Population aging and health spending: an analysis of intergenerational and intragenerational transfers in the Brazilian private health care plans*

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The health insurance pricing model in Brazil prohibits large variations of monthly fees by imposing strict premium rules by age. Therefore, intergenerational transfers may occur from younger age groups, who are lower-risk, to older ones. Population aging will result in a larger share of policy-holders at older ages, increasing intergenerational transfers and making the current pricing structure unsustainable in the future. The aim of this article is to estimate the magnitude of intergenerational and intragenerational transfers (within the same age group) in the Brazilian private health care plans, by examining data from a representative sample of health insurance providers. We found intergenerational transfers to occur, on average, from policy holders younger than 66 years of age to older ones. Results also show significant intragenerational transfers within two of the age groups defined by existing legislation: 0 to 18 and 59 years and older. Finally, simulations using changes in the age structure over the last 15 years confirm population aging may result in larger intergenerational transfers with increasing loss-ratio over time.

Keywords: Population aging. Health expenditure. Brazilian private health care plans. Intergenerational transfers. Intragenerational transfers.

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Introduction

The age distribution of any population is the result of historical demographic processes. In Brazil, the demographic transition began in the 1930s, starting with a decline in mortality rates among the total population, especially infant mortality rates. Fertility levels remained practically constant until the end of the 1960s. As a result, between the 1940s and 1970s, the Brazilian population age structure suffered almost no changes, becoming slightly younger with the fall in mortality. During this period, the proportion of the population under 20 years of age corresponded to between 52% and 53% of the total population, while the proportion of the population older than age 65 remained at low levels, between 2.4% and 3.1%. From the mid-1960s onward a process of profound changes in the Brazilian population age structure began, mainly due to the decline in fertility rates (CARVALHO; SAWYER; RODRIGUES, 1998; CARVALHO; GARCIA, 2003).

The advance of the demographic transition implied a more rapid increase in the adult population compared to the total population. Gradually, higher population growth rates have become concentrated in older age groups, accelerating the population aging process. Fertility declines have been the principal factor responsible for changes in the Brazilian population age structure, although one should expect life expectancy gains to play an increasingly important role in the decades to come (MYRRHA *et al.*, 2012, 2017). According to IBGE projections, the proportion of people over 60 years of age will rise from 11% in 2010 to 32% in 2060, while the population over age 80 will grow from 2% to 8% in this same period.

Population aging directly affects healthcare systems, as health expenditure patterns demonstrate important differences by age. Healthcare expenses are very costly in infancy, in addition to significantly increasing at older ages, mainly in the final decades of life (GABRIELE *et al.*, 2005; RICHARDSON; ROBERTSON, 1999). The largest expenses among the elderly reflect a higher prevalence of chronic degenerative diseases, which are associated with increased consumption of healthcare services and higher hospitalization rates, as well as longer average hospital stays (CUTLER; MEARA, 1998; KEEHAN, 2004; KILSZTAJN *et al.*, 2002; ANDRADE *et al.*, 2010; BERENSTEIN, 2005; REIS; NORONHA, WAJNMAN, 2016).

A rise in healthcare expenses, driven by population aging, has spurred a debate regarding the sustainability of the public health services offered by the Brazilian Unified Health System (SUS), as well as services provided by private health insurers. In the case of the latter, there are growing worries due to two prominent reasons. The first one is the number of Brazilian families who are covered by private health insurance, despite SUS being both universal and free of charge. Since 1998, when the Brazilian government started to regulate private health insurance plans, the number of beneficiaries holding private medical-hospital health plans (with or without dental care) has increased by approximately 52%, growing from 30.9 million in 2000 to 47.2 million in 2018, in addition to showing positive annual growth rates each year, with the exception of the period between 2015

and 2017 (ANS, 2018a). The second reason arises from the monthly premiums charged by private health insurers, which need to maintain a relationship with the risks they cover so that health plan operations can achieve actuarial balance. The sustainability of private healthcare plans in Brazil is made viable through a mutual financing arrangement, in which the monthly premiums paid by all beneficiaries during a given period are destined to cover the healthcare expenses of a determined group. In this type of financing system, known as *pay-as-you-go*, individuals pay monthly premiums, independent of risk occurrence, and without forming financial reserves (FIPECAFI, 2009).

Once health expenses increase significantly as a result of age, private health insurance's pricing structures should follow the same pattern to maintain an association with the covered risks and to guarantee financial and actuarial balance. However, Brazilian regulations impose limits on variations in monthly premium prices based on age (FIPECAFI, 2009). These limits were defined, first, by the Private Health Insurance and Plans Council Resolution n. 6/98. According to this regulation, monthly premiums should be stratified into a maximum of seven age groups (0 to 17 years, 18 to 29 years, 30 to 39 years, 40 to 49 years, 50 to 59 years, 60 to 69 years, and 70 years and older). Resolution n. 6/98 further specified that the monthly premiums charged to the oldest age group could not surpass six times the amount of the monthly premiums charged to the youngest age group. Besides, beneficiaries 60 years or older who have held the same private health insurance plans for more than ten years could not be subject to premium variations, as they age.

The Elderly Persons Law (Law n. 10.741/03), published in Brazil in October 2003, prohibits charging different private health insurance premiums to the elderly, classifying all persons 60 years of age and older as being elderly. In this context, the Brazilian National Regulatory Agency for Private Health Insurance and Plans (ANS) published Normative Resolution n. 63/03, which established new rules and set the final possible premium age readjustment at age 59 years, further limiting permitted price variations by age group. Normative Resolution n. 63/03 outlined ten age groups: 0 to 18 years, 19 to 23 years, 24 to 28 years, 29 to 33 years, 34 to 38 years, 39 to 43 years, 44 to 48 years, 49 to 53 years, 54 to 58 years, and 59 years and older. It also maintained the prior regulation stipulating that the monthly premiums charged to the oldest age group cannot surpass six times the monthly premiums charged to the youngest age group and prohibited the accumulated variation between the seventh and tenth age groups from being higher than the accumulated variation between the first and the seventh. Considering the limitations included in the Elderly Persons Law, all beneficiaries 59 years or older should pay equal monthly premiums, even though healthcare expenses increase with age. Furthermore, the goal of limiting price variations between the final and seventh age groups was to reduce price increases in the age groups older than 49 years of age, as a way of ensuring that part of the price variation will be spread out among younger age groups.

Net transfers from younger to older individuals (generational solidarity) will occur if premium cost restrictions result in subsidized prices for the oldest age groups (prices which

are inferior to the effective costs generated for private health plans by this subgroup). Regulation could cause lower risk (younger) beneficiaries to bear the burden incurred by excessive expenditure among older people, by paying monthly premium prices higher than their predicted healthcare use. This type of arrangement could make private health insurance a financially unappealing option, if it were to reduce the incentive for younger people to enroll in private healthcare plans, resulting in adverse selection. In other words, by charging a premium based upon the average risk of the population to be insured (*community rating*), private health insurers create incentives for individuals who are at higher risk to use healthcare services to join private health plans, in comparison to lower risk individuals (MAIA, 2004).

Although the empirical evidence concerning adverse selection in Brazil is still not conclusive (MAIA, 2012; ALVES, 2004; RESENDE; ZEIDAN, 2010; NUNES; SOARES; BASÍLIO, 2014), intergenerational transfers in health plans are viable only if the youngest beneficiaries continue to enroll, even if there is no initial financial advantage for them. Higher participation among younger beneficiaries could allow for transfers to older beneficiaries to be spread out among many younger beneficiaries, resulting in lower *per capita* transfers. However, as the population ages, there will be an increasing burden on net contributors, as there will be fewer young people to subsidize the healthcare bill generated by a growing number of elderly persons, which could increase the probability of adverse selection. Consequently, it is unclear whether the existing rules governing generational solidarity in private health plans in Brazil will be able to be maintained in the future demographic context.

