

## Surveillance of intradomestic contacts of leprosy cases: perspective of the client in a hyperendemic municipality

*Vigilância de contatos intradomiciliares de hanseníase: perspectiva do usuário em município hiperendêmico*  
*Vigilancia de contactos intradomiciliares de lepra: perspectiva del usuario en municipio hiper endêmico*

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### ABSTRACT

**Objective:** To characterize approach methods for intradomestic contacts (IdC) of leprosy cases resident in Northern Brazil, during 2001-2012. **Method:** A cross-sectional and descriptive study in the state of Rondônia. Included IdC of leprosy cases diagnosed/ reported in SINAN-Ministry of Health (MS), 2001-2012. A semi-structured instrument was applied to the IdCs, with six interventions: complete dermatological examination; complete neurological examination; BCG vaccination; instructions for return to the health unit; BCG guidance; and guidance to mobilize other contacts. **Results:** From a total of 459 IdCs included, failure to perform the dermatological examination was reported by 191 people (41.6%) and the neurological examination, by 252 (54.9%); 138 (30.1%) did not have BCG indicated and 122 (26.6%) did not receive guidelines; 257 (56.0%) were not advised to return for a new evaluation/follow-up and 186 (40.5%) were not asked to mobilize other contacts. **Conclusion:** Despite the favorable indicators of IdC examination coverage in the state, the evaluation process presents patterns that indicate operational quality failures.

**Descriptors:** Leprosy; Surveillance; Communicant Search; Prevention & Control; Epidemiology.

### RESUMO

**Objetivo:** Caracterizar padrões de abordagem de contatos intradomiciliares (CId) de casos de hanseníase residentes no Norte do Brasil, de 2001-2012. **Método:** Estudo transversal e descritivo no estado de Rondônia. Incluídos CId de casos de hanseníase diagnosticados/ notificados no SINAN-Ministério da Saúde (MS), 2001-2012. Aplicou-se instrumento semiestruturado aos CId verificando-se seis intervenções: exame dermatológico completo; exame neurológico completo; vacinação BCG; orientação para retorno à unidade de saúde; orientação sobre BCG e orientação para mobilizar outros contatos. **Resultados:** Foram incluídos 459 CId. A não realização do exame dermatológico foi referida por 191 pessoas (41,6%) e o neurológico, por 252 (54,9%); 138 (30,1%) não tiveram a BCG indicada e 122 (26,6%) não receberam orientações; 257 (56,0%) não foram orientados a retornar para nova avaliação/seguimento e 186 (40,5%) não foram orientados para mobilização de outros contatos. **Conclusão:** Apesar dos indicadores favoráveis de cobertura de exame de CId no estado, o processo de avaliação apresenta padrões que indicam falhas operacionais de qualidade.

**Descritores:** Hanseníase; Vigilância; Busca de Comunicante; Prevenção & Controle; Epidemiologia.

## RESUMEN

**Objetivo:** Caracterizar normas de abordaje de contactos intradomiciliarias (Cid) de casos de lepra residentes en el Norte de Brasil, de 2001-2012. **Método:** Estudio transversal y descriptivo en el estado de Rondônia. Incluidos Cid de casos de lepra diagnosticados/notificados en SINAN-Ministerio de Salud (MS), 2001-2012. Se aplicó instrumento semi estructurado a los Cid verificándose 6 intervenciones: examen dermatológico completo; examen neurológico completo; vacunación BCG; orientación para retorno a la unidad de salud; orientación sobre BCG y orientación para movilizar otros contactos. **Resultados:** Fueron incluidos 459 Cid. La no realización del examen dermatológico fue referida por 191 personas (41,6%) y el neurológico, por 252 (54,9%), 138(30,1%) no tuvieron la BCG indicada y 122 (26,6%) no recibieron orientaciones, 257 (56,0%) no fueron orientados a retornar para nueva evaluación/seguimiento y 186 (40,5%) no fueron orientados para movilización de otros contactos. **Conclusión:** A pesar de los indicadores favorables de cobertura de examen de Cid en el estado, el proceso de evaluación presenta normas que indican fallos operacionales de calidad. **Descriptores:** Lepra; Vigilancia; Busca de Comunicante; Prevención & Control; Epidemiología.

