

EPIDEMIOLOGICAL PROFILE OF MALE PEDIATRIC CLINICAL EMERGENCIES IN PIAUÍ STATE FROM 2019 THROUGH 2024**PERFIL EPIDEMIOLÓGICO DE URGÊNCIAS CLÍNICAS PEDIÁTRICAS MASCULINAS EN ESTADO DE PIAUÍ DE 2019 A 2024****PERFIL EPIDEMIOLÓGICO DAS URGÊNCIAS CLÍNICAS PEDIÁTRICAS MASCULINAS NO ESTADO DO PIAUÍ DE 2019 A 2024****Isabelle Marcos Noronha Arrais¹****Ligia Maria de Sousa Arrais²****Államy Danilo Moura e Silva³**

¹ Centro Universitário Santo Agostinho – UNIFSA, Teresina, Brazil. ORCID: <https://orcid.org/0009-0009-7145-0299>

² Centro Universitário Santo Agostinho – UNIFSA, Teresina, Brazil. ORCID: <https://orcid.org/0009-0000-4632-1692>

³ Universidade Estadual do Piauí – UESPI, Teresina, Brazil. ORCID: <https://orcid.org/0000-0001-7368-5395>

Corresponding Author**Isabelle Marcos Noronha Arrais**

Rua Simplício Mendes, 1316,
Vermelha, Teresina/PI – Brazil. CEP:
64.018-510 – contact: +55(89) 98136-
8570. E-mail:
isabellenoronha6@gmail.com

Submission: 10-09-2025**Approval:** 24-11-2025**ABSTRACT**

Introduction: Pediatric emergencies represent an important segment in the epidemiological profile of the state of Piauí, with a predominance of cases among male individuals, according to regional statistical data. **Objective:** To analyze the epidemiological profile of male pediatric clinical emergencies in the state of Piauí from 2019 to 2024. **Methods:** This is an epidemiological study with an observational and quantitative design, of the ecological type, using data from the Hospital Information System regarding all male pediatric emergencies in the state of Piauí among individuals aged zero to 19 years. The following variables were investigated: age group, sex, year of hospitalization, municipality of hospitalization, health macro-regions, number of hospitalizations, and number of deaths. **Results:** An oscillating trend in the total number of hospitalizations was observed, distributed across the 11 health regions of the state, with a significant decline between 2019 and 2020, possibly associated with the impact of the COVID-19 pandemic. The highest prevalence of hospitalizations occurred among children under one year of age, leading the rates throughout the analyzed period. **Conclusion:** Although the number of hospitalizations showed an oscillating pattern over the analyzed period, pediatric emergencies remain an important epidemiological indicator for public health in Piauí, requiring ongoing strategies for prevention and management of health issues.

Keywords: Emergencies; Pediatrics; Epidemiological Profile; Hospitalization; Public Health.

RESUMEN

Introducción: Las urgencias pediátricas representan un segmento importante en el perfil epidemiológico del estado de Piauí, con predominio de casos entre individuos del sexo masculino, según datos estadísticos regionales. **Objetivo:** Analizar el perfil epidemiológico de las urgencias clínicas pediátricas masculinas en el estado de Piauí entre 2019 y 2024. **Métodos:** Se trata de un estudio epidemiológico de carácter observacional y cuantitativo, de tipo ecológico, utilizando datos del Sistema de Información Hospitalaria referentes a todas las urgencias masculinas de la población pediátrica del estado de Piauí entre cero y 19 años. Se investigaron las siguientes variables: grupo etario, sexo, año de hospitalización, municipio de hospitalización, macrorregiones de salud, número de hospitalizaciones y número de defunciones. **Resultados:** Se observó un comportamiento oscilante en el número total de hospitalizaciones, distribuidas entre las 11 regiones de salud del estado, con una caída significativa entre 2019 y 2020, posiblemente asociada al impacto de la pandemia de COVID-19. La mayor prevalencia de hospitalizaciones se registró entre niños menores de un año, liderando los índices durante todo el período analizado. **Conclusión:** Aunque el número de hospitalizaciones mostró un patrón oscilante a lo largo del período analizado, las urgencias pediátricas se mantienen como un importante indicador epidemiológico para la salud pública en Piauí, requiriendo estrategias continuas de prevención y manejo de los problemas de salud.

Palabras clave: Emergencias; Pediatría; Perfil Epidemiológico; Internación Hospitalaria; Salud Pública.

