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Implementation of the pact for health in Brazil: what changes did it bring to child mortality?

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ABSTRACT. This study aimed to verify the association of social inequalities with infant mortality rate so as to infer what has changed in Brazil with the implementation of the Pact for Life. This was an epidemiological ecological study of the time series type with spatial correlation carried out through the Mortality Information System, considering the years from 1996 to 2016. For the development and analysis of the data, the 161 Intermediate Regions of Urban Articulation were considered. The infant mortality coefficient in the years studied was the dependent variable, and as independent variables, the ones selected were the Human Development Index, Gini Index, percentage of poor people and the coverage of the Family Grant Program. Descriptive data were analyzed in the Statistical Package for the Social Sciences. Mortality data were spatialized to determine bivariate spatial autocorrelations using the Geoda software. It was identified in the results that there was a decrease in the infant mortality rate in the decades; spatial autocorrelation showed high coefficients in the Northeast in the first decade, and higher coefficients in the North and Midwest in the second decade. In the bivariate analysis of the infant mortality coefficient with the Human Development Index, greater autocorrelation was observed in the Southeast, South and Midwest regions in the two decades; with the Gini index, the first decade showed autocorrelation in the North and Northeast, and in the second decade, there was autocorrelation in the North, Northeast, and Midwest. When assessed with poverty, autocorrelation was observed in the North and Northeast; and with coverage of the Family Grant Program, autocorrelation was concentrated in the Northeast. Even before and after the release of the Pact for Life, social inequalities were directly related to infant mortality. The Pact, which had one of its indicators the reduction in infant mortality, was effective when evaluated in isolation, however, despite the decrease in this problem.

Keywords: infant mortality; inequalities; children's health.

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Introduction

Infant mortality is the term used to characterize all deaths that occur in children under the age of one year in a given area in a given period of time. It is the most effective indicator to assess the population's health situation. This indicator was included in the Millennium Development Goals (MDGs) during the period from 1990 to 2015, with the objective of reducing by two thirds the mortality in children under 5 years of age during that period, and it was later inserted in the Sustainable Development Goals (SDGs) for evaluation by 2030 (United Nations Children's Fund, 2015).

After technical studies on infant mortality, the Ministry of Health disclosed the Pact for Health in 2006, which appeared as a commitment among managers of the Unified Health System (SUS) to be reviewed annually according to the constitutional principles of SUS. Within this ordinance, three articulated spheres were defined as priority, namely: the Pact for Life, the Pact in Defense of SUS, and Pact of Management of SUS (Ministério da Saúde, 2006). Regarding maternal and child health, the Pact for Life emerge as an important aspect, providing fundamental indicators based on the development of actions that allow an improvement in the health care of this group in Brazil.

Thus, the study of infant mortality in Brazil, a developing country, must be evaluated considering the reality of social inequalities. Some measures used to monitor these inequalities arise, including the Human Development Index (HDI), considered a measure to monitor inequalities from the perspective of income, education and longevity to assess the economic development of the country. There is still the Gini Index

that measures the concentration of income in a given group, comparing the 20% poorest with the 20% richest (Programa das Nações Unidas para o Desenvolvimento, 2010).

In this sense, the lowest infant mortality rate (IMR) values are found in countries with high HDIs, with three deaths per thousand live births, while infant mortality rates in countries with low HDI remain high (Malik, 2014). In addition, significant decrease in income inequality has a direct impact on infant mortality, reducing it, and the increase in income results in the increase of IMR (Sousa, Campos, Silva, Bezerra, & Lira, 2016).

Another important factor to be highlighted is poverty in the country; it is known that poor individuals tend to have a lower proportion of access to health services, as well as other quality of life indicators. Thus, in an attempt to reduce the existing poverty in the country, government programs were created to try to minimize social inequalities, with emphasis on the Family Grant Program (FGP) created in 2003, considered one of the largest because it consists in the conditional cash transfer in the world and because it reached a high coverage in the last decade as a social and popular security net program (Silva & Paes, 2019). The FGP made it possible for several families to get out of the condition of extreme poverty, and therefore changes in the existing social indicators took place.

Despite government investments to reduce inequalities, studies show that in 2013, among the five regions of Brazil, only the North and Northeast had infant mortality rates above the target proposed in the MDGs for 2015, of 15.7 deaths per thousand born (Ministério da Saúde, 2014) It is noteworthy that the prevalence rates of infant mortality are very discrepant among the regions of Brazil, a large part of the deaths are in general potentially preventable and they are directly related to malnutrition and infectious diseases (Lourenço, Brunken, & Luppi, 2013).

However, in the last 25 years, there has been a significant reduction in infant mortality in Brazil, and thus it was found that the country reached the target 4 of the MDGs (to reduce infant and child mortality) by two-thirds by 2015 (Ministério da Saúde, 2015). Despite such decrease, current rates are still high. The identification of regional inequalities is necessary in order to correct them, since the majority of infant deaths occur in the first year of life, especially in the first month (França et al., 2017).

