

Home Visits in Primary Care: Differences among Professional Categories and Health Macro-regions

Abstract

Context: Home visit is a modality of health care that is expanding in Brazil and in the world. Public and private services have invested in the implementation of this type of assistance. It happens due to its potential to transform the model of care, highlighting the work quality of the primary health care teams. **Aims:** To analyze house call rates in primary care in the Brazilian public healthcare system according to professional categories and health macro-regions in the state of Minas Gerais, southeast region of Brazil. **Settings and Design:** An ecological study that used as the information source the production data from the Primary Care Information System (2010 to 2015). **Methods and Materials:** House call rates (per 3000 inhabitants) by primary care professionals constituted the response variable. The independent variables were professional categories and the 13 health macro-regions of the state. **Statistical Analysis Used:** The data were analyzed using the Mann-Whitney test. **Results:** A total of 26,932,463 house calls were performed in the period, but the number of visits in 2015 was significantly lower compared to 2010. Significantly higher house call rates were found for some professional categories (mid-level professionals and nurses) and significant differences were found among the macro-regions ($P < 0.05$). **Conclusions:** The profile of house calls by primary care professionals revealed the constant presence of this care modality, but the distribution of these visits is uneven among the different professional categories and macro-regions of the state.

Keywords: Health information systems, home care services, home visits, primary health care

Introduction

Health inequalities pose a challenge to the establishment of healthcare systems that seek the universal coverage of the population in an integral approach. Universal actions with intensity and gradation proportional to the degree of social disadvantage are capable of reducing the effects of the social gradient on health. This form of organizing healthcare systems is denominated proportional universalism.^[1] The home visit (HV) is a healthcare modality capable of contributing to this organizational precept. HVs address social determinants of health due to the potential to reduce inequalities and disparities regarding the health conditions of the population.^[2] The benefits of HVs include supporting older adults and individuals with limitations with regard to leaving their homes,^[3] greater prenatal care for pregnant women as well as the diminishing of mother and child mortality rates.^[4] Moreover, this modality enables a more humanized form of care in cases of

terminal patients, who can be seen in the comfort of their own homes.^[5]

HVs are part of the job description of all health professionals who make up primary care (PC) teams. The professionals involved are community health agents, nursing technicians and assistants, oral health technicians and assistants, physicians, nurses, dentists, and other upper-level professionals.^[6]

The literature highlights the large number of physicians, nurses and nursing technicians/assistants that make HVs part of their routine service.^[3,7] In this context it is noted the protagonism of nurses that, besides performing HVs, coordinate care, promote communication between the family and multidisciplinary team and identify the demand for other health professionals.^[7] Community health agents (CHA) play a fundamental role in gathering information on the socioeconomic-cultural situation of each family. There are few reports regarding the practice of HVs among dentists but it has been identified, that half of the professionals on the oral health team do not perform this service.^[8]

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Contextual aspects, such as socioeconomic status and demographic characteristics, can exert an influence on the offer of healthcare services to the population. A study on the Global Disease Burden for dental caries, edentulism, and periodontal disease reported regional inequalities, with high prevalence rates of these oral problems in the three poorest macro-regions of the state of Minas Gerais (Jequitinhonha, Northeast, and North).^[9] The perception of these regional differences in the socioeconomic and demographic context can serve as the basis for the organization of services. To the best of our knowledge, the regional profile of HVs performed by public healthcare workers has not previously been identified.

Questions remain regarding the profile of HVs performed in the public healthcare system and differences in the contribution of professional categories to home care in quantitative and geographic terms. Therefore, the aim of the present study was to analyze HVs performed in primary care in the Brazilian public health system between 2010 and 2015 according to professional health categories and macro-regions in the state of Minas Gerais, Brazil.