RESUMO

Introdução: As urgências pediátricas representam um importante recorte no perfil epidemiológico do estado do Piauí, com predominância de ocorrências entre indivíduos do sexo masculino, segundo dados estatísticos regionais. **Objetivo:** Analisar o perfil epidemiológico das urgências clínicas pediátricas masculinas no Estado do Piauí de 2019 a 2024. **Métodos:** Estudo epidemiológico, de caráter observacional e quantitativo, do tipo ecológico, utilizando dados do Sistema de Informações Hospitalares referentes a todas as urgências masculinas da população pediátrica do estado do Piauí entre zero a 19 anos. Investigaram-se as seguintes variáveis: faixa etária, sexo, ano de internação, município de internação, macrorregiões de saúde, número de internações e número de óbitos. **Resultados:** Observa-se um comportamento oscilante no número total de internações, distribuídas entre as 11 regiões de saúde do estado, com uma queda significativa entre 2019 e 2020, possivelmente associada ao impacto da pandemia da COVID-19. A maior prevalência de internações registrada foi entre crianças menores de um ano, liderando os índices em todo o período analisado. **Conclusão:** Embora apresentem um padrão oscilante do número de internações ao longo do período analisado, as urgências pediátricas se estabelecem como um importante indicador epidemiológico para a saúde pública no Piauí, demandando estratégias contínuas de prevenção e manejo de agravos.

Palavras-chave: Urgências; Pediatria; Perfil Epidemiológico; Internação Hospitalar; Saúde Pública.



INTRODUCTION

According to the Aurélio dictionary, urgency is defined as something that needs to be done quickly or that is imminent and may be associated with both acute and chronic conditions ⁽¹⁾. From this perspective, the emergency service aims to provide personalized care in complex health situations ⁽²⁾.

However, due to their unpredictability, emergency services face challenges that directly affect the quality of patient reception ⁽³⁾. As stated by Doll *et al.* ⁽⁴⁾ structural barriers such as insufficient supplies, medications, tests, and funding compromise the resolution of less complex cases. This situation directly contributes to the overload and saturation of emergency and urgent care services.

In this same perspective, the pediatric population gains prominence in emergency services, as they express their conditions more subtly than adults. Clinical management therefore becomes more complex, favoring inaccurate or delayed diagnoses and compromising therapeutic conduct and prognosis ⁽⁵⁾. In this context, care for the pediatric public requires specific attention, considering that the Ministry of Health classifies pediatric patients as children from zero to 10 years of age and adolescents from 10 to 19 years of age ⁽⁶⁾.

Given the epidemiological indicators summarized and analyzed in literature reviews ^(5,7), an increase in the demand for emergency services is observed, including for cases that could be resolved in Primary Care, especially among young children whose immune systems

are still developing. In such cases, fever is one of the main symptoms that lead parents to seek care, due to concerns about severity and possible complications ⁽⁸⁾.

According to the Mortality Information System (SIM), in 2013, 75,685 deaths were recorded among children and adolescents aged zero to 19 years, of which 28.88% were due to external causes, with the highest incidence among boys, especially due to accidents ⁽⁹⁾. Meanwhile, in developed countries such as France, the profile of pediatric emergencies in 2022 was dominated by infectious respiratory diseases.

Filócomo *et al.* ⁽¹⁰⁾ identified that accidents accounted for 12.1% of pediatric visits in a public hospital in the Southeast region, with the highest frequency among children aged 10 to 13 years. Among children aged one to four years, foreign body ingestion, intoxications, and burns were the most prominent occurrences. In this context, studies indicate that boys are more vulnerable to injuries, influenced by sociocultural factors ⁽¹¹⁾.

Factors such as income, education, and geographic location directly influence access to healthcare, highlighting the urgency of more equitable and decentralized public policies ⁽¹²⁾. Addressing these inequalities is essential to ensuring equity in care and improving the health conditions of children and adolescents in vulnerable situations.

In pediatric emergency care, reception must follow triage protocols carried out by trained nurses, who consider not only technical



aspects but also a humanized approach⁽¹³⁻¹⁴⁾. In this context, the nurse, often the child's first point of contact with the service, also provides support to family members, promoting comprehensive care⁽¹⁵⁾. Thus, the aim of this study was to analyze the epidemiological profile of male pediatric clinical emergencies in the state of Piauí from 2019 to 2024.

