



PUBLIC EXPENSES WITH HOSPITALIZATIONS DUE TO VIRAL HEPATITIS
GASTOS PÚBLICOS COM HOSPITALIZAÇÕES DEVIDO ÀS HEPATITES VIRAIS
GASTOS PÚBLICOS CON HOSPITALIZACIONES DEBIDO A LAS HEPATITIS VIRALES

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ABSTRACT

Objective: to describe public expenditure on hospitalizations due to viral hepatitis in northeastern Brazil between 2013 and 2017. **Method:** this is a quantitative, ecological and descriptive study with data from the Hospital Information System. Data was analyzed with the aid of Excel software, using absolute and relative frequencies and presented in tables. **Results:** 4,317 hospitalizations were registered for the treatment of viral hepatitis in Northeastern Brazil. The prevalence of hospitalizations in 2014 (40.6%), in the State of Maranhão (27.2%) and in public institutions (50.2%) stands out. In addition, there was a financial impact of over R \$ 1.3 million on public coffers and Maranhão represented the largest burden (21.3%). **Conclusion:** it is necessary to increase the diagnostic and therapeutic rates, especially in the state of Maranhão, as it shows the largest number of hospitalizations, implying higher public hospital expenses. **Descriptors:** Epidemiology; Public Health; Public Health Surveillance; Health Care Costs; Information Systems.

RESUMO

Objetivo: descrever os gastos públicos com as hospitalizações devido às hepatites virais no Nordeste brasileiro entre 2013 e 2017. **Método:** trata-se de um estudo quantitativo, ecológico e descritivo com dados do Sistema de Informações Hospitalares. Analisaram-se os dados com o auxílio do *software Excel*, utilizando-se frequências absolutas e relativas e apresentando-os em tabelas. **Resultados:** registraram-se 4.317 internações para o tratamento das hepatites virais no Nordeste brasileiro. Destaca-se a prevalência de internações no ano de 2014 (40,6%), no Estado do Maranhão (27,2%) e nas instituições públicas (50,2%). Gerou-se, além disso, um impacto financeiro superior a R\$ 1,3 milhão aos cofres públicos e o Maranhão representou o maior ônus (21,3%). **Conclusão:** torna-se necessário o incremento nas taxas diagnósticas e terapêuticas, especialmente, no Estado do Maranhão, por evidenciar a maior quantidade de internações, implicando maiores gastos públicos hospitalares. **Descritores:** Epidemiologia; Saúde pública; Vigilância em Saúde Pública; Custos de Cuidados de Saúde; Sistemas de informação.

RESUMEN

Objetivo: describir los gastos públicos con las hospitalizaciones debido a las hepatitis virales en el noreste de Brasil entre 2013 y 2017. **Método:** se trata de un estudio cuantitativo, ecológico y descriptivo, con datos del Sistema de Informaciones del Hospital. Los datos se analizaron con el auxilio del *software Excel* utilizando frecuencias absolutas y relativas y presentadas en tablas. **Resultados:** se registraron 4,317 hospitalizaciones para el tratamiento de las hepatitis virales en el noreste de Brasil. Se destaca una mayor prevalencia de hospitalizaciones en 2014 (40.6%), en el Estado de Maranhão (27.2%) y en las instituciones públicas (50.2%). Además, se generó un impacto financiero de más de R \$ 1,3 millones para las arcas públicas y Maranhão fue responsable de una mayor carga (21,3%). **Conclusión:** se torna necesario el aumento en las tasas diagnósticas y terapéuticas, especialmente en el Estado de Maranhão, ya que se evidencia una mayor cantidad de hospitalizaciones, lo que implica mayores costos hospitalarios. **Descriptor:** Epidemiología; Salud Pública; Vigilancia En Salud Pública; Costos De La Atención En Salud; Sistemas de Información.

