Evolution of Hansen's Disease in Women In Piauí: What Changed Between 2014 and 2024?

Evolução da Hanseníase em Mulheres no Piauí: O Que Mudou Entre 2014 e 2024?
Evolución de la Hanseniasis en Mujeres en Piauí: ¿Qué Cambió Entre 2014 y 2024?

RESUMO
Objetivo: Analisar a evolução dos casos de hanseníase em mulheres no Piauí entre 2014 e 2024, considerando prevalência, diagnóstico e acompanhamento. **Método:** Estudo epidemiológico descritivo, retrospectivo e quantitativo, baseado em dados secundários do Departamento de Informação e Informática do Sistema Único de Saúde. Foram avaliadas variáveis como faixa etária, macrorregião de saúde e contatos registrados. **Resultados:** Identificou-se tendência de redução nos registros e nos exames de contatos ao longo da década, com queda acentuada após 2020, possivelmente associada à pandemia do Coronavírus 2019. A maioria dos casos concentrou-se em mulheres de 40 a 59 anos, sobretudo na macrorregião Meio Norte. Observou-se subnotificação em áreas remotas e menor número de diagnósticos em mulheres em relação aos homens. **Conclusão:** A hanseníase em mulheres no Piauí ainda constitui desafio, marcado por diagnóstico tardio e barreiras de acesso. Reforça-se a necessidade de vigilância epidemiológica, busca ativa e campanhas de conscientização.
DESCRITORES: Hanseníase; Monitoramento Epidemiológico; Mulheres.

ABSTRACT
Objective: To analyze the evolution of leprosy cases in women in Piauí between 2014 and 2024, considering prevalence, diagnosis, and follow-up. **Method:** Descriptive, retrospective, and quantitative epidemiological study based on secondary data from the Information and Informatics Department of the Brazilian Unified Health System. Variables such as age group, health macro-region, and registered contacts were evaluated. **Results:** A decreasing trend was identified in case records and contact examinations throughout the decade, with a sharp decline after 2020, possibly associated with the Coronavirus 2019 pandemic. Most cases were concentrated in women aged 40 to 59 years, especially in the Mid-North macro-region. Underreporting was observed in remote areas and a lower number of diagnoses in women compared to men. **Conclusion:** Leprosy in women in Piauí remains a challenge, marked by late diagnosis and barriers to access. The need for epidemiological surveillance, active case finding, and awareness campaigns is reinforced.
DESCRIPTORS: Leprosy; Epidemiological Monitoring; Women.

RESUMEN
Objetivo: Analizar la evolución de los casos de lepra en mujeres en Piauí entre 2014 y 2024, considerando prevalencia, diagnóstico y seguimiento. **Método:** Estudio epidemiológico descriptivo, retrospectivo y cuantitativo, basado en datos secundarios del Departamento de Información e Informática del Sistema Único de Salud. Se evaluaron variables como grupo etario, macrorregión de salud y contactos registrados. **Resultados:** Se identificó una tendencia a la reducción en los registros y en los exámenes de contactos a lo largo de la década, con una caída marcada después de 2020, posiblemente asociada a la pandemia de Coronavirus 2019. La mayoría de los casos se concentró en mujeres de 40 a 59 años, principalmente en la macrorregión Medio Norte. Se observó subregistro en áreas remotas y un menor número de diagnósticos en mujeres en comparación con los hombres. **Conclusión:** La lepra en mujeres en Piauí sigue constituyendo un desafío, caracterizado por el diagnóstico tardío y barreras de acceso. Se refuerza la necesidad de vigilancia epidemiológica, búsqueda activa y campañas de concientización.
DESCRIPTORES: Lepra; Monitoreo Epidemiológico; Mujeres.

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INTRODUCTION

Leprosy is a chronic, infectious, contagious, and notifiable disease that is curable with treatment and follow-up available through the Unified Health System (SUS), and investigation is mandatory throughout the national territory[1].

Caused by Mycobacterium leprae, this disease mainly affects the skin and peripheral nerves and can cause highly incapacitating neural lesions, which contributes to the stigma and discrimination faced by those affected. Despite advances in diagnosis and treatment, Brazil remains among the most endemic countries in the world, facing challenges in eradicating active transmission of the disease[2-3].

