

Prevalence of use of health services and associated factors in the Metropolitan Region of Manaus: a cross-sectional population-based study

Introduction: study Use of health services to identify and propose measures to combat inequalities has involved several countries, including Brazil. Our objective was to estimate the prevalence of health services use and associated factors in the Metropolitan Region of Manaus.

Methods: A population - based survey with a random sampling in three stages, stratified by sex and age quotas, was conducted with adults ≥ 18 years of age between May and August 2015, considering how primary medical consultation outcome, dental and hospitalization in last year. The associated factors were investigated by calculating the prevalence ratios (PR) obtained by Poisson regression in a hierarchical model.

Results: 4,001 adults were included in the study, 53% women. About half of the individuals reported using tertiary health care when they needed care. The self-reported prevalence of medical consultation was 77% (95% confidence interval: 75-77%), dental 36% (95% CI: 34-37%) and hospitalization 7% (95% CI: 6-7%) . Medical consultation was associated with women (PR = 1.18, 95% CI: 1.14-1.23), elderly (PR = 1.18, 95% CI: 1.10-1.26) and people with (PR = 1.14, 95% CI: 1.10-1.19). Dental appointments reduced with advanced age (PR = 0.38, 95% CI 0.30-0.49), lower educational level (PR = 0.62, 95% CI 0.51-0.74) and lower class (RP = 0.65, 95% CI: 0.57-0.75). Hospital admission was associated twice more in women than men, and three times more among those who reported very poor health status.

Conclusions: There was high use of medical consultation. Less proportion of the population consulted with the dentist, especially the poorest and least educated. Policies of organization and provision of services are necessary to increase equity in health services in the region.

In recent years, special attention has been given estimates of use and access to health services in Brazil and the world, with the prospect to identify and propose measures to reduce inequalities ([1](#)). The use of

health care services is the result of the process that involves individuals in need and health services with their infrastructure, in which include technologies, inputs and professional ([2](#), [3](#)).

Population-based surveys aim to assess the health of the population. By analyzing its relation to medical services also allow us to identify inequalities between groups and the distribution of the population risk factors ([4](#)). The information drawn from these studies subsidize the planning, organization and monitoring of health actions ([5-8](#)).

In 2013, a Brazilian national survey evaluated the use of health services in the last year for medical consultation (61% to 75%), dental consultation (34% to 52%), and hospitalization (5.7 to 7.5 %) between the regions by self-reported responses ([9](#)).

Manaus, Amazonas state capital, is located in the North and its metropolitan area ranks second to last in the Human Development Index among the 20 existing in Brazil ([10](#)). The Amazon has the largest territorial extension and lowest demographic density in Brazil; more than 60% of its population is concentrated in the metropolitan region of Manaus ([11](#)). The intercity transport system is typically waterway and there are great distances between cities and the capital, which is the largest provider of health services.

These characteristics influence the availability and access to medical care in the region and, consequently, the use of these services. Evidence on the utilization profile and access to health care network will subsidize policies in the sector.

The present study aimed to analyze the prevalence and factors associated with the use of health services in adults residing in the Metropolitan Region of Manaus.

This is a cross-sectional population-based study. Primary outcomes were medical, dental and hospitalization visits in the last 12 months.

The interviews were carried out from May to August 2015 in the municipalities that make up the Metropolitan Region of Manaus: Manaus, Careiro da Várzea, Iranduba, Itacoatiara, Manacapuru, Novo Airão, Presidente Figueiredo and Rio Preto da Eva.

Adult subjects ≥ 18 years were eligible for the study. We perform probabilistic sampling in three stages, stratified by sex and age quota based on official data to increase the representation ([12](#)). In the first stage, 400 were randomly selected primary sectors and 20 secondary among 2,647 urban census tracts in the metropolitan region of Manaus ([11](#)). The second stage was based on a systematic procedure that included 10 households in each selected sector. A number was drawn between 1 And 20 to set the first residence to be visited. Next, the 20 th subsequent residence was identified until completing 10 interviews by census sector. In case of unavailability, the address immediately to the right was approached; The same procedure was performed to the left on the unavailability of the latter. In the third stage, all residents ≥ 18 years old were present at the residence and an individual was randomly chosen to be interviewed, based on predefined quotas of gender and age according to the official census.

The independent variables were: gender (male / female), age group (18-24, 25-34, 35-44, 45-59, ≥ 60 years), marital status (single, married, separated, and widowed) , color self-reported skin (white and yellow, black, brown and Indian), education (higher education, secondary education, education fundamentale unless fundamental), social class (A and B, C, D, E) ([12](#)) (Formal job, informal work, retired, student / housewife, does not work, health plan (yes or no), self-perception of health (very good, good, regular, bad, very bad), place of care And interior) and if the same health service is sought (yes and no). Variables included to explain the outcome comprised: service or professional for care related to health in the last 15 days, reason to seek care, success in the first attempt, reason For non-attendance, how many times he returned to seek care, which was the main health care received and for which reason he did not seek health care in the last two weeks.

