



Children's hospitalizations by sensitive conditions in primary care in the Northeast of Brazil


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Abstract

Objectives: to analyze the temporal evolution of hospitalizations due to sensitive conditions in primary care among children under five years of age in the Brazilian Northeast region.

Methods: ecological descriptive study with hospitalizations data from the Sistema de Informações Hospitalares do Sistema Único de Saúde (Hospital Information System from the Public Health System). The admissions rates on sensitive conditions in primary care between 2004 and 2013 were calculated in two age groups: children under one year old and between one and five years of age.

Results: there was a reduction of hospitalization rates in the Northeast, despite the existence of fluctuations in the analyzed period. Bahia and Sergipe presented, respectively, the highest and lowest admission rates (465.14 and 220.19 per 10 thousand inhabitants). It has been shown that children under one year old are more affected by sensitive diseases in primary care, presenting a total rate of 709.08 per 10 thousand inhabitants. The main causes of hospitalizations were related to the infectious gastroenteritis group and its complications with a rate of 218.76 per 10 thousand inhabitants.

Conclusions: despite the decrease of hospitalizations due to sensitive conditions in primary care, the Northeast still presents high rates compared to other States, thus, evidencing the need to qualify the services offered through professionals' qualification and the inclusion of health actions for the real necessity in the community.

Key words Primary healthcare, Hospitalization, Morbidity, Child's health



Introduction

The *Atenção Primária à Saúde* (APS) (Primary Health Care), a gateway to healthcare networks, refers to a set of promotion, prevention, treatment and rehabilitation actions that have an impact on the population's well-being and development.¹ One of the APS pillars in Brazil is the *Estratégia Saúde da Família* (ESF) (Family Health Strategy) that goes beyond medical care and curative practices, since its actions focus on the family, which is perceived from its physical and social environment, through the established link between the user and the professional, promoting an integral, continuous and qualified care.¹⁻²

The access to these health actions, besides improving the population's quality of life, also reducing the socioeconomic inequalities and contributing to the reduction of hospitalization rates, as well as to the improvement of the health indicators. Despite its importance, in 2013 only 53.4% of the Brazilian households were registered in a family health unit. The study compared the results of the *Pesquisa Nacional de Saúde* (PNS) (National Health Research) along with the *Pesquisa Nacional por Amostragem de Domicílios* (PNAD) (National Research on Household Samples) carried out by IBGE in 2008.³

Some of the indicators referred to the percentage of households and residents enrolled in a family health unit. The data were analyzed by the sampling weights for the primary sampling units, households and residents. When evaluating the regions of the country, the Northeast had the largest number of registered households with 64.7%, and the lowest in the Southeast with only 46.0%.³ Another study showed that in 2013 the Northeastern region had 73.8% ESF coverage, while in the Southeast, it was 44.5%.⁴

However, in order for the APS have positive impacts on the population's health indicators, it is necessary, besides the coverage of services, to have quality in care and assistance. One of the ways to evaluate its performance is through the analysis of the hospitalization indicator on sensitive conditions at the primary care (ICSAP).⁵ The National List had as its conceptual framework model proposed by Caminal-Homar & Casanova-Matutano, in addition to, the referral lists of the municipal and the State health secretariats from the country, as well as the international studies, were used as references.⁶

This list is divided by groups of hospitalization causes and according to the document number. 221, on April 17, 2008, which can be used as a tool for

assessing APS and the health system performance (SUS) in the national, state and municipal levels areas.^{3,7}

The non-resolution of these APS sensitive conditions generates a greater demand for costs, because the cases that could be solved at this care level on lower technological density are transferred to the higher density ones, including hospitalizations. This fact increases expenses, unnecessarily burdens to SUS⁸ in addition, these sensitive conditions influence the mortality and morbidity rates from different age groups.

The children's population is one of the most vulnerable group to miss out these diseases and its complications, which were observed in studies carried out in Piauí,⁹ in Rio Grande do Norte¹⁰ and in São Paulo,¹¹ in which the majority of infants' death under one year old could be avoided if more effective, qualified and timely health actions were performed during the pregnancy-puerperal period.^{7,10,11}

Understanding the impact that APS has on the population's quality of life and recognizing the importance of a healthy development and growth for the children's lives. This study aimed to analyze the temporal evolution of ICSAP among children under five years of age in the Northeast Region.

