

DEMOGRAPHIC PROFILE OF GASTROENTEROLOGICAL DISEASES IN THE BRAZILIAN AMAZON: EVIDENCE FROM A UNIVERSITY REFERRAL HOSPITAL

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Abstract: Background: Gastrointestinal diseases represent an important cause of morbidity and healthcare utilization worldwide. Their distribution is influenced by demographic, social and territorial determinants (OMRAN, 1971; STARFIELD, 1998). Objective: To analyze the demographic profile of patients with gastrointestinal diseases treated at a university referral hospital in the Brazilian Amazon. Methods: Cross-sectional observational study based on 237 medical records collected between 2019 and 2020. Results: Male sex, age above 50 years, low educational level and origin from inland municipalities predominated among patients. Conclusions: Demographic and social determinants strongly influence access to specialized gastroenterology services in the Amazon region.

Keywords: Gastroenterology; Demography; Epidemiology; Social Determinants of Health; Amazon; Public Health.

Introduction

Gastroenterological diseases represent an important component of the global burden of

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disease, accounting for millions of outpatient visits, hospital admissions, and deaths annually (BRAY et al, 2024; WHO, 2024). In addition to the biological factors traditionally associated with illness, evidence accumulated in recent decades shows that demographic and social variables exert a significant influence on the occurrence, diagnosis, and evolution of these diseases (MARMOT, WILKINSON, 2006; BUSS, PELLEGRINI, 2007).

The theory of epidemiological transition proposed by Omran (1971) describes the process by which populations subjected to progressive aging present an increase in the prevalence of chronic diseases, including various gastrointestinal diseases. This phenomenon has been observed in different countries and manifests itself particularly intensely in regions marked by socioeconomic inequalities and limited access to specialized services (WHO, 2024).

At the same time, studies conducted by Marmot and Wilkinson (2006) have shown that the social determinants of health directly influence the disease profile of populations. Schooling, income, housing conditions, and access to health services condition not only the occurrence of diseases, but also the diagnostic opportunity and clinical outcomes.

In Brazil, such inequalities take on particular characteristics in the Amazon Region. The vast territorial extension, population dispersion, dependence on river transport and the concentration of specialized services in the capitals produce additional barriers to timely access to diagnosis and treatment (SANTOS, 2006; PAHO, 2022; IBGE, 2024).

In this context, the Getúlio Vargas University Hospital, located in Manaus, is an important regional reference center for gastroenterological care, receiving patients from various locations in Amazonas and neighboring states. The demographic profile of this assisted population provides relevant information for understanding the social and territorial determinants related to gastroenterological diseases in the Amazon.

In view of this scenario, the present study aims to analyze the demographic profile of patients treated at the Gastroenterology Service of the Getúlio Vargas University Hospital, emphasizing the variables sex, age, marital status, place of birth, and education, seeking to understand their relationship



with the social and territorial inequalities characteristic of the Amazon region.

Method

Design

This is an observational, cross-sectional, descriptive and analytical-exploratory study, conducted from secondary data from the clinical records of patients treated at the Diagnostic Imaging Unit of the Gastroenterology Service of the Getúlio Vargas University Hospital, in Manaus, Amazonas, Brazil.

The design followed classic recommendations of observational epidemiology described by Rothman, Greenland, and Lash (2008).

Population and sample

The sample consisted of 237 patients treated between January 2019 and December 2020, selected based on the eligibility criteria previously established in the main research.

Variables analyzed

The following variables were evaluated:

- Sex;
- Age group;
- Marital status;
- Naturalness;
- Origin;



- Schooling.

Data analysis

The data were submitted to descriptive analysis using absolute and relative frequencies. The interpretation of the results was based on the references of the social determinants of health (MARMOT, WILKINSON, 2006; BUSS, PELLEGRINI, 2007), the epidemiological transition (OMRAN, 1971) and the organization of health care networks (STARFIELD, 1998; MENDES, 2011).

Ethical aspects

The research observed the ethical principles provided for in Resolution No. 466/2012 of the National Health Council (BRASIL-MS, 2017), preserving the anonymity and confidentiality of the participants.

Results

Distribution by sex

The analysis of the gender variable showed a slight predominance of males (58.6%; n=139) compared to females (41.4%; n=98) among patients treated at the Gastroenterology Service of the Getúlio Vargas University Hospital.

This pattern follows trends observed in several epidemiological studies that identify a higher frequency of chronic liver diseases, portal hypertension and gastrointestinal complications in men, especially in populations exposed to behavioral and occupational risk factors (GARCIA-TSAO, BOSCH, 2010; BRAY et al, 2022; WHO, 2024).

Although the difference observed between the sexes was not significantly high, the results



suggest that biological and sociocultural factors may influence the pattern of use of specialized gastroenterology services.