METHODS

This is an epidemiological, quantitative, ecological study. It used secondary hospital morbidity data from the Hospital Information System of the Unified Health System (SIH/SUS), extracted from the website of the Department of Informatics of the Unified Health System (DATASUS), with a specific focus on emergency-related hospital admissions among male individuals aged zero to 19 years. The period analyzed covers the years 2019 to 2024 and includes all municipalities in the state of Piauí, organized by Health Regions and Development Territories (DT).

The data were organized in a tabular database containing the annual number of hospitalizations by municipality, enabling temporal and territorial comparative analysis of the epidemiological profile. For the purpose of spatializing the information and identifying geographic patterns, a georeferenced vector layer containing the territorial boundaries of the Development Territories (DTs) of Piauí was used.

Regarding the variables, the following were investigated: age group, sex, year of

hospitalization, municipality of hospitalization, health region, number of hospitalizations, and number of deaths. The data were organized in a tabular database containing the annual number of hospitalizations by municipality, allowing for temporal and territorial comparative analysis of the epidemiological profile. For the purpose of spatializing the information and identifying geographic patterns, a georeferenced vector layer containing the territorial boundaries of the Development Territories (DTs) of Piauí was used.

The construction of the thematic map was carried out using QGIS® software, adopting categorized symbology by year of occurrence. Each annual category received a distinct color scheme, allowing the visualization of the temporal evolution of emergency hospitalizations. Additionally, the total number of cases was included in the respective territories, facilitating a direct interpretation of the epidemiological burden by location.

Regarding the graphical representation, the colors on the map vary according to the values recorded each year and must be interpreted exclusively within the context of that specific year. In other words, the intensity of the color reflects the comparison among territories within the same period, not across different years. For example, if the Entre Rios Development Territory presented the highest number of hospitalizations in 2019, it will be represented with the darkest color for that year. If it continues to lead in 2024, even with a lower absolute number, the dark shade will be



maintained, respecting the logic of intra-annual comparison.

This methodological approach contributed to the identification of trends, spatial patterns, and variations in the profile of hospital morbidity among the state's territories, enabling a more precise and contextualized epidemiological analysis, which is essential for health planning and the strategic allocation of resources.

Since the information in this study was aggregated and does not allow the identification of the individuals comprising the study population, submission to a Research Ethics Committee was not required. However, it is emphasized that Resolution No. 466/12 of the National Health Council will be respected.

RESULTS

Table 01 presents relevant data on hospital morbidity in public health services. Over the six years analyzed, 101,198 hospitalizations were recorded, distributed among the state's 11 health regions. A fluctuating pattern in the total number of hospitalizations can be observed, with a significant decrease between 2019 (18,376) and 2020 (12,916), possibly associated with the impact of the COVID-19 pandemic on the demand for and access to hospital services. Beginning in 2021, the numbers progressively increased, reaching a peak in 2023 (19,098), followed by slight stability in 2024 (19,080).

Table 01 – Distribution of emergency hospitalizations in the Unified Health System among male children and adolescents in the Health Regions of the state of Piauí from 2019 to 2024.

Health Region/Municipality	2019	2020	2021	2022	2023	2024	Total
22001 Carnaubais	932	387	317	235	363	327	2561
SÃO MIGUEL DO TAPUIO	33	8	19	18	37	32	147
CASTELO DO PIAUÍ	99	26	20	38	34	36	253
SÃO JOÃO DA SERRA	11	3	-	-	-	-	14
CAMPO MAIOR	789	350	278	179	292	259	2147
22002 Chapada das Mangabeiras	1052	560	766	991	956	907	5232
CRISTINO CASTRO	87	96	96	128	138	110	655
PARNAGUÁ	264	172	213	265	284	217	1415
AVELINO LOPES	2	-	-	-	-	7	9
BOM JESUS	441	207	361	423	362	361	2155
CURIMATÁ	198	58	71	117	105	138	687
CORRENTE	60	27	25	58	67	74	311
22003 Cocais	1173	657	885	1304	1421	1354	6794

