

Expanding health access in the more vulnerable region in the state of São Paulo, Brazil: is this a reflection of the *Mais Médicos* (More Doctors) Program?

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Abstract *The Mais Médicos (More Doctors) Program seeks to broaden access to health by providing medical professionals, investments in health units and multi-professional integration geared to the Family Health Strategy. Vale do Ribeira includes 25 cities and is among the most vulnerable regions in São Paulo. It has been allocated 41 physicians from the Program. This study is to evaluate access to health, comparing health indicators before and after the Program. We collected data from DATASUS, SIAB, and the Ministry of Health. There was a marked increase in the number of appointments for infants under one year of age, adults, the elderly, STD/HIV patients and group patient care. There was a decrease in appointments outside the catchment area, as well as hospital admissions for other causes, mothers exclusively breastfeeding their infants up to four months. We concluded that after deployment of the Program, there was an increase in health access and health promotion focused on an area that presents an enormous challenge for Primary Health Care (PHC). It would seem that, since this is a high vulnerability area with a large area for care, hospital admissions for PHC care-sensitive conditions, as well as referrals for secondary services, did not decrease.*

Key words *Family and community medicine, Access to health services, Social vulnerability, Primary health care*

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Introduction

The creation of the Unified Health System (SUS) represented an important conquest for the right to health care. This implies, not only guaranteeing universal and equal access to health services, but also the formulation of health policies that positively affect social health determinants¹. It is in this second context that vulnerable population groups should be considered, who as the result of economic, cultural, ethnic, social and historical questions have had their rights violated and their living and health conditions made so insecure.

Primary Health Care (PHC), with emphasis on the Family Health Strategy (FHS), plays a leading role in confronting the reality of life in Brazil, which is extremely heterogeneous and has a culture of persistent regional inequalities. Primary Health Care is active in organizing the flow of patients within the SUS, and can assist in the saving of funds in health resources by reducing hospital admissions for PHC-sensitive health conditions², as well as actively promoting health in the broadest possible sense, encouraging and empowering the populating and providing support in reducing vulnerabilities³.

Although the number of physicians has dramatically increased over the last few decades, the SUS continues to suffer from a shortage of professionals, especially in primary care and in municipalities that are located far from the great urban centers. In the publication entitled *The Medical Demography of Brazil (Demografia Médica do Brasil)* (2011), the Federal Council of Medicine (CFM) and the Regional Council of Medicine of São Paulo (Cremesp) discovered that Brazilians who live in the South and Southeast have, on average, twice as many physicians as those living in the North, Northeast and Mid-West regions of the country – excluding the Federal District of Brasília. Similarly, those living in any capital city have available, on average, twice as many physicians as those living in other regions within the same state⁴.

Before the *Mais Médicos* Program was started in Brazil, the ratio of physicians per 1,000 inhabitants in Brazil was 1.8, rising to 3.46 in the Federal District of Brasília and 0.58 in the state of Maranhão and there were four times as many health workers in the private sector than in the SUS⁴. In São Paulo the ratio was 2.49/1.000 inhabitants. In 2006, the World Health Organization published a report recommending a ratio of 2.3 physicians per 1,000 inhabitants to ensure the adequate provision of services. This number

is only a point of reference, and it should be taken into account that a health system can become more or less dependent on a physician depending on its structuring within the health-disease process and according to the personal and cultural characteristics involved⁴.

Aimed at combating the inequalities of access to Primary Health Care, The *Mais Médicos* Program was established on October 22, 2013, under Law No. 12.871. As part of this Program, the *Mais Médicos* for Brazil Program was created at the same time, in order to provide emergency physicians in vulnerable areas of the country. The *Mais Médicos* Program also envisages a series of measures to strengthen and consolidate Primary Health Care^{5,6}. In addition to human resources, this includes investments to improve the infrastructure of the health care network, in particular the basic health units, and providing new work vacancies and educational reforms related to the graduation courses in medicine and medical residencies in the country, focusing in particular on enhancing Basic Health Care, Family Health Strategy and other priority SUS areas⁷.

