

Prevalence of leprosy patients notified in the municipality of São Luís, Maranhão, from 2010 to 2020

RESUMO | Objetivo: identificar a prevalência de pacientes notificados com hanseníase em São Luís, Maranhão, durante 2010-2020. Método: estudo descritivo, exploratório, retrospectivo, transversal, quantitativo, realizado no Banco de Dados público do DATASUS cuja coleta ocorreu em agosto de 2021. A amostra foi composta por 9.387 pacientes notificados com Hanseníase. Resultados: observa-se prevalência amostral em maio de 2012, sexo masculino, faixa etária entre 30-39 anos, Ensino Médio completo, pardos, casos multibacilares, avaliação de incapacidade física e de cura no estágio Grau 0, apresentaram mais que cinco lesões, baciloscopia negativa, episódios sem reação, sendo abordados como casos novos cuja forma prevalente foi a dimorfa, tendo como esquema terapêutico mais prescrito a poliquimioterapia durante 12 meses e prevalência de cura. Conclusão: houve uma prevalência dos casos de hanseníase em homens jovens com bom grau de instrução escolar. Apesar da alta prevalência de casos novos, o tratamento foi efetivo de modo a levá-los à cura.

Descritores: Hanseníase. Mycobacterium leprae. Notificação de doenças. Sistemas de informação em saúde.

ABSTRACT | Objective: to identify the prevalence of patients notified with leprosy in São Luís, Maranhão, during 2010-2020. Method: descriptive, exploratory, retrospective, cross-sectional, quantitative study, conducted in the public database of the DATASUS whose collection occurred in August 2021. The sample was composed of 9,387 patients notified with Leprosy. Results: sample prevalence was observed in May 2012, male gender, age range 30-39 years, complete High School, brown, multibacillary cases, evaluation of physical disability and cure in Grade 0 stage, presented more than five lesions, negative bacilloscopy, episodes without reaction, being addressed as new cases whose prevalent form was the dimorphic, having as the most prescribed therapeutic scheme the polychemotherapy for 12 months and prevalence of cure. Conclusion: there was a prevalence of leprosy cases in young men with good schooling. Despite the high prevalence of new cases, the treatment was effective in order to lead them to cure.

Keywords: Leprosy. Mycobacterium leprae. Notification of diseases. Health information systems.

RESUMEN | Objetivo: identificar la prevalencia de pacientes notificados con lepra en São Luís, Maranhão, durante 2010-2020. Método: estudio descriptivo, exploratorio, retrospectivo, transversal, cuantitativo, realizado en la base de datos pública del DATASUS cuya recogida ocurrió en agosto de 2021. La muestra estaba compuesta por 9.387 pacientes notificados con lepra. Resultados: se observó una prevalencia de muestra en mayo de 2012, sexo masculino, edad entre 30-39 años, educación media completa, pardos, multibacilares, valoración de incapacidad física y de cura en el estadio Grau 0, presentando más de cinco lesiones, baciloscopia negativa, episodios sin reacción, siendo abordados como casos nuevos cuya forma prevalente era la dimorfa, teniendo como esquema terapéutico más prescrito la poliquimioterapia durante 12 meses y prevalencia de cura. Conclusión: había una prevalencia de casos de lepra en hombres jóvenes con buena escolaridad. A pesar de la alta prevalencia de casos nuevos, el tratamiento fue eficaz de manera que los curará.

Palabras claves: Lepra. Mycobacterium leprae. Notificación de enfermedades. Sistemas de información en salud.

Eizequiel Araújo Sales Junior

Nursing Student at CEUMA University (UNI-CEUMA). São Luís - MA, Brazil.
ORCID: 0000-0002-0158-1535

Patrícia Fernandes do Prado

Nurse, Master in Health Sciences, Professor at the Nursing Department at the State University of Montes Claros (UNIMONTES). Montes Claros - MG, Brazil.
ORCID: 0000-0002-5433-5485

Simone Guimarães Teixeira Souto

Nurse, Master in Health Sciences, Professor at the Nursing Department at the State University of Montes Claros (UNIMONTES). Montes Claros - MG, Brazil.

