Waiting time and medical consultation length in the Manaus metropolitan region, Brazil: a cross-sectional, population-based study, 2015*

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Abstract

Objective. To assess waiting times and length of medical consultations in the Manaus metropolitan region, Brazil. **Methods**. This was a cross-sectional study conducted with adults living in the region in 2015. Waiting time for consultation and length of consultation in minutes were reported by the participants. Analysis was performed using Tobit regression and weighted by the sample design. **Results**. 4,001 individuals were interviewed. Average waiting time was 125.4 minutes (95%CI 120.2;130.5), while consultations lasted an average of 52.5 minutes (95%CI 48.0;57.0). Women, poor people, people with less education, indigenous people, people resident in the state interior, people without health insurance, and individuals seen by gynecologists waited longer for their consultation ($p < 0.05$). Consultation time was shorter for non-White people, those with poor health status and those who had health insurance ($p < 0.05$). **Conclusion**. On average length of medical consultations was half the waiting time. Social inequalities were observed in these lengths of time.

Keywords: Waiting Lists; Health Services Accessibility; Quality of Health Care; Cross-Sectional Studies; Physicians' Offices.

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Introduction

A medical consultation is a moment of interaction between health professionals and patients and is based on interpersonal relationships.[1] Adequate communication is essential for high quality diagnosis and treatment, and affects health outcomes.[2] Medical care, technical knowledge, empathy towards patients, ease of access to medical care and adequate consultation length are associated with better medical consultation quality.[3] In order to achieve continuing health service improvement, periodic evaluation of the entire process is necessary as well as evaluation of patients' satisfaction with consultations.[4]

> *Population-based studies evaluating waiting time and length of medical consultations in Brazil are scarce, especially in the country's Northern region.*

Waiting lists indicate an imbalance between demand for health services and ability to provide them.[5] Organizational and structural restrictions are the main factors contributing to this imbalance,[5] and one of them, time spent waiting to be seen, affects patient satisfaction and the resolutive capacity of the health system.[6,7] In high complexity environments, long waiting lists and delays in service delivery unnecessarily increase length of hospitalization time.[8] Difficulty in getting appointments is one of the main causes of dissatisfaction, given that having to wait for long periods of time generally results in shorter consultations.[8]

Whereas waiting time is attributed to organizational processes, length of consultation is characterized by health demands and concerns, that differ between individuals and, for this reason, require empathetic interactions.[9] Greater length of medical consultation time does not necessarily improve Primary Health Care performance results, including prescriptions issued, requests for laboratory tests and referrals, or patient satisfaction with the service provided.[10] The contents of a medical consultation appear to play an important role with regard to both patient and doctor satisfaction.[11]

Population-based studies evaluating waiting time and length of medical consultations in Brazil are scarce, especially in the country's Northern region. The objective of this study was to analyze waiting time and medical consultation length and associated factors in the Manaus metropolitan region in 2015.

Methods

A population-based cross-sectional study was conducted with adults living in the Manaus metropolitan region in the state of Amazonas. The metropolitan region comprises a further seven municipalities apart from the state capital Manaus: Careiro da Várzea, Iranduba, Itacoatiara, Manacapuru, Novo Airão, Presidente Figueiredo and Rio Preto da Eva. We used data from a study conducted in the second semester of 2015 about use of health supplies and the health situation of the population in the region.[12]

Individuals aged 18 years or over were eligible to take part in the study. The sampling process was comprised of three stages: (i) random selection of census tracts; (ii) systematic selection of households; and (iii) random selection of an adult present in the household, according to predefined sex and age quotas, based on official national estimates, in accordance with the process detailed in an earlier publication.[12]

The sample size was calculated as being 4,000 people, estimating 50% health service use, with a 95% confidence level, 2% accuracy and a 1.5 design effect.[12]

The primary outcomes were waiting time and medical consultation length. The independent variables were:
a) age (in years: 18-24; 25-34; 35-44; 45-59; 60 or over);
b) sex (male; female);
c) socioeconomic class (A/B, C or D/E, where A represents the wealthiest people and D/E the poorest, as per reported durable goods items and head of household schooling, according to the 2015 Brazilian Economic Classification Criterion);[13]
d) schooling (higher education; high school education; elementary education; below elementary education);
e) race/skin color (white; black; yellow; brown; indigenous);
f) health status (very good/good; regular; poor/very poor);
g) city of residence (capital; interior);
h) health insurance (yes; no); and
i) medical specialty at last consultation (family doctor /general practitioner; gynecologist; specialist).