Distribution according to age

The age variable presented one of the most relevant results of the study.

There was a predominance of individuals over fifty years of age, evidencing a significant concentration of patients in the age groups associated with population aging.

This finding is compatible with the epidemiological transition model described by Omran (1971) and with the most recent reports of the World Health Organization (2024), which demonstrate a progressive growth in chronic non-communicable diseases as the life expectancy of populations increases.

The predominance of elderly patients and mature adults suggests that the demand for specialized gastroenterological care is strongly associated with population aging and the accumulation of risk factors throughout life.

Marital status

Regarding marital status, there was a predominance of individuals who were married or in a stable union.

This pattern is often identified in studies involving adult and elderly populations, reflecting the demographic composition of the predominant age groups in the sample (IBGE, 2024).

However, marital status can also act as an indirect indicator of social support, an element recognized by the literature as an important factor associated with the search for health services, therapeutic adherence and coping with chronic diseases (MARMOT, WILKINSON, 2006; BUSS, PELLEGRINI, 2007).



Place of birth and origin

The analysis of place of birth revealed a predominance of individuals born in the State of Amazonas.

Likewise, the origin of the patients showed a strong concentration of users from municipalities in the interior of Amazonas.

This result highlights the regional role played by the Getúlio Vargas University Hospital in specialized gastroenterological care.

From the perspective of the geography of health, this distribution confirms the persistence of important territorial inequalities in the supply of specialized services, a phenomenon widely described by Santos (2006) and by studies on the regionalization of care in the Unified Health System (MENDES, 2011; BRAZIL-MS, 2010; GIOVANELLA et al, 2024).

Dependence on services concentrated in the capital imposes prolonged commutes, high indirect costs, and potential delay in access to specialized diagnosis (PAHO, 2022; IBGE, 2024).

Education

Schooling proved to be one of the main social markers identified in this investigation.

There was a predominance of patients with incomplete primary education or low formal education.

This pattern reinforces the influence of social determinants of health on the distribution of gastroenterological diseases and access to specialized services (MARMOT, WILKINSON, 2006; BUSS, PELLEGRINI, 2007).

According to Marmot and Wilkinson (2006), schooling has a direct influence on the ability to understand health-related information, recognize signs of illness and seek care in a timely manner.



The results suggest that educational vulnerability is an important component of the demographic profile of the patients treated at the service studied.

Discussion

The results of this investigation demonstrate that the demographic profile of patients treated at the Gastroenterology Service of the Getúlio Vargas University Hospital is characterized by the interaction between population aging, social inequalities and territorial barriers to access to specialized care.

The predominance of individuals over fifty years of age reinforces the influence of the demographic and epidemiological transition on the demand for specialized services (OMRAN, 1971; WHO, 2024). Population aging has been accompanied by an increase in the incidence of chronic digestive diseases, liver diseases, and gastrointestinal neoplasms in different regions of the world (BRAY, 2022; SUNG, 2021).

Demography of Amazonian Aging

The aging observed in the population studied follows a demographic trend already identified in different Brazilian regions, including the Legal Amazon. Although historically the North Region has had a younger age structure compared to other regions of the country, recent data from the Brazilian Institute of Geography and Statistics show continuous growth in the elderly population, as a result of the reduction in fertility and the increase in life expectancy (IBGE, 2024; UNITED NATIONS, 2024).

According to United Nations projections, population aging is one of the most important demographic phenomena of the twenty-first century, producing profound transformations in health systems and increasing the demand for specialized services aimed at the management of chronic



diseases (UNITED NATIONS, 2024). Beard et al. (2016) highlight that increased longevity is associated with the expansion of complex chronic conditions and the need for integrated care models.

In the Amazon, this process has particular characteristics. The coexistence of large geographical distances, infrastructure limitations, and unequal distribution of specialized services enhances the impacts of population aging on the care network. As a consequence, there is a growing demand for tertiary services capable of treating patients with multiple clinical conditions and more complex diagnostic needs.

In this context, the age profile identified in this investigation can be interpreted not only as an expression of the biological characteristics of gastroenterological diseases, but also as a reflection of the demographic transformations currently underway in the Amazon region (BEARD et al, 2016; PRINCE et al, 2015).

The male predominance observed in this study follows findings described in international investigations involving liver diseases and portal hypertension (GARCIA-TSAO, BOSCH, 2010). Such distribution may reflect behavioral differences related to the use of health services, occupational exposure, and the prevalence of certain risk factors.

In the field of social determinants, the low level of education identified in the population studied deserves special attention. The literature shows that individuals with less schooling tend to have lower health literacy, greater difficulty in navigating care systems and less access to preventive strategies (MARMOT, WILKINSON, 2006; BUSS, PELLEGRINI, 2007).

