

ORIGINAL ARTICLE

# Analysis of the Vulnerability Profile of tuberculosis co-infection in people living with HIV

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## Abstract

**Introduction:** studies that seek to identify and outline the vulnerability profile contribute to directing necessary interventions to be carried out in people with tuberculosis (TB) and HIV (acronym in English for human immunodeficiency virus) co-infection, to achieve the end of TB.

**Objective:** to describe the profile of people with tuberculosis and HIV co-infection, from 2016 to 2018, in Espírito Santo, Brazil.

**Methods:** this is a cross-sectional descriptive study, using secondary data from the Notifiable Diseases Information System (SINAN) for TB and HIV, through a methodological process of database preparation and descriptive data analysis, the information was encoded and stored anonymously in a database in Excel for Windows®; Afterwards, the STATA statistical package, version 16 (Stata Corp LP, College Station, TX, USA) was used to carry out descriptive analyses with identification of relative and absolute values, and tables were generated for data analysis. The study was approved by the Research Ethics Committee of the Health Sciences Center of the Federal University of Espírito Santo (CEP/CCS/UFES) under opinion number 4022892 on 05/12/2020.

**Results:** of a total of 4,428 cases, 325 cases were TB-HIV co-infection, 322 cases were located in the SINAN-TB database and three cases were located after linking with the SINAN-HIV database that presented a record of negative results for the diagnostic test of HIV in the SINAN-TB database. There was a profile with a predominance of men (71%), young people (20 to 39 years old) (52%), mixed race (59%), up to 8 years of schooling (25%), of which 29% reported alcohol consumption, 26% used illicit drugs, and 37% were smokers, who had the pulmonary form of the disease (66%), they reported adherence to antiretroviral therapy (65%) and only 44% had a cure outcome at closure and 20% stopped treatment; the majority of cases (61%) did not undergo directly observed treatment and only 6.9% of cases reported receiving assistance from the government's income transfer program.

**Conclusion:** in order to ensure greater coverage of tuberculosis control in PLHIV patients, it is necessary to expand the dialogue between health and social support policies; enable access to health services such as antiretroviral treatment for all people diagnosed with HIV, and timely directly observed treatment (DOT) for people who present this vulnerability profile. Carrying out new studies is essential to contribute to technological advancement and planning in health service actions.

**Keywords:** tuberculosis, HIV, epidemiology, health profile, public health.

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## Authors summary

### Why was this study done?

It was done due to a different methodological process for the processing and arrangement of data. When carrying out a search in the scientific literature, it was found that after the inclusion of new variables in the compulsory notification form from 2016 onwards, few studies sought to understand the profile of TB-HIV co-infection in Espírito Santo, Brazil, using the System database of Notifiable Diseases Information. In order to address sociodemographic and clinical factors to favor the evaluation of measures and the targeting of interventions necessary to control the chain of transmission of the disease among people with TB-HIV co-infection and consequently achieve strategies for the end of TB.

### What did the researchers do and find?

A methodological process of data processing was carried out before carrying out the descriptive analysis and outlining the epidemiological profile. With this process it was possible to identify that three cases were still considered negative in the Tuberculosis database, and when carrying out a Linkage between the TB and HIV database, they were found to be positive in the HIV database. In addition to the individual vulnerability profile among young people, men, mixed race/color; programmatic vulnerability, which consists of access to health services, for example, failure to carry out DOT and Antiretroviral Therapy; and social vulnerability, knowing that the double burden of the disease increases catastrophic costs for the individual and their family, most records show that individuals do not receive income transfers from the government.

### What do these findings mean?

They mean that the vulnerability profile found is in accordance with the literature and has been widely discussed over the years, but even with scientific and technological advances there are still difficulties in putting into practice [solutions to] the problems listed and providing access to health and citizens' rights.

### Highlights

Predominance of cases of TB-HIV co-infection in young men, mixed race/skin color and complete primary education.

Most declare that they did not undergo Directly Observed Treatment (DOT).

Less than two thirds of registered cases used antiretroviral therapy.

Not even half of the cases (40%) showed a cure outcome at the end of treatment.

Only 6% of individuals declared receiving income transfers from the government.

## INTRODUCTION

Tuberculosis (TB) is the leading cause of death among people living with HIV (human immunodeficiency virus) (PVHIV)<sup>1,2</sup>. Reduced access to TB diagnosis and treatment during the new coronavirus disease pandemic as of 2019 (COVID-19) reversed years of progress in providing essential services to control this disease. Globally, the estimated number of deaths from TB increased between 2019 and 2021, unlike the decline observed between 2005 and 2019<sup>2</sup>. In 2022 it was considered the second leading cause of death worldwide.