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## INTRODUCTION

Leprosy is a control neglected tropical disease with a prolonged evolution and high morbidity burden, it is considered a public health problem in various countries, including Brazil<sup>(1)</sup>. It is a clinical dermato-neurological syndrome that presents a high potential to cause physical disability by evolving to deformities, besides its social and psychological impact<sup>(2-5)</sup>.

Despite the declining trend in the detection of new cases across the world, from 299,036 cases in 2005 to 210,758 in 2015<sup>(1)</sup>, leprosy remains at levels and with trends that are still far from under control<sup>(6)</sup>. Of this total in 2015, 74% of cases occurred in Asia and 13.6% in the Americas. Brazil is the second most affected country in the world in terms of absolute numbers, with 26,395 new cases and ranking first in the Americas<sup>(1)</sup>. In 2015, the overall detection coefficient in Brazil was 14.07 cases per 100,000 inhabitants, while in children under 15 it was 4.46 cases per 100,000 inhabitants<sup>(7)</sup>. These figures indicate a country with an endemic disease that is sustained at high levels<sup>(2,8-9)</sup>.

Although Brazil has also registered a reduction in the prevalence and detection coefficients of new cases of leprosy, the North, Northeast and Central-West regions maintain hyperendemic patterns, with clusters of important dynamic transmission<sup>(9-11)</sup>. Rondônia is considered to be one of the Brazilian states with the highest levels of endemicity. In 2013, the state had a general detection coefficient of 42.24 cases per 100,000 inhabitants and in children under 15 years, a detection coefficient of 12.33 cases for 100,000 inhabitants<sup>(12)</sup>. Among the 52 municipalities in the state, the municipality of Cacoal accounts for a significant proportion of these cases, with a general detection coefficient above the state average of 45.42 cases per 100,000 inhabitants in 2013, and a detection coefficient in children under 15 years of 19.06 per 100,000 inhabitants<sup>(13)</sup>.

One of the key actions for the control of leprosy is the development of surveillance programs of intradomestic contacts, thereby guaranteeing adequate coverage and quality<sup>(8-9,14)</sup>. In fact, intradomestic contacts represent a population with a higher risk of disease than the general population due to the greater probability of exposure to the bacillus<sup>(15)</sup>. In Brazil (until February 2016, according to current guidelines at the time of the research), intradomestic contact was considered to include any person who resides or has lived with the leprosy patient in

the last five years at the time of diagnosis<sup>(6)</sup>. Starting in March 2016, with the publication of the new guidelines for surveillance, care and elimination of leprosy, the Health Ministry considers household contact to be any person who resides or has resided with the leprosy patient, irrespective of the operational classification and duration. Furthermore, the surveillance is broadened to include social contact; defined as any person who lives or has lived in close and prolonged proximity, whether as a family member or not, with the untreated patient<sup>(16)</sup>.

With a focus on early detection and reduction of new cases of leprosy, the Ministry of Health<sup>(8,14)</sup> proposed the epidemiological investigation of all intra-household contacts, including: dermato-neurological examination (DNE) of all intradomestic contacts with new cases of leprosy; a review of guidelines on the incubation period, transmission, early signs and symptoms of leprosy; and guidelines on the BCG (Bacille Calmette-Guérin) vaccine; in addition to guidelines for the application of vaccines.

Notwithstanding the importance of this set of strategic actions, it was observed that in Brazil that from 2002 to 2011 the proportion of contacts examined among the registered cases did not surpass 60%. From 2012 to 2014, there was an increase to approximately 74%<sup>(17)</sup>. This aspect is relevant, since it contributes to the unfinished agenda that the Country has to consider for effective control of the disease<sup>(18-19)</sup>.

In the state of Rondônia, it is noted that the proportion of contacts examined among those registered ranged from 72.9% in 2001 to 77.7% in 2013<sup>(12)</sup>. In turn, the municipality of Cacoal presented a 99.3% examination rate in 2013, considered to be excellent coverage in the examination of contacts<sup>(13)</sup>.

