

## CHALLENGES IN LEPROSY CONTROL ACTIONS IN BRAZILIAN BASIC CARE

Desafios nas ações de controle da hanseníase na atenção básica brasileira

Desafíos en las acciones de control de la lepra en la atención básica brasileña

Larissa Genuíno Carneiro Martini<sup>1</sup>, Aisha Sthefany Silva de Meneses<sup>2</sup>, João Mário Pessoa Júnior<sup>3</sup>, Emanuella de Castro Marcolino<sup>4</sup>, Ana Elisa Pereira Chaves<sup>5</sup>, Francisco de Sales Clementino<sup>6</sup>

### How to cite this article:

Martini LGC, Meneses ASS, Pessoa Jr. JM, Marcolino EC, Chaves AEP, Clementino FS. Challenges in leprosy control actions in brazilian basic care. 2021 jan/dez; 13:1548-1553. DOI: <http://dx.doi.org/0.9789/2175-5361.rpcfo.v13.10441>.

### ABSTRACT

**Objective:** to analyze leprosy control actions in Primary Care in Brazil, based on the external evaluation of the Program for Improving Access and Quality of Primary Care (PMAQ-AB). **Method:** cross-sectional study with a quantitative approach carried out based on secondary data collected from the PMAQ-AB professional teams, 2nd cycle. **Results:** the Midwest region with the highest percentage of teams with registered cases of leprosy (71.20%), being the one that most diagnoses new cases (90.2%); most teams refer to the existence of the notification form (85,9%) and follow up on users' treatment (95,2%); the Southeast appears as the region that does the least active search for treatment absentees (83%); as for home surveillance, most of the professionals interviewed claim to do it (94,8%). **Conclusion:** the need to improve the work of the teams to provide comprehensive care to people with leprosy is reinforced.

**Descriptors:** Leprosy; Primary health care; Quality of health care.

- 1 Undergraduate Nursing student at the Federal University of Campina Grande. Campina Grande, Paraíba, Brazil.
- 2 Nurse, Specialist in Family Health, Multiprofessional Residency Program in Family and Community Health (PMJP/FCM/UFPB). Campina Grande, Paraíba, Brazil.
- 3 PhD, Professor at the Center of Biological and Health Sciences, Department of Health Sciences, Federal Rural University of the Semi-arid. Mossoró, Rio Grande do Norte, Brazil.
- 4 PhD, Professor at Unifacisa University Center. Campina Grande, Paraíba, Brazil.
- 5 PhD, Professor at Biological and Health Sciences Center, Nursing Academic Unit, Federal University of Campina Grande. Campina Grande, Paraíba, Brazil.
- 6 PhD, Professor of the Center for Biological Sciences and Health, Nursing Academic Unit, Federal University of Campina Grande, Paraíba, Brazil. Leader of the Study and Research Group on Health Services Policies and Management (GEPPGESS), CNPQ.

## RESUMO

**Objetivo:** analisar as ações de controle da hanseníase na Atenção Básica no Brasil, a partir da avaliação externa do Programa de Melhoria do Acesso e da Qualidade da Atenção Básica (PMAQ-AB). **Método:** estudo transversal de abordagem quantitativa realizado a partir de dados secundários coletados junto as equipes de profissionais do PMAQ-AB, 2º ciclo. **Resultados:** a região Centro-Oeste com maior percentual de equipes com casos registrados de hanseníase (71,20%), sendo a que mais realiza diagnóstico de casos novos (90,2%); grande parte das equipes refere a existência da ficha de notificação (85,9%) e segue acompanhamento do tratamento dos usuários (95,2%); o Sudeste aparece como a região que menos faz busca ativa de faltosos do tratamento (83%); quanto a vigilância intradomiciliar, a maioria dos profissionais entrevistados afirma realizá-la (94,8%). **Conclusão:** reforça-se a necessidade de melhorias do trabalho das equipes para o atendimento integral às pessoas com hanseníase.

