

# Evaluation by community health agents of the attributes of Primary Health Care for fighting leprosy: a cross-sectional study\*

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## ABSTRACT

**Objective:** To evaluate whether the attributes of Primary Healthcare are present in leprosy control actions in Londrina from Community Health Workers' (CHW) perspectives. **Methods:** Observational and evaluative study. Data collection occurred between January and March 2020 in Londrina, Paraná, using the questionnaire "Primary Care Assessment Tool (PCATool) - Hansen's disease - CHW version" and a population-based census of 246 CHWs from 52 Primary Healthcare Units. The analyses used a cutoff point ( $\geq 6.6$ ), central tendency, and dispersion measures. One-way ANOVA and Tukey's post hoc tests were used to analyze differences. **Results:** The general performance towards the primary healthcare attributes were evaluated as strong (mean = 6.95 / SD = 1.08) and the essential score (mean = 7.39 / SD = 1.0). On the other hand, the derived score was evaluated as poor (mean = 6.07 / sd = 1.06). Concerning the Access attribute, the rural zone had a lower score than the urban (mean = 4.47 / SD = 1.63). **Conclusion:** The study highlights issues that can be improved, such as first contact access, catalog of services offered to leprosy patients, information provided to the community, professional training, and differences in PHC performance between urban and rural regions.

**Descriptors:** Work Performance; Primary Health Care; Community Health Workers; Communicable Disease Control; Leprosy.

## INTRODUCTION

According to the Brazilian Ministry of Health (MH)<sup>(1)</sup>, Brazil incorporated the National Strategy for Combating Leprosy 2019-2022 and the Global Strategy for Eliminating Leprosy 2016-2020 proposed by the World Health Organization<sup>(2)</sup>. Both strategies incorporate actions to control leprosy within the scope of the Health Care Network (HCN) in the three spheres of government. It is essential to highlight that Primary Healthcare (PHC) is defined as the main gateway and communication center of the RAS<sup>(2-4)</sup>. According to MH guidelines, suspected cases must be identified, treated, and linked to the PHC through the Family Health Strategy (FHS) or the Primary Healthcare Units (PHU)<sup>(5)</sup>. The Community Health Workers (CHWs) stand out as professional members of this strategy, playing a fundamental role within the FHS team. The work of these professionals consists of supporting the identification and active searching of confirmed or suspected cases and guiding the community regarding preventive measures and conducts to be taken in the face of a worsening health scenario<sup>(6)</sup>.

The PHC attributes categorized by Starfield<sup>(7)</sup> as essential (first contact access, care coordination, longitudinality, and comprehensiveness) and derivative (family orientation, community orientation, and cultural competence) are intended to quantify and qualify how and how much the leprosy control actions of the municipalities are conducted by CHWs, serving as indicators for managers. These attributes are essential for assessing the quality of care this type of health service provides.

The following research question arose from concerns about the theme: "Are the attributes of PHC included in the leprosy control actions conducted in Londrina, Paraná (PR), from the perspective of CHWs?" This research aims to provide subsidies for improving leprosy control and management actions by identifying the presence and extension of PHC attributes that can be improved, with a direct reflection on the population's quality of life.

Therefore, this study aims to evaluate whether the attributes of PHC are present in leprosy control actions in Londrina from CHWs' perspectives.

## METHOD

This is an observational and evaluative study guided by the STROBE checklist, conducted in the city of Londrina, Paraná, Brazil, the fourth most populous municipality in the South Region of the country, excluding the capitals. In 2019, the population estimate was 569,7338<sup>(7)</sup>. This municipality belongs to the epidemiological group 2.2 of the stratification carried out by the Ministry of Health, which fits in the list of municipalities that have the following characteristics: leprosy detection rate < 10 cases/100,000 inhabitants with more than 75% of cases monitored for the degree of physical disability (DPD) at diagnosis, with the presence of grade 2 DPD cases, and with less than 80% of contacts of new cases tested<sup>(1)</sup>.

Regarding the characterization of the scenario, in 2020, 52 PHUs were identified (42 – in urban areas and 10 – in rural areas), with a population estimate of PHC coverage of 323,550, corresponding to 56.7% in the municipality. Notably, the municipality has no record of a parameterized FHS team. The estimate of FHS coverage is 251,850, which currently corresponds to a coverage of 44.2% distributed among the 73 teams<sup>(8)</sup>.

