SAÚDE E PESQUISA
e-ISSN 2176-9206

ORIGINAL ARTICLE

https://doi.org/10.17765/2176-9206.2025v18e13248

DATA QUALITY, TIMELINESS AND ACCEPTABILITY OF THE TUBERCULOSIS SURVEILLANCE SYSTEM IN NATAL-RN

QUALIDADE DE DADOS, OPORTUNIDADE E ACEITABILIDADE DO SISTEMA DE VIGILÂNCIA DE TUBERCULOSE EM NATAL-RN

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Received: 17 Oct. 2024
Accepted: 16 Dec. 2024

ABSTRACT: **Objective:** To evaluate the quality of data, timeliness and acceptability of the tuberculosis epidemiological surveillance system in Natal, Rio Grande do Norte, Brazil. **Methods:** Evaluative research of tuberculosis records in the Notifiable Diseases Information System (Sinan), from 2018 to 2022. For data analysis, the completeness, consistency, timeliness and acceptability of the system were considered. **Results:** 3,083 cases of tuberculosis were recorded in Natal. Overall completeness ranged from 78.7% to 83.1%, consistency 49.4% to 56.7%, and acceptability 61.2% to 66.8%. The proportion of opportunity for notification, typing and processing for the entire period evaluated was 71.4%, 83.2% and 41.6% respectively. **Conclusion:** The system is complete in most areas and inconsistent in the evaluated point. Timely for notification and typing, but late for treatment and with low acceptability potential, indicating the need for improvement, however considered necessary for carrying out surveillance actions.

KEYWORDS: Health Evaluation. Epidemiological Monitoring. Health Information Systems. Tuberculosis. Epidemiological Surveillance.

RESUMO: **Objetivo:** Avaliar a qualidade dos dados, oportunidade e aceitabilidade do sistema de vigilância epidemiológica da tuberculose em Natal, Rio Grande do Norte, Brasil. **Métodos:** Pesquisa avaliativa, dos registros de tuberculose no Sistema de Informação de Agravos de Notificação (Sinan), de 2018 a 2022. Para análise de dados foram considerados a completude, consistência, oportunidade e a aceitabilidade do sistema. **Resultados:** Foram registrados 3.083 casos de tuberculose em Natal. A completude geral variou de 78,7% a 83,1%, a consistência 49,4% a 56,7% e a aceitabilidade 61,2% a 66,8%. A proporção da oportunidade de notificação, digitação e tratamento de todo período avaliado foi 71,4%, 83,2% e 41,6% respectivamente. **Conclusão:** O sistema é completo na maioria dos campos e inconsistente no ponto avaliado. Oportuno para notificação e digitação, mas tardio para o tratamento e com baixo potencial de aceitabilidade, indicando a necessidade de melhoria, entretanto considerado necessário para o encaminhamento de ações de vigilância.

PALAVRAS-CHAVE: Avaliação em Saúde. Monitoramento Epidemiológico. Sistemas de Informação em Saúde. Tuberculose. Vigilância Epidemiológica.

INTRODUCTION

Tuberculosis (TB) is a communicable disease caused by the bacillus *Mycobacterium tuberculosis*, with a high lethality when not treated (about 50%). Before the onset of the COVID-19 pandemic, it was the leading cause of death from a single infectious agent, especially acquired immunodeficiency syndrome (AIDS).[1]

At the global level, tuberculosis continues to be a serious public health problem. According to the World Health Organization (WHO), in 2021, approximately 10 million people fell ill with TB, especially in regions like Southeast Asia, Africa and the Western Pacific. Countries like India, China and Indonesia are among the most affected. In this sense, the WHO presented a strategy to combat tuberculosis, establishing goals to achieve the end of the epidemic by the year 2035.[2]

In 2017, the Brazilian Ministry of Health established the National Plan to End Tuberculosis as a Public Health Problem, adopting the foundations of the Global Strategy to End TB, with the following goals: to reach less than 10 cases per 100 thousand inhabitants and to reduce the tuberculosis mortality coefficient to less than 1 death per 100 thousand inhabitants by the year 2035.[3]

In 2021, 68,271 new cases of tuberculosis were registered in Brazil, resulting in an incidence rate of 32.0 cases per 100 thousand inhabitants. The state of Rio Grande do Norte had a lower incidence coefficient (27.7 TB cases per 100,000 inhabitants) than the coefficient of Brazil in general (32.0 TB cases per 100,000 inhabitants) and that of the capital of the neighboring state, Fortaleza (30.5 TB cases per 100,000 inhabitants).[4]

Since 1998, tuberculosis has been a notifiable disease, with its records made in health establishments and entered into the Notifiable Diseases Information System (SINAN, as per its Portuguese acronym). Continuous updating followed by the qualification of the SINAN database is essential for monitoring the epidemiological scenarios of diseases and conditions contained in the system.

