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Performance of health plan operators: before and during the pandemic

Desempeño de los operadores de planes de salud: antes y durante la pandemia

Desempenho das operadoras de planos de saúde: antes e durante a pandemia

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Abstract

Objective: To analyze the economic-financial and operational performance of Health Plan Operators (HPO), before (3Q2018-4Q2019) and during the pandemic (1Q2020-2Q2021) under the theory of institutional isomorphism.

Method: This is descriptive documentary research that uses statistical techniques to compare medians (Wilcoxon and Kruskal-Wallis) and correlation (Spearman) between performance and socioeconomic indicators, considering the five Health Plan Operators (HPO) with the largest number of beneficiaries.

Results: A statistically significant reduction was observed, after the beginning of the pandemic, for the indicators of profitability, expenses, cost variation, and financial result. On the other hand, there was a growth in current liquidity and an increase in the mean receipt timeframe of payments (CRPM) and event payment (APTE). The performance comparison shows that in the pandemic, profitability and APTE were no longer significantly different. As for the association between the variables, the unemployment rate shows the highest number of relationships with the performance levels.

Theoretical/methodological contributions: Highlights the performance of the five largest OPS, considering the Sars-Cov-2 pandemic period, considering that these companies can be directly affected by the potential increase in demand for health care by their beneficiaries. By the theoretical prism of institutional isomorphism, these companies are references for the sector.

Keywords: Supplementary health; Covid-19; New Coronavirus; Health plan operators; Economic-financial performance.

Resumen

Objetivo: Analizar el desempeño económico-financiero y operativo de las Operadoras de Planes de Salud (OPS), antes (3Q2018-4Q2019) y durante la pandemia (1Q2020-2Q2021) a la luz de la teoría del isomorfismo institucional.

Método: Se trata de una investigación documental descriptiva, utilizando técnicas estadísticas para comparar medianas (WiCLoxon y Kruskal-Wallis) y correlación (Spearman), entre desempeño e indicadores socioeconómicos, considerando las cinco Operadoras de Planes de Salud (OPS) con mayor número de beneficiarios.

Resultados: Se observó una reducción estadísticamente significativa, luego del inicio de la pandemia, para los indicadores de rentabilidad, gastos, variación de costos y resultado financiero. Por otro lado, hubo un incremento en la liquidez corriente y un incremento en los plazos promedio de cobro de contraprestaciones (APRT) y pago de eventos (APTE). La comparación de desempeño indica que, en la pandemia, la rentabilidad y el APTE ya no muestran diferencias significativas. En cuanto a la asociación entre las variables, la tasa de desempleo tiene un mayor número de relación con los índices de desempeño.

Aportes teóricos/metodológicos: Destaca el desempeño de las cinco OPS más grandes, considerando el período de la pandemia del Sars-Cov-2, dado que estas empresas pueden verse directamente afectadas por el potencial aumento de la demanda de atención en salud por parte de sus beneficiarios. Desde la perspectiva teórica del isomorfismo institucional, estas empresas son referentes para el sector.

Palabras clave: Salud complementaria; COVID-19; Nuevo coronavirus; operadores de planes de salud; Desempeño económico-financiero.

Resumo

Objetivo: Analisar o desempenho econômico-financeiro e operacional das Operadoras de Planos de Saúde (OPS), antes (3T2018-4T2019) e durante a pandemia (1T2020-2T2021) à luz da teoria do isomorfismo institucional.

Metodologia: Trata-se de pesquisa descritiva documental, com o uso de técnicas estatísticas de comparação de medianas (Wilcoxon e Kruskal-Wallis) e correlação (Spearman), entre os indicadores de desempenho e socioeconômicos, considerando as cinco Operadoras de Plano de Saúde (OPS) com maior número de beneficiários.

Resultados: Observou-se redução estatisticamente significativa, após início da pandemia, para os indicadores de rentabilidade, de despesas, variação de custo e de resultado financeiro. Por outro lado, ocorreu crescimento de liquidez corrente e aumento de prazos médios de recebimento de contraprestações (APRT) e de pagamento de eventos (APTE). A comparação de desempenho indica que na pandemia a rentabilidade e o APTE deixaram de apresentar diferenças significativas. Quanto à associação entre as variáveis, a taxa de desocupação apresenta maior número de relação com os índices de desempenhos.

Contribuições do estudo: Evidencia o desempenho das cinco maiores OPS, considerando o período de pandemia Sars-Cov-2, tendo em vista que essas empresas podem ser afetadas diretamente pelo aumento potencial da demanda por assistência à saúde de seus beneficiários. Pelo prisma teórico do isomorfismo institucional essas empresas são referências para o setor.

Palavras-chave: Saúde suplementar; Covid-19; Novo Coronavírus; Operadoras de planos de saúde; Desempenho econômico-financeiro.

1 Introduction

The accelerated contagion by the new coronavirus (Sars-Cov-2), which started in Wuhan (China) in December 2019, triggered a high number of deaths from Covid-19, mainly in Italy and Spain. The first deaths formally recorded in Brazil were in March 2020, the month in which it was considered a pandemic by the World Health Organization - WHO (Nasu, 2020). Less than a month after the first death, on April 1, 2020, Brazil had reached the number of 6,834 infected people and 241 deaths (Conselho Nacional de Secretarias de Saúde [CONASS], 2021).