A census included all (N = 295) CHWs in Londrina, Paraná. Of these 295 subjects, 246 participated in this study. There was a percentage of 16.6% losses (49 professionals) due to 16 (5.4%) being dismissed, eight (2.7%) on medical leave, eight (2.7%) refusing to participate, seven (2.3%) not being located after three attempts, seven (2.3%) on vacation, and three (1.0%) on maternity leave.

The data collection was conducted from January to March 2020, using a structured questionnaire after prior contact for scheduling according to the availability of each participant. The questionnaires were applied individually at the PHUs, where the CHWs were employed through

an interview lasting approximately 40 minutes. It is worth noting that the interviewer did not interfere with the responses. Only the domains were read to present the questionnaire to the CHWs. Three undergraduate and two graduate students, members of the Research Action Group at the State University of Londrina, Paraná (GAPI-UEL), previously trained for the study's purpose, collaborated on the data collection. The "Primary Care Assessment Tool (PCATool) - Hansen's disease - CHW version," constructed and validated by Lanza et al.<sup>(9)</sup> based on the PCATool-Brasil<sup>(10)</sup>, was used. The original instrument consists of 7 domains: 1. Information about the respondent (7 items), 2. Information about leprosy care in the municipality (4 items), 3. Point of entrance (4 items), 4. Access (10 items), 5. Continued service (10 items), 6. Completeness of services available and services provided (23 items), 5. Family guidance (8 items), 7. Community guidance (7 items), and 8. Professional guidance (2 items), totaling 75 items in the instrument.

The leading researcher obtained consent from the main author of the instrument to make adjustments to respond to some reflections and concerns on the part of managers at the local level about leprosy control actions conducted by CHWs and to compare these actions with those proposed by the MH and the activities developed. In each domain, their substitutions, inclusions, and exclusions of terms were made, in addition to including demographic and professional data. It should be noted that the category of Comprehensiveness of services provided to leprosy patients was included and categorized as Domain Six.

Thus, the resulting adapted instrument for collecting information related to the demographic characteristics, professional characteristics, and PHC attributes was composed as follows: 1. Information about the interviewee (11 items), 2. Information about leprosy care in the municipality (5 items), 3. Point of entrance (5 items), 4. Access (10 items), 5. Continued care (10 items), 6. Completeness of services available, services provided for leprosy patients, and services provided by the CHWs (32 items), 5. Family guidance (9 items), 7. Community guidance (7 items), and 8. Professional guidance (3 items), totaling 92 items.

Regarding the eighth item, the researchers who built and validated the instrument named the "Professional guidance" attribute since professionals have access to training and education on various health-related topics within the Unified He-

alth System (SUS in Portuguese) scope. Although the item "Coordination" is on the list of PHC attributes, the author justifies the exclusion of this domain because she mentions that the CHWtÁ CERTP is not expected to coordinate care<sup>(9)</sup>.

The Likert-type response scale used is scored as follows: 1 (definitely not), 2 (probably not), 3 (probably yes), 4 (definitely yes), 9 (do not know/do not remember), and 88 (not applicable).

The study variables can be divided into two groups: (1) Information about the interviewees: Demographic characteristics (gender, age, and education), PHU of employment, occupation time, number of leprosy training sessions, time working in Leprosy Control Actions (LCA), and previous experience treating a case of leprosy; and (2) Attribute score and PHS score: The calculation of the scores refers to the responses of each item of the domains, and the calculation of the general, essential and derived domains are made in according to the PCATool-Brasil<sup>(10)</sup>.

Regarding the bias, the participants made a memory effort to try to minimize this bias with the collaboration of the local manager in choosing an opportune time without prejudice to their work activities, so they had enough time to answer the questionnaire.

We consider the possibility of recall bias because people had difficulty remembering if they had already treated a case of leprosy or had previous training on leprosy. This error could have been minimized if we had access to the records of each CHW at the PHU. However, this would require time, costs, and services with good quality records, which is unfeasible in most PHUs. For the statistical analysis, data were collected using the printed instrument. Then, the answers were typed into the Open Data Kit (ODK) Collect® mobile application, which saves the data for a second verification before sending it to the database, thus allowing the double verification. After the double verification, the data stored in the application were exported to Excel and later analyzed in the IBM Statistical Package for the Social Sciences (SPSS), version 20.0.