**Descritores:** Hanseníase; Atenção primária à saúde; Qualidade da assistência à saúde.

## RESUMEN

**Objetivo:** analizar las acciones de control de la lepra en Atención Primaria en Brasil, a partir de la evaluación externa del Programa de Mejoramiento del Acceso y Calidad de la Atención Primaria (PMAQ-AB). **Método:** estudio transversal con enfoque cuantitativo realizado a partir de datos secundarios recogidos de los equipos profesionales del PMAQ-AB, 2º ciclo. **Resultados:** la región Medio Oeste con mayor porcentaje de equipos con casos registrados de lepra (71,20%), siendo la que más diagnostica nuevos casos (90,2%); la mayoría de equipos se refieren a la existencia del formulario de notificación (85,9%) y seguimiento del tratamiento de los usuarios (95,2%); el Sudeste aparece como la región que realiza la búsqueda menos activa de ausentistas de tratamiento (83%); en cuanto a la vigilancia domiciliar, la mayoría de los profesionales entrevistados afirman realizarla (94,8%). **Conclusión:** se refuerza la necesidad de mejorar el trabajo de los equipos para brindar atención integral a las personas con lepra.

**Descritores:** Enfermedad de hansen; Primeros auxilios; Calidad de la asistencia sanitaria.

## INTRODUCTION

Leprosy is a chronic, infectious disease whose etiological agent is *Mycobacterium leprae*, an alcohol-acid-resistant, weakly gram-positive bacillus that infects peripheral nerves, more specifically Schwann cells.<sup>1-2</sup> Due to its chronicity and low lethality, the disease remains in endemic expansion; given its magnitude and disabling power, it has been classified as a public health problem.

Brazil remains the second most affected country by leprosy in the world and the first in the Americas.<sup>3-4</sup> From 2012 to 2016, 151,764 new cases of the disease were diagnosed, equivalent to an average detection rate of 14.97 new cases per 100,000 inhabitants.<sup>4</sup> The highest average detection rates were in the Midwest (37.27/100,000 inhab.) and North (34.26/100,000 inhab.) regions. The South (3.75 per 100,000 population) and Southeast (5.31 per 100,000 population) had the lowest rates.<sup>4-5</sup>

Considering this panorama, the Ministry of Health (MH) has adhered to the Global Plan for Leprosy Control 2016-2020 proposed by the World Health Organization (WHO)<sup>6</sup>, based on three major pillars: strengthening control and government partnership, combating leprosy and its complications, and fighting discrimination by promoting social inclusion. The strategy of decentralization of disease control actions and of comprehensive care for people with leprosy is strengthened through the work performed by the professional teams in Primary Care.<sup>7</sup>

In this complex and challenging scenario, it is understood the importance of a multifaceted look at the leprosy control actions carried out by the AB professional teams based on the integrality of care provided to people with leprosy and their families. In addition, the formulation of strategies for evaluating the work process through indicators of quality of service or even methodological approaches that point to the adoption of new decentralized practices by professionals and using participatory management is important.<sup>9-10</sup>

In 2011, the National Program for Improvement of Primary Care Access and Quality (PMAQ-AB) was established, which seeks, through the evaluation strategy, greater transparency and effectiveness of the actions developed and included leprosy among the comprehensive care needed by the Brazilian population to be evaluated.<sup>11</sup>

Although advances have been observed in the scenario with the measures adopted under the national policy, Brazilian municipalities still face difficulties in access to diagnosis and treatment of people affected by the disease, such as: failure in the coverage of the Family Health Strategy (FHS); geographical and physical barriers in urban and rural areas; irregular distribution of basic health units by coverage area; lack of training and overload of health professionals to articulate all the programs of AB, together with other obstacles of municipal management.<sup>8,12</sup>

Based on this context, the following questions are posed: What actions are developed by the Family Health Strategy Teams (FHS Teams) in the Primary Care setting for leprosy control? Thus, the study aims to analyze leprosy control actions in Primary Care in Brazil, based on the external evaluation of PMAQ-AB.

## METHODS

A cross-sectional study with a quantitative approach was conducted based on the secondary database of the Ministry of Health, obtained from the external evaluation of PMAQ-AB, 2nd cycle (2013), which included a total of 26,218 FHS Teams from the five regions of Brazil (Figure 1). In this evaluation, all teams of Basic Health Units (BHU) that participated in the adherence to PMAQ-AB were included at the time; and, the teams of the Community Health Workers Program were excluded.

**Table 1** - Distribution of regions and professional teams participating in the PMAQ-AB. 2nd Cycle.

PMAQ-AB / 2nd Cycle - Module II	
Region	No. of EqAB*
North	2.133
Northeast	10.760
Midwest	2.240
Southeast	6.577
South	4.508
National Total	26.218

Legend: EqAB: Primary Care Team.