The primary outcomes were: waiting time for medical consultation, defined with effect from the time the patient arrived at the health service until they entered the consulting room; and length of medical consultation,

defined with effect from the time the patient entered the consulting room until they came out. Both outcomes were defined in minutes.

The primary outcomes were measured through the following questions:

The last time you went to the doctor's, how long did you wait to be seen (from the time you arrived at the health service until the consultation started)?

How long did the medical consultation last?

Economic classification was estimated according to the 2015 Brazilian Economic Classification Criterion, as per reported durable goods, head of household schooling and access to mains water and asphalt paved streets in the vicinity of the residence.[13]

Experienced interviewers carried out face-to-face interviews and the completed questionnaires were stored on tablets (Tab3 SM-T110 Samsung® Galaxy), using the Survey To Go application (Dooblo Ltd, Israel). The data were transmitted to a server via internet. A pre-test was conducted to ensure the questionnaire was understandable. The interview site was georeferenced and part of the interview was sound recorded; 20% of the interviews were audited by telephone for the purposes of quality control.[12]

The bivariate analysis, performed using Tobit regression, enabled identification of factors associated with waiting time (after having removed values equal to 0 and greater than 180 minutes) and consultation length (after having removed values equal to 0 and greater than 120 minutes). The cut-off point was defined according to minimum and maximum values plausible for the results. The adjusted coefficients (β) were also calculated using Tobit regression, with all the variables that had a variance inflation factor (VIF) of less than 10, in order to avoid multicollinearity. Sensitivity analysis was performed using the backward stepwise method to investigate the robustness of the model. The variable with the highest p-value was removed from the complete model. This process was repeated until the highest p-value was less than 0.20 for all variables. Predictive graphs were produced using statistically significant variables ($p < 0.05$), in order to provide a better illustration of the differences between the main variable categories. All the analyses were performed using Stata (v.14.2), with correction for the sample's complex design (*svy* command) and calculation of 95% confidence intervals (95%CI).

The study project was approved by the Federal University of Amazonas Research Ethics Committee (CEP/UFAM):

Opinion No. 974.428/2015 and Certificate of Submission for Ethical Appraisal [CAAE] No. 42203615.4.0000.5020, on March 3rd 2015. All participants confirmed their agreement to taking part in the study by signing a Free and Informed Consent form.

Results

A total of 5,410 people were invited to take part in the study; 95 were not eligible and 1,314 refused (946 women and 368 men), resulting in 26% losses and refusals. 4,001 individuals were interviewed. There was a greater concentration of respondents in the 25-44 year age range (49.9%), 84.2% fell into lower socioeconomic classification (C/D/E) and 4.0% had higher education. The majority of interviewees stated that their skin color was brown (72.2%), reported good health status (66.1%), lived in the state capital (86.9%) and did not have health insurance (87.0%). The majority had consulted a general practitioner or family doctor the last time they had an appointment (77.1%) (Table 1).

Average waiting time for a medical consultation was 125.4 minutes (95%CI 120.2;130.5), and average length of consultation time was 52.5 minutes (95%CI 48.0;57.0). The highest median waiting time in minutes was found among people belonging to socioeconomic classification D/E (median=120 – interquartile range: 30;180), indigenous people (median=120 – interquartile range: 60;180), people resident in the state interior (median=120 – interquartile range: 30;180) and those seen by a gynecologist at their last consultation (median=120 – interquartile range: 45;180). Lowest median waiting times corresponded mainly to people who had health insurance (median=40 – interquartile range: 20;120) and those falling into economic classification A/B (median=60 – interquartile range: 30;120). The most frequent medical consultation length median was 15 minutes. The shortest median consultation length was found for indigenous people (median=10 – interquartile range: 5;20) and people resident in the state interior (median=10 – interquartile range: 10;30) (Table 1).