Thus, the present study aimed to verify the association of social inequalities with infant mortality rates, and based on this association, infer what has changed in Brazil after the implementation of the Pact for Life.

Material and methods

This is an ecological, national, retrospective, temporal study with cross-sectional design and analysis of spatial correlation, with analysis of a twenty-year period, based on collected from 1996 to 2016, excluding the year 2006 because it was the year of implementation of the Pact for Life.

The study scenario was all Brazilian municipalities, being aggregated in the Intermediate Regions of Urban Articulation (IRUA), which consist of 161 regions and have as characteristics the articulation of the centers and the ability to polarize a significant number of municipalities in the service of goods and services considered highly complex. They also concentrate public and private management activities and are articulated at the regional scale, private bodies and companies (Instituto Brasileiro de Geografia e Estatística [IBGE], 2017).

As a dependent variable, the following indicator was selected: Mortality rate in children under 1 year old per year (calculated as the number of deaths in children under 1 year old divided by the number of live births, multiplied by 1000), being collected in the Mortality Information System (MIS) through DATASUS. The following independent variables were selected: Gini Index, HDI, and Percentage of Poor People, extracted from the United Nations Development Programme (UNDP). The two last censuses in 2000 and 2010 were determined for the study, and data from 2000 (1996-2005) was considered for the first study period, and data from 2010 (2007-2016) for the second period. In addition, the variable coverage of the FGP, collected in the E-manager AB system, was used. For statistical analysis, data were entered into the Statistical Package for the Social Sciences (SPSS) version 22.2 (Paiva & Alves, 2015) serial number 10101141047. Analyses were performed in the descriptive modality, with mean, median, standard deviation, 95% confidence interval and p-value < 0.05, and the Student's t test was performed to compare means.

For the purposes of spatial analysis, data were exported to TerraView and maps corresponding to the means of these variables in relation to the IRUA were generated. After this, clustering values of the dataset and also of the neighbors were verified. The GeoDa software was used for bivariate spatial correlation

between the dependent and the independent variables. In the bivariate spatial correlation, spatial dependence can be direct or inverse. The correlation of the variables by area can be of the following types: High-High (high IMC high value of the independent variable), Low-Low [low Infant Mortality Coefficient (IMC) and low value of the independent variable], High-Low (high IMC and low value of the independent variable), Low-High (low IMC and high value of the independent variable).

Regarding the ethical and legal aspects for the development of this study, appraisal from the Ethics and Research Committee was not necessary because the study did not involve subjects and data were of public domain.

Results

Table 1 presents the analysis of the IMCs in the IRUA. Higher IMC mean were seen for the period 1996 - 2005 (22.67); in the second decade of the studied period, the mean was 14.43. It is also noteworthy that the p-value was < 0.001 in the Student's t test, thus indicating statistically significant results.

Table 1. Infant Mortality Coefficient values in the Intermediate Regions of Urban Articulation in Brazil from 1996 to 2005 and from 2007 to 2016. Brazil, 2018.

Decade	N	Mean	Median	SD	CI		p-value*
					Minimum	Maximum	
1996-2005	161	22.67	20.28	10.76	21.14	24.51	<0.001
2007-2016	161	14.43	14.30	2.81	14.01	14.89	

Source: Departamento de Informática do SUS [DATASUS] (2018).* Student's t-test.

The Figure 1 shows the temporal distribution of the IMC in Brazil across the historical series of the study. There was a substantial reduction over the years, with a IMC of 40.77 in 1996, and a decreasing trend in the entire historical series. Yet, a slight increase was observed in 2016, which went from 12.92 in 2015 to 13.41 in 2016.

