

INCIDÊNCIA DE TUBERCULOSE EM TEMPOS DE COVID-19

TUBERCULOSIS INCIDENCE IN TIME OF COVID-19

Laura Mendes Lopes¹, Matheus de Almeida¹, Artur Blos Lopes¹, Maressa Neves Ayer¹,
Thelma Skare¹, Renato Nisihara^{1*}

¹Faculdade Evangélica Mackenzie do Paraná, Curitiba, Paraná.

*Corresponding author: Faculdade Evangélica Mackenzie do Paraná, Departamento de Medicina.
Rua Padre Anchieta, 2770 — Brasil CEP 80730-000 Tel.+55 41 99911 9572
E-Mail: renatonisihara@gmail.com; renato.nisihara@fempar.edu.br

RESUMO

Introdução: A taxa de detecção de tuberculose pode ter mudado durante a pandemia de COVID-19 pela nova realidade e hábitos criados para combater a pandemia. **Objetivo:** Analisar a incidência de tuberculose no Brasil durante os anos de 2018 a 2020; comparando-se os períodos e as populações vulneráveis. **Métodos:** Foram coletados dados presentes no Cadastro do Ministério da Saúde do Brasil sobre a incidência de tuberculose nos anos de 2018, 2019 e 2020, levando em consideração a distribuição por idade, sexo e grupos vulneráveis como moradores de rua, presidiários, profissionais de saúde e imigrantes. **Resultados:** Observou-se diminuição do número de novos casos de tuberculose no ano de 2020 comparado com 2018 e 2019. Não foram observadas diferenças na proporção de homens e mulheres e nem por faixa etária. Dentre os indivíduos vulneráveis, verificou-se que mantiveram, em 2020, a mesma proporção observada em 2018 e 2019. **Conclusão:** A detecção de novos casos de tuberculose diminuiu durante a pandemia de COVID19 em todos os segmentos da população estudada.

Palavras-chave: Tuberculose; pandemia; populações vulneráveis.

ABSTRACT

Introduction: The detection rate of tuberculosis may have changed during the COVID-19 pandemic due to the new reality and habits created to combat the pandemic. **Objective:** To analyze the incidence of tuberculosis in Brazil during the years 2018 to 2020; comparing the detection rate during this period in general and vulnerable populations. **Methods:** Data on the incidence of tuberculosis in the years 2018, 2019, and 2020 were collected from the Registry of the Brazilian Ministry of Health, taking into account the distribution by age, sex, and affiliation to vulnerable groups such as homeless people, inmates, health professionals and immigrants. **Results:** The overall number of new tuberculosis cases in 2020 was lower than in 2018 and 2019. There was no difference in the percentage of men and women or between age groups. The incidence of tuberculosis among people belonging to vulnerable groups remained the same in 2020 as in 2018 and 2019. **Conclusion:** New cases of tuberculosis decreased equally in all segments of the population studied during the COVID-19 pandemic.

Keywords: Tuberculosis; pandemic; vulnerable populations.

INTRODUCTION

Tuberculosis (TB), caused by *Mycobacterium tuberculosis* is an infectious disease recognized since antiquity. However, it is still one of the main infectious causes of death in the world, despite the great advances in its diagnosis and treatment (1,2). According to the WHO, it is estimated that in 2019, about 10 million people around the world became ill with TB, and approximately 1.4 million deaths from the disease were accounted for (3). The prevalence and incidence of the infection is influenced by individual patient factors, social, community and health system aspects (4) and is more common among the marginalized population and those with low socioeconomic status (2). About 95% of new TB cases appear in countries with few economic resources (4). In 2015, the WHO launched a “Strategy to End TB 2016–2035”, with the aim of universally aligning the fight against TB, addressing not only aspects of the disease, but also its social and economic determinants (5).

In late 2019, a novel coronavirus was recognized as the cause of pneumonia cases in Wuhan, China. This infection spread rapidly, resulting in a global pandemic, causing the interruption of many routine health services, including those intended for the treatment of TB (6-8). *Mycobacterium tuberculosis* and SARS-CoV-2 are infectious agents that, although they belong to different groups of microorganisms, are both spread by airborne transmission, although SARS-CoV-2 is much more infectious (9). A WHO (World Health Organization) survey in 165 countries showed that 42% of them had interruptions in their tuberculosis detection and treatment strategies (7).

