Original Article

Hospitalization costs for Ambulatory Care Sensitive Conditions: time series 2008-2015

Custos com Internações por Condições Sensíveis à Atenção Primária: séries temporais 2008-2015

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ABSTRACT

Objective: to evaluate the costs of hospitalizations for ambulatory care sensitive conditions in the 2008-2015 time series. **Methods:** ecological study with records of the Hospital Information System. The sample was composed of records of admissions for diagnoses of the Brazilian List hospitalizations for ambulatory care sensitive conditions. Polynomial regressions were used to analyze the temporal trend of rates. **Results:** there was a decrease in the rates per 10,000 inhabitants (67.38 to 51.99) (r^2=0.9783; p<0.001). The most costly causes were asthma, heart failure, cystitis, and pneumonia. There was a decreasing trend in hospitalizations (β=-2.15; p<0.001) and expenditures (β=-2243.24; p=0.169). **Conclusion:** the diagnosis asthma caused greater expenses, while inflammatory disease of the cervix reached caused lower expenses. In the time series, there was a trend towards reduction of expenses evidenced by the difference between the highest cost in 2009 and the lowest in 2015.
Descriptors: Primary Health Care; Basic Health Services; Health Care Quality, Access, and Evaluation; Hospital Information Systems; Ecological Studies.

RESUMO

Objetivo: avaliar os custos com Internações por Condições Sensíveis à Atenção Primária, ponderando as séries temporais de 2008-2015. **Métodos:** estudo ecológico que se utilizou dos registros do Sistema de Informação Hospitalar. Amostra composta pelos registros de internações de diagnósticos incluídos na Lista Brasileira de Internações por Condições Sensíveis à Atenção Primária. Regressões polinomiais foram utilizadas para análise da tendência temporal das taxas ao longo do período. **Resultados**: houve decréscimo nas taxas por 10.000 habitantes (67.38 a 51.99) (r^2=0,9783; p<0,001). As causas mais onerosas foram: asma, insuficiência cardíaca, cistite e pneumonia. Evidenciou-se tendência de redução das internações (β=-2,15; p<0,001) e dispêndios médios (β=-2243,24; p=0,169). **Conclusão:** o diagnóstico asma obteve maior consumo, enquanto que a doença inflamatória do colo do útero atingiu menor quantitativo. Na série temporal, observou-se tendência de redução de gastos evidenciada pela diferença entre o maior custo no ano de 2009 e o menor, em 2015.
Descritores: Atenção Primária à Saúde; Serviços Básicos de Saúde; Qualidade, Acesso e Avaliação da Assistência à Saúde; Sistemas de Informação Hospitalar; Estudos Ecológicos.

Introduction

Since its emergence, the Unified Health System has been undergoing profound transformations, marked by advances, and also overcoming of important obstacles, such as the quality of services and care provided to the population at all levels of complexity, ie. primary, secondary, tertiary, and nowadays also quaternary[1].

In order to operationalize the organization of these levels within the health system, indicators of quality of care and user access are measured to ensure the principles of equity and comprehensiveness[2]. However, due to difficulties related to geography, human resources, budget and infrastructure of the system itself, secondary and tertiary levels have to receive cases resulting from health problems aggravated because of poor resolution in primary care[3].

Primary care is the gateway used by the population to access health services, acting in the promotion and protection of health. It is important for public health because it guides the system to avoid overcrowding in hospitals. Thus, primary care is a qualified care category to benefit society's health indicators[1].

In this context, the Brazilian Ministry of Health defines ambulatory care sensitive conditions as a cluster of health problems for which appropriate primary care interventions are designed to minimize the risk of hospitalizations. Actions such as prevention, diagnosis and early treatment of acute diseases, as well as control and monitoring of chronic diseases should result in the reduction of hospitalizations for ambulatory care sensitive conditions (HACSC)[4-5].