On that occasion, an Associação Brasileira de Saúde Coletiva (ABRASCO) published a technical note that warned about the positioning of health plans regarding omission or opportunism, as well as exposing the capacity to provide care in public and private health beds in Brazil. In this context, Agência Nacional de Saúde Suplementar (ANS) started reporting the monitoring of the health plan sector during the pandemic period through the Bulletin - Covid 19, which contains the information extracted from Documentos de Informação Periódica das Operadoras de Planos de Assistência à Saúde (DIOPS), reported by operators (Lessa, 2021).

The collapse of the public and private health sector in several cities in the country, with intensive use of hospitalizations and beds in the Intensive Care Unit (ICU), equipment, basic supplies, among others, raised questions about the financial health of Operadoras de Planos de Saúde (OPS) (Lessa, 2021). And accounting provides, through performance indicators measured based on financial statements, analysis techniques that make it possible to generate relevant, reliable and timely information for stakeholders interested in the Brazilian private health sector (Assaf Neto, 2020; Baldassare, 2014). And there are many agents interested in the continuity of the OPS, due to the relevance of the services they provide, complementing the public health services offered by the Unified Health System (SUS).

In this direction, Lima, Beiruth and Martinez (2021) investigated the financial liquidity of OPS, in cooperatives, while Araújo (2020) evaluated the longitudinal growth of economic-financial indicators in a self-management unit. And Areias and Carvalho (2021), in order to minimize the risks of liquidation of OPS, approach reinsurance as a measure to protect the continuity of these companies, considering the number of bankruptcies in this sector worrying. It is observed as a gap that no study analyzed the performance of OPS through the comparison of averages between two periods and the relationship between performance and socioeconomic indicators, in this period of pandemic. So, the present study proposes the following question: **how did the Covid-19 pandemic affect the performance of the economic-financial and operational levels of OPS?** With these questions, it is intended to carry out an intrinsic and extrinsic analysis of the five largest OPS, in number of beneficiaries, since on average they offer health coverage to approximately 20 million Brazilians, in different regions of the country (ANS, 2018). Consequently, this study aims to analyze the economic-financial and operational performance of OPS, before (3Q2018-4Q2019) and during the pandemic (1Q2020-2Q2021).

This analysis will be performed by comparing the average performance between the two periods and analysis of association with socioeconomic indicators, guided by the theory of institutional isomorphism, considering that these organizations are conditioned to the same environment and regulatory and normative framework. In addition to it, OSPs with greater market share have the potential to influence smaller ones, in situations of uncertainty and ambiguity. Although inserted in similar operationalization conditions, they present organizational structures and strategic decision-making that differentiate them in terms of performance (DiMaggio, & Powell, 1983; Soeiro, & Wanderley, 2019; Xavier, Souza, & Avelar, 2019). Organizational performance has several metrics to measure and evaluate it, with economic-financial and operational performance levels being one of them (Silva, & Lobel,

2017; Soeiro, & Wanderley, 2019). The monitoring of profitability, liquidity, capital structure, and operational levels allows us to assess how the sector's benchmark OPS are related to the external environment (extrinsic analysis) and the effects of the pandemic period on them. The results of this research contribute to the literature by showing changes in the performance behavior of the main Brazilian OPS that occurred during the pandemic period and the associated socioeconomic indicators, offering information to internal and external users interested in this sector. In addition, the analysis of issues related to the performance of the five largest OSPs in the pandemic context has the potential to contribute to the design of public policies, normative and professional practices.

2 Theoretical reference

2.1 Structure of the health system in Brazil and the pandemic

The Brazilian health system is one of the pillars of Social Security with Social Security. SUS, composed by a regionalized and hierarchical network, offers health services to the population in general, with funding from the budget of the Union, States, Municipalities and other sources. Private institutions are part of the country's health system, complementing the services provided by the SUS (Constituição da República Federativa do Brasil, 1988).

In order to provide a better quality of services aimed at health, private health plans in the country, require pecuniary consideration from the contracting party, to guarantee the continued provision of the contracted services. Supplementary health care plans are classified by modalities: benefits administrator; self-management; medical cooperative; philanthropy; specialized health insurers; and group medicine (ANS, 2000, 2009a, 2009b; Pietrobon, Prado, & Caetano, 2008). In this research, only group medicine companies and specialized health insurance companies are considered. Operators that operate in the group medicine modality operate private health plans for individuals (individual or family members) or for legal entities (collective plans). Beneficiaries use services offered by the operator itself, such as medical, hospital, laboratory and clinical care; with a vertical structure, with a view to greater control of expenses (ANS, 2009b). Specialized health insurers do not have their own network, but offer an accredited network of hospital medical service providers to their policyholders. The operator pays these service providers directly, when services are provided (ANS, 2000; Baldassare, 2014).

The supplementary health sector is supervised by ANS, which has several functions. Mainly, the control of monthly fee readjustments (payments) of health plans in individual contracts, analysis of the causes of readjustments, which includes the validation of Variação de Custos Médicos Hospitalares (VCMH) in the last twelve months, submitted by each operator or insurer. This is composed by the variation in the frequency of use of services, new technologies and health costs. In 2021, ANS set the readjustment to be applied to individual health plans at up to -8.19%. The negative value reflects the drop-in care costs that happened in the sector in 2020, due to the Covid-19 pandemic (Grupo Case Benefícios e Seguros [GCBS], 2021). The costs of operators that are directly related to the increase in demand due to the new Coronavirus are: assistance costs that impact cash, costs with reimbursement to SUS and costs with the variation of the Provision for Events Occurred and Not Reported (PEONR). According to the DIOPE/DIDES Joint Normative Instruction, n. 5 of 2011 of ANS, the amount to be registered for payment to the SUS varies according to Aviso de Beneficiários Identificados (ABI), sent by the ANS to the operator.