Subjects and Methods

An ecological, cross-sectional study was conducted, the units of analysis of which were the 13 health macro-regions and 853 municipalities of Minas Gerais, which is located in southeast Brazil, the most populous and urbanized region of the country. With a population of 19,597,330 at the 2010 census, Minas Gerais has a Human Development Index of 0.731, which is the ninth highest among the 27 states of Brazil. The size of the state is close to that of some countries (similar area as that of France) in territorial, population, and economic aspects, raising the state to a considerable level of representativeness in both the national and international contexts.^[10]

Source of data

In August 2017, PC production data and markers were consulted in the PC Information System of the Department of Informatics (known as DATASUS) of the Brazilian public healthcare system, which is part of the Brazilian Health Ministry.

Outcome

The outcome was HV rates between 2010 and 2015 by the health professionals that compose the PC teams of the public healthcare system. The rates were calculated from the number of HVs performed per professional category weighted by the population size of the municipality, using the population of the area of coverage of a PC team (3000 inhabitants) as reference.^[6] This weighting followed a previously described method for analyzing regional differences.^[11] The population size was obtained from DATASUS using demographic and socioeconomic indicators in the “Resident Population” option.

Independent variables

The independent variables were professional category (mid-level professionals, nurses, physicians,

and other upper-level professionals including dentists) and the 13 macro-regions (South, Central South, Centre, Jequitinhonha, West, East, Southeast, North, Northwest, East of South, Northeast, South Triangle, North Triangle) according to the Regionalisation Directing Plan of the state.

Data analysis

Descriptive statistics were performed, with the calculation of central tendency and variability measures. As the HV rates did not have normal distribution, the Mann-Whitney test was used for the statistical analysis. Median HV rates in the 13 macro-regions were used for the comparison of the professional categories with separate analyses for each year. The median HV rates of the municipalities ($n = 853$) was used for the comparison of the macro-regions in an individualized manner for each professional category in each year separately. The spatial distribution of the HV rates was plotted on maps using the QGIS® program, version 2.14.11. The descriptive and inferential analyses were performed with the aid of InStat 3.06 (GraphPad Software, Inc.).

Ethical aspects

As an ecological study using secondary data from public databases, authorization from an ethics committee was not required.

Results

Throughout the period from 2010 to 2015, a total of 26,932,463 HVs were performed considering all professional categories. The majority were performed by mid-level professionals (>50%) and nurses (>20%). The maximum percentage of missing or unregistered data was 1.3% for physicians, 7.4% for nurses, 8.7% for mid-level professionals, and 22.9% for other upper-level professionals.

The number of HVs performed by mid-level professionals, nurses and physicians diminished from 2010 to 2015. The largest reduction was found among mid-level professionals, with three times fewer HVs performed in 2015 compared to 2010.

In the comparison of median HV rates, statistically significant differences were found among the professional categories. Higher rates were found for mid-level professionals compared to physicians and other upper-level professionals in all years ($P < 0.001$). The difference between mid-level professionals and nurses was only statistically significant in 2014 ($P < 0.05$). The HV rates among nurses were significantly higher than those found for other upper-level professionals throughout the entire period ($P < 0.05$), except 2014.

Among the 13 macro-regions of the state, the lowest number of HVs (2706) was found for the category of other upper-level professionals in the Northeast macro-region in 2015 and the highest number (448,103) was found for mid-level professionals in the South macro-region in 2010. When population size was weighted, the Centre macro-region had the lowest HV rate by other upper-level professionals in 2013 (11 visits/3000 inhabitants). The

highest rate was found for mid-level professionals in the Jequitinhonha macro-region in 2010 (814 visits/3000 inhabitants).

Statistically significant differences in HV rates were found among the macro-regions [Tables 1, 2, 3 and 4]. HV rates among mid-level professionals, nurses, and physicians were significantly higher in the Southeast region than those recorded for the Centre and Northwest regions in a large part of the period studied [Tables 1, 2, and 3].

Among nurses, HV rates were significantly higher in the East of South region than those recorded in the Centre and Northwest regions in every year [Table 2]. For other

upper-level professionals (including dentists), HV rates were significantly higher in the South Triangle region compared to the Centre and West regions in 2010 and 2011 [Table 4].

Figure 1 displays the median HV rates of the period for all professional categories distributed among the health macro-regions of the state of Minas Gerais according to quartiles.