It is recognized, however, that in addition to the achievement of satisfactory coverage levels in the assessment of intradomestic contacts, it is necessary that this evaluation be developed with a focus on integrality in health care and with sufficient quality for timely diagnosis and treatment<sup>(2,19-20)</sup>. This dimension has not been systematically addressed – neither by health services nor by research on the subject. In addition, there are few studies integrating the perspective of people affected by leprosy and their contacts<sup>(4)</sup>.

## OBJECTIVE

To characterize the patterns in approaching intradomestic contacts of leprosy cases diagnosed from 2001 to 2012 in

the municipality of Cacoal, Rondônia, from the perspective of these contacts.

## METHOD

### Ethical aspects

The project was approved by the Research Ethics Committee of the Federal University of Ceará (UFC-PROPEQ). The research was conducted in collaboration with the Municipal Health Department of Cacoal. Throughout the entire process, managers and health professionals from this municipality were involved, as well as teachers and students from local universities.

### Design, place of study and period

A cross-sectional and descriptive study was carried out in the municipality of Cacoal, in the state of Rondônia, and conducted from April to October 2014. It is an integral part of the national multicenter project called *IntegraHans-Norte/Nordeste*, coordinated by the Federal University of Ceará.

Cacoal is the fifth largest municipality in the state of Rondônia, with a population of 87,226 inhabitants in 2015, a population density of 20.72 inhabitants/km<sup>2</sup> and Municipal Human Development Index in 2010 of 0.718<sup>(21)</sup>. Population coverage by family health teams progressed from: 14.0% in 1999; to 23.3% in 2001; and then to 78.3% by 2015<sup>(22)</sup>.

### Study population

Intradomestic contacts of people affected by leprosy diagnosed from 2001 to 2012 and living in the municipality of Cacoal, Rondônia. In this study, a household contact was considered to be any person who resides or has resided with the leprosy case in the last five years, at the time of diagnosis<sup>(12)</sup>, within the parameters of the Ministry of Health<sup>(6)</sup>.

Included in the study were those intra-household contacts whose reference cases (first case of leprosy reported in the same household within the study period) had previously authorized the approach by the researchers. Exclusion criteria were: intradomestic contacts not approached as a result of non-authorization by the reference cases; those who did not agree to participate in the research; and those that could not be located.

### Study protocol

Data collection was carried out from April to October 2014. In a first step, to identify cases of leprosy, the database of the Information System of Notification Diseases (Sinan), provided by the Municipal Secretary Of Health of Cacoal, selecting only the cases residing in that municipality and when the leprosy was diagnosed in the period from 2001 to 2012.

The population base was defined as 908 cases of leprosy, from which 2,726 intradomestic contacts were registered in Sinan. In order to reach the intradomestic contacts, the addresses were updated using the database of the National Registry of Users of the Unified Health System (CadSUS), also made available by the city where the study is located.

The field activities were initiated with a visit to the homes of leprosy reference cases and after reading and signing the informed consent form to approach the contacts. For this

activity, field researchers and professionals of the family health teams (including community health agents) were trained, with standardization of the work process in order to guarantee a technically appropriate ethical approach. The people affected by leprosy were asked to invite their intradomestic contacts to approach the family health unit or other defined social infrastructure located in their area of coverage.

The intradomestic contacts were interviewed by the researchers using a standardized structured instrument including variables related to gender, age, race, and questions related to the approach taken by health professionals at the time the reference leprosy case was diagnosed. The questions prioritized the recommendations in the Guidelines for Surveillance, Attention and Control of Leprosy 2010<sup>(6)</sup>.

In order to characterize the patterns for approaching the intradomestic contacts of leprosy cases, from the perspective of the user, the recommendations of Administrative Rule 3.125 of 2010<sup>(6)</sup>, in force when the research was conducted, were used as base, from which six main actions were identified in the surveillance process of intradomestic contacts: A) complete dermatological examination: inspection of the skin, in all body segments, for spots, plaques, nodules, papules and other signs and symptoms of leprosy; B) complete neurological examination: palpation of the main nerve trunks frequently affected and in the performance of tests to verify thermal, painful and tactile changes in lesions and suspicious areas; C) vaccination with BCG: individuals who were evaluated and after discarding signs and symptoms of leprosy followed the protocol stipulated by the Health Ministry regarding the application of BCG; D) orientation to return to the health unit: individuals are advised to return to the health unit for annual evaluation and/or if there were signs and symptoms of the disease; E) guidance on BCG vaccine: individuals are advised that the BCG vaccine is not a specific vaccine for immunization against leprosy; and F) orientation to seek other contacts: individuals are instructed to bring other intradomestic contacts to perform the contact exam.

