Review article

Prevalence of health services utilization in Brazil: a systematic review and meta-analysis*

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Abstract

Objective: to analyze the prevalence of use of health services in Brazil. **Methods**: systematic review and meta-analysis of population-based cross-sectional studies; MEDLINE, EMBASE, other sources, and microdata of surveys were searched; two researchers selected the studies, extracted the data and assessed methodological quality to include in the meta-analysis. **Results**: from 1,979 retrieved references, 27 studies were included; the prevalence of medical visits in the previous year was 71% (confidence interval of 95% [95%CI] = 69; 73%; I2=99%); the proportion of women in each study (p=0.001; R2=25%) and the recall period (p>0.001; R2= 72%) contributed to the heterogeneity; prevalence of dental consultation was 37% (95%CI = 32; 42%; I2=100%), and of hospitalization, 10% (95%CI = 9; 11%; I2=98%), in the last year. **Conclusion**: more than half of the population had at least one medical visit, about one-third had a dental consultation and a tenth was hospitalized in the previous year.

Keywords: Health Services; Prevalence; Review Literature as Topic; Meta-Analysis as Topic.

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Introduction

The use of health services is directly associated to the individuals' needs, services' offer, financial and health professional resources, and to socioeconomic and cultural conditions.[1,2] It is important to distinguish 'use' from 'access' – which is sometimes employed as a synonym for use –, considering the use of the health service by the individual as a proof of access.[3] However, access is related to opportunity, whereas utilization is the demonstration of this opportunity.[3]

In Brazil, the utilization of health services depends on three types of provision: public, private and supplementary. The public sector is the main provider, funded by the State in the federal, state and municipal levels.[4,5] Besides the services offered directly by the public health system, the private network also performs specific services for the Brazilian National Health System (SUS). The other types – private health insurance and direct disbursement – are also co-funded by the Government, through transfer of public resources – and other types of transfers of resources – to private institutions.[4,5]

> *The measurement of the health services utilization is also a diagnose tool, used as indirect measure of access.*

It is essential to monitor the use of health services in order to compare the changes in health status, and help decision makers in the promotion of improvements and rearrangements of health services, either regarding physical facilities, acquisition of equipment and inputs, or to hire human resources.[3,4] Studies on this topic have special relevance, especially in contexts in financial constraints whilst the demand for assistance increases.

The measurement of the health services utilization is also a diagnose tool, used as indirect measure of access. The World Health Organization (WHO) recommends the assessment of the general level of health, the distribution of health among the population, the capacity of response and financial allocation.[6] In Brazil, such measures are conducted through population-based surveys, developed by official institutes or individual researchers.[7] The institutional researches began in 1990 and, nowadays, are the main instrument that guides the development and assessment of public health policies. By using self-reported responses, it is possible to measure the use of health services in all Brazilian regions.[8]

Currently, there is no summarization of these studies in the country that could enable a comparison between the findings. In this sense, systematic reviews are strategic to summarize the data and project better estimates for decision making in the health area.[9]

The objective of this study was to estimate the prevalence of health services utilization in Brazil, through a systematic review with meta-analysis of population-based surveys.

Methods

Design and protocol register

We conducted a systematic review with meta-analysis of population-based surveys. The study protocol was recorded in the International Prospective Register of Systematic Reviews (PROSPERO), number CRD42015016648. The report of this systematic review meets Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).[10]

Eligibility criteria

The eligible studies were population-based cross-sectional studies conducted in Brazil which described the prevalence of medical, dental visits, and hospitalizations. There were no restrictions regarding age, sex, health professional, and date of service use. Neither there were limits concerning the language of the study, type or year of publication.

Studies conducted in specific population groups, such as institutionalized people, indigenous and pregnant women, and those restricted to primary health care were excluded.

Information sources and search strategies

We searched for studies in the following bibliographic databases: MEDLINE, Scopus, EMBASE, Latin American and Caribbean Center on Health Sciences Information (LILACS), and Scientific Electronic Library Online (SciELO). We examined the references' list of relevant studies and contacted specialists as needed. Moreover, the following data provided by national surveys were included: National Household Sample Survey (PNAD), National Health Survey (PNS) and National Survey on Dental Health (SB Brasil).

The searches were updated up to January 2017. The strategies for each database are reported in a supplementary file (Supplementary Figure 1).

Studies selection and data extraction

For the studies selection and data extraction, we used the Covidence system.[11] After excluding the duplicate records, two independent researchers (Araújo MEA and Andrade KRC) selected the manuscripts based on the title and abstract, following the pre-defined criteria of inclusion and exclusion. Disagreements were resolved by consensus or by a third researcher (Silva MT).

Then, the full texts were gathered for assessment. References which reported results from a same survey were assessed, so the study included would be the one that presented and most detailed data so the others could be excluded.

The following data were extracted from the studies: author; year; place; sample size; sex; age group; use of health services; and recall period. In cases of disagreement, the decision was taken by consensus. Whenever there was access to microdata, we gathered data from people of 18 years or over and excluded the proxy-respondents. When the data were not available, we contacted the corresponding author of the included study.