As a result of the growing contagion and number of deaths from Covid-19 in 2020, ANS released the in-person service of health operators, including remote work as an alternative, according to Technical Note n. 06 of 2020/DIRAD-DIFIS/DIFIS. Thus, routine consultations and, consequently, clinical and laboratory tests were postponed. With no significant variations in the provision of reimbursements to the SUS, most of the impact on costs in the period was due to the repressed demand for surgeries, the reduction of elective consultations and emergency consultations and the prioritization of remote care (Lessa, 2021).

Lessa (2021) mentions that the cost reduction can be explained by the pent-up demand for face-to-face consultations, exams and surgeries, and by the lower cost of remote care when compared to face-to-face. In general, patients were afraid of exposing themselves in a medical-hospital environment, due to the greater risk of contagion. In addition, health workers were prioritized for the care of patients with Covid-19, so many surgical processes were also extended for the same reason.

However, with the worsening of the pandemic in 2021, the average monthly cost per patient (health plan beneficiary) with ICU use grew by 76.23%, comparing the values of March 2020 (R$ 54,797.00) with March 2021 (BRL 96,572.00). The main reasons for the historical increase in costs for OPS are due to the increase in the number of infected people, with longer hospital stays, including the use of the ICU, putting pressure on the consumption of intubation kits, medicines and other supplies used by hospitals (Federação Nacional de Saúde Suplementar [Fenasaúde], 2021).

The reimbursement to SUS is due by OPS, in the case of eventual assistance to their beneficiaries, who are covered by the respective plans, according to article 32 of Law n. 9,656 of 1998 and ANS standards, with procedures evidenced in Annex I (ANS, 2018). Reimbursement to SUS is counted as an event. According to the normative definition, an event is the entire amount spent on health care services. The amount due is recorded in the Provision for Events/Claims to Settlement account. The accounting must be carried out monthly in a Verification Trial Balance and sent electronically, on a quarterly basis, through Periodic Information from the OPS to the ANS (ANS, 2018).

The time lapse between the service provided by the SUS and the notification of the reimbursement process due by the operator is one year, due to the time required for data processing and the operator's assessment. Cases identified by the ANS are notified quarterly and can be questioned administratively in up to two instances. It is noteworthy that the cases of hospitalizations of beneficiaries of SUS plans represent less than 2% of the total cases of hospitalizations in the SUS, from 2016 to the first quarter of 2020 (Lessa, 2021).

2.2 Economic and operational performance indicators

The analysis of financial statements aims to analyze the economic-financial behavior of entities, through indicators, in order to establish longitudinal comparisons and with the sector in which it is inserted, subsidizing managers and stakeholders in making strategic decisions (Assaf Neto, 2020; Gardi et al., 2021). The quality of accounting information is relevant so that these indicators can reliably show the relationships they propose. In this direction, the corporate governance structure, considering practices, internal controls and risk management, contribute positively to the quality of accounting information (ANS, 2018; Baioco, & Almeida, 2017).

Regarding organizational aspects, these OSPs have different structures. However, in the light of institutional isomorphism, there is a tendency to have similarities in coping with the pandemic, considering the normative framework, the search for legitimacy and social acceptance, as well as the use of a reference standard for new procedures and processes, which

can be used as an example what is being practiced by leading OSPs in the sector. From the perspective of coercive isomorphism, these OPS, even with different organizational structures, are subject to the rules and procedures standardized by ANS for the health sector, which leads them to adopt similar practices (DiMaggio, & Powell, 1983; Xavier et al., 2019).

It is noteworthy that OPS, according to normative isomorphism, seek legitimacy and social acceptance as they meet the expectations of the involved agents, considering the normative aspects, their values, beliefs and culture. Thus, they walk towards socially constructed convergences that also make them similar. In addition to it, OPS are subject to the same conditions as the external environment, even in a situation of turmoil caused by Covid-19, with a normative framework being built together with the demands arising from the crisis. In this environment of uncertainty, companies use as a parameter the procedures and processes performed by market leading OPS (mimetic isomorphism) (DiMaggio, & Powell, 1983; Soeiro, & Wanderley, 2019; Xavier et al., 2019). Even with the trend of convergence in their actions, the used strategies can lead to different economic-financial and operational performance, especially after the pandemic.

Continuing with the above, Table 1 presents the minimum indicators for monitoring suggested by ANS, according to Annex III of Normative Resolution no. 443 of 2019, with the aim of ensuring financial stability, continuity of its services and also a change in culture.

Table 1

List of quarterly economic-financial and operating indicators

Indicator	Interpretation	Formulas
Net Profit Margin (NPM) (%)	Shows the company's ability to turn revenue into net income. It is desirable that this index be positive and high.	$NPM=\frac{Net\ Result}{Effective\ Considerations}\ .\ 100$
Return on Equity (ROE) (%)	Shows the return on invested equity. It is desirable that this index be positive and high.	$ROE=\frac{Net\ Result}{\text{Net Worth}}.100$
Return on Assets (ROA) (%)	Shows operational efficiency in generating profits from assets after the effects of financing. It is desirable that this index be positive and high.	$ROA=\frac{\text{Operational Result}}{\text{Total Assets}}.\ 100$
Percentage of Assistance Expenses in relation to Income from Payments (IP) (%)	It shows the proportion of Effective Considerations intended for the payment of Net Indemnifiable Events. It is desirable that this rate be low.	$IP=\frac{Net\ Indemfiniable}{Effective\ Considerations}\ .100$
Percentage of Administrative Expenses in relation to Income from Payments (EP%)	It demonstrates how much the expense with the operation of the health plan depends on the monthly income. It is desirable that this rate be low.	$DA=\frac{Administrative\ Expense}{\text{Effective Considerations}}\ .\ 100$
Percentage of Commercial Expenses in relation to Revenue from Considerations (ER) (%)	It demonstrates how much the commercial expense depends on the monthly income. It is desirable that this rate be low.	$IC=\frac{Commercial\ Expense}{Effective\ Consideraions}.100$
Percentage of Operating Expenses in relation to Operating Revenues (OOR) (%)	It demonstrates how much the operating expense depends on the monthly fee income. It is desirable that this rate be low.	$OOR=\frac{\text{EIL+IC+DA+ODO}}{\text{Effective Cons.}}.100$