ORCID: 0000-0003-0562-005X

Carolina dos Reis Alves

Nurse, PhD in Health Sciences, Professor at the Nursing Department at Faculdade Santo Agostinho (FASA). Montes Claros - MG, Brazil.
ORCID: 0000-0003-2107-6306

Ana Patrícia Fonseca Coelho Galvão

Nurse, Co-advisor, Doctoral Student in Health Sciences at the Faculty of Medical Sciences of Santa Casa de São Paulo (FCMSCSP), Professor at the Nursing Department at Ceuma University (UNICEUMA). São Luís - MA, Brazil.
ORCID: 0000-0003-3376-5678

Patrick Leonardo Nogueira da Silva

Nurse, Advisor, Master's Student at the Postgraduate Program in Primary Health Care at the State University of Montes Claros (PP-GCPS/UNIMONTES). Montes Claros - MG, Brazil.
ORCID: 0000-0003-2399-9526

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INTRODUÇÃO

Leprosy, historically known as Leprosy, is an infectious and neglected disease in which it has high transmissibility, with its potential for physical

disability (PD) and stigma associated with the high prevalence of contagions that characterize it. ⁽¹⁾ It is a zoonosis whose main etiologic agent is *Mycobacterium leprae*, having this tropism for the peripheral nerves, especially the ocular, hand and foot nerves. ⁽²⁾

In the course of the pathological evolution, the affected regions undergo a reduction of the afferent pathways in order to cause a hypoesthesia of the temperature neuroreceptors (thermoreceptors) and, gradually, there will be a decrease in baroreceptors, as well as in somesthetic sensitivity (protopathic and epicritic touch). ^(3,4) For such reasons of great PD, leprosy has been treated as a serious public health problem in several countries, including Brazil which, even developing strategies for its elimination, the reality is much further even from control. ^(5,6)

Because it is a disabling disease that generates physical, emotional and socioeconomic damage, there is a need for further study in order to understand its mechanism, as well as to intervene in the cycle leading to the cure of the clinical condition. The disease has a transmissibility by the respiratory route triggered by contact with droplets. ⁽¹⁾ Clinical and epidemiological evaluation is essential in the diagnosis of leprosy, as its classification is according to the number of skin lesions, being considered Paucibacillary (PB) when the disease presents up to five skin lesions; and Multibacillary (MB) when cases of the disease present more than five skin lesions, through which the multidrug therapy (MDT) regimen is performed. ^(1,7)

In the global context of elimination of leprosy, whose goal is less than one case for every 10 thousand inhabitants, only Brazil has not yet managed to consolidate this goal. In the world ranking of new diagnoses, it is in 2nd place, second only to India. ⁽⁸⁾ On the American continent, Brazil alone covers 90% of all new cases. Between 2012 and 2016, detection rates of new cases considered hyperendemic were recorded in states such as Mato Grosso (88.9/100,000 inhabitants), To-

cantins (69.13/100,000 inhabitants) and Maranhão (53.9/100,000 inhabitants). ^(7,8,9)

Treatment with MDT is composed of the interaction of three antimicrobials, Rifampicin, Dapsone and Clofazimine. The paucibacillary patient (PB) will take a monthly dose of Rifampicin (600mg) under the supervision of the nurse at the Basic Health Unit (UBS) and daily doses of Dapsone 100mg at home. The

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treatment lasts for six months. The multibacillary patient (MB) will take Rifampicin (600mg), Dapsone (100mg) and Clofazimine (300mg), under supervision at the UBS, and daily doses of Dapsone (100mg) and Clofazimine (50mg) at home, for 12 months. ⁽¹⁾

This begins after the positive diagnosis of leprosy, and care is provided on an outpatient basis, regardless of its operational classification, in which the provision

of adequate therapy to the patient by the public health service is mandatory, that guarantees contraceptive guidance and resources in the midst of the treatment of women with leprosy or reactional episodes even after the end of MDT, specifically those who use drugs with a teratogenic effect in compliance with Law No. 10,651, of April 2003. ^(7,10)

In this scenario, the importance of the integrated action of the multiprofessional team is highlighted, being able to develop health actions in order to combat, treat and control leprosy, holistically performing all patient follow-up in a systematized and individual way in view of the entire healing process and subsequent discharge. ⁽¹¹⁾ Nursing has a prominent role with the provision of fundamental service to the health of the population, as well as being part of the Family Health Strategy (FHS) acting directly in disease control actions. ⁽¹²⁾ The nursing consultation has a high contribution value in detecting active cases and helping patients with leprosy, contributing to health promotion and disease prevention. ⁽¹³⁾

Therefore, the objective was to identify the prevalence of reported patients with leprosy in the city of São Luís, Maranhão, during the period from 2010 to 2020.