According to the Leprosy Epidemiological Bulletin released by the Ministry of Health in 2024, the disease detection rate was 9.67/100,000 inhabitants in 2022, totaling 316,182 cases in the period between 2013 and 2022. The Northeast Region of Brazil has hyperendemic rates of leprosy, with a significant number of individuals affected. Between 2018 and 2022, 48,568 new cases were registered in the region, of which 13,928 progressed to some degree of physical disability [4].

In Piauí, one of the poorest states in the country, the high rates of leprosy reinforce the need for continuous epidemiological surveillance and assistance to the population, with a view to controlling and reducing cases. The progression of leprosy can be configured as a reflection of factors related to the etiological agent, the immunological and genetic characteristics of the host, and the social and economic conditions of the individual, such as malnutrition, poverty, and migration[5].

In addition, the neural lesions caused by the bacillus have great potential to cause disability and stigmatization, directly affecting the individual's quality of life, both in the family and social environment. Early diagnosis is challenging, especially in areas with little training and low awareness of the disease. Thesimilarity to other dermatoses and the lack of widely accessible diagnostic methods contribute to underreporting and worsening of the disease. Fear of prejudice leads many patients to avoid treatment, making it difficult to control transmission and rehabilitation[1,5].

According to the Notifiable Diseases Information System (SINAN), in 2023, the assessment of the degree of physical disability in new cases of leprosy reached 86% in the state of Piauí. This data highlights the importance of early detection and continuous monitoring, since cases with physical disability, if not treated properly, can worsen the patient's condition and lead to permanent sequelae[6].

Although leprosy is more prevalent among men, women face specific challenges, such as late diagnosis and difficulties in accessing treatment, which can aggravate the progression of the disease. This reality is also observed in the state of Piauí, where there is a growing trend in both direct and indirect indicators of severity in women, such as an increase in the proportion of multibacillary cases and degrees of physical disability[6-7].

Since the degree of disability in women is often higher than in men, this may indicate that they are being diagnosed at more advanced stages of the disease, resulting in more severe physical complications[8]. According to data from the Notifiable Diseases Information System (SINAN), in 2024, 330 women were diagnosed with leprosy, while 506 men also received this diagnosis, highlighting a disparity in coping with the disease between genders[6].

Analyzing the evolution of leprosy in women in Piauí is essential to identify epidemiological patterns and assess the impact of health policies over the years. Women face specific challenges in relation to the diagnosis and treatment of the disease, influenced by social, cultural, and biological factors. The stigma associated with leprosy can affect the search for medical care, delaying the start of treatment and increasing the risk of complications[9].

Gender differences also influence how the disease manifests and is treated, with factors such as domestic workload and reduced mobility to seek treatment, especially in more remote areas. This can result in late diagnosis and, consequently, greater disability. In some cases, leprosy in women is also related to social vulnerability, where lack of information and misperceptions about the disease contribute to delayed diagnosis, worsening the condition. In the last ten years, several factors may have influenced the evolution of leprosy in women in Piauí, including changes in public policies, access to health services,and, more recently, the impacts of the COVID-19 pandemic.

Over the past ten years, several factors may have influenced the evolution of leprosy in women in Piauí, including changes in public policies, access to health services, and, more recently, the impacts of the COVID-19 pandemic. The pandemic period has brought significant challenges to the detection and monitoring of leprosy, with the prioritization of other health conditions and the consequent reduction in active case finding[10-11].

In this scenario, understanding how leprosy has evolved among women in Piauí over the years is essential to support more equitable and effective public policies for controlling the disease. Thus, the question that guides this study is: how did leprosy cases in women in the state of Piauí evolve between 2014 and 2024?

Given this, the objective of this

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study was to analyze the evolution of leprosy in women in Piauí from 2014 to 2024, highlighting changes in prevalence, diagnosis, and follow-up, in order to contribute to more effective surveillance and control strategies.

METHOD

This study is descriptive, retrospective, and quantitative in nature, focusing on the analysis of the prevalence and distribution of leprosy in women in the state of Piauí between 2014 and 2024. The research is based on secondary data extracted from the DATASUS Tabnet platform, which provides detailed information on leprosy notifications at the national and state levels, with the search restricted to the state of Piauí and segmented for females.