Financial Result Index (FRI)	Indicates how much of the Effective Consideration receipts are being converted into Financial Result. It is desirable that this index be positive and high.	$FRI=\frac{\text{Net Financial Result}}{\text{Effective Cons.}}$
Current Liquidity (CL)	It shows the ability to pay debts in the short term. It is desirable that this index is equal to or greater than 1.0.	$CL=\frac{\text{Current Assets}}{Current\ Liabilities}$
Interest in Third-Party Capital (TPC) (%)	It shows the proportion of the company's indebtedness, in the short and long term, in relation to its financing with equity. When this proportion is greater than 100%, it indicates a greater degree of financial dependence on third-party capital.	$TPC=\frac{\text{PC+PNC}}{\text{Net Equity}}.100$
Average Payment Receipt Term (APRT)	It represents the average time (day) that the operator takes to receive credits from health operations, after deducting the provision for losses on credits (PPSC). Thus, the lower the APRT, the more independent it is to raise funds from third parties to finance working capital.	$APRT=\frac{\text{Cred. health op +PPSC}}{\text{Effective Cons.}}.360$
Average Payment Term for Events (APTE)	It represents the average time (day) that the operator takes to pay providers what they have already been warned about. The higher the APTE, the longer the time to use the resource as working capital.	$APTE=\frac{\text{Prov to liquidate}}{\text{EIL}}.360$
Cost Variation (%)	This proportion indicates how much the cost of Indemnifiable Events per beneficiary has changed from one year to the next.	$CV=\left(\frac{\text{Current EIPCA}}{\text{Previous EIPCA}}\text{-}1\right).100$

Source: Adapted from ANS (2018), Assaf Neto e Lima (2017) and Silva and Lobel (2016).
Legend: OOE= Other Operating Expenses; OOI= Other Operating Income; NIE = Net Indemnifiable Events; PFCL= Provision for Losses on Credits; EIPCCY = Event Indemnities per capita current year; EIPCPY = Event Indemnities per capita previous year.

The contextualization of these performance indicators with the socio-economic situation affected by the pandemic becomes necessary, as the external environment influences the OPS, not only due to the increase in demand resulting from Covid-19, but also due to the installed socio-economic crisis. strong retraction in the level of production, as measured by the Gross Domestic Product (GDP), which happened as a result of social isolation measures aimed at reducing the spread of contagion (Castro, 2020; Shehzad, Xiaoxing, Bilgili, & Koçak, 2021; Silber, 2020). Concomitantly, there was an increase in the unemployment rate, which depicts the proportion of people in the workforce who are unemployed, and the closing of companies (IBGE, 2021; Silber, 2020). As a measure to stimulate production, the Central Bank, through Comitê de Política Monetária (COPOM), reduced the Selic interest rate in March and August 2020, reaching the historic low of 2% per year (Banco Central do Brazil [Bacen], 2021). The reduction in GDP, together with the increase in unemployment, can lead to a reduction in family income and, consequently, cause a decrease in the number of beneficiaries. The decrease in interest rates can affect the structure of capital, profitability and profitability (Fraga, Oliveira, Santos, & Ferreira, 2021; Jacques, Borges, & Miranda, 2020).

In 2021, with the rapid increase in contagion and the number of deaths from Covid-19, the Brazilian health system collapsed (Castro, 2020; National Council of Health Secretaries, 2021; Rocha Filho et al., 2021). Table 2 shows the quarterly evolution of the number of deaths, with a growth of 117,255.26%, from the first quarter of 2020 to the second quarter of 2021.

Table 2

Quarterly evolution of the number of deaths (1T2020 – 2T2021)

Trimester	No. of deaths
1T2020	114
2T2020	56.956
3T2020	84.336
4T2020	49.389
1T2021	119.755
2T2021	202.185

Source: *Conass (2021).*

The number of deaths from Covid-19 is an indicator of the worsening of the health and economic crisis, as social isolation became more frequent and lasting as deaths intensified. The SUS has the structure to act in epidemiological crises, supported by the Ministry of Health (MS), in the state, district and municipal health departments. Since 2000, it has developed actions aimed at training and professional qualification programs, creating Information Centers and Health Surveillance Strategies, capable of detecting, investigating, intervening and communicating events in this area. However, the minimization of the event by the Federal Government and information without scientific evidence caused disorientation in the system, with wrong policies. In this scenario, Conselho Nacional de Secretários de Saúde gains prominence, supporting actions to combat the pandemic and minimize infections and deaths (Henriques, & Vasconcelos, 2020).

2.3 Related studies

The studies presented in this section contribute to the theme and support the outline and discussion of the results of this research. Lessa (2021) analyzed the variation in care costs between the pre- and post-pandemic periods (Coronavirus Sars-CoV-2), in relation to the change in the cost of providing reimbursement to the SUS. He worked with the hypothesis that there was a reduction in costs, resulting from the following factors: lower demand for hospitals in the first year of the pandemic; prioritization of care related to Covid-19, as well as emergency care aimed at the new disease. A single case study was used, with a qualitative approach, considering the largest private health operator in Brazil, in number of beneficiaries, with public capital at B3. The conclusions showed an increase in care costs with an impact on cash related to the pandemic.