NOSSA SENHORA DOS	-	-	-	-	-	12	12
REMÉDIOS							
PIRACURUCA	62	10	14	20	13	8	127
BATALHA	79	33	100	184	101	28	525
LUZILÂNDIA	254	98	137	167	136	178	970
ESPERANTINA	219	133	169	242	272	313	1348
PORTO	20	16	8	30	53	83	210
BARRAS	83	38	51	141	47	-	360
PEDRO II	240	141	167	207	295	359	1409
PIRIPIRI	216	188	239	313	504	373	1833
22004 Entre Rios	9128	6939	7857	8598	9260	9767	51549
AGRICOLÂNDIA	2	-	1	10	2	2	17
ÁGUA BRANCA	61	24	37	71	99	54	346
AMARANTE	171	68	71	108	116	59	593
SÃO PEDRO DO PIAUI	10	5	1	30	51	35	132
ALTO LONGÁ	9	12	4	11	41	43	120
ALTOS	160	35	48	144	187	147	721
TERESINA	8025	6495	7317	7640	8049	8745	46271
BENEDITINOS	9	4	6	7	8	4	38
MIGUEL ALVES	228	145	100	191	287	278	1229
UNIÃO	95	24	40	35	62	86	342
REGENERAÇÃO	137	65	116	142	186	211	857
JOSÉ DE FREITAS	121	47	67	150	140	95	620
DEMerval LOBÃO	100	15	49	59	32	8	263
22005 Planície Litorânea	1695	1212	1192	1778	2291	2216	10384
PARNAÍBA	1631	1180	1123	1677	2132	2119	9862
LUÍS CORREIA	51	32	10	12	11	1	117
BURITI DOS LOPES	7	-	-	-	-	-	7
COCAL	6	-	59	89	148	96	398
22006 Serra da Capivara	856	637	596	713	726	485	4013
SÃO JOÃO DO PIAUÍ	56	39	44	63	78	108	388
SÃO RAIMUNDO NONATO	786	598	552	650	648	377	3611
CARACOL	14	-	-	-	-	-	14
22007 Tabuleiros do Alto Parnaíba	186	89	138	163	219	223	1018



URUÇUÍ	166	78	125	154	200	173	896
RIBEIRO GONÇALVES	20	11	13	9	19	50	122
22008 Vale do Canindé	342	194	208	339	365	318	1766
OEIRAS	299	179	185	287	304	262	1516
SIMPLÍCIO MENDES	43	15	23	52	61	56	250
22009 Vale do Rio Guaribas	844	664	626	955	1235	1130	5454
PICOS	475	424	386	682	955	812	3734
WALL FERRAZ	34	27	19	28	16	-	124
ALAGOINHA DO PIAUÍ	20	5	3	2	-	-	30
FRONTEIRAS	280	171	201	215	236	274	1377
IPIRANGA DO PIAUÍ	2	8	-	2	5	5	22
BOCAINA	1	9	5	4	-	10	29
SÃO JULIÃO	11	-	-	-	-	-	11
MONSENHOR HIPÓLITO	21	20	12	22	23	29	127
22010 Vale do Sambito	399	168	144	289	313	336	1649
PIMENTEIRAS	11	7	11	7	22	14	72
VALENÇA DO PIAUÍ	221	110	75	209	179	202	996
INHUMA	2	1	11	8	29	14	65
SÃO FÉLIX DO PIAUÍ	7	1	-	-	1	-	9
ELESBÃO VELOSO	149	43	47	65	76	102	482
FRANCINÓPOLIS	9	6	-	-	6	4	25
22011 Vale dos Rios Piauí e Itaueiras	1358	1158	1232	1624	1621	1684	8677
GUADALUPE	47	16	46	116	130	129	484
FLORIANO	1104	1019	1032	1244	1227	1338	6964
ITAUEIRA	18	12	4	18	41	21	114
MANOEL EMÍDIO	1	-	-	1	-	-	2
PAES LANDIM	-	-	3	6	8	4	21
CANTO DO BURITI	185	107	139	230	207	185	1053
ARRAIAL	3	4	8	9	8	7	39
22012 Chapada Vale do Rio Itaim	411	251	385	393	328	333	2101
SIMÕES	167	131	142	186	147	108	881
JAICÓS	137	59	177	131	132	170	806
PAULISTANA	107	61	66	76	49	55	414



Total 18376 12916 14346 17382 19098 19080 101198

Source: Ministry of Health – Hospital Information System of the Unified Health System (SIH/SUS).

Among the regions analyzed, Entre Rios stands out, accounting for 51,549 hospitalizations, which corresponds to more than 50% of the state total. This is mainly due to the concentration of services in Teresina, which alone recorded 46,271 hospitalizations, highlighting the central role of the capital in providing emergency hospital care for male pediatric patients in the state. This concentration may reflect both the greater availability of specialized health services and the centralization of demand originating from other municipalities.