According to Resolution No. 466/2012 of the National Health Council (CNS), which establishes guidelines and regulatory standards for research involving human subjects, studies that use secondary data, provided that they do not allow the direct identification of individuals and come from publicly available sources, do not need to be submitted to the Research Ethics Committee (CEP). Therefore, this study did not require formal ethical approval[12].

To contextualize the data, a comparison was made between cases of leprosy in women and men, according to the data available on the platform. The analysis focused on the number of cases diagnosed in both sexes, without performing additional calculations, such as prevalence indicators. A qualitative analysis was performed to identify possible disparities in the distribution of cases between women and men, allowing us to understand the differences in the incidence of the disease in the state of Piauí.

For the analysis and presentation of the data, women were classified according to age group, with the categories: 1-9 years, 10-19 years, 20-39 years, 40-59 years, 60-79 years, and 80 years or older. In addition, variables related to the macro-regions of health residence were considered, such as Semi-Arid, Mid-North, Coastal, and Cerrados, with the aim of identifying possible geographical differences in the incidence of leprosy.

The presence of skin lesions was also analyzed, taking into account age group and year of diagnosis, given that this aspect is crucial in the clinical characterization of the disease.

The research included a comparison between reported cases and examined cases, allowing gaps in diagnosis and clinical follow-up to be identified. Reported cases refer to formal records made by health units or public health services on the identification of leprosy, usually based on initial symptoms or warning signs. These cases may be subject to underreporting due to difficulties in accessing health care, lack of resources, or late diagnosis.

On the other hand, examined cases are those confirmed through clinical and laboratory tests, where the disease is diagnosed more accurately. This differentiation between reported and examined cases allows us to observe flaws in the diagnostic process, such as the failure to recognize leprosy early or the lack of adequate follow-up, in addition to highlighting the importance of improving monitoring and intervention strategies.

The data were organized and analyzed using Excel software, with graphs and tables used to facilitate the visualization of the distribution of cases in the variables studied. For quantitative analysis, absolute and relative frequencies were calculated, providing a detailed description of the prevalence of the disease among different age groups.

The comparison between reported and examined cases enabled the evaluation of disease detection and diagnosis strategies, as well as the analysis of epidemiological trends of leprosy in the state of Piauí over the period from 2014 to 2024.

The interpretation of the results took into account epidemiological indicators of leprosy, with an emphasis on comparison with the national average, in order to contextualize the situation in Piauí within the Brazilian scenario.

RESULTS

The total number of contacts examined in women in the state of Piauí between 2014 and 2024 was 11,342. There was a general downward trend in the number of contacts examined, with significant annual variations. These variations refer to fluctuations in the number of contacts examined over the years, with peaks and troughs indicating changes in monitoring patterns and testing.

These fluctuations may be associated with changes in surveillance strategies, health policies, awareness campaigns, or variations in the population's adherence to examinations (Graph 1).

In 2014, 1,536 contacts were examined, with a progressive decrease in the following years, totaling 1,245 in 2016, representing a drop of approximately 19% compared to 2014. In 2017, there was a 30% increase (n=1,618) in the number of contacts examined compared to 2016. However, this increase did not continue over time. Between 2018 and 2019, the number of contacts examined remained relatively stable, registering 1,436 in 2018 and 1,285 in 2019, with a decrease of approximately 10% in the last year.