Concerning age, the median (42 years) was identified and then categorized into two age groups (23 to 42 years and 43 to 75 years). The number of trainings was categorized into no training, one training, and two or more training. Working in LCA was categorized into 0 to 60 months, 61 to 120 months, and > 120 months.

Data analysis took place in different stages. Initially, simple frequency calculations and central tendency measures were obtained for demogra-

phic (gender, age, and level of education) and professional variables (time of occupation, time working in LCA, number of training, and prior experience treating a case of leprosy). Concerning the number of professionals who have already assisted a leprosy case and received training, a cross-reference table was created with the following data: professionals who assisted leprosy cases and obtained  $\geq 1$  training on leprosy.

After data consolidation, score calculations were performed using central tendency and dispersion measures (minimum, maximum, mean, and standard deviation).

All scores were analyzed according to the guidelines of the PCATool-Brasil Manual<sup>(10)</sup>. The inversion of the values for specific variables (D.3, D.4, D.5, and D.10) determined by the instrument's author was carried out so that the higher the value assigned in the response, the lower the orientation towards PHC. Therefore, these items had their values reversed to: (value 4=1), (value 3=2), (value 2=3), and (value 1=4)<sup>(9)</sup>.

The description of missing data is equivalent to the participants' blank responses. That is, when responses equal to 9 (I do not know/I do not remember) obtained 50% or more of the total items of each element, the component was disregarded. Therefore, the data were archived in the database<sup>(10)</sup>.

On the other hand, when the number of responses "I do not know/I do not remember" was inferior to 50% of the total items of each component, the value "9" was replaced by "2" (probably not). This description is intended to demonstrate the subjects unknown by the research participant<sup>(10)</sup>.

The transformation of the scores into a scale from 0 to 10 was attributed to all variables using the following formula: (Obtained score - 1)  $\times$  10 / 3. Moreover, the scores for each attribute and component were calculated using the simple average of the response values of the items. This process was repeated to calculate the general, essential, and derived scores, changing the numerator and denominator for the corresponding category.

A score cutoff point of  $\geq 6.6$  was adopted, indicating a substantial degree of PHC guidance, and  $< 6.6$  indicating a poor degree of PHC guidance<sup>10</sup>. Faced with this tool's conceptual diversity of performance measurement, we decided to standardize the terms "substantial" and "poor" in this research.

Data normality was analyzed using the Shapiro-Wilk test, and analysis of variance (ANOVA)

was used to compare the mean scores of attributes. Next, Tukey’s multiple comparison tests were used to identify which pairs of groups differed. A 5% significance level was chosen for the tests.

The Research Ethics Committee of the State University of Londrina (CEP/UEL) approved the project under Certificate of Presentation for Ethical Appreciation (CAAE) number: 21617519.0.0000.5231 / opinion: 3,734,980, approved on November 29, 2019. All involved signed copies of the Informed Consent Form, and the researchers signed the Confidentiality Term.

**RESULTS**

The population consisted of 246 CHW distributed in the city’s regions: 58 (23.6%) North, 52

(21.1%) South, 42 (17.1%) East, 42 (17.1%) West, 23 (9.3%) Central, and 29 (11.8%) Rural.

As for the demographic profile, there was a predominance of females (83.3%; n=205), and the most recurrent age group was 23 to 42 years old (69.1%; n=170), with a mean of 39.0 and an SD = 9.2. The other predominant data were higher education level (43.5%; n=107), working for ≤ 25 months (93.1%; n= 229), working in LCA for up to 60 months (64, 1%; n = 157), having no training on leprosy (39.9%; n = 98) followed by only one prior training (32.9%; n = 81), and has assisted a case of leprosy (60.2%; n = 148). A rate of 67.5% (n = 100) of participants had received training and treated a patient with leprosy (Table 1).