Discussion

HVs performed by professionals of PC teams were a constant part of the routine of healthcare services in the state of Minas Gerais between 2010 and 2015. This demonstrates an organization of services directed at health

Table 1: Median home visit rates performed by mid-level professionals in health macro-regions, Minas Gerais, Brazil, 2010-2015

MACRO-REGIONS (Codes)	YEAR					
	2010 HV rates (Code)*	2011 HV rates (Code) *	2012 HV rates (Code) *	2013 HV rates (Code) *	2014 HV rates (Code) *	2015 HV rates (Code) *
South (1)	648.30	551.84 (7)	536.50 (7)	534.16	510.53	432.16 (9)
Central South (2)	750.75	942.13	845.59 (8)	904.13 (6)	911.91 (3,6,8,9,13)	525.83 (9)
Centre (3)	437.15 (7)	487.21 (7)	409.06 (7)	434.39 (7)	398.04 (2,7)	403.67
Jequitinhonha (4)	632.7	764.18	694.82	499.07	394.48	346.42
West (5)	642.53	570.42	549.04	615.90	603.35	525.00 (9)
East (6)	410.58 (7)	448.07 (7)	449.17 (7)	371.44 (2,7,10)	350.73 (2,7)	245.24 (7,10,11)
Southeast (7)	840.91 (3,6,8,9)	1070.50 (1,3,6,8,9)	1145.30 (1,3,6,8,9)	779.37 (3,6,8,9)	837.64 (3,6,8,9)	645.98 (6,9)
North (8)	439.80 (7)	397.73 (7)	384.63 (2,7)	423.19 (7)	429.47 (2,7)	370.69
Northwest (9)	459.00 (7)	446.25 (7)	553.47 (7)	371.62 (7)	198.70 (2,7,10)	135.16 (1,2,5,7,10,11)
East of South (10)	750.10	941.67	746.20	726.24 (6)	680.48 (9)	565.04 (6,9)
Northeast (11)	681.45	618.60	489.40	459.42	439.11	564.54 (6,9)
South Triangle (12)	638.3	518.97	525.26	407.05	363.85	299.55
North Triangle (13)	648.30	551.84 (7)	486.40	525.34	311.33 (2)	321.67

*Codes of health macro-regions in which home visit rates were significantly different ($P < 0.05$, Mann-Whitney test); HV (home visits)

Table 2: Median home visit rates performed by nurses in health macro-regions, Minas Gerais, Brazil, 2010-2015

MACRO-REGIONS (Codes)	YEAR					
	2010 HV rates (Code)*	2011 HV rates (Code) *	2012 HV rates (Code) *	2013 HV rates (Code) *	2014 HV rates (Code) *	2015 HV rates (Code) *
South (1)	324.84 (4,5)	260.76 (3)	257.83 (3,9)	232.04 (3,9)	208.94	166.41 (9)
Central South (2)	239.07	207.65	300.26	212.86 (9)	317.32	153.51
Centre (3)	199.97 (1,7,10)	182.74 (1,7,10)	161.91 (1,7,10)	155.73 (1,7,10)	150.34 (7,10)	141.04 (10)
Jequitinhonha (4)	243.83	197.65	182.23	128.75 (10)	172.01	131.98
West (5)	159.33 (1,7,10)	147.73 (7,10)	157.67 (7,10)	167.76 (7,10)	141.69	144.5
East (6)	307.33	224.3	218.67	190.5	172.21	134.86 (10)
Southeast (7)	418.63 (3,5,9,13)	357.58 (3,5,9,13)	330.46 (3,5,8,9)	261.41 (3,5,8,9)	260.60 (3,9)	192.57 (9,12)
North (8)	244.51	239.36	203.31 (7,10)	169.93 (7,10)	160.52 (10)	138.22 (10)
Northwest (9)	160.66 (7,10)	144.88 (7,10)	121.10 (1,7,10)	98.33 (1,2,7,10)	133.15 (7,10)	91.42 (1,7,10,11)
East of South (10)	393.48 (3,5,9)	314.66 (3,5,9,13)	307.92 (3,5,8,9)	353.13 (3,4,5,8,9,12,13)	267.50 (3,8,9,13)	218.15 (3,6,8,9,12)
Northeast (11)	384.29	280.44	249.28	216.57	213.7	184.35 (9)
South Triangle (12)	309.81	227.32	192.06	145.10 (10)	130.52	84.86 (7,10)
North Triangle (13)	208.69 (7)	169.56 (7,10)	170.61	132.42 (10)	133.90 (10)	110.17