One of the areas contemplated by the *Mais Médicos* Program is the Vale do Ribeira in the State of São Paulo, a region that extends from the southern borders of the State of São Paulo to the north of the State of Paraná. This region covers an area of 24,192 km and has a total population of 544,052 inhabitants, divided into 25 municipalities within the State of São Paulo and with seven municipalities located in the State of Paraná⁸. The Vale do Ribeira is one of the most vulnerable regions in the States of São Paulo and Paraná, with an average Human Development Index (HDI) of 0.75, which is below the state average⁹.

In the Vale do Ribeira, especially in the zone located in the State of São Paulo, there exists a distinctive cultural and socio-economic diversity, with different populations living in highly vulnerable conditions: family agricultural workers, fishermen, *quilombola* (descendants of runaway slaves), communities and indigenous communities. According to the Territorial Information System, 25.94% of the population lives in rural areas and 7.7% of the population lives in extreme poverty⁸.

The indigenous communities are divided into three Guarani villages, belonging to the Mbya and Nhandiva sub-groups, with around 400 individuals, according to estimates provided by the National Indian Foundation – FUNAI, in 2012. These villages are scattered in the following municipal districts: Sete Barras, Miracatu,

Cananéia, Peruíbe, Iguape, Itariri, Eldorado and Pariquera-Açu. In turn, there are 33 *quilombola* communities who have been settled in the region since the eighteenth century, which are located in the municipalities of Barra do Turvo, Cananéia, Eldorado, Iguape, Iporanga, Itaóca and Registro. The *caiçara* or fishing communities live in the districts of Cajati Cananéia, Iguape, Ilha Comprida, Iporanga, Itaóca, Itariri, Jacupiranga, Juquiá, Juquitiba, Pariquera-Açu, Pedro de Toledo, Peruíbe, Registro and Sete Barras. There are also 159 resettled families living in the municipalities of Apiaí, Eldorado and Miracatu⁸.

The aim of this study is to evaluate the production indicators and the health indicators before and after the implementation of the *Mais Médicos* Program in these areas.

Methods

This is a cross-sectional study that reviews secondary data that is available for public consultation. The data, covering the period between 2011 and 2014, was obtained from DATASUS, SIAB and the Ministry of Health from the municipalities participating in the *Mais Médicos* Program in the region: Barra do Turvo, Cananéia, Eldorado, Iguape, Iporanga, Jacupiranga, Juquiá, Miracatu, Pariquera-Açu, Pedro de Toledo, Registro and Sete Barras. The variables chosen were divided into two groups:

1) *Indicators of productivity*: the number of consultations for infants under the age of one year; the number of consultations in the following age groups: from 1 to 4 years, from 5 to 9 years, from 10 to 14 years, from 15 to 19 years, from 20 to 29 years, from 30 to 39 years, from 40 to 49 years, from 40 to 49 years, from 50 to 59 years and for those over the age of 60; the number of childcare, pre-natal, pap test, STD/AIDS, diabetes, hypertension, leprosy, tuberculosis consultations; the number of group health care consultations; home visits by a physician and home visits by a nurse; the number of consultations outside the FHS coverage area; number of referrals for specialist treatment; number of urgent/emergency referrals.

2) *Indicators of primary health care-sensitive cases*: hospital admissions for Pneumonia Acquired in the Community (PAC) and malnutrition; hospitalization due to complications from diabetes; hospitalization due to other causes; number of monitored pregnant women; pregnant women with pre-natal in the month; infants

up to the age of 4 months; infants up to the age of 4 months who are being exclusively breast-fed; number of registered diabetic patients; number of registered hypertension patients; number of monitored hypertension patients; number of registered leprosy patients and number of monitored leprosy patients.

Data analysis

The analysis was conducted using an “R” statistic program version 3.2.1. (<http://cran.r-project.org>), with a 0.05 adopted significance level. Since the variables studied did not present a normal distribution, we evaluated the medians and compared the interquartile interval between 25% and 75%. The independence between the observations could not be assumed. However, we decided to use the Wilcoxon signed-rank test (for paired samples) when comparing data for 2012 and 2014. We used the Friedman test to evaluate the annual variation between 2011 and 2014 of the Family Health Strategy coverage rates, hospital admissions due to primary health care-sensitive conditions, referrals for intermediate outpatient care, and the percentage of pre-natal coverage.

