# Physicians' income in Brazil: a study on information sources

Mário Scheffer[1] , Felipe Oliveira Pinto Ribeiro[1] , Mário Dal Poz[2] , Lucas Andrietta[1]*

## SUMMARY

**OBJECTIVE:** Data on physicians' income are relevant for well-informed health policies, both due to their strategic role and the volume of resources that their activities represent to health systems. In Brazil, multiple sources of data measure the income of these professionals, each one with singularities that generate a complex and heterogeneous picture. This study explores the methodological aspects of different data sources, pointing to potentials and limitations to measuring the income of physicians.

**METHODS:** We use the sources' documentation and data on the average monthly income in 2019, by gender and macro region, from four distinct surveys: Continuous Pnad (National Household Sample Survey), RAIS (Annual Listing of Social Information), Medical Demographics, and IRPF (Personal Income Tax).

**RESULTS:** The results confirm the heterogeneity of definitions, variables, and methodologies. The data set can evidence phenomena such as the income difference between men and women. Regional inequalities are evident; however, the data interpretation is less assertive.

**CONCLUSIONS:** Although eventual gaps and discrepancies among sources can limit some strong conclusions, the analysis of different methodologies employed can suggest relevant hypotheses for in-depth studies.

**KEYWORDS:** Salaries and fringe benefits. Economics, medical. Health workforce. Methods.

## INTRODUCTION

Universal and robust health systems require investments in human resources, including the improvement of data, evidence, and knowledge about physician and other healthcare labor markets. In this perspective, the Ninth World Health Assembly adopted the "Global Strategy on Human Resources for Health: Workforce — 2030"[1], which includes, among its objectives, the implementation of National Health Workforce Accounts, with the purpose of facilitating the standardization of health workforce information systems toward interoperability. Improving the capacity of using and exchanging health workforce data in broader health information systems (either regional or national), as well as in international information systems, allows countries to make policy decisions based on (or informed by) evidence on the health workforce[2].

Information on physicians' income is especially relevant, both due to the strategic role of these professionals in certain structures and levels of care of the health system and the volume of resources that their activities and salaries represent in public and private health expenditure[3].

Physicians' income can be influenced by education, supply of professionals, and human resources policies, and it can reflect on the services' quality, productivity, and health system organization[4].

The income can be associated with choices on work location and medical specialties, job permanence, or turnover[5].

Studies on income usually refer to multiple data sources and approach macroeconomic policies, employment, multiple income composition (e.g., labor and capital), salary inequalities, and correlation between income and training, occupation, and other variables[6,7]. However, there are few studies on the income of specific professions that also aggregate both social relevance and expressive investment, as it is in the case of physicians.

The number of physicians has grown greatly in the past decade in Brazil, along with the establishment of medical courses and classes, the stronger presence of women, persistence of regional supply inequalities, and unbalances between public and private healthcare services. Physicians keep earning high salaries compared to other higher education professions; however, there was an increase in the number of simultaneous jobs and weekly workload of professionals[8].

[1]Universidade de São Paulo, Faculdade de Medicina – São Paulo (SP), Brazil.
[2]Universidade do Estado do Rio de Janeiro, Instituto de Medicina Social – Rio de Janeiro (RJ), Brazil.
*Corresponding author: lucasandrietta@gmail.com

This article addresses the possibilities of measuring the economic income of Brazilian physicians. Preliminary exploring available databases, we expect to indicate their potentials and limitations for income studies as a tool to guide policy decisions and health workforce planning.

## METHODS

This descriptive and exploratory study aims at presenting the strength and limitations of four different data sources on physicians' income in Brazil, while it drafts income characteristics, trends, and scenarios of these professionals.

The initial criterion for selecting sources was the availability of the number of physicians covered/registered and the monthly income per capita. Next, we selected variables that met two requirements, namely, the presence in different databases and comparability potential. Thus, the data obtained were disaggregated by gender and macro region. When possible, the income obtained exclusively from the professional exercise of Medicine was prioritized. We considered the available time series, the update frequency, and chose 2019 as the reference year to approach and illustrate the analysis on databases' methodological aspects.