METHOD

This is a descriptive, exploratory, retrospective, cross-sectional study with a quantitative approach. The study was carried out in the city of São Luís, Maranhão, through the Information System of Diseases and Notification (SINAN - Sistema de Informação de Agravos e Notificação). The epidemiological variables were made available through the Database of the Department of Informatics of the Unified Health System (DATASUS), Ministry of Health (MH), Secretariat of Health Surveillance (SVS - Secretaria de Vigilância à Saúde). The study population was given through publicly accessible secondary data related to the prevalence of reported leprosy patients. The study sample

consisted of 9,387 patients reported with leprosy during the period from January 2010 to December 2020.

The following eligibility criteria for participating in the study were adopted: ⁽¹⁾ being Brazilian and residing in the studied municipality; ⁽²⁾ be classified as A30, according to the International Classification of Disease No. 10 (ICD-10); ⁽³⁾ have the data notified during the stipulated period; and ⁽⁴⁾ have all information available on DATASUS. The following were excluded: ⁽¹⁾ files from patients not residing in the city of São Luís, Maranhão; ⁽²⁾ sheets with incomplete data. A self-designed form based on the notification form from the Information System on Diseases and Notifications (SINAN) of the Ministry of Health was used. Data collection was carried out with secondary data of public access available for download on the website of the Department of Informatics of the Unified Health System (DATASUS) during the 2nd semester of 2021, in August, by the responsible researcher.

A form was used as a data collection instrument containing the following study variables according to the year of notification: month of notification; output type;

sex; schooling; color/race; pregnant; age group; diagnostic operational classification; input mode; reported clinical form; notified disability assessment; assessment of incapacity to cure; skin lesions; smear; reactional episode; therapeutic scheme; number of doses (PB); number of doses (MB). Data collection was carried out at DATASUS in which the data are publicly available, via online, on the following website: <http://tabnet.datasus.gov.br/cgi/tabcgi.exe?sinanet/cnv/hanswbr.def>.

Data were stored in the statistical program Statistical Package for the Social Sciences (SPSS®), version 15.0, for later tabulation and discussion. Data analysis followed a simple non-parametric and non-probabilistic descriptive epidemiology. They were presented in tables with absolute frequencies and percentages, as well as Measures of Central Tendency (MCT), being the Weighted Arithmetic Mean (WAM) and the Standard Deviation (SD), prepared using Microsoft Excel®, version 2010. Data processing was performed using bivariate statistical analysis. This includes all methods of Descriptive Statistics that allow the analysis of each variable separately with a confidence in-

terval of 95% (CI 95, $p \leq 0.05$). Epi Info, a publicly available statistical program, was applied.

The study complied with the ethical precepts established by Resolution No. 510/2016 of the National Health Council (CNS - Conselho Nacional de Saúde), which regulates research involving human beings. Considering that the study is a research with secondary databases in the public domain, sending the research project for consideration and approval by the Research Ethics Committee (CEP - Comitê de Ética em Pesquisa) was not necessary/mandatory.

RESULTS

In the city of São Luís - MA, during a period of 10 years (2010-2020), a prevalence of the sample collected during the month of May ($n=896$; 9.54%) and in the year 2012 can be observed ($n=963$; 10.25%) as shown in Table 1.

Regarding the socioeconomic and demographic profile of the sample studied, it was observed that there was a prevalence of notifications from male patients (52.45%); aged between 30-39

Table 1 – Profile of notifications of patients with leprosy according to the month and year of notification. São Luís - MA, Brazil. (n=9,387).