A form was used in data collection, encompassing the variables on leprosy control actions, based on the research instrument of PMAQ-AB<sup>11</sup> - Module II, interview with a health professional from the FHS, which covered the following dimensions: record of the number of users with leprosy; diagnosis of new cases of leprosy; notification form of leprosy cases in the unit; follow-up of user's treatment; active search for treatment defaulters; surveillance of household contacts of new leprosy cases.

In data treatment, descriptive analysis of the variables selected for the study was performed through absolute

and relative frequency, presented in table form, with the support of Microsoft Excel®. Considering the use of free access secondary data, the analysis by the Research Ethics Committee was waived; however, the recommendations of Resolution 510/2016 were followed.

## RESULTS

The results obtained from the data of the 2nd Cycle of PMAQ-AB in the external evaluation phase (2013) indicate leprosy control actions developed by the FHSEs among the Brazilian regions encompassing the six selected global dimensions. Of the 26,218 professional teams evaluated, the Midwest region presents the highest percentage of teams with registered leprosy cases (71.20%) and is the one that most performs diagnosis of new cases of the disease (90.2%), with frequencies higher than the national average of registration (37.50%) and diagnosis (86%).

Most refer the existence of a notification form (85.9%) and follow up the treatment of users with leprosy (95.2%), especially in the North, Northeast and Center-West regions; the Southeast appears as the region that does less active search for those who miss treatment (83%); and, regarding the surveillance in the home, the professionals interviewed said they perform it (94.80%), Table 1.

**Table 1** - Leprosy control actions by the Basic Health Units participating in the external evaluation of PMAQ-AB, by region and national. (Brazil, 2013).

Action	North		Northeast		Mid West		Southeast		South		Brazil	
	n	%	n	%	n	%	n	%	n	%	n	%
<b>User Registration</b>												
Yes	1266	59,4	4498	41,8	1594	71,2	1314	20	1170	26	9842	37,5
No	867	40,6	6262	58,2	646	28,8	5263	80	3338	74,0	16376	62,5
Total	2133	100	10760	100	2240	100	6577	100	4508	100	26218	100
<b>Diagnosis of new cases</b>												
Yes	1742	81,7	9530	88,6	2020	90,2	5436	82,7	3816	84,6	22544	86
No	391	18,3	1230	11,4	220	9,8	1141	17,3	692	15,4	3674	14
Total	2133	100	10760	100	2240	100	6577	100	4508	100	26218	100
<b>Notification sheet</b>												
Yes	1820	85,3	9779	90,9	1998	89,2	5307	80,7	3617	80,2	22521	85,9
No	313	14,7	981	9,1	242	10,8	1270	19,3	891	19,8	3697	14,1
Total	2133	100	10760	100	2240	100	6577	100	4508	100	26218	100
<b>Treatment Follow-up</b>												
Yes	1228	97	4363	97	1544	96,9	1142	86,9	1092	93,3	9369	95,2
No	38	3	135	3	50	3,1	172	13,1	78	6,7	473	4,8
Total	1266	100	4498	100	1594	100	1314	100	1170	100	9842	100
<b>Active Search for Missing Persons</b>												
Yes	1147	90,6	4079	90,7	1502	94,2	1091	83	1087	92,9	8906	90,5
No	119	9,4	419	9,3	92	5,8	223	17	83	7,1	936	9,5
Total	1266	100	4498	100	1594	100	1314	100	1170	100	9842	100
<b>Contact surveillance</b>												
Yes	1209	95,5	4309	95,8	1537	96,4	1195	90,9	1080	92,3	9330	94,8
No	57	4,5	189	4,2	57	3,6	119	9,1	90	7,7	512	5,2
Total	1266	100	4498	100	1594	100	1314	100	1170	100	9842	100

## DISCUSSION

The findings obtained by the external evaluation of the 2nd cycle of PMAQ-AB bring to debate important challenges in the field of leprosy management and policies. One of them concerns the registration of new cases by the health professional teams. In the present study, the national average found among those who do not register new cases is relatively high (62.5%), even among regions considered endemic such as the Northeast (58.2%). The scarcity of records may be related to the misconception of some professionals about filling out notification forms, sometimes seen as a merely bureaucratic matter, with no impact on the health panorama.<sup>12-13</sup>

Studies highlight obstacles in the work process of leprosy care teams, including the production of precarious records, underreporting of cases, under-recording of activities and/or records in informal documents, with negative effects on the goals set for the elimination of leprosy or even its reduction in endemic areas.<sup>14-15</sup>

One of the factors that contribute to the persistence of leprosy as a public health problem refers to the gap between diagnosis and treatment.<sup>16</sup> Although most of the study teams confirm that they diagnose new cases of leprosy (86%), we found, among the regions, a significant percentage of those who do not diagnose, such as in the North (18.30%) and Southeast (17.30%).