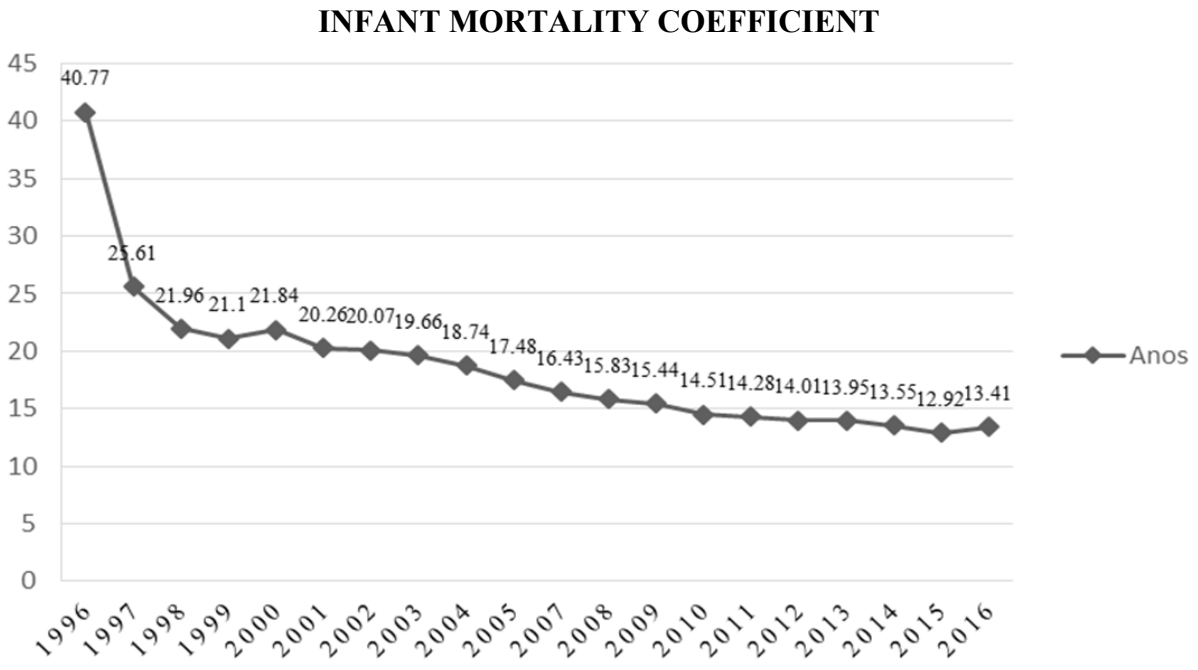

Figure 1. Temporal distribution of Infant Mortality Coefficient values in Brazil from 1996 to 2005 and from 2007 to 2016. Brazil, 2018.
Source: DATASUS (2018).

Figures 2a (1996 to 2005) and 1b (2007 to 2016) show the distribution of the IMC per 1000 live births in the IRUA in Brazil. In Figure 2a, the worst coefficients are in the Northeast region, with the highest value in the state of Piauí. Other states had high coefficients values, ranging from 47.59 to 68.51. In Figure 2b, the worst coefficients were concentrated in the North and Midwest regions in the state of Mato Grosso; however high coefficients were also seen in all regions, especially the Northeast and part of the Southeast.

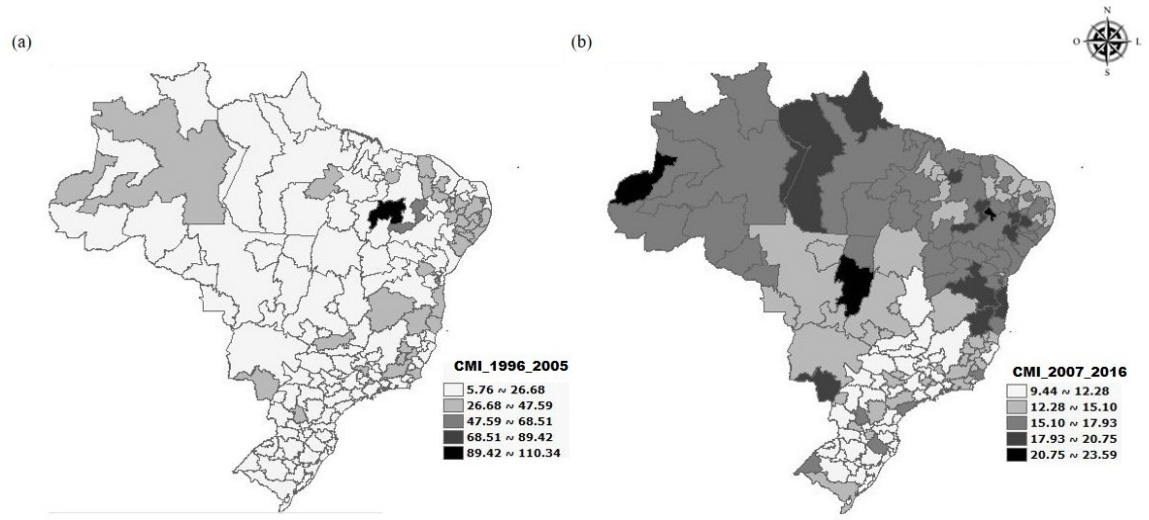

Figure 2. Spatialization of Infant Mortality Coefficient values from 1996 to 2005 (a) and from 2007 to 2016 (b). Brazil, 2018.
Source: DATASUS (2018).

With regard to the HDI, Figures 3a and b show the bivariate analysis of this indicator and IMC values. Figure 3a shows the Moran Index of -0.22 and p = 0.05; the analysis indicated a negative statistically significant autocorrelation. High correlations were also observed in the Southeast, South and Midwest regions, and showed high HDIs and IMCs. Moreover, high-low correlations in the North and Northeast and low-high correlations in the South, Southeast and Midwest were seen.