In this sense, Epidemiological Surveillance plays a fundamental role in the constant monitoring of data related to TB, with a view to analyzing them and evaluating the situation of this disease, providing support for decision-making, formulation and reformulation of health policies.

Among the challenges for performing quality TB surveillance, one can mention the incompleteness of information in the notification forms, including records on treatment abandonment, timeliness for notification, completeness of the contacts examined, cases tested for HIV and follow-up sputum smear microscopies performed.[5]

Studies referring to the tuberculosis surveillance system indicate the low completeness, lack of data updating, lack of closure and low maintenance capacity of the system as weaknesses that hinder progress in strengthening surveillance and production of reliable information.[6]

Poor quality records in the surveillance system hinder the epidemiological analysis of the disease and weaken the monitoring of the health-disease process, making the data unreliable, thus compromising the adoption of intervention measures efficiently to mitigate the transmission of the disease to other people/regions.[7]

In order to ensure that a system is reliable, complete and consistent, it must be submitted to a regular evaluation routine, thus becoming useful for decision-making by health managers, because the more reliable the system, the more potential it will have to support the construction of more effective public policies.

In view of the above, the present study aimed to evaluate the data quality, timeliness and acceptability of the tuberculosis epidemiological surveillance system in Natal, Rio Grande do Norte State, Brazil, from 2018 to 2022.

METHODOLOGY

This is a descriptive study on the quality, timeliness, acceptability and reliability of the epidemiological surveillance system for tuberculosis in Natal/RN. Natal, the capital of the state of Rio Grande do Norte (RN), is located in the Northeast region of Brazil. According to data from the Brazilian Institute of Geography and Statistics (IBGE, as per its Portuguese acronym) from 2022, it covers a territorial area of 167.4 km², which is divided into 36 neighborhoods and is organized into five health districts, all of which are included in this study. The city's population density is 4,488.03 inhabitants per square kilometer, with a population of 751,300 inhabitants in 2022.

The data source for the evaluation was the notifications made in the Notifiable Diseases Information System (SINAN, as per its Portuguese acronym), from January 1, 2018 to December 31, 2022. SINAN is considered the system responsible for collecting, transmitting and disseminating data for epidemiological surveillance. For the study, the records of patients notified with tuberculosis living in the city of Natal were considered.

The study was structured using the parameters of the Updated Guidelines for Evaluating Public Health Surveillance Systems of the Centers for Diseases Control and Prevention.[7] The objective of the evaluation of public health surveillance systems is to ensure that problems of importance to public health are being monitored efficiently and effectively through the use of this instrument.

In order to check the quality of the data, the completeness and consistency of the related data were analyzed. Completeness is understood as the proportion with which each record of an information system presents non-null values. The fields considered null or incomplete are both those filled in and "ignored", "inconclusive" and those left blank.

In completeness, the fields selected were: gender, age group, race/color, date of treatment initiation, sputum smear microscopy at the 2nd month, sputum smear microscopy at the 6th month, contacts examined and closure status. In order to evaluate the consistency of the data, which means that there are no discrepancies when compared with different variables or databases, the date of notification greater than or equal to the date of diagnosis was evaluated.

Timeliness calculations were performed considering the timeliness for notification, typing, and treatment. Notification timeliness was measured by notifications that were related ≤7 days from the date of diagnosis. Typing ≤30 days from the date of notification. Treatment ≤1 day after diagnosis. Acceptability, which deals with people's acceptance of participating in the system[7], was evaluated using patients tested for HIV, contacts examined among those identified, pulmonary cases who underwent sputum smear microscopy and pulmonary cases without abandonment.

The results were classified according to a study that evaluated the quality of the data, the timeliness, and the acceptability of tuberculosis in the microregions of Brazil, where the L1 and L2 parameters, presented in Chart 1, were used to indicate performance as follows: poor (indicator < L1%), regular (indicator ≥ L1% and < L2%), excellent (indicator ≥ L2%), Chart 1.[5] In order to organize the data, the Microsoft Excel spreadsheet editor was used. All data compilation and extraction were carried out from August to October 2023. Because this was a study conducted with data in the public domain and without identification of the participants, it was not necessary for the Research Ethics Committee to evaluate it

Chart 1. Table of attributes with indicators used for evaluation, their calculation formula and classification.