In a recent study, Turra, Noronha, and Andrade (2015) evaluated the existence and the magnitude of generational solidarity in the private healthcare sector, in addition to its impact on the financial standing of private health insurers. The results show that healthcare expenses exceed revenue only among the oldest individuals (80 years and older), who benefit from transfers from younger age groups. Also, in-patient care expenses are the main culprit behind transfers among age groups, given that their average cost and utilization rates are more significant at more higher ages. The study, however, did not consider expenses other than healthcare expenses, such as administrative and financial costs, which may mitigate the magnitude of intergenerational transfers.

In addition to intergenerational transfers, intragenerational transfers can also occur within the age groups defined by existing regulations, most importantly in broader age groups, such as those from 0 to 18 years and 59 years and older, as they contain individuals with different risk levels. Findings from a Brazilian study (RIBEIRO, 2005) indicated that the physician utilization rate, which corresponds to the relationship between the number of people seeing a doctor at least once in a given year and the number of risk-exposed persons during that same year, was 82.4 among newborns and 46 among 18-year-olds. Furthermore, the hospitalization rate among newborns (11.5) was approximately 85% higher than the rate among 18-year-olds (6.2). Concerning the oldest age group defined by the ANS (59 years or older), the physician utilization rate was 71.5 for 59-year-old beneficiaries, and

75.1 for those 69 years of age. The differences in hospitalization rates were even more significant, being nearly 44% higher among 69-year-old beneficiaries in comparison with those 59 years old. These findings confirm that, within the same ANS age groups, there are significant variations in health service utilization risks, which can generate a considerable volume of net transfers among individuals that pay the same premiums.

In light of the findings mentioned above, this study examines the current patterns and levels of inter and intragenerational transfers in the Brazilian private healthcare sector. Our analysis includes the various types of revenues and expenses involved in operating health insurance plans, in addition to healthcare expenses per se. The study also looks at the pure (exclusive) effect of changes in age distribution on generational solidarity over 15 years, using a counterfactual analysis of the relationship between healthcare expenses and monthly premiums. We hope our findings will contribute to the discussion concerning the sustainability of private health insurance plans in Brazil in light of the current pricing structures and rapid population aging.

Methodology

Database

The database reflects beneficiary records for the period spanning from 2000 to 2015, in addition to the monthly premiums and healthcare expenses (out-patient and in-patient) for the year 2015. This information's level of detail is superior to that observed in public databases made available by the ANS. The data were obtained from 11 private health insurers, from several medical cooperatives and medical groups, encompassing approximately 780,000 beneficiaries in 2015 and corresponding to 1.6% of all Brazilian medical-hospital health plan beneficiaries for that year. The data do not identify individual beneficiaries or specific private health insurers. They were made available by an actuarial and regulatory consulting firm that specializes in the healthcare sector. Each of the contributing private health insurers granted us data use authorization. To test for the external validity of the sample, we compared the sample's age distribution with the general sector patterns recorded by the ANS in 2015. We did not identify significant differences, although the sample's age distribution was slightly older relative to the total ANS beneficiary population. The difference in average ages was just 0.9 years, minimizing the possibility of age selection bias for the sample.

We obtained financial statements from private health insurers published by the ANS to comprehensively estimate intergenerational net transfers. The financial statements allowed us to collect data concerning other expenses and revenues, such as administrative and business expenses and financial returns, as well as healthcare expenses, which the original database also included. The accounting documentation is official information that private health insurers must provide to the ANS in quarterly reports (Diops). Monthly premium

costs and healthcare expenses originally provided by the sample database and the values reported by the same private health insurers in the Diops-ANS are consistent, indicating differences of less than 2%. This finding provides extra reassurance regarding our decision to incorporate additional accounting information provided solely by the Diops-ANS.

Methods

Descriptive analysis

In order to estimate inter and intragenerational private healthcare transfers, we divide our analysis into four parts. First, we describe the population being studied, in addition to the revenue, expense, and utilization frequency patterns observed in 2015.

Intergenerational transfers: single years of age

Next, we measure intergenerational transfers using revenue and expense distributions by single year of age, which can be viewed as a less restrictive age categorization than what is laid out by ANS pricing structure rules. This step is essential because it allows us to measure transfers between different ages employing the maximum amount of available information from the database. We calculate intergenerational transfers based on different alternative measures. First, we estimate the total and age-specific loss ratios, which correspond to the ratio between healthcare expenses and monthly premiums, in addition to total and age-specific combined ratios, which are equal to ratio between the sum of all expenses (administrative, business, and healthcare) and the sum of all revenues (monthly premiums and financial returns) (ANS, 2015).

Second, we disaggregate and analyze the operating results by age achieved by private health insurers. We measure both the operating income (OI), limited to the difference between healthcare expenses and monthly premium revenues, as well as net results (NR), which encompass all revenues and expenses. One important contribution of our work is that it compares measurements that have differing degrees of comprehensiveness regarding revenues and expenses, which allows us to gauge the financial reality of private health insurers better, and to avoid minimizing the possible effects of aging. Following the calculations of Turra, Noronha, and Andrade (2015), we decompose operating income (OI) as:

$$OI^t = \sum_{i=1}^{n} (MP_i - HE_i) \times (B_i)$$
$$\therefore OI^t = \sum_{i=1}^{n} (AT_i) \times (B_i) \tag{1}$$

Where:

OI^t: operating income in 2015;

MP_i^t: average monthly premium revenues in 2015 at age i;

HE_i^t: average healthcare expenses in 2015 at age i;

B_i^t: risk-exposed beneficiaries in 2015 at age i;

AT_i^t: average transfers per risk-exposed beneficiary in 2015 at age i.
Risk-exposed beneficiaries correspond to the number of active beneficiaries, weighted by the individual exposure time in a given year.

We also decompose net results (which include all revenues and expenses) using the following steps:

$$NR^t = \sum_{i=1}^{n} (MP_i - HE_i - AE_i - BE_i + FR_i) \times (B_i)$$

$$\therefore NR^t = \sum_{i=1}^{n} (ALT_i) \times (B_i) \tag{2}$$

Where:
NR^t: net results in 2015;
MP_i^t: average monthly premium revenue in 2015 at age i;
HE_i^t: average healthcare expenses in 2015 at age i;
AE_i^t: average administrative expenses in 2015 at age i;
BE_i^t: average business expenses in 2015 at age i;
FR_i^t: average financial returns in 2015 at age i;
B_i^t: risk-exposed beneficiaries in 2015 at age i;
ALT_i^t: average liquid transfers per beneficiary in 2015 at age i.

We estimate the age distribution of administrative and business expenses, as well as financial returns, as a proportion of the distribution of risk-exposed beneficiaries by age. As aforementioned, the objective of the decomposition of the net results is to present a more reliable estimate of private health insurers' financial reality, given that, in addition to healthcare expenses, monthly premiums are also designated to pay for other expenses, such as administrative and business expenses. Furthermore, private health insurers possess resources derived from other sources, such as financial returns.

Inter and intragenerational transfers: ANS age groups

In the third stage of our analysis, we repeat the estimation of intergenerational transfers (loss and combined ratios, operating income, and net results), this time using the ten age groups defined by the ANS. As the existing pricing structure age patterns are very restrictive and create broad age groups, they result in simultaneous inter and intragenerational transfers. To estimate intragenerational transfers, we focus specifically on the age groups 0-18 and 59 years and older, due to the risk heterogeneity present in these age groups and their importance regarding morbidity and mortality patterns.