Methods

This is an ecological descriptive study, in which the causes of ICSAP were analyzed in children under five years of age residing in the Northeast region, between 2004 and 2013.

Regarding to sensitive diseases to the APS, a published list was used as basis under the document number. 221 on April 17, 2008, which included the International Diseases Classification categories. The list consists of 19 categories, such as infectious gastroenteritis and complications, iron deficiency anemia, nutritional deficiencies, hypertension, and among others.⁷

The data from this study were extracted from the *Rede Interagencial de Informações para a Saúde* (Ripsa) (Interagency Health Information Network) in October 2017, which aims to provide basic data, indicators and analyzes on health conditions and trends.

To compose this study, absolute numbers and hospitalization rates were used for sensitive conditions in primary care, stratified by state, sensitive cause group, and by age group. The hospitalizations were analyzed in two age groups: children less than one year old (birth up to 11 months and 29 days) and

children between one year old and less than five years of age (12 months to 59 months and 29 days). After the data was collected, the data was entered on a spreadsheet in the Microsoft Excel 7.0 program.

The censuses were worked on in different decades corresponding from 2000 to 2010. The rates used were collected directly from Ripsa, which uses as an exponential basis, 10,000.¹²

This study was carried out with secondary data from a public domain platform and on-line and it was unnecessary to submit this study to the Research Ethics Committee, according to the Resolution of the National Health Council of the Ministry of Health, number 510, on April 7, 2016.

Results

Table 1 shows that during the analyzed period the state of Bahia in the Northeast of Brazil has the highest ICSAP rate of children under the age of five (465.14 per 10 thousand inhabitants). Despite the decrease trend of the rates between 2004 and 2009 in Bahia State, thus, there was an increase in the rate in the previous year of 2010. However, Sergipe State obtained the lowest rate (220.19 per 10,000 inhabitants) under the same hospitalization conditions.

Table 2 presents the number and the hospitalization rates in each State in the Northeast of Brazil, in the period studied according to the age group that were analyzed. It was evidenced that children under one year old were more affected by ICSAP, presenting a rate of 709.08 per 10,000 inhabitants.

Figure 1 shows a reduction in the hospitalization rates, despite the existence of fluctuations in the period of the analysis. Children under the age of one, there was a reduction of 18.6% from 2004 (872.03) to 2013 (709.08). Children aged one to four years old showed a reduction of 8.9% from 2004 (392.82) to 2013 (357.83).

Hospitalizations for sensitive conditions in primary care occurred mainly due to diseases related to the infectious gastroenteritis group and its complications with a rate of 218.76 per 10,000 inhabitants. Soon after, the respiratory system diseases (bacterial pneumonia, asthma and pulmonary diseases) appeared, totaling 163.75 per 10,000 inhabitants (Table 3).

It is also observed that the North and Northeast regions in Brazil had the highest rates of ICSAP in children under five years of age, respectively, verifying that these regions and the Mid-West presents higher hospitalization rates in Brazil (Table 4).

It should be noted that, when analyzing the occurrence of ICSAP rates by sex, the male children were more affected by these aggravations in the two age groups observed, presenting an overall rate of 456.19/10,000, while the female children presented 397.08/10,000 hospitalizations. This difference was more significant among children under the age of one, with 787.88/10,000 for the male and 627.31/10000 for the girls. Among the children at the age of one to four years, the boys presented a rate of 374.5/1,000 and the girls 340.59/10,000. (Data not tabulated).

Table 1

Hospitalization rate on Sensitive Conditions in Primary Care per 10,000 children under the age of five in the States in the Northeast of Brazil between 2004 and 2013 according to the year of hospitalization. Teresina, Piauí, Brazil, 2017.