Education and Health Literacy

The relationship between schooling and health goes beyond the simple statistical association between years of schooling and the occurrence of diseases. In recent decades, the concept of health literacy has become an important reference for understanding the inequalities observed in access to and use of health care services.



Braveman and Gottlieb (2014) highlight that individuals with less schooling often have greater difficulties in understanding medical information, interpreting therapeutic guidelines and recognizing signs and symptoms of illness early. These limitations can directly influence the demand for care, adherence to treatment, and the clinical results obtained.

Solar and Irwin (2010), in a document developed for the World Health Organization, argue that education is one of the main structural determinants of health inequalities, influencing economic opportunities, living conditions, and access to the social resources necessary to maintain well-being.

In the Amazonian context, where geographical barriers often add to socioeconomic vulnerabilities, low education can further amplify difficulties in accessing specialized diagnosis. Thus, the results suggest that health education strategies and strengthening health literacy should be considered fundamental components of public policies aimed at reducing care inequalities in the region (MARMOT, WILKINSON, 2006; BUSS, PELLEGRINI, 2007; BRAVEMAN, GOTTLIEB, 2014; SOLAR, IRWIN, 2010).

The social vulnerability observed in this investigation can also be understood in the light of the concept of structural violence proposed by Farmer et al. (2006), according to which historical and socioeconomic inequalities directly influence the opportunities for access to health services and the patterns of illness of populations. From a systemic perspective, Frenk (2010) highlights that effective health systems depend on the ability to reduce inequalities and adapt their responses to the specific needs of different population groups. In addition, Donabedian (1988) argues that the quality of care should be evaluated not only by the clinical results achieved, but also by the system's ability to ensure timely, equitable and continuous access to health care.

From the territorial point of view, the results show a classic pattern of care centralization. The concentration of patients from the interior of Amazonas confirms the regional dependence on specialized centers located in the capital (MENDES, 2011; SANTOS, 2006; BRAZIL-MS, 2010).

This scenario is supported by studies that analyze the organization of the Unified Health System on a national scale. Paim et al. (2011) demonstrate that, although the SUS has significantly



expanded access to health services in recent decades, important regional inequalities persist related to the distribution of care resources and specialized infrastructure. Similarly, Szwarcwald et al. (2016) identified significant differences in the use of health services associated with socioeconomic, educational, and territorial factors. Such evidence suggests that the inequalities observed in this investigation do not represent an isolated phenomenon, but rather an expression of structural challenges still present in the Brazilian health system.

The vast territorial extension of the Amazon, associated with logistical difficulties and the predominance of river transport, is an important structural determinant of access to specialized care (PAHO, 2022; IBGE, 2024).

Studies developed specifically in the Amazon reinforce this interpretation. Garnelo, Sousa and Silva (2017) demonstrate that the processes of regionalization of care face particular obstacles resulting from population dispersion, low population density and infrastructure limitations existing in much of the region. Confalonieri (2005) points out that the environmental, geographic and socioeconomic conditions of the Amazon have a direct influence on the organization of health services and on the patterns of illness observed in the population. From a geopolitical perspective, Becker (2007) argues that the historical process of occupation and regional development favored the concentration of investments and specialized services in the capitals, contributing to the maintenance of territorial inequalities that remain visible today.

The results found also dialogue with recent studies on regionalization and health care networks. Viana et al. (2018) emphasize that the consolidation of regionalized networks depends on the articulation between territorial governance, installed capacity, and care integration. In a complementary way, Mendes et al. (2012) demonstrate that the supply of specialized care remains unevenly distributed in the Brazilian territory, contributing to regional differences in the patterns of access and use of health services. These findings reinforce the need for specific strategies to expand diagnostic and care capacity in historically vulnerable regions, such as the Amazon. Additionally, Macinko and Mendonça (2018) highlight that strengthening the Family Health Strategy is one of the



most effective mechanisms to expand care coordination, reduce inequalities in access, and increase the problem-solving capacity of Primary Health Care.

From this perspective, the demographic profile observed goes beyond its descriptive dimension and starts to reflect structural characteristics of the organization of health services.

Conclusion

The demographic profile of the patients treated at the Gastroenterology Service of the Getúlio Vargas University Hospital is characterized by the predominance of men, individuals over fifty years of age, low education and mostly from municipalities in the interior of Amazonas. These findings demonstrate that the specialized demand for gastroenterology in the Brazilian Amazon is strongly influenced by population aging, educational inequalities, and territorial barriers to access to health services.

The results show that demographic, social and territorial factors exert a significant influence on the use of specialized services, revealing that access to gastroenterological care remains conditioned by important structural inequalities. In this context, the profile observed goes beyond its merely descriptive dimension and starts to reflect characteristics of the organization of the regional care network and the social determinants that condition the health-disease process.