### Analysis of results and statistics

For the consolidation and descriptive analysis of the data, with absolute and relative frequency composition, the programs used were Epi-Info version 7.1.5 (*Centers for Disease Control and Prevention, Atlanta, GA, USA*) and Stata version 11.2 (*Stata Corp LP, College Station, TX, USA*).

## RESULTS

A total of 313 cases of leprosy diagnosed during the study period and reported in Sinan were located and approached in the study. Regarding the intradomestic contacts of the reference cases, 2,267 were excluded due to the non-authorization to approach them or because they were residing in another municipality or had died. The final study population consisted of 459 contacts,

Of the 459 (100%) household contacts interviewed, the mean age was 31.4 years (standard deviation 20.5), 270 (59.1%) were female and the predominant race was brown, 268 (58%).

Table 1 refers to the procedures performed by the health team regarding the approach of contacts, during the period in which the reference case was in active registration. Of the 459 (100%) contacts interviewed, 191 (41.6%) reported not having the dermatological examination and 252 (54.9%) did not undergo the neurological exam. Regarding the BCG vaccine, 321 (69.9%) reported having been vaccinated. When asked if they were given guidance to return to the unit for reassessment, 257 (56.0%) said they did not receive this guidance. Regarding guidance on the indication and schedule of the BCG vaccine, 337 (73.4%) responded that they received this guidance, and 252 (54.9%) reported that they were instructed to mobilize other intradomiciliary contacts for the evaluation.

**Table 1** – Characterization of the approach to intradomiciliary contacts of leprosy cases by the health team, at the time diagnosis of the reference case was made, Cacoal, Rondônia, Brazil, 2014

Contact approach variables	n (459)	%
<b>Dermatological Exam</b>		
Yes, complete (entire body)	175	38.1
Yes, incomplete (partial body)	56	12.2
Yes, not known if complete or partial	12	2.6
Not performed	191	41.6
Not known	25	5.5
<b>Neurological Exam</b>		
Yes, complete (face and upper and lower members)	129	28.1
Yes, incomplete (face or upper or lower members)	31	6.8
Yes, not known if complete or partial	17	3.7
Not performed	252	54.9
Not known	30	6.5
<b>Received BCG</b>		
Yes, 1 dose	292	63.6
Yes, 2 doses	23	5.0
Yes, did not remember how many doses	6	1.3
Had cases of leprosy, but did not receive BCG	101	22.0
Not known	37	8.1
<b>Counseled to return for future exam</b>		
Yes, return if there are signs or symptoms	110	24.0
Yes, available after first exam	26	5.7
Yes, did not know or remember when	21	4.5
Yes, return for reevaluation scheduled	13	2.8
No	257	56.0
Not known /refused to answer	32	7.0
<b>Received advice on BCG</b>		
Yes	337	73.4
No	103	22.4
Not known /refused to answer	19	4.2
<b>Guidance to mobilize other contacts</b>		
Yes	252	54.9
No	186	40.5
Not known	21	4.6

Note: BCG - Bacilo de Calmette-Guérin vaccine.

When questioned about which health professional performed DNE, 139 (64.4%) of the 216 (100%) contacts who answered this question reported that they were evaluated by

the nurse, followed by a technician or nursing assistant 60 (37.8%), medical professional 8 (3.7%), community health agent 1 (0.5%), dental surgeon 1 (0.5%) and dental assistant 1 (0.5%). Six contacts did not remember the health professional who carried out the evaluation.

Among the intradomiciliary contacts who performed the dermatological and/or neurological examinations, 140 (54.7%) stated that the main motivating factor was family mobilization and 98 (38.3%) because they received counseling. Among those who reported difficulties, the lack of guidance was noted by 28 (58.3%) people, followed by 7 (14.6%) who reported incompatibility with the health service's schedule to perform this evaluation, as shown in Table 2.