The primary outcome was measured using three questions: "*when you consulted a doctor for the last time? "*" "*When you consulted a dentist last? "*" ("The last 12 months", "from 1 to less than 2 years", "from 2 to less than 3 years", "3 years or more", "never went to the doctor") and "*In the last 12 months, how many times have you been hospitalized (a) in hospital for 24 hours or more? "*"(Possibility of answer: number of times, categorized to yes or no).

The collection was performed in mobile electronic devices (Samsung® Galaxy Tab3 SM-T110) by 14 trained interviewers with experience in carrying out population surveys. Interview records were

transmitted via the internet and stored using Survey ToGo software (Dooblo Ltd, Israel). The instrument was understood through a pre-test comprising 150 interviews.

To minimize the risk of information bias, a telephone audit was conducted with 20% of respondents. To guarantee the reliability of the data, the location was georeferenced and part of the interview had the audio recorded.

The sample size was calculated from an estimated 50% prevalence of use of health services, considering the confidence level of 95%, 2% accuracy and design effect 1.5 ([13](#)). From the population estimated by officials of 2,106,322 residents ≥ 18 years in the region ([11](#)), was reached on a sample of 3,598 individuals. At this amount, 10% was added to offset any losses and refusals.

The descriptive statistics of the variables measured in the study were initially obtained by calculating the frequency and its stratification by the use of medical, dental and hospitalization consultations. In this step, any differences between the proportions were identified by the Pearson chi-square calculation. Subsequently, bivariate analyzes were performed between all independent and dependent variables, to calculate the prevalence ratio (PR).

To identify factors associated with the use of these services, the RP were adjusted in a hierarchical model ([14](#)) and calculated with 95% confidence interval (95% CI) by Poisson regression with robust variance ([15-17](#)).

Thus, a hierarchical model of three blocks was constituted: (1) demographic variables (gender, age, race, marital status); (2nd) socioeconomic variables (income, schooling and occupation); And (3) health (health plan, perception of health status, reference by the same health service, place of care). From the first block, the variables for the next step were maintained if they presented $p \leq 0.05$. The multicollinearity between the independent variables was investigated by *Variance Inflation Factors* ([18](#)).

Data analysis was carried out in Stata 14.2. In all calculations, pondered the complex sample design by incorporating sample weights (*svy* command).

The research project was approved by the Ethics Committee of the Federal University of Amazonas, through Opinion No 974 428, March 2015. All individuals who agreed to participate signed a consent form and clear.

Figure 1 shows the recruitment process. A total of 4,001 adult individuals ≥ 18 years of age were interviewed, with 24% of refusals. The sample consisted of 53% of women (Table 1). Most reported brown skin color (72.2%) and 1% as indigenous. Half of the subjects were between the ages of 18 and 34, were single and had completed high school. The predominant economic class was C (57%), about one third were in informal work (autonomous and domestic), most reported being in good health (54%).

The prevalence of medical consultation in the last year was 77% (95% CI: 75-77%). Women, the elderly, widows, individuals with lower levels of education than primary school, retirees, individuals who do not work and who report poor health status are the majority (over 80%) of respondents who have consulted in the last 12 months (Table 1).

Table 2 shows the adjusted analyzes. The variables that remained positively associated with statistical significance after adjusting for the demographic block were female (PR = 1.18, 95% CI: 1.14-1.23) and elderly individuals (PR = 1.18, 95% CI: 1, 10-1, 26). In the socioeconomic block, education levels did not influence the consultations. Minor prevalence ratios were observed in extracts C, D and E (PR = 0.94, 95% CI: 0.89-0.98) and in non-working individuals. The health plan holders (RP = 1.14, 95% CI: 1.10-1.19), different health perceptions of "very good" were factors associated with medical consultation in the last block.

The interviewees reported 36% (95% CI: 34-37%) of dental appointments in the last year (Table 1). Approximately 50% of these consultations were carried out by young individuals with full higher education, in income class A and B, who had formal work and health insurance. The lower the educational level (RP = 0.62, 95% CI: 0.51-0.74) and income (RP = 0.65, 95% CI: 0.57-0.75), and higher age RP = 0.38, 95% CI: 0.30-0.49), the lower the frequency of consultation with the dentist. On the other hand, married individuals (RP = 1.15, 95% CI: 1.05-1.26), health plan holders (PR = 1.25, 95% CI: 1.13-1.38), and those With a poor perception of health (PR = 1.44, 95% CI: 1.13-1.83) had more consultations, Table 2.

The frequency of hospitalization in the last year was 7% (95% CI: 6-7%). Women reported hospitalization approximately three times as often as men. Poor individuals, students and / or housewife who reported poor health status were hospitalized more.

After adjustment, women were twice as often associated with hospital admission as men. Referring to very bad health status was associated with three times that very good health state.