Assessment of methodological quality of the studies included

The methodological quality was assessed individually and independently, by the aforementioned researchers. Eight criteria were assessed, based on a previously developed tool:[12] (i) random or census sample; (ii) sample list from a demographic census; (iii) sample size, previously calculated; (iv) outcome measurement by a validated tool; (v) unbiased assessment by trained interviewers; (vi) response rate equal or higher than 70%; (vii) report of 95% confidence interval (95%CI) and analysis of subgroups; and (viii) descriptions of the study subjects. Each fulfilled item received punctuation from 0 to 8. In the present review, the surveys were considered of high quality when they obtained score ≥6.

Data analysis

The primary outcome was the use of health services: medical visit, dental visit and hospitalization. The prevalence of use of health services was calculated for each service, with 95% confidence interval (95%CI), per country region, taking into account the recall periods for each included study. The variable related to the use of any health service, measured on PNAD 2003 and 2008 and PNS 2013 was not considered.

Single studies were grouped in meta-analysis of random effect, by the method proposed by DerSimonian and Laird.[13] The heterogeneity between the studies was analyzed by the fixed effect model of inverse variance; and the magnitude of inconsistency, estimated by the I-squared statistics (I^2).[14] We investigated heterogeneity by meta-regressions, using Knapp and Hartung test, which evaluated the effect of the following variables: proportion of women; recall period; year of data collection; and region of study. The small-study effect was assessed through the visual check of the funnel graph and Egger test.[15]

All the analyses were performed at Stata platform (version 14.0). The commands 'metaprop' and 'metareg' were used.[16]

Results

Studies selection

The search strategy found 1,979 records, of which 270 were duplicate. After screening the titles and abstracts, 54 manuscripts were selected for full text reading. Of those, 21 studies met the eligibility criteria[17-37] and six institutional surveys were identified and included: PNAD 1998, 2003 and 2008; PNS 2013; and SB Brasil 2003 and 2010.[38-43] Thus, there was a total of 27 researches for meta-analysis.[17-43] The selection process is detailed in Figure 1.

Most surveys had data collection from 2000 to 2010, and 11 of them were published between 2011 and 2014.[17,28,29,31-36,42,43] Seven researches had national coverage,[31,38-43] ten investigated data from the Northeast region,[18,22,23,27,28,35,38,39,41,43] 15 from the South[17,20,21,24-26,29,30,33,34,37-39,41,43] six from the Southeast[19,32,38,39,41,43] five from the Midwest[36,38,39,41,43] and four from the North.[38,39,41,43]

Most of the 702,878 people included in the 27 researches were women (58%). Three studies did not provide data on sex.[18,28,42] Most studies were about the adults' health, whilst some restricted their target-population to elderly[19,20,32,34] and children.[22]

The recall period for prevalence assessment of health services' utilization in the Brazilian studies varied from 15 to 360 days. Other characteristics of the studies are presented in Table 1.

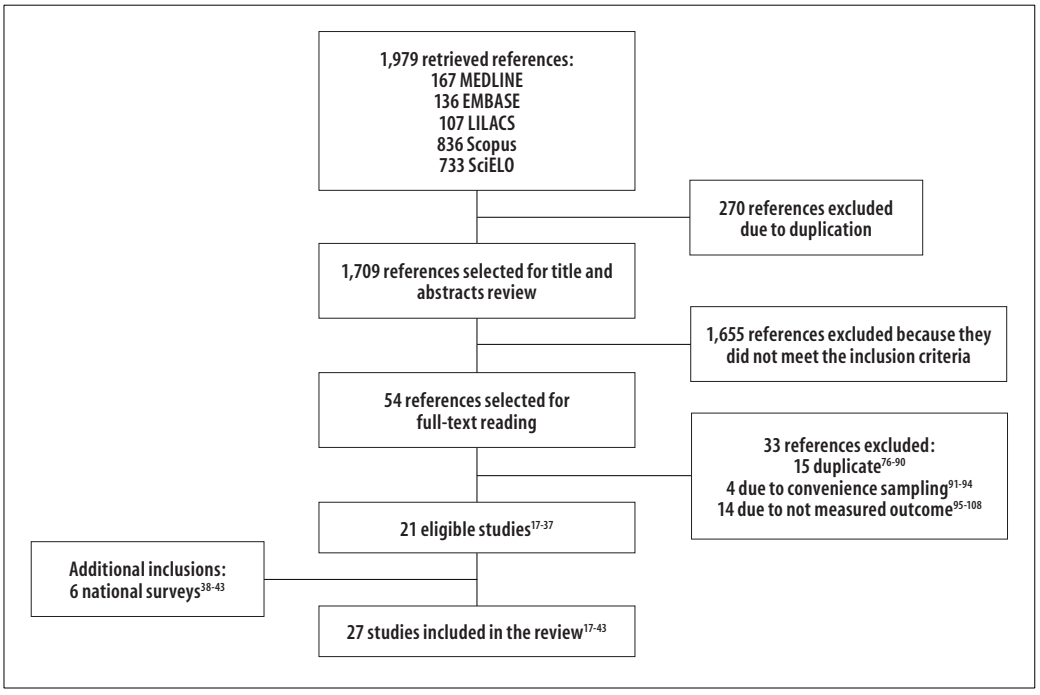


Figure 1 – Search, selection and studies inclusion process

Methodological quality of the studies

All the studies used probabilistic and complex sampling procedures, based on the calculation of the sample size. The outcomes – use of health services – were assessed by trained interviewers. All the surveys collected self-reported information about the use of health services. Proportions of response rate higher than 70% were informed in 17 of the 27 studies. Five single surveys did not inform refusals or losses.[18,27,28,35,37] Twenty studies were considered of high methodological quality, with average global score of 6.6. No study was excluded due to the methodological quality. The critical evaluation of the individual quality can be found in the Supplementary Table 1.