*Codes of health macro-regions in which home visit rates were significantly different ($P < 0.05$, Mann-Whitney test); HV (home visits)

Table 3: Median home visit rates performed by physicians in health macro-regions, Minas Gerais, Brazil, 2010-2015

MACRO-REGIONS (Codes)	YEAR					
	2010 HV rates (Code)*	2011 HV rates (Code) *	2012 HV rates (Code) *	2013 HV rates (Code) *	2014 HV rates (Code) *	2015 HV rates (Code) *
South (1)	147.65 (3,5,8)	104.76 (5)	104.52 (5)	92.49	101.98 (7)	105.94
Central South (2)	111.48	112.55	91.37	94.66	123.27	72.73 (7)
Centre (3)	77.04 (1,6,7)	84.46 (7)	76.34 (7)	69.54 (7)	86.64 (7)	85.52
Jequitinhonha (4)	81.35	84.29	89.07	78.22	84.9	102.58
West (5)	71.38 (1,6,7)	60.86 (3,7)	72.00 (3,7)	69.17 (7)	86.69 (7)	81.58 (7)
East (6)	139.83 (3,5)	104.3	96.70 (7)	120.44	116.76	87.31 (7)
Southeast (7)	256.55 (3,5,8,9)	195.95 (3,5,8,9)	167.56 (3,5,6,8, 9,11)	158.98 (3,5,8,9)	192.32 (1,3,5,8,9,13)	137.47 (2,5,6,8, 9,12)
North (8)	75.47 (3,7)	88.69 (7)	77.73 (7)	71.34 (7)	95.72 (7)	77.78 (7)
Northwest (9)	89.34 (7)	80.84 (7)	63.76 (7)	76.19 (7)	91.04 (7)	55.59 (7)
East of South (10)	143.58	112.86	98.77	96.54	121.58	96.72
Northeast (11)	114.89	119.23	90.57 (7)	102.39	95.34	89.02
South Triangle (12)	123.52	102.1	90.6	96.46	98.48	65.28 (7)
North Triangle (13)	138.15	116.43	89.21	102.51	91.20 (7)	86.98

*Codes of health macro-regions in which home visit rates were significantly different ($P < 0.05$, Mann-Whitney test); HV (home visits)

Table 4: Median home visit rates performed by other upper-level professionals (including dentists) in health macro-regions, Minas Gerais, Brazil, 2010-2015

MACRO-REGIONS (Codes)	YEAR					
	2010 HV rates (Code)*	2011 HV rates (Code) *	2012 HV rates (Code) *	2013 HV rates (Code) *	2014 HV rates (Code) *	2015 HV rates (Code) *
South (1)	45.14	40.22	32.32	38.73	58.99	22.94
Central South (2)	27.8	27.32	23.33	17.46	145.78	58.35
Centre (3)	25.03 (12)	21.65 (12)	18.20 (7,8)	19.25	40.89	22.68
Jequitinhonha (4)	42.82	51.09	49.95	60.84	107.1	22.16
West (5)	20.85 (12)	12.25 (12)	26.78	33.14	110.99	72.78
East (6)	45.53	73.86	54.32	28.6	108.86	35.57
Southeast (7)	44.53	47.62	53.54 (3)	42.32	123.56	66.63
North (8)	63.54	59.24	54.40 (3)	37.19	96.25	48.16
Northwest (9)	38.29	26.72	29.36	18.14	29.97	25.17
East of South (10)	27.12	22.03	19.12	28.27	60.35	42.19
Northeast (11)	54.79	49.81	50.79	36.82	95.42	38.88
South Triangle (12)	121.36 (3,5)	126.71 (3,5)	81.4	70.12	177.91	27.6
North Triangle (13)	31.12	27.67	38.75	48.73	111.56	41.73

*Codes of health macro-regions in which home visit rates were significantly different ($P < 0.05$, Mann-Whitney test); HV (home visits)

promotion with a differentiated approach of fragmented action only for combating specific diseases.^[12] However, HVs are distributed unevenly among professional categories and the different health macro-regions.