Figure 3b shows the analysis of the HDI with the second study period (2007 to 2016), with a Moran Index of -0.49 and p = 0.01. Both figures showed weak autocorrelation values; the IMC showed a negative autocorrelation, and p-value showed statistical significance. There was a small amount of autocorrelation in the Midwest, Southeast and South, as well as in the previous decade in the case of the South and Southeast, and a high-low correlation in the North and Northeast. However, most of the Midwest, Southeast and South regions showed a low-high correlation, with low IMC and high HDI.

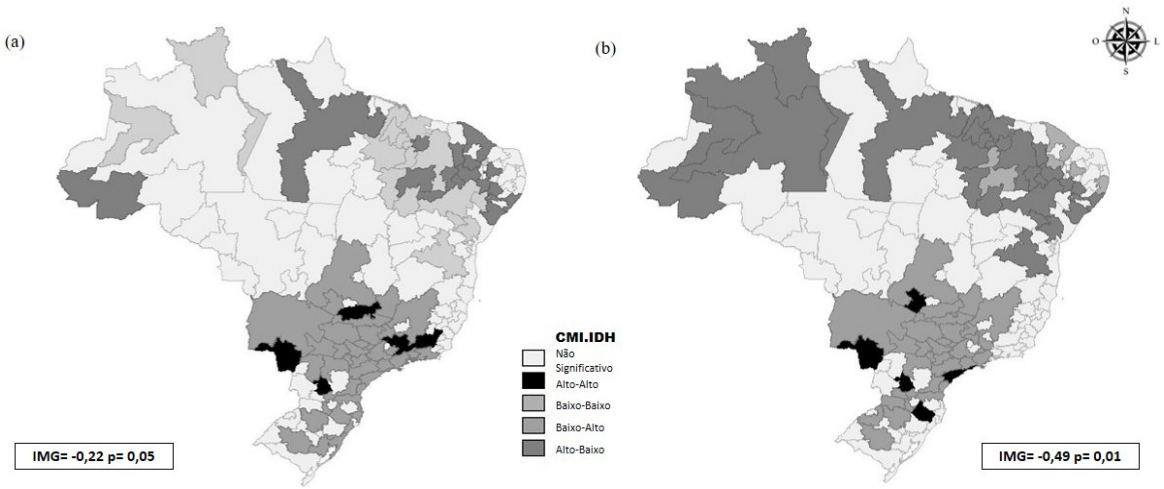

Figure 3. Spatial correlation between Infant Mortality Coefficient and Human Development Index values in (a) 1996 to 2005, (b) 2007 to 2016. Brazil, 2018.
Source: DATASUS (2018).

Figures 4a and b show the crossing of the IMC with the Gini Index. In the first decade, there was a weak, positive and statistically significant autocorrelation, with a Moran Index of 0.19 and p = 0.05, showing autocorrelation and also a high-high correlation in the North and Northeast regions.

In the second decade (Figure 4b), there was a mean statistically significant positive autocorrelation, with a Moran Index of 0.55 and p = 0.01. Attention is drawn here to the North region, which showed a high-high correlation in most of its completeness, a different scenario from the previous decade. The Midwest and part of the Northeast also presented a high-high correlation in some places.