In Brazil, between 2012 and 2019, the proportion of new TB cases tested for HIV increased by around 15%, reaching 82.8% in 2019. In 2020 and 2021, there was a decrease in new TB cases tested for HIV, with proportions of 82.6% and 82.7%, respectively, and in 2022 this rate was 79.7%<sup>2-4</sup>. In 2022, while the co-infection rate was 8.4% in Brazil, the state of Espírito Santo had a co-infection rate of 8.1% in 2020.

In addition to HIV infection, other risk factors are related to TB infection and illness, such as: overcrowding, impoverishment, poor living conditions, injectable drug use, alcohol use, smoking, diabetes, lack of access to health and malnutrition, among other factors<sup>1,2,5</sup>.

A study published in 2021, carried out in the Republic of Congo<sup>6</sup> from 2014 to 2019, with 49,460 people, identified that situations related to poor provision of health services, linked to the inherent characteristics of individuals, such as co-infection, for example, increase the risk of unfavorable outcomes of death, loss to follow-up and absence or suppression of viral load. Furthermore, the study suggests that addressing the social stigmas and clinical challenges faced in TB/HIV co-infection can favor the control of the tuberculosis transmission chain.

Studies that seek to identify and outline the vulnerability profile favor the targeting of necessary interventions to be carried out in people with TB-HIV co-infection, and consequently, achieve strategies to end TB<sup>7</sup>. The objective of this study was to outline the epidemiological profile of people with TB-HIV co-infection in the State of Espírito Santo, Brazil.

## METHODS

This is a cross-sectional and descriptive study, using secondary data reported in the Notifiable Diseases Information System (SINAN-TB), in the period from 2016 to 2018 and in SINAN-HIV, in the period from 2007 to 2019, made available by the State Department of Health (SESA)<sup>8</sup>.

The study included records of cases diagnosed with tuberculosis and HIV, among those residing in the state of Espírito Santo, a location chosen due to the opportunity to access the nominal database, to carry out a methodological strategy for data processing; and records that were duplicates were excluded<sup>8</sup>. Subsequently, data preparation was carried out, with duplication analysis and linkage with the HIV bank in order to obtain information regarding HIV; the data was anonymized and removed from the State Department of Health (SESA) in June 2022 to proceed with the analysis, according to figure 1.

In addition to the variables of Tuberculosis (ICD10: A15-A19) and HIV (ICD10: B20-B24), other variables were used, classified and analyzed according to vulnerability levels, according to the study method published by Maciel and collaborators in 2015<sup>9</sup>. The variables used at the "individual vulnerability level" were: sex, age, race/skin color, educational level and associated

diseases; for the “programmatic vulnerability level”, the variables were: form of TB, sputum smear microscopy, culture, DOT, ART during TB treatment, type of entry and closure status; and for the level of “social vulnerability”, the variables used were: special populations and beneficiary of the government’s income transfer program.