Findings

A total of 12 districts within the Vale do Ribeira region were studied: Barra do Turvo, Cananéia, Eldorado, Iguape, Iporanga, Jacupiranga, Juquiá, Miracatu, Pariquera-Açu, Pedro de Toledo, Registro and Sete Barras. Together they received a total of 41 physicians, which represents an average of 3.5 physicians per municipality.

After the deployment of the *Mais Médicos* Program, we noted that there was a significant increase in the numbers of consultations made by members of the population over the age of 15, and in cases of STD/AIDS, there was a reduction in consultations made outside the catchment area (Table 1 and Figure 1).

In the period between 2011 and 2014, when the municipalities were analyzed jointly, it was noted that there was no change in the FHS coverage. However, during this period, the rate of referrals and pre-natal coverage showed a marked variation. On the other hand, the rate of hospital admissions for Primary Health Care-sensitive condition (CSAIP) remained stable (Figure 2).

There was a significant reduction in hospital admissions for other reasons and for exclusive

Table 1. Median, interquartile interval, and the variation (between 2012 and 2104) of the monthly values of indicators of productivity and primary health care-sensitive cases in 2012 and 2014 in the municipalities of the Vale do Ribeira.

	Md (IQR) ^a (2012)	Md (IQR) ^a (2014)	Variation (%)
Consultations outside the coverage area ^b	93 (82-114)	45 (40-58)	- 52%
Consultations for infants under the age of 1 year ^b	415 (354-434)	475 (438-559)	14%
Consultations for patients aged between 1 & 4	780 (718-882)	866 (741-986)	11%
Consultations for patients aged between 5 & 9	822 (777-922)	893 (773-957)	9%
Consultations for patients aged between 10 & 14	861 (786-921)	912 (771-961)	6%
Consultations for patients aged between 15 & 19 ^b	927 (867-955)	1084 (1002-1140)	17%
Consultations for patients aged between 20 & 39 ^b	3062 (2884-3216)	3542 (3254-3795)	16%
Consultations for patients aged between 40 & 49 ^b	1906 (1821-1955)	2241 (2121-2457)	18%
Consultations for patients aged between 50 & 59 ^b	2123 (2026-2213)	2639 (2456-2916)	24%
Consultations for patients over the age of 60 ^b	3739 (3559-3814)	4967 (4462-5527)	33%
Childcare	2453 (2236-2626)	2460 (2289-2713)	0%
Pre-natal care	1121 (1079-1232)	1363 (1237-1418)	22%
Pap tests	1230 (1167-1369)	1342 (1191-1439)	9%
Health care for STD/AIDS ^b	84 (69-91)	152 (112-171)	81%
Health care for diabetes	3120 (3001-3201)	3186 (3070-3486)	2%
Health care for hypertension	8488 (8095-8913)	8091 (7966-8487)	- 5%
Health care for leprosy	8 (4-16)	8 (6-27)	0%
Health care for tuberculosis	25 (16-49)	22 (19-27)	-12%
Referrals for specialist care	2118 (2029-2309)	2407 (2116-2612)	14%
Referrals for in-patient care	15 (8-18)	20 (18-23)	33%
Urgent/emergency referrals	93 (86-113)	88 (79-107)	- 5%
Group health care ^b	714 (572-1160)	2082 (1445-2806)	192%
Home visits by physicians	581 (518-606)	777 (709-901)	34%
Home visits by nurses	1261 (1176-1306)	1281 (1192-1417)	2%

Md - Median; ^a IQR; IQR - Interquartile Range (25% - 75%); ^b p < 0.05.

breast-feeding infants up to the age of 4 months, in spite of an increase in the absolute number of monitored pregnant mothers and in the number of pre-natal women. There was no significant change at all in the number of registered and monitored patients with diabetes and hypertension (Table 2).