Other regions with significant numbers include Cocaís (6,794 hospitalizations), Vale do Rio Guaribas (5,454), Chapada das Mangabeiras (5,232), and Vale dos Rios PiauÍ e Itaueiras (8,677). Together, these five regions account for approximately 77% of the hospitalizations during the period, reinforcing the unequal distribution of hospital demand among the state's regions. On the other hand, regions such as Tabuleiros do Alto ParnaÍba (1,018), Serra da

Capivara (4,013), and Vale do Sambito (1,649) recorded lower numbers of hospitalizations, which may indicate lower population density, reduced access to health services, or underreporting.

It is also possible to observe significant variations among municipalities within each region. Hub municipalities such as Picos, Floriano, ParnaÍba, Campo Maior, and Piripiri also show high values, reinforcing their importance as regional care centers. In contrast, several municipalities recorded zero or very low numbers throughout the entire period, such as São Julião, Manoel EmÍdio, Paes Landim, and Avelino Lopes, suggesting limitations in the local provision of pediatric emergency care or the displacement of patients to neighboring municipalities.

Based on Table 02, it is possible to identify important patterns in the age profile of users of the public hospital system for emergency care in the state.

Table 02 – Age group distribution of emergency hospitalizations in the Unified Health System among male children and adolescents in the Health Regions of the state of PiauÍ from 2019 to 2024.

Age Group	2019	2020	2021	2022	2023	2024
Under 1 year	5131	4064	4364	4922	5747	6541
1 to 4 years	4352	2434	3042	4149	4492	3943
5 to 9 years	3043	2076	2189	2973	3466	3214
10 to 14 years	2581	1840	2090	2517	2624	2456
15 to 19 years	3269	2502	2661	2821	2769	2926

Total	18376	12916	14346	17382	19098	19080
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Source: Ministry of Health – Hospital Information System of the Unified Health System (SIH/SUS).

During the analyzed period, it can be observed that children under one year of age accounted for the highest number of hospitalizations in all years, totaling 30,769 hospitalizations between 2019 and 2024. This age group represented approximately 30% of the total hospitalizations during the period, standing out as the most vulnerable, possibly due to immunological immaturity and greater susceptibility to infections and neonatal complications.

The second age group with the highest cumulative number of hospitalizations was children aged 1 to 4 years, with 22,412 hospitalizations, followed by the 15 to 19 years group (16,948 hospitalizations), 5 to 9 years (16,961), and 10 to 14 years (14,108). Although adolescents aged 15 to 19 years maintain a consistent average over the years, the volume is lower than that of the younger groups, indicating

a higher demand for emergency care in the early stages of childhood.

When analyzing the temporal evolution, a general decrease in hospitalizations across all age groups can be observed in 2020, which may be associated with the direct and indirect effects of the COVID-19 pandemic, including changes in healthcare-seeking behavior, postponement of non-COVID-related care, and stricter sanitary controls. From 2021 onward, the numbers began to rise again, particularly among children under 1 year of age, whose upward trend is more evident, increasing from 4,364 hospitalizations in 2021 to 6,541 in 2024, an increase of approximately 50%.

Based on Table 03, it is possible to identify the main cause groups that led to emergency hospitalizations in this population, according to the International Classification of Diseases (ICD-10).

Table 03 – Distribution of emergency hospitalizations in the Unified Health System, according to ICD-10, among male children and adolescents in the Health Regions of the state of Piauí from 2019 to 2024.

ICD-10 Chapter	2019	2020	2021	2022	2023	2024
I. Certain infectious and parasitic diseases	3819	2536	3033	3276	2764	2886
II. Neoplasms (tumors)	573	500	381	430	424	459
III. Diseases of the blood, blood-forming organs, and immune disorders	255	146	181	267	324	267
IV. Endocrine, nutritional, and metabolic diseases	253	154	168	227	204	244