The article used the following sources, whose characteristics are also compared in "Results" section:

- National Household Sample Survey: Performed by the Brazilian Institute of Geography and Statistics (IBGE), it aims at generating indicators on workforce fluctuations in the country. With a quarterly frequency and national coverage of 3,500 cities, Pnad's sampling plan uses and stratifies primary sampling units (UPA), with each one of them having at least 60 permanent private households (DPP)[9]. We used Pnad microdata for the fourth quarter from 2012 to 2020, focusing on the variable V4019 "Usual income at all jobs." The sample was filtered by Occupation Code, including the "general physicians" and "specialist physicians." The 95% confidence intervals were calculated considering the variation of the number of interviewed physicians at each quarter.
- Annual Listing of Social Information: This is an administrative registry of the Ministry of Work and Social Security (MTP) for the characterization of the formal labor market, at national level and up to a municipal level breakdown. It is performed annually, mandatory to all employers. The RAIS database contains the original statements on current amount of jobs and the fluxes of employed labor (both admissions and terminations), by

gender, age group, education degree, average income, and income ranges in minimum wages[10]. In this study, all active job contracts from 2010 to 2019 in the following groups of the Brazilian Classification of Occupations (*CBO2002*): clinical physicians, surgical specialties physicians, and diagnosis and therapeutic medicine physicians.

- Personal Income Tax Returns: This is composed of the active returns presented by taxpayers, regardless of being or not selected to go through tax audits. With the purpose of reducing the effects of inconsistent amounts, data are filtered by the Federal Revenue, in order to remove distorted figures regarding incomes, deductions, payments, assets, and others. Once fiscal confidentiality rules are observed, the "Greater Figures of Personal Income Tax Returns (DIRPF)" are made available, with semi-disaggregated data and general indicators according to state, gender, income ranges, and other variables[11]. This study obtained, by means of the Law on Access to Information (LAI), filtered data from 2012 to 2017 of statements that answered *Physician* in the field *Main Occupation* of the annual tax return survey.
- Brazilian Medical Demography: This includes survey on physicians' sociodemographic, education, labor, and practice data, conducted by the Scholl of Medicine of the University of São Paulo (FMUSP), supported by the Federal Council of Medicine (CFM), Brazilian Medical Association (AMB), and National Commission of Medical Residency[8]. This study produced income data from a telephone survey, using a probability sample of 2,400 doctors, carried out in 2019 by DMB. Income was considered within the period of 1 month, resulting from the practice of Medicine, considering all works, job contracts, and activities of physicians. The income is self-reported by interviewees, who were previously presented to six income ranges.

All data extracted from various databases were deflated by the Broad Consumer Price Index (IPCA) to constant values of December 2020.

## RESULTS

The main available sources for measuring the income of physicians in Brazil have distinct origins, objectives, and methodologies (Table 1). Regarding the generating institution,

all databases involve public agencies, such as IBGE, MTP and Federal Revenue, Federal Council of Medicine, and the University of São Paulo.

As to the objectives, the databases aim to monitor the evolution of workforce (Pnad), characterization of the formal labor market (RAIS), taxation of individuals (DIRPF), and trends and scenarios related to the population of physicians in Brazil (DMB).

Regarding methods, Pnad and DMB use probabilistic sampling, with a residential survey and population survey of physicians, respectively; and DIRPF and RAIS use the group of physicians who are present in notarial records or mandatory administrative statements.