Discussion

The aim of this study is to examine the effects of the availability of medical assistance and implementation and consolidation of the Family Health Strategy through the *Mais Médicos* Program in a highly vulnerable region in the State of Sao Paulo.

It was noted that there was an increase in the number of consultations for the adult and elderly section of the population, as well as a higher number of STD/AIDS treatments, and a reduction in the number of consultations outside the catchment area. This shows there has been better

access to Primary Health Care in these locations with improved patient care to meet the spontaneous demands and other care activities carried out by the Basic Health Unit, and that a greater ability has been shown to resolve the health demands of the population. Reinforcing the methods used to deal with these issues, has resulted in a sharp fall in the number of hospital admissions due to other causes, which shows there has been a greater capacity to produce services and to respond to the health requirements of a certain sector of society. However, there was no increase in treatment for patients between the ages of 0 and 14 years old. A possible explanation for this might be the fact that physicians from the Program have been inserted into the mixed basic health units, which include gynecologists and pediatricians who were already working there.

There was a marked increase in the number of referrals made for medium complexity outpatient care, due to better access to PHC, which is an outcome expected in the short-term. We ex-

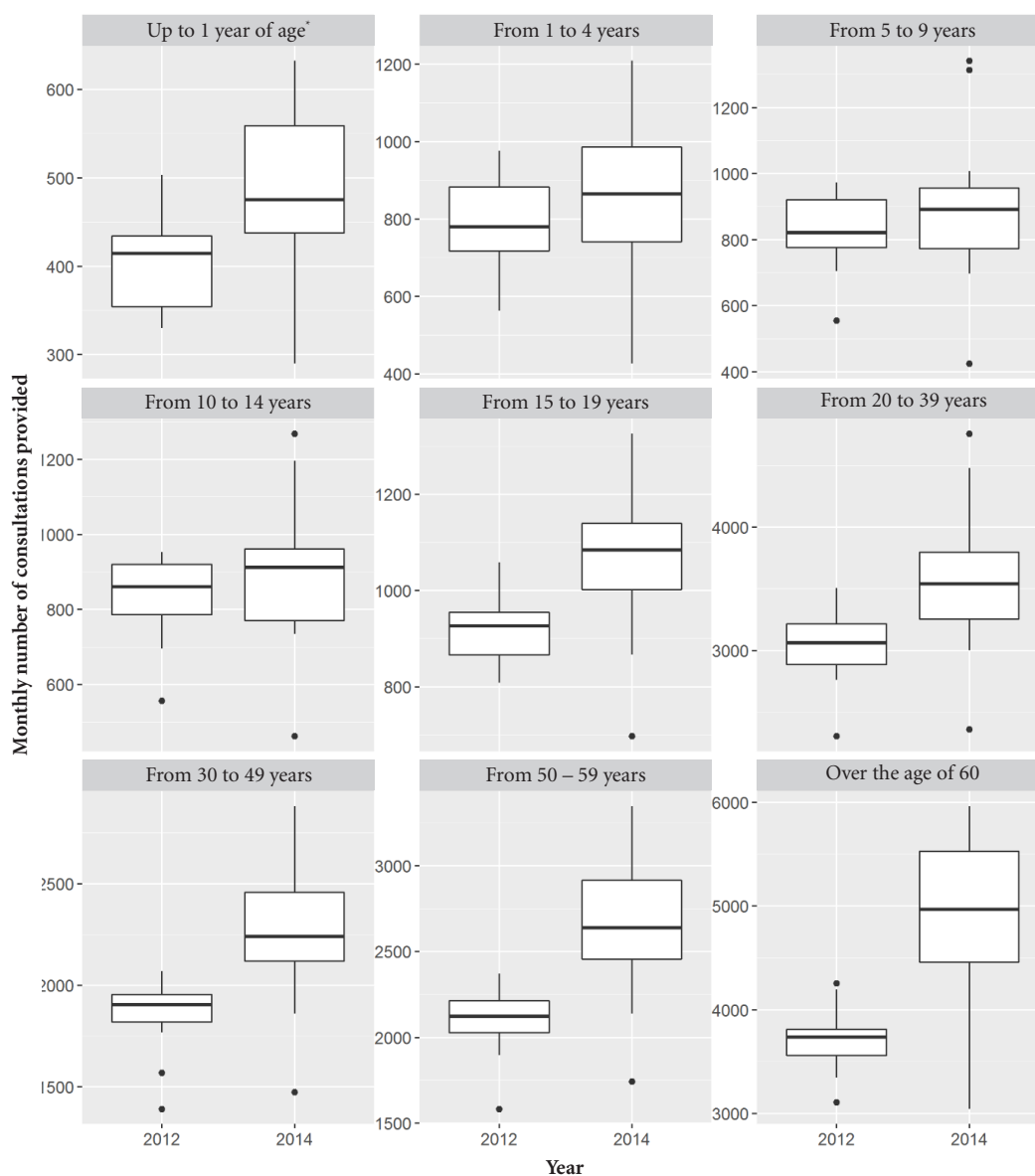


Figure 1. Variations in the number of monthly consultations, for 2012 and 2014, according to age group.

* $p < 0.05$. Fonte: Datasus/SIAB.

pect that in the long-term, the number of hospital admissions for primary health care-sensitive conditions should decrease, and that numbers would stabilize, or even be reduced, in the case of referrals for medium complexity treatment. However, further studies should be conducted to verify this theory.