Araújo (2020) analyzed the economic-financial impacts on a Health Assistance Plan Operator, in the small self-management modality, located in the Northeast region, in the previous period (first and second quarter of 2019) and during the COVID Pandemic -19 (first and second quarter of 2020). In this study, the indicators Net Profit Margin (NPM), Loss Ratio, Return on Equity (ROE), Return on Total Assets (ROA), Current Liquidity (CL), Debt Capital/Equity Ratio (IC/ER) and General Indebtedness (GI) were used to assess performance. The comparison was made by the percentage growth of the indicators among the analyzed quarters. The results revealed, when comparing the indicators from the period before the

pandemic with the indicators calculated during the pandemic, that the operator obtained favorable results during the Covid-19 pandemic. This result was explained by the cancellation of elective procedures during the pandemic, thus reducing care expenses. Research by Araújo (2020) and Lessa (2021) made it possible to understand the economic-financial and operational performance of operators in the context of a pandemic.

Lima et al. (2021) analyzed the continuity of health plan operators in the cooperative modality from the perspective of liquidity, from 2018 to 2020. They used multiple regression with panel data and found a positive and significant effect of the health crisis on finances. This study contributes to the present research, as it makes it possible to compare the relationship among performance levels and the pandemic, of operators in the group medicine and health insurance modality, with the cooperative modality, researched by the authors.

Baldassare (2014) expands the modalities of operator, when analyzing the economic-financial performance of self-management, medical cooperative, group medicine and insurance operators, from 2001 to 2012. It was investigated how the modality and size of the operator (according to the number of beneficiaries) influence the economic-financial performance of health plan operators. The group medicine modality presented higher operational return on assets and lower claims rate, when compared to the others. These results are in line with the strategies of the verticalization process, with a view to obtaining efficiency gains. In this direction, Baldassare's study (2014) contributes to the present article by highlighting the influence of the operator modality on its performance.

In this context, the present research uses five OPS, three in the group medicine modality and two insurance companies and explores the theme by analyzing the economic-financial and operational performance indexes of OPS, in the context of a pandemic, extending the period of analysis until the second quarter of 2021. And it adds the analysis of the relationship of these levels with the socioeconomic environment resulting from the health crisis.

3 Methodological Aspects

Quantitative and descriptive research techniques were used, with data processing using statistical techniques, in order to characterize the variables and the relationships between them (Martins, & Theóphilo, 2016). And as for the data collection strategy, documentary research was used, using the quarterly financial statements made publicly available by ANS to calculate the performance indicators of liquidity, capital structure, profitability/profitability, activity and operational performance (as described in Table 1). The socioeconomic variables, with quarterly historical series, were: unemployment rate, GDP and Selic rate and number of deaths from Covid-19, as shown in Table 2 (Bacen, 2021; Conass, 2021; IBGE, 2021).

The sample as presented in Table 3 was defined by intentional criterion. This is because it opted for the five largest OPS in December 2020, which represents 29.50% of the total (47,534,119) of beneficiaries in the country (ANS, 2021).

Table 3

Five largest Medical-Hospital operators, according to number of beneficiaries (Dec.2020)

Rank	Company	Number of Beneficiaries
1ª	Bradesco Saúde S.A	3,257,660
2ª	NotreDame Intermédica Sistema de Saúde	3,079,145
3ª	Amil Assistência Médica Internacional	2,826,819
4ª	HapVida Assistência Médica	2,680,868
5ª	Sul América Companhia de Seguro Saúde	1,821,701

Source: *Adapted from ANS (2020).*

The dummy variable Covid was added, assigning 1 for occurrence and 0 for the period before the pandemic in the country. The normality test (Shapiro-Wilk) was carried out for the indicators, whose most variables did not present a distribution with statistical adherence to the normal distribution function, leading to the application of non-parametric tests for the comparison of means and correlation analysis. The Wilcoxon Test was applied, considering the period before the pandemic started and after it started in March 2020 (Fávero, & Belfiore, 2020). To assess whether there is a performance divergence between the five OPS, the non-parametric Kruskal-Wallis test was applied.

Another possibility to contextualize operators' performance levels with the pandemic can be through the relationship among them and macroeconomic indicators (unemployment rate, interest rate and GDP). Association analysis was performed using the Spearman correlation test. A significance level of 5% was considered to perform this statistical test (Fávero, & Belfiore, 2020).

4 Results

Table 4 presents the univariate descriptive statistics with the purpose of describing the behavior of the variables through the mean, standard deviation and minimum and maximum values, in the two periods before and during the pandemic.