Table 3 presents the reasons for the demand and lack of access to health services in the last 15 days; 48% of respondents reported seeking a tertiary service when they needed care, and 76% had their last consultation with a general practitioner. A fifth sought care in the last 15 days and the main motivation was illness. Eight out of 10 respondents were seen on the first attempt. Among the individuals who did not get care in the two weeks, 57% reported lack of places and 14% because of lack of doctor. Most of these people (77%) returned to seek care, seeking 1.4 ± 1.2 times in the subsequent two weeks.

Every 10 interviewees about 8 went to the doctor in the last year. Women, the elderly, retirees, individuals with a health plan and who reported poor health status were the ones who consulted the most. About one third of the interviewees used dental services in the period. Higher utilization occurred among individuals with higher income, schooling, formal employees and health plan holders. Seven out of 100 respondents were hospitalized in the past year. The hospitalizations were associated with women, students and / or housewife and people with very poor perception of health status. Tertiary health care was the most sought after, and most had their last consultation with general practitioner. Diseases were the main motivations for seeking health care in the last 15 days. The difficulty of access was attributed to the lack of places and doctors.

The study presents common limitations to the cross-sectional design. Outcomes were measured at a single point in time, making it impossible to establish causality. Other limiting relate to memory bias, since people tend to remember a greater or lesser extent past activities, depending on the value they had in their lives ([19](#)). The absence of a pattern between the available surveys (recall periods, age range) makes comparability at both national and international levels difficult.

The prevalence of medical consultation in this study was similar to that of surveys conducted in other Brazilian Regions. In Rio Grande do Sul, Lajes, Pelotas and Porto Alegre, prevalences were found ranging from 66% to 76% last year ([20-23](#)). With recall period of 90 days, other national surveys identified prevalence rates of 60%, 42% and 35% ([21](#) , [24](#) , [25](#)).

In European Union countries, the medical consultation use in the past 12 months ranged from 63% to 94% between Sweden and Spain ([26](#)). In Latin America, the prevalence in the last 30 days was 41% among individuals users of the public service and 39% by private insurance holders, a study conducted in Peru ([27](#)).

More than 80% of the women attended the medical appointment in the last year. In addition to factors inherent to prevention care, it is a young population of reproductive age, which requires greater use of health services. This prevalence is similar to other studies in the Brazilian context (82% to 86%) ([20](#) , [28](#)) and international, where the frequency of visits by women was (84%) compared to men (74%) and less difference relation to hospitalization, women (12%) and men (11%) are Norwegian survey data in 2008 ([29](#)).

With regard to dental appointment, our findings were consistent with data from the National Health Survey (PNS), referring to the North, where 34% held consultations last year ([9](#)). A Canadian population-based survey of 5,600 individuals conducted in 2012 found that 75% of respondents had consulted a dentist in the previous year. Despite the high use, the survey reports that 34% needed dental treatment ([30](#)).

The low prevalence of use of dental services is related to access problems in the public health system, since the greater use was concentrated in individuals with higher income, schooling, employees and health plan. Thus, negative outcomes in oral health will be more observed in the most vulnerable population.

Regarding the hospital, we found lower prevalence compared to surveys in the Central-West and South, which had a range of 9% to 15% ([23](#) , [24](#) , [31](#)). There are no previous reports of hospitalizations in the Metropolitan Region of Manaus for comparison. The NHP 2013 revealed a prevalence of 5.8% of

hospitalizations for the Northern Region and the National Survey 2008 Household Sample pointed 7.7% (9). More than 70% of admissions in the North are financed by the Unified Health System (9).

The availability of hospital beds in the study region and (1.9 beds per 1,000 inhabitants in 2009) may be contributing to the low prevalence, compared to Rio Grande do Sul, state with a higher percentage of hospitalization, the density is 5 , 27: 1000 (32). The supply of beds of Brazil (2.3: 1,000) is low compared with countries of the Organization for Economic Cooperation and Development, 4.8 beds per 1,000 inhabitants (33). On the other hand, it can also be justified by a predominantly young population (34), under 30 years, which require less hospitalization compared to older (35).

Despite the low prevalence of hospitalization, there is a high search for tertiary services in the event of illness, overburdening the service and causing higher expenses to the industry than if there were organization demand through primary health care (36).

The American study reported that 51% of non-critically ill adults admitted to the emergency indicated non-medical factors in the use of the service (lack of information, 23%, inadequate access to specialized outpatient care, 14%, need for diagnostic examination, 12% inappropriate to primary care, 10%) (37).

Regarding the issues of access, we identified that the lack of vacancies for service reported by more than half of individuals who have used the health service in the last 15 days, was over study conducted in 2012 in the city of Pelotas (38). Studies of inequality in utilization and access to health services are carried out in various parts of the world in order to identify and point to decision makers the gaps in health systems (39-42). We consider that there are potential inequalities in income, education, and health insurance statements related to the use of dental services.

In conclusion, medical consultations are frequent among residents, while there are limitations in the use of dental services, with greater use in high economic and educational extracts. The tertiary service is the most sought after for first care and the hospitalization was inferior to other regions of Brazil. The findings demand actions of organization and offer of the services for the purpose of equity and orientation of the service flow.