, with the disease being the dependent variable and the years the independent variables, in addition to 2003 being the reference year, and having been adjusted by gender and age group. All analyzes were carried out using the survey mode of the Stata 13 software, given the complex sample design.

In relation to ethical aspects, the interview took place only after the individuals selected were made aware of the Informed Consent and after having signed the document, in case of agreement.

This work was approved by the Research Ethics Committee of the School of Medicine of Universidade de São Paulo on November 4, 2015, under protocol number 437/15.

RESULTS

The prevalence levels of self-reported arterial hypertension in the city of São Paulo were: 17.2% (95%CI 14.8 – 19.9) in 2003 and 23.2% (95%CI 21.5 – 25.0) in 2015. This increase was statistically significant when comparing the values of 2003 and 2015. There was a 30% increase in the prevalence of hypertension in the municipality (PR = 1.3; 95%CI 1.1 – 1.5), considering the year of 2003 as a reference (adjusted for gender and age group) (Table 1).

Considering 2015, the prevalence of arterial hypertension was higher among women (26.5%; 95%CI 24.2 – 28.9) than among men (19.5%; 95%CI 17.3 – 21.8) and higher among individuals aged 60 years or older (54.9%; 95%CI 51.0 – 58.6). The prevalence of hypertension was higher among widowers (56.2%; 95%CI 50.9 – 61.2), individuals that have a religion (24.6%; 95%CI 22.7 – 26.6), without education (47.2%; 95%CI 37.0 – 57.7) and migrants from the state of São Paulo (33.6%; 95%CI 27.4 – 40.4) (Table 2).

Regarding lifestyle characteristics, the prevalence of hypertension was higher among individuals who did not practice enough physical activities (30.9%; 95%CI 27.0 – 35.2), obese individuals (39.5%; 95%CI 35.3 – 43.8) and ex-smokers (33.9%; 95%CI 29.6 – 38.5) (Table 2).

After adjusting the variables, the individuals who were most likely to report hypertension were women (PR = 1.2; 95%CI 1.0 – 1.4), the elderly (PR = 2.6; 95%CI 2.2 – 3.1) and those who had a religion (PR = 1.3; 95%CI 1.0 – 1.7). Individuals who were married (PR = 1.5; 95%CI 1.2 – 2.2), separated (PR = 2.0; 95%CI 1.5 – 2.8) and widowers (PR = 1.6; 95%CI 1.2 – 2.2), had a higher chance when compared to singles, as well as those with lower levels of education, such as people who had up to intermediate education (PR = 1.3; 95%CI 1.0 – 1, 7), primary education (PR = 1.6; 95%CI 1.3 – 2.0) and those who didn't study (PR = 1.4; 95%CI 1.0 – 2.0), when compared to those with higher education.

Regarding the place of birth, individuals who migrated from other municipalities in the state of São Paulo had higher chances (PR = 1.2; 95%CI 1.0 – 1.5) when compared to those who were born in the capital. People with low weight (PR = 1.3; 95%CI 1.0 – 1.5), overweight (PR = 1.7; 95%CI 1.4 – 2.0) and obesity (PR = 2.5; 95%CI % 2.1 – 2.9) were more likely to have hypertension in relation to eutrophic individuals, and ex-smokers (PR = 1.2; 95%CI 1.0 – 1.4) had a 20% higher prevalence than those who have never smoked (Table 2).

This study also pointed out a significant increase in obesity in the city of São Paulo, going from 11.4% (95%CI 9.0 – 14.3) in 2003 to 20.7 (95%CI 19.1 – 22.3) in 2015 (Table 3).

Table 1. Prevalence (%) and prevalence ratio of self-reported hypertension in individuals aged 20 years or older, according to year. São Paulo. Health Survey in the Municipality of São Paulo (ISA Capital), 2003 and 2015.

Year	Prevalence (%)	95%CI	Prevalence ratio	95%CI	P
2003	17.2	14.8 – 19.9	1	-	-
2015	23.2	21.5 – 25.0	1.3*	1.1 – 1.5	0.001

95%CI: 95% confidence interval; *adjusted by gender and age group.