Table 4

Descriptive statistics of economic-financial. operational. Covid-19 mortality and macroeconomic indicators. before and during the pandemic (3Q2018-4Q2019 and 1Q2020-2Q2021)

Level	Period before the pandemic (3T2018-4T2019)				Pandemic period (1T2020-2T2021)			
	Average	Standard Deviation	Minimum	Maximum	Average	Standard Deviation	Minimum	Maximum
NPM	5.28	2.84	-0.93	9.09	5.12	4.28	-3.78	14.49
ROE	10.48	7.07	-1.31	23.67	7.38	7.76	-2.86	30.00
ROA	5.16	3.68	-0.92	13.55	4.02	4.80	-2.08	19.54
DM	79.19	6.32	68.97	87.87	76.30	8.93	58.45	92.91
DA	7.74	2.82	3.83	11.17	7.35	2.41	3.51	10.88
IC	5.14	0.97	3.69	6.42	5.21	1.05	3.31	6.87
OOR	93.61	4.79	85.63	101.50	91.27	7.27	76.90	102.70
FRI	0.02	0.02	-0.00	0.07	0.01	0.03	-0.02	0.08
CL	1.19	0.40	0.50	1.81	1.34	0.48	0.59	2.37
TPC	96.19	42.00	40.30	170.90	92.37	49.88	36.22	187.20
APRT	6.03	5.53	1.39	28.29	7.56	6.25	1.34	28.19
APTE	32.60	22.53	11.78	114.50	48.87	28.38	14.85	125.80
CV	35.16	55.88	-75.32	116.10	21.98	72.30	-77.20	111.00
DEATHS					85.46	64.60	0.11	202.20
DESOC	11.83	0.51	11	12.70	13.80	0.87	12.20	14.70
PIB	0.37	0.43	-0.30	0.90	0.18	5.28	-9.20	7.80
SELIC	1.50	0.13	1.27	1.59	0.66	0.18	0.50	1.03

Source: survey data.

Legend: NPM= Net Profit Margin; ROE= Return on Equity; ROA= Return on Total Assets; EP= Percentage of Assistance Expenses in relation to Income from Payments; EI= Percentage of Administrative Expenses in relation to Income from Considerations; EC= Percentage of Commercial Expenses in relation to Income from Considerations; POR= Percentage of Operating Expenses in relation to Operating Revenues; FRI= Financial Result Index; CL= Current Liquidity; ITC= Interest in Third-Party Capital; APRT= Average Payment Receipt Term; APTE= Average Payment Term for Events; CT = Cost Variation. Number of observations: 30

Note: all data are quarterly

The company Hapvida achieved the highest rates of Return on Equity (ROE) in the entire period analyzed, with 26.28% and 30.00% in 3Q2020 and 4Q2020, respectively, reducing to 4.44% and 6.41 % in the two following quarters in 2021, with greater variability among the other OSPs. Its return on assets (ROA) was also the highest 12.04% (2Q2020); 16.44% (3Q2020); and 19.55% (4Q2020), reducing to 2.84% and 4.32% in subsequent quarters.

All OPS showed growth in the number of beneficiaries in the period of the pandemic (1Q2020-2Q2021), except for Amil with a reduction of 2.20%. Hapvida showed the highest growth (12.68%) followed by Notredame (8.34%), while the Insurers: Bradesco and Sul América grew approximately 3.45% and 3.27% respectively (ANS, 2021). It is noteworthy that the two operators in the group medicine modality showed higher profitability and profitability, with Notredame with the highest average of Net Profit Margin (NPM) and Return on Equity (ROE), and from the beginning of the pandemic the Hapvida leads the ranking of the five largest operators.

Baldassare's results (2014) corroborate the finding that the group medicine modality has a higher operational return on assets, when compared to the others. This is in line with the strategies of the verticalization process, to obtain efficiency gains. Amil performed poorly in

profitability before and during the pandemic. And in the context of a pandemic, the results of Lima et al. (2021) show better performance of cooperatives, therefore, they expand the information that in addition to operators in the group medicine modality and insurance companies, cooperatives also obtained better economic-financial performance.

The average rate of Interest in Third-Party Capital (TPC) was reduced, as total liabilities fell in relation to shareholders' equity during the pandemic period. However, there was an increase in the variation coefficient, due to the heterogeneity of dependence on third-party capital among operators. Bradesco OPS had the highest TPC (1.87 in 2Q2021) in the pandemic period, due to the growth of total liabilities (22.24%) greater than the growth of PL (6.78%), indicating a greater degree of dependence of third-party capital; while the other companies had a reduction in the degree of indebtedness in the pandemic. Amil showed less dependence on third-party capital throughout the period analyzed, with total liabilities representing 40.52% of PL, in 2Q2021.

The average term levels, which are relevant to understanding the operator's working capital needs, indicate whether the company received its considerations before making payments for events. The Average Time for Receipt of Considerations (ATRC) and the Average Time for Payment of Events (ATPE) increased by 1.25% and 1.50%, respectively. This indicates that cash flow in the pandemic period was slower, to receive and to make payments.

Amil had the lowest Average Period for Receiving Considerations (APRC) in the entire period analyzed, among the other operators, with approximately 4 days to receive considerations and 35 days to pay providers. While Bradesco takes an average of 15 days to receive and 75 days to pay providers, using these resources as working capital for a longer period of time.

Table 5 shows the comparison of sample medians, using the non-parametric test (Wilcoxon). When considering a margin of error of up to 10% (significance level), it was found that only the Net Profit Margin (NPM) and Commercial Expenses in relation to Income from Considerations (IC) did not show significant statistical differences, suggesting that the pandemic period did not affect NPM and Commercial Expenses in relation to the Income from Considerations (IC) of the sample.

Table 5

Analysis of difference in economic-financial and operational performance before and after the Covid-19 pandemic (3T2018-4T2019 to 1T2020-2T2021)

Level	Median		Value_p	Decision Making
	Before	During		
NPM	5,80	4,66	0,918	Accepted H_0
ROE	10,86	5,52	0,066*	Rejected H_0
ROA	4,97	3,11	0,086*	Rejected H_0
DM	79,92	77,26	0,008**	Rejected H_0
DA	9,41	8,22	0,056*	Rejected H_0
IC	5,48	5,41	0,241	Accepted H_0
OOR	93,81	91,41	0,035**	Rejected H_0
FRI	0,01	0,00	0,015**	Rejected H_0
CL	1,19	1,26	0,010**	Rejected H_0
TPC	86,48	79,60	0,060*	Rejected H_0
APRT	3,51	5,39	0,060*	Rejected H_0
APTE	27,46	40,61	0,060*	Rejected H_0
CV	42,79	41,06	0,060*	Rejected H_0

Source: Research data.

