GIGAPP Estudios Working Papers
ISSN 2174-9515. Año (2025), Vol.10. Núm.292, págs. 779-792

DOI: 10.5281/zenodo.15322412

# Trends in health care quality, resolubility, and population longevity in Brazil, 1998-2019

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Documento recibido: 29 septiembre 2024
Aprobado para publicación: 01 marzo 2025

## Resumen

El presente estudio investiga las asociaciones entre las dimensiones de calidad y la resolubilidad de la atención primaria de salud en Brasil, según grupos de edad. Este estudio comprende un análisis cuantitativo de datos de encuestas transversales representativas a nivel poblacional en 2008, 2003, 2008, 2013 y 2019. Los resultados indican una asociación positiva entre la evaluación de la buena calidad de la atención médica y la resolubilidad, con mayores efectos en adultos que en personas mayores. Por el contrario, el buen estado de salud presentó un menor efecto en la calidad de la atención médica en adultos que en personas mayores. La multimorbilidad y la asistencia a centros públicos mostraron efectos negativos en la evaluación de la calidad de la atención médica en adultos y personas mayores. Los hallazgos mostraron que el aumento de la longevidad de la población, la resolubilidad de la atención médica, el estado de salud, la multimorbilidad y la asistencia a centros públicos de salud se asocian con la percepción de la calidad de la atención médica en Brasil. El estudio contribuye a la literatura

sobre la asociación entre la calidad y la resolubilidad de la atención médica, abordando cuestiones emergentes relacionadas con la transición demográfica.

Palabras clave: Calidad de la atención médica; Resolubilidad en salud; Envejecimiento; Costos de la atención médica; Gestión del sistema de salud; Brasil

## Abstract

The present study investigates associations between dimensions of quality and resolubility of primary health care in Brazil, according to age groups, comprising quantitative analysis of data from cross-sectional surveys representative at population level in 2998, 2003, 2008, 2013, and 2019. The results indicate positive association between evaluation of good health care quality and resolubility with higher effects among adults than elderly individuals. Contrarily, good health status presented lower effect on health care quality among adults than elderly individuals. Multimorbidity and attendance to public facilities showed negative effects on evaluation of health care quality among adults and elderly individuals. The findings showed that increase in population longevity, health care resolubility, health status, multimorbidity, and attendance to public healthcare facilities are associated with perception of health care quality in Brazil. The study contributes to the literature on association between quality and resolubility of health care, addressing emerging issues related to demographic transition.

Keywords: Health care quality; Resolubility in health; Aging; Health care costs; Health system management; Brazil

## Resumo

O presente estudo investiga as associações entre as dimensões da qualidade e da resolubilidade da atenção primária à saúde no Brasil, segundo faixas etárias, por meio da análise quantitativa de dados de inquéritos transversais representativos da população em 2019, 2003, 2008, 2013 e 2019. Os resultados indicam associação positiva entre a avaliação da boa qualidade da atenção à saúde e a resolubilidade, com efeitos mais significativos entre adultos do que entre idosos. Por outro lado, o bom estado de saúde apresentou menor efeito na qualidade da atenção à saúde entre adultos do que entre idosos. A multimorbidade e a frequência a serviços públicos apresentaram efeitos negativos na avaliação da qualidade da atenção à saúde entre adultos e idosos. Os achados mostraram que o aumento da longevidade populacional, a resolubilidade da atenção à saúde, o estado de saúde, a multimorbidade e a frequência a serviços públicos de saúde estão associados à percepção da qualidade da atenção à saúde no Brasil. O estudo contribui para a literatura sobre a associação entre qualidade e resolubilidade da atenção à saúde, abordando questões emergentes relacionadas à transição demográfica.