High rates of HACSC in a population sample result from difficult access to health services, lack of adequate and satisfactory attention to health issues, low registration in primary care, spontaneous search for specialized or urgent care, or little remediability of the actions taken in service. Thus, increasing number of hospitalizations requires vigilance and careful investigation of the causes of this outcome[6].

Thus, the public health system offers Primary Care service with weaknesses in terms of access to users, with a tendency towards low indicators of quality and resolution, and consequent generation of unnecessary hospitalizations. On the other hand, when primary care actions are offered in a planned and timely manner, chronic diseases and their severe conditions and, consequently, the number of hospitalizations, tend to decrease[7].

Hospitalizations for ambulatory care sensitive conditions, indicated as parameters of admission and quality, began to recognize primary health care, as they became an instrument to investigate the efficiency of the services, directly reflecting on the planning of the health budget[8]. Based on this premise, investigations were conducted on this theme. In the countryside of São Paulo, HACSC between 2008 and 2010 were responsible for an expenditure of R$ 30,370,691.08, representing 17.0% of total investments in health[9]. In Santa Catarina, there was a decrease in the percentage of expenditures between 2001 and 2011, with a regression coefficient of 0.97, leading to a reduction in the HACSC rate of 3.0% per year, and a seven-fold reduction in the per capita financial investments in health[10].

Although investments in all levels of health care in Brazil are scarce, there is a disparity in the distribuition of financial resources among the levels of health care, as there is a biased impression that tends to cover primary care with a lower level of complexity and, therefore, less need for technological, therapeutic and diagnostic resources[11].

In this scenario, the present study is innovative and important for public health, as it will enable the identification of costs incurred by HACSC. The study will allow to direct actions to reduce total hospital expenditures, for the analysis of these indicators make it possible to plan strategies to reduce this type of hospitalizations, and also assist managers in the detection of critical areas in the municipality. Therefore, the objective was to evaluate the costs of HACSC, considering the time series of 2008-2015.

Methods

An ecological study to establishe temporal trends was conducted from January to February 2018. The unit of analysis was the municipality of Picos, Piauí, Brazil, located in the Center-South Region of Piauí, Northeast Brazil, which has a population estimate of 76,928 inhabitants and territorial area of 577,304 km^2[12].

In the health sector, Picos has as its managing body the Municipal Health Secretariat. In Primary Care, the activities are carried out by 36 Basic Health Units; one Family Health Strategy team is assigned to each unit. Health care in the municipality is complemented by a Medium-sized Hospital, which meets emergency demands of low and medium complexity, Works with funds from the municipality and the state, and is administered by the Piauiense Foundation for Hospital Services. In the macroregion, Picos receives people from about 42 municipalities who also use health services through the referral and counter-referral system[13].

The study population consisted of records of hospitalizations that occurred in Picos whose main diagnosis pointed out in the hospital system, contained in the Unified Health System, was a sensitive condition to ambulatory care, according to the International Classification of Diseases - Tenth Revision (ICD-10), in 2008 and 2015. Thus, as this is an ecological study in which full annotations were available, the thorough analysis of the data conferred robustness to the inferences.

The causes of hospitalization and diagnoses analyzed are described in the Ordinance 221 of the Ministry of Health, of April 17, 2008, present in the 10th International Classification of Diseases and Health Related Problems: vaccine-preventable diseases and sensitive conditions; infectious gastroenteritis and complications; anemia; nutritional deficiencies; ear, nose and throat infections; bacterial pneumonia; asthma; lower airway diseases; hypertension; angina; cardiac insufficiency; cerebrovascular diseases; diabetes mellitus; epilepsies; kidney and urinary tract infection; skin and subcutaneous tissue infection; inflammatory disease of the female pelvic organs; gastrointestinal ulcer; prenatal and childbirth related diseases; congenital syphilis; and congenital rubella syndrome[14].

Data were collected through secondary information about hospitalizations for ambulatory care sensitive conditions (HACSC), originated from Hospitalization Authorizations contained in the Hospital Information System information database available online in the website of the Department of Informatics of the Unified Health System (DataSUS)[15]. The study explored the time series between 2008 and 2015 because only these years were available at the moment of access.