Table 2. Prevalence ratio (PR) of hypertension according to socioeconomic, demographic and lifestyle variables. São Paulo. Multicentric Health Survey in the Municipality of São Paulo (ISA Capital) 2015.

Variables	Prevalence		Crude prevalence ratio			Adjusted prevalence ratio*		
	%	95%CI	PR	95%CI	p**	PR	95%CI	p**
Gender								
Male	19.5	17.3 – 21.8	1	-	-	1	-	-
Female	26.5	24.2 – 28.9	1.4	1.2 – 1.6	**< 0.001**	1.2	1.0 – 1.4	**0.025**
Age group								
20–59 years	16.0	14.3 – 17.9	1	-	-	1	-	-
60 years or more	54.9	51.0 – 58.6	3.4	3.0 – 3.9	**< 0.001**	2.6	2.2 – 3.1	**< 0.001**
Marital status								
Single	10.7	8.5 – 13.5	1	-	-	1	-	-
Married	23.5	21.2 – 26.0	2.2	1.7 – 2.8	**< 0.001**	1.5	1.2 – 2.0	**< 0.001**
Separated	33.5	28.1 – 39.4	3.1	2.4 – 4.1	**< 0.001**	2.0	1.5 – 2.8	**< 0.001**
Widowed	56.2	50.9 – 61.3	5.2	4.0 – 6.8	**< 0.001**	1.6	1.2 – 2.2	**0.001**
Religion								
No	14.2	10.9 – 18.3	1	-	-	1	-	-
Yes	24.6	22.7 – 26.6	1.7	1.3 – 2.3	**< 0.001**	1.3	1.0 – 1.7	**0.020**
Education								
Higher	18.1	14.3 – 22.7	1	-	-	1	-	-
Secondary	14.6	12.7 – 16.8	0.8	0.6 – 1.0	0.095	0.9	0.7 – 1.1	0.378
Intermediate	26.7	22.6 – 31.1	1.5	1.1 – 2.0	**0.009**	1.3	1.0 – 1.7	**0.020**
Primary	45.2	41.2 – 49.3	2.5	2.0 – 3.2	**< 0.001**	1.6	1.3 – 2.0	**< 0.001**
No education	47.2	37.0 – 57.7	2.6	1.9 – 3.6	**< 0.001**	1.4	1.0 – 2.0	**0.032**
Birthplace								
São Paulo	17.9	15.5 – 20.7	1	-	-	1	-	-
SP State	33.6	27.4 – 40.4	1.9	1.5 – 2.4	**< 0.001**	1.2	1.0 – 1.5	**0.037**
Other state	27.6	24.8 – 30.5	1.5	1.3 – 1.8	**< 0.001**	1.1	0.9 – 1.3	0.303
Other country	21.2	12.6 – 33.4	1.2	0.7 – 2.0	0.518	0.7	0.5 – 1.1	0.180

Continue...

Table 2. Continuation.

Variables	Prevalence		Crude prevalence ratio			Adjusted prevalence ratio*		
	%	95%CI	PR	95%CI	p**	PR	95%CI	p**
Nutritional status								
Eutrophy	15.0	13.2 – 17.1	1	-	-	1	-	-
Low weight	32.8	26.1 – 40.3	2.2	1.5 – 2.8	**< 0.001**	1.3	1.0 – 1.5	**0.029**
Overweight	21.3	18.2 – 24.8	1.4	1.2 – 1.7	**< 0.001**	1.7	1.4 – 2.0	**< 0.001**
Obesity	39.5	35.4 – 43.8	2.6	2.2 – 3.1	**< 0.001**	2.5	2.1 – 2.9	**< 0.001**
Smoking								
Never	22.3	20.2 – 24.5	1	-	-	1	-	-
Smoker	17.7	14.4 – 21.6	0.8	0.6 – 1.0	**0.044**	1.0	0.8 – 1.2	0.659
Ex-smoker	33.9	29.6 – 38.5	1.5	1.3 – 1.8	**< 0.001**	1.2	1.0 – 1.4	**0.024**

95%CI: 95% confidence interval; *adjusted by the variables present in the table; **values in bold represent statistical significance ($p < 0.05$).