Population aging and intergenerational transfers

In the final part of our study, we present a counterfactual analysis to measure variations in intergenerational transfers as a result of changes in the age structure of health insurance plans. To do this, we record the age distribution of beneficiaries by single year of age,

between 2000 and 2015, in addition to the average healthcare expenses and monthly premiums reported in 2015. We do not make any financial adjustments and do not control for the influence of any other variable. Thus, we are merely estimating the amount of transfers in 2015 under different demographic contexts. The simulation considers only operating income transfers. We excluded administrative and business expenses, as well as financial returns. We defined the counterfactual loss ratios as:

$$CHE_i^t = B_i^t \text{ x } HE_i^{2015} \tag{3}$$

Where:

CHE_i^t: counterfactual healthcare expenses at age i in year t;

B_i^t: age distribution of beneficiaries at age i in year t;

HE_i^{2015}: average recorded healthcare expenses at age i in 2015.

$$CMP_i^t = B_i^t \text{ x } MP_i^{2015} \tag{4}$$

Where:

CMP_i^t: counterfactual monthly premiums at age i in year t;

B_i^t: age distribution of beneficiaries at age i in year t;

MP_i^{2015}: average recorded monthly premiums at age i in 2015.

Using these two indicators, we can estimate the counterfactual loss ratio as:

$$CLR^t = \frac{\sum_{i=0}^{\omega} CHE_i^t}{\sum_{i=0}^{\omega} CMP_i^t} \tag{5}$$

Where:

CLR^t: counterfactual loss ratio in year t;

CMP_i^t: counterfactual monthly premiums at age i in year t;

CHE_i^t: counterfactual healthcare expenses at age i in year t.

In all steps of our analysis, we examine three different types of private health plans: individual and family health plans, employer-based health insurance plans, and health insurance plans by association. Individual and family health insurance plans are contracted by natural persons, while legal entities contract the other two types of health insurance plans. In the case of employer-based plans, expenses coverage is offered to select populations sharing employment or statutory links to the legal entity, whereas, in the case of plans by association, specific professional designations, classes, or sectors connect the participants. Differentiating among the three types of health insurance plans is important because age distribution, utilization rates, revenues, and expenses vary across them as a consequence of different regulations regarding termination and premium adjustment policies, in addition to factors such as the demographic characteristics of the labor market.
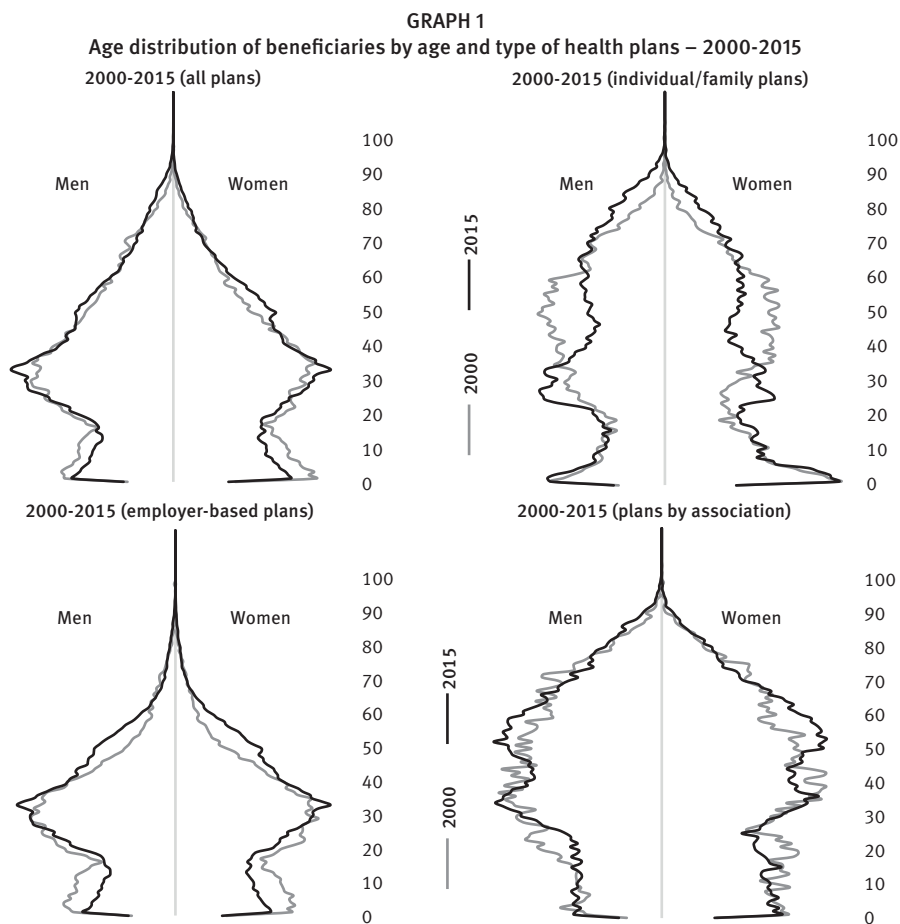
Results

Descriptive analysis

Inter and intragenerational private health insurance transfers are directly related to population characteristics, especially age. Therefore, to describe the population under study, we conduct a brief analysis of the evolution of beneficiaries included in the sample, spanning the period from 2000 to 2015. Furthermore, we look at recorded revenue, expense, and utilization frequency patterns in 2015. In this first step, we do not limit our analysis to the age groups delineated by the ANS, as we seek to examine variables of interest incorporating the broadest possible age range.

The selected sample encompassed approximately 780,000 risk-exposed beneficiaries in 2015. The average annual growth rate of the number of beneficiaries over the previous 15 years (2000-2015) was 8.6%. It is important to note that the growth rate was negative in 2009 and almost zero in 2015. A reduction in new enrollments and increases in plan terminations in these specific years were spurred by economic and financial crises, which affected the incomes of many private health insurance beneficiaries. Concerning the evolution of the age distribution of beneficiaries, there were significant changes during the period under consideration. The 2015 population is older than the one in 2000, containing relatively more beneficiaries ages 25 and older (Graph 1).

In any population, the number of people at each age is the result of historical fertility, mortality, and migration rates. However, there exist additional specific factors that influence the age structure of private health insurance plans, such as mortality differences between beneficiaries and the population as a whole, insurance enrollment and cancellation rates resulting from labor market changes, variations in the regional provision of healthcare plans, among other factors (TURRA; NORONHA; ANDRADE, 2015). Also, age structure can vary significantly based upon the type of health insurance plan contracted (Graph 1). Individual and family healthcare plans tend to present an older age distribution, as anyone is free to enroll, whereas employer-based private health insurance plans show a higher proportion of working age beneficiaries. Furthermore, individual/family plans are more rigid, affecting the age distribution of beneficiaries, as they only permit cancellations in cases of fraud or lack of payment, and limit premium readjustments to the index published by the ANS. Therefore, there is a financial incentive for older beneficiaries to maintain individual and family plans, given that the applicable readjustment limits may not be sufficient to financially balance the contract, resulting in monthly premiums that are lower than actual expenditures.

GRAPH 1
Age distribution of beneficiaries by age and type of health plans – 2000-2015

2000-2015 (all plans)   2000-2015 (individual/family plans)

Men   Women   Men   Women

2000-2015 (employer-based plans)   2000-2015 (plans by association)

Men   Women   Men   Women

Source: Data from a sample of Brazilian private health insurers.