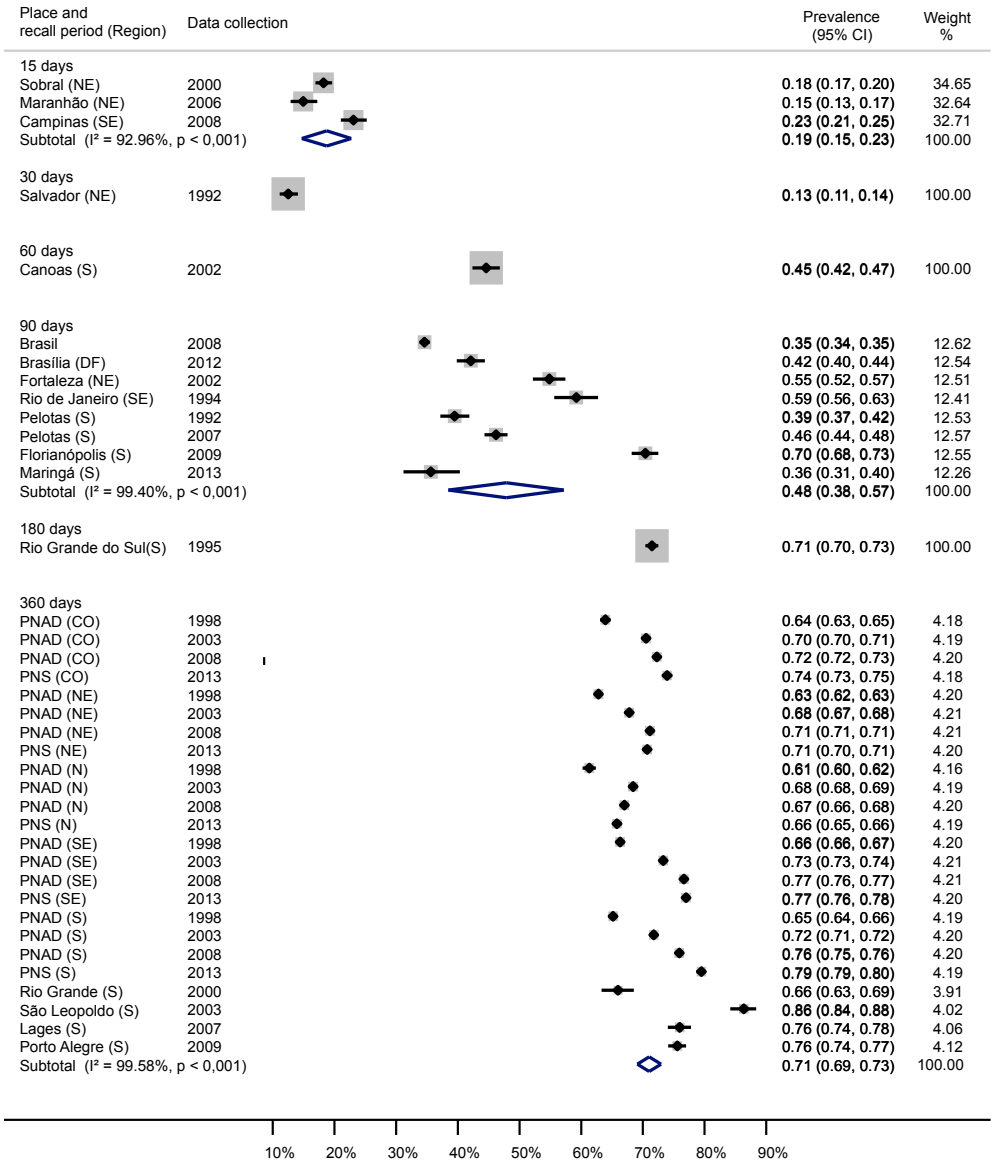
Prevalence of use of health services

Figure 2 presents the prevalences of medical visits found in the 18 studies,[17-25,27,29-34,36,37] in the three PNAD and PNS,[38,39,41,43] stratified by region, covering 549,999 interviewed individuals. Forty-eight per cent (95%CI=39 to 57; I^2=99%) of the interviewed individuals reported having been to the doctor in the previous 90 days. Those studies were of local coverage and two of them assessed the frequency in elderly people, reporting higher prevalence of medical care (59 to 70%). Considering the studies that verified the use of medical visits in the period of one year prior to the interview, the frequency of use was of 71% (95%CI=69 to 73%; I^2=99%), and most of these studies had national coverage. Four single studies, conducted in the South region, presented prevalences consistent with national surveys for that region. In approximately one decade (2010 to 2013) a reduction in the prevalence of medical visits of 2 percentage points (pp) in the North region was observed; on the other hand, there was an increase in the other regions. The South region presented the highest increase for the period.