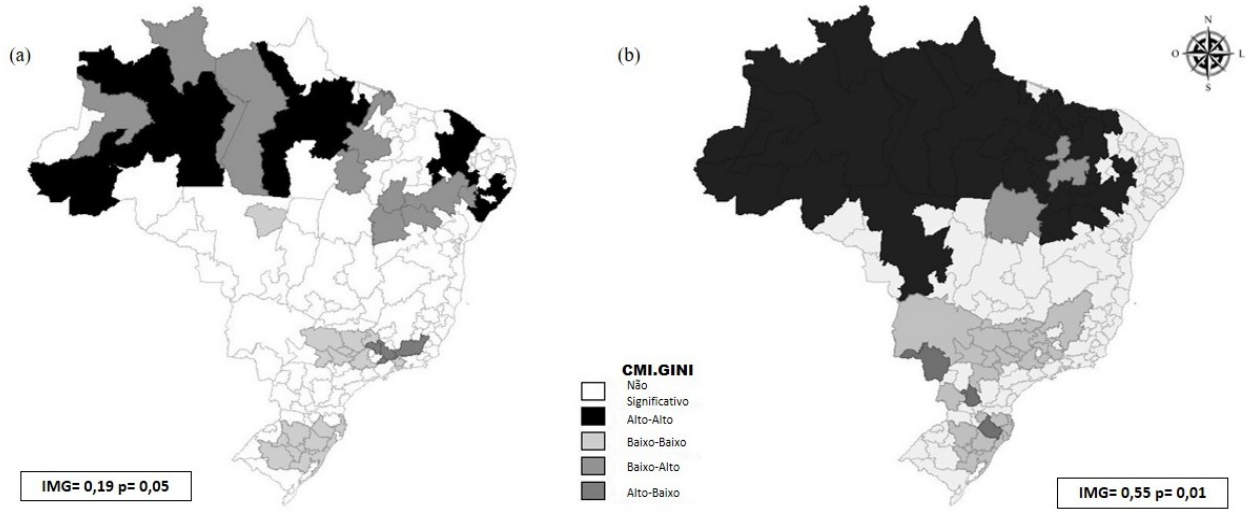

Figure 4. Spatial correlation between Infant Mortality Coefficient and Gini Index, (a) 1996 to 2005, (b) 2007 to 2016. Brazil, 2018. Source: DATASUS (2018).

Figures 5a and b refer to the IMC associated with the percentage of poor people. In Figure 2a for the first decade, there was a weak, positive and statistically significant autocorrelation, with a Moran Index of 0.24 and p = 0.05. There was autocorrelation and a high-low correlation in the North and Northeast regions. The South and Midwest showed the best indices with low-low correlation, showing low IMC and low percentage of poor people.

In Figure 5b, which refers to the second decade analyzed, there was a mean, positive and statistically significant autocorrelation. In this scenario, the North and Northeast showed a strong autocorrelation, in addition to a high-low correlation in the Northeast region. The Southeast, South, and Midwest showed a low-low correlation, but with high-low correlations in some regions.

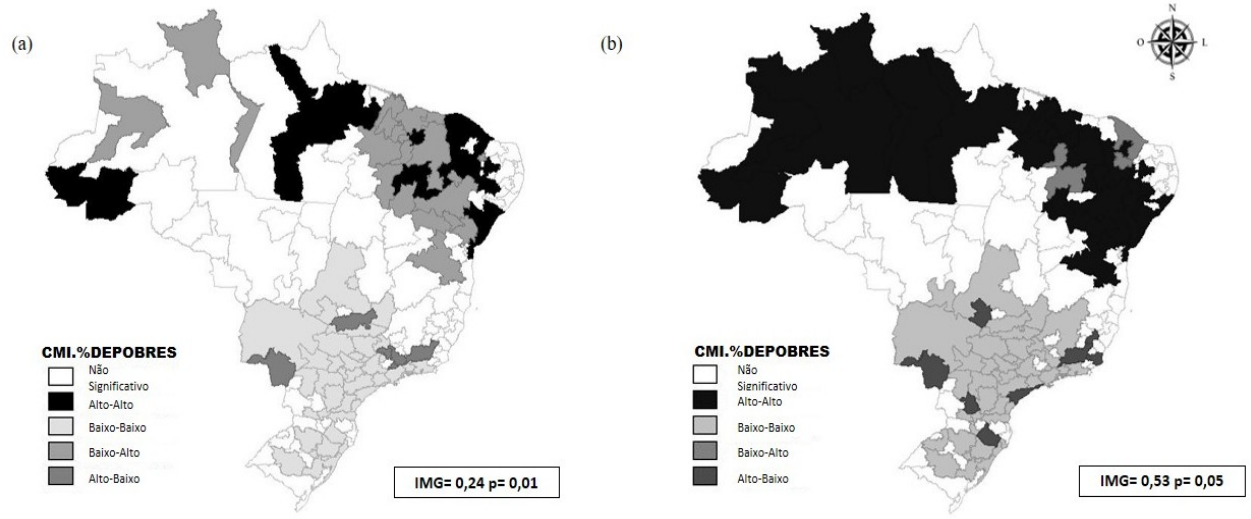

Figure 5. Spatial correlation between Infant Mortality Coefficient and Percentage of Poor People, (a) 1996 to 2005, (b) 2007 to 2016. Brazil, 2018. Source: DATASUS, 2018.

Figure 6 shows the association between IMC and FGP Coverage. In this analysis, it was only possible to evaluate the period from 2007 to 2016 because only these data were available in the system at the time of data collection. Weak autocorrelation with statistical significance was observed, with a Moran Index of 0.21 and p = 0.05.There was also a positive spatial autocorrelation, which is similar to the values of its neighbors. The highest high correlation is concentrated in the Northeast region, showing high IMC and great FGP coverage. Part of the Midwest region showed a high-low correlation, and the Southeast, Midwest and a small part of the South presented a low-low correlation.