Month	Year of notification											Total
	10	11	12	13	14	15	16	17	18	19	20	
01	57	47	72	55	57	77	57	70	75	74	93	734
02	58	91	87	72	79	83	63	68	87	97	88	873
03	96	77	102	67	84	76	94	89	74	71	55	885
04	57	76	67	69	61	82	76	69	80	80	17	734
05	93	98	105	88	90	97	82	85	68	74	16	896
06	49	96	55	84	64	82	70	52	70	71	33	726
07	59	54	67	87	75	74	74	70	50	75	37	722
08	66	115	96	84	75	91	71	83	81	86	39	887
09	69	74	77	89	67	66	75	70	66	67	57	777
10	96	63	83	77	88	84	58	82	90	81	47	849
11	94	66	89	87	53	57	50	67	65	69	47	744
12	46	51	63	57	59	57	59	56	55	51	06	560
Total	840	908	963	916	852	926	829	861	861	896	535	9.387

Fonte: Autoria própria, 2021.

years (19.39%); Completed high school (25.68%); browns (67.58%); and did not apply to the gestational condition (59.83%) (Table 2).

Regarding the clinical, laboratory and therapeutic profile, there was a prevalence of patients classified as multibacillary (80.07%); which the assessment of PD at diagnosis was predominantly Grade 0 (55.63%); on the other hand, the evaluation of cases of inability to cure, of the patients who were performed, predominated in the Grade 0 stage (30.87%), however, there was a great demand from patients that this variable was not filled in order to be classified as ignored/white (33.56%). The reported patients had more than five lesions (33.59%); with negative smear (42.14%); episodes without reaction (74.86%); which were approached as new cases (81.34%) whose prevalent form was borderline (60.69%), with the most prescribed therapeutic regimen MDT/MB/12 doses (79.32%), reaching cure in most cases (64.54%) (Table 3). Table 4 statistically correlates the level of significance between the variables "gender" and "age group". It is observed that the age group was not significant for the acquisition of the disease, considering the CI > 0.05. However, it shows the prevalence in male patients aged between 30 and 39 years.

The results presented address a high rate of young patients infected by the bacillus in order to affect public health. The active search for contacts and early screening of carriers of the disease support the implementation of early diagnosis, as well as treatment, in order to prevent the etiological agent from being released into the external environment and infecting another person. It should be noted that patient isolation during the first month of treatment is essential to prevent the spread of the bacillus while the carrier continues to eliminate it in the environment.

DISCUSSION

Leprosy is an infectious disease of high di-

Table 2 – Socioeconomic and demographic profile of reported leprosy patients during 2010-2020. São Luis - MA, Brazil. (n=9,387).

Variable	n	%	WAM ± SD
Gender			
Male	4.924	52,45	-
Female	4.463	47,55	-
Age group (years)			
1-4	45	0,47	2,46±1,1401
5-9	309	3,29	6,99±1,4142
10-14	527	5,61	11,99±1,4162
15-19	557	5,98	16,99±1,4161
20-29	1.483	15,79	24,49±2,8748
30-39	1.821	19,39	34,49±2,8742
40-49	1.493	15,9	44,49±2,8748
50-59	1.380	14,7	54,50±2,8733
60-69	1.043	11,11	64,48±2,8759
70-79	542	5,77	74,48±2,8800
80 e +	187	1,99	89,25±5,8188
Education			
Ignored/Blank	261	2,78	-
Illiterate	686	7,3	-
Incomplete Elementary School (1st-4th grade)	1.394	14,85	-
Complete Elementary School (1st-4th grade)	534	5,68	-
Incomplete Elementary School (5th-8th grade)	1.582	16,85	-
Complete Elementary School (5th-8th grade)	939	10,0	-
Incomplete high school (1st-3rd year)	818	8,71	-
Complete high school (1st-3rd year)	2.411	25,68	-
Incomplete Higher Education	232	2,47	-
Complete Higher Education	398	4,23	-
Does not apply	132	1,45	-
Color/Race			
Ignored/Blank	123	1,31	-
White	1.281	13,64	-
Black	1.521	16,2	-
Yellow	106	1,12	-
Brown	6.341	67,58	-
Indigenous	15	0,15	-
Pregnant			
Ignored/White	11	0,11	-
1st Quarter	07	0,07	-
2nd Quarter	12	0,12	-
3rd Quarter	11	0,11	-
Gestational age unknown	13	0,13	-

fusibility and easy transmissibility, which can affect both men and women. In this study, regarding gender, the prevalence of this disease in the city of São Luís - MA between 2010 and 2020 was in male patients (52.45%). A study carried out in the municipality of Maracanaú - CE, during the period from 2009 to 2018, converges with this study, considering that the diagnosis of leprosy was also more prevalent in males. ⁽¹⁴⁾