In the only study that focused on the age group from 5 to 9 years, conducted in Sobral, Ceará State, the researchers assessed the medical visits occurred in the previous 15 days, and an 18% prevalence was observed (95%CI=17 to 20%).[22] The studies that focused on the elderly population measured medical visits in the previous two weeks (Campinas, 23% [95%CI= 21 to 25%]),[32] three months (municipalities of Rio de Janeiro, 59% [95%CI= 56 to 63%];[19] and Florianópolis, 70% [95%CI = 68 to 73%])[34], and six months (Rio Grande do Sul State, 71% [95%CI= 70 to 73%]).[20]

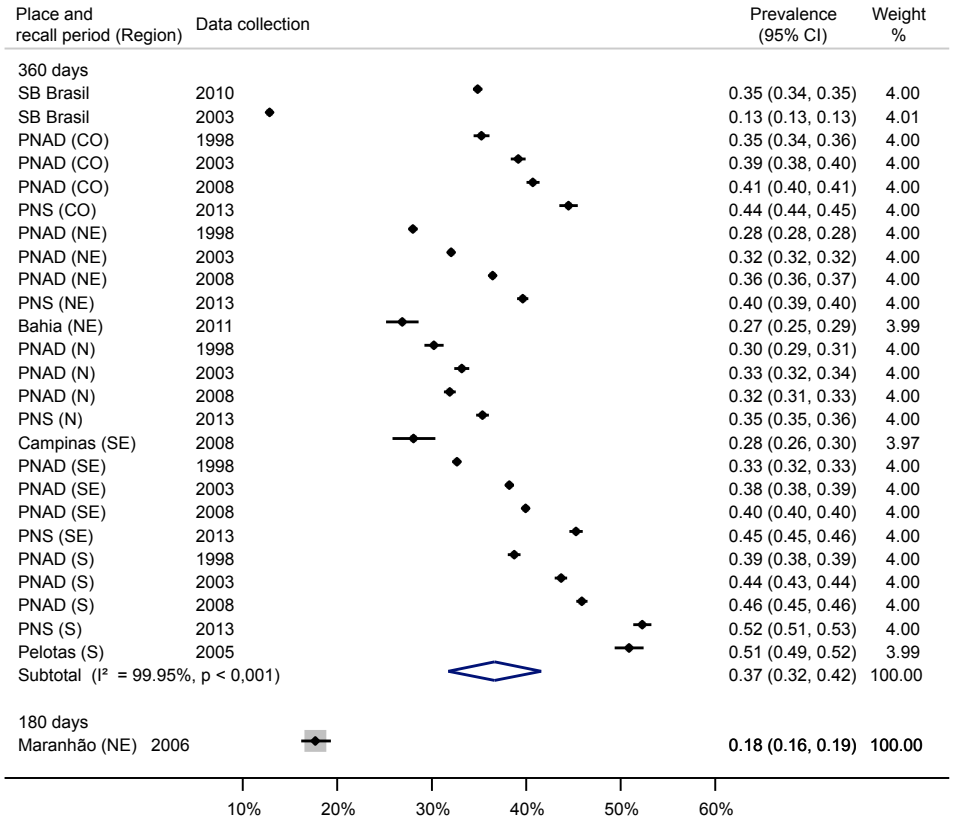
With regard to dental visits, 659,043 individuals were interviewed in six national surveys (PNAD 1998, 2003 and 2008; PNS 2013; and SB Brasil 2003, and 2010)[38-43] and four individual studies (municipality of Pelotas 2005;[26] Maranhão State 2006;[28] municipality of Campinas 2008;[32] and Bahia State 2011[35]). A total of 37% of the population (95%CI= 32 to 42%; I^2=100%) had been to the dentist in the previous year. From 2003 to 2013, there was an eight pp. increase in dental visits in the Northeast and South regions, and a two pp. decrease in the North region (Figure 3).

Eleven surveys measured hospitalization, with the participation of 520,261 individuals.[20,23,24,32,33,36-39,41,43] We observed that 10% of the interviewed individuals



NE: Northeast
SE: Southeast
S: South
DF: Federal District
N: North
CO: Midwest
PNAD: National Household Sample Survey
a) 95%CI: 95% confidence interval

Figure 2 – Prevalence of medical visits per recall period and stratified by Brazilian region



SB: National Oral Health Survey
PNAD: National Household Sample Survey
PNS: National Health Survey
CO: Midwest
NE: Northeast
N: North
SE: Southeast
S: South
a) 95%CI: 95% confidence interval

Figure 3 – Prevalence of dental visits per recall period and stratified by Brazilian region

(95%CI= 9 to 11%; I^2=98%) had been hospitalized in the year before the surveys. There was a reduction in the prevalence of hospitalization in all the country regions – higher reduction in the North, with four pp. and lower in the South, with one pp. –, from 2003 to 2013 (Figure 4).

Assessment of heterogeneity and small study effect

All the meta-analyses presented high heterogeneity. With regard to medical visits, the variables 'proportion of women' (p=0.001; R^2=25%) (Supplementary Figure 2) and 'recall period' (p>0.001; R^2=72%) (Supplementary Figure 3) contributed the higher variability of the prevalences.