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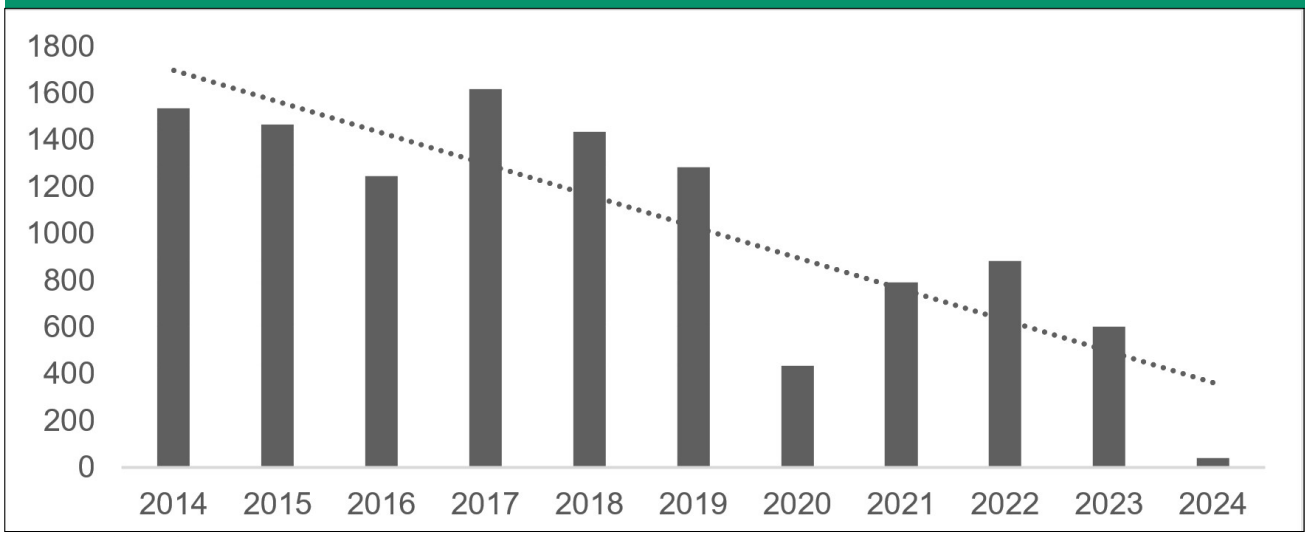
Graph 1 – Contacts examined per year diagnosed with leprosy in women in Piauí between 2014 and 2024. Piauí, Brazil.



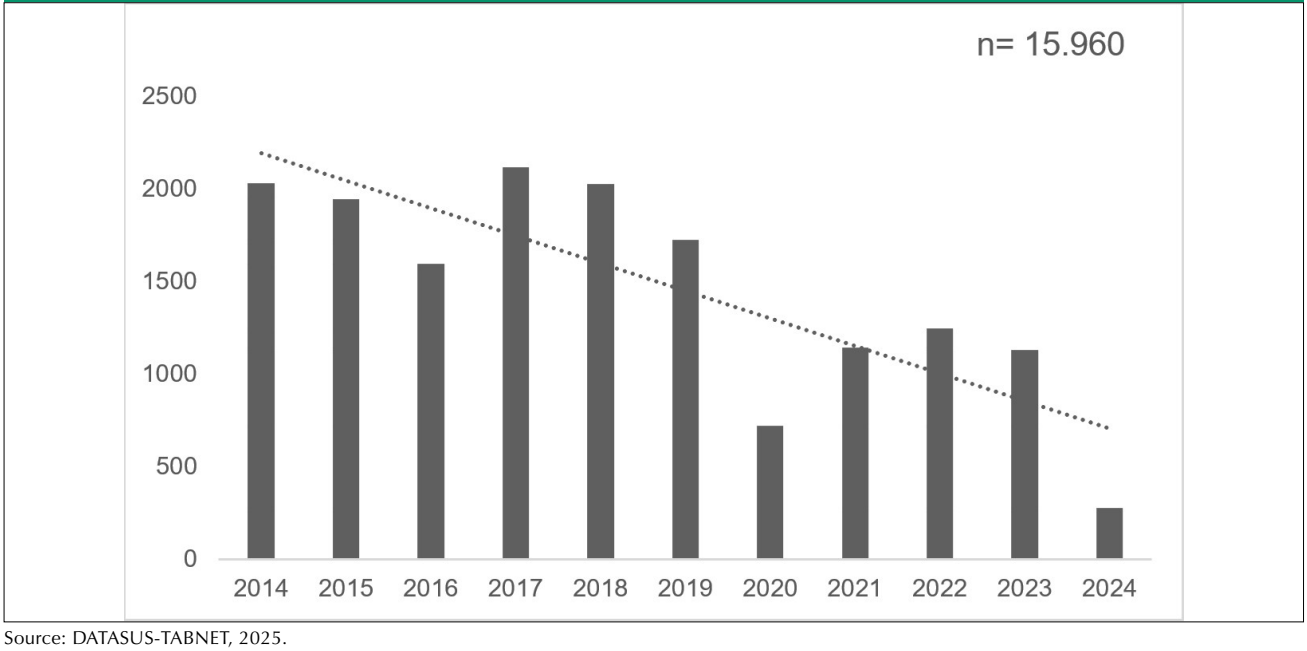
Source: DATASUS-TABNET, 2025.