The search for the data to be included in the research was guided by the flow: access to the DataSUS platform[15]. In the information access tab, the command Health Information (TABNET) was first chosen; then Epidemiological and Morbidities; Hospital Morbidity of the Unified Health System/Hospital Information System; General, by place of hospitalization, from 2008; and then, state of Piauí, from Jan/2008 to Dec/2015; Picos, and ICD-10 list - disease.

Data were obtained using the Brazilian List of HACSC as a data collection instrument. Based on this information, the data were inserted in a Microsoft Excel spreadsheet and, after this, the rates were calculated using the gross value of hospitalizations as numerator, and the population of the chosen period as denominator. Data were normalized to 10,000 inhabitants because the city's population is less than 100,000 residents.

A polynomial regression model was used for trend analysis, considering the causes of HACSC as the dependent variable (Y) and the years as the independent variable (X). The trend was considered significant when the estimated model obtained $p < 0.05$.

The linear regression results are presented in terms of coefficient β, significance level and adjusted R^2. As for serial autocorrelation, the Breusch Godfrey

test was used, allowing autocorrelation when p<0.05.

The research did not involve any type of intervention (direct or indirect) with humans. Secondary elements available in public databases were used via online access. Therefore, submission to the Brazil platform was not necessary. However, we reaffirm the ethical commitment to manipulate the data according to their originality, without making changes that would meet the researcher's needs.

Results

Table 1 shows the distribution of HACSC in Picos in general and according to disease, showing that in the period studied there was a decrease in the rates per 10,000 inhabitants (67.38 to 51.99), confirmed by the coefficient of determination (r^2=0.9783; p<0.001)

The main causes of HACSC were diabetes mellitus (r^2=0.8897; p=0.005), kidney and urinary tract infection (cystitis) (r^2=0.9117; p=0.047), and diseases related to prenatal and birth (Congenital Syphilis) (r^2=0.9832; p=0.015), which remained at an increasing trend during the period. Some groups, such as ear, nose, and throat infections (otitis media and other middle ear disorders after mastoiditis) (r^2=0.9838; p=0.004), asthma (r^2=0.9551; p=0.007), hypertension (essential hypertension) (r^2=0.9826; p = 0.017), and heart failure (r^2=0.9849; p=0.011) showed a decrease during most of the time. The other groups remained stable during the study period, presenting a lower frequency of hospitalization.

Table 1 - Distribution of hospitalizations for ambulatory care sensitive conditions, according to disease. Picos, PI, Brazil, 2018

Diseases	2008	2009	2010	2011	2012	2013	2014	2015	r²*	p†
General	67.38	67.09	65.37	61.76	60.37	56.72	57.88	51.99	0.9783	<0.001
whooping cough	0	0	0	0	0	0	0.13	0	0.9463	0.310
Hepatitis B	0.27	0.41	0.13	0.13	0.39	0.92	0.65	0.26	0.9813	0.322
Rheumatic fever	0.27	0.54	0.13	0.26	0.13	0.13	0.39	0.26	0.5345	0.626
Malaria	0	0	0	0	0.13	0.13	0.13	0	0.9223	0.201
Anemia	0.41	0.54	0.27	0.66	0.79	0.52	0.26	0.13	0.8258	0.427
Otitis media	2.48	2.19	2.58	2.26	1.85	1.44	1.31	0	0.9838	0.004
Pharyngitis and tonsillitis	0	0.68	0	0	0	0	0	0	0.6689	0.310
Pneumonia	49.94	64.09	40.18	51.89	36.16	59.70	75.87	67.80	0.7817	0.229
Asthma	175.77	241.30	195.33	189.41	146.39	143.60	126.45	93.80	0.9551	0.007
Bronchitis	4.69	9.31	6.94	12.93	14.70	17.09	12.58	10.71	0.9245	0.083
Emphysema/Other COPD‡	13.38	19.30	8.58	10.40	3.31	6.83	7.99	9.66	0.7789	0.130
Hypertension	38.08	58.47	57.61	50.42	42.65	30.64	12.58	11.10	0.9826	0.017
Cardiac insufficiency	64.84	63.54	57.34	65.36	62.39	53.26	39.96	44.94	0.9849	0.011
Diabetes	21.11	26.01	32.41	31.48	31.66	38.13	32.36	39.32	0.8897	0.005
Cystitis	25.80	39.85	50.26	42.81	44.38	55.49	50.32	47.55	0.9117	0.047
Duodenal/gastric ulcer	0.96	0.82	0.95	0.80	1.19	1.05	0.13	0.26	0.9374	0.119
Congenital syphilis	0	38.61	40.48	23.69	48.78	137.45	89.68	346.32	0.9832	0.015