Attribute	Nº	Indicator	Form of Calculation	L1	L2
Completeness	1	Gender	Proportion (%) of cases with gender filling in	70	90
	2	Age group	Proportion (%) of cases with age group filled in	70	90
	3	Race/color	Proportion (%) of cases with race/color filled in	70	90
	4	Date of treatment start	Proportion (%) of cases with the date of treatment start filled in	70	90
	5	Number of contacts examined	Proportion (%) of cases with the number of contacts examined filled in	70	90
	6	Closure status	Proporção (%) de casos com o preenchimento da situação de encerramento	70	90
	7	Sputum smear microscopy at the 2nd month	Proportion (%) of cases with information on whether or not sputum smear microscopy was performed at the 2nd month	70	90
	8	Sputum smear microscopy at the 6th month	Proportion (%) of cases with information on whether or not sputum smear microscopy was performed at the 6th month	70	90
General completeness			Average of indicators 1 to 8	70	90
Consistency	9	Date of notification greater than or equal to the date of diagnosis	Proportion (%) of cases with date of notification greater than or equal to the date of diagnosis	70	90
Timeliness	10	Timeliness for notification	Proportion (%) of cases with an interval between the date of notification and diagnosis less than or equal to 7 days	70	90
	11	Timeliness for typing	Proportion (%) of cases with an interval between the date of typing and notification less than or equal to 30 days	70	90
	12	Timeliness for treatment	Proportion (%) of cases with an interval between the date of treatment start and diagnosis of less than 1 day	70	90
Acceptability	13	Contacts examined among those identified	Proportion (%) of contacts of cases examined among those identified, for cases that have information on contacts examined and identified	70	90
	14	New pulmonary cases that underwent sputum smear microscopy	Proportion (%) of new cases of pulmonary tuberculosis that underwent sputum smear microscopy	80	90
	15	Pulmonary cases without abandonment	Proportion (%) of pulmonary tuberculosis cases that did not have primary abandonment or treatment abandonment	90	95
	16	HIV testing	Proportion (%) of cases tested for HIV (excludes ongoing HIV from the numerator)	70	85

Source: Adapted from Silva (2017, p. 3310).

RESULTS

In the period from 2018 to 2022, 3,083 cases of tuberculosis were notified in the municipality of Natal, 2,316 of which were new cases. In 2018, the highest number of new cases was recorded (511); and, in 2021, the lowest number (422).

Over these five years, tuberculosis predominantly affected the male population, accounting for 70.3% of the cases in all the years analyzed. In addition, the most affected age group was between 20 and 39 years old, covering 44.6% of the cases in the period in question. Regarding race/color, it was observed that the brown population was the most affected, with 64.3% of the cases during the entire period analyzed (Table 1).

Table 1. Characterization of tuberculosis cases in the Notifiable Diseases Information System of Natal, Rio Grande do Norte, 2018-2022.