In countries such as Peru, the COVID-19 pandemic has negatively impacted health programs focused on TB, due to the diversion of resources to control the pandemic. Consequently, combat measures, epidemiological surveillance of tuberculosis cases were affected and data point to an increase in the number of cases, especially of multidrug-resistant tuberculosis, and to the underdiagnosis of the disease (10). In Brazil, data are available at the Ministry of Health databases, and knowledge and discussion of such numbers is important for health professionals involved in the fight against TB. Although the provision of services to combat TB has not been interrupted in Brazil, the demand for them by patients may have been impacted by the fear of contamination by SARS-CoV-2.

This study aims to analyze the detection rate of new tuberculosis cases in the years 2018 and 2019 compared to 2020 in Brazil, assessing the impact of the pandemic.

METHODS

Information on tuberculosis comes from the “Sistema de Informação de Agravos de Notificação” (Sinan), publicly available in the internet in the DATASUS database (11). Thus, submission to the Research Ethics Committee was waived. TB incidence data were obtained from the Brazilian Ministry of Health Registry in the years 2018, 2019 and 2020. Stratification was performed according to the patient’s sex and age. The incidence of TB in vulnerable groups was studied, such as inmates, homeless, immigrants and health professionals. TB cases were grouped into quarters and compared.

STATISTICAL ANALYSIS

The collected data were spread out using the Excel® program. Statistical analyzes are descriptive and expressed in absolute numbers and percentages. P values lower than 5% were considered statistically significant.

RESULTS

Table 1 and **figure 1** show the numbers of cases over the years studied according to sex and age emphasising the decrease of the total detections as well as 2020. Previously, before the lockdown period, the number of new cases was similar to earlier years, between 23 and 24 thousand cases in the quarter. From the second quarter of 2020 onwards, there was an important reduction of the number of detected cases (-25.8%) in the months of April, May and June 2020. The same situation would remain in the last two quarters of 2020 with lower numbers than 2018 and 2019.

There was no significant difference ($P = 0.62$) between the proportion of men and women; the same occurs in the different age groups.

Table 1 - Numbers of TB cases over the years 2018, 2019 and 2020 according to sex and age.

Quarters	2018				2019				2020			
	1	2	3	4	1	2	3	4	1	2	3	4
TOTAL	23861	24185	24958	23651	23861	24185	24958	23651	24936	18501	21765	20958
MEN	16757	17061	14400	16469	16757	17061	14400	16469	17632	13097	15318	14675
WOMEN	7102	7119	7557	7180	7102	7119	7557	7180	7304	5404	6447	6283
Age												
Until 9 years	185	280	318	280	371	444	512	493	389	282	331	322
Until 19 years	1640	1672	1825	1693	1575	1556	1597	1509	1502	990	1230	1207
20- 49 years	14 447	15162	15787	14835	15127	15244	15849	14868	15599	11857	13699	13020
50- onwards	6408	6704	18970	23446	6784	6931	6988	6730	6988	4986	6040	5938