**Table 1** – Demographic and professional characterization of Community Health Workers (N=246). Londrina, PR, Brazil, 2020

<b>Variables</b>	<b>n</b>	<b>%</b>
<b>DEMOGRAPHICS</b>		
<b>Sex (N = 246)</b>		
Female	205	83.3
Male	41	16.7
<b>Age range (N = 246)</b>		
23 to 42 years	170	69.1
43 to 75 years	76	30.9
<b>Educational level (N = 246)</b>		
Primary level	1	0.4
Secondary level	95	38.6
Technical level	43	17.5
Higher education level	107	43.5
<b>PROFESSIONAL CHARACTERISTICS</b>		
<b>Time working as a CHW* (N = 246)</b>		
3 to 12 months	7	2.8
13 to 24 months	10	4.1
≥ 25 months	229	93.1
<b>LCA experience time** (N = 246)</b>		
0 to 60 months	157	64.1
61 to 120 months	60	24.5
> 120 months	28	11.4

Variables	n	%
<b>Leprosy training (N = 246)</b>		
No training	98	39.9
One	81	32.9
Two or more	67	27.2
<b>Assisted a patient with leprosy previously (N = 246)</b>		
Yes	148	60.2
No	98	39.8
Assisted a patient and received prior training (n = 100)		
≥ 1	100	67.5

\*CHW = Community Health Worker

\*\*LCA = Leprosy Control Actions

In the analysis of the mean scores of the PHC attributes, the dimensions that performed poor were: "Access" (mean score - 6.13), "Comprehensiveness of services provided (leprosy)" (mean score - 6.19), "Community guidance"

(mean score - 6.39) and "Professional guidance" (mean score - 3.1). The general performance of the PHC was substantially evaluated by the CHW (6.95), as shown in Table 2.

**Table 2** - Distribution of mean, essential, derived, and general scores of the attributes of Primary Health Care through leprosy control actions according to the Community Health Workers' (N=246) evaluation. Londrina, PR, Brazil, 2020

	PHC dimensions	Min-Max	Average	SD*
Attributes	Point of entrance	0 - 10	7.15	1.61
	Access	0 - 9.33	6.13	1.41
	Continuous Service	0 - 9.33	7.12	1.71
	Completeness of available services	1.18 - 10	9.42	0.88
	Comprehensiveness of services provided (leprosy)	0 - 10	6.19	2.51
	Comprehensiveness of services provided (CHW)	0 - 10	7.12	2.40
	Family orientation	0 - 10	7.79	1.96
	Community orientation	0 - 10	6.39	2.29
	Professional orientation	0 - 10	3.10	2.29
Score	Essential	4.51- 9.31	7.39	1.00
	Derivative	0 - 10	6.07	1.6
	General	3.01 - 9.18	6.95	1.08

\*SD = standard deviation

As for the presence and extent of the attributes, the comparison between the regions of the municipality (North, South, East, West, Central, and Rural) was analyzed.

A lower average difference was detected for the attributes related to the rural region, pointing to the need for better monitoring of PHC in this region. Table 3 shows the average scores of the

attributes by region, highlighting the following attributes: "Access" (Rural ≠ North, South, East, West, and Central), "Comprehensiveness of services provided to leprosy patients" (South ≠ Central), "Integrity of services provided by the CHWs" (Rural ≠ West, Central), "Community guidance" (Rural ≠ West; West ≠ North, South, East) and "Professional guidance" (Rural ≠ West).

**Table 3** - Comparison of the presence and extent of attributes (N=246) according to the regions of the municipality of Londrina. Londrina, PR, Brazil, 2020

Attributes	Municipality Regions												Anova p-value	Post Hoc Tukey's
	North		South		East		West		Central		Rural			
	Average	SD*	Average	SD*	Average	SD*	Average	SD*	Average	SD*	Average	SD*		
Point of entrance	7.01	1.83	7.49	1.25	7.44	1.82	6.58	1.53	7.37	1.50	7.04	1.41	0.076	-
Access	6.34	1.41	6.91	.99	6.26	.92	6.22	1.12	5.91	.94	4.47	1.63	<0.001	Rural ≠ North, South, East, West and Central
Continuous service	7.27	1.35	7.31	1.00	6.87	2.09	6.44	2.40	7.64	1.42	7.27	1.94	0.313	-
Completeness of available services	9.47	1.22	9.54	.44	9.32	.66	9.42	.80	9.69	.36	9.03	1.19	0.091	-
Comprehensiveness of services provided to leprosy patients	6.53	2.45	6.76	2.24	6.31	2.19	5.78	2.34	4.87	3.44	5.70	2.64	0.034	South ≠ Central
Comprehensiveness of the services provided by CHWs	7.39	2.07	7.54	1.95	6.96	2.49	6.16	2.91	6.13	3.27	8.15	1.22	0.002	Rural ≠ West, Central
Family orientation	7.68	1.90	8.04	1.58	7.73	2.17	7.27	2.23	8.36	1.60	7.86	2.30	0.662	-
Community orientation	6.49	2.01	6.94	2.16	6.65	2.28	5.04	2.44	5.87	2.84	7.19	1.51	<0.001	Rural ≠ West; West ≠ North, South.
Professional orientation	3.14	2.12	3.29	1.73	3.20	2.80	2.14	1.79	2.96	2.77	4.14	2.62	0.016	Rural ≠ West