* r^2: coefficient of determination; †t-test for coefficient of determination; ‡Chronic obstructive pulmonary disease

Table 2 presents the expenditures in R$ referring incurred by HACSC from 2008 to 2015, according to disease. They totaled R$ 13,166,698.98, and 2009 was the year which presented the greatest cost, totaling R$ 1,988,211.38. During this period, the cause that brought the highest burden was asthma, with R$ 4,707,965.40; and the one that brought lower expenses was inflammatory cervical disease, with R$ 342.84.

The serial autocorrelation, performed by the Breusch-Godfrey test, showed values of p=0.044 for the HACSC rate and p=0.313 for the average expenses in Brazilian reais. Based on this, a polynomial regression analysis was applied and showed a decreasing trend in HACSC (β=-2.15; 95% CI= -268 – -1.62; p < 0.001; adjusted R^2 = 0.933), and average expenses (β = -2243.24; 95% CI = -5757.5 – 1571.1; p=0.169; adjusted R^2 = 0.160) with the hospitalizations described during the study period.

Table 2 - Total cost (in R$) of hospitalizations for ambulatory care sensitive conditions, according to disease. Picos, PI, Brazil, 2018

Doenças	2008	2009	2010	2011	2012	2013	2014	2015	Total
whooping cough	0	0	0	0	0	0	873	0	873
Hepatitis B	0	681	227	203	1,261	1,219	1,118	444	5,155
Rheumatic fever	403	832	187	406	243	187	610	428	3,300
Malaria	0	0	0	0	229	229	267	0	725
Anemia	684	725	475	1,217	1,476	991	467	257	6,296
Otitis media	7,302	10,061	11,600	11,744	9,138	6,832	7,800	0	64,480
Pharyngitis and tonsillitis	0	1527	0	0	0	0	0	0	1,527
Pneumonia	219,044	297,518	186,690	245,117	173,582	285,210	361,965	327,268	2,096,397
Asthma	575.069	853,328	699,211	702,380	529,931	535,277	471,182	341,583	4,707,965
Bronchitis	7,393	14,266	10,681	20,145	22,661	26,331	19,780	18,602	139,862
Emphysema	46,611	73,070	32,352	42,529	12,926	27,561	26,944	34,045	296,040
Hypertension	50,842	82,105	85,706	72,389	64,624	44,098	18,231	16,420	434,417
Cardiac insufficiency	307,310	334,744	303,074	362,125	344,544	295,983	223,065	253,549	2,424,397
Diabetes	48,011	72,809	87,824	92,836	96,585	111,814	95,248	114,196	719,326
Cystitis	216,175	237,198	279,825	298,219	359,000	288,546	259,469	250,534	2,188,969
Salpingitis and oophoritis	1,944	3,087	3,500	3,201	4,195	1,790	3,871	2,372	23,965
Cervical diseases	0	0	0	0	0	175	0	167	342
Other diseases of the female pelvic organs	4,496	3,380	5,615	5,252	7,062	4,221	2,324	4,586	36,940
Duodenal/gastric ulcer	2,910	2,534	2,922	2,233	1,955	1,824	186	1,605	16,171
Congenital syphilis	0	338	258	258	517	1,035	517	2,646	5,572
Total	1,488,199	1,988,211	1,710,154	1,860,261	1,629,936	1,633,330	1,495.938	1,368,709	13,166,698