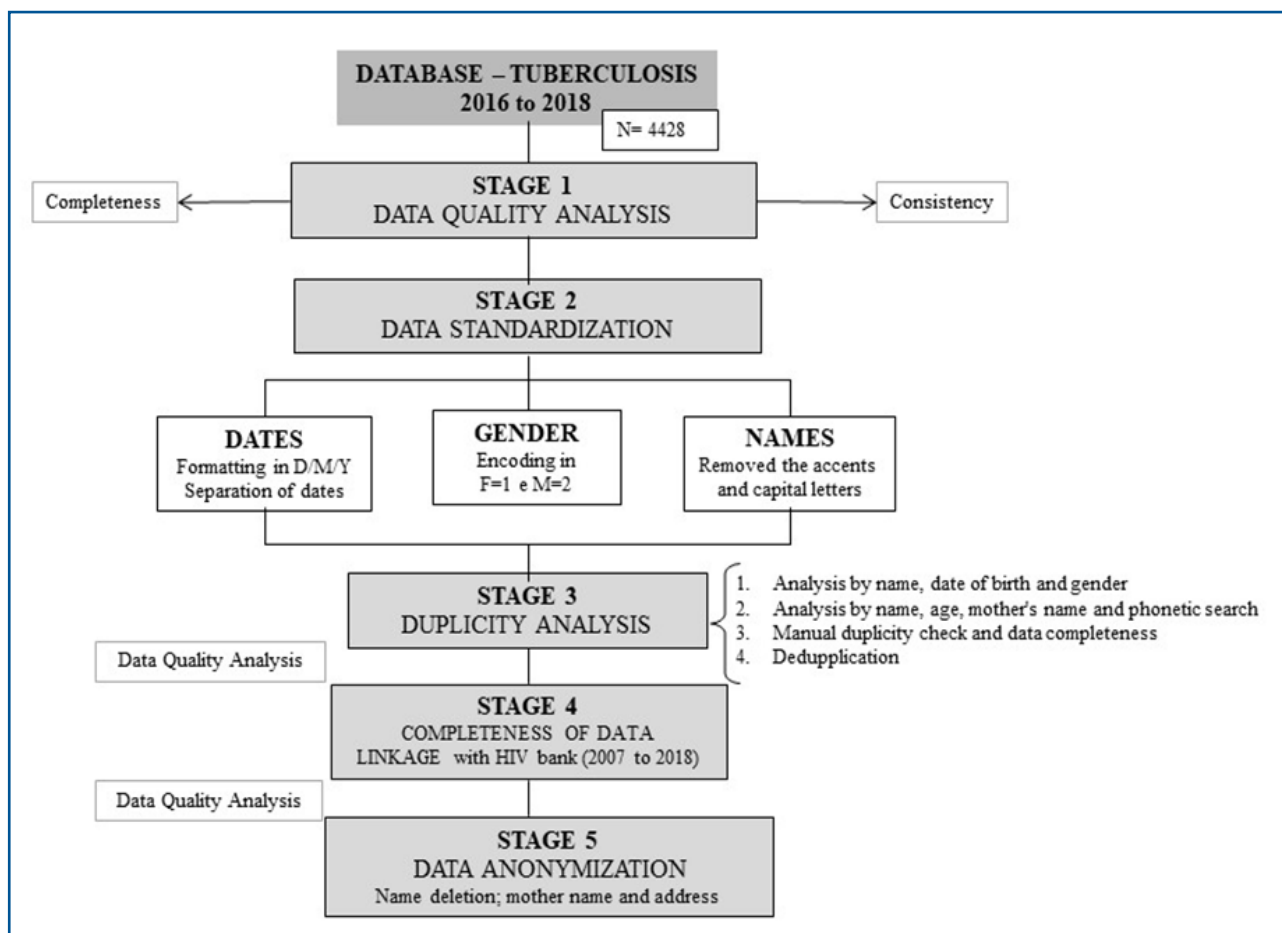
The information was encoded and stored anonymously in a database in Excel for Windows®; the STATA statistical package, version 16 (Stata Corp LP, College Station, TX, USA) was used to carry out descriptive analyses with identification of relative and absolute values.

The study was approved by the Research Ethics Committee of the Health Sciences Center of the Federal University of Espírito Santo (CEP/CCS/UFES) under opinion # 4022892 on 05/12/2020, according to Resolution # 466/12 of the National Health Council (CNS).

## RESULTS

The SINAN-TB database, from 2016 to 2018, in Espírito Santo, Brazil, presented a total of 4,428 cases; After carrying out the steps described in figure 1, 325 cases of TB-HIV co-infection were identified, of which 322 cases were located in the SINAN-TB database, and three cases were located after linking with the SINAN-HIV database, which presented a result record negative for the HIV diagnostic test in the SINAN-TB database.

Among the 325 cases of TB-HIV co-infection, 232 (71%) were males, 169 (52%) were between 20 and 39 years old, 190 (59%) declared themselves mixed race, 80 (25%) had completed primary education, 291 (89%) had AIDS, 96 (29%) had alcoholism, 85 (26%) used illicit drugs, and 122 (37%) were smokers. (tables 1 and 2).



**Figure 1:** Flowchart on the methodology of the data preparation process in the SINAN-TB database, during the period from 2016 to 2018.

Source: The Authors, 2023

**Table 1:** Distribution of demographic factors of individual vulnerability related to interruption of TB treatment in PLHIV in Espírito Santo, in the period from 2016 to 2018.

CHARACTERISTICS	Total N	%
Gender	N= 325	
Feminine	93	28.6
Masculine	232	71.4
Age, years	N= 325	
< 20	6	1.9
20-39	169	52.0
40 – 59	135	41.5
> 60	15	4.6
Race/skin color	N= 321	
White	68	21.1
Black	37	11.5
Mixed	190	59.2
Ignored	26	8.2
Education, years studied	N= 325	
Illiterate	9	2.88
1 a 4 years	52	16.6
5 - 8 years	80	25.5
9 a 12 years	69	22.0
> 12 years	14	4.5
N/A	89	28.5

Source: The Authors, 2023

A total of 215 (66%) had the pulmonary form of TB, only 55 (23%) had a positive result for smear microscopy and 120 (36%) of the cases had a positive result for culture, 143 (61%) cases did not undergo DOT, and 194 (65%) of the cases used ART. Regarding the type of entry, 253 (77%) were considered new cases; regarding the case closure situation, there was a predominance of the cure outcome with 145 (44%) cases, 66 (20%) died from other causes and 40 (12%) abandoned treatment (table 3). Regarding the social aspect, the study showed that only 22 (6.9%) people reported receiving assistance from the government's income transfer program (table 4).