	2018		2019		2020		2021		2022		2018-2022	
	N (644)	**%**	**N (631)**	**%**	**N (583)**	**%**	**N (561)**	**%**	**N (664)**	**%**	**N**	**%**
Gender												
Male	452	70.2%	446	70.7%	404	69.3%	394	70.2%	470	70.8%	2,166	70.3%
Female	192	29.8%	185	29.3%	179	30.7%	167	29.8%	194	29.2%	917	29.7%
Ignored	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Age group												
> 1 year	3	0.5%	7	1.1%	1	0.2%	10	1.8%	2	0.3%	23	0.7%
1-4 years	4	0.6%	3	0.5%	1	0.2%	1	0.2%	7	1.1%	16	0.5%
5-9 years	4	0.6%	7	1.1%	1	0.2%	0	0.0%	5	0.8%	17	0.6%
10-19 years	37	5.7%	37	5.9%	26	4.5%	28	5.0%	32	4.8%	160	5.2%
20-39 years	292	45.3%	288	45.6%	267	45.8%	259	46.2%	268	40.4%	1,374	44.6%
40-59 years	219	34.0%	208	33.0%	198	34.0%	170	30.3%	245	36.9%	1,040	33.7%
60-79 years	76	11.8%	75	11.9%	75	12.9%	82	14.6%	96	14.5%	404	13.1%
≥ 80 years	9	1.4%	6	1.0%	14	2.4%	11	2.0%	9	1.4%	49	1.6%
Ignored	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Race/color												
White	142	22.0%	118	18.7%	121	20.8%	126	22.5%	120	18.1%	627	20.3%
Black	46	7.1%	57	9.0%	62	10.6%	57	10.2%	57	8.6%	279	9.0%
Yellow	6	0.9%	3	0.5%	2	0.3%	10	1.8%	3	0.5%	24	0.8%
Brown	416	64.6%	413	65.5%	373	64.0%	330	58.8%	451	67.9%	1,983	64.3%
Indigenous	1	0.2%	1	0.2%	0	0.0%	1	0.2%	2	0.3%	5	0.2%
Ignored/blank	33	5.1%	39	6.2%	25	4.3%	37	6.6%	31	4.7%	165	5.4%
COMPLEMENTARY DATA												
Date of treatment start	628	97.5%	614	97.3%	573	98.3%	536	95.5%	637	95.9%	2,988	96.9%
Number of contacts examined	286	44.4%	308	48.8%	314	53.9%	328	58.5%	414	62.4%	1,650	53.5%
Closure status	628	97.5%	608	96.4%	373	98.3%	529	94.3%	597	89.9%	2,935	95.2%
Sputum smear microscopy at the 2nd month	380	59.0%	310	49.1%	365	62.6%	354	63.1%	355	53.5%	1,764	57.2%
Sputum smear microscopy at the 6th month	328	50.9%	279	44.2%	328	56.3%	278	49.6%	276	41.6%	1,489	48.3%
General completeness	450	69.9%	424	67.2%	431	73.9%	405	72.2%	456	68.6%	2,164	70.2%

Source: Survey Data.

In all the years evaluated, the completeness of the "gender" and "age group" fields was 100%. In turn, the "race/color" variable obtained its best result in 2020 (95.7%) and its lowest in 2019 (93.8%), still considered an excellent result. In 2018, the variables "date of treatment start" and "closure status" presented 97.52% completeness, configuring an excellent performance, which was maintained throughout almost the entire period, except in 2022, when it presented regular completeness of 89.91% in the closure status.

Regarding the variables "number of contacts examined", "sputum smear microscopy at the 2nd month" and "sputum smear microscopy at the 6th month", the year 2018 presented poor completeness levels of 44.41, 59.01% and 50.93%, respectively. The field "number of contacts examined" increased its percentage in the following years and reached 62.35% in 2022, configuring its best scenario; however, it continued with poor performance. Regarding sputum smear microscopies, in 2019, they presented only 49.13% at the 2nd month and 44.22% at the 6th month, increasing their completeness in the following year, when they presented 62.61% and 56.26%, in that order.

In 2021, sputum smear microscopy completeness in the 2nd month continued with a slight increase (63.10%), but sputum smear microscopy in the 6th month decreased (49.55%). In the following year, the performance of these variables continued to decrease, reaching 53.46% and 41.57%, respectively (Table 2).

Table 2. Completeness of the tuberculosis variables selected in the Notifiable Diseases Information System of Natal, Rio Grande do Norte, 2018-2022.

TOTAL CASES 3,083	2018		2019		2020		2021		2022		2018-2022	
	N (644)	**%**	**N (631)**	**%**	**N (583)**	**%**	**N (561)**	**%**	**N (664)**	**%**	**N**	**%**
Gender	644	100%	631	100%	583	100%	561	100%	664	100%	3,083	100%
Age group	644	100%	631	100%	583	100%	561	100%	664	100%	3,083	100%
Race/color	611	94.9%	592	93.8%	558	95.7%	524	93.4%	663	95.3%	2,918	94.6%
Date of treatment start	628	97.5%	614	97.3%	573	98.3%	536	95.5%	637	95.9%	2,988	96.9%
Closure status	628	97.5%	608	96.4%	373	98.3%	529	94.3%	597	89.9%	2,935	95.2%
Number of contacts examined	286	44.4%	308	48.8%	314	53.9%	328	58.5%	414	62.4%	1,650	53.5%
Sputum smear microscopy at the 2nd month	380	59.0%	310	49.1%	365	62.6%	354	63.1%	355	53.5%	1,764	57.2%
Sputum smear microscopy at the 6th month	328	50.9%	279	44.2%	328	56.3%	278	49.6%	276	41.6%	1,489	48.3%
General completeness	-	80.5%	-	78.7%	-	83.1%	-	81.8%	-	79.8%	-	80.7%

Source: Survey Data.