Starting in 2020, with the COVID-19 pandemic, there was a significant drop in the number of contacts examined, which decreased to 435. In the following years, this downward trend continued, with 793 contacts examined in 2021, 883 in 2022, and 602 in 2023. In 2024, to date, only 41 contacts have been examined.

The records suggest a general downward trend in the number of contacts examined, with a sharp decline since 2020. Considering that leprosy is transmitted by aerosols, the imposed social isolation may have contributed to the reduction in cases.

However, the total number of contacts registered in women in Piauí between 2014 and 2024 was 15,960. The annual distribution of registered contacts fluctuated throughout the period, with notable variations between years (Graph 2).

Graph 2 – Contacts recorded per year of diagnosis of leprosy in women in Piauí between 2014 and 2024. Piauí, Brazil.



Source: DATASUS-TABNET, 2025.

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In 2014, the number of contacts registered was 2,031. This number was relatively high in the early years, remaining above 2,000 until 2018, when it registered 2,027. From 2019 onwards, there was a decrease in the number of contacts registered, with 1,727 contacts in that year. This decline accelerated in 2020, when the number of registered contacts fell to 722, likely reflecting the impact of the COVID-19 pandemic and its restrictions on access to health services.

In the following years, the number of registered contacts increased again, reaching 1,143 in 2021 and 1,245 in 2022. However, in 2023, there was a slight decrease, with 1,128 registered contacts. In 2024, to date, the number has fallen dramatically to 275, well below previous years, indicating a significant reduction in contact tracing. These data indicate a general downward trend in the number of contacts registered over the decade, with a substantial decline since 2020.

The analysis of skin lesions in women diagnosed with leprosy in Piauí between 2014 and 2024, stratified by age group, reveals an uneven distribution over the years, with a higher concentration of cases in the older age groups (Table 1).

Tabela 1. Lesões cutâneas em mulheres relacionadas à hanseníase, segundo a faixa etária e o ano de diagnóstico no Piauí entre 2014 e 2024. Piauí, Brasil, 2024.

Year of diagnosis	Age group					
	1-9 years	10-19 years	20-39 years	40-59 years	60-79 years	80 years or older
2014	67	348	944	1.299	823	293
2015	98	272	867	1.345	900	233
2016	14	152	733	1.035	708	384
2017	63	439	958	1.337	777	87
2018	200	295	1.387	1.556	1.360	148
2019	22	325	1.107	1.431	986	253
2020	21	69	571	488	441	126
2021	19	95	560	795	779	126
2022	13	211	580	1.114	1.067	57
2023	11	187	771	1.212	994	185
2024	-	7	346	385	155	3
Total	528	2.400	8.824	11.997	8.990	1.895

Source: DATASUS-TABNET, 2025.

According to Table 2, the predominant age group for skin lesions was 40 to 59 years, with a total of 11,997 cases (34.64%), followed by the 20 to 39 age group, with 8,824 cases (25.48%). These age groups accounted for most of the diagnoses, which may indicate greater exposure or longer disease progression, since leprosy is commonly diagnosed at more advanced stages in adults. The 10-19 age group also had a considerable number of cases, with 2,400 diagnoses (6.93%).

In annual terms, 2018 and 2019 showed a notable increase in the number of skin lesions, especially in the 20-39 and 40-59 age groups, with 1,387 and 1,556 cases in 2018, respectively.

In contrast, in 2020, the peak year of the COVID-19 pandemic, there was a significant drop in diagnoses, with a total of only 1,716 cases, reflecting the impact of mobility restrictions and the possible distancing of people from health services.

The age group of 60 years or older (with 1,895 cases or 5.48% of the total) presents a considerable number, although lower in comparison with the intermediate age groups. This suggests that, although leprosy is more prevalent in younger and middle-aged individuals, the disease also affects the elderly population, requiring adequate care and strategies for the treatment of this age group.

In total, 34,634 skin lesions were diagnosed in women during the study period, reflecting the magnitude of leprosy in the state and the importance of interventions focused on both the most vulnerable age groups and the monitoring of older people. The analysis of data by age group is essential for targeting specific actions for the prevention, diagnosis, and treatment of leprosy in the state of Piauí.