State	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average annual rate
Alagoas	598.23	555.37	447.72	389.00	330.12	309.42	381.43	285.51	248.92	244.21	378.99
Bahia	545.47	540.15	493.90	464.31	430.60	426.71	546.47	439.74	400.23	363.81	465.14
Ceará	462.10	455.11	419.20	366.36	326.16	334.08	341.91	341.55	280.40	319.46	364.63
Maranhão	340.50	374.70	390.12	338.53	291.02	339.98	423.64	373.41	333.88	368.17	357.40
Paraíba	606.08	630.12	522.86	426.17	382.00	395.92	376.11	280.04	227.50	229.58	407.64
Pernambuco	484.03	476.38	420.29	375.80	329.17	320.39	315.85	294.89	281.26	277.43	357.55
Piauí	579.42	531.90	466.25	377.42	392.35	386.19	507.94	427.50	355.41	342.21	436.66
Rio Grande do Norte	411.49	413.19	344.07	309.16	221.47	239.49	275.01	223.65	195.21	204.72	283.75
Sergipe	386.93	334.88	262.06	215.55	164.98	151.58	195.23	149.12	176.14	165.47	220.19
Total	489.65	484.23	436.29	386.79	346.00	350.91	406.25	346.34	308.28	308.90	386.36

Source: Public Health System IT Department.

Table 2

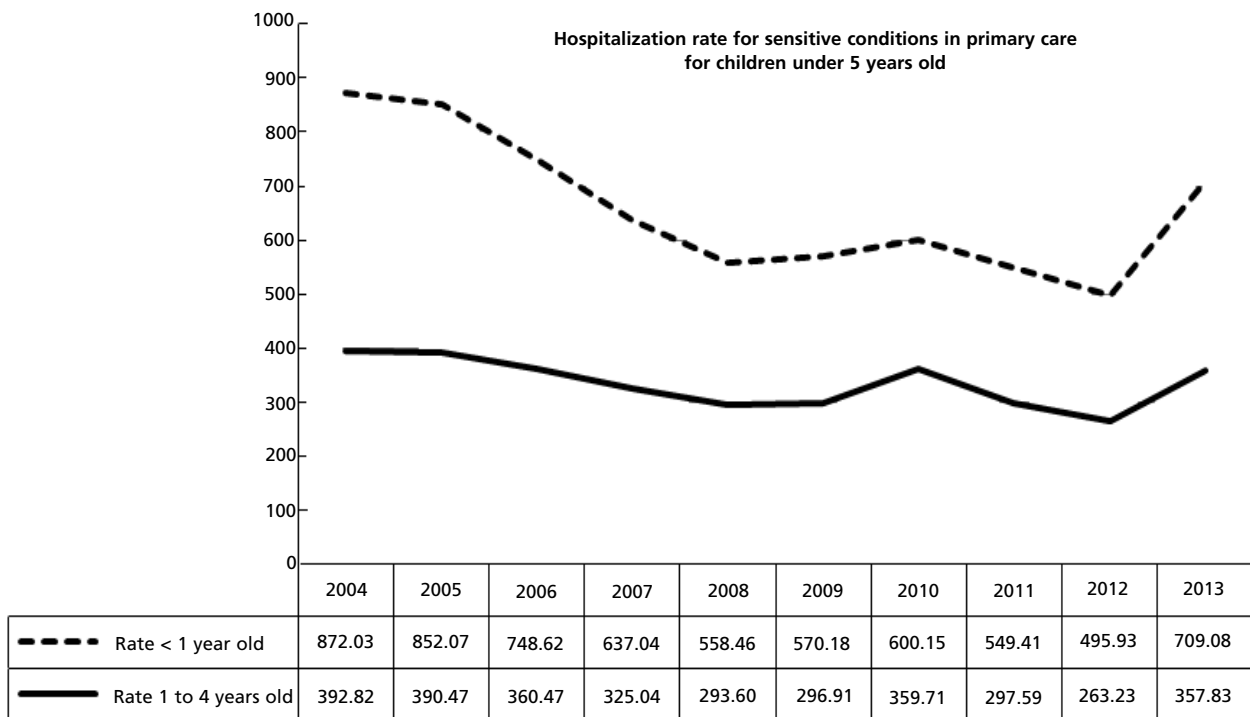
Distribution of the number and the hospitalization rates for Sensitive Conditions in Primary Care per 10,000 children under the age of five in the States in the Northeast of Brazil, according to age group. Teresina, Piauí, Brazil, 2017.