Concerning the dental visits, the Midwest (p=0.012), Southeast (p=0.031) and South (p=0.001) regions contributed to a higher heterogeneity, and 45% of this variability could be explained by these regions. The year of data collection of the surveys was related to higher variation in the prevalences of hospitalization (p=0.001; R^2=36%) (Supplementary Figure 4).

The visual inspection of the funnel graph about prevalence of medical visits in the previous year revealed asymmetry in the distribution of studies (Supplementary Figure 5); however, the small studies effect was discarded by Egger test (p=0.841). For the group of studies with other recall periods, it was not possible to estimate the presence of this effect due to the need to gather at least ten studies to perform it. In turn, the presence of this effect has probably influenced the result for dental visits (p>0.001) and hospitalizations (p=0.007; Supplementary Figures 6 and 7).

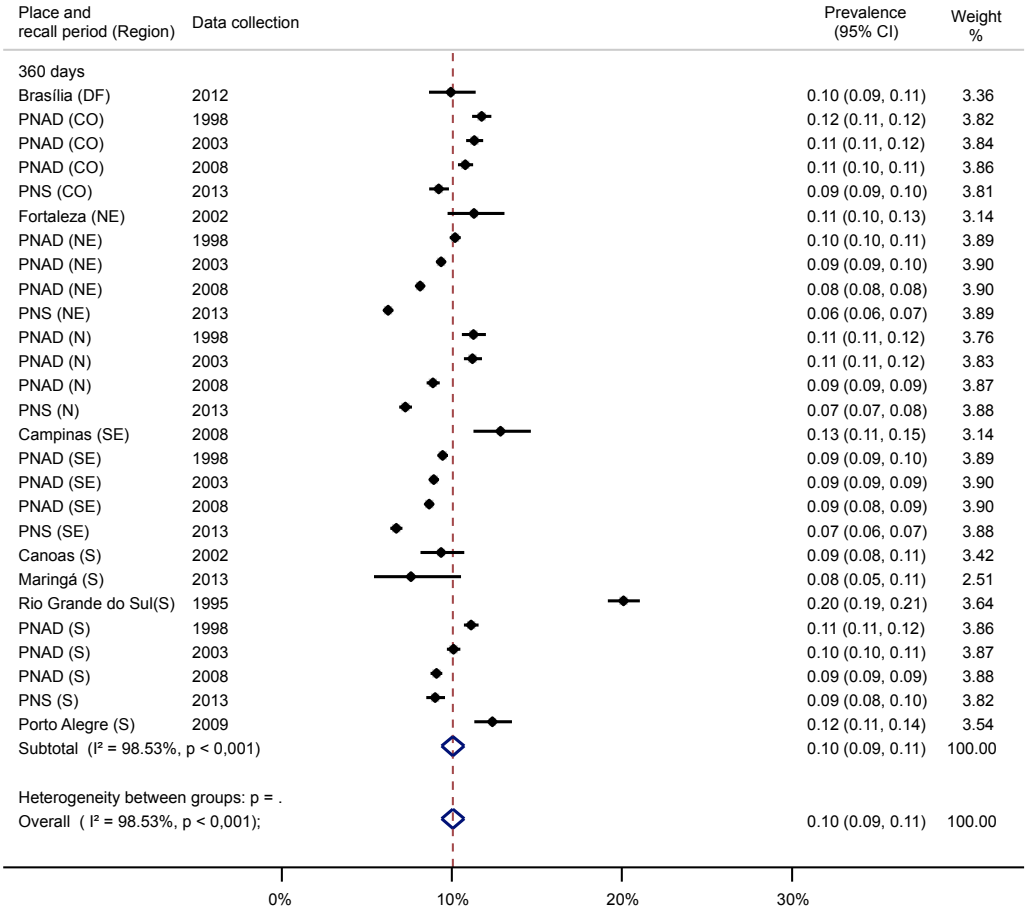
Discussion

The results show that for every 100 Brazilians, 71 had been to the doctor, 37 to the dentist, and ten had been hospitalized in the year prior to the survey, after analyzing the results of 27 researches whose data were collected from 1992 to 2013. Except for the North region, in a ten year period (2003-2013), we observed an increase in medical and dental visits. The prevalence of hospitalization reduced in all Brazillian regions, for the same period. Most surveys of local coverage were conducted in the South and Southeast regions of Brazil.

Although there was a broad and extensive search, it is possible that some surveys have not been identified, such as those that measure the use of health services as a secondary outcome. This may have occurred in both the search strategy and the title and abstract screening.