Overall, the elderly dependency ratio among insurers is higher than the ratio for the total Brazilian population for all of the years analyzed. The elderly dependency ratio is higher than the national average for individual/family health insurance plans, while it is lower for employer-based health insurance plans. During the period under analysis, there was an increase in the elderly dependency ratio among beneficiaries pertaining to individual health insurance plans, while it remained practically constant among employer-based health insurance plans. Moreover, for private health insurance plans by association, there was a reduction in the dependency ratio during the initial years under study, followed by an increase from 2008 onward.

Regarding the sex composition of the beneficiaries, there were no significant changes between 2000 and 2015. In 2000, approximately 54% of beneficiaries were women, while, in 2015, women comprised around 53% of beneficiaries. This composition is very similar to the sex composition of the private healthcare sector as a whole, according to the data published by the ANS for 2015.

Altogether, the 11 private health insurers included in our sample collected nearly R$1.6 billion (Brazilian reais) from monthly premiums in 2015, representing around 1% of the private health insurance sector's total billing for this period. From an aggregate standpoint, the most substantial portion of this revenue was raised from beneficiaries between the ages of 18 and 65 (approximately 68%), with the mean age at payment corresponding to 45 years, reflecting the concentration of beneficiaries at economically active ages. Not surprising, estimates of average monthly premiums also vary by age. The average monthly premium payment in 2015 was R$170, with the average costs paid by beneficiaries older than 45 years surpassing this reference value. The average monthly premium for the oldest age group (59 years or older, following the ANS definition) is nearly four times greater than that of the youngest age group (0 to 18 years; ANS definition), as a consequence of age-related risk patterns and the ANS's pricing regulations (Graph 2). Furthermore, there are significant differences between average monthly premiums calculated based upon the type of dependency, contract, and plan participation. The costs paid by policyholders are higher than those for their dependents and other household members, as are those paid by individual plans and members of plans that do not charge copays at the moment of utilization, which tend to impose higher monthly premiums.

GRAPH 2
Average monthly premium and health care expenses by age − 2015
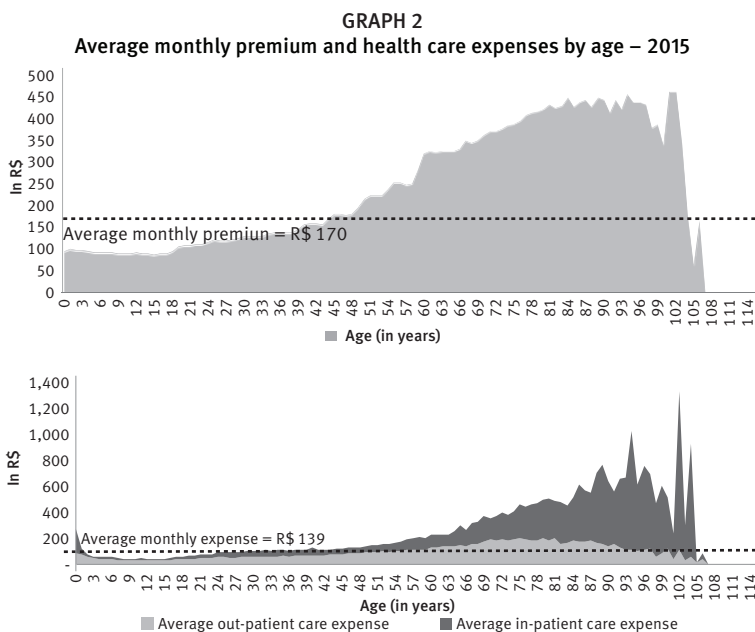
Source: Data from a sample of Brazilian private health insurers.

Our sample of insurers recorded almost R$1.3 billion in total healthcare expenses in 2015, with approximately R$580 million (45%) coming from inpatient care expenses and R$720 million (55%) from out-patient care expenses. About 63% of total expenses occurred among beneficiaries between the ages of 18 and 65 years, and the mean

healthcare utilization age was equal to 48 years. Among patients between the ages of 1 and 64, the majority of healthcare expenses corresponded to outpatient procedures, while beneficiaries under the age of 1 and over the age of 65 reported greater expenses resulting from hospitalizations.

Average monthly expenses were equal to R$139 in 2015, with beneficiaries under the age of 1 year and over the age of 49 years reporting above average healthcare expenses (Graph 2). Expenses grow significantly with age, corroborating earlier findings published in the literature (GABRIELE *et al.*, 2005; RICHARDSON; ROBERTSON, 1999; CUTLER; MEARA, 1998; KEEHAN, 2004; KILSZTAJN *et al.*, 2002; ANDRADE *et al.*, 2010). Therefore, when these results are analyzed using the age groups defined by the ANS, the average expenses of the final age group (59 years or older) are approximately 5.5 times greater than those reported for the first age group (0 to 18 years).

When evaluating average expenses by age and procedure type (results available upon request), we estimated that the oldest beneficiaries showed the most significant expenses regardless of the health procedures analyzed. One reason is the high utilization rates among the elderly, as the age group 0 to 18 years recorded an average of four medical appointments annually, while the oldest age group (59 years or older) reported approximately seven. Besides, the mean annual utilization of exams and therapies was equal to 29 for beneficiaries 59 years or older compared to only seven among the youngest age group (0 to 18 years).

The percentage of hospitalized beneficiaries also increases significantly with age (results available upon request). The average expenses per hospitalized beneficiary were equal to R$ 9,096 in 2015. Very young and older beneficiaries incur higher expenses, as they tend to require more expensive medical services, as well as more extended hospital stays. The mean hospital stay length among the sample of insurers was 4.8 days in 2015, with beneficiaries between birth and four years of age and those older than 64 years exhibiting longer mean hospital stays. At ages 80 and older, the mean stay length reached 12 days in 2015. Concerning the ANS age categorization, the average expenses per hospitalized beneficiary were approximately R$6,000 from ages 0 to 18, while beneficiaries older than 59 years reported average expenses of R$14,000, nearly 2.35 times greater than those of the youngest age group. Finally, expenses can vary significantly based upon the type of contract, sex, and dependency status, being larger among female policyholders of individual plans with no copayments, as shown in Table 1.

Average monthly health care expenses per beneficiary, by type of plan, copayment, sex and dependency status – 2015

Variables	Average monthly health care expenses (R$)		
	Outpatient care	Inpatient care	Total
Type of plan			
Individual/Family Plans	116.87	100.42	217.29
Employer-Based Plan	66.41	46.88	113.28
Plans by Association	82.93	80.80	163.73
Copayment			
Yes	73.50	63.88	137.39
No	94.88	58.99	153.88
Sex			
Male	63.52	57.82	121.34
Female	89.51	65.86	155.37
Dependency status			
Policy Holder	88.78	71.73	160.51
Dependent	67.90	51.38	119.28
Other Household Member	42.20	88.25	130.45

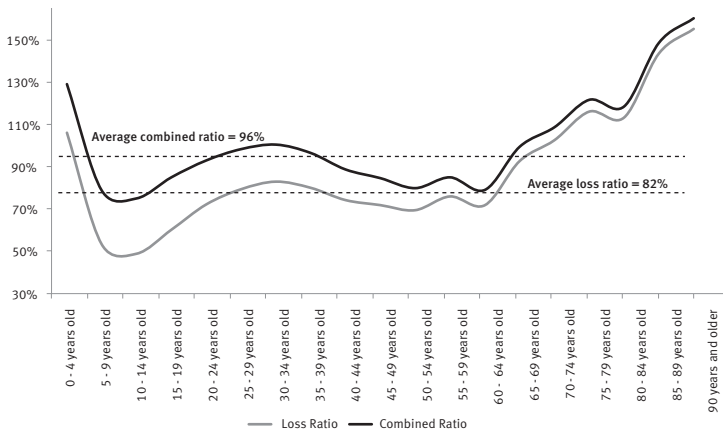Source: Data from a sample of Brazilian private health insurers.