Legend: significance levels: ***, **, *, respectively for 1%, 5% and 10%. H0: the medians are equal.

The profitability, indebtedness and operating indicators showed statistically lower medians in the pandemic period, except for Net Profit Margin (NPM) and Commercial Expenses in relation to Income from Considerations (IC), corroborating the reduction in profitability, expenses, indebtedness and increase in the operating cycle and liquidity, which are also indicated by the absolute value of the arithmetic averages. The reductions in the median values of Assistance Expenses in relation to Income from Payments (IP) and the Financial Result Index (FRI), with 99% confidence, can be explained by the sharper reductions in the values of expenses with indemnifiable events and results net financial income in relation to the reductions in consideration obtained, in the second period.

The profitability ratios showed significant differences, accepting a greater margin of error (10%) and indicating that, in the pandemic period, the medians of Return on Equity (ROE) and Return on Total Assets (ROA) presented lower values when compared to the medians of the previous period. These results partially corroborate those obtained by Araújo (2020), regarding the observation of growth in profitability and current liquidity, during the pandemic period.

Interest in Third-Party Capital (TPC) and Cost Variation (CV) showed reductions, with significant differences in the medians between the two periods, with 90% confidence. However, it is noteworthy that the CV of 2Q2021 compared to 1Q2021 presented the highest rates of the period, due to the intensification of the pandemic (Conass, 2021). It is noteworthy that Lessa (2021) observed an increase in care costs with an impact on cash, in the pandemic period measured until December 2020, except in the months in which lockdowns occurred, which generated pent-up demand for services unrelated to Covid-19. The operating levels Operating Expenses in relation to Operating Revenues (OOP), Average Period for Receiving Considerations (APRC) and Average Period for Payment of Events (APPE) showed significant increases, considering a margin of error of up to 5%, confirming that, in the second period, the generation of working capital through operating activities became slower.

Table 6 makes it possible to compare the economic-financial and operational performance between the five health plan operators, using the Kruskal-Wallis test, by presenting the significant differences in the economic, financial and operational performance indicators between the operators, before and during the beginning of the pandemic, with a significance level of up to 10% of confidence. When analyzing the performance of the five operators, it appears that only the Cost Variation (CV) did not present significant differences in the two periods.

Table 6

Analysis of the difference in performance between the five Health Plan Operators before and after the Covid-19 pandemic

Level	Probability associated with the test statistic			
	Value_p Before	**Decision**	**Value_p During**	**Decision**
NPM	0.0001***	Rejected H0	0.018**	Rejected H0
ROE	0.004**	Rejected H0	0.107	Accepted H0
ROA	0.001**	Rejected H0	0.128	Accepted H0
DM	0.000***	Rejected H0	0.003**	Rejected H0
DA	0.000***	Rejected H0	0.000***	Rejected H0
IC	0.000***	Rejected H0	0.000***	Rejected H0
OOR	0.000***	Rejected H0	0.003**	Rejected H0
FRI	0.000***	Rejected H0	0.001**	Rejected H0
CL	0.000***	Rejected H0	0.000***	Rejected H0

TPC	0.000***	Rejected H0	0.000***	Rejected H0
APRT	0.016**	Rejected H0	0.029**	Rejected H0
APTE	0.062*	Rejected H0	0.140	Accepted H0
CV	0.983	Accepted H0	1.000	Accepted H0

Source: Research data.
Legend: significance levels: ***, **, *, respectively for 1%, 5% and 10% H0: There is no difference between the medians of the economic, financial and operational levels of the five operators.

According to the Kruskal-Wallis test, significant differences were observed between the five operators with up to 90% confidence, except for Cost Variation (CV). This suggests that costs among the five operators showed similar behaviors before and during the pandemic. Based on this finding, users can interpret that the five operators had similar costs between them and that the pandemic period did not change the median cost. In this period of the pandemic, it was found that the OPS no longer showed significant differences in performance in relation to the Return on Total Assets (ROA), Return on Equity (ROE) and Average Term of Payment of Events (ATPE) as occurred before the pandemic, indicating that, even using different strategies, they obtained statistically equal results.

When evaluating whether the performance levels are associated with the socioeconomic environment affected by the crisis of the new Sars-Cov-2 coronavirus, greater robustness is made to the comparisons established previously. So, Table 7 presents the relationship among the socioeconomic indicators and the economic-financial and operational levels from 3Q2018 to 2Q2021, according to Spearman's correlation test. There are significant positive associations of the health crisis indicators (Deaths and Covid) with the unemployment rate and inverse with the interest rate - Selic, which suffered a strong reduction in 2020.