State	< 1 year old		1 to 4 years old		< 5 years old	
	n	rate	n	rate	n	rate
Alagoas	48942	837.82	75121	318.58	124063	421.67
Bahia	166896	745.17	407206	452.25	574102	510.6
Ceará	95494	728.03	175990	325.38	271484	403.96
Maranhão	71619	606.85	167309	343.89	238928	395.23
Paraíba	39124	703.87	88242	392.15	127366	453.9
Pernambuco	106648	808.92	158955	296.64	265603	397.8
Piauí	34902	694.45	88686	426.36	123588	478.53
Rio Grande do Norte	24713	521.3	50355	263.78	75068	315.01
Sergipe	15406	442.87	27411	195.81	42817	244.98
Total	603744	709.08	1239275	357.83	1843019	427.14

Source: Public Health System IT Department.

Figure 1

Admission rate for sensitive conditions in primary care per 10,000 children under the age of five between 2004 and 2013, according to age group. Teresina, Piauí, Brazil, 2017.



Source: Public Health System IT Department.

Table 3

Number and hospitalization rates for sensitive conditions in primary care per 10,000 children under the age of five in the States of Northeast in Brazil by age group. Teresina, Piauí, Brazil, 2017.

Group	< 1 year old		1 to 4 years old		< 5 years old	
	n	rate	n	rate	n	rate
Preventable diseases due to immunization and sensitive conditions	4,396	5.16	2,999	0.87	7,395	1.71
Infectious gastroenteritis and complications	297,273	349.14	646,649	186.71	943,922	218.76
Anemia	2,592	3.04	3,170	0.92	5762	1.34
Nutritional deficiencies	13,288	15.61	15,526	4.48	28,814	6.68
Ear, nose, and throat infections	4,590	5.39	13,649	3.94	18,239	4.23
Bacterial pneumonias	91,159	107.06	159,668	46.1	250,827	58.13
Asthma	76,483	89.83	293,684	84.8	370,167	85.79
Pulmonary diseases	57,268	67.26	28,288	8.17	85,556	19.83
Hypertension	546	0.64	449	0.13	995	0.23
Angina	94	0.11	37	0.01	131	0.03
Cardiac insufficiency	3,060	3.59	2,665	0.77	5,725	1.33
Cerebrovascular diseases	139	0.16	248	0.07	387	0.09
Diabetes Mellitus	695	0.82	1,818	0.52	2,513	0.58
Epilepsies	6,700	7.87	16,377	4.73	23,077	5.35
kidney and urinary tract infection	16,180	19.0	26,080	7.53	42,260	9.79
skin and subcutaneous tissue infection	9,346	10.98	26,609	7.68	35,955	8.33
Inflammatory disease of female pelvic organs	156	0.18	201	0.06	357	0.08
Gastrointestinal ulcer	913	1.07	858	0.25	1,771	0.41
Diseases related to prenatal and delivery	18,866	22.16	300	0.09	19,166	4.44

Source: Public Health System IT Department.

Table 4

Hospitalization rate for sensitive conditions in primary care per 10,000 children under the age of five by age group, according to the Brazilian geographic region. Teresina, Piauí, Brazil, 2017.

Region	< 1 year old	1 to 4 years old	< 5 years old
North	836.52	385.54	473.31
Northeast	709.08	357.83	427.14
Midwest	735.28	308.90	392.59
South	734.00	246.41	339.94
Southeast	605.27	189.99	270.56
Total	688.20	278.71	358.56

Source: Public Health System IT Department.

Discussion

The total number of hospitalizations for ICSAP was 1,843,019, considering the period and the age groups analyzed, there was a 26.7% reduction in the hospitalization rates between 2004 and 2013, which corroborates other researches carried out in Brazil, which have shown reductions in children's hospitalization rates.¹³⁻¹⁵ It is known that these hospitalizations cause damage to the governmental public vaults, as to individuals and to society.¹⁶ In this perspective, this reduction is beneficial, since it avoids unnecessary expenses as well as the social burden of morbidity.¹⁷ This may be related to the accomplishment of previously performed procedures in services of greater complexity at an ambulatory level¹⁸ and also, the improvement in the access conditions, the effectiveness in the assistance provided by the APS, the increase in the coverage of the ESF and the improvement in the social conditions that have been observed in recent years.¹⁷⁻²⁰

In the other hand, Bahia State presented the highest rate of ICSAP during the analyzed period, which may be justified by the fact that this State has the highest population density and the greatest territorial extension among the Northeast States, which can become difficult to cover the APS services.²¹ In 2013, only 58.5% of the households in Bahia were registered in the family health units.³