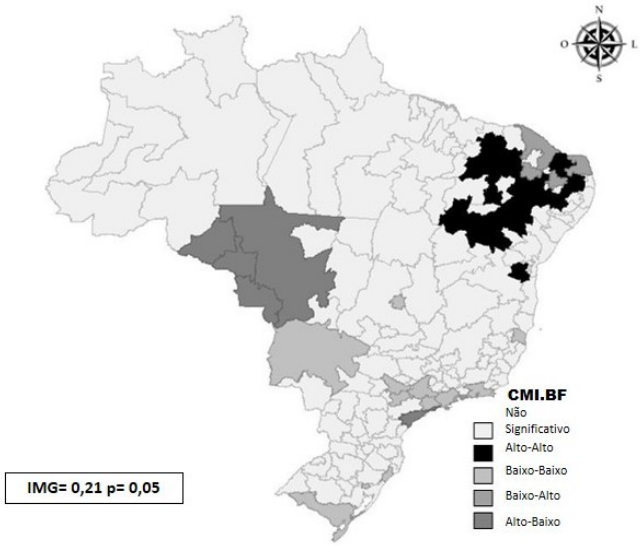

Figure 6. Spatial correlation between the Infant Mortality Coefficient and Family Grant Program Coverage, 2007 to 2016. Brazil, 2018. Source: DATASUS (2018).

Discussion

The present study aimed to verify the association of social inequalities with infant mortality in Brazil, analyzing the situation before and after the implementation of the Pact for Life. Overall, it was seen that the average mortality coefficient in the two decades had a significant drop (table 1), going from the mean of 22.77 to 14.43 in the second decade. This indicates that the interventions of the Pact had an effect on this cause, which was also confirmed by analyzing the graph 1, where there was a reduction in the entire historical series. Epidemiological studies carried out in Brazil have shown that IMR has been progressively decreasing when analyzed on a yearly basis. In 1997, the rate was 35.20%, and in 2007, 24.3% (Mombelli, Sass, Molena, Téston, & Marcon, 2012).

Driven by the MDGs, substantial advances in reducing infant mortality occurred between 1990 and 2015 worldwide. The overall mortality rate decreased from 90.6 deaths per 1000 live births in 1990 to 42.5 in 2015, a reduction of 53%. This is equivalent to a worldwide reduction in the annual number of deaths from 12.7 million to 5.9 million. Although this is a huge achievement and has been celebrated, these and other analyses have made it clear that the achievements varied considerably in terms of cause of death, region, and country (Burke, Heft-Neal, & Bendavid, 2016). As the global community directs its energies towards SDGs, it is essential to examine these variations to target interventions and resources for an optimal impact (Davey & Deribe, 2017).

Data from this study show that from 2015 to 2016 the IMC increased from 12.92 to 13.41 (graph 1). Researches affirm that in this increase, the Northeast and Midwest region had the highest percentages with 3.4% and 3.6% respectively. This increase is explained by the number of live births in that period: 3,017,668 in 2015 and 2,857,800 in 2016 (Fundação Oswaldo Cruz [FIOCRUZ], 2018).

When analyzing the spatialization of IMC values in the IRUA (Figure 2), different scenarios were observed in the two decades. In the first decade, despite higher coefficients, the greatest evidence is concentrated in part of the North and Northeast, and part of the Southeast; also, the worst coefficients were seen in Piauí. The second decade, in turn, presented worse coefficients in a part of the North and Midwest, corresponding to the Amazon and Mato Grosso.

Even so, high coefficients were distributed in all regions, especially in the North, Northeast and Southeast. The South, in turn, appeared with the lowest coefficients in the two decades, as seen in Figures 2 (a) and (b). Although the first decade had the largest IMC, it was observed that disparity and inequality in infant deaths between regions were the aspects that separate the first decade from the second. The IMC in the region of Piauí was 89.42 to 110.34, and in the second, 12.28 to 15.10.

In this perspective, it is necessary to emphasize the Brazilian territorial inequality, with accentuated social inequalities between regions, revealing the importance of overcoming the loco-regional specificities through the adoption of policies that favor the quality of life of the population (Faria, 2016).

Confirming the results presented in the spatialization of the IMC, the Brazilian Institute of Geography and Statistics (IBGE, 2016) reported that the IMC is lower in regions that have greater economic development: Southeast and South, being responsible for 17.7% and 16.1 %, respectively, while the highest coefficients are in the North with 25% and Northeast with 35.6%. The Midwest has an intermediate coefficient, with 18.9%.

When the IMC was spatialized with the HDI (Figure 3), it was observed in the first decade that the small parts of the Southeast and South and Midwest regions showed a high HDI and high IMC; however, the largest portion of these regions was found to present a low-high correlation, that is a low IMC and high HDI. Attention is paid to the North and Northeast regions, which have high IMC and low HDI. In the second decade, the same scenario persisted in these regions, with a considerable increase of high-low in the North and Northeast.

It is worth highlighting the income that is also measured by the HDI; the income per capita is measured by the sum of income and earnings of people. According to IBGE (2018), the Federal District and São Paulo have the highest per capita income in the country, with 2,460 and 1,898 Brazilian Reais respectively, and the best incomes are concentrated in the states of the South and Southeast, which strengthens the best indicators found in this research. The state of Maranhão, in turn, has the lowest income in the country, with 605 Brazilian Reais, followed by the other states in the Northeast and North.