V. Mental and behavioral disorders	115	71	74	80	72	36
VI. Diseases of the nervous system	247	280	284	360	398	390
VII. Diseases of the eye and adnexa	29	26	21	28	50	55
VIII. Diseases of the ear and mastoid process	24	9	16	37	58	63
		101	100	132	152	
IX. Diseases of the circulatory system	110					146
		1962	1990	4199	5524	
X. Diseases of the respiratory system	4737					4382
XI. Diseases of the digestive system	1091	829	920	998	1180	1107
XII. Diseases of the skin and subcutaneous tissue	301	243	263	376	391	427
XIII. Diseases of the musculoskeletal system and connective tissue	145	72	138	106	147	657
XIV. Diseases of the genitourinary system	488	353	440	525	514	571
XV. Pregnancy, childbirth, and the puerperium	-	-	-	-	-	4
XVI. Certain conditions originating in the perinatal period	2306	2389	2403	2555	2940	3415
XVII. Congenital malformations, deformations, and chromosomal abnormalities	195	171	206	228	237	234
XVIII. Symptoms, signs, and abnormal clinical and laboratory findings	268	174	289	278	216	198
XIX. Injuries, poisonings, and certain other consequences of external causes	3211	2710	3208	3078	3305	3398
XXI. Contacts with health services	208	190	230	199	198	141
Total	18375	12916	14345	17379	19098	19080

Source: Ministry of Health – Hospital Information System of the Unified Health System (SIH/SUS).



Throughout the analyzed period, respiratory diseases (Chapter X) stood out as the main cause of hospitalization, with 22,794 cases, representing approximately 22.5% of the total hospitalizations during the period. There was significant variation in these numbers, with a sharp decline in 2020 (1,962 cases), possibly related to social distancing measures and mask use during the pandemic, followed by a strong increase in the subsequent years, reaching a peak in 2023 with 5,524 hospitalizations. This highlights the high vulnerability of children and adolescents to respiratory diseases, especially after the relaxation of sanitary measures.

Another prominent group is that of injuries, poisonings, and certain other consequences of external causes (Chapter XIX), with 18,910 hospitalizations. These causes, predominantly associated with accidents and trauma, were the second leading reason for hospitalizations. Unlike respiratory diseases, this group showed relatively stable numbers over the years, highlighting the need for ongoing accident prevention policies during childhood and adolescence, especially in home and school environments.

Next, conditions originating in the perinatal period (Chapter XVI) rank third in volume, totaling 16,008 hospitalizations. This reflects the high rate of hospitalizations among newborns, especially during the first days of life, reaffirming the data observed in Table 02 regarding the concentration of hospitalizations among children under 1 year of age.

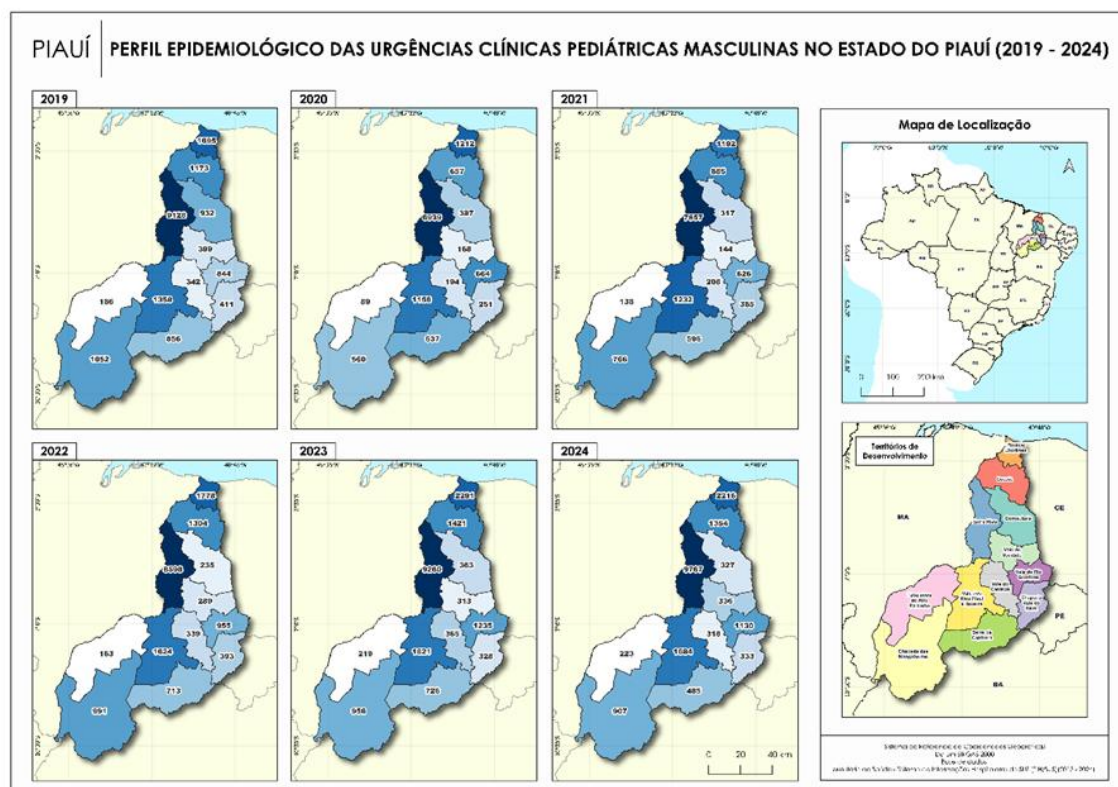
Infectious and parasitic diseases (Chapter I) also present a significant volume, with a total of 18,314 cases, peaking in 2019 (3,819) and showing a fluctuating trend in the following years. This group includes conditions such as gastroenteritis, dengue, and other endemic infections, which have a significant impact on the pediatric population in areas with poor sanitary infrastructure.