People aged 60 years or over (β=-21.8 – 95%CI -32.1;-11.6), people who were of black (β=-19.8 – 95%CI -29.9; -9.8) and brown race/skin color (β=-107 – 95%CI -177;-37) and health insurance beneficiaries (β=-32.5 – 95%CI -39.1;-25.9), women (β=9.3 – 95%CI 4.2;14.4), people falling into economic classifications C

Table 1 – Characteristics of the population, median waiting time and median medical consultation time (n=4,001), Manaus metropolitan region, 2015

Variables	n (%)[a]	Median (interquartile range)	
		Waiting time (minutes)	Consultation length (minutes)
Age range (years)			
18-24	838 (20.9)	80 (30;180)	15 (10;40)
25-34	1.152 (28.8)	90 (40;180)	15 (10;30)
35-44	843 (21.1)	90 (30;180)	15 (10;20)
45-59	772 (19.3)	90 (30;180)	15 (10;25)
≥60	396 (9.9)	60 (28;130)	15 (10;30)
Sex			
Male	1.888 (47.2)	65 (30;130)	15 (10;25)
Female	2.113 (52.8)	90 (30;180)	15 (10;30)
Economic classification			
A/B	629 (15.7)	60 (30;120)	15 (10;20)
C	2.285 (57.1)	82 (30;180)	15 (10;30)
D/E	1.087 (27.1)	120 (30;180)	15 (10;30)
Educational level			
Higher education	158 (4.0)	90 (30;180)	15 (5;25)
High school education	1.903 (47.5)	65 (30;120)	15 (10;30)
Elementary education	649 (16.2)	90 (40;150)	15 (10;20)
Below elementary education	1.291 (32.3)	80 (30;180)	15 (10;30)
Race/skin color			
White	636 (15.9)	90 (30;180)	15 (10;61)
Black	300 (7.5)	65 (30;120)	15 (10;20)
Yellow	138 (3.5)	90 (40;150)	15 (10;20)
Brown	2.886 (72.2)	80 (30;180)	15 (10;30)
Indigenous	41 (1.0)	120 (60;180)	10 (5;20)
Health status			
Very good/good	2.646 (66.1)	80 (30;180)	15 (10;30)
Regular	1.108 (27.7)	90 (30;180)	15 (10;25)
Poor/very poor	247 (6.2)	100 (30;180)	15 (10;20)
City of residence			
Capital (Manaus)	3.479 (86.9)	80 (30;180)	15 (10;30)
Interior	522 (13.2)	120 (30;180)	10 (10;30)
Health insurance			
No	3.478 (87.0)	90 (40;180)	15 (10;30)
Yes	523 (13.0)	40 (20;120)	15 (10;25)
Medical specialty at last consultation			
Family doctor /general practi-tioner	2.995 (77.1)	80 (30;180)	15 (10;25)
Gynecologist	402 (10.3)	120 (45;180)	15 (10;30)
Specialist	489 (12.6)	60 (30;150)	15 (10;30)

a) Percentages corrected according to the sample design.

(β=11.3 – 95%CI 4.7;17.9) and D/E (β=17.3 – 95%CI 9.0;25.6), those who had not completed elementary education (β=13.0 – 95%CI 0.1;25.9), those resident in the state interior (β=10.6 – 95%CI 2.8;18.4) and those seen by a gynecologist (β=12.0 – 95%CI 3.2;20.8) waited longer before having their consultation (Table 2).

People who were 25-34 years old (β=-8.5 – 95%CI -12.5;-4.5), 35-44 years old (β=-9.2 – 95%CI -13.4;-5.0) and 45-59 years old (β=-7.6 – 95%CI -11.9;-3.2), people

who stated they were of black (β=-20.7 – 95%CI -26.0;-15.5), yellow (β=-23.2 – 95%CI -28.2;-18.2), brown (β=-12.0 – 95%CI -16.2;-7.7) and indigenous race/skin color (β=-21.3 – 95%CI -33.5;-9.0), individuals with regular health status (β=-6.3 – 95%CI -9.1;-3.4), poor health status (β=-15.0 – 95%CI -18.8;-11.1) and people who had health insurance (β=-8.8 – 95%CI -11.9;-5.7) spent less time in their consultations. Medical consultations lasted longer for individuals falling into