Discussion

Because the study used secondary data, there were some limitations regarding notes in electronic records in databases. Although the Unified Health System has a large database, the records refer only to hospitalizations made under this system, which although correspond to the majority, do not express the totality. It is salso noteworthy that these data represent aspects of a specific geographically limited area, which hinders the generalization to other realities.

Despite the limitations of this research, the results may support local managers in the planning, implementation and evaluation of actions aimed at increasing the resolution of primary care, with consequent reduction of expenses in medium and high complexity procedures. Moreover, it may contribute to meeting the demand of the fundamentals and guidelines of the unified health system, including universality, completeness and equity.

The various transformations that have taken place in the Unified Health System have instigated a reduction in HACSC in varied places of Brazil[9]. Consequently, expenditure mitigation may be due to the strengthening of primary care, resuting in an increased coverage of the Family Health Strategy in the country[16], although the nature of the present ecological study does not allow inequivocally to affirm this relationship. However, it is emphasized that during the 2000s, the city of Picos quantitatively increased the number of Family Health Strategy teams, presenting the largest estimated population coverage of Piauí, Brazil. It currently has 36 teams that assist more than 60,000 people from Picos in Primary Health Care services[13].

It is therefore considered that the work process of Primary Health Care may be related to the occurrence of HACSC, understanding that such hospitalizations are mainly a result of the way health services are organized, and of the training and performance of health professionals, which may make it possible to reduce these hospitalization rates.

However, there are other variables that were not surveyed in the presente study and that may have a direct relation to the HACSC indicator, such as data related to the population's socioeconomic conditions and the way of access to Primary Health Care services, as well as the georeferencing of their distribuition. Another aspect is that the restructuring in the paradigm and organization of the health model/system, with the expansion of Primary Health Care and of the Family Health Strategy, reorganized and qualified health services in Picos, but it is not be possible to associate the drop of HACSC only with this variable.

In parallel to other studies, there was no statistical significance in the decrease of the HACSC coefficients and expenses with primary care in a study conducted in Rio Grande do Sul, which showed that health expenditures, per capita burden, and coverage of the Family Health Strategy increased significantly but this had no relation with the hospitalizations analyzed. It is therefore inferred that despite the financial investments and the coverage of the Family Health Strategy, these points were not enough to provide adequate health care to the population[17].

In Rondônia, the frequency of HACSC was high between 2012 and 2016 and, although there was an increase in the coverage of the Family Health Strategy in the same time period, this increase had no significant effect on the frequency of HACSC so that changes could occur in the state[18].

In Paraná, a study on the profile of HACSC found a decrease between 2000 and 2010, with a reduction in hospitalizations for high prevalence diseases in Brazil, but with maintenance of preventable hospitalizations for cardiovascular and respiratory diseases. In this sense, it is inferred that primary care services with well-defined guidelines and principles are able to reduce the risk of acute chronic conditions and support lower rates of infection by communicable diseases[19].

Regarding expenditures, the evaluation of avoidable hospitalization rates in association with the quality of primary health care showed that the amounts paid for these hospitalizations follow the decrease in percentages and HACSC rates[20].

Constant high costs for treating respiratory conditions such as asthma, bronchitis, and pneumonia may be related to the characteristics of the local climate, which is dry, with an average temperature of 37 °C, and contaminated by dust and smoke particles resulting from burning, as the municipality is part of the Piauí semiarid region[13]. In this sense, a joint action of public policies for intersectoral link bewteen municipal management spheres is necessary for solutions to improve air quality, as well as permanent education actions for the population[1].