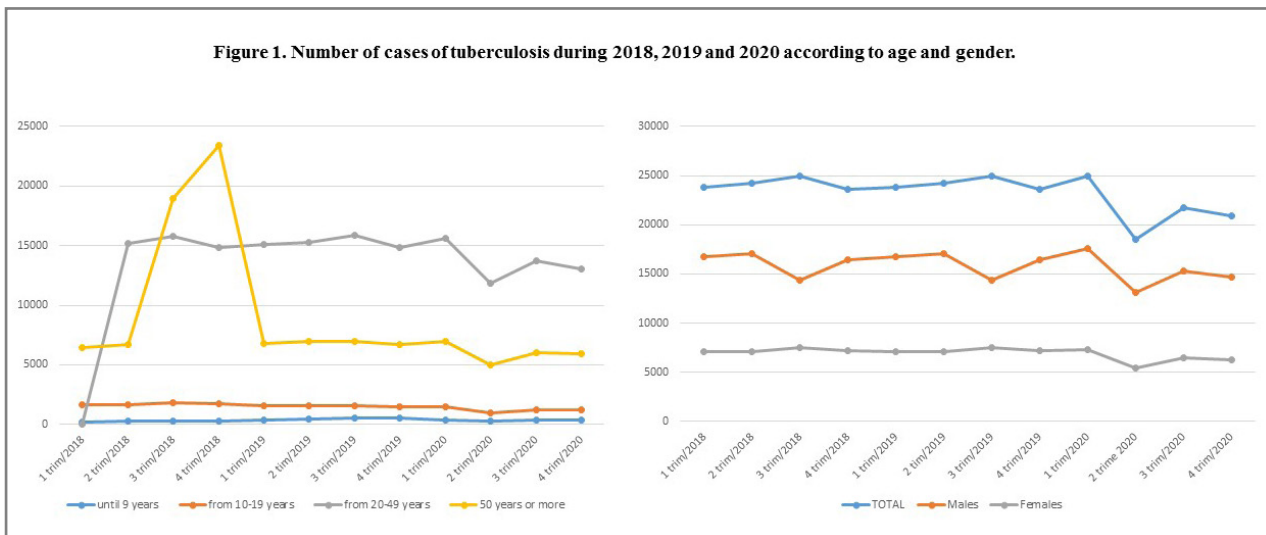


Table 2 shows the distribution of tuberculosis incidence in risk groups in the three years studied. No significant differences were observed in the proportion of cases in these groups during this period of years. However, it is interesting to observe that there was a reduction in the number of cases between 2019 and 2020. Nevertheless, it was -10.8% lower than that observed in the general population. In all the vulnerable populations evaluated, the reduction in the number of cases was around 10%, being the most expressive among health professionals, which it was observed a reduction of 13.4%.

Table 2 - Incidence of tuberculosis cases in high-risk populations during the years 2018, 2019 and 2020.

	2018 (n=94,720)	2019 (n=96,655)	2020 (n=86,166)
Homeless people	3432 (3.6%)	3683 (3.8%)	3530 (4.0%)
Healthcare professionals	1225 (1.2%)	1167 (1.2%)	1324 (1.5%)
People deprived of liberty	10885 (11.5%)	11755 (12.1%)	10514 (12.2%)
Immigrants	681 (0.7%)	646 (0.6%)	586 (0.6%)

DISCUSSION

The data raised into account some questions about the reduction of tuberculosis cases reported in Brazil in 2020 comparing the two previous years. The beginning of March 2020 was marked by the beginning of Covid-19 cases in Brazilian territory, that increased exponentially over the months. Therefore, social distancing and personal care measures were implemented by the Brazilian government to stop the spread of the pandemic in Brazil. Mandatory use of masks in public places and the establishment of restrictions on agglomerations were required (12). It can be said that the general population was apprehensive about the circulation of the new virus and adhered to such measures, including when circulation was restricted.

Our results showed that in 2020 there was a decrease in the total number of TB detections, without changes in the pattern according to sex, age group or presence of high risk of contagion. This reduction was also observed by other authors. Migliori et al. (13) studying 32 centers in several countries, observed a reduction of 27 (84%) of them in the first 4 months of 2020 when compared to the same period of 2019.

The reduction observed in new cases may have several explanations. It can be inferred that the use of masks and social distancing may have helped to reduce contamination. A study published in 2020 linked the use of masks during the Covid-19 pandemic and the decrease in active cases of Influenza. The circulation of the virus dropped rapidly after the implementation of social restriction measures, and in about 2 weeks there was a significant reduction in transmissions (14). Thus, the fact of using masks and maintaining distance can be important factors in reducing the notification of tuberculosis cases in Brazil. Additionally, it is possible that there has been a decrease in the use of health services (15). Therefore, this reduction may represent the non-detection of new cases, which is a worrying situation. Although there are no corroborating publications, it is possible to hypothesize that the health system itself may have diverted resources destined for TB care centers to use in the fight against COVID-19. Another possibility is that the patients themselves have not looked for treatment centers due to the fear of contamination by COVID-19. Not treating tuberculosis infection or treating it improperly can favor future spread of the disease and increase the risk of drug resistance (1,2). Efforts must be made to ensure that care for TB patients is preserved during the COVID-19 pandemic. The use of telemedicine has been proposed as an alternative to improve this situation (13). However, it must be kept in mind that the poorest population (that is, the most vulnerable and most susceptible to tuberculosis infection) may not have access to this resource.

In this study, it was not possible to detect a special group of the population that was more susceptible to treatment interruption, in which it was able to concentrate efforts to reverse the problem. It seems to affect all studied segments of society. It is noteworthy, however, that among

the most vulnerable populations, there was a smaller reduction (about 10%) in relation to the general population. This fact may be associated with the lower incorporation of restrictive habits and mask use by this segment of the population.