**Table 2** – Reasons that facilitated or impeded performance of the dermato-neurological examination of intradomiciliary contacts of leprosy cases, Cacoal, Rondônia, Brazil, 2014

Factors that facilitated performing the DNE	n (256)	%
Mobilization by family	140	54.7
Was advised regarding this	98	38.3
Personal commitment to realize the exam	15	5.9
Compatibility of schedule with work obligations	2	0.8
Received a home visit	1	0.4
<b>Factors that impeded performing the DNE</b>	<b>n (48)</b>	<b>%</b>
Was not advised regarding this	28	58.3
Incompatibility of schedule with work obligations	7	14.6
Did not want to undergo exam	4	8.3
Family did not want to be involved	2	4.2
Transportation difficulties	2	4.2
Work	1	2.1
Others	4	8.3

Note: DNE – dermato-neurological exam.

## DISCUSSION

The present study, in a hyperendemic area in the state of Rondônia, reveals that, in spite of widely accepted official indicators of global coverage of the examination of intradomiciliary contacts, the evaluation process presents operational failures in terms of the quality of these actions. It reinforces, therefore, the agenda not yet completed for leprosy control in Brazil<sup>(19)</sup>, indicating that the perspective of contacts is a significant element<sup>(4)</sup>.

The high loss of intradomiciliary contacts to be approached refers in large part to the temporal question between the evaluation action and the field work. Case cohorts were inserted in the municipality of Cacoal from 2001 to 2012, with evaluation in 2014, which explains aspects related to migration and deaths<sup>(23)</sup>. In addition, the refusals from leprosy reference cases may be associated with the strong disease-related stigma<sup>(3-4,19,24)</sup>. In the study population, there was a predominance of females, with average age in the economically productive range and brown ethnicity. This profile allows a preliminary inference for a lower weight of memory bias in this research. A study addressing lost

contacts in Brazil corroborates the general aspects identified in this study<sup>(24)</sup>. Other studies reinforce the potential for follow-up of contacts, despite operational difficulties<sup>(25)</sup>.

The strategy to reduce the burden of leprosy and extent of disease control as a public health problem at the national level necessarily involves the qualified approach of leprosy case contacts<sup>(2,4,15,20,25)</sup>. Appropriate investigation of the contacts is essential, since it contributes to a decisive interference in the transmission dynamics of the disease<sup>(20)</sup>. In addition, early diagnosis enables a positive effect on the natural history of the disease, especially at primary and secondary prevention levels<sup>(2,18,20)</sup>, thereby reducing the chance of disability and deficiency, which ultimately has a strong social, economic and psychological impact<sup>(3)</sup>.

Qualified dermatoneurological examination is essential for the detection of leprosy, since the diagnosis of this disease is eminently clinical<sup>(2,8-9,14,25)</sup>. However, it was observed in this study that most of the contacts interviewed reported not having undergone such a complete evaluation. It is valid to emphasize that in order to diagnose leprosy, it is necessary to carry out a thorough examination of the skin for spots, plaques, nodules, as well as alterations of thermal, pain and/or tactile sensitivity, as well as a thorough examination of peripheral nerve trunks by means of palpation, since leprosy may present as alterations in the skin and/or altered nerve trunk<sup>(2,8,14)</sup>.

Careful realization of this test is also necessary to provide the correct indication of BCG vaccine use according to the vaccination history<sup>(2,8,14)</sup>. It has been observed that the main action developed in contact surveillance is BCG vaccination, without the complete dermatoneurological examination. Only BCG vaccine is indicated when any suspicion of leprosy is excluded; If the patient presents signs and symptoms characteristic of the disease, it should be followed up with investigation and diagnosis, rather than administer BCG<sup>(2,8,14,24-25)</sup>.

Regarding the BCG vaccine, it was also observed that most of the contacts were advised on its indication. All contacts should receive guidance regarding the fact that the BCG vaccine is not specific for leprosy<sup>(2,8,14)</sup>. In addition, it should be stressed that the fact receiving the vaccine will not prevent development of the disease itself, however it will reduce the chance of developing the most severe forms<sup>(20)</sup>. This fact reinforces the importance of longitudinal considerations in the care of households and families with expression of leprosy<sup>(2,14)</sup>.