Table 2 – Coefficients (β) of waiting time for medical consultation and consultation length in minutes (n=4,001), Manaus metropolitan region, 2015

Variables	Waiting time[a]		Consultation length[a]	
	β (95%CI[c])	P-value[e]	β (95%CI[c])	P-value[e]
Age range (years)		<0.001		<0.001
18-24	Reference		Reference	
25-34	-1.7 (-8.7;5.2)		-8.5 (-12.5;-4.5)	[b]
35-44	-0.3 (-7.9;7.2)		-9.2 (-13.4;-5.0)	[b]
45-59	-0.2 (-8.1;7.7)		-7.6 (-11.9;-3.2)	[b]
≥60	-21.8 (-32.1;-11.6)	[b]	-0.8 (-6.6;5.0)	
Sex				0.093
Male	Reference		Reference	
Female	9.3 (4.2;14.4)	[b]	2.4 (-0.4;5.1)	
Economic classification		<0.001		<0.001
A/B	Reference		Reference	
C	11.3 (4.7;17.9)	[b]	6.5 (3.3;9.8)	[b]
D/E	17.3 (9.0;25.6)	[b]	12.5 (8.2;16.7)	[b]
Educational level		0.244		0.064
Higher education	Reference		Reference	
High school education	10.1 (-1.9;22.1)		1.9 (-4.2;8.0)	
Elementary education	9.0 (-4.4;22.3)		-3.2 (-10.0;3.6)	
Below elementary education	13.0 (0.1;25.9)	[b]	-0.5 (-7.0;6.0)	
Race/skin color		0.001		<0.001
White	Reference		Reference	
Black	-19.8 (-29.9;-9.8)	[b]	-20.7 (-26.0;-15.5)	[b]
Yellow	-12.9 (25.9;0.1)		-23.2 (-28.2;-18.2)	[b]
Brown	-10.7 (-17.7;-3.7)	[b]	-12.0 (-16.2;-7.7)	[b]
Indigenous	7.7 (-15.5;30.9)		-21.3 (-33.5;-9.0)	[b]
Health status		0.255		<0.001
Very good/good	Reference		Reference	
Regular	1.5 (-4.0;7.1)		-6.3 (-9.1;-3.4)	[b]
Poor/very poor	9.1 (-1.8;20.0)		-15.0 (-18.8;-11.1)	[b]
City of residence		0.008		0.379
Capital (Manaus)	Reference		Reference	
Interior	10.6 (2.8;18.4)	[b]	2.0 (-2.5;6.5)	
Health insurance		<0.001		<0.001
No	Reference		Reference	
Yes	-32.5 (-39.1;-25.9)	[b]	-8.8 (-11.9;-5.7)	[b]
Medical specialty at last consultation		0.027		0.297
Family doctor /general practitioner	Reference		Reference	
Gynecologist	12.0 (3.2;20.8)	[b]	3.6 (-1.0;8.2)	
Specialist	0.3 (-7.0;7.5)		1.0 (-2.7;4.7)	

a) Tobit model with all variables.
b) Variable remained significant in the sensitivity analysis.
c) 95%CI: 95% confidence interval.

economic classifications C (β=6.5 – 95%CI 3.3;9.8) and D/E (β=12.5 – 95%CI 8.2;16.7) (Table 2).

Women spent more time waiting than men to have their consultation, regardless of age range (Figure 1). Expected waiting time and consultation length, stratified by health insurance, economic classification and race/skin color, showed that individuals who had health insurance, those who fell into a lower economic classification, and who were of black and brown skin color waited less time and had shorter consultations (Figure 2).