Primary health care actively promotes health in the broadest sense, using different formulas to deal with disease. According to Ferreira Neto and

Kind, group practices decentralize the focus on pathology, which is characteristic of individual care, and uses a more comprehensive approach to the conditions and way of life of the users, which highlights other life dimensions associated with health promotion¹⁰. This fact was observed as a result of the significant number of group health care treatments.

These data bolster the broadening of the promotion of health with the program, either with

the presence of a physician or by creating new teams and enhancing of the Family Health Strategy. These teams include a team of multi-professionals, using a horizontal model, who are active

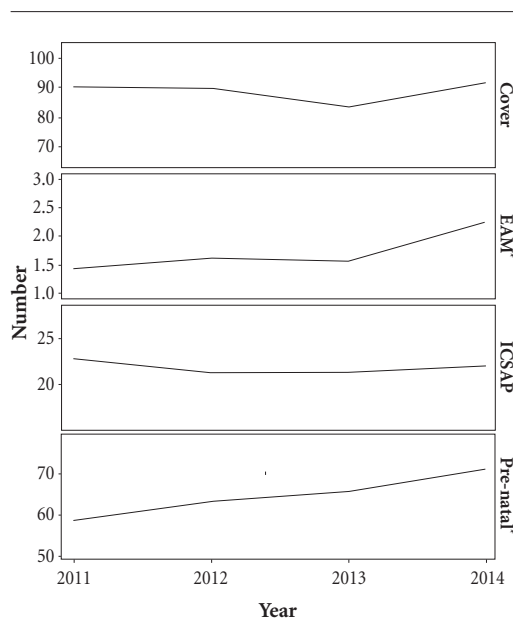


Figure 2. Variation of FHS coverage of hospital admissions for primary health care-sensitive conditions, for intermediate outpatient care referrals and for pre-natal coverage for the period between 2011 and 2014.

* $p < 0.05$. Source: Datasus/Ministry of Health.

in all areas of primary health care: care coordination, initial contact with the health system, comprehensiveness, family and community guidance, ongoing care, considering the cultural responsibilities involved at all times¹¹. Ribeiro¹² makes a criticism of the *Mais Médicos* Program arguing that “the health system waits for an individual to get sick so that it can then treat the disease,” when it should instead “preserve and maintain the health of the majority of individuals who are not yet sick, although dangerously exposed to risk factors that lead to the development of high risk diseases among the population.” However, in the Vale do Ribeira, the *Mais Médicos* Program has had a positive effect in introducing strategies to promote health, specifically with home visits and group work.