According to the United Nations Programme (2015), between the 2000 and 2010 censuses, the North and Northeast showed the greatest increase in HDI, showing variations in regional growth rates and effective reduction of inequalities in relation to other regions of the country. Even so, the UNDP warns that the analysis of the macro-regions must be done with caution, as internal inequalities are often masked by averages, giving the false impression that municipalities, states and their regions are homogeneous.

When there is an increase in the HDI, a likely impact in terms of decreased IMC is expected (Vieira-da-Silva, Silva, & Esperidão, 2017). In the present study, it was observed that the increase in HDI in the North and Northeast regions was not enough to decrease the IMC, which highlights that the greater are the social inequalities, the greater is the IMC. In spite of this, other factors are also related to this increase, such as professional practice in the quality of care provided, strategies adopted by Primary Health Care (PHC) to reduce this indicator, policies aimed at this scenario, and other variables that deal with actions adopted for this purpose.

The relationship between IMC and HDI is expected, since the components used to calculate the HDI are some of the determinants of infant mortality (Geib, Fréu, Brandão, & Nunes, 2015). Therefore, if the HDI of a municipality or region is considered good, this municipality will have a better quality of life and, consequently, it will offer better health conditions for the population, ultimately promoting a lower IMC.

It was also seen that there was a high HDI and high IMC in Mato Grosso, Minas Gerais and Paraná (Figure 2). These states are located in the regions with the highest HDI in the country; the highest HDI value in 2010 was obtained by the Southeast region of the country, with a value of 0.766, followed by the Midwest, with a MHDI of 0.757, and in third place, the South region with a MHDI of 0.754 (Programa das Nações Unidas para o Desenvolvimento [PNUD], 2014). Bonatti, Silva, and Muraro (2018) carried out a study with the objective of verifying the trend of infant mortality in Mato Grosso between 2007 and 2016; the authors point out that despite the state's HDI is high, the Northwest region of Mato Grosso is characterized by a small territorial extension, with low demographic density and the worst socioeconomic indicators. It is also noteworthy that the main source of income in this region is family farming, which is low; families basically live from the sale of agricultural products, which can be reflected in low HDI, low education, and little access to health services as well as an inferior quality of life.

In addition, the authors suggest that in this state there is a logical inversion in the care provided by SUS, whose gateway should be primary care. However, the largest investments in the state are concentrated in the medium and high complexity care. Investing in primary care is not only represented by prenatal care and quality in primary care; it is also important to implement effective a maternal and infant health care network, as proposed by the stork network (Ministério da Saúde, 2011). Investments in health must adopt the logic of equity in financing, considering important indicators in directing resources, such as GDP per capita, population with health insurance, Family Grant insurance, demographic density of the municipality, and other aspects (Bonatti et al., 2018).

The health care model adopted by SUS is exemplified in the Family Health Strategy and in the principles of PHC. This model uses the performance of professionals with bonding and responsibility towards users,

developing efforts that assist in the use and coordination in the provision of services through the Health Care Networks (HCN) (Saltman, Rico, & Boerma, 2006).

When the IMC was related to the Gini Index (Figure 4), it was found that in the two decades, this correlation was positive and statistically significant. It is noteworthy that in the second decade, the North region started to have a higher high-high standard, implying that there was a greater inequality in the distribution of income, thus causing a strong correlation with the IMC.

The North region is seen as a mixture of different realities which directly reflects the population's living standards, with one of the lowest HDI, the highest Gini indices and the second lowest demographic density in the country. They are explained by the vast territorial dimension, with large distances between localities and visible deficiencies in the transport systems in general, hindering the development of this region (IBGE, 2016).

These indicators reflect the small participation in the economic activity of the country; it is possible to verify that many poor municipalities are isolated from those more developed. The transport systems are deficient and promote the spread of poverty. Thus, it is necessary to invest in the infrastructure and educational policies in the region, which will not only reduce inequality but also provide income growth in the poorest municipalities, with incentives for agricultural production that will stimulate the potential of each region (Leite, 2017). Such factors may imply high IMC in the region. So, it is possible to infer that if Gini is directly related to infant mortality, it is necessary to develop health actions and strategies based on this indicator.

Another important factor to be mentioned is the expansion of universities for public health services in PHC, as research shows that in the Northeast and Southeast regions, a greater insertion of students from nursing, dentistry and medicine courses was obtained through the Education through Work for Health Program (PET Health), which contributes to a training with a focus on Primary Care (Farias-Santos & Noro, 2017) and inserts these students in the services, ensuring a more comprehensive service to the public and a better quality of care. However, despite this expansion, the professional assistance for this level of health care is still inefficient.