Table 7
Relationship between economic-financial and operational indicators with macroeconomic indicators, deaths from Covid-19 and existence of the pandemic (3Q2018-2Q2021)

	DEATHS	**COVID**	**DESOCUP**	**PIB**	**SELIC**
DEATHS	1.000				
COVID	0.928*	1.000			
DESOCUP	0.881*	0.822*	1.000		
PIB	0.760	0.097	0.441*	1.000	
SELIC	-0.824*	-0.885*	-0.726*	-0.323*	1.000
NPM	-0.176	-0.087	-0.098	0.016	0.009
ROE	-0.310*	-0.249	-0.339*	0.077	0.039
ROA	-0.293*	-0.226	-0.318*	0.081	0.020
DM	-0.069	-0.166	-0.122	-0.049	0.194
DA	-0.105	-0.137	-0.110	0.006	0.114
IC	0.080	0.053	0.0585	0.037	-0.053
OOR	-0.029	-0.134	-0.099	-0.070	0.193
FRI	-0.192	-0.279*	-0.176	0.038	0.221
CL	0.122	0.150	0.138	0.094	-0.192
TPC	-0.094	-0.092	-0.073	0.001	0.099
APRT	0.215	0.199	0.377*	0.075	-0.003
APTE	0.361*	0.372*	0.490*	-0.050	-0.108
CV	0.149	-0.002	0.060	-0.075	0.009

Source: survey data.
Notes: 60

When analyzing the relationship of performance levels with socioeconomic indicators, negative and significant associations were observed between profitability (ROA and ROE) with the number of deaths by Covid-19 and with the unemployment rate, suggesting that the intensification of the pandemic resulted in reductions in return on the assets and on the equity of the OPS, mainly due to the reduction of income from considerations. The negative and significant association between the Financial Result Index (FRI) and Covid-19 indicates that the occurrence of the pandemic caused a reduction in the performance of this index due to the lower financial income obtained through financial investments or resulting from interest charges. During the pandemic period, there was a historic reduction in Selic rate as a measure to stimulate production and consumption. During the pandemic period, Selic interest rate fell sharply, resulting in a lower cost of raising funds from third parties and lower profitability with financial investments (Bacen, 2021; Castro, 2020; CONASS, 2021; Rocha Filho et al., 2021).

The Average Period for Receiving Considerations (APRC) showed a positive and significant correlation only with the unemployment rate, while the Average Period for Payment of Events (APPE) showed positive and significant associations with the number of deaths due to Covid-19, the existence of a pandemic and unemployment rate. These results suggest that the formation of working capital, resulting from operational activities, became slower with the occurrence and intensification of the health crisis, with the deadlines for payment of events being more affected.

5 Final considerations

In the context of a pandemic, the health market gains relevance among stakeholders in several dimensions, including on the economic, financial and operational efficiency of OPS, as they guide the decisions of government agents, beneficiaries, service providers and others. In this context, guided by institutional isomorphism, this study aims to verify and analyze the economic-financial and operational performance of OPS, before (3Q2018-4Q2019) and during the pandemic (1Q2020-2Q2021), using the Wilcoxon and Kruskal Wallis median comparison techniques and association analysis using Spearman's correlation coefficient (3Q2018-2Q2021).

The results allow us to conclude that the five largest OSPs were able to pay their short-term commitments; positive profitability and profitability; low dependence on third-party capital; average term for receipt of considerations shorter than the average term for payment of events, indicating working capital from operating activities throughout the period analyzed (3Q2018 to 3Q2021). However, the variability around the mean increased in the pandemic period, suggesting more heterogeneous performances.

When comparing the previous period and the pandemic period, there were significant reductions for: profitability (Return on equity and Return on total assets), expenses (assistance expenses; Administrative expenses; Commercial expenses and Operating expenses), participation debt capital (PDC), financial result index (FRI) and cost variation (CV). There are also statistically significant increases for Average Period for Receiving Considerations (APRC), Average Period for Payment of Events (APPE) and Current Liquidity (CL) between the two periods. It is noteworthy that, before the pandemic, OPS remained with the resources from operational activities, working with them for approximately 24 days, going to, during the pandemic, to 35 days. This result may have contributed to the increase in the ability to pay debts in the short term. Thus, all economic-financial and operational performance levels were affected

in the pandemic period, except for the Net Profit Margin (NPM) and Commercial Expenses in relation to Income from Considerations (IC).

When comparing the performance between the OPS, analyzing the two periods, it is concluded that only the Return on Total Assets (ROA), Return on Equity (ROE) and Average Payment Term for Events (APTE) showed changes in the of decision. This indicates that, before the pandemic, the OPS had different profitability indexes and Average Payment Term for Events (APTE) between them, however, in the pandemic period, these differences were no longer statistically significant. This suggests that the situation of health and economic crisis overcame the intrinsic differences in their respective organizational structures.

The correlation analysis among socioeconomic levels and economic-financial and operational levels made it possible to verify that the unemployment rate is the indicator that presents the greatest number of associations with the performance levels. The results indicate a reduction in profitability and longer average terms for receipt of considerations and payment of events. These results suggest that the economic-financial and operational performance of the sector is extrinsically related to the unemployment rate, which increased during the pandemic period. It is noteworthy that the short period of analysis is one of the limits of this study, suggesting for future research to expand the sample and time scale to assess the financial, economic and operational efficiency of OPS, with the Covid-19 pandemic, including with a view to observing compensation with reimbursement to the SUS.

This research as a theoretical and managerial contribution complements the analysis of the performance of OPS in a pandemic period caused by the new coronavirus Sars-Cov-2. It shows that by extending the analysis to the second quarter of 2021, the results obtained differ from those presented by Lima et al. (2021), who observed positive impacts of the pandemic on the performance of health plan cooperatives, from 2018 to 2020, therefore, before the peak of deaths that occurred in the first half of 2021. The results obtained here corroborate the findings of Lessa (2021), regarding the increase in care costs, related to the pandemic period (2020 to March 2021). And it expands the findings by relating the economic-financial and operational performance levels with the GDP, unemployment and interest rate (Selic) indicators, in addition to the number of deaths. As for practical contributions, they support stakeholders in their decision-making.

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