The small study effect (publication bias) was discarded by Egger test for medical visits in the previous year, but it was confirmed for dental visits and hospitalizations. Thus, smaller and least accurate studies influenced on the results.[44]

The studies identified were all limited to a self-reported approach to measure the use of health services, that is, no valid tool was used to confirm whether or not the assistance had been performed. In other contexts, it is possible to map this use through an identification number (such as the Social Security Number in the



DF: Federal District
CO: Midwest
NE: Northeast
N: North
SE: Southeast
S: South
PNAD: National Household Sample Survey
PNS: National Health Survey
a) 95%CI: 95% confidence interval

Figure 4 – Prevalence of hospitalizations per recall period and stratified by Brazilian region

Table 1 – Characteristics of the included studies

Region and collection year (reference)	Sample (n)	Women (%)	Period (days)	Physician		Dentist		Hospital	
				Prevalence	95%CI[a]	Prevalence	95%CI[a]	Prevalence	95%CI[a]
North									
PNAD[b] North region 1998[38]	7,890	64.6	360	61.0	60.0;62.0	30.0	29.0;31.0	11.0	11.0;12.0
PNAD[b] North region 2003[39]	13,714	65.9	360	68.0	68.0;69.0	33.0	32.0;34.0	11.0	11.0;12.0
PNAD[b] North region 2008[41]	21,522	58.3	360	67.0	66.0;68.0	32.0	31.0;33.0	9.0	9.0;9.0
PNS[c] North region 2013[43]	19,072	59.5	360	66.0	65.0;66.0	35.0	35.0;36.0	7.0	7.0;8.0
Northeast									
Maranhão 2006[27]	1,059	60.4	15	15.0	13.0;17.0	–	–	–	–
Maranhão 2006[28]	2,273	–	180	–	–	18.0	16.0;19.0	–	–
Sobral 2000[22]	3,276	50.0	15	18.0	17.0;20.0	–	–	–	–
Fortaleza 2002[23]	1,370	52.9	90	55.0	52.0;57.0	–	–	–	–
Fortaleza 2002[23]	1,370	52.9	360	–	–	–	–	11.0	10.0;13.0
Salvador 1992[18]	1,887	–	30	13.0	11.0;14.0	–	–	–	–
Bahia 2011[35]	2,539	69.2	360	–	–	27.0	25.0;29.0	–	–
PNAD[b] Northeast region 1998[38]	35,979	65.6	360	63.0	62.0;63.0	28.0	28.0;28.0	10.0	10.0;11.0
PNAD[b] Northeast region 2003[39]	43,555	66.0	360	68.0	67.0;68.0	32.0	32.0;32.0	9.0	9.0;10.0
PNAD[b] Northeast region 2008[41]	53,477	62.3	360	71.0	71.0;71.0	36.0	36.0;37.0	8.0	8.0;8.0
PNS[c] Northeast region 2013[43]	26,281	62.7	360	71.0	70.0;71.0	40.0	39.0;40.0	6.0	6.0;7.0
Southeast									
Rio de Janeiro 1994[19]	738	61.3	90	59.0	56.0;63.0	–	–	–	–
Campinas 2008[32]	1,515	51.4	15	23.0	21.0;25.0	–	–	–	–
Campinas 2008[32]	1,515	51.4	360	–	–	28.0	26.0;30.0	13.0	11.0;15.0
PNAD[b] Southeast region 1998[38]	37,764	65.5	360	66.0	66.0;67.0	33.0	32.0;33.0	9.0	9.0;10.0
PNAD[b] Southeast region 2003[39]	40,169	65.5	360	73.0	73.0;74.0	38.0	38.0;39.0	9.0	9.0;9.0
PNAD[b] Southeast region 2008[41]	48,985	62.2	360	77.0	76.0;77.0	40.0	39.0;40.0	9.0	8.0;9.0
PNS[c] Southeast region 2013[43]	19,465	61.6	360	77.0	76.0;78.0	45.0	45.0;46.0	7.0	6.0;7.0
South									
Lages 2007[30]	2,022	61.4	360	76.0	74.0;78.0	–	–	–	–
Florianópolis 2009[34]	1,705	63.9	90	70.0	68.0;73.0	–	–	–	–
Canoas 2002[24]	1,954	57.3	60	45.0	42.0;47.0	–	–		
Canoas 2002[24]	1,954	57.3	360	–	–	–	–	9.0	8.0;11.0
São Leopoldo 2003[25]	1,026	100.0	360	86.0	84.0;88.0	–	–	–	–
Rio Grande 2000[21]	1,260	53.8	360	66.0	63.0;69.0	–	–	–	–
Pelotas 1992[17]	1,657	56.3	90	39.0	37.0;42.0	–	–	–	–
Pelotas 2005[26]	3,993	55.1	360	–	–	51.0	49.0;52.0	–	–
Pelotas 2007[29]	2,706	56.6	90	46.0	44.0;48.0	–	–	–	–
Porto Alegre 2009[33]	3,391	55.8	360	76.0	74.0;77.0	–	–	12.0	11.0;14.0
Rio Grande do Sul 1995[20]	6,961	65.9	180	71.0	70.0;73.0	–	–	–	–
Rio Grande do Sul 1995[20]	6,961	65.9	360	–	–	–	–	20.0	19.0;21.0
Maringá 2013[37]	421		90	36.0	31.0;40.0	–	–	–	–
Maringá 2013[37]	421	–	360					8.0	5.0;11
PNAD[b] South region 1998[38]	19,921	64.2	360	65.0	64.0;66.0	39.0	38.0;39.0	11.0	11.0;12.0
PNAD[b] South region 2003[39]	21,895	65.4	360	72.0	71.0;72.0	44.0	43.0;44.0	10.0	10.0;11.0
PNAD[b] South region 2008[41]	26,260	60.7	360	76.0	75.0;76.0	46.0	45.0;46.0	9.0	9.0;9.0
PNS[c] South region 2013[43]	10,398	60.5	360	79.0	79.0;80.0	52.0	51.0;53.0	9.0	8.0;10.0