Mortality and its relationship with socio-economic variables such as income, education, consumption of goods and services tend to play an important role in determining health inequalities. In this way, the analysis of the percentage of poverty was carried out and so, as regards this indicator (Figure 5), the first decade was high-high in part of the North and Northeast; in the second decade the highest pattern was high-high in both. In the previous decade the northeastern region showed a higher low-high pattern, moving to high-high in the same places in the second decade. South and Southeast had a low IMC and low percentage of poor in the first decade, in the second the same regions appeared as low-low, but with some high-low regions. It is defined here for this variable that the poor people are those who have per capita household income equal to or less than R$ 140.00 per month.

Studies show that the North and Northeast have one of the highest percentages of people without access to housing and consumption items and scarce access to piped water, sewage and electricity (Caldas & Sampaio, 2015). Moreover, although health services, including public health care for children, are free in many contexts, poor people access them to a lesser extent compared to the most favored, as they are less educated and have cultural and social barriers to access health services (Chowdhury, Jahan & Rahman, 2017). For example, a study carried out in Uganda found in its results that 55.4% of the poorest population (most of them residents in rural areas) considered the distance to health service units to be long, constituting a barrier to accessing health services, compared to 17.2% in the wealthiest population (Bureau of Statistics Uganda, 2011).

It is also estimated that children from the poorest families are three times more likely to die before the age of five than those in the richest quintile. This trend has remained constant in some countries, but has worsened in most of them. The SDGs prioritize improving equity as an important goal for 2015-2030, and emphasize reducing inequalities in infant health within and between countries (United Nations, 2015). Thus, knowledge about the percentage of poverty in the Brazilian regions allows identifying problems that are still persistent and contribute to a better planning of public policies for infant health, as well as enabling the definition of priorities, interventions and also, evaluation of the effectiveness of existing programs.

Another important indicator to be evaluated is the FGP coverage, as it has a direct impact on poverty and in turn, on infant mortality in the country, especially in the most vulnerable regions, and it is possible to observe that the results of this study showed a high standard of autocorrelation in the Northeast, showing high IMC and greater FGP coverage (Figure 6). The Midwest West showed a high-low correlation, thus indicating inequality in FGP coverage between the regions (Figure 6).

Brazil still has a great income inequality. To overcome this situation, conditional cash transfer programs have been created with a view to transfering federal government values to poor families (Rasella, Aquino, Santos, Paes-Sousa, & Barreto, 2013).

From this perspective, it is evident that the FGP has contributed to reducing the levels of poverty in the whole country and especially in the Northeast. This program has made it possible for many families to escape from the level of extreme poverty. As a social policy, it contributes in the short term because it immediately alleviates the families' situation of poverty, improving their quality of life and ensuring their access to other complementary actions and programs also aimed at taking families out of the state of poverty (Souza, 2018).

Campello (2013) reinforces that the program has managed to meet several objectives due to its conditionalities in terms of health. There was greater expenditure on food, reducing infant malnutrition and food insecurity, and in turn, this helped to reduce the IMR. In terms of education, the program also managed to achieve its goals, as there was an increase in school attendance and a decrease in the school dropout rate. Thus, the cash transfer program (FGP) played a significant role in reducing infant mortality, which was a result of increased coverage (Silva & Paes, 2019).

Furthermore, it is emphasized that the cash transfer program FGP is of fundamental importance, as it directly fought poverty, bringing income and promoting improvements in the living conditions of the poorest people and ultimately leading to access to basic services. However, the high-high evidence in the Northeast solidifies what has already been highlighted, that the Northeast is still characterized by poverty and has low incentives in terms of socioeconomic indicators, because despite the incentive of the FGP in this region, high IMC values are still seen.

In view of this discussion, it is necessary to carry out greater supervision of the FGP in vulnerable regions, as well as, to promote a greater strengthening of public access policies aimed at promoting the improvement of the living and health conditions of the infant population in order to reduce the high rates still found and improve the right of access not only to social goods, but to quality health services.

Thus, despite the evidence of great advances in infant health in our country, regional weaknesses are detected and they must be considered. The new practice of prevention and promotion should be a reality for all Brazilian municipalities; however, this practice is not equally applied in the infant population.

The limitation of this study is related to the use of secondary data from the MIS, which is subject to under reporting, although it has been recognized in recent years that this system in Brazil has made significant contributions regarding the quality of information. There was also a limitation regarding the study design, as the possibility of ecological bias is evidenced in the use of ecological correlations.

Conclusion

At the end of this study, it became evident that even before and after the Pact for Life, social inequalities have been directly related to infant mortality. Despite this, there was a significant reduction in the two decades, as well as a substantial decrease in the entire historical series, especially when observing the first and last year analyzed. In the specific aspect of infant mortality, the Pact may have been effective; however, it is clear that regional disparities are still challenges to be overcome in the country, because the basic indicators used were directly related to infant mortality with Brazilian regions.

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