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Demographic Profile of 432 Patients Undergoing Spirometry at the Pulmonary Function Test Laboratory of Professor Mazzini Bueno Tuberculosis Care, Fluminense Federal University, Brazil

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Abstract | **Case Report**

Demography involves the scientific study of human populations. The spirometry exams assess lung ventilatory function. The objectives were to report the demographic profile of patients undergoing spirometry at the Professor Mazzini Bueno Tuberculosis Care, which is linked to the Faculty of Medicine of the Fluminense Federal University (CAIT-UFF) in the municipality of Niterói, State of Rio Janeiro, Brazil, during the period from July 2017 to July 2023, and to compare this data with the results of the most recent Brazilian Institute of Geography and Statistics (IBGE) census (2022). A total of 432 spirometries were performed, with a median age of 60 years (range 14–89). The female patients accounted for 59%, significantly more than males ($\chi^2 = 13.526$; $p = 0.0002$). Former smokers comprised 44% of the cohort, followed by nonsmokers (38%) and 18% of active smokers ($\chi^2 = 49.681$; $p < 0.0001$). The main indications for spirometry were asthma, rhinosinusitis, and COPD. The most patients residing in São Gonçalo city (66%). The demographic data patients align with official IBGE results.

Keywords: Demographics; spirometry; age; sex; smoking.

INTRODUCTION

Demography is the scientific analysis of human populations, examining their characteristics and temporal changes. It contributes to crafting effective policies in health, education, public safety, and economics. The term comes from the Greek words for population ("dêmos") and to study ("gráphein"), first used by Achille Guillard in 1855. A demographic profile represents a group's features, including population size, age, sex, geographic distribution, migration, religion, education, and ethnicity [1].

Spirometry evaluates ventilatory lungs function to identify obstructive, restrictive, or mixed disorders [**2**]. Despite a decline, chronic noncommunicable respiratory diseases are still the fourth leading cause of death in Brazil [**3**]. Considering the well-known management principle, often attributed to Professor Peter Drucker (1909-2005), that "what is not measured cannot be improved," the objectives of this study were to report the demographic profile of patients undergoing spirometry exams and compare them with the results of the last IBGE census in the State of Rio de Janeiro, Brazil.

Cases Presentation, Methods, and Results

This retrospective observational study was conducted using secondary data extracted from anonymized medical records. No identifiable personal information was available to the investigators at any stage of the study. In accordance with the ethical principles outlined by the Declaration of Helsinki and the International Ethical Guidelines for Health-related Research Involving Humans (CIOMS), research involving fully anonymized data may be exempt from formal review by a Research Ethics Committee or Institutional Review Board, depending on local regulations [**4, 5**].

Patients referred for spirometry testing were sent by primary healthcare units throughout the metropolitan region of the state of Rio de Janeiro. The equipment used was an 8-liter volumetric spirometer (Spirom 2®) with Spiromatic® software, calibrated prior to testing according to the manufacturer's instructions. Printed reports reviewed were generated in accordance with guidelines from the American Thoracic Society and the Brazilian Thoracic Association [**2**]. The statistical analysis employed nonparametric tests. A significance level was set at $p < 0.05$, utilizing MedCalc and GraphPad Prism software.

The study included 432 spirometry, with a majority of female patients (59% vs. 41% male), showing a significant difference ($\chi^2 = 13.526$; $p = 0.0002$). The Shapiro–Wilk test indicated that the age data was not normally distributed ($W = 0.9320$; $p < 0.0001$), resulting in a median age of 60 years (range 14.0–89.0). The coefficient of variation (CV) for age was 28% (Wilcoxon test = 91,806; $p < 0.0001$), indicating heterogeneity because CV below 25% is considered homogeneous. The presentation of smoking addiction among patients referred for spirometry is summarized in Table 1. A former smoker was defined as an individual who had not smoked any type of tobacco for at least six months [6].