Table 3. General characteristics of the study population according to nutritional status. São Paulo. Health Survey in the Municipality of São Paulo (ISA Capital), 2003 and 2015.

Nutritional status	ISA Capital 2003 (n = 1,667)			ISA Capital 2015 (n = 3,184)		
	%	95%CI	n	%	95%CI	n
Eutrophy	53.5	50.2 – 56.8	716	41.5	39.3 – 43.8	1,295
Low weight	7.1	5.8 – 8.8	222	5.9	5.0 – 6.9	258
Overweight	28.0	24.7 – 31.5	300	32.0	30.0 – 34.0	906
Obesity	11.4	9.0 – 14.3	195	20.7	19.1 – 22.3	658

95%CI: 95% confidence interval.

DISCUSSION

The results showed a progressive increase in the prevalence of self-reported arterial hypertension in the city of São Paulo. This value is similar to that found in Vigitel 2016, which indicated a prevalence of 25.9% (95%CI 23.8 – 29.1) in the capital of São Paulo State[9].

A possible explanation for this increase can be attributed to the expansion of the diagnosis of the disease due to the greater access to health services by the population through the teams of the Family Health Strategy (Estratégia Saúde da Família – ESF)[11]. It can also be considered that the increase in the prevalence of hypertension in this population is related to the increase in overweight and obesity in the population of the city of São Paulo[12].

This study also pointed out an increase in the prevalence of obesity in the municipality from 2003 to 2015, and both overweight and obesity are known risk factors for hypertension[13].

Another factor to be considered is that populations around the world are aging. This demographic change could also explain the increase in hypertension in São Paulo[14]. Arterial hypertension in this municipality was more prevalent among women, a result that corroborates the findings of several studies conducted in Brazil with self-reported data[11,15,16]. On the other hand, the literature shows that the prevalence of hypertension is higher among men when blood pressure is measured, as shown by data from PNS[17].

In a study conducted with the Brazilian population, an association was found between hypertension and gender at the limit of significance in the adjusted model[11], and in a study with the elderly population in the state of São Paulo, the association between women was present only in the crude analysis[18]. In this study, women were 20% more likely to have hypertension. A possible explanation for this is that women are generally more aware of illnesses, seek more medical assistance and have greater adherence to health care[19,20].

There is a direct relationship between age and arterial hypertension, according to widely publicized studies[11,16,21,22]. Thus, in this study, the prevalence of hypertension was higher among the elderly (60 years and over). The PR was about three times that of adults aged 20 to 59 years, similarly to that found in other studies[11,23]. A fact that may explain this association is that, with advancing age, the arteries tend to become more rigid, which may be related to the increase in blood pressure in these people[24,25]. Another factor for the higher prevalence of hypertension among the elderly may be the demographic transition itself, due to the accelerated aging of the population[26].

In the municipality of São Paulo, when considering the marital status of individuals, those who were separated were twice as likely to have hypertension. Additionally, a positive association was found between married and widowed individuals compared to singles. The same was observed by Belon et al., who also found a higher chance of hypertension among married people, suggesting that living with someone could be related to greater access to health services, impacting on a greater chance of detecting hypertension in this group[27].

Some authors suggest that the quality of marriage may play a more important role in health than the marital situation itself[28] and that the quality of the relationship moderates the effect of stress. It has been reported that when the marital relationship has a negative quality, there may be an increase in blood pressure, as stress can affect the vascular system[29].

With regard to separated individuals, a higher prevalence of sleep complaints was found among the newly separated, which increases the risk of arterial hypertension in the future[30]. Among widowers, it has been seen in the literature that women had a higher risk of hypertension as soon as they lost their husbands, but those who have been widows for a long time have not had such an association, since the mourning period, which corresponds to a moment of great emotional stress, has passed[31]. Thus, people who experience situations of prolonged emotional tension may become hypertensive, especially when there is a genetic disposition for such a disease[32], strengthening, however, the different prevalence rates found in this study.