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INTRODUCTION

Viral hepatitis (VH) is defined as infectious disease and its etiology consists of different viral agents with primary tropism to hepatocytes. Among the etiological agents, viruses with the greatest clinical and epidemiological importance are highlighted, such as hepatitis A (VHA), B (VHB), C (VHC), D (VHD) and E (VHE) viruses.¹⁻³ However, other viral agents, such as Torque teno virus (TTV), G-virus and Sendai virus (SEV-V), which also cause VH, however, have a low clinical and epidemiological impact.¹

It is estimated that worldwide there are 325 million people with chronic stage VHB and 170 million VHC. It is reported that in Brazil, it is estimated that there are approximately two million chronic VHB carriers and three million VHC carriers. However, it is noteworthy that a significant number of infected people are unaware of their clinical situation and establish them as a link in the virus transmission chain.⁴

It should be noted that VH virus infections are not recent, as there have been described, in historical documents cases, that presented the same characteristics in China and Babylon for over five thousand years.⁵ It is also evidenced that VH have universal distribution and distinct epidemiological, clinical and laboratorial points of view.^{2,6}

Factors that should be considered for the endemic and epidemic evaluation of VH are presented in Brazil. These include, among them, regional and population socioeconomic heterogeneities and inequality in the distribution of health services, especially, diagnostic and therapeutic technologies.⁷ These factors are related to the increasing epidemiological behavior of VH in Brazil and, consequently, to the tendency of permanence of these diseases.⁶

In this perspective, the Ministry of Health (MH) created the National Program for the Prevention and Control of Viral Hepatitis (PNHV) in 2002, and in 2003 these diseases were defined as compulsory

diseases throughout the Brazilian territory. It is warned that the data generated through these notifications enable the spatiotemporal surveillance of VH, which, in turn, direct the strategies for its prevention and control.

The Unified Health System (UHS) is responsible for the health coverage of approximately 80% of the Brazilian population⁸ noting that drug therapies express significant costs and represent a substantial portion of public health spending. It should be emphasized that studies aimed at the economic evaluation of health are essential to describe the profile of expenditures and define criteria for the prioritization of groups of pathologies.⁵ In this context, it is possible to rationalize costs without impairing the quality of clinical, diagnostic and/or therapeutic care.

OBJECTIVE

- To describe the public spending on hospitalizations due to viral hepatitis in Northeast Brazil between 2013 and 2017.

METHOD

This is a quantitative, ecological and descriptive study performed using secondary data from the Hospital Information System (HIS).⁹ The HIS is constituted in an administrative data base belonging to the Department of Informatics of the Unified Health System (DATASUS), responsible for receiving and compiling all information regarding hospital admissions within the scope of the public health system throughout the Brazilian territory.¹⁰⁻¹¹

The Northeastern region of Brazil, composed of nine Federative Units (FU), was selected as the study scenario, according to table 1, and the data were collected in August 2018, considering the time limit from January 1, 2013 to 31 of December, 2017. The following variables were approved: Hospital Hospitalization Authorizations (HHA), approved per year of care, by UF and by institutional regime; and public expenditures were stratified according to the UFs.

Table 1. Description of the Federative Units that belong to the Northeast region. Northeast Brazil 2018.

Federative Units	Human development Index *	Territorial extension	Estimated Population **	Demographic Density *
Maranhão	0.639	331,936.949 km ²	7,000.229	19.81 hab/km ²
Piauí	0.646	251,611.929 km ²	3,219.257	12.40 hab/km ²
Ceará	0.682	148,887.633 km ²	9,020.460	56.76 hab/km ²
Rio Grande do Norte	0.684	52,811.107 km ²	3,507.003	59.99 hab/km ²
Paraíba	0.658	56,468.435 km ²	4,025.558	66.70 hab/km ²
Pernambuco	0.673	98,076.021 km ²	9,473.266	89.62 hab/km ²
Alagoas	0.631	27,848.140 km ²	3,375.823	112.33 hab/km ²
Sergipe	0.665	21,918.443 km ²	2,288.116	94.36 hab/km ²
Bahia	0.660	564,732.450 km ²	15,344.447	24.82 hab/km ²

* Updated information in 2010

** Updated information in 2017

Source: Brazilian Institute of Geography and Statistics (IBGE)¹²

In the list of procedures, the option "treatment of viral hepatitis" was selected as a modality of hospital care of medium complexity under code 0303010118. It is reported that this treatment consists of attending to various types of VH, their clinical forms and co-infections and covering the codes between B15 and B19 of the 10th International Classification of Diseases and Related Health Problems (ICD -10).

Data was analyzed using simple descriptive statistics (absolute and relative frequencies). The need for the study to be considered by the Research Ethics Committee was waived because

the data collection occurred from a public domain information system, according to Resolution No. 466/2012 of the National Health Council.

RESULTS

During the study period (2013-2017), 4,317 hospitalizations for the treatment of VH were registered in the Northeast of Brazil, according to table 2. The prevalence of hospitalizations in 2014 is highlighted, totaling 1,754 (40.6 %). In addition, from 2015, there was a decreasing behavior of values, ending in 2017 with 659 (15.3%) hospitalizations.