Regarding the age group, data from the Ministry of Health (MH) inform that in the years 2015 to 2019 in Brazil, the incidence of notifications of the disease was more frequent in individuals between 50 and 59 years old. ⁽¹⁵⁾ Thus, the data from the municipality of São Luís - MA, differ from the ministerial data, so that in this municipality in the northeast of Brazil, the disease was more prevalent in young adults, who range from 30 to 39 years of age, being, thus, more prone to the consequences of the disease as a result of early onset.

Education is a variable that impacts the initial perception of symptoms in patients in order to intervene early in the event of local or systemic changes. The lower the instructive degree, the more predisposed the patient is to acquire the disease. Also according to the MS, between 2015 and 2019 in Brazil, 42.2% of patients had incomplete elementary education ⁽¹⁵⁾ differently from the results obtained in this study where 25.68% of the individuals had completed high school.

The color/race most self-reported by the reported patients was brown (67.58%). In accordance with these results, it was found in another study carried out in the micro-region of Tucuruí - PA, from 2010 to 2014, that 61.1% of all individuals reported with leprosy were brown. ⁽¹⁶⁾ As for the operational classification, there is a superiority among multibacillary (MB) cases, indicating a percentage of 80.07%. On the other hand, another study with data from the municipality of Florianópolis - PI, from 2009 to 2013, indicates that 55.93% were paucibacillary (PB) pa-

No	3.721	39,63	-
Does not apply	5.612	59,83	-

Source: The authors, 2021.

Table 3 – Clinical, laboratory and therapeutic profile of reported leprosy patients during 2010-2020. São Luís - MA, Brazil. (n=9.387).

Variables	n	%
Operational classification (diagnosis)		
Ignored / Blank	01	0,02
PB	1.869	19,91
MB	7.517	80,07
Assessment of the degree of PD at diagnosis		
Ignored/Blank	41	0,43
Grade 0	5.222	55,63
Grade 1	2.724	29,01
Grade 2	917	9,76
Not rated	483	5,17
Assessment of the inability to heal		
Ignored/Blank	3.151	33,56
Grade 0	2.898	30,87
Grade 1	1.031	10,98
Grade 2	345	3,67
Not rated	1.962	20,92
Skin lesions		
Doesn't know	999	10,64
Single lesion	2.817	30,0
2-5 lesions	2.417	25,74
> 5 lesions	3.154	33,59
Bacilloscopy		
Ignored/Blank	242	2,59
Positive	1.995	21,25
Negative	3.956	42,14
Not performed	3.194	34,02
Reactional Episode		
Not filled	721	7,68
Reaction type 1	1.265	13,47
Reaction type 2	210	2,23
Reaction type 1 and 2	166	1,76
No reaction	7.025	74,86
Input mode		
Ignored/Blank	01	0,01
New case	7.636	81,34
Transfer from the same municipality	255	2,71
Transfer from another municipality (same state)	64	0,68

tients. ⁽¹⁷⁾ More than half of all diagnosed cases (55.63%) were assessed as grade 0 for PD. Corroborating these results, there is the municipality of Maracanaú - CE, which likewise had grade 0 for PD. ⁽¹⁴⁾

The patients reported in São Luís - MA, had more than five skin lesions (33.59%) in view of all the reported cases, as well as the progression of the disease in the patient. In disagreement with these percentages, in the city of Floriano - PI, the patients presented, at most, two skin lesions ⁽¹⁷⁾, which can be attributed to the early discovery and intervention of the disease in the patient, increasing the quality of life and the chances of cure. New cases are the most prevalent mode of entry of the disease in the capital of Maranhão (81.34%), in order to converge with the clinical findings of studies carried out in the municipalities of Floriano - PI ⁽¹⁷⁾ and Maracanaú - CE. ⁽¹⁴⁾