Palavras-chave: Qualidade da atenção à saúde; Resolubilidade em saúde; Envelhecimento; Custos da atenção à saúde; Gestão do sistema de saúde; Brasil

## Introduction

The Brazilian health system was designed to provide universal health care coverage for the population, focusing on the provision of care, free of charge for individuals in the context of the Brazilian Unified Health System (*Sistema Único de Saúde*, SUS). Public and private facilities linked to the SUS should supply comprehensive care for patients financed by the government through taxes, whereas the provision of health care in the private sector is predominantly financed through health insurance or out-of-pocket disbursements (Britnell, 2015; Moreira et al., 2024). The focus on universal health coverage in Brazil is reinforced through household visits by multiprofessional health teams promoted in the Family Health Strategy program (*Estratégia de Saúde da Família*, ESF) (Nishijima, Sarti & Schor, 2020; Nishijima et al., 2019; Cerda et al., 2022).

Evidence from diverse countries shows that strengthening primary health care through strategies towards health promotion and disease prevention reduces the risk of financial burden associated with hospitalizations due to chronic diseases linked to the ongoing process of demographic transition (Bitton et al., 2017; Huber et al., 2020; Sawicki et al., 2021; Zhou et al., 2020). The increase in population longevity represents a challenge in the management of health systems worldwide, considering the effects of population ageing on the prevalence of chronic diseases, and their impacts on health care costs (Baldwin, 2020; Travassos, Coelho & Arends-Kuenning, 2020; Zurynski et al., 2021; Trindade et al., 2024). The ability of health systems to provide high-quality health care in a timely manner ensures effectiveness for resolution of health demands of the population, particularly referring to (Bitton et al., 2017; Donabedian, 2005).

Although quality and resolubility of health care play important roles in maintaining individuals' well-being, ensuring longevity with quality of life, major part of the literature on the associations between evaluation of health care quality and resolubility at primary level focuses on national health systems in high-income countries (Sekhon, Cartwright & Francis, 2017; Bilger, Pletscher & Müller, 2024). In particular, the lack of comprehensive data collection at population level limits investigations on the factors associated with access and utilization of primary health care in developing countries, especially in Latin American countries (Doubova et al., 2016; Houghton, Bascolo & del Riego, 2020). Thus, the present study investigates associations between dimensions of quality and resolubility of primary health care in Brazil, according to age groups, focusing on potential effects of demographic transition in the country.

## Materials and Methods

### Study design

The study comprises quantitative analysis of microdata from five cross-sectional surveys representative at population level, conducted by the Brazilian Institute for Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística*, IBGE) in 1998, 2003, 2008, 2013, and 2019.

## Datasets

The datasets included in the study comprise publicly available information from individuals participating in nationwide surveys designed to support evidence-based decision making in public policies in Brazil, accessible at the platform of IBGE (https://www.ibge.gov.br/estatisticas/sociais/saude.html).

The datasets include three National Household Sample Surveys (*Pesquisa Nacional por Amostra de Domicílios*, PNAD), performed in 1998, 2003 and 2008, and two National Health Surveys (*Pesquisa Nacional de Saúde*, PNS), performed in 2013 and 2019. The PNAD comprises annual survey focusing demographic and socioeconomic characteristics of the general population in Brazil, based on data collection of individuals in households selected through complex sampling design in three stages, including supplementary information on health status and health care utilization by individuals in 1998, 2003, and 2008. The PNS refers to regular survey focusing on health characteristics of the adult population in Brazil, encompassing information on individuals selected through complex sampling design in three stages.

Data collection was performed through validated questionnaires applied by trained interviewers, based on close-ended questions designed to gather information on demographic, socioeconomic, and health characteristics of individuals. The information collected by IBGE was compiled into text files, transcribed according to codebooks available on official documentation of each survey. Procedures adopted in data collection, storage, and management were performed in accordance with the Declaration of Helsinki and the legal framework in Brazil.

The analyses conducted in the present study included information collected through questions with similar phrasing and responses in PNAD and PNS datasets, ensuring adoption of data comparable across surveys. Considering that PNS includes only adult individuals (≥18 years old), information from PNAD selected for the study included only adult individuals.