Note: p<0.05. \*SD = Standard deviation

## DISCUSSION

This study evaluated the performance of the PHC through LCA evaluated by CHWs, as well as the presence and extent of the PHC attributes according to the regions of the municipality. Concerning the quality of PHC from the CHW's perspective, a substantial degree of PHC guidance was found by analyzing the overall score. The same relationship was found for the essential score. On the other hand, poor guidance was obtained in the derived score. Surveys conducted with the same assessment tool for CHWs or other health professionals showed that the ge-

neral and essential scores presented the same orientation considering the cutoff point (6.6)<sup>(11,9)</sup>. Table 3 showed a significant difference between the mean scores of the CHW's responses on assessing the Completeness of available services (mean = 9.61 / SD = 0.88). It is assumed that this difference is related to the organizational issue of the city's health network, which provides prevention and follow-up programs, immunizations, pediatric care, adolescents, adults, and older adults' health, family planning, prenatal care, cervical cancer preventive actions, sexually transmitted infections (STIs) prevention,

care for endemic and chronic diseases, mental health problems, wound dressings, advice or treatment for harmful use of tobacco, advice on healthy eating, and assessment of oral health among others.

Such conception is important when we analyze the essential and general scores, aiming to reach the best evaluations from reflecting these results. It is observed that the average score of professional orientation presented an average = 3.1 / SD = 2.29, demonstrating a fragility of the attribute influencing a poor classification of the derived score (average = 6.07 / SD = 1.6) and a substantial orientation, close to the cutoff point of the overall score (mean = 6.95 / SD = 1.08). Regarding the access attribute, specifically related to the regions, it is observed that the opinion of the CHWs was different, as shown by the lowest evaluation (mean = 4.47 / SD = 1.63) in the rural region. A study demonstrated structural and organizational barriers in the rural population's access to the FHS, including the unavailability of vaccines, short periods for assistance, and physical structure inadequacies that hamper health promotion<sup>(12)</sup>.

On the other hand, there are recent national efforts to transform the reality exposed through the "Saúde na Hora" program within the scope of the National Primary Care Policy, which aims to expand opening hours, FHS coverage, access to essential PHC services, number of users involved in actions in promotion services, and reduce the number of care for low-risk patients in tertiary-level services<sup>(13)</sup>.

Regarding the comprehensiveness of the services provided to the patient with leprosy, the items considered were: dermato-neurological examination, referral for bacilloscopy or skin biopsy, case diagnosis, multidrug therapy, active search for absent patients within 30 days, self-care group, and annual follow-up of the person after discharge to cure.

These services meet the attributions of the CHWs listed by the National Policy of Primary Care<sup>(14)</sup> since, according to Article IV – the CHW must develop actions that seek integration between the health team and the population assigned to the PHU, considering the characteristics and purposes of the follow-up work of individuals and social groups or communities, and Article VI – he/she must participate in the PHC regulation processes to monitor users' needs concerning scheduling or withdrawing from consultations and exams. It is understood that this professional has the attribution of partici-

pating in the integrality of the services provided to the patient with leprosy.

In line with the variables explored above, the MH reinforces that the model of disease control actions based on decentralization for PHC must guarantee the following services: diagnosis, timely treatment, prevention and treatment of physical disabilities, surveillance/follow-up of contacts, health education, and application of the Bacillus Calmette-Guérin (BCG) vaccine<sup>(15)</sup>.