Regarding the date of notification greater than or equal to the date of diagnosis, 2018 presented 56.67% and 2019 54.99% of consistency, being considered a poor performance. In the following years, there was a decrease, registering the lowest performance in 2022, with 49.39%.

Regarding the timeliness for notification, a regular performance was achieved (72.98%) in 2018, as well as the following years, with 2020 standing out, which recorded the best of them (74.61%). In 2022, there was a drop, obtaining a percentage of 67.77%. The period reached an average of 62.72 (SD 575.19). As for the timeliness for typing, it was considered regular for all years of the analysis, with its

highest record in 2020 (84.73%) and average of 22 (SD 47.16). The timeliness for treatment showed a poor performance in all years, registering a mean of 58.36 (SD 583.88) (Table 3).

Table 3. Summary measures of the interval (in days) between symptom onset, notification, and typing of tuberculosis cases in the Notifiable Diseases Information System (SINAN), Natal, Rio Grande do Norte, 2018 to 2022.

	2018	2019	2020	2021	2022	2018-2022
	N (644)	**N (631)**	**N (583)**	**N (561)**	**N (664)**	**N**
Interval (in days) between diagnosis and notification						
Proportion of timely cases	73.0%	71.5%	74.6%	70.2%	67.8%	71.4%
Average	20.14	65.20	49.27	110.57	73.07	62.73
Standard deviation	90.92	296.44	491.21	1122.61	407.65	575.19
Median	1.00	1.00	1.00	1.00	2.00	1.00
Interval (in days) between notification and typing						
Proportion of timely cases	81.1%	82.4%	84.7%	83.4%	83.7%	83.2%
Average	24.43	21.54	22.70	19.52	18.81	21.41
Standard deviation	54.16	43.79	47.36	39.94	37.28	44.95
Median	6.00	6.00	6.00	6.00	5.00	6.00
Interval (in days) between diagnosis and treatment						
Proportion of timely cases	46.7%	43.7%	39.3%	39.0%	38.4%	41.6%
Average	14.79	60.71	43.96	108.51	69.79	58.36
Standard deviation	89.79	299.71	494.89	1,148.46	415.32	583.88
Median	1.00	1.00	1.00	1.00	1.00	1.00

Source: Survey Data.

In the aforementioned period, the indicator of contacts examined among those identified pointed to a poor performance, with its best rate in 2021 (47.29%). The variable “new pulmonary cases that underwent sputum smear microscopy” obtained 61.66% in 2018, giving its best percentage when considering the entire period. Regarding pulmonary cases without abandonment, the period from 2018 to 2022 showed a regular performance in all years. With regard to HIV testing, 2018 showed a poor performance, but improved in the following years, giving a regular performance to this indicator (Table 4).

Table 4. Consistency and acceptability of the variables selected on tuberculosis in the Notifiable Diseases Information System, Natal, Rio Grande do Norte, 2018-2022.

	2018		2019		2020		2021		2022		2018-2022	
	N (644)	**%**	**N (631)**	**%**	**N (583)**	**%**	**N (561)**	**%**	**N (664)**	**%**	**N**	**%**
Consistency												
Date of notification greater than or equal to the date of diagnosis	365	56.7%	347	54.9%	316	54.2%	283	50.4%	328	49.4%	1,638	53.1%
Acceptability	189		12		189		38		90		6	
Contacts examined among those identified	430	23.9%	493	28.5%	494	38.6%	98	47.3%	199	39.9%	27	34.4%
New pulmonary cases that underwent sputum smear microscopy	334	65.4%	296	61.7%	53	53.2%	21	40.5%	23	44.5%	6	53.6%

	2018		2019		2020		2021		2022		2018-2022	
	N (644)	**%**	**N (631)**	**%**	**N (583)**	**%**	**N (561)**	**%**	**N (664)**	**%**	**N**	**%**
Pulmonary cases without abandonment	367	87.2%	17	85.5%	101	81.7%	29	79.1%	43	84.0%	8	83.5%
HIV testing	440	68.3%	70	77.2%	892	77.9%	266	82.0%	415	83.4%	56	77.7%
General acceptability	393	61.2%	33	63.2%	778	66.8%	170	62.2%	242	63.0%	41	62.3%

Source: Survey Data.