Discussion

On average, the adult population of the Manaus metropolitan region waits two hours to have a medical
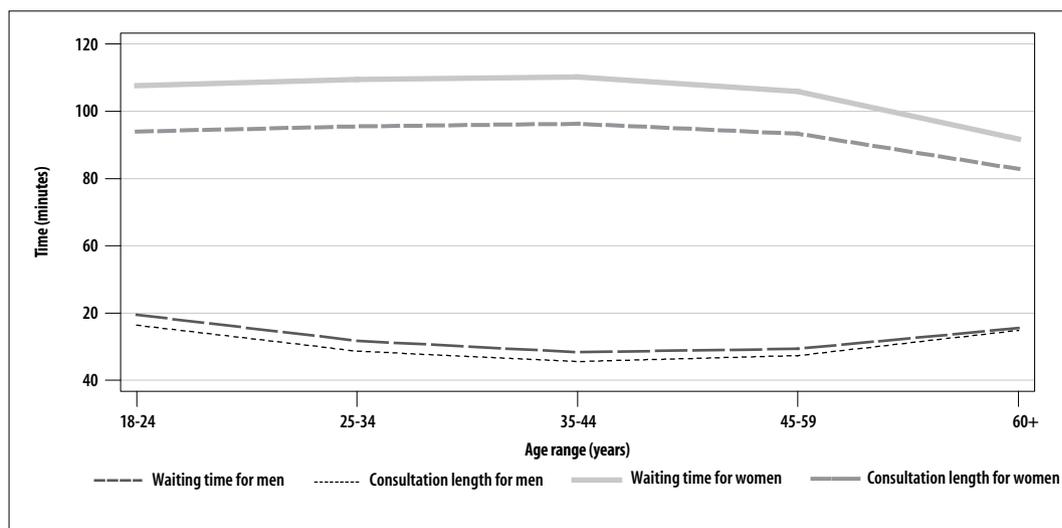
Figure 1 – Consultation waiting time for men and women in minutes, by age range (N=4,001), Manaus metropolitan region, 2015
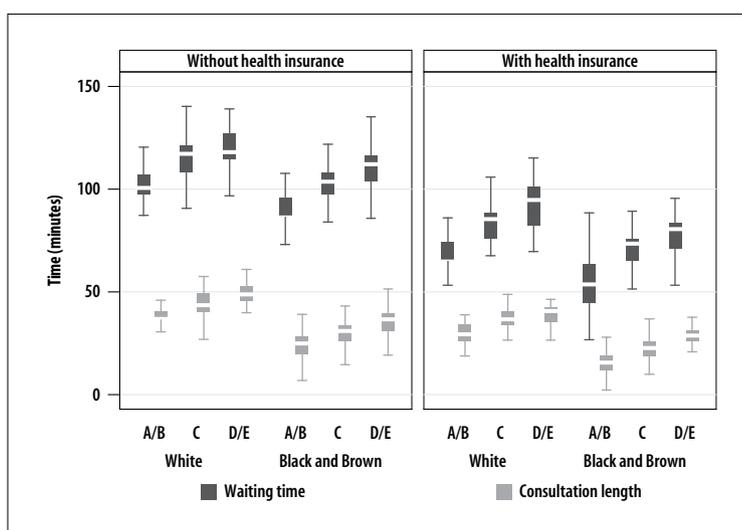

Figure 2 – Waiting time and consultation length for individuals of white, black and brown skin color, stratified by socioeconomic classification and health insurance (n=4.001), Manaus metropolitan region, 2015

consultation. Longer waiting times were found for women, people with lower educational attainment and lower income levels and those who did not have health insurance. On average, medical consultations lasted for less than an hour and were significantly shorter for non-White people and those with poorer health status and private health care insurance.

The results presented are subject to selection bias, due to the inclusion of people present at the household at the time of the interview and who agreed to take part in the study. This may have had an impact on the profile and the answers of the study participants. The results were self-reported and for this reason may be subject to information bias, including recall bias; as the time that had elapsed between the interview and the last most recent medical consultation was not collected, it was not feasible to make a detailed analysis of the effect of this possible bias on the results. Prior analyses of accuracy between self-reported time and administrative data were not identified, but high agreement was found

between reported use of the service and administrative records.[14] The analyses did not consider case severity and resolutive capacity, nor the administrative and logistic process faced by patients in order to access the health services. The multivariate analysis was based purely on statistical criteria for inclusion of the variables, which may weaken the analytical findings. In order to obtain representativeness of the population, we used probabilistic sampling, with predefined sex and age quotas, and the complex design was taken into consideration in the analyses, which increase confidence in the results found.