In the range of the services above and given the organizational and structural aspects, there was a statistically significant difference ( $p=0.034$ ) between the southern region (mean = 6.76 / SD = 2.24) and the central region (mean = 4.87 / SD = 3.44), in the integrality of the services provided by the CHWs for leprosy patients.

According to the data on the number of CHWs per region provided by the municipality's PHC coordinator, there is a heterogeneous distribution (south region = 65 CHWs / central region = 28 CHWs), justifying the predominance of the south region 21.1% versus a shortage of participants from the central region, with only 9.3%. This distribution may have contributed to this study's results.

Despite the derived score formed by the attributes family orientation (mean = 7.79 / SD = 1.96), community orientation (mean = 6.39 / SD = 2.29), and professional orientation (mean = 3.10 / SD = 2.29), a poor PHC orientation was found in the last two attributes. Concerning community orientation (mean = 6.39 / SD = 2.29), the rural region (mean = 7.19 / SD = 1.51) differed from the western region (mean = 5.04 / SD = 2.44), and the western region differed from the northern (mean = 6.49 / SD = 2.01), south (mean = 6.94 / SD = 2.16) and east regions (mean = 6.65 / SD = 2.28) evidencing weaknesses that may affect the community. Impacts from community guidance have been noted in demystifying misconceptions about the disease, laden with stigma and social prejudice. Therefore, health education strategies have favored progress with the adolescent public since they act as multipliers of information for the family and community<sup>(16)</sup>.

The presence of this same attribute in the rural area obtained a better result when analyzed with the western (urban) region. A study in Cascavel, Paraná, evaluated results obtained through the PCATool – Children for a better understanding of PHC attributes in the urban and rural contexts. The study revealed higher rates in the rural region in all attributes. The au-

thors of the study above concluded that there is a lack of research in the urban community on community participation in Local Health Councils to discuss health problems<sup>(17)</sup>.

Prior studies conducted at national and international levels reinforce that knowledge about the disease and its dissemination to the community generates positive effects for the early detection of leprosy<sup>(18-20)</sup>.

Finally, the Professional guidance attribute had a higher mean in the rural region (mean = 4.14 / SD = 2.26) compared to the west (mean = 2.14 / SD = 1.79).

Concerning this finding, we can include the Telehealth service provided by MH as a point of discussion. In the study by Dolny et al.<sup>(21)</sup>, the evaluation model of Telehealth as a Permanent Health Education (PHE) strategy for PHC professionals indicates the need for training of the researchers involved, identification of problems in the work context, expansion of knowledge in the local context, interdisciplinary work, the leadership of teams for decision-making, the inclusion of managers, work organization, and meaningful learning<sup>(21)</sup>.

The study highlights the limitation of the need for a PHC record to feed information about leprosy patients and contacts, the number of consultations and training about this condition, and communication and integration problems within the HCN.

In addition, it is necessary to discuss whether the referrals made by the PHC to other levels of care have been necessary, assisted, and feasible given the high demand for other diseases and leprosy. The (re)organization of the PHC can avoid the overload of demands at other levels of the healthcare system and strengthen the presence and extension of the Access attributes, mainly concerning the opening hours of the rural facilities, the integrality of the services

provided for the leprosy patient, and community and professional guidance. Further studies may be conducted using the logic discussed in this paper.

## CONCLUSION

The present study evaluated the PHC performance for leprosy control as substantial, obtaining a high overall performance score. However, the study highlights some issues that can be improved, such as first contact access, services offered to leprosy patients, information for the community, and professional training, given the difference in the averages of PHC performance found in urban and rural regions. The rural region had the lowest average in the Access attribute and the attributes of Completeness of services provided by the CHWs. Moreover, community and professional guidance achieved higher averages than the urban regions.

The present study found that to obtain a better PHC performance, managers could invest in expanding the opening hours of rural facilities and providing services for leprosy patients in the range of services available and provided. It is also suggested to insert the CHW as a key element in offering these services to the patient, family, and community, as well as periodic training to support and reflect on the leprosy control actions performed by this professional.

\*Paper extracted from the master's dissertation "Assessment of community health agents for leprosy control actions in primary health care presented to the Universidade Estadual de Londrina, Londrina, PR, Brazil.

## CONFLICT OF INTERESTS

The authors have declared that there is no conflict of interests.

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