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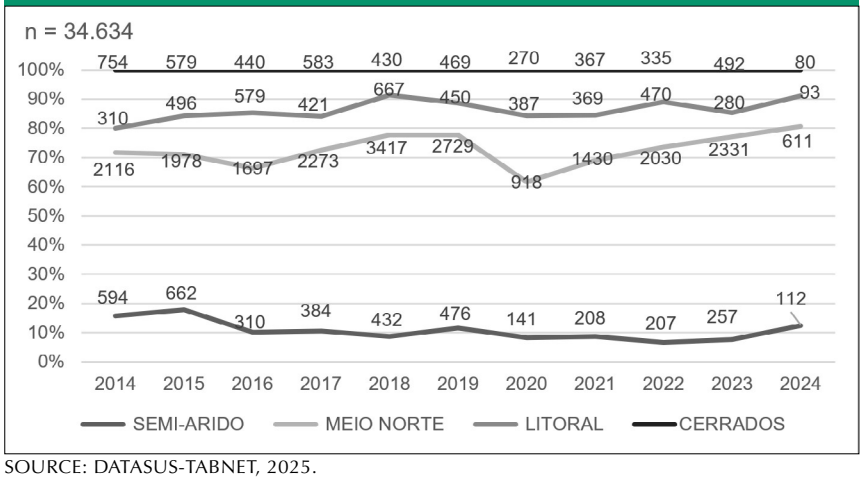
Table 2 – Absolute and relative frequency by age group in women in Piauí between 2014 and 2024. Piauí, Brazil.

Age Group	Absolute Frequency (AF)	Relative Frequency (%)
1 a 9 anos	528	1,52%
10 a 19 anos	2.400	6,93%
20 a 39 anos	8.824	25,48%
40 a 59 anos	11.997	34,64%
60 a 79 anos	8.990	25,96%
80 ou mais	1.895	5,47%

Source: DATASUS-TABNET, 2025.

The analysis of skin lesions in women diagnosed with leprosy in Piauí, stratified by year of diagnosis and macro-region of residence, reveals significant regional differences and annual variations (Graph 3).

Graph 3- Leprosy skin lesions by year of diagnosis and macro-region of residence in women in Piauí between 2014 and 2024. Piauí, Brazil.



SOURCE: DATASUS-TABNET, 2025.

The Mid-North macro-region had the highest number of skin lesions during the study period, with 21,530 cases (62.3% of the total), followed by the Coastal macro-region, with 4,522 cases (13.1%), the Cerrados macro-region, with 4,799 cases (13.9%), and the Semi-Arid macro-region, with 3,783 cases (10.9%).

It can be observed that, over the years, the Mid-North macro-region also led the numbers in almost every year, with notable peaks in 2017 (2,273 cases) and 2018 (3,417 cases).

In 2020, the peak year of the COVID-19 pandemic, all macro-regions showed a sharp drop in the number of injuries, with the Semi-Arid region having the largest proportional reduction, with only 141 cases.

From 2021 onwards, there is a trend towards recovery in diagnoses, especially in the Mid-North and Coastal macro-regions, which showed a gradual increase in cases until 2023. The Cerrados macro-region, in turn, maintained more stable numbers throughout the period, with a notable increase in 2017 (583 cases), but with a decline in 2024, totaling 80 cases (Graph 3).

The survey based on leprosy data in Piauí between 2014 and 2024, obtained from DATASUS Tabnet, revealed a total of 34,634 cases of leprosy in women during the period analyzed. This number reflects the prevalence of the disease in females, which, despite representing a significant portion, is still substantially lower than the rate observed in males, which was 71,597 cases.

DISCUSSION

Given this scenario, this study aimed to analyze the evolution of leprosy cases in women in Piauí between 2014 and 2024, investigating changes in prevalence, diagnostic strategies, and disease monitoring over the decade. Based on the analysis of available epidemiological data, a general downward trend was observed in the number of contacts examined and registered, with significant annual variations reflecting changes in surveillance patterns and access to health services.

Leprosy remains a significant challenge for public health in Brazil, and the data from this study reinforce the complexity of its epidemiological surveillance, especially among women in the state of Piauí. The reduction in the number of contacts examined and registered over the period analyzed suggests a possible decline in the effectiveness of screening and diagnostic strategies, potentially aggravated by the effects of the COVID-19 pandemic[10].