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Table 1 – Conclusion

Region and collection year (reference)	Sample (n)	Women (%)	Period (days)	Physician		Dentist		Hospital	
				Prevalence	95%CI[a]	Prevalence	95%CI[a]	Prevalence	95%CI[a]
Midwest									
Brasília 2012[36]	1,820	59.8	90	42.0	40.0;44.0	–	–	–	–
Brasília 2012[36]	1,820	59.8	360	–	–	–	–	10.0	9.0;11.0
PNAD[b] Midwest region 1998[38]	12,494	63.1	360	64.0	63.0;65.0	35.0	34.0;36.0	12.0	11.0;12.0
PNAD[b] Midwest region 2003[39]	15,067	64.4	360	70.0	70.0;71.0	39.0	38.0;40.0	11.0	11.0;12.0
PNAD[b] Midwest region 2008[41]	18,950	60.0	360	72.0	72.0;73.0	41.0	40.0;41.0	11.8	10.0;11.0
PNS[c] Midwest region 2013[43]	9,971	61.4	360	74.0	73.0;75.0	44.0	44.0;45.0	9.0	9.0;10.0
Brazil									
SB[d] Brazil 2003[40]	108,992	54.9	360	–	–	13.0	13.0;13.0	–	–
SB[d] Brazil 2010[42]	36,904	–	360	–	–	35.0	34.0;35.0	–	–
Brazil, 2008[31]	12,402	55.0	90	35.0	34.0;35.0	–	–	–	–

a) 95%CI: 95% confidence interval
b) PNAD: National Household Sample Survey
c) PNS: National Health Survey
d) SB: Dental Health

United States).[45] In Brazil, the reliability of this type of information in the public branch may be tracked with the adoption of the National Health Card.[46]

Another important limitation of present study is the two decades difference between some of the surveys included. During this period, there were demographic and economic changes that provided better living conditions to Brazilians, higher offer of public services and, consequently, longer lifespan in the population.[47] Aging is a factor that increases the search for health services,[48] which is neglected by the younger population.[49]

However, most studies present characteristics that show better reliability. The surveys used census information as sampling sources, calculated the sample size and achieved good response rates. In this review, the selection and extraction were performed by two researchers, independently, and one critical assessment tool was used to check the quality of the studies.[12]

Some parameters analyzed in the meta-regression stood out as possible sources of heterogeneity: proportion of women, recall period and year of data collection. Higher prevalences are observed in longer recall periods,[51] which also results in higher probability of individuals to forget to report the use of a health service. The high heterogeneity limits the external validity of the results.[51,52]

There is no consensus in literature regarding the validity and accuracy of self-reported data in the use of health services. Self-report depends on cognitive factors; for instance, diseases such as dementia and mental problems influence on the capacity of a person to remember some information.[53]

A review that included 42 studies about validity of self-report in the use of health services points to strategies to improve the accuracy of assessment:[55] surveys with commemorative days; and inclusion of two recall intervals (one long and another more recent). By analyzing the results of studies that compared the self-report and records, this review pointed that self-report of medical visit has higher inaccuracy in long recall periods than in short ones (the accuracy was of 60% to recall a medical visit in the previous three months, against 20% in the previous 12 months).[54]

The recall bias reduces the accuracy of the individuals' answers and is attributed to individual factors, such as age, education level and socioeconomic status.[55] Important events, which is the case of hospitalizations, are measured with more accuracy than routine events, such as medical prescription, search for a specialist, or a medical or dental visit.[56] A cohort study, conducted in Australia found underestimation of self-reported medical visits in the previous years, comparing to the information recorded by the health insurance, possibly due to recall bias;[57] the individuals in the study were over 74 years old, which may have led to confounding, because elderly people forget things more often than younger individuals.

The recall period has been object of analysis and standardization in international surveys. To ensure the comparability between European Union countries, this

period was defined as 360 days.[3] At the same time, a study from WHO adopted a 30 day period for surveys conducted in low-income countries.[58] In Brazil, most of local studies, conducted by individual researchers used 90 days as the recall period, whilst researches of national coverage (PNAD, PNS and SB-Brasil) used 360 days.

A German study compared results of surveys conducted between the years of 1991 and 2009, involving all the age groups, and, when considering the recall period of 12 months, they found a prevalence between 70 and 86% of medical visits; in the previous 90 days, between 67 and 66%; and in the previous 30 days, a proportion higher than 29%.[59] In the United Kingdom, in 2012, the frequency of medical visits in the previous 15 days was of 45%.[60]

Other cross-sectional studies, involving specific groups, were carried out in different contexts. In Iran, in 2012, researchers observed that 61% of the women had used health services in the previous 12 months.[61] An analysis of four surveys conducted in Spain, from 2001 to 2009, pointed an increase in medical visits by elderly individuals in the previous 30 days. From 40 to 53%, among women, and from 32 to 48% among men.[48] Among the elderly people who used the Mexican social security in 2003, 88% had been to the doctor for curative medicine, and 70% for preventive in the previous 360 days.[62] In Cuba, in 2010, among the individuals who presented health problems in the previous 30 days, 54% had been to a general practitioner.[63] A survey from 2003, involving Canadians and Americans, older than 18 who had any type of disability presented a self-reported frequency of medical visits in the previous 12 months superior to 80%.[64]