In this last perspective, most of the respondents answered that they were not told to return to the health unit for a new evaluation. It is worth highlighting the relevance of evaluating the intrahousehold contacts annually for a period of 5 years, taking into account the incubation period of the disease, which is from 2 to 7 years, and that the intradomiciliary contacts have significant epidemiological importance, being considered at high risk and vulnerability compared to the general population<sup>(2,8,14-15,19-20)</sup>.

With an annual evaluation, the professional has the opportunity for early diagnosis of leprosy, thus avoiding deformities caused by the disease, as well as limiting the transmission dynamics<sup>(4)</sup>. The orientation to mobilize other contacts to be evaluated has been verified with most contacts, which is important, since family involvement helps in the effectiveness of contact surveillance. However, considering the relevance of

such action in addition to this passive surveillance, other more active strategies should be strengthened<sup>(14)</sup>.

Regarding the attribution of Basic Care/Family Health professionals in the control of leprosy, under the regulations of the Brazilian Ministry of Health, only the physician and the nurse are responsible for the dermatoneurological exam<sup>(2,8,14)</sup>. In this study, however, it was observed that although most of the contacts were evaluated by the nurse and a minority by doctors, it was also performed by other professionals considered not qualified to perform this function. Each health professional must recognize and assume his/her role in disease prevention, surveillance and control<sup>(2,8,14)</sup>. The lack of quality identified by the present research relative to the examination of contacts may be directly related to this scenario.

Among the factors that facilitated the examination, family involvement and the guidance given to cases of leprosy on the importance of performing the dermatoneurological exam demonstrate the importance of a more active involvement by the families of those affected by the disease. On the other hand, corroborating the previous questions, most of the contacts that reported difficulties in carrying out the examination reinforced as a main factor the lack of orientation. These data reiterate the need for more informed actions in health education, especially in basic health care<sup>(2,8,14)</sup>. One of the justifications for this aspect may be associated with the low coverage of the Family Health Strategy in the municipality of Cacoal during the period considered in this study, which was below 35% until the first half of 2014, with no more than eight family health teams<sup>(22)</sup>. However, the current scenario since mid-2014 of population coverage by the family health teams is approximately 78%<sup>(22)</sup>, with 18 teams, and may increase still further in the future. In addition to this is the great potential of the Family Health Support Unit team incorporated into the health network of the municipality, which can qualify the actions through matriculation with the Family Health Strategy.

### Limitations of the study

The present study presents limitations related, initially, to the secondary reference database with addresses for the identification of intradomiciliary contacts with the reference cases (Sinan). However, the option to insert the CadSUS database, which is more up-to-date in terms of the addresses, minimized these problems, hence valorizing the use of a population database. Another aspect to be considered refers to memory and cohort biases: the study integrated people diagnosed with an elapsed time of 2 to 13 years for the interview regarding their intradomiciliary contacts. In addition to the migration and death aspects, the refusal of reference cases to authorize the approach of their intradomiciliary contacts may be related to issues of stigma and prejudice that are still present, even in historically hyperendemic areas such as in this study.

### Contributions to the area of nursing, health or public policy

The importance of this study is underscored considering its unusual approach and the relevant questions to qualify the surveillance of contacts of leprosy in Brazil; the present study also presented data showing the fragility of the service

regarding the examination of intradomestic leprosy contacts. Therefore, new perspectives are opened for studies on the theme, beyond the scenario of the state of Rondônia.

## CONCLUSION

The process for evaluation of intradomestic contacts in the reality of the municipality of Cacoal, from the perspective of the user, presents operational failures that translate clear standards of insufficiency in the quality of these actions, even though they are fundamental for the control of leprosy. Poor quality was observed in the incomplete nature of the dermatological clinical evaluation and especially the neurological evaluation, which together are essential for the diagnosis of the disease, as well as indication for the BCG vaccine without considering the clinical evaluation. The lack of guidance by health professionals regarding the BCG vaccine, the return to the health unit and orientation to mobilize other contacts is also noteworthy.

Finally, we reiterate the importance of reinforcing intradomestic contact surveillance actions, based on the guarantee of examination coverage, but above all on the quality of

execution of this approach, which is essential for the control of leprosy as a public health problem.

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