Intergenerational transfers by single year of age

The distribution of revenues and expenses by age suggests there are many uncertainties regarding the sustainability of the generational solidarity model adopted by the ANS in a context of population aging. Therefore, it is essential to understand the magnitude of intergenerational transfers under the current regulatory apparatus. Here, we calculate the average net resource transfers and the transfers balance in 2015 at each age, according to the type of health insurance contract. As in the case of the descriptive analysis, in this stage, we still do not restrict our estimations to the ANS-defined age groups, which we will examine in the following section.

We start by describing the relationship between expenses and revenues, through the use of loss and combined ratios. According to Graph 3, the average loss ratio (the ratio between healthcare claims and monthly premiums) in 2015 was equal to 82%. For the age groups 0 to 4 years and 70 and older, expenses exceeded monthly premiums, indicating the existence of intergenerational transfers, on average, to the youngest and oldest beneficiaries. Loss ratios take into account only monthly premiums and healthcare expenses. However, monthly premiums are also used to pay for other expenses, such as administrative expenses (14.8% of the total) and business expenses (0.4% of the total). On the other hand, approximately 98.8% of revenues are derived from monthly premiums, while another 1.2% of revenues come from financial returns. Therefore, we also estimate the combined ratio, which corresponds to the ratio between total expenses and total

revenues. The average combined ratio was equal to 96% in 2015, higher than the value of 82% previously estimated using only healthcare expenses and monthly premiums. As a result, insurers can expect to retain a net result corresponding to just 4% of revenues. Once again, expenses exceeded revenues for the very young (ages 0 to 4 years) and the elderly (65 years and older). Additionally, the ratio among beneficiaries ages 30 to 34 years slightly surpassed 100%, reflecting increased medical expenses resulting from maternity and external causes (Graph 3).

GRAPH 3
Age-specific loss and combined ratios – 2015

Source: Data from a sample of Brazilian private health insurers.

Table 2 presents a summary of the results, taking into account private health insurers' complete balance sheets. Transfers occur distinctly according to the type of insurance contract. The combined ratio is equal to 95% among individual plans, 99% for employer-based private health insurance plans, and 91% for private health insurance plans by association. Expenses exceed revenues after the age of 66 in all types of contracts. According to our results, this is the age that delineates the groups that are net contributors and net receivers, regardless of the age groups defined by the ANS. Net receivers (older beneficiaries) pay premiums 2 to 3 times greater than net contributors (younger beneficiaries), but they spend 3 to 4 times more than the latter. In 2015, each net contributor transferred an average of R$50 to R$496 depending upon the type of health insurance contract. This variation does not depend only on loss ratios; instead, it is primarily impacted by the balance between the number of net contributors and net receivers, reinforcing the role of age structure. As mentioned in the previous section, the age distribution of employer-based private health insurance beneficiaries directly reflects that of the labor market. There are more than 30 net contributors per net receiver, reducing the demand for transfers in this type of plan. On the other hand, there are proportionally more elderly persons in individual health insurance plans and private health insurance plans by association, and thus, the respective ratio between net contributors and receivers are much

lower for these two type of plans, equal to 4.2 and 5.1, respectively. Population aging could make revenues insufficient to cover expenses if current plan characteristics, pricing structure conditions, and high loss ratios do not change.

TABLE 2
Summary of intergenerational transfers – 2015

	Individual/ family plans	Employer-based plans	Plans by association	All plans
Net donors				
Age (years)	0 - 65	0 - 65	0 - 65	0 - 65
Mean Age (years)	31.0	30.3	35.8	31.4
Risk-Exposed Beneficiaries	105,039.67	473,233.32	134,772.57	713,045.42
Total Revenues (monthy premium + financial returns) (R$)	269,686,801.37	750,337,411.21	271,082,333.36	1,291,106,545.94
Average Revenues per Beneficiary (R$)	2,567.48	1,585.55	2,011.41	1,810.69
Total Expenses (health care + administrative + business expenses) (R$)	217,583,757.05	726,378,982.27	225,634,565.10	1,169,597,304.43
Average Expenses per Beneficiary (R$)	2,071.44	1,534.93	1,674.19	1,640.28
Average Transfers Made (R$)	**496.03**	**50.63**	**337.22**	**170.41**
Net Receivers				
Age (years)	66 and older	66 and older	66 and older	66 and older
Mean Age (years)	76.0	73.7	75.2	75.2
Risk-Exposed Beneficiaries	24,698.33	14,707.68	26,319.43	65,725.58
Total Revenues (monthy premium + financial returns) (R$)	123,687,231.55	62,995,404.27	126,112,050.28	312,794,686.10
Average Revenues per Beneficiary (R$)	5,007.92	4,283.16	4,791.60	4,759.10
Total Expenses (health care + administrative + business expenses)	155,645,302.72	75,751,912.34	135,513,806.04	366,911,021.09
Average Expenses per Beneficiary (R$)	6,301.85	5,150.50	5,148.81	5,582.47
Average Transfers Received (R$)	**-1,293.94**	**-867.34**	**-357.22**	**-823.37**
Total Net Transfers (R$)	**20,144,973.15**	**11,201,920.86**	**36,046,012.51**	**67,392,906.52**
Net Transfers by Beneficiary (R$)	**155.27**	**22.96**	**223.76**	**86.54**
Combined Ratio	**95%**	**99%**	**91%**	**96%**
Ratio Net Receivers/ Net Donors				
Average Revenues per Beneficiary	**1.95**	**2.70**	**2.38**	**2.63**
Average Expenses per Beneficiary	**3.04**	**3.36**	**3.08**	**3.40**

Source: Data from a sample of Brazilian private health insurers.

Inter and intragenerational transfers by ANS age group

Until now, we have examined intergenerational transfers by single years of age. In this section, we estimate transfers using the more restrictive age groups outlined by the ANS. Table 3 shows the loss and combined ratios, in addition to transfers made and

received, taking into account only the operating income (monthly premiums and operational expenses), as well as all expenses and revenues for each of the ten ANS age groups.

The operating income is positive among all age groups. The net results are also positive among most age groups except beneficiaries 59 years and older. As there are only ten ANS age groups, it is not surprising that intergenerational transfers are lower in comparison with the analysis conducted before, based on single years of age. By grouping age into a small number of categories, the ANS pricing structure results in intragenerational transfers. Since the regulation requires that beneficiaries from the same age group pay uniform monthly premiums, independent of having different risk factors, the ANS age groups reduce intergenerational transfers but increase intragenerational transfers.