Around one third of the Brazilian population had been to the dentist the year before the survey, from 2003 to 2013. Although there is no evidence on the adequate periodicity to visit a health professional,[65] the proportion revealed shows that most part of the population does not go to the dentist every six months, which is traditionally recommended. The low frequency of dental visits by the Brazilian population possibly brings negative outcomes in dental health. Data of health insurance users from Michigan, United States, showed that the rate of tooth loss was much higher among those who had been only once to the dentist in the previous year, when compared to individuals who went at least twice in the same period.[66]

An analysis of secondary data related to a population-based survey conducted in Canada from 2007 to 2009, with 5,600 individuals aged between 6 and 79, observed that 75% of them had been to the dentist in the previous years; even with this high use, 34% needed dental care, 6% of them, urgently.[67] Data of the 2015 National Health Interview Survey, from the United States, pointed to a prevalence of 62% of dentist visits the previous year.[68] In 2012, in the United Kingdom, a survey looked into the regular and occasional dental visits: 38% frequently went to the dentist, 44% of them due to symptomatic reasons.[60]

From 1995 to 2013, about 10% of the Brazilians had been hospitalized in the previous year. In high income countries, where life expectancy is higher, such as Germany, this prevalence varied from 9 to 15% in the previous 12 months, according to surveys comparability.[59] In Cuba, 2010 data suggest that among elderly individuals who presented health problems, 29% were hospitalized in the previous 30 days.[63] As we can see, the prevalences of medical visit and hospitalization in Brazil, in the previous year were similar to countries like Germany and Mexico.[59,62] The prevalence of dental visits was approximately half of that observed in high-income countries, such as Canada and United States.[67,68]

When the recall period of 360 days was observed, from 2003 to 2013, the national surveys showed less frequency of medical and dental visits in the North region (38% and 33%, respectively) and higher frequencies in the South (86% and 52%, respectively).

There was a sharp increase in medical visits in the South, Southeast and Midwest regions, where we can find the highest human development indexes (HDI) of the country.[69] With regard to dental visits, the positive exception was the Northeast region, with an increase similar to the regions with better HDI.

Another fact to consider is the availability of health professionals. In 2013, the North region had a density of 1 physician per 1,000 inhabitants, whereas the South had 2.1 and the Southeast had 2.7 physicians per 1,000 inhabitants.[70] A survey from the World Dental Federation, conducted in 2015, presented a density of 1 dentist/1,000 inhabitants, and such data places Brazil in a favorable condition, when compared to high-income countries, such as Canada and USA,[71] despite the Brazilian regional inequalities.[72] Such differences are probably observed in local level, with lower density of professionals in the context of social vulnerability.

The differences between the prevalences of medical visits, dental visits and hospitalizations found by PNS and PNAD may be explained by methodological differences. Although PNS is part of the Integrated System of Household Surveys, it corresponds to an independent sample, with more geographic spaces, including more municipalities. Moreover, in PNS, one resident per household was interviewed and there was more accuracy on estimates, avoiding proxy-respondents,[73,74] whilst in PNAD, the individual interviewed answered for all the other residents in that household.

Despite the reduction observed on the prevalence of hospitalizations, the economic impact of expenses on the tertiary level is still high. In 2010, the expenses represented 52% of all health expenses.[4] In turn, the primary health care was responsible for about 80 to 90% of all assistance, counting with only 14% of the financial resources directed to the Health area.[4]

We can conclude that medical visits were the most common health service, used by more than 70% of the Brazilian population. A little more than one third of the Brazilians went to the dentist in the studied period. Except for the North and Northeast regions, there was an increase in medical visits in scenarios with better socioeconomic status; at the same time there was a reduction on the prevalence of hospitalizations in the North, showing geographical inequalities in the use of health services throughout the country. There is methodological heterogeneity among the assessed studies, influenced by the range of the recall period, the proportion of women and the regional differences. The validation of assessment tools of health services use, the standardization of the recall period and the conduction of more studies on this topic in the Midwest and North regions are top priorities for future researches.

Authors' Contributions

Araújo MEA contributed to the searches, extraction, selection, quality assessment of the studies, data analysis, writing and review of the manuscript. Silva MT contributed to the searches, data analysis and review of the manuscript. Andrade KRC contributed to the selection, extraction and quality assessment of the studies. Galvão TF contributed to the writing and review of the manuscript. Pereira MG contributed to the review of the manuscript. All authors approved its final version and declare to be responsible for all aspects of the work, ensuring their accuracy and integrity.

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Erratum

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Original text:

Figure 2 presents the prevalences of medical visits found in the 18 studies,[17-20,22-25,27,29-34,36,37,44]

Corrected text:

Figure 2 presents the prevalences of medical visits found in the 18 studies,[17-25, 27, 29-34, 36, 37]

Pages 597 to 599:

N.B.: The following references should be taken to have one number less than the number shown, i.e. consult the reference immediately prior to the reference cited.

Original text:	Corrected text:
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