Analysis of the contacts examined revealed a sharp decline starting in 2020, reaching its lowest number in 2024. This finding highlights the impact of the pandemic on the surveillance of infectious diseases, including leprosy, due to the prioritization of the response to COVID-19 and restrictions on movement. The reduction in contact examinations may have contributed to late diagnosis and, consequently, to a possible increase in silent transmission

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of the disease[11].

In addition, the reduction in the number of contacts registered after 2019 suggests persistent challenges in identifying and monitoring exposed individuals. Leprosy is a notifiable disease and, according to the World Health Organization (WHO), contact tracing is one of the key strategies for its control. The decrease in these records may indicate failures in the continuity of surveillance policies and in the adherence of health units to the active search protocol.

Analysis by age group highlights that most cases occurred between 40 and 59 years of age, followed by the 20 to 39 age group. This age distribution reinforces the existing literature, which points to the greater susceptibility of adults to developing leprosy after long incubation periods.(8)However, the diagnosis of cases in children and adolescents, albeit to a lesser extent, is indicative of the continued active transmission of the disease, as pointed out by recent epidemiological studies[14].

The geographic distribution of skin lesions revealed that the Mid-North Macroregion accounted for most cases. This pattern may be related to population density and greater availability of health services in the region. However, the identification of cases in the Semi-Arid Macroregion raises a red flag, as it indicates that leprosy persists in areas that are difficult to access, where geographical and socioeconomic barriers can hinder early diagnosis and adequate treatment[15].

Another relevant finding is the discrepancy in cases between the sexes, with a significantly lower prevalence among women. This phenomenon has already been described in the literature and may be related to multiple factors, including differences in immune response, exposure patterns, and social barriers to access to health services. Studies suggest that women may face greater stigma associated with the disease, which can delay seeking care and timely diagnosis[7,15].

Given these findings, it is essential to strengthen leprosy surveillance and control actions in Piauí, with a focus on active case finding and expanding access to diagnosis for the most vulnerable groups, such as women and populations in rural areas. In addition, health education and stigma reduction strategies are essential to ensure that people affected by leprosy seek treatment early, minimizing complications and interrupting the chain of transmission.

The drop in registrations after the pandemic highlights the need for investments in public health policies to recover losses in epidemiological surveillance. Hybrid care models, using telemedicine and artificial intelligence, have proven effective in maintaining the monitoring of neglected diseases and may be an alternative for contact tracing and monitoring in remote areas[15-16].

Therefore, the results of this study reinforce the need for intersectoral and decentralized actions to combat leprosy, ensuring that women have equal access to diagnosis and treatment, and that epidemiological surveillance is improved to identify new cases early, especially in regions that are difficult to access.

This study had some limitations that should be considered when interpreting the results. First, a time frame of the last 10 years was used, based on data available in the Ministry of Health's DATASUS-TABNET system. However, the lack of complete records in some databases may have impacted the analysis, since incomplete or missing information in certain regions may have compromised the representativeness of the data.

In addition, the reliability of the data used may have been compromised by underdiagnosis or difficulties in collecting information, especially in municipalities in Piauí with limited access to health services and adequate infrastructure for data recording. These factors may have influenced the accuracy of the information and, consequently, the results obtained.

CONCLUSION

The research revealed a reduction in contact examinations and leprosy registrations in women in Piauí between 2014 and 2024, especially after the COVID-19 pandemic. This decline may be related to the prioritization of other health demands, the overload of the system, and social barriers that hinder access to diagnosis and treatment.

Analysis by age group showed that most cases occurred between 40 and 59 years of age, followed by the 20 to 39 age group, highlighting the importance of early detection. Geographically, the Mid-North macro-region had the highest number of diagnoses, while more remote regions had lower numbers, suggesting underreporting and difficulties in access.

The lower incidence of leprosy among women compared to men may be related to a combination of biological, cultural, and social factors. In addition, the stigma associated with the disease and the lack of information are still major obstacles, delaying the search for treatment and making it difficult to adhere to it. These elements reinforce the urgency of educational campaigns that promote awareness, demystify the disease, and encourage early care seeking.

In view of this, it is urgent to strengthen public policies for epidemiological surveillance, focusing on active screening, expanding access and decentralizing services, in addition to the continuous training of professionals and the use of technologies for remote monitoring.

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