DISCUSSION

During the period evaluated, the system was considered untimely, with low potential for acceptability by users, complete for general data and moderately complete for complementary data. Regarding completeness, considering them separately, the following variables: gender, age group, race/color, date of treatment start and closure status were considered complete, whereas the information on sputum smear microscopy (2nd and 6th) and contacts examined were incomplete. The low completeness of the sputum smear microscopy fields and the number of contacts examined point to the misuse of follow-up bulletins, or to the fact that most of them are not considered mandatory fields.[8] Studies from 2007 to 2016 point to this and another study from 2001 to 2006 reinforces these findings.[9,10] It is worth noting the scarcity of recent literature focused on tuberculosis, which reinforces the contribution of this study by offering contemporary and relevant data for the post-pandemic scenario.

In addition, the impact of the COVID-19 pandemic, which occurred during the period analyzed, should be considered. TB, as an airborne disease and compulsory notification, had its surveillance affected by social isolation and the overload of health services. Many people sought care for respiratory symptoms due to COVID-19 and, during hospitalization, were diagnosed with TB. [1] This scenario reinforces the need for integrated surveillance strategies, which simultaneously consider the management of respiratory diseases with similar symptoms, such as TB and COVID-19, aiming at more timely diagnoses and reducing underreporting.

In this sense, observing the results regarding the indicator of timeliness for notification, it is evaluated that there has been no improvement in this indicator over the years. Thus, it is possible to state that there are flaws in the use of the notification instrument. Regarding the timeliness for typing, the indicator showed poor results in 4 of the 5 years of the period evaluated. Such results show concern, as they compromise the right time for action. The pandemic may have contributed to this unsatisfactory performance, both in terms of notification and typing, since human resources were redirected to the fight against COVID-19, prioritizing emergency actions and limiting the updating of TB records in the system; however, these occurrences may also be related to the view that filling out the forms and typing them in the system represents only a bureaucratic obligation and consumes a lot of time for the professional, in addition to often being mistakenly considered a less important activity.

It is essential that the professional understands the relevance of filling out the forms properly and typing them in a timely manner, so that the production of data is reliable, making it possible to analyze health conditions and their trends.[11] Through the analysis of consistent data, it is possible to

generate information about the health situation, which is essential for the control of diseases and public health problems.

From this perspective, it is important to reaffirm that information systems are essential tools for epidemiological surveillance, since they trigger the information-decision-action process.[12] Thus, improvement and direction in the production of information are essential for the formulation of actions and public policies relevant to the fight against TB.

Regarding the timeliness for treatment, the study revealed a low performance during the period evaluated for the interval between diagnosis and treatment. In another study, the results of this indicator were also considered poor, with no gain during the period from 2012 to 2014.[13]

It is essential that tuberculosis treatment starts in a timely manner, in order to interrupt the chain of transmission and speed up the cure process. Especially because there is a high number of TB cases in Brazil. Despite the diagnosis and treatment made available by the Brazilian Unified Health System (SUS, as per its Portuguese acronym), 4,500 cases of deaths are still registered per year. In 2022, it was observed that there were 459 new cases of tuberculosis reported after death, which demonstrates that these people were not diagnosed in a timely manner and could not access the treatment offered by the SUS.[3]

The Brazilian Ministry of Health recommends that all identified contacts be examined and treated for latent infection, in order to minimize the risk of developing the disease in its active form.[14] Contacts are all people who lived in some way with the index case at the time it was diagnosed with tuberculosis (TB). Health services should be organized in such a way that this extremely relevant evaluation for the control of this disease is carried out in all TB contacts. [15]

In the evaluation, contacts may be symptomatic, requiring investigation by means of sputum smear microscopy, or they may be asymptomatic, requiring the tuberculin skin test (TST) or Interferon-Gamma Release Assays (IGRA). In the screening of latent tuberculosis infection, the exclusion of active disease should be performed appropriately, through chest X-ray.[16]

During the period of this study, a low potential for acceptability was observed. The poor performance in the indicator of contacts examined among those identified reveals the need for improvement in this issue. As other studies reveal, the reasons why this variable has developed unsatisfactorily over the years may be related to staff turnover, considering that the professional-patient bond is indispensable in this activity, as well as the long waiting time for access to consultations, often causing the client to give up, making diagnosis difficult and delayed. These challenges represent obstacles to the timely diagnosis and treatment of tuberculosis, contributing to the continuity of the disease transmission chain.[17]

In addition, it is possible to mention the socioeconomic profile that directly interferes in the locomotion of contacts in unfavorable conditions to the health unit for clinical evaluation, as recommended by the Brazilian Ministry of Health.