## Variables

The variables selected in PNAD and PNS datasets comprised information on demographic, socioeconomic, and health characteristics of individuals, in addition to household and survey characteristics, collected during the surveys by the IBGE. The information selected in the datasets of the surveys was organized into a single database containing re-coded variables according to the following formats:

- Demographic characteristics: sex (male=0, female=1), age (continuous in years), self-declared skin color/ethnicity (discrete: black, brown, indigenous, white, and yellow);
- Socioeconomic characteristics: educational attainment (continuous in years of education), occupational status (unemployed=0, employed=1);
- Health characteristics: self-assessed health status (very poor to regular=0, good or very good=1), difficulty to walk (no=0, yes=1), diagnosis of multimorbidity (no=0, yes=1), health insurance ownership (no=0, yes=1), utilization of health care in the last two weeks (no=0, yes=1), type of health care facility (private=0, public=1), health care financing through health insurance (no=0, yes=1), health care financing out-of-pocket (no=0, yes=1), health care financing through the SUS (no=0, yes=1), health care quality (very poor to regular=0, good or

very good=1), health care resolubility (continuous in proportion of days in the last two weeks attending health care facilities until resolution of the health issue);
- Household characteristics: household size (discrete in household residents), household income per capita (continuous in purchase power parity in 2022);
- Survey characteristic: year.

The diagnosis of multimorbidity was based on the declaration of simultaneous occurrence of two or more medical diagnoses of the following diseases: arthritis, asthma, cancer, chronic kidney disease, depression, diabetes, heart diseases, hypertension, orthopedic problems, and tendinitis.

Individuals declaring utilization of health services two weeks before the survey were asked to assess health care quality, assigning scores from 5-point Likert scale from very poor to very good quality. The evaluations referring to good and very good scores were converted into binary variable referring to evaluation of good quality of health care.

The resolubility of health care was determined through the inverse proportion of days attending health care facilities until resolution of individuals' health issues within the two weeks previous to the survey, i.e., individuals indicating lower attendance until resolution of their health issues were assigned higher resolubility scores, and vice-versa.

The household income per capita was estimated through sum of household residents' incomes updated to 2022 using official consumers prices index in Brazil and converted into purchase power parity using the correspondent conversion factor obtained from the World Development Indicators platform of the World Bank (https://databank.worldbank.org/reports.aspx?source=world-development-indicators).

## Statistical analysis

Statistical analyses in the study were conducted based on distribution of individuals in two age groups: adults (individuals 18-19 years old) and elderly (≥60 years old). Descriptive statistics were based on mean and standard errors for continuous variables, and frequencies for binary variables. Marginal effects based on pairwise comparisons were calculated to identify differences in perception of health care quality and resolubility between adults and elderly individuals.

Logistic regression models were estimated to investigate the associations between evaluation of quality and resolubility of health care according to age group (adults and elderly individuals). The logistic models included control variables of individual (sex, age, skin color, etc.), household (per capita income, household members, etc.), and geographic characteristics (area and state), and type of health care financing (public sector funding, health insurance, or out-of-pocket expenditures).

Statistical analyses were performed through Stata, version 17 (Stata Corp.), using complex survey design to ensure representativeness at population level, and adopting significance level of 5% ($p<0.05$).

## Results

The results confirm the occurrence of demographic transition in Brazil, showing increase in the age of adults (from 34.97 to 37.86 years old) and elderly individuals (from 69.51 to 70.10 years old) between 1998 and 2019. Furthermore, the proportions of women and individuals declaring white skin color living in urban areas were higher among elderly individuals in comparison to adults, whilst educational attainment and residents in the households were lower among the elderly.