**Table 1.** Methodological aspects of data sources for physicians' income studies.

| Databases | Continuous PNAD | RAIS/caged system | Medical demographics | Personal Income Tax Returns (DIRPF) |
|---|---|---|---|---|
| Description | Continuous survey on general characteristics of the population, education, job market, income, and housing in Brazil | Administrative database that gathers information on employee hiring, termination, and transfers made by companies that operate according to the regime of the Brazilian Consolidation of Labor Laws (CLT). | Study on sociodemographic, training, and work characteristics of physicians in Brazil | Mandatory statement sent to the Federal Revenue by every taxpayer who has obtained taxable income |
| Nature of the survey | Official research by a sample of households | Mandatory administrative registry | Survey, sectional study | Taxation data aggregated and complemented by the Law on Access to Information (LAI) |
| Analysis unit | Household and Individual | Formal employment tie and establishment | Individual | Individual |
| Institution | IBGE | Ministry of Work and Social Security | CFM/FMUSP | Federal Revenue |
| Frequency | Quarterly | Monthly | Biannually | Annually |
| Collection method / information source | In-person survey answered by a person living in the household | Electronic form filled out by companies | Telephone survey voluntarily answered by physicians and other official databases | Compilation of data from annual Federal Revenue tax returns |
| Territorial scope | National | National | National | National |
| Maximum territorial disaggregation | State and metropolitan regions | City | Macro region | State |
| Relevant variables | Location (state, capital, metropolitan region, urban/rural area), gender, age group, ethnicity, education, occupation, monthly income, worked hours/week, number of jobs, possession or not of a specialist title | Location, monthly, employment period, number of contracted working hours per week, age of professional, personal information, hires, and terminations | Location (state, age, countryside/capital, region, rural/urban area), gender, time since graduation, possession or not of a specialist title, specialty, number of vacancies in graduation, number of vacancies in medical residence, physicians doing medical residence, field of activity, work in the public/private sector, work characteristics, number of employment ties, monthly salary, location of residence, location of work | State, state capital, nature of occupation (i.e., self-employed professional), gender, age group, taxable income, assets and rights, donations, inheritance, salary (monthly salary), total income, taxable income, main occupation |
| Target population | People living in private and permanent households in the area of research scope | Employees working under the formal employment tie regime (CLT) | Physicians with an active professional registry in a Regional Board of Medicine (CRM) | Individuals with taxable income |

Source: Own elaboration based on official documentation[7-10].

There are currently 500,000 physicians in Brazil[8]. The larger number of physicians (392,492) is covered by DIRPF. The size of samples varies from 771 persons in Pnad to 2,400 in DMB. In the case of RAIS, which has the formal job contract as unit of analysis, 262,618 records were considered (Table 2).

The monthly income of physicians ranged from R$16,438.00 (PNAD) to R$32,677.00 (DIRPF). In the case of RAIS, the average salary from formal employment ties was R$10,219.00. In the DMB, whose method does not allow establishing a general average, the self-reported income median is within the range from R$17,120.00 to R$22,470.00.

All databases indicate lower income for women in comparison to men, though there are discrepancies due to the nature of the source. RAIS indicates that the average salary paid to women is almost equivalent to men's (93.7%). In Pnad, women's income corresponds to 73.4% of men's. The greatest difference is seen in DIRPF, where the reported women's income reaches 64.3% of men's income. In DMB, women are concentrated in lower income ranges, having their median value within the second range (R$11,770.01–R$17,120.00).

There are differences in physicians' incomes according to macro regions, but variations, in the comparison between databases, are not always coincident.

In Pnad, Northeast and North regions present an average income that is notably higher to the national average; South and Midwest present a lower average; and Southeast is close to the national average.

In DMB, we could highlight the higher frequency of physicians in the Northeast and Midwest regions in the superior range (>R$34,200 per month) when compared to the remaining regions. We emphasize that in the DMB, the participation of each income range varies among regions, and there is a significant overlap of confidence intervals for the regional comparison (Table 3).

In the DIRPF, the income is higher in the South and Midwest regions, when compared to the North and Northeast. Likewise, in RAIS, the South and Midwest overcome other regions.