It is known that the identification of leprosy cases presents some difficulties and, many times, the clinical picture is confused with several other dermatoses, and late diagnosis is a serious problem associated with the disease, significantly increasing the risk of developing sequelae.<sup>16-17</sup> Moreover, the delay in diagnosis may be associated with misdiagnosis and prejudice related to the disease, which contributes to the delay in seeking treatment and to self-medication.<sup>18-19</sup>

Souza<sup>20</sup>, in a research carried out in the state of Bahia, emphasizes that although the prevalence of leprosy has decreased over the years, the disease keeps its chain of transmission active, evidenced mainly by the tendency to increase the proportion of multibacillary cases and the coefficient of new cases with grade II physical disability at the time of diagnosis, suggesting also that the diagnosis occurs late and that there is a high hidden prevalence.

As for the existence of the Notification Form among the participating BHUs, the national average found confirms the existence (85.9%) among the teams. However, we highlight regions with percentages of absence of the form higher than the national value: North (19.80%), South (14.70%), and Southeast (19.30%). Corroborating this debate, a study in the United Kingdom showed that the absence of records interferes in the statistics, resulting in a situation different from the reality that intervenes in case management and resource allocation.<sup>21</sup>

It is understood the relevant role of the awareness of the professionals in the AB in the correct completion of the notification form of leprosy cases, being, therefore, one of the actions performed continuously among health professionals, aiming at the planning process and implementation of coping strategies to be adopted.<sup>7,12</sup>

In the follow-up of leprosy patients, the present study found that the regions with historically higher prevalence of cases, such as the Northeast, stand out with percentages above the national average; on the other hand, the Southeast region presents the highest percentage of non-monitoring (13.10%) of the patients notified. This finding reflects the persistence of barriers in the accessibility and care dynamics of services, which contributes to the loss of opportunities for adequate attention and care, resulting in dissatisfaction among users and health professionals.<sup>14,16,22-23</sup>

Research<sup>24</sup> conducted in a school in Belém, Pará in 2016 with the objective of analyzing the monitoring activities of leprosy control actions, observed a percentage of treatment abandonment corresponding to 10% of users in treatment. Treatment abandonment can be associated with the long duration of treatment, lack of knowledge about the disease, disbelief in the cure, and fear of isolation.<sup>19,22</sup>

Early diagnosis and treatment initiated immediately contribute to prevent the evolution of leprosy to major disabilities. Thus, it is possible to break the epidemiological chain of transmission of the disease<sup>17</sup> and, consequently, the social stigma and discrimination against affected persons and their families.<sup>25-26</sup>

In the scope of the action of active search for those who missed leprosy treatment, in the evaluation, the regions that had the highest percentage of follow-up also stood out, especially the Northeast (91.5%). The Southeast appears as the region that does the least active search. These findings are consistent with other studies<sup>27-28</sup> that reinforce the need for investments in training and updating professionals for the early detection of patients with the disease, since there is evidence of a failure in the quality and effectiveness of the actions performed by health professionals.

Intradomiciliary surveillance has been performed by most of the teams assessed in the national scenario; among those that do not perform surveillance actions, the Southeast (9.10%) and South (7.70%) are cited. In this regard, other evaluations demonstrated precarious household contacts, a low effectiveness in the application of the health policy focused on early diagnosis and timely treatment, as well as follow-up of people affected by leprosy.<sup>27-29</sup>

The importance of monitoring the Home Living Network (HDN) is reinforced in order to act immediately and obtain early diagnosis, avoiding further sequelae and breaking the chain of transmission of the disease.<sup>28</sup> Moreover, it is important to emphasize the need for continued surveillance of leprosy in the FHS for five years after the beginning of the assistance, since this strategy can contribute to early diagnosis, thus avoiding the accumulation of undetected cases (hidden prevalence) and also the installation of physical disabilities responsible for the stigma that accompanies the disease.<sup>29</sup>

## CONCLUSION

The analysis of leprosy control actions, from the external evaluation of PMAQ-AB in Brazil, allowed us to identify weaknesses to be overcome in the work process of the professional teams evaluated, specifically regarding the

active search, diagnosis of new cases and surveillance of household contacts. Leprosy is still considered a challenge for public health, especially in the AB, because it is configured as the ideal level of care to control and eliminate the disease. It reinforces the need for improvements in the work of the FHS teams for the comprehensive care of people with leprosy, family and community.