***Table 1. Characteristics of adults and elderly individuals (%). Brazil, 1998-2019.***

| Variables | ADULTS | | | | | ELDERLY | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1998 | 2003 | 2008 | 2013 | 2019 | 1998 | 2003 | 2008 | 2013 | 2019 |
| **Sex** | | | | | | | | | | |
| Male | 48.48 | 48.34 | 48.40 | 47.87 | 47.81 | 44.48 | 44.07 | 43.83 | 43.62 | 43.32 |
| Female | 51.52 | 51.66 | 51.60 | 52.13 | 52.19 | 55.52 | 55.93 | 56.17 | 56.38 | 56.68 |
| **Age†** | 34.97 | 35.21 | 36.08 | 36.89 | 37.86 | 69.51 | 69.77 | 69.94 | 69.89 | 70.10 |
| | 0.11 | 0.03 | 0.04 | 0.06 | 0.05 | 0.06 | 0.05 | 0.05 | 0.09 | 0.07 |
| **Skin color/ethnicity** | | | | | | | | | | |
| Black | 6.06 | 6.36 | 7.58 | 9.22 | 11.38 | 6.77 | 6.77 | 7.38 | 8.79 | 10.08 |
| Brown | 37.53 | 40.01 | 42.70 | 43.48 | 45.02 | 31.01 | 33.04 | 35.10 | 35.99 | 36.77 |
| Indigenous | 0.22 | 0.20 | 0.30 | 0.44 | 0.48 | 0.17 | 0.19 | 0.29 | 0.32 | 0.52 |
| White | 55.61 | 52.97 | 48.84 | 46.06 | 42.36 | 60.98 | 59.14 | 56.09 | 53.68 | 51.32 |
| Yellow | 0.58 | 0.46 | 0.58 | 0.79 | 0.76 | 1.07 | 0.86 | 1.14 | 1.22 | 1.31 |
| **Educational attainment†** | 7.47 | 8.36 | 9.26 | 10.21 | 10.83 | 3.80 | 4.30 | 4.99 | 5.89 | 6.92 |
| | 0.19 | 0.04 | 0.04 | 0.05 | 0.04 | 0.26 | 0.06 | 0.06 | 0.09 | 0.07 |
| **Occupational status** | | | | | | | | | | |
| Employed | 68.29 | 68.22 | 71.92 | 70.20 | 69.22 | 27.77 | 26.26 | 26.83 | 21.69 | 22.60 |
| Unemployed | 31.71 | 31.78 | 28.08 | 29.80 | 30.78 | 72.23 | 73.74 | 73.17 | 78.31 | 77.40 |
| **Household size†** | 4.48 | 4.22 | 3.93 | 3.71 | 3.49 | 3.42 | 3.24 | 3.03 | 2.89 | 2.62 |
| | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.04 | 0.02 | 0.01 | 0.02 | 0.01 |
| **Household income per capita†** | 707.99 | 642.66 | 777.93 | 1010.53 | 1027.05 | 755.91 | 753.16 | 926.31 | 1213.78 | 1279.82 |
| | 51.81 | 8.25 | 8.80 | 17.70 | 16.00 | 62.30 | 13.97 | 14.73 | 58.73 | 26.85 |
| **Health insurance** | 26.59 | 26.46 | 27.81 | 29.48 | 26.34 | 26.86 | 29.33 | 29.67 | 30.83 | 29.30 |
| **Good health status** | 76.84 | 77.22 | 76.27 | 87.93 | 88.03 | 39.34 | 43.59 | 45.01 | 73.84 | 72.05 |
| **Difficulty to walk** | 0.59 | 0.59 | 0.78 | 1.46 | 1.64 | 6.20 | 5.80 | 6.70 | 6.94 | 9.33 |
| **Diagnosis of multimorbidity** | 16.28 | 13.01 | 12.73 | 6.13 | 7.28 | 53.97 | 48.45 | 48.94 | 20.89 | 25.78 |
| **Health care last two weeks** | 13.18 | 14.37 | 14.35 | 14.77 | 17.71 | 21.46 | 24.36 | 22.72 | 24.95 | 27.54 |
| **Type of health care facility** | | | | | | | | | | |
| Public | 53.11 | 56.58 | 55.32 | 59.82 | 57.24 | 54.80 | 59.79 | 58.40 | 61.18 | 57.43 |
| Private | 46.89 | 43.42 | 44.68 | 40.18 | 42.76 | 45.20 | 40.21 | 41.60 | 38.82 | 42.57 |
| **Health care financing** | | | | | | | | | | |
| Health insurance | 28.67 | 28.00 | 27.51 | 30.79 | 29.94 | 28.51 | 27.74 | 27.87 | 27.35 | 29.45 |
| Out-of-pocket | 17.42 | 16.66 | 20.44 | 15.43 | 18.48 | 15.89 | 14.56 | 19.27 | 17.01 | 19.10 |
| SUS | 53.91 | 55.34 | 52.05 | 53.78 | 51.58 | 55.60 | 57.70 | 52.86 | 55.64 | 51.45 |
| **Good quality of health care** | 99.66 | 99.60 | 99.52 | 99.73 | 98.77 | 99.57 | 99.54 | 99.48 | 99.63 | 98.02 |
| **Health care resolubility†** | 95.98 | 96.03 | 96.36 | 99.49 | 98.21 | 95.39 | 95.34 | 95.51 | 99.66 | 98.01 |
| | 0.08 | 0.07 | 0.06 | 0.06 | 0.07 | 0.24 | 0.13 | 0.12 | 0.05 | 0.09 |
| **Area** | | | | | | | | | | |
| Urban | 81.79 | 85.80 | 84.93 | 86.54 | 86.40 | 85.74 | 88.57 | 87.54 | 88.3 | 88.76 |
| Rural | 18.21 | 14.20 | 15.07 | 13.46 | 13.60 | 14.26 | 11.43 | 12.46 | 11.7 | 11.24 |