Table 2. Hospitalizations in the Brazilian Northeast according to the year of care. Northeast Brazil 2013-2017.

Year	N	%
2013	96	2.2
2014	1,754	40.6
2015	1,042	24.1
2016	766	17.8
2017	659	15.3
Total	4,317	100

Source: Ministry of Health - UHS Hospital Information System (HIS/UHS)

It was registered, stratifying the HHA according to the FUs, that Maranhão stood out, with 1,173 (27.2%) of all approved HHA, and Bahia showed

836 (19.4%) approvals, revealing the second largest value.

Table 3. Hospitalizations in the Brazilian Northeast according to the federative units. Northeast Brazil 2013-2017.

Federative Unit	N	%
Maranhão	1,173	27.2
Piauí	316	7.3
Ceará	509	11.8
Rio Grande do Norte	210	4.9
Paraíba	358	8.3
Pernambuco	695	16.1
Alagoas	88	2.0
Sergipe	132	3.0
Bahia	836	19.4
Total	4,317	100

Source: Ministry of Health - UHS Hospital Information System (HIS/UHS)

Table 4 shows the stratification of hospitalizations and the institutional regime. It is observed that 2,169 (50.2%) authorizations were

approved in public institutions. Nonetheless, it is reported that private institutions showed reduced values, with 533 (12.4%) cases.

Table 4. Internments in the Brazilian Northeast according to the institutional regime. Northeast Brazil 2013-2017.

Regime	N	%
Public	2,169	50.2
Private	533	12.4
Ignored	1,615	37.4
Total	4,317	100

Source: Ministry of Health - UHS Hospital Information System (HIS/UHS)

During the study period, the treatment of VH generated a financial impact of over R \$ 1.3 million to the public coffers. It is also mentioned that Maranhão caused the largest burden on UHS,

with R \$ 293,492.53 (21.3%), followed by the States of Pernambuco, with R \$ 278,221.07 (20.2%), and Bahia. , with R \$ 241,650.68 (17.7%), totaling 59.1% of VH spending in the Northeast.

Table 5. Hospital public expenses in the Brazilian Northeast according to the federative units. Brazil, 2013-2017

Federative Units	Public spending (R\$)	%
Maranhão	293,492.53	21.3
Piauí	132,118.71	9.6
Ceará	142,087.34	10.3
Rio Grande do Norte	111,401.13	8.1
Paraíba	98.335,86	7.1
Pernambuco	278,221.07	20.2
Alagoas	28,810.91	2.1
Sergipe	49,941.24	3.6
Bahia	241,650.68	17.7
Total	1,376,059.47	100

Source: Ministry of Health - UHS Hospital Information System (HIS/UHS)

DISCUSSION

The evolution of health technologies over the years is pointed out as one of the factors related to the growing financial impact of the sector, noting that modern hospitals charge significant amounts in the purchase of medical equipment.¹³ The free UHS dispensation of drugs with a high financial value reflects the significant evolution of the system, since the majority of users do not have sufficient resources to cover the treatment and non-adherence therapeutics would promote an increase in the mortality of the population.¹⁴

Access to high-cost drugs is available through the Ministry of Health's High Cost Medication Program (PMAC). It is noted that dispensing occurs for users with prescription for treatment of acute or chronic diseases, among the patients who undergo transplantation, associated with genetic diseases, hepatitis, among others.¹⁵

Table 2 shows the number of hospitalizations per year of care and a marked decrease in the number of hospitalizations for HV over the years. This result is explained by a possible higher investment/treatment of cases with high cost medicines, which prevents complications and, consequently, hospitalizations.

Most hospitalizations occurred in the states of Maranhão, with 1,173 (27.2%), Bahia, with 836 (19.4%), and Pernambuco, with 695 (16.1%), according to Table 3. It is understood, however, that it is not yet feasible to explain the concentration of cases in these States, especially in Maranhão, due to the low frequency of seroepidemiological studies that, in general, are limited to the range of specific populations and serologies.¹⁵ As possible contributors to justify such results, the state's socioeconomic conditions are listed. Maranhão presents the second lowest HDI (0.639) among the Northeastern States.¹²

It is observed that 2,169 (50.2%) authorizations were approved in public institutions, as shown in table 4. In addition, private institutions account

for a difference in the number of approvals of approximately 37.9%. in relation to those in government domain.