As for the clinical form of leprosy most reported in São Luís - MA, there was an excess of cases diagnosed as borderline (60.69%) of the total sample, in line with the clinical findings of another scientific study carried out in the State of Alagoas, during 2014 to 2016, whose prevalence was of patients infected with Dimorphous leprosy. ⁽¹⁸⁾ In contrast, in the study by Maricá - RJ, there was a prevalence of the Virchowian form. ⁽¹⁹⁾ The most used therapeutic regimen was treatment with MDT/MB for 12 months (79.32%), in line with this result, the study in the microregion of Tucuruí, PA (67.4%) similarly used the same treatment with MDT/MB. ⁽¹⁶⁾

Considering that the leprosy disease has a cure capacity, the patients reported in São Luís - MA, who underwent uninterrupted treatment with the medications recommended by the MH and completed it presented results that expressed statistical superiority in the cure rate (64.54%) of the patients who completed the treatment. Following these results in Maricá - RJ, the cure index was also prevalent. ⁽¹⁹⁾

CONCLUSION

Transfer from another state	52	0,55
Relapse	218	2,32
Other newcomers	1.161	12,39
Notified clinical form		
Ignored/Blank	09	0,09
Undetermined	502	5,34
Tuberculoid	1.393	14,83
Dimorphous	5.697	60,69
Virchowian	1.498	15,95
Not classified	288	3,1
Therapeutic scheme		
Ignored/Blank	01	0,01
MDT/PB/6 doses	1.848	16,69
MDT/MB/12 doses	7.446	79,32
Other Substitute Schemes	92	0,98
Output type		
Not filled	972	10,35
Healing	6.055	64,54
Transfer to the same municipality	557	5,93
Transfer to another municipality	897	9,55
Transfer to another state	102	1,08
Transfer to another country	08	0,08
Death	97	1,03
Abandonment	658	7,01
Diagnostic error	41	0,43

Source: The Authors, 2021. PD = Physical Disability. PB = Paucibacillary. MB = Multibacillary. MDT = Polychemotherapy.

Table 4 – Statistical analysis of the confidence index of patients notified with leprosy according to sex and age group. São Luís - MA, Brazil. (n=9,387).

Variáveis	Gender				Total		CI95%
	Male		Female				
	n	%	n	%	n	%	
Age Group (years)							
1-4	25	0,26	20	0,21	45	0,47	0,333
5-9	160	1,71	149	1,58	309	3,29	0,157
10-14	269	2,87	258	2,74	527	5,61	0,120
15-19	277	3,0	280	2,98	557	5,98	0,117
20-29	833	8,87	650	6,92	1.483	15,79	0,146
30-39	996	10,61	825	8,78	1.821	19,39	0,132
40-49	699	7,45	794	8,45	1.493	15,9	0,145
50-59	707	7,54	673	7,16	1.380	14,7	0,151
60-69	553	5,9	490	5,21	1.043	11,11	0,174
70-79	308	3,28	234	2,49	542	5,77	0,242
80 e +	97	1,04	90	0,95	187	1,99	0,833

Source: The Authors, 2021. CI = Confidence Interval.

The study design is one of the limitations in view of the difficulty in investigating low-prevalence conditions. Also, the reduced sample size due to the data coming from a public database, as well as possible underreporting or loss of data, in order to make it difficult to carry out a more in-depth analysis with a view to sampling reliability. Therefore, it is concluded that there was a prevalence of leprosy cases in young men with a good level of schooling. Despite the high prevalence of new

cases in the multibacillary forms, as well as the number of lesions, what characterizes the development of the bacillus in the body, there was no neurofunctional impairment of physical capacity, in view of the effectiveness of the multidrug therapy performed by the patients in order to lead them to a cure.

The capital of Maranhão still has expressive numbers regarding the prevalence of leprosy. Cases were observed in children under 15 years old, thus suggesting the

precocity of the target audience regarding contamination by the bacillus in order to become a source of transmission. Such data indicate the little intensification of the active search of these patients and their contacts. Therefore, measures should be taken aimed at screening and early treatment, as well as actions aimed at symptom recognition for its prevention, in addition to training health professionals in order to break the chain of transmission and evolution of the disease.

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