Obs.: † Mean and standard error; SUS = Brazilian Unified Health System (funding through public sector).

Although unemployment was higher among the elderly individuals, household income per capita was higher due to payments associated with retirements and pensions. Furthermore, although health insurance coverage was similar among adults and elderly individuals, the utilization of health care in the two weeks previous to the survey was higher among the elderly in Brazil (Table 1).

The higher proportion of elderly individuals accessing health care was probably linked to the higher occurrence of diagnosis of multimorbidity and difficulty to walk, in addition to lower proportion of individuals declaring good health status. Yet, patterns of health care utilization were similar among adults and elderly individuals regarding funding sources and types of health care facilities. Major part of individuals in the population attended public health care facilities financed through the SUS (Table 1).

Pairwise comparisons showed a lack of significant differences in perception of health care quality between adults and elderly individuals between 1998 and 2013. However, elderly individuals tended to present lower perception of health care quality in 2019 (-0.008; p<0.001).

In general, there was lower health care resolubility among elderly individuals. Furthermore, there were increasing differences in the level of resolution of health issues between adults and elderly individuals from 1998 (-0.582; p<0.01) to 2008 (-0.852; p<0.001), followed by substantial changes in 2013 (0.163; p<0.05) and 2019 (-0.206; p<0.05) (Table 2).

***Table 2. Marginal effects in pairwise comparisons between adults & elderly individuals. Brazil, 1998-2019.***

| Marginal predictions | | 1998 | | 2003 | | 2008 | | 2013 | | 2019 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perception of healthcare quality | | | | | | | | | | | |
| Adults | Margin | 0.997 | | 0.996 | | 0.995 | | 0.997 | | 0.988 | |
| | SE | 0.000 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | |
| Elderly | Margin | 0.996 | | 0.995 | | 0.995 | | 0.996 | | 0.980 | |
| | SE | 0.000 | | 0.000 | | 0.000 | | 0.001 | | 0.001 | |
| Pairwise comparison | Contrast | -0.001 | | -0.001 | | 0.000 | | -0.001 | | -0.008 | *** |
| | SE | 0.000 | | 0.000 | | 0.000 | | 0.001 | | 0.001 | |
| Healthcare effectiveness | | | | | | | | | | | |
| Adults | Margin | 95.979 | | 96.031 | | 96.358 | | 99.493 | | 98.214 | |
| | SE | 0.077 | | 0.066 | | 0.060 | | 0.056 | | 0.065 | |
| Elderly | Margin | 95.396 | | 95.338 | | 95.505 | | 99.656 | | 98.008 | |
| | SE | 0.237 | | 0.130 | | 0.124 | | 0.053 | | 0.093 | |
| Pairwise comparison | Contrast | -0.582 | ** | -0.693 | *** | -0.852 | *** | 0.163 | * | -0.206 | * |
| | SE | 0.220 | | 0.138 | | 0.129 | | 0.076 | | 0.103 | |

Obs.: SE = standard error; * p<0.05; ** p<0.01; *** p<0.001.