## DISCUSSION

The four sources considered provide relevant information for the study of physicians' income in Brazil. The differences between databases can be explained by the objectives, parameters, and criteria previously established by the institutions generating the information, as well as by the diversity of collection methods, concepts, variables, and units of analysis.

**Table 2.** Selected physicians' income indicators by gender and macro region, 2019.

| Original variables and research scope | All physicians | Gender | | | Macro region | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Women (W) | Men (M) | Ratio (W/M) | North | Northeast | Southeast | South | Midwest |
| Pnad | | | | | | | | | |
| Usual monthly income from all jobs (R$) | 16,438 | 14,463 | 18,244 | **79.3%** | 17,978 | 17,325 | 16,645 | 14,806 | 14,933 |
| Error margins (95% confidence interval) | ±1,216 | ±1,653 | ±1,551 | | ±4,887 | ±3,231 | ±1,739 | ±2,026 | ±2,754 |
| Sample size (N) | 771 | 418 | 353 | | 61 | 143 | 324 | 171 | 72 |
| RAIS | | | | | | | | | |
| Average monthly income from employment ties (R$) | 10,219 | 9,871 | 10,533 | **93.7%** | 10,536 | 9,345 | 9,838 | 12,358 | 11,095 |
| Participation in the total (N=262,618 employment ties) | 100% | 48% | 52% | | 5% | 19% | 53% | 12% | 10% |
| DIRPF* | | | | | | | | | |
| Average monthly income from all sources (R$) | 32,677 | 25,158 | 39,156 | **64.3%** | 29,873 | 31,047 | 32,550 | 34,495 | 35,648 |
| Participation in the total (N=392,432 statements) | 100% | 46% | 54% | | 4.6% | 18.9% | 52.6% | 15.9% | 8.0% |

Source: Own elaboration with data from IBGE, RAIS/CAGED, and Federal Revenue. *IRPF data specific to the medical category were obtained by means of the Law on Access to Information. All values adjusted to R$ of December 2020.

Table 3. Percentage distribution of physicians by income range, gender, and macro region, 2019.

| Income range | Percentage distribution (%) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | All physicians | Gender | | Macro region | | | | |
| | | Women | Men | North | Northeast | Southeast | South | Midwest |
| Up to R$11,770.00 | 21.7 (±1.8) | 30.6 (±3.0) | 14.8 (±2.1) | 13.4 (±7.4) | 19.7 (±4.1) | 23.8 (±2.6) | 21.8 (±4.5) | 17.5 (±5.5) |
| R$11,770.01–R$17,120.00 | 23.6 (±1.9) | 28.7 (±3.0) | 19.5 (±2.3) | 18.3 (±8.4) | 21.1 (±4.2) | 25.3 (±2.6) | 22.4 (±4.5) | 23.0 (±6.1) |
| R$17,120.01–R$22,470.00 | 19.3 (±1.7) | 21.6 (±2.7) | 17.5 (±2.2) | 28.0 (±9.7) | 20.3 (±4.1) | 18.4 (±2.4) | 20.0 (±4.3) | 17.5 (±5.5) |
| R$22,470.01–R$28,890.00 | 14.4 (±1.5) | 10.8 (±2.0) | 17.4 (±2.2) | 17.1 (±8.1) | 14.0 (±3.6) | 14.6 (±2.1) | 14.2 (±3.8) | 13.7 (±5.0) |
| R$28,890.01–R$34,240.00 | 7.4 (±1.1) | 4.1 (±1.3) | 9.9 (±1.8) | 12.2 (±7.1) | 9.0 (±2.9) | 6.0 (±1.4) | 7.9 (±2.9) | 8.7 (±4.1) |
| Above R$34,240.01 | 13.6 (±1.5) | 4.3 (±1.3) | 20.9 (±2.4) | 11.0 (±6.8) | 15.9 (±3.8) | 11.9 (±2.0) | 13.6 (±3.7) | 19.7 (±5.8) |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Source: Own elaboration with data from Medical Demographics. Margins calculated to the 95% confidence interval. Total sample size: 2,003 people interviewed. Income ranges deflated to R$ in December 2020.