Saving expenditures with avoidable hospitalizations is a real possibility of reversing such resources to increase the effectiveness of primary health care. Thus, it is important that further research using robust methods of economic and epidemiological analysis be carried out in order to identify the reason of the real increase in HACSC, since the resources available in primary care and the expansion of the Family Health Strategy should be theoretically sufficient to treat these diseases before complications arise[7,16].

It is emphasized that the prevention and control of these diseases are directly related to the efficiency of primary care services. The magnitude of the occurrence of these types of hospitalizations points to the need for greater attention in terms of management of the primary care network so as to readjust the allocation of strategic and financial resources according to the demands of the population, which should be assessed through periodic situational diagnoses. Furthermore, rationalization and supervision for the appropriate use of available resources is recommended, so that there is greater efficiency in the health care field[9].

Improvements in primary health care with structural investments and according to the essential characteristics such as ease of access, comprehensive care, effective coordination of care, consideration of the family context, and the establishment of links between services and population are actions that can contribute to the decrease of HACSC in the municipality[9].

The role of nursing in this reduction is important, as the work in primary health care includes the assistance from an interdisciplinary team aiming at the comprehensiveness of actions, with permanent education prioritizing health promotion, prevention and risk control of diseases that are part of the Brazilian list of HACSC[20].

Conclusion

Asthma was the diagnosis associated with greater expenses, while inflammatory cervical disease was associated with lower expenses. In the time series, there was a trend towards a reduction in expenses evidenced by the difference between the highest expenditure in 2009 and the lowest in 2015.

Collaborations

Sousa MEF, Sousa EC and Pereira FGF contributed with conception and design of the project, or analysis and interpretation of data. Melo GAA collaborated with the writing of the article and relevant critical review of the intellectual content. Carvalho REFL and Silva MRF cooperated with the final approval of the version to be published.

References

1. Miranda GMD, Mendes ACG, Silva ALA. The challenge of organizing a universal and efficient National Health System in the Brazilian federal pact. Saúde Soc. 2017; 26(2):329-35. doi: https://doi.org/10.1590/S0104-12902017168321

2. Barros FPC, Sousa MF. Equity: concepts, meanings and implications for the Brazilian National Health Sys Saúde Soc. 2016; 25(1):9-18. doi: https://doi.org/10.1590/S0104-12902016146195

3. Barbosa ML, Celino SDM, Carneiro AG, Costa GMC. Health care provided by SUS: the experience of foreign students. Esc Anna Nery 2016; 20(4):e20160092. doi: dx.doi.org/10.5935/1414-8145.20160092

4. Rehem TCMSB, Ciosak SI, Egry EY. Primary Care Sensitive Hospitalization: users detect flaws on the access to services. Rev Esc Enferm USP. 2014;

48(Esp2):70-6. doi: https://doi.org/10.1590/S0080-623420140000800011

5. Santos LM, Gonçalves MA, Charles C. As despesas municipais em saúde impactam as Internações por Condições Sensíveis à Atenção Primária (ICSAP)? Uma análise em municípios de Minas Gerais. Rev Gestão Sistema Saúde. 2016; 5(1):62-75. doi: https://doi.org/10.5585/rgss.v5i1.185

6. Avelino CCV, Goyatá SLT, Nogueira DA, Rodrigues LBB, Siqueira SMS. Quality of primary health care: an analysis of avoidable hospitalizations in a Minas Gerais county, Brazil. Ciênc Saúde Coletiva. 2015; 20(4):1285-93. doi: http://dx.doi.org/10.1590/1413-81232015204.12382014.