Other relevant groups, although in smaller proportions, include diseases of the digestive system (6,125 cases), diseases of the nervous system (1,959 cases), and diseases of the genitourinary system (2,891 cases). Neoplasms (Chapter II), although less frequent (2,767 cases), deserve attention due to their severity and the complexity of treatment in young age groups.

Groups with lower incidence include mental and behavioral disorders (448 hospitalizations) and diseases of the ear and mastoid process (207 hospitalizations), although these data may reflect underreporting or direct referrals to outpatient care.

Based on Figure 1, a spatial and temporal representation of the distribution of emergency hospitalizations among male children and adolescents across the various Health Regions of the state can be observed. The set of maps by year highlights both the geographic concentration and the evolution of the number of hospitalizations over the period.

Figure 1 – Distribution of emergency hospitalizations in the Unified Health System among male children and adolescents in the Health Regions of the state of Piauí from 2019 to 2024.



Source: Ministry of Health – Hospital Information System of the Unified Health System (SIH/SUS).

Over the six-year period, the Entre Rios Health Region, predominantly represented by the capital Teresina, stands out as the main hub for hospitalizations in all years analyzed. In 2019, this region recorded 9,128 hospitalizations, a figure that decreased in 2020 (6,939), following the general downward trend related to the COVID-19 pandemic, but then resumed growth, reaching 9,767 hospitalizations in 2024. This persistent concentration demonstrates the central role of the capital in the state's pediatric hospital network, suggesting both a greater availability of specialized services and a possible centralization of demand from other regions.

In addition to Entre Rios, other regions that stood out over time include Cocais, with

significant increases in recent years (from 1,132 in 2021 to 2,210 in 2024), and Vale do Rio Guaribas, which also showed continuous growth (from 1,232 in 2021 to 1,684 in 2024). These trends reinforce the importance of these regions as care hubs, possibly linked to the expansion of health infrastructure or population growth.

Regions such as Serra da Capivara, Chapada das Mangabeiras, and Vale do Canindé maintained relatively low or stable numbers throughout the period, which may reflect lower population density, underutilization of services, or even difficulties in access. In contrast, it is noted that in regions such as Planície Litorânea and Vale dos Rios Piauí e Itaueiras, the numbers

fluctuated but maintained relative stability, without sharp peaks.

The spatial representation presented in the maps is useful for highlighting regional inequalities in access to emergency hospital services, while also allowing the identification of priority areas for strengthening health policies. The geographic analysis integrated with the temporal series underscores the need to decentralize specialized care, promoting a better distribution of hospital resources in order to reduce the overload in central regions and increase the effectiveness of the health network in peripheral areas.

DISCUSSION

The results of this study highlight a fluctuating pattern in pediatric hospitalizations in Piauí, with a notable concentration of hospitalizations among children under one year of age, a predominance of external causes and perinatal conditions, as well as the centralization of care in the capital. These findings are relevant for understanding the dynamics of hospital demand and guiding strategies within the SUS.

In light of the results, there was a significant decrease in the number of hospitalizations between 2019 and 2020, likely related to the impacts of the COVID-19 pandemic on hospital demand and access. The study by Albuquerque *et al.*⁽¹⁶⁾ shows a similar pattern at the national level, with a significant and sudden reduction in hospitalizations for non-COVID-19 respiratory diseases, explained by changes in care-seeking behavior, fear of

contagion, and barriers to accessing health services.