This study has limitations, considering the use of secondary data and the limited number of variables studied; however, the results found are relevant for obtaining a current panorama of the professional teams that follow patients with leprosy throughout the Brazilian territory.

## ACKNOWLEDGEMENTS

To the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPQ), through the Institutional Scientific Initiation Scholarship Program of the Federal University of Campina Grande (PIBIC/CNPQ-UFCG).

## REFERENCES

1. World Health Organization (WHO). Weekly epidemiological record. [Internet]. 2017 [cited 2020 jun 20]. Available from: <https://apps.who.int/iris/bitstream/handle/10665/259738/WER9251-52.pdf?sequence=1>
2. Ministério da Saúde (BR). Secretaria de Vigilância em Saúde. Guia prático sobre a hanseníase [Internet]. Brasília: Ministério da Saúde; 2017 [acesso em 20 de junho de 2020]. Disponível em: <https://portalarquivos2.saude.gov.br/images/pdf/2017/novembro/22/Guia-Pratico-de-Hanseniaze-WEB.pdf>
3. Nobre ML, Illarramendi X, Dupnik KM, Hacker MA, Nery JAC, Jerônimo SMB, et al. Multibacillary leprosy by population groups in Brazil: lessons from an observational study. *PLoS Negl Trop Dis*. [Internet]. 2017 [cited 2020 apr 10];11(2). Available from: <https://doi.org/10.1371/journal.pntd.0005364>
4. Ministério da Saúde (BR). Secretaria de Vigilância em Saúde. Boletim Epidemiológico - Caracterização da situação epidemiológica da hanseníase e diferenças por sexo, Brasil, 2012-2016 [Internet]. Brasília: Ministério da Saúde; 2018 [acesso em 23 de junho de 2020]. Disponível em: <https://portalarquivos2.saude.gov.br/images/pdf/2018/janeiro/31/2018-004-Hanseniaze-publicacao.pdf>
5. Ministério da Saúde (BR). DATASUS. Informações de Saúde. Brasília: Ministério da Saúde; 2020 [acesso em 28 jun 2020]. Disponível em: <http://www2.datasus.gov.br/DATASUS/index.php?area=0203>
6. Organização Mundial de Saúde (OMS). Estratégia Global para Hanseníase 2016-2020: Aceleração rumo a um mundo sem hanseníase [Internet]. Geneva: Organização Mundial de Saúde; 2016 [acesso em 27 de junho de 2020]. Disponível em: <https://apps.who.int/iris/bitstream/handle/10665/208824/9789290225201-pt.pdf>
7. Souza EA, Boigny RN, Ferreira AF, Alencar CH, Oliveira MLW, Ramos Jr AN. Vulnerabilidade programática no controle da hanseníase: padrões na perspectiva de gênero no Estado da Bahia, Brasil. *Cad. Saúde Pública*. [Internet]. 2018 [acesso em 28 de junho de 2020]; 34(1). Disponível em: <https://doi.org/10.1590/0102-311x00196216>
8. Araujo NM, Storer JM, Burin EA, Fontes MCF, Arcêncio RA, Pieri FM. Acesso dos doentes de hanseníase na atenção primária à saúde: potencialidades, fragilidades e desafios. *Hansen. int*. [Internet]. 2016 [acesso em 28 de junho de 2020]; 41(1/2). Disponível em: [http://hi.ils.br/detalhe\\_artigo.php?id=12781](http://hi.ils.br/detalhe_artigo.php?id=12781)
9. Ministério da Saúde (BR). Secretaria de Vigilância em Saúde. Diretrizes para vigilância, atenção e eliminação da hanseníase como problema de saúde pública [Internet]. Brasília: Ministério da Saúde; 2016 [acesso em 26 de junho de 2020]. Disponível em: <https://portalarquivos2.saude.gov.br/images/pdf/2016/fevereiro/04/diretrizes-eliminacao-hanseniaze-4fev16-web.pdf>