In the case of new pulmonary cases that underwent sputum smear microscopy, this indicator was poorly represented in 2018. People with pulmonary or laryngeal TB who have a positive sputum smear microscopy, have a considerably greater capacity to transmit the disease; therefore, one should highlight the importance of performing the sputum smear microscopy test in a timely manner.[17]

People who live in the same environment with individuals diagnosed with active pulmonary tuberculosis have a high risk of infection. From this perspective, the importance of immediate investigation of these cases is reinforced, as well as contact tracking, with a view to enabling the early detection of new cases of infection both in the active form and in the latent infection. This practice is

essential for breaking the transmission of the disease and reducing the possible spread of resistance to antituberculosis drugs.[18]

Regarding pulmonary cases without abandonment, the entire study period had a regular performance in this indicator. Numerous practices performed by health professionals are of great importance and can help in the success of the treatment. An example of them is the Directly Observed Treatment (DOT), a key tool within the patient's treatment that has as one of its main objectives to enable adherence, ensuring the patient's cure, interrupt the chain of transmission and reduce the abandonment rate.[19]

In this sense, the importance of health promotion in tuberculosis control is noted. Educational and prevention strategies should be strengthened, especially in vulnerable populations, in order to raise awareness of the symptoms and the importance of early diagnosis. Social mobilization campaigns and actions integrated with Primary Health Care can contribute to reducing transmission rates and treatment abandonment.

The indicator "HIV testing" showed a regular performance in most years, giving a poor performance only in 2018. The Tuberculosis Control Manual recommends offering these tests to all patients diagnosed with tuberculosis, considering that the early diagnosis of this infection has an important impact on the evolution of both diseases.[17] The improvement in the testing indicator over the years may reflect the attention of health professionals regarding compliance with this recommendation.

It is worth noting that, in people living with HIV/AIDS, active tuberculosis is the condition with the greatest impact on AIDS and TB mortality rates. The Global Tuberculosis Control Report, presented by the WHO, considers that people living with this infection are 21 to 34 times more favorable to becoming ill with active TB compared to the general population. In this understanding, it is necessary to structure and organize health services, with the aim of reinforcing specific actions related to TB/HIV co-infection.[20]

However, this study presents some important considerations. The scarcity of evaluations of the epidemiological surveillance system for tuberculosis in other regions of the country should not be seen only as a limitation, but as a timeliness for exalting the relevance of this study. The study contributes with updated and specific data, filling gaps in the literature and providing subsidies for future investigations in different regional contexts in Brazil. In addition, the evaluation does not foresee the difficulties inherent to the development of the routine by the team, only the weaknesses of the system, being an important element to broadly evaluate not only the system but also the surveillance process, through the users. The production of the present study can also be considered fundamental to identify the fragility of the system in a global way, giving the timeliness for future work, with a view to deepening this theme.

In addition, this study has important practical implications for tuberculosis surveillance in Natal-RN. It is recommended that health professionals be continuously trained to fill out the notification forms correctly and in a timely manner. Moreover, it is necessary to implement strategies that ensure the early start of treatment and the proper follow-up of contacts. Improvements in the structure of information systems, with investments in technology and human resources, can increase the effectiveness of surveillance and, consequently, reduce TB incidence and mortality.

CONCLUSION

The results allow us to conclude that the epidemiological surveillance system for tuberculosis in Natal-RN has good levels of completeness in general variables, such as gender, age group and race/color. Nonetheless, there are critical challenges related to the completeness of complementary data, such as sputum smear microscopies and contacts examined, and to the consistency of records. In addition, the timeliness for notification and treatment proved to be unsatisfactory, especially during the period of the COVID-19 pandemic, which impacted health services.

In order to improve the effectiveness of the system, it is necessary to implement strategies for continuous training of health professionals, in addition to reinforcing the importance of accurate and timely completion of notification forms. Investments in technology and human resources are essential to improve data collection and management processes, contributing to the reduction of tuberculosis incidence and mortality. Accordingly, the surveillance system will be able to provide more reliable information and support effective public policies to control the disease.

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