The resumption of hospitalizations after 2020, peaking in 2023, reflects the reopening of health services, the return of school activities, and increased viral circulation. A similar pattern was observed in Ontario, Canada, where pediatric hospitalizations for acute respiratory infections showed a sharp decline in 2020 and 2021, followed by a significant increase in 2022 and 2023⁽¹⁷⁾. At the national level, Santos *et al.*⁽¹⁸⁾ also demonstrated that the social distancing measures implemented in Brazil were directly related to the reduction in cases during the analyzed period.

An investigation conducted in the state of Tocantins on the epidemiological profile of pediatric hospitalizations indicated greater exposure among males, reflected in the higher prevalence of care⁽¹⁹⁾. In Piauí, a similar pattern was observed, suggesting a national trend of increased vulnerability in this group. This finding may be associated with sociocultural factors, as girls are often perceived as more fragile and therefore receive greater care, while boys tend to be more exposed to activities and pathogens from an early age⁽²⁰⁾.

Another relevant finding was the predominance of hospitalizations among children under one year of age, identifying them as the most vulnerable group in the state of Piauí. A study conducted by Leão and Caldeira⁽²¹⁾ confirms this trend, highlighting that, over a decade, the frequency and rates of hospitalizations among children under five

decreased, but the proportion of hospitalizations in children under one year remained stable. Furthermore, the study identified that factors such as the coverage of the Family Health Strategy and improvements in social conditions act as protective factors against avoidable hospitalizations in this age group.

A national study reinforces this pattern. Silva *et al.*⁽²²⁾, in a birth cohort, found that 19% of children were hospitalized during their first year of life, a percentage considerably higher compared to later ages. Similarly, an international study confirmed this scenario: in South Africa, a cohort study showed much higher hospitalization rates during the first six months of life, particularly due to severe respiratory infections⁽²³⁾.

Regarding the causes of hospitalizations, injuries, external causes, and poisonings stood out as the second largest category. The study by Werner and Platt⁽²⁴⁾ showed that approximately 38.7% of cases involving the ingestion of harmful substances resulted in hospitalization, especially among children under one year of age. This highlights the relevance of this classification for understanding the epidemiological profile of hospitalizations.

Another aspect that stood out was the centralization of male pediatric emergency care in the state capital, identified as a regional health hub, highlighting the expansion of low- and medium-complexity health services⁽²⁵⁾. This reflects a process of urbanization, which facilitated the concentration of power and infrastructure in certain locations. This dynamic

contributed to exacerbating inequalities and hindering the realization of the SUS principles regarding universal and equitable access to health services⁽²⁶⁾.

CONCLUSIONS

The study analyzed the epidemiological profile of male pediatric clinical emergencies in the state of Piauí from 2019 to 2024. The results indicated fluctuations in the number of pediatric emergency visits over the years, with a considerable decrease between 2019 and 2020, followed by an increase between 2022 and 2023. Respiratory diseases stood out as the main cause. The highest occurrence was recorded among children under one year of age, with a predominance of males.

Among the findings, the high rate of hospitalizations among children under one year highlights the immunological vulnerability of this age group, emphasizing the need for public policies focused on preventing complications during the early years of life. In addition, the second leading cause of hospitalizations was the group of injuries, poisonings, and external causes, which remained constant throughout the period, indicating the need for more effective strategies to prevent accidents in childhood and adolescence.

The results of the present study contributed to the understanding of the dynamics of pediatric hospitalizations, making it possible to identify the main morbidity profiles, the most vulnerable age groups, and the predominant causes of hospitalizations. The analysis also



revealed inequalities in the distribution of hospitalizations across the state, highlighting the fragility of health services, especially in inland municipalities, and the greater centralization of hospital care in the capital, Teresina.

Therefore, the study is important for supporting managers and professionals in developing more effective and equitable strategies and public policies, emphasizing the importance of regionalization and the problem-solving capacity of local services. The relevance of the data can contribute significantly to the development and improvement of pediatric management and care in the state of Piauí.

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Isabelle Marcos Noronha Arrais: conception and/or planning of the study; data acquisition, analysis and/or interpretation; manuscript writing and/or critical revision; final approval of the published version.

Ligia Maria de Sousa Arrais: conception and/or planning of the study; data acquisition, analysis and/or interpretation; manuscript writing and/or critical revision; final approval of the published version.

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Conflict of Interest Statement

Nothing to declare.

Scientific Editor: Ítalo Arão Pereira Ribeiro.
Orcid: <https://orcid.org/0000-0003-0778-1447>