Healthcare services that invest in HVs expand their objectives by promoting health, disease prevention, treatment and rehabilitation with integral, humanized care,^[12] which is in line with the principles of the Brazilian public healthcare system.^[6] However, its applicability is valued in different contexts as part of healthcare systems in the most varied countries.^[4,5]

The incorporation of HVs to the routine of health professionals is a challenge. Indeed, there is a consensus on

the notion that such professionals do not have opportunities in their training to develop the skills needed for the practice of HVs.^[12] The large part of the HVs revealed in the present study represent an indication of change in the practice of health professionals and their adherence to the principles and guidelines of the Family Health Strategy.^[12]

The considerable participation of PC professionals in home care has been identified in previous studies.^[8,12] However, the results of the study by De-Carli, Santos^[8] were based on the reports of the professionals themselves, which could be a source of bias, as some professionals may not admit to a lack of HVs in their work routine and may adapt their statements to expectations rather than the reality of their actions. In contrast, the present results were based on

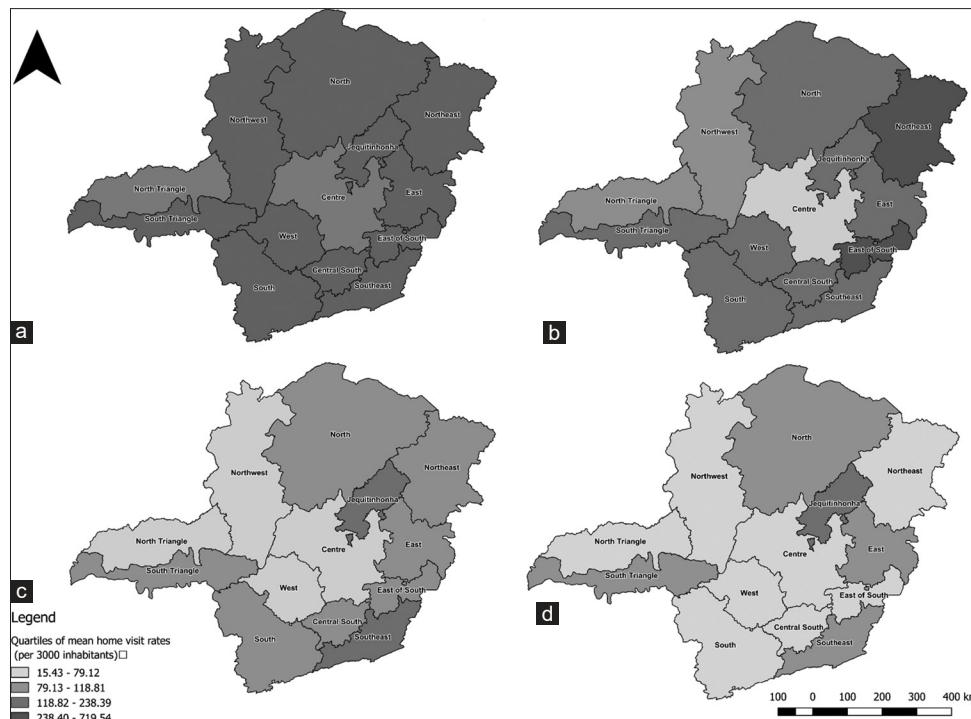


Figure 1: (a) Mid-level professionals, (b) nurses, (c) physicians, (d) other upper-level professionals including dentists

data entered in information systems and are therefore not subject to this type of inconsistency.

Differences were found among the professional categories, as mid-level professionals performed the most HVs, followed by nurses, physicians and other upper-level professionals (in that order). Although HVs in this last category were made up of the sum of the production of several professionals, including dentists, it was the one with the lowest number of visits. Such differences remained significant in the comparison of HV rates, which may indicate that mid-level professionals deal directly with the population in home care and are the first to identify needs, which they then pass on to the teams. These significant differences are important from the standpoint of public health, especially with regard to management, as they may demonstrate an operational organization that aims to optimize the services offered.