Results of logistic regression models showed that higher health care resolubility, age, good health status, and living in rural areas presented positive associations with perception of health care quality among adults and elderly individuals. The association between evaluation of good health care quality and resolubility presented higher effects among adults (OR=1.014; p<0.001) than elderly individuals

(OR=1.010; p<0.05). Contrarily, good health status presented a lower effect on health care quality among adults (OR=2.372; p<0.001) than elderly individuals (OR=4.101; p<0.001).

Diagnosis of multimorbidity and attending public health care facilities were negatively associated with health care quality. The presence of multimorbidity and attendance to public health care facilities among adults (OR=0.657; p<0.001 and OR=0.419; p<0.001, respectively) showed lower effect on evaluation of health care quality than among elderly individuals (OR=0.599; p<0.05 and OR=0.257; p<0.001, respectively) in the period (Table 3).

***Table 3. Odds ratios of logistic models for adults and elderly individuals. Brazil, 1998-2019.***

| Variables | | Adult | | | | Elderly | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | OR | SE | 95%CI | Sig | OR | SE | 95%CI | Sig |
| Health care resolubility | | 1.014 | 0.002 | 1.011;1.018 | *** | 1.010 | 0.005 | 1.001;1.020 | * |
| Sex | (female=1) | 0.984 | 0.058 | 0.877;1.105 | | 0.781 | 0.111 | 0.591;1.033 | |
| Age | | 1.018 | 0.002 | 1.014;1.023 | *** | 1.019 | 0.008 | 1.004;1.035 | * |
| White skin color | (yes=1) | 1.045 | 0.060 | 0.933;1.170 | | 1.140 | 0.160 | 0.865;1.502 | |
| Educational attainment | | 0.982 | 0.008 | 0.967;0.997 | * | 0.969 | 0.016 | 0.938;1.001 | |
| Occupational status | (employed=1) | 0.845 | 0.048 | 0.757;0.944 | * | 0.841 | 0.146 | 0.598;1.183 | |
| Good health status | (yes=1) | 2.372 | 0.159 | 2.080;2.705 | *** | 4.101 | 0.975 | 2.574;6.535 | *** |
| Difficulty to walk | (yes=1) | 0.780 | 0.120 | 0.577;1.054 | | 0.852 | 0.143 | 0.613;1.184 | |
| Diagnosis of multimorbidity | (yes=1) | 0.657 | 0.043 | 0.578;0.746 | *** | 0.599 | 0.112 | 0.415;0.865 | * |
| Health insurance | (yes=1) | 1.207 | 0.154 | 0.940;1.550 | | 1.715 | 0.460 | 1.014;2.901 | * |
| Public health care facility | (yes=1) | 0.419 | 0.053 | 0.328;0.537 | *** | 0.257 | 0.092 | 0.127;0.517 | *** |
| Financing through health insurance | (yes=1) | 1.931 | 0.323 | 1.390;2.681 | *** | 1.705 | 0.819 | 0.665;4.374 | |
| Financing out-of-pocket | (yes=1) | 1.436 | 0.199 | 1.095;1.883 | * | 1.025 | 0.289 | 0.590;1.782 | |
| Household income per capita | | 1.026 | 0.010 | 1.007;1.045 | * | 1.023 | 0.029 | 0.968;1.081 | |
| Area | (rural=1) | 1.378 | 0.110 | 1.179;1.612 | *** | 1.736 | 0.281 | 1.263;2.384 | * |

Obs.: OR = odds ratio; 95%CI = 95% confidence interval; * p<0.05; ** p<0.01; *** p<0.001.

## Discussion

The findings of the study support previous evidence on the ongoing demographic transition in Brazil (Lopus, 2024), showing that elderly individuals were predominantly women, individuals declaring white skin color with lower educational attainment living in urban areas, in comparison to adults (Travassos, Coelho & Arends-Kuenning, 2020). Furthermore, elderly individuals generally inhabit households with lower number of residents in comparison to adults. Yet, household income per capita in the present study was higher than previous evidence synthesized in recent review of literature (Travassos, Coelho & Arends-Kuenning, 2020).