TABLE 3
Intergenerational transfers by ANS age groups – 2015

ANS Age Group	Health care expenses (R$)	Administrative expenses (R$)	Business expenses (R$)	Financial returns (R$)	Montlhy premiums (R$)
0-18	138,950,248	28,677,075	837,494	2,483,416	199,384,739
19-23	48,717,492	10,279,782	300,214	890,222	71,472,825
24-28	80,153,419	14,471,646	422,634	1,253,235	100,617,839
29-33	102,822,188	17,764,328	518,795	1,538,379	123,511,061
34-38	102,675,050	18,141,084	529,797	1,571,006	126,130,550
39-43	86,132,895	16,267,692	475,086	1,408,771	113,105,310
44-48	82,443,690	16,518,127	482,400	1,430,459	114,846,527
49-53	93,498,948	19,134,842	558,819	1,657,065	133,039,907
54-58	97,144,805	18,353,638	536,005	1,589,413	127,608,392
59 and older	469,467,755	68,239,492	1,992,886	5,909,495	474,452,621
ANS Age Group	Loss ratio (%)	Combined ratio (%)	Operating income (R$)	Net results (R$)	
0-18	70.0	83.0	60,434,490	33,403,337	
19-23	68.0	82.0	22,755,333	13,065,560	
24-28	80.0	93.0	20,464,421	6,823,376	
29-33	83.0	97.0	20,688,873	3,944,129	
34-38	81.0	95.0	23,455,501	6,355,625	
39-43	76.0	90.0	26,972,415	11,638,408	
44-48	72.0	86.0	32,402,837	16,832,768	
49-53	70.0	84.0	39,540,959	21,504,363	
54-58	76.0	90.0	30,463,587	13,163,357	
59 and older	99.0	112.0	4,984,866	- 59,338,017	

Source: Data from a sample of Brazilian private health insurers.

Two age groups in particular (0 to 18 years and 59 years and older) encompass a wide range of individuals who possess significant age and risk heterogeneity, resulting in transfers between low and high-risk individuals within the same age group, as seen in Graph 4. In the case of beneficiaries in the age group 0-18, the transfers balance is negative in the first year of age (with slight variations between operating income and net profits).

The transfers balance becomes positive after that, meaning that beneficiaries between the ages of one and 18 pay monthly premiums higher than the value of their expenses (R$72.9 million in operating income profits), more than counterbalancing the losses incurred by infants under the age of one (R$12.4 million in operating income losses). In the case of the oldest age group, comprised of beneficiaries 59 years and older, we find that total revenues exceed expenses among those under 66 years of age and that the transfers balance becomes negative after this age. Nonetheless, in contrast with the youngest age group, intragenerational transfers are insufficient to finance the excess of expenses in the age group 59 and older. As asserted in our prior analysis based on single years of age, paying the healthcare expenses of individuals over 66 years of age requires transfers not only from beneficiaries ages 59 to 65 years but also from adults in younger age groups.
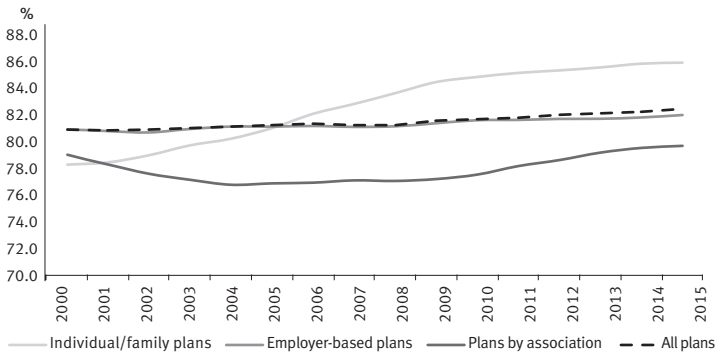
GRAPH 4
Intergenerational transfers by ANS age groups – 2015
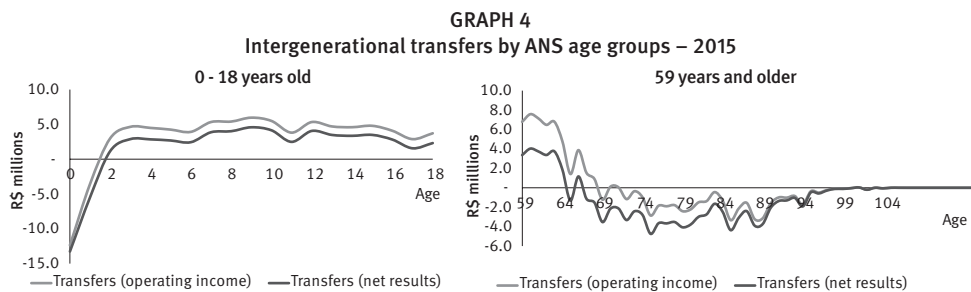
Source: Data from a sample of Brazilian private health insurers.

Population aging and intergenerational transfers

In the previous section, we showed that the transfer balance is positive in all types of private health insurance plan contracts, but that profit margins are shallow. Therefore, it is worth examining the susceptibility of loss ratios to variations in the age structure of beneficiaries by the type of private health insurance plan contract. We examine the sample's age distribution from 2000 to 2015 by single year of age and combine it with monthly premiums and healthcare expenses by age recorded in 2015. The current analysis omits administrative and business expenses, as well as revenues derived from financial returns.

We estimate that age structure changes over the course of 15 years (2000-2015) have resulted in a one percentage point increase in the loss ratio of all types of private health insurance plans that comprise our sample. When we examine the results by the type of private health insurance plan contract, the impact of age structure changes is significantly higher among individual health insurance plans. They show an increase of eight percentage points in the loss ratio, in comparison with just one point for employer-based private health insurance plans and private health insurance plans by association (Graph 5).

GRAPH 5
Loss ratio by type of plan − 2000-2015

Source: Data from a sample of Brazilian private health insurers.

Discussion

In the current study, we estimated the size of intergenerational and intragenerational transfers in a sample of 11 private health insurers in Brazil. Our findings represent an important contribution to the national literature on healthcare systems. Based on a subsample of 16 private health insurers, Turra, Noronha, and Andrade (2015) had already measured the magnitude of intergenerational transfers in the private health sector in Brazil. However, given the unavailability of information by single years of age, the early estimates were restricted to net transfers between ten-year age groups. Furthermore, the authors did not consider financial revenues, and operational and administrative expenses.

The development of this kind of analysis is especially relevant to Brazil, given the rapid process of population aging, and the critical role that private insurers play in the Brazilian healthcare system. The importance of private health insurers, in terms of both the provision and the financing of healthcare services, has gradually grown to cover approximately 25% of the Brazilian population since the implementation of the 1988 Federal Constitution (ANS, 2018a). The regulation of the private health insurance sector has also improved since then, starting with Law n. 9.656 in 1998, which established specific measures concerning private insurers operations, with the goal of protecting consumers. The Brazilian National Regulatory Agency for Private Health Insurance and Plans (ANS), which is linked to the National Health Ministry, was created in 2000 through Law n. 9.961, and expanded the defense of the public interest in private health insurance provision (ANS, 2001). One of the most important rules, contained in Normative Resolution n. 63/03, concerns the price regulatory mechanisms by age group, especially among the oldest and youngest beneficiaries. The extent to which this rule creates an between the two extreme age groups exceed the pricing structure limits imposed on private health insurers by the ANS.

Our findings demonstrated that the financial performance of private health insurers was positive. The average loss ratio, calculated using the ratio between healthcare expenses

and monthly premium revenues, was equal to 82% in 2015. However, the loss ratio also indicates that the financial performance of private health insurers may be worrisome, given the recommendations that this index stays below 70%-75% (CASTRO NETI; DE OLIVEIRA, 2012; SILVA; LOEBEL, 2016). When calculating the combined ratio, which includes administrative and business expenses, as well as financial returns, the average result for private insurers was 96%, implying a profit margin of just 4%. This percentage varied based upon the type of health insurance contract, being equal to 91% for private health insurance plans by association, 95% for individual private health insurance plans, and 99% for employer-based private health insurance plans.