The HV rates of nurses were significantly higher than those of other upper-level professionals. The fundamental role nurses play in HVs has been highlighted in the literature^[7,13,14] and has been contrasted with the low performance of other professional categories, especially oral health teams.^[8,14] These findings suggest a lack of value placed on the role of oral health teams with regard to performing HVs in both public^[13] and private^[14] healthcare services. This tendency is confirmed by the exclusion of dentists as part of the multidisciplinary homecare team,^[13] which is in stark contrast to the scenario envisaged by the National PC Policy. Integral home care should include oral health teams, which should make efforts to work in a multidisciplinary manner to intervene and orientate family members and caregivers to offer preventive, minimally invasive actions.^[6]

The present findings demonstrate that health professionals are committed to health care based on the principles of equity, integrality, and multidisciplinary work.^[12] However, the reduction in the number of HVs at the end of the period analyzed merits particular attention. The higher quantity in 2010 compared to 2015 may partially be explained by differences in the entering of data in the PC Information System, which tends to make adjustments and corrections in the data made available over time. Moreover, beginning in 2016, another databank (with a similar name) began to be used by the Health Ministry to track the production of Family Health Teams: the Primary Healthcare Information System.^[15] This migration of databanks may have contributed to the lag in entering data.

A distinct pattern was found among the health macro-regions regarding the distribution of HVs, with significantly higher HV rates in some regions. The Centre region stood out as that with the lowest rates among all regions in the state considering all professional categories throughout the entire period analyzed. This macro-region is the most populous in the state, is where the state capital is located, is one of the most urbanized and has the highest socioeconomic status. The results indicate that the organization of healthcare services in terms of the home care modality has followed the concept of proportional universalism^[1] and is more present in regions in which the population has poorer health conditions.^[4,9] As HVs can be seen as a modality with the potential to reduce the effect of the social gradient on health, it should perhaps be included more in the routine practices of health team in regions with greater social disadvantages.

The concentration of specialized professionals and health teams in more urbanized regions favors the offer of care at

clinics and hospitals, which may be one reason for the low HV rates found in the Centre macro-region, as reported in Canada^[3] and the USA.^[14] Contextual characteristics can exert an influence on the occurrence of HVs, the coverage of health teams in a given region, the healthcare model itself,^[13,16] knowledge regarding the HV policy on the part of administrators and health professionals^[17,18] and an excess of care demands.^[17] Other factors include the social vulnerability and violence found in poor urban communities as well as difficulties in geographic access.^[16,17] Despite this potential association, a study addressing home care for elderly individuals found no influence of municipal characteristics on the care offered by general physicians, specialists, dentists, physiotherapists, and other health professionals.^[19] However, the possible association between contextual factors and HV was not the aim of the present study.

The present investigation has limitations that should be considered. As secondary data were used, the researchers had no control over the systematic, standardized entry of data to the information system. An important consequence of this analysis regards pointing out to administrators the need for improving the records. However, this type of problem is expected in an ecological study. Despite these limitations, the present investigation clarifies differences in the performance of HVs among professional categories in different regions, which represents an advance in relation to comparisons of absolute numbers in a merely descriptive manner, as performed in previous studies found in the literature.

It is fundamental for healthcare services to have an overview of home care to identify discrepancies between the actions of health professionals and the situations of the regions. By offering this outline, the results of the present study could contribute to the reorganization of the work process of health professionals and the adjustment of home care policies to the actual situations found in different regions.

Conclusion

The present findings demonstrate that PC professionals perform a large number of home visits, but the distribution of these visits is uneven among the different professional categories and macro-regions of the state. The identification of contextual factors at the services and in the macro-regions should be addressed in future studies. The present findings could contribute to the reorganization of homecare policies in universal public healthcare systems and assist municipal administrators in implementing changes in the work process of health teams.

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Conflicts of interest

There are no conflicts of interest.

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