Although not marked, there was an increase in the number of home visits undertaken by physicians, which corroborates the report issued by the Federal Court of Auditors (TCU) in 2015 that stated there had been an increase in the number of home visits in municipalities participating in the *Mais Médicos* Program¹³. According to Borges and Oliveira (2011), a home visit by a physician promotes an image of the “humanization of the physician” from the point of view of patients, which increases their confidence and bolsters the links they establish with the health system. Thus, broadened care, where physicians are inserted into the reality in which these individual live,

Table 2. Median, interquartile range and variation (between 2012 and 2104) of the monthly values of basic health care-sensitive indicators in 2012 and 2014 in the municipalities of the Vale do Ribeira.

Health situation	Md (IQR) ^a (2012)	Md (IIQ) ^a (2014)	Varição (%)
PAC hospitalization & malnutrition	6 (2-11)	4 (2-6)	- 27%
Hospitalization due to Diabetes complications	15 (11-18)	15 (11-16)	0%
Hospitalization due to other causes ^b	254 (244-269)	212 (195-227)	- 16%
Number of pregnant women ^b	1017 (928-1091)	1094 (1053-1167)	8%
Number of monitored pregnant women ^b	1006 (913-1079)	1067 (1020-1147)	6%
Prenatal mothers in the month ^b	978 (887-1035)	1035 (992-1131)	6%
Infants up to 4 months	605 (559-630)	572 (527-618)	-5%
Infants up to 4 months in Exclusive breast feeding ^b	520 (559-630)	483 (447-511)	-7%
Registered cases of diabetes	5602 (5131-6510)	6394 (6042-6662)	14%
Monitored patients with diabetes	5016 (4782-6027)	5349 (5218-5638)	7%
Patients registered with hypertension	19173 (18061-21754)	20752 (19676-21202)	8%
Monitored patients with hypertension	17460 (16786-20033)	16996 (16722-17968)	-3%
Patients registered with leprosy	30 (26-31)	20 (19-22)	-33%
Monitored patients with leprosy	27 (25-29)	20 (19-21)	-26%

Md-media; IQR^a- Interquartile Range; ^b $p < 0.05$.

makes it possible to establish greater articulation as regards multi-professional strategies and therefore these have a better chance of achieving practical success¹⁴. Therefore, home visits are an important health care strategy, since they guarantee access and take into consideration the social and cultural context of individuals and enhance their relationship with the physician and the health system.

We noted a reduction, albeit not marked, in the coverage area of the FHS during 2013, the year this program was established. Several theories can help explain this: (1) cancellation of the registration of fictitious teams that often continued to be registered with the CNES in order to receive their ongoing level of funding; (2) dismissal of contracted health professionals who were employed by the municipal councils so that they could receive physicians contracted by the federation; (3) manipulation of data so that the municipalities could receive physicians from the Program.

We also observed a reduction in the percentage of follow-up of patients with hypertension and diabetes, which we expected to increase due to the greater coverage provided by the physicians. This fact may reflect the dismantling of

programs specifically designed for patients with hypertension and diabetes, such as *Hiperdia*, which has the effect of taking the focus off the follow-up.

The reduction in the FHS coverage associated with increased access to health care (number of consultations, diagnosis, hospital admissions and referrals) suggest that the physicians previously allocated to the FHS did not work full-time at the FHS, unlike the physicians who work for this Program.

The IPEA calculates the index of vulnerability based on three issues: urban structure (sanitation and urban mobility), human capital (health and education) and income and work (various aspects)⁹. Thus, improving access to health care may even eventually reduce the indices of vulnerability in the region in the medium-term.

We expect that in the medium-term there will also be a reduction in referrals and hospital admissions for Primary Health Care-sensitive reasons. However, since this is an analysis of the Program's first year of operation and involves an area that has a high index of vulnerability, which brings a lot of pressure to bear on health care, this is something that will very likely not occur in the short-term.

Collaborations

BP Silva and D Stockmann: concept, final draft, data collection, approval of the final version for publication. DS Lúcio: statistical analysis, data interpretation, approval of the final version for publication. E Henna: statistical analysis, data interpretation, final revision, approval of the final version for publication. MCP Rocha and FM Junqueira: concept, final draft, critical review, approval of the final version for publication.

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