The waiting times found in the Manaus metropolitan region are longer than those reported in other national contexts. A study conducted in 2000 at a health center in Porto Alegre, in the Southern region of Brazil, found that the users of that service waited between 5 and 85 minutes to be seen by the doctor.[15] Among individuals living in Brazilian municipalities with a poverty rate greater than 20% and receiving health care via the More Doctors (*Mais Médicos*) program – a program to provide doctors in remote areas of the country where health care is lacking –, 76% of service users waited less than an hour for their consultations and consultation length was less than 30 minutes for 98% of them.[16]

Interventions to reduce waiting times include open-access appointment making, medical monitoring by telephone, screening by nurses and general practitioners and consultations by email.[17] Administrative matters, such as general practitioner working hours, for instance, can influence how long patients have to wait.[18] Tools to support joint decision making have shown themselves to be effective in terms of improving the contents of medical consultations and doctors' satisfaction, without increasing consultation length.[11]

In this study, patients who had health insurance spent less time waiting for their consultation. This finding is similar to that of a cross-sectional study that analyzed 21 million outpatient consultations by patients using the Medicaid system in the United States in 2013, which also found longer waiting times for patients who did not have private health care insurance, compared to patients who did have health insurance.[3] A possible explanation for this fact could be greater availability of health personnel and/or less demand, leading to a shorter waiting time in health services.[3]

Low schooling was associated with longer waiting times and shorter consultation length. In a population-based study conducted in Argentina, 61% of those who had not completed their elementary education waited an hour or more for their consultation, compared to 32% of those who had higher education.[19] Analysis of administrative records conducted in Australia in 2004 and 2005, also revealed the influence of socioeconomic classification on waiting time and the close relationship between socioeconomic level, schooling and access to health services.[20] Low schooling may imply communication barriers during consultations and less access to health services. These factors are possibly related to shorter medical consultation length.[21] Within this scenario, the empathy of health workers involved and their ability to overcome limitations also deserve to be evaluated.

A national health survey conducted in Portugal between 2005 and 2006 concluded that socioeconomic variables and region of residence influenced times spent waiting for a consultation.[22] This appears to be a primordial characteristic in countries with universal health systems, directly influencing the principle of equality. The same has been found in Italy, Canada and Spain.[23-26] In this study, individuals with a lower economic classification waited longer for a medical consultation.

Women waited longer than men for their consultations and these also lasted longer for women. Gynecology was the specialty with the longest waiting time. A Swedish cohort study conducted between 2009 and 2012 assessed 159,352 medical consultations and concluded that even when they had identical levels of priority according to classification protocols, women waited longer than men to have their medical consultations.[27] A hypothesis here is greater self-care tendency among women, and possibly taking longer to report their health problems and interact with health professionals during consultations.[28] Particularities of physical examination and specific care procedures for females may also explain this difference found between the sexes.

Waiting time and consultation time was lower for individuals of black and brown race/skin color, even after stratifying for health insurance. Less frequent use of health services may explain the shorter waiting time found for ethnic minorities.[29] Previous analyses of this population have shown that people of brown skin color have less health insurance coverage and fewer self-reported chronic diseases – possibly due to lack of diagnosis –, whereas indigenous people have higher prevalence of chronic diseases.[29] Structural discrimination and racism my also explain the shorter consultation times found.

Demand for health service improvements is continuous. The need exists to move forward with management models and increase human and structural resources in order for the National Health System to guarantee comprehensive, universal and equal access to the entire population.[30] Restrictions on investments, such as that used to establish an upper limit on social expenditure, will be potentially prejudicial to the scenario found.

The time spent by the population of the Manaus metropolitan region in relation to medical consultations is long; and consultations last half as long as waiting time, on average. Waiting time and consultation length are negatively impacted by social inequalities. Future studies should consider the quality of the services provided.

Authors' contributions

Galvão TF and Silva MT designed the article, analyzed and interpreted the data and critically reviewed the manuscript. Tiguman GMB and Costa Filho DB interpreted the data and drafted the first version of the manuscript. All the authors have approved the final version and state that they are responsible for all aspects thereof, guaranteeing its accuracy and integrity.

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