Some studies were carried out with the purpose of raising questions about people's religiosity and spirituality and their association with the prevalence of arterial hypertension. In a survey conducted in the United States, a lower prevalence of hypertension was found in individuals who practiced religious activities[33]. Another American study found that practitioners of religious activities were 40% less likely to have hypertension[34]. Although religious people tend to have lower rates of hypertension[35], since they theoretically follow guidelines that value health care, people in the city of São Paulo who have religion were more likely to have hypertension than people without a religion. As this is a cross-sectional study, it is not possible to point out the temporality of this information; that is, it is not known whether people became religious before or after the diagnosis of hypertension. However, people tend to seek a religion in situations of stress, in search of greater well-being[36].

Studies show that lower levels of education are associated with risk factors for hypertension[11,37], as observed in the city investigated. Individuals who studied up to primary and intermediate school and those who never studied were more likely to have hypertension, compared to those with higher education. This may be because people with higher education levels are more aware of health care and behaviors related to disease prevention[38]. In addition, it is also necessary to consider possible inequalities in access, since more educated people have less difficulty in accessing health services[39].

The birthplace of São Paulo residents was associated with hypertension, since the PR observed among individuals who were born in other municipalities in the state of São Paulo and migrated to the capital was higher when compared to those born in the capital. A study carried out with elderly people in the interior of the state found a higher PR among those born in other states than among those born in the same state where the research was carried out[18]. One factor that can explain what happened is the stress to which migrants are exposed due to the process of adapting to changes in habits and culture[40].

Physical inactivity is considered an independent risk factor associated with hypertension[41], but in the city of São Paulo, individuals in this condition were 40% more prone to hypertension than those who were physically active, which was not maintained in the final model but only in the simple analysis. A possible explanation for what happened is that people who do not exercise tend to be obese and to eat in an unhealthy way, which are already known risk factors for hypertension[42,43].

In the municipality analyzed, a positive association was found between hypertension and overweight and obesity. Overweight individuals had a 70% greater chance of having hypertension in relation to eutrophic individuals, and obese individuals had more than twice the chance. Studies show that obesity is directly associated with hypertension[44,45]. On the other hand, they also show that small reductions in body weight result in a significant drop in arterial hypertension and improve the associated metabolic changes[46-48].

Smoking is a recognized risk factor for hypertension, as the components of cigarettes induce vasoconstriction and affect the elasticity of the arteries, since the presence of nicotine and carbon monoxide constitutes aggressions to the vascular endothelium, causing an inflammatory response and accelerating the atherosclerosis process[49-51]. In the municipality

of São Paulo, ex-smokers were 20% more likely to report hypertension than individuals who had never smoked. A similar result was found in other studies[11,52]. One possible explanation for this is that quitting can trigger withdrawal symptoms, such as increased appetite with consequent weight gain[11,53,54]. In addition, it is from the age of 45 that people usually seek treatment to stop smoking, that is, after a long period of exposure to tobacco, which is when the first chronic effects of the substances begin to appear[55]. In any case, it is worth mentioning that, because of the study design, individuals could have stopped smoking after the diagnosis of hypertension, since smoking cessation is highly recommended as soon as possible, regardless of the time of use, depending on the harm caused by smoking and its possible complications[56].

A possible limitation of this study is related to the fact that all information is self-reported, including the diagnosis of hypertension. This information helps to identify people who received the diagnosis, but does not identify individuals who are unaware of such a condition. However, self-reported hypertension has been used in population-based surveys and has proved to be a safe tool in the absence of blood pressure measurement[57-59]. In addition, it is important to consider that, due to the cross-sectional design of the study, exposure and effect are measured at the same time, which does not allow the establishment of causal relationships[60].

CONCLUSION

The prevalence of hypertension increased significantly between 2003 and 2015 in the city of São Paulo, and the factors positively associated were: being female, age (60 years or more), marital status (married, separated, widowed), having a religion, education (intermediate education, primary education, no education), nutritional status (underweight, overweight, obesity) and smoking (ex-smokers).

The periodic repetition of this type of survey helps to provide important data to monitor and follow up on the behavior of diseases, as well as to identify their associated factors, highlighting the need to reassess ongoing actions and strategies and to intensify those that contribute to prevention and control, mitigating the damage to individuals as well as reducing public spending.

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