In conclusion, this study reports a decrease in the detection of new TB cases in Brazil during the COVID-19 pandemic, a decrease that equally affected men and women of all age groups, as well as segments of the population considered to be more vulnerable. As tuberculosis is an entity with a high impact on morbidity and mortality, the possibility of not detecting new cases and consequently not instituting treatment is worrying and could have serious repercussions on public health. Therefore, it is necessary that not only government entities remain in charge of the diagnosis and monitoring of tuberculosis. Nevertheless, the entire medical community should be alert to the possible detection of new cases.

REFERENCES

- 1- Natarajan A, Beena PM, Devnikar AV, Mali S. A systemic review on tuberculosis. *Indian J Tuberc.* 2020; 67(3):295-311. doi: 10.1016/j.ijtb.2020.02.005.
- 2- Furin J, Cox H, Pai M. Tuberculosis. *Lancet.* 2019; 393(10181):1642-1656. doi: 10.1016/S0140-6736(19)30308-3.
- 3- World Health Organization. Global tuberculosis report 2020. [Acesso em 8 ago. 2021]. Disponível em: <https://www.who.int/publications/i/item/9789240013131>.
- 4- Laycock KM, Enane LA, Steenhoff AP. Tuberculosis in adolescents and young adults: emerging data on tb transmission and prevention among vulnerable young people. *Trop Med Infect Dis.* 2021;6(3):148. doi: 10.3390/tropicalmed6030148.
- 5- Lönnroth K, Raviglione M. The WHO's new End TB Strategy in the post-2015 era of the sustainable development goals. *Trans R Soc Trop Med Hyg.* 2016;110(3):148-50. doi: 10.1093/trstmh/trv108.
- 6- World Health Organization. WHO Director-General's opening remarks at the media briefing on COVID-19-11; 2020. [Acesso em 31 ago. 2021]. Disponível em: <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-mediabriefing-on-covid-19—11-march-2020>.
- 7 - World Health Organization. Pulse survey on continuity of essential health services during the COVID-19 pandemic: interim report, 27 August 2020; 2020. [Acesso em 31 ago. 2021]. Disponível em: https://www.who.int/publications/i/item/WHO-2019-nCoV-EHS_continuitiesurvey-2020.1.
- 8 - World Health Organization. Director-General's remarks at the media briefing on 2019-nCoV on 11 February 2020. [Acesso em 12 ago. 2021]. Disponível em: <http://www.who.int/dg/speeches/detail/who-director-general-s-remarks-at-the-media-briefing-on-2019-ncov-on-11-february-2020>.
- 9 - Silva DR, Mello FCQ, D'Ambrosio L, Centis R, Dalcolmo MP, Migliori GB. Tuberculosis and COVID-19, the new cursed duet: what differs between Brazil and Europe? *J Bras Pneumol.* 2021;47(2):e20210044. doi: 10.36416/1806-3756/e20210044.
- 10 - Khan FMA, Kazmi Z, Hasan MM, Dos Santos Costa AC, Ahmad S, Essar MY. Resurgence of tuberculosis amid COVID-19 in Peru: Associated risk factors and recommendations. *Int J Health Plann Manage.* 2021; 27. doi: 10.1002/hpm.3291.

- 11 - Brasil, Ministério da Saúde. Banco de dados do Sistema Único de Saúde - DATASUS, Informações de Saúde, Rede assistencial. [Acesso em 31 ago. 2021] Disponível em <http://tabnet.datasus.gov.br/cgi/tabcgi.exe?sinanet/cnv/tubercbr.def>.
- 12 - Coronavírus Brasil. [Internet]. 2018. [Acesso em 28 jun. 2021]. Disponível em: <https://covid.saude.gov.br>.
- 13 - Migliori GB, Thong PM, Akkerman O, Alffenaar JW, Álvarez-Navascués F, Assao-Neino MM, et al. Worldwide Effects of Coronavirus Disease Pandemic on Tuberculosis Services, 2020 jan./abr. *Emerg Infect Dis.* 2020;26(11):2709-2712. doi: 10.3201/eid2611.203163.
- 14 – Olsen SJ. et al. Decreased influenza activity during the COVID-19 pandemic—United States, Australia, Chile, and South Africa. *Am. J. Transplant.* 2020 dez.; 20 (12): 3681-3685. doi: 10.1111/cjt.16381.
- 15 - Comella-Del-Barrio P, De Souza-Galvão ML, Prat-Aymerich C, Domínguez J. Impact of COVID-19 on Tuberculosis Control. *Arch Bronconeumol.* 2021 abr.; 57 (2): 5-6. doi: 10.1016/j.arbres.2020.11.016