10. BRASIL. Portaria nº 3.125, de 7 de outubro de 2010. Aprova as Diretrizes para Vigilância, Atenção e Controle da Hanseníase. Diário Oficial da União. 2010. Disponível em: [http://bvsms.saude.gov.br/bvs/saudelegis/gm/2010/prt3125\\_07\\_10\\_2010.html](http://bvsms.saude.gov.br/bvs/saudelegis/gm/2010/prt3125_07_10_2010.html)
11. Ministério da Saúde (BR). Programa Nacional de Melhoria do Acesso e da Qualidade da Atenção Básica (PMAQ): Manual Instrutivo 3º Ciclo (2015-2016) [internet]. Brasília: Ministério da Saúde; 2015 [acesso em 27 de junho de 2020]. Disponível em: [http://189.28.128.100/dab/docs/portaldab/documentos/Manual\\_Instrutivo\\_3\\_Ciclo\\_PMAQ.pdf](http://189.28.128.100/dab/docs/portaldab/documentos/Manual_Instrutivo_3_Ciclo_PMAQ.pdf)
12. Monteiro LD, Lopes LSO, Santos PR, Rodrigues ALM, Bastos WM, Barreto JA. Tendências da hanseníase após implementação de um projeto de intervenção em uma capital da Região Norte do Brasil, 2002-2016. *Cad. Saúde Pública (Online)*. [Internet]. 2018 [acesso em 20 de junho de 2020]; 34(11). Disponível em: <https://doi.org/10.1590/0102-311x00007818>
13. Santos NP, Lírio M, Passos LAR, Dias JP, Kritski AL, Galvão-Castro B. Completeness of tuberculosis reporting forms in five Brazilian capitals with a high incidence of the disease. *J. bras. pneumol*. [Internet]. 2013 [cited 2020 jun 20]; 39(2). Available from: <https://doi.org/10.1590/S1806-37132013000200014>
14. Paz MML, Paz BL. Hanseníase e os desafios para sua erradicação: casos notificados em um município no Ceará. *Rev Interd*. [Internet]. 2018 [acesso em 24 de junho de 2020]; 11(2). Disponível em: <https://revistainterdisciplinar.uninovafapi.edu.br/index.php/revinter/article/view/1297>
15. Radigonda B, Souza RKT, Cordoni JL, Silva ANM. Avaliação do acompanhamento de pacientes adultos com hipertensão arterial e ou diabetes melito pela Estratégia Saúde da Família e identificação de fatores associados, Cambé-PR, Brasil, 2012. *Epidemiol. serv. saúde* [Internet]. 2016 [acesso em 20 de junho de 2020]; 25(1). Disponível em: <https://doi.org/10.5123/s1679-49742016000100012>
16. Carneiro DF, Silva MMB, Pinheiro M, Palmeira IP, Matos EVM, Ferreira AMR. Itinerários terapêuticos em busca do diagnóstico e tratamento da hanseníase. *Rev. baiana enferm*. [Internet] 2017 [acesso em 29 de junho de 2020]; 31(2). Disponível em: <https://portalseer.ufba.br/index.php/enfermagem/article/view/17541/14581>
17. Marega A, Pires PN, Mucufó J, Muloliwa A. Hansen's disease deformities in a high risk area in Mozambique: A case study. *Rev. Soc. Bras. Med. Trop*. [Internet] 2019 [cited 2020 jun 20]; 52. Available from: <https://doi.org/10.1590/0037-8682-0103-2018>
18. Martins PV, Iriart JAB. Itinerários terapêuticos de pacientes com diagnóstico de hanseníase em Salvador, Bahia. *Physis*. [Internet] 2014 [acesso em 26 de junho de 2020]; 24(1). Disponível em: <http://dx.doi.org/10.1590/S0103-73312014000100015>
19. Henry M, Galan N, Teasdale K, Prado R, Amar H, Rays MS et al. Factors contributing to the delay in diagnosis and continued transmission of leprosy in Brazil – an explorative, quantitative, questionnaire based study. *PLoS Neglected Tropical Disease* [Internet]. 2016 [cited 2020 jun 20]; 10(3). Available from: <https://doi.org/10.1371/journal.pntd.0004542>
20. Souza CDF. Hanseníase e determinantes sociais da saúde uma abordagem a partir de métodos quantitativos - Bahia, 2001-2015. [Doutorado em Saúde Pública] Pernambuco (Brasil): Instituto Aggeu Magalhães; 2018 [acesso em 30 de junho de 2020]. Disponível em: <https://www.arca.fiocruz.br/handle/icict/27525>
21. Fulton N, Anderson LF, Abubak I. Leprosy in England and Wales 1953–2012: surveillance and challenges in low incidence countries. *BMJ Open*. [Internet]. 2016 [cited 2020 jul 2];6(5). Available from: <http://dx.doi.org/10.1136/bmjopen-2015-010608>
22. Pelizzari VDZV, Arruda GO, Marcon SS, Fernandes. Perceptions of people with leprosy about disease and treatment. *Rev RENE*. [Internet]. 2016 [cited 2020 jul 2]; 17(4). Available from: <https://doi.org/10.15253/2175-6783.2016000400005>
23. Nascimento AKA. Características epidemiológicas da hanseníase do Estado da Bahia, 2005 – 2015. [Mestrado em Ciências Ambientais e Saúde] Goiás (Brasil): Pontifícia Universidade Católica de Goiás; 2017 [acesso em 2 de julho de 2020]. Disponível em: <http://tede2.pucgoias.edu.br:8080/handle/tede/3724>