The findings corroborate the national and international literature that recognizes the social determinants of health, the regionalization of care and the organization of care networks as fundamental elements for understanding health inequalities (MARMOT, WILKINSON, 2006; BUSS, PELLEGRINI, 2007; STARFIELD, 1998; MENDES, 2011; SANTOS, 2006; BRAZIL-MS, 2017; BRAZIL-MS, 2010; GIOVANELLA et al, 2024; BRAVEMAN, GOTTLIEB, 2014; SOLAR, IRWIN, 2010). More than describing individual characteristics of patients, this study demonstrates how demographic, social, and territorial factors influence timely access to diagnosis and the use of specialized care.



The results suggest that strategies aimed exclusively at expanding hospital capacity will be insufficient to change this scenario. The reduction of care inequalities requires strengthening Primary Health Care, expanding regional diagnostic capacity, qualifying health education actions, strengthening health literacy and improving mechanisms for regionalizing care.

By integrating health demography, social determinants, and organization of services, this investigation broadens the understanding of gastroenterological diseases beyond their clinical dimension, contributing to the development of more comprehensive approaches aimed at planning, managing, and strengthening the Unified Health System in contexts marked by high territorial vulnerability, such as the Brazilian Amazon.

Study Contributions

The present study contributes to the literature by demonstrating that the demographic profile of patients treated in specialized gastroenterology services can be used as an indirect indicator of the conditions of access to health services and the territorial organization of care.

In addition, it expands knowledge about the social determinants associated with the use of specialized care in the Brazilian Amazon.

Implications for Health Management

The results suggest the need to strengthen Primary Health Care (STARFIELD, 1998; BRAZIL-MS, 2017), expansion of regional diagnostic capacity (MENDES, 2011; BRASIL-MS, 2010) and the development of specific strategies for populations living in geographically remote areas.

The low level of education observed also reinforces the importance of health education and communication actions adapted to the sociocultural characteristics of the population served (MARMOT, WILKINSON, 2006; BUSS, PELLEGRINI, 2007).



Prospects for Future Research

Future studies may investigate the association between demographic profile, time to diagnosis and clinical severity of gastroenterological diseases.

Spatial analyses capable of identifying priority areas for expanding the supply of specialized services are also recommended (SANTOS, 2006; TRAVASSOS, CASTRO, 2024).

Originality and Scientific Contribution

The main originality of this study lies in the interpretation of the demographic profile as an expression of the structural determinants that condition access to specialized care.

More than describing population characteristics, the investigation demonstrates how social and territorial factors influence the use of gastroenterology services in the Amazon.

Although studies on demographic profiling are relatively frequent in the epidemiological literature, the present investigation proposes a broader interpretation of population data by understanding demographic variables as indirect indicators of structural determinants of access to specialized care.

Traditionally, gender, age, education and origin are used only to characterize the populations studied. In this study, however, these variables are analyzed as expressions of the social, territorial and organizational conditions that influence the care path of patients.

From this perspective, the identified demographic profile is no longer just a population description and becomes an analytical tool for understanding health inequalities in the Amazon.

This approach expands the interpretative potential of epidemiological studies and brings health demography closer to contemporary references of the social determinants of health, the geography of health, and the organization of care networks.



Potential Applications of the Results

The findings may support:

- regional health planning;
- organization of care networks;
- definition of care priorities;
- territorial distribution of diagnostic resources;
- development of health education programs aimed at vulnerable populations.

The results of this investigation can be applied at different levels of health management and planning.

In the context of Primary Care, the findings allow the identification of priority population groups for health education, screening and surveillance of gastroenterological diseases.

In regional management, the data can support processes of regionalization of care, distribution of diagnostic resources, and definition of priority areas for investments in health infrastructure.

In epidemiological surveillance, the identified demographic profile can serve as a reference for monitoring population trends associated with gastroenterological diseases in the Amazon.

In the academic field, the study offers a methodological basis for comparative investigations involving other medical specialties and different Brazilian regions.

Limitations and Strengths

Among the limitations are the use of secondary data and the dependence on the quality of clinical records (ROTHMAN, GREENLAND, LASH, 2008).

As strengths, the regional representativeness of the sample and the integration between



demographic, social and territorial variables stand out, an approach that has not yet been explored in the national literature.

Statement of Public Health Relevance

The results reinforce that the inequalities observed in gastroenterological care do not result exclusively from the occurrence of diseases, but also from demographic, social and territorial conditions that shape access to specialized services.

Understanding these factors is essential for the development of strategies aimed at reducing health inequities, especially in regions characterized by large geographical distances and high social vulnerability.

By evidencing the relationship between population aging, low schooling and dependence on specialized services concentrated in the capital, this study contributes to the strengthening of public policies guided by equity and social justice.

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