Table 1: Prevalence of smoking status among patients who underwent spirometry at the Professor Mazzini Bueno Tuberculosis Care of Fluminense Federal University in Rio of Janeiro State, Brazil, covering the period from July 2017 to July 2023

Smoking status	Patient (N=432)	Prevalence (%)
Former smoker	192	44.0
Nonsmoker	163	38.0
Current smoker	77	18.0

Statistical note: The histogram chart had a significant negative trend line among the groups ($\chi^2 = 49,681$; $p < 0.0001$).

The main indications were asthma, rhinosinusitis and COPD, bronchiectasis, sequelae of pulmonary tuberculosis, and others. The main municipalities of residence were São Gonçalo (66%), Niterói (25%), and others.

Discussion

Retrospective studies are essential in clinical research for exploring real-world data, especially when prospective studies are impractical. They are best used for hypothesis generation, epidemiological insights, and preliminary evidence**,** but their findings should ideally be confirmed with more robust study designs [**7**].

The population of Rio de Janeiro State in 2022 was 6,211,223, comprising 53% women and 47% men [**9**]. Our study of 432 exams indicated that 59% of patients were female and 41% male, with a median age of 60 years (range 14-89). The census revealed that 13% of the population was 65 years or older, while 17% were children [**8**]. At CAIT, 18% of patients were smokers (**Table 1**). The Surveillance System for Risk and Protective Factors for Chronic Diseases through Telephone Survey (VIGITEL) data from 2010-2013 indicated that smoking prevalence in Rio de Janeiro State varied from 21% to 34% depending on socioeconomic strata, although there has been a notable decrease over time attributed to effective tobacco control policies in Brazil [**9**]. Smoking cessation treatment has been implemented in primary health care units of the Brazilian Unified Health System, with structured services offering behavioral and pharmacological interventions [**9**].

A limitation of this study is the small number of demographic factors examined, suggesting that further variables should be included in future research [**1**].

Conclusions

The demographic data of patients referred for spirometry exams at CAIT-UFF aligns with the official IBGE report.

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References

1. Guillard, A. (1855). *Éléments de statistique humaine, ou démographie comparée*. Guillaumin.
2. Albuquerque, A. L. P., Berton, D. C., Campos, E. V. M. F. Á. S., Queiroga-Júnior, F. J. P., Santana, A. N. C., Wong, B. M. S., *et al.,* (2025). New spirometry

recommendations from the Brazilian Thoracic Association: 2024 update. *Jornal Brasileiro de Pneumologia, 50*(6), e20240169.

3. Ministério da Saúde, Secretaria de Vigilância em Saúde, Departamento de Análise em Saúde e Vigilância de Doenças Não Transmissíveis. (2021). *Saúde Brasil 2020/2021: Uma análise da situação de saúde e da qualidade da informação.* Ministério da Saúde.
4. World Medical Association. (2013). World Medical Association Declaration of Helsinki: Ethical principles for medical research involving human subjects. *JAMA, 310*(20), 2191–2194.
5. Council for International Organizations of Medical Sciences (CIOMS), & World Health Organization. (2016). *International ethical guidelines for health-related research involving humans*. CIOMS.
6. Hughes, J. R., Keely, J. P., Niaura, R. S., Ossip-Klein, D. J., Richmond, R. L., & Swan, G. E. (2003). Measures of abstinence in clinical trials: Issues and recommendations. *Nicotine & Tobacco Research*, *5*(1), 13–25.
7. von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., & Vandenbroucke, J. P. (2008). The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: Guidelines for reporting observational studies. *Journal of Clinical Epidemiology, 61*(4), 344–349.
8. Instituto Brasileiro de Geografia e Estatística (IBGE). (2022). *Indicadores sociodemográficos e de saúde no Brasil: 2022*.
9. Ministério da Saúde. (2024). *Vigitel Brasil 2023: Vigilância de fatores de risco e proteção para doenças crônicas por inquérito telefônico*. Ministério da Saúde.