It is worth noting that the coverage of APS services is not the only factor that justifies the high rates of PHCS in Bahia. As for, Piauí State, despite having more than 80% of the residents enrolled in the ESF teams, also presents a high ICSAP rate compared to other States in its region. Thus, other dimensions must also be taken into consideration, such as insufficient financial support to guarantee universality and integrality on care, professional qualification, availability and location of services.²²

Despite the improvements mentioned above, the Northeast Region, when compared to other regions in the country, has the lowest consultation rates, the greatest difficulties in accessing the health services, and other important elements such as: high illiteracy rates and low sewage coverage.²³ In addition, the context in which individuals live also interferes with the process of illness, since social determinants, such as education, employment, income, basic sanitation, affect the population's health.²⁴ Therefore, this reality reveals that more investments should be made in the APS in order to reduce the ICSAP, as well as the population's living conditions since they have an impact on the individual's health.²⁰

It should be reaffirmed that the reduction of child

morbidity and the severity of problems that compromise child's health is closely related to the quality of the services offered by the ESF.²⁰ However, in spite of the reduction in the ICSAP, there are still cases of diseases that could be avoided if there were more effective actions from the APS. This is the case of gastroenteritis and respiratory diseases, which are also strongly associated to socioeconomic and environmental circumstances.¹⁷

In this study, gastroenteritis were the most impacting conditions for hospitalizations of children under the age of five during the decade reported, corroborating results from other regions in the country, such as the South and the Southeast.^{5,25} It is known that housing conditions, such as access to basic sanitation and running water are factors that influence the occurrence of these diseases. However, the performance of primary health services has an impact on its prevention, since part of the gastroenteritis is of mild intensity. Thus, low complexity technologies adopted by the APS are effective in preventing such infections, such as oral rehydration therapy, oral human rotavirus vaccine, the use of anti-parasitic, as well as family-oriented health education actions.²⁶ Therefore, it is necessary to have a greater resoluteness of teams which includes, not only the cure of diseases, but the minimization of its complications.²⁷

The respiratory system diseases were also important causes of hospitalization of children under the age of five in the Northeast region, which is in accordance to the reality of the country.^{5,13,15,25} It was observed that among this group of diseases, asthma was the most frequent among children under five years old. Because it is a disease that combines genetic, environmental and other factors, the APS professionals must act, especially in the modifiable factors, through actions of promoting, preventing and controlling the affection.²⁸ Although this group has a greater biological susceptibility, hospitalizations could be avoided, in the context of the APS itself, through the early identification of signs and symptoms. In addition, the teams have resources to prevent and treat other respiratory diseases through the use of low-tech measures such as immunizations and antibiotics.²⁶

A discreet difference was observed between the ICSAP rates among males and females. Similar results were found in another study that investigated the APS related to hospitalizations in Cuiabá-MT State, in which the male children accounted for 55.1% of the hospitalizations,¹³ corroborating, also, a study carried out in Montes Claros-MG State, which affirms that male children are the ones who

get most ill and use the health services.²⁹ On the other hand, a study carried out in Salvador city which investigated death and hospitalizations for asthma for over a decade, showed that male children were the most hospitalized, although females had a higher rate of deaths.³⁰

Thus, in order to reduce child morbidity from preventable causes, more significantly, it is necessary to reorganize the healthcare model, promoting changes and strengthening in primary care, in order to make the APS more effective and qualified to reduce the ICSAP.^{8,19}

As a limitation of this study, it should be mentioned that the use of secondary data may present problems regarding to the quality of information sources due to underreporting and classification errors.

Finally, it is worth noting that despite the importance to increase the coverage on the APS services, this is not the only factor that influences the quality of these services, since the Northeast still maintains high rates of ICSAP when comparing to other

regions in the country. It is noteworthy that children under one year old are still more affected by this group of diseases, despite immunization programs and a great number of consultations in the first year of life. Therefore, the need to qualify the service offered, based on the professionals' training and awareness of, focusing not only on the number of services, but the quality of assistance given to the individual. This includes health actions aimed to the real needs of the community, as well as a closer bond between the professional and the subject, aiming for the active participation in its health-disease process.

Contribuições dos autores

Ribeiro MG and Araujo Filho ACA - collection and analysis of the data as well as in the article design. Rocha SS - guided the preparation of the article from selecting the theme to the final revision. All the authors have approved the final version of the manuscript.

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