7. Costa LQ, Pinto Júnior EP, Silva MGC. Time trends in hospitalizations for Ambulatory Care Sensitive Conditions among children under five years old in Ceará, Brazil, 2000-2012. Epidemiol Serv Saúde. 2017; 26(1):51-60. doi: https://doi.org/10.5123/S1679-49742017000100006

8. Arruda JS, Dias da Costa JS. Hospitalizations for primary care sensitive conditions in Novo Hamburgo, Rio Grande do Sul. Rev Bras Med Fam Comunidade. 2017; 12(39):1-11. doi: http://dx.doi.org/10.5712/rbmfc12(39)1256

9. Ferreira JBB, Borges MJG, Santos LL, Forster AC. Internações por condições sensíveis à atenção primária à saúde em uma região de saúde paulista, 2008 a 2010. Epidemiol Serv Saúde. 2014; 23(1):45-56. doi: http://dx.doi.org/10.5123/S1679-49742014000100005

10. Brasil VP, Costa JSD. Hospitalizations owing to ambulatory care sensitive conditions in Florianopolis, Santa Catarina, Brazil – an ecological study, 2001-2011. Epidemiol Serv Saúde. 2016; 25(1):75-84. doi: http://dx.doi.org/10.5123/S1679-49742016000100008

11. Harrison MJ, Dusheiko M, Sutton M, Gravelle H, Doran T, Roland M. Effect of a national primary care pay for performance scheme on emergency hospital admissions for ambulatory care sensitive conditions: controlled longitudinal study. BMJ. 2014; 349:6423. doi: doi.org/10.1136/bmj.g6423

12. Instituto Brasileiro de Geografia e Estatística (IBGE). Indicadores de Base Populacional [Internet]. 2019 [citado 2019 Ago 16]. Disponível em:http://cidades.ibge.gov.br/xtras/perfil.php?codmun=220800

13. Prefeitura Municipal de Picos. Secretaria Municipal de Saúde de Picos. Plano Diretor do Município de Picos [Internet]. 2019 [citado 2019 ago 16]. Disponível em: http://www2.picos.pi.gov.br/#!

14. Ministério da Saúde (MS). Secretaria de Atenção à Saúde. Portaria nº 221, de 17 de abril de 2008. Define a lista brasileira de Internações por Condições Sensíveis à Atenção Primária. [Internet]. 2008 [citado 2019 Aug 16]. Disponível em: http://bvsms.saude.gov.br/bvs/saudelegis/sas/2008/prt0221_17_04_2008.htm

15. Ministério da Saúde (BR). DATASUS. Dados de morbidade hospitalar do SUS (SIH/SUS) [Internet]. 2015 [citado 2019 Nov 01]. Disponível em: http://tabnet.datasus.gov.br/cgi/deftohtm.exe?sih/cnv/nipi.def

16. Souza QK, Peixoto SV. Descriptive study on the evolution of hospitalization costs for ambulatory care sensitive conditions in Brazil, 2000-2013. Epidemiol Serv Saúde. 2017; 26(2):285-94.doi:http://dx.doi.org/10.5123/S1679-49742017000200006

17. Soranz D, Pinto LF, Penna GO. Themes and Reform of Primary Health Care (RCAPS) in the city of Rio de Janeiro, Brazil. Ciênc Saúde Coletiva. 2016; 21(5):1327-38. doi: http://dx.doi.org/10.1590/1413-81232015215.01022016

18. Santos BV, Lima DS, Fontes CJF. Hospitalization for ambulatory care-sensitive conditions in the state of Rondônia, Brazil: a descriptive study of the period 2012-2016. Epidemiol Serv Saúde. 2019; 28(1):e2017497. doi: http://dx.doi.org/10.5123/S1679-49742019000100001

19. Borges PKO, Schawb PM, Blanski CR, Floriano LSM, Lopes BG, Muller EV. Sensitive hospitalizations to primary care and care in the health care network. Rev Rene. 2016; 17(5):668-75. doi: http://dx.doi.org/10.15253/2175-6783.2016000500012

20. Conceição RS, Silveira GSP, Veiga AJP, Matta JMB. Air temperature and its relationship with some respiratory diseases in Victory Conquest – BA. Rev Geoaraguaia [Internet]. 2015 [cited Nov 1, 2019]; 5(2):69-81. Available from: http://periodicoscientificos.ufmt.br/ojs/index.php/geo/article/view/4929/pdf_28