24. Peres AS, Aquino AFV, Mira BC, Rocha HPS, Cruz KPM, Aviz PCL. Monitoramento do Programa de Controle da Hanseníase em uma unidade de saúde. *Interdisciplinary Journal of Health Education*. [Internet]. 2016 [acesso em 28 de junho de 2020];1(2). Disponível em: <https://ijhe.emnuvens.com.br/ijhe/article/view/108>
25. Alves CJM, Barreto JA, Fogagnolo L, Contin LA, Nassif PW. Avaliação do grau de incapacidade dos pacientes com diagnóstico de hanseníase em serviço de dermatologia do estado de São Paulo. *Rev. Soc. Bras. Med. Trop.* [Internet]. 2010 [acesso em 27 de junho de 2020]; 43(4). Disponível em: <http://dx.doi.org/10.1590/S0037-86822010000400025>
26. Faria, L, Calábria LK. Aspectos históricos e epidemiológicos da hanseníase em Minas Gerais. *Rev Med Saude Brasília*. [Internet] 2017 [acesso em 25 de junho de 2020]; 6(3). Disponível em: <https://portalrevistas.ucb.br/index.php/rmsbr/article/view/8394/5492>
27. Araújo, R.M.S; Tavares CM, Silva JMO, Alves RS, Santos WB, Rodrigues PLS. Análise do perfil epidemiológico da hanseníase. *Rev. enferm. UFPE on line*. [Internet]. 2017 [acesso em 28 de junho de 2020],11(9). Disponível em: <https://periodicos.ufpe.br/revistas/revistaenfermagem/article/view/234513/27722>
28. Sousa GS, Silva, RLF, Xavier MB. Hanseníase e Atenção Primária à Saúde: uma avaliação de estrutura do programa. *Saúde debate* [Internet]. 2017 [acesso em 27 de junho de 2020], 41(112). Disponível em: <http://dx.doi.org/10.1590/0103-1104201711219>
29. Lobato DC, Neves DCO, Xavier MB. Avaliação das ações da vigilância de contatos domiciliares de pacientes com hanseníase no Município de Igarapé-Açu, Estado do Pará, Brasil. *Rev Pan-Amaz Saude*. [Internet]. 2016 [acesso em 27 de junho de 2020]; 7(1). Disponível em: <http://dx.doi.org/10.5123/S2176-62232016000100006>

Received in: 24/08/2020

Required revisions: 05/03/2021

Approved in: 10/03/2021

Published in: 01/10/2021

**Corresponding author**

João Mário Pessoa Júnior

**Address:** Universidade Federal Rural do Semi-árido  
Rua Francisco Mota Bairro, 572, Presidente Costa e Silva  
Mossoró/RN, Brazil

**Zip code:** 59.625-900

**Email address:** joao.pessoa@ufersa.edu.br

**Disclaimer: The authors claim to  
have no conflict of interest.**