An analysis of the performance of total expenses and revenues by age allowed us to measure intergenerational transfers in the private health sector. Also, we were able to evaluate the extent to which intergenerational subsidies sustained positive operating results for the insurancers in our sample. Considering all types of private health insurance contracts together, we found that beneficiaries ages 66 and older are net transfer receivers. In 2015, each beneficiary above age 66 received an intergenerational subsidy of R$823.37, on average. As the average transfer from each net contributor (individuals 0 to 65 years of age) was equal to R$170.41, roughly five net contributor beneficiaries were necessary to finance the excess of expenses of each net receiver beneficiary. Therefore, the more significant number of beneficiaries younger than 66, which is nearly 11 times greater than the number of beneficiaries ages 66 years and older, may explain the positive results. A separate analysis of individual/family and employer-based private health insurance contracts reveals that there are 4 and 32 beneficiaries, respectively, under the age of 66 years for each beneficiary above this age threshold. These figures are 65% and 88% greater, respectively than the number of net contributors necessary to guarantee the financial health of private health insurers for each type of health insurance contract.

In addition to intergenerational transfers, we also examined intragenerational transfers. As the age groups established by Normative Resolution 63/03 are broad, especially the youngest and oldest groups, this analysis is critical. The ANS age groups can result in sizeable heterogeneity in morbidity patterns, and, consequently, in healthcare expenses. Not surprisingly, we found that intragenerational transfers occur in the widest-ranging age groups (0 to 18 years and 59 years and older). However, we estimated a negative balance only for the age group 59 years and older, which requires revenues from younger age groups to compensate for excess expenses.

The counterfactual analysis of the loss ratios showed just how sensible the financial health of private health insurers is to changes in beneficiaries age structure. Population aging between 2000 and 2015 alone would have increased loss ratios by one percentage point. Regarding only individual private health insurance contracts, the variation would be equal to eight percentage points; whereas, employer-based private health insurance plans showed a variation of less than one percentage point. Despite dealing with a relatively short time period from a demographic perspective (15 years), these results suggest that

any future changes in population structure will affect the operating margins for all types of contracts offered by private health insurers. The demographic transition process will put pressure on the existing intergenerational scheme, in addition to having consequences on pricing structure rules and the types of services offered. However, it is essential to consider that healthcare expenses do not increase only as a result of changes in the age structure and that other factors that we did not consider in the current study, such as technological innovations, could contribute to rapid modifications in medical-hospital costs.

The age structure of private health insurers in our sample allowed them to report a positive financial performance. However, the small difference between revenues and expenses weakens their ability to maintain the existing intergenerational pact. In the initial phases of the demographic transition, when population growth rates are high, and the share of the youth in the population is large, transfers are distributed among many young people, and generational solidarity is a sustainable financing mechanism. With the progression of the demographic transition, there is an increasing need for transfers from youth and adults to the elderly. As a result, the intergenerational pact, and consequently, the sustainability of private health insurers becomes at risk (TURRA; NORONHA; ANDRADE, 2015). This situation is especially relevant to individual and family health insurance contracts, which already demonstrate a relatively older beneficiary age structure in comparison with employer-based private health insurance plans. The annual readjustment ceiling for individual contracts is defined by the ANS, in contrast to employer-based private health insurance plans and private health insurance plans by association, which are not subject to these regulations (ANS, 2018b). Moreover, individual plans cannot be unilaterally restricted and, accordingly, private health insurers cannot cancel contracts in cases where plans are no longer financially advantageous unless beneficiaries wish to do so. In this context, many private health insurers have restricted the availability of individual health insurance plans in recent years (IDEC, 2013).

The intergenerational pact in the private health sector cannot be sustained in the face of existing regulations, principally regarding individual health insurance contracts. Therefore, action should be taken with the goal of maintaining the financial outlook of the private health insurance market. Adjusting monthly premiums based on other observable individual risk factors is not a viable option. In addition to being prohibited by the ANS, this practice could be considered unfair because the monthly premiums charged among high-risk groups would be extremely expensive, and could exclude individuals with the worst health conditions from the private health insurance market. In general, the regulatory measures adopted by different societies have the goal of guaranteeing equal access to health insurance policies independent of an individual's risk level or their socioeconomic status. As a result, the adoption of pricing strategies based on *community rating* has been frequently implemented. For example, this is the case in Australia, Belgium, and the Netherlands (SOWA *et al.*, 2018; SCHILLAERT; GUILLAUME; VAN DE VOORDE, 2018; VAN KLEEF *et al.*, 2018). However, this type of pricing structure, in which no risk variables are utilized to modify premium prices, can generate problems associated with adverse

selection (VAN DE VEN; ELLIS, 2000). Even in Brazil, where regulations allow for the prices of monthly premiums to vary by age group, adverse selection can occur, since age does not explain all of the risks associated with predicted health expenses. Despite the existence of an association between age and healthcare expenses, there is an intense debate in the literature concerning the nature of this relationship. Many argue that age is merely a proxy, a variable that substitutes other observable and unobservable characteristics that could indirectly affect healthcare expenses, such as time to death, morbidity patterns, and the price and quality of available medical technology (RAITANO, 2006; MILLER, 2001; MAIA; ANDRADE; FERES, 2012; RODRIGUES; AFONSO, 2012). Furthermore, regulatory rules can limit the ratio by which risk premiums can vary among these subgroups. Other countries, such as Switzerland and Germany, also adjust premiums for specific risk factors. In Switzerland, insurers adjust premiums according to age and region (VAN DE VEN *et al.*, 2003; OECD, 2004; LEU *et al.*, 2009). In Germany, premium prices can vary depending on the sex, age, and physical condition of individuals. However, these differentiations can only occur when signing up for an insurance plan, and cannot suffer other adjustments as beneficiaries age (MENDES, 2009).

Under the current partial risk-sharing model based on age, worries about the effects of the demographic transition are justified, especially in light of a reduction in the number of younger beneficiaries. The Brazilian population is rapid aging (CARVALHO; SAWYER; RODRIGUES, 1998; BRITO *et al.*, 2007) and it is unlikely this process will be reversed. Additionally, even if Brazil becomes more economically attractive to young international migrants in the future, these migration flows will not contribute to the permanent rejuvenation of the population. In this regard, it is inevitable that the country will experience constant population aging throughout the 21st century (TURRA, 2018).

Specific mechanisms can be adopted to guarantee the sustainability of private health plans, maintaining intergenerational subsidies in the context of an older population. Among the most commonly employed mechanisms, incentives for lifetime health cover, additional aging reserve fund, and fiscal incentives for private healthcare coverage are of particular importance (MENDES, 2009; BAUMANN; MEIER; WERDING, 2004; PAOLUCCI; SHMUELI, 2011; PAOLUCCI; STOELWINDER, 2011). How these mechanisms are implemented, and their implications depend on the characteristics of the healthcare systems and policies in each country. For example, in Australia subsidies are granted to individuals with private health insurance, while high-income individuals lacking health insurance are taxed. Also, in Australia, individuals are encouraged to hold lifetime healthcare coverage in order to guarantee greater portfolio risk diversification for private health insurers (MENDES, 2009). In Germany, the private health insurance sector created an additional aging reserve, charging a 10% surcharge on the total premiums cost for individuals between 21 and 60 years old. The amount is annually added to the reserve, which can be drawn upon once individuals reach 65 years of age, as a way of reducing the cost of monthly premiums (MENDES, 2009; BAUMANN; MEIER; WERDING, 2004).

Singapore, China, South Africa, and the United States have adopted an alternative form of financing their healthcare systems known as Medical Savings Accounts (MSA), which consist of individual or family savings accounts used to finance healthcare expenses over the course of a lifetime (LANGE; STEINORTH, 2012; HANVORAVONGCHAI, 2002). This model offers one alternative protection to beneficiaries, given that future increases in premium costs are likely to occur due to population aging. Its success in Brazil would depend on a variety of factors, including the enrollment rates among the youngest age groups, as the current model based on mutualism would continue to exist. Consequently, younger age groups would have to help to keep funding healthcare services for older groups, independent of their own efforts to save.