The income reported by physicians in the surveys (Pnad and DMB) has a relative convergence and tends to better express earnings resulting exclusively from the professional exercise of medicine, though the self-reported information may cause some measurement biases. In DMB, for instance, 16.1% of physicians refused to answer on their income[8].

Statements for income tax purposes tend to overestimate the income related to medical activities, while salary recorded in formal job contracts underestimate it.

Unlike DMB, the individual income from all works registered in Pnad (R$16,438.00) allows deeper breakdowns. However, due to the reduced samples, even more so in Pnad than in DMB, results in large confidence intervals, inadequate for certain interpretations, and cross-referencing.

The result from RAIS (R$10,219.00) has the limitation of measuring only formal jobs (CLT) which, definitely are not the only and, possibly, not even the main component of physicians' income currently in Brazil.

In DIRPF, the amount of R$32,677.00 refers to the physicians' incomes resulting from other sources besides their medical activities: interest rates, profits, rent fees, and companies. It is not possible to access data on the income composition from various sources, although they exist. Information in lower breakdown levels must be obtained through the Law on Access to Information. Brazil's alignment to international initiatives of tax microdata disclosure could contribute to the quality of surveys and public policy[12].

Income inequality according to gender was confirmed in all databases. The intermediate results obtained in Pnad and DMB seem to better represent the category set. RAIS indicates that formal contracts have a narrower income gap between men and women. DIRPF shows that patrimonial income tends to significantly emphasize the disparity in favor of men. This result reiterates the higher probability of men obtaining a higher salary than women in Medicine[13], confirming recent studies made in Brazil[14], Iran[15], Peru[16], New Zealand[17], and Italy[18].

Regarding the physicians' income according to macro regions, there are more significant divergences among databases. Notably, the existence of contrast between RAIS and DIRPF or approximations between Pnad and DMB. The comparisons should be done cautiously for this variable and can become more difficult both given the nature of databases and multiple factorial phenomena: distinct socioeconomic characteristics, regional inequalities in physician supply with impact on salary policies, health services profiles and demanded specialties, work productivity, the magnitude of public and private subsystems, and other aspects.

## CONCLUSIONS

The available sources provide relevant and incipiently explored information for the study of physicians' income in Brazil.

The distinct purposes, methodologies, and operational aspects of surveys suggest that single-sourced analyses may have distorted results and conclusions. Therefore, future studies on this subject must use different sources to guide the research within the discrepancies found.

It is desirable to improve existing databases toward a higher level of standardization of the main indicators on physicians and other health professionals, which requires the creation of a harmonized and integrated income information system, allowing interoperability, data exchange, and comparison among sources.

The Brazilian medical workforce is currently going through pronounced changes, such as an increasing number of professionals, shortage of specialized training, dissemination of precarious and outsourced jobs, feminization, and greater inclusion of professionals from lower income families or self-declared black and brown[8]. In contrast, recent economic crises emphasize the

chronic underfunding of the Brazilian Unified Health System (SUS) and seasonal retraction of private health insurance coverage[19], which impacts the medical labor market.

In face of these endogenous and exogenous transformations of the profession, and due to representing a significant portion of resources necessary to the operation of universal and effective health systems, physicians' income remains an unavoidable study object in the human resources and health policies research fields.

## ETHICS

The study was approved by the Research Ethics Committees of the Faculty of Medicine of the University of São Paulo, under the title Medical Demographics in Brazil: the profile, distribution, work, and specialization of physicians (CAAE: 35140914.7. 0000.0065).

## AUTHORS' CONTRIBUTIONS

**MCS**: Conceptualization, Investigation, Writing – original draft. **FOR**: Data curation, Writing – original draft. **MDP**: Validation, Writing – review & editing. **LSA**: Supervision, Conceptualization, Data curation, Writing – review & editing.

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