Attention is drawn to the records of institutions with regime ignored in table 4, occupying the second highest frequency, with 1,615 (37.4%) hospitalizations. This situation is evidenced in another study and it is suggested that the most credible justification is underreporting during data registration.¹⁶ Excluding ignored information, 2,702 known cases of hospitalizations for VH would be added, and 2,169 (80.3%) were treated at the public health network, thus confirming the strengthening of UHS in the last few years. decades.

In addition, UHS is the largest social inclusion policy in Brazil, directly covering a population of over 150 million people and, indirectly, over 270 million people.¹⁷ It is a health system comprised of a complex network of services financed by state revenues and social taxes from the three levels of government (federal, state and municipal), as well as private investments.¹⁸

It is reported that people with low socioeconomic status are more likely to use public services. Specifies the predominance of female users, self-declared brown people and complete elementary school, with half of the users belonging to the middle class and a considerable part receive the benefit of Bolsa Familia,¹⁹ characteristics present in most of the northeastern population.

However, it is argued that the UHS has universal access and offers the simplest to the most complex services to all Brazilians, regardless of their socioeconomic conditions. As a consequence, there is a significant reflection on the health indicators of the population to the point of surpassing other social areas, such as education, the economy, housing and public safety.²⁰

Table 5 shows that the treatment for VH generated a financial impact of over R \$ 1.3

million to the public coffers. In addition, according to information from DATASUS, public institutions present the prevalence in the amounts spent, with R \$ 648,922.22 (47.2%), followed by ignored ones, with R \$ 560,481.91. (40.7%), and the private ones, with R \$ 166,821.24 (12.1%).²¹

It is reinforced that the states that generated the highest costs to UHS were Maranhão, with R \$ 293,492.53 (21.3%), Pernambuco, with R \$ 278,221.07 (20.2%), and Bahia, with R \$ 241,650.68 (17.7%). In all of them, public institutions stood out as the source of the highest number of hospital admissions and values spent on hospitalizations for VH.

It is stated, however, that these expressive values may not necessarily reflect an administrative efficiency of the financial resources, that is, higher expenditures do not mean reach of better health conditions.¹⁸ For example, these expenditures refer to hospitalizations that are usually due to the hepatic complications generated by VH.

From this perspective, a definition of technical efficiency is adopted as the relationship between the resources used and the achievement of results. Efficiency is achieved when the results are maximized under a given level of resources or when they are minimized to obtain the same or better results.^{18,22}

One of the complications is cirrhosis of the liver, which significantly impairs the health system through therapeutic interventions.²³ It is also reported in the case of Hepatitis C that the high costs invested when the disease is already in advanced stage are due to constant hospital admissions, medical consultations, pharmacotherapy, examinations and in some circumstances liver transplantation.²⁴

It is revealed in one study²⁵ that the public resources burdened with the treatment of hepatic cirrhosis due to Hepatitis B are significant for UHS. It is also emphasized that some authors²⁵⁻⁶ argue that early elimination of the virus is an efficient action to reduce spending and ensure an increase in the population's survival rate.²⁵ It was evidenced, in another study²⁷ that the financial impacts with hospitalizations and other expenses for users with hepatic cirrhosis due to Hepatitis C were superior, when compared to the users without the complication.

Given this context, the need for efficient allocation of financial resources is pointed out, in order to increase early the diagnostic and therapeutic rates, which avoids the progress of the disease and, consequently, the excessive costs to public coffers.²⁴ These measures are considered indispensable, as it is estimated that around 400 million people with the hepatitis B virus worldwide and 180 million of the chronic form of hepatitis C are estimated worldwide,²⁸ constitutes an

important public health problem.²⁹ It is also noted that in Brazil, 21.4% of deaths among hepatitis patients are due to B virus and 75.8% of virus C.³⁰

CONCLUSION

This study evidenced the need for an increase in diagnostic and therapeutic rates, especially in the state of Maranhão, due to the prevalence of hospitalizations, resulting in higher public hospital expenses. It is also mentioned that the population has an important role in controlling the pathology through preventive measures such as adherence to immunizations, protection in sexual relations and food hygiene, among other prophylactic strategies.

The scarcity of economic studies related to hospital expenses for VH in Brazil is underscored. It is reported that, most of the studies report the financial impacts at the outpatient level, which generated difficulties in the construction of the discussion. It should also be pointed out that the Hospital Information System does not make public expenditures stratified by the types of VH or the treatments used, which makes it difficult to know the exact destination of the financial resources for the various therapeutic modalities.

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