In the Brazilian context, we must consider other aspects when implementing actions aimed at assuring the sustainability of the private health insurance sector. The first aspect, which may affect future measures, is the design of the Brazilian healthcare system. The Brazilian healthcare system is mixed, characterized by the coexistence of the public and private sectors in financing and providing healthcare services. In the public healthcare system (SUS), healthcare supply is comprehensive, universal, and free. The private sector plays a duplicative role since it can offer the same services as the public system. According to Andrade *et al.* (2018), this institutional framework affects the demand for both SUS and private sector healthcare services in different ways. Individuals who have private healthcare coverage can be encouraged to use SUS in the face of supply restrictions of the services offered by private health insurers, or in response to financially prohibitive cost-sharing mechanisms. Also, the services furnished by SUS are recognized as being of higher quality than those provided by the private sector for specific types of healthcare. These services are especially likely to include more complex services with exceptionally high costs. Therefore, it is possible that the impact of population aging could have even more significant implications on the financial sustainability of private healthcare plans, mainly due to the obligation of private insurers to fully cover expenses for healthcare services provided by the public sector to individuals who own health insurance plans. SUS reimbursements already occur for procedures that are included in contracts or in the ANS procedures list. Even so, it will be necessary to adopt more efficient control mechanisms and continually refine them, in order to ensure their effective implementation. Moreover, if there were to be any further deterioration in funding for SUS, the supply of services offered by the public sector could be compromised, hampering access to healthcare services, particularly those of greater complexity.

The second aspect denotes the need to improve healthcare expense management. Part of the increase in healthcare expenses in recent years can be attributed to waste arising from excessive procedures and the incorporation of technologies that do not

meet cost-benefit criteria, and whose use is encouraged by the current payment structure (COUTO; PEDROSA; ROSA, 2016). Some authors assert that the private sector for medical services should be seen as a stimulus for technological advancement, once doctors and service providers are guaranteed that patients will have the financial resources to pay for treatments, thus incentivizing research and resulting in the creation of new technologies. From this perspective, the financing system in the private healthcare sector in Brazil generates a dynamic moral hazard, creating incentives for the implementation of new medical technologies (ANDRADE, 2003; GOYEN; DEBATIN, 2009; AZEVEDO *et al.*, 2016). Moreover, the fee for service model, in which health insurers pay for care, is the most commonly used compensation model in Brazil, resulting in higher profits for providers when they perform more expensive procedures (ANDRADE, 2003; AZEVEDO *et al.*, 2016).

Another important measure for managing healthcare expenses is the implementation of incentives for preventive medicine throughout an individual's life cycle. Although it takes time to produce positive effects, preventive medicine has been one of the proposals to reduce the impact of population aging on healthcare expenses, as it can delay the emergence of diseases and their adverse consequences (FAUSTO; MATTA, 2007; CZERESNIA, 2003). Prevention can also result in longevity gains, implying a *per capita* reduction in healthcare expenses, as longer lives can result in lower healthcare expenses at the time of death (MILLER, 2001; LUBITZ; RILEY, 1993; SESHAMANI; GRAY, 2004). The Brazilian private health insurance market has already implemented certain incentives, such as health promotion and risk and disease prevention programs, which have been supported by the ANS since 2004 (ANS, 2001).

Finally, it is important to reinforce that the demographic transition and the resulting increase in the proportion of the population at older ages, merits a discussion concerning the exact definition of who is elderly. In general, improvement in the quality of life and economic development follow life expectancy gains. In this light, we would expect the elderly to experience ever-improving health, raising labor market insertion and income-generating capabilities at older ages. Therefore, a more extensive discussion concerning precisely who should be defined as elderly in Brazil will be imperative, as the current definition encompasses individuals at ages 60 years and older. Generally speaking, in countries where the demographic transition is in its more advanced stages, the elderly comprise individuals 65 and older, and there have already been proposals to raise this age (SANDERSON; SHERBOV, 2013; OUCHI *et al.*, 2017). This discussion creates the need to revise the Elderly Persons Law in Brazil, which prohibits any discriminatory practices among individuals above 60 years of age. It will be fundamental to recognize the existing risk heterogeneity within such a large group of individuals, as well as that risks may change over time (TURRA; NORONHA; ANDRADE, 2015).

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Resumo

Envelhecimento populacional e gastos com saúde: uma análise das transferências intergeracionais e intrageracionais na saúde suplementar

O modelo de precificação de planos de saúde no Brasil prevê a imposição de limites de variação das mensalidades por faixa etária, possibilitando a transferência de recursos dos mais jovens, que têm menor risco de utilização, para aqueles em idades mais avançadas. O aumento da proporção de idosos nas carteiras dos planos de saúde poderá inviabilizar as transferências intergeracionais e a atual estrutura de precificação. O objetivo deste artigo é estimar a magnitude das transferências intergeracionais (entre diferentes grupos de idade) e intrageracionais (em um mesmo grupo de idade) na saúde suplementar brasileira, por meio da análise de dados de uma amostra representativa de operadoras de planos de saúde. Segundo os resultados encontrados, os saldos das transferências intergeracionais foram positivos e ocorrem dos mais jovens para beneficiários de 66 anos ou mais. Os resultados mostram ainda a ocorrência de transferências intrageracionais em duas das faixas etárias definidas pela legislação vigente: 0 a 18 anos e 59 anos ou mais. Finalmente, o exercício de retroprojeção demonstrou que nos últimos 15 anos a sinistralidade nos planos individuais apresentou constante aumento, indicando risco crescente de insuficiência das mensalidades para fins de custeio das despesas no médio prazo, em razão do envelhecimento populacional.

Palavras-chave: Envelhecimento populacional. Gastos com saúde. Saúde suplementar brasileira. Transferências intergeracionais. Transferências intrageracionais.

Resumen

Envejecimiento de la población y el gasto en salud: un análisis de las transferencias intergeneracionales e intrageneracionales en los planes privados de salud de Brasil

El modelo de fijación de precios de seguros de salud en Brasil prohíbe grandes variaciones de las tarifas mensuales mediante la imposición de reglas estrictas por franja etaria, lo que posibilita transferencias intergeneracionales desde los grupos de edades más jóvenes, que son de menor riesgo, hacia los de edades más avanzadas. El envejecimiento de la población asegurada a la salud implicará un aumento de las transferencias intergeneracionales y hará que la estructura actual de precios sea insostenible en el futuro. El objetivo de este artículo es estimar la magnitud de las transferencias intergeneracionales (entre diferentes grupos de edad) e intrageneracionales (dentro del mismo grupo etario) en los planes de salud privados brasileños, mediante el análisis de los datos de una muestra representativa de los proveedores de seguros de salud. Según los resultados obtenidos, los saldos de las transferencias intergeneracionales fueron positivos y ocurren desde los más jóvenes hacia los asegurados de 66 años o más. Los resultados muestran también la ocurrencia de transferencias intrageneracionales en dos franjas etarias definidas por la legislación vigente: de cero a 18 años y de 59 años o más. Finalmente, el ejercicio de retroproyección demostró que en los últimos 15 años la siniestralidad en los planos individuales presentó un aumento constante, que indica un riesgo creciente de insuficiencia de las mensualidades para costear las transferencia en el mediano plazo, a causa del envejecimiento poblacional.

Palabras clave: Envejecimiento poblacional. Gasto en salud. Planes privados de salud brasileños. Transferencias intergeneracionales. Transferencias intrageneracionales.