Nevertheless, there was higher health care utilization among the elderly in comparison to adult individuals, potentially linked to higher occurrence of multimorbidity and physical limitations, in addition worse self-assessment of health status. The higher occurrence of multimorbidity and difficulty to walk among the elderly contributes to the lower proportion of individuals declaring good health status, in addition to increasing the vulnerability to economic shocks due to catastrophic health expenditures in their households (Travassos, Coelho & Arends-Kuenning, 2020; Cerda et al., 2022; Trindade et al., 2024).

In addition, the present study identified lower level of resolution of health issues at primary care level among elderly individuals in comparison to adults, leading to higher risk of complications due to chronic diseases like diabetes and hypertension (Nishijima et al., 2019, Nishijima, Sarti & Schor, 2020). The higher risk of complications increases the probability of hospitalizations with worst health outcomes (Bitton et al., 2017; Huber et al., 2020; Sawicki et al., 2021; Zhou et al., 2020). Moreover, health care resolubility was positively associated with perception of health care quality in the Brazilian population, in accordance with previous study using limited data on primary health care utilization from Latin American countries (Doubova et al., 2016).

Additionally, the results of logistic models showed substantial differences in factors associated with perception of good health care quality between adults and elderly individuals. Diagnosis of multimorbidity and attendance to public health care facilities were negatively associated with good health care quality among adults and elderly individuals; however, effects on the perception of quality were higher in elderly individuals.

Evidence in the literature shows that diagnosis of multimorbidity is linked to higher costs and complexity of health care, potentially influencing patients' perceptions on quality of care (Zulman et al., 2014). In addition, public policies focusing quality of care through payment for performance usually lack dimensions related to multimorbidity (Ruscitto et al., 2016).

Regarding attendance to public health care facilities, previous studies in high-income countries have shown mixed effects on the perception of health care quality among patients (Wong et al., 2010; Pullicino et al., 2015); however, national-level evidence from the Brazilian health system usually indicates perception of lower quality of care among individuals accessing public facilities (Doubova et al., 2016; Lima et al., 2018).

Conversely, the assessment of good health status was positively associated with the perception of good quality of care in the present study, similarly to previous evidence in the literature (Goodrich & Lazenby, 2023). The synthesis of findings on the subject showed that health status presented direct relation with health care quality, especially referring to nursing (Goodrich & Lazenby, 2023).

The analyses presented in the study also reinforce the challenges imposed by advances in population longevity in the context of management of national health systems worldwide (Ruscitto et al., 2016), especially in developing countries like Brazil (Bitton et al., 2017; Doubova et al., 2016; Travassos, Coelho & Arends-Kuenning, 2020). Furthermore, the study contributes to evidence-based decision-making processes in public policies of health in Brazil, particularly referring to programs targeting elderly individuals vulnerable to impoverishment due to catastrophic health expenditures (Travassos, Coelho & Arends-Kuenning, 2020; Cerda et al., 2022; Trindade et al., 2024).

The study presents certain limitations referring to the analysis of secondary data publicly available from population-based surveys. First, the use of cross-sectional data hinders establishment of causal links among variables in the analysis. Second, the availability of self-reported information on health status, perception of health care quality and other variables may contain bias. Yet, it is important to highlight the application of complex sampling procedures in the survey design, in addition to the lack

of other sources of data linking diverse dimensions of health care utilization in developing countries. Finally, the selection of information directly comparable across surveys and the adoption of robust statistical techniques on nationally representative datasets provides essential information for public policy planning and monitoring in Brazil.

## Conclusions

The findings of the study showed that the ongoing process of demographic transition in Brazil contributed to the increase in population longevity throughout the last decades, imposing challenges to the management of the national health system. Health care resolubility, health status, multimorbidity, and attendance at public healthcare facilities have been associated with perception of health care quality among adults and elderly individuals. However, the elderly presented higher sensitivity to factors influencing perceptions on quality of care, probably due to their vulnerability to chronic diseases. Thus, the present study contributes to the literature on association between quality and resolubility of health care in Latin America, addressing emerging issues related to the demographic transition in Brazil.

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DOI: https://doi.org/10.5281/zenodo.15322412