**Table 3:** Distribution of programmatic vulnerability factors related to interruption of TB treatment in PLHIV in Espírito Santo, in the period from 2016 to 2018.

CHARACTERISTICS	Total N	%
Type	N= 325	
Pulmonary	215	66.1
Extrapulmonary	75	23.1
Pulmonar + Extrapulmonary	35	10.8
Putum Smear Microscopy	N= 236	
Positive	55	23.3

**Table 2:** Distribution of clinical factors of individual vulnerability related to interruption of TB treatment in PLHIV in Espírito Santo, in the period from 2016 to 2018.

CHARACTERISTICS	Total N	%
Illness – AIDS	N= 325	
No	26	8.0
Yes	291	89.6
Ignored	8	2.4
Illness – alcoholism	N= 322	
No	211	65.5
Yes	96	29.8
Ignored	15	4.7
Illness – diabetes	N= 322	
No	289	89.8
Yes	9	2.8
Ignored	24	7.4
Illness – mental health	N= 322	
No	287	89.1
Yes	13	4.0
Ignored	22	6.9
Illness – Illicit drug use	N=324	
No	219	67.6
Yes	85	26.2
Ignored	20	6.2
Illness – smoking	N=322	
No	180	55.9
Yes	122	37.9
Ignored	20	6.2
Illness – others	N= 297	
No	249	83.8
Yes	24	8.1
Ignored	24	8.1

Source: The Authors, 2023

**Continuation - Table 3:** Distribution of programmatic vulnerability factors related to interruption of TB treatment in PLHIV in Espírito Santo, in the period from 2016 to 2018.

CHARACTERISTICS	Total N	%
Directly Observed Treatment	N= 233	
No	143	61.4
Yes	84	36.0
Ignored	6	2.6
Antiretroviral Therapy		
During TB Treatment	N= 297	
No	91	30.7
Yes	194	65.3
Ignored	12	4.0
Entry	N= 325	
New Case	253	77.9
Recidivism	26	8.0
Re-entry after interrupting treatment	12	3.7
Unknown	1	0.3
Transferral	27	8.3
After death	6	1.8
Situation of Closure	N= 323	
Cure	145	44.9
Interrupting treatment	40	12.4
Death	12	3.7
Death due to other causes	66	20.4
Transferral	36	11.1
Change of diagnosis	15	4.6
TB-DR	3	0.9
Change of Plans	5	1.5
Bankruptcy	0	0
Primary	1	0.3
Abandonment		

Source: The Authors, 2023

## DISCUSSION

Over the last few years, several advances have been achieved by TB control programs in all spheres of management of the Unified Health System (SUS). However, there are still challenges to be overcome to achieve the objective of ending TB as a public health problem in Brazil. The sociodemographic profile identified in this study corroborates the literature regarding individual, social and programmatic vulnerability<sup>10-12</sup>. There is a recurrence of cases of TB-HIV co-infection in young men, mixed race/skin color and complete primary education. The majority presented the pulmonary form of the disease, admitted as a new case, a significant number declared that they were smokers and had not undergone DOT. Less than two-thirds

**Table 4:** Distribution of social vulnerability factors related to interruption of TB treatment in PLHIV in Espírito Santo, in the period from 2016 to 2018.

CHARACTERISTICS	Total N	%
Beneficiary of the Government Income Transfer Program	N= 315	
No	203	64.5
Yes	22	6.9
Ignored	90	28.6
Special Populations – Immigrants	N= 320	
No	307	95.9
Yes	0	0.0
Ignored	13	4.1
Special Populations – Deprived of liberty	N= 320	
No	294	91.9
Yes	16	5.0
Ignored	10	3.1
Special Populations – Homeless Population	N= 320	
No	280	87.5
Yes	31	9.7
Ignored	9	2.8

Source: The Authors, 2023

of registered cases used ART and not even half of the cases showed a cure outcome at the end of treatment.

The limitations of the study are related to the small sample size due to the period considered for the study, which was chosen as a result of the insertion of new variables of interest available in version 5 of the notification form, such as: the inclusion of special populations (population deprived of liberty, homeless population, health professionals and immigrants), beneficiaries of the government cash transfer program, ART during TB treatment, rapid molecular test for TB (TMR-TB), sensitivity test, and if transferred (inform transfer site), and the change in the variables “if extrapulmonary” (second option removed), “sputum smear microscopy” (second smear microscopy removed), “associated diseases and conditions” (including use of illicit drugs and smoking) and “follow-up smear microscopy” (included after the 6th month)<sup>13</sup>. A larger sample would allow the creation of more robust analyses in order to evaluate associations and identify predictive profiles.

In addition to being persistent, TB is also a perpetrator of poverty, as it compromises the health of individuals and their families, which causes economic and social impacts<sup>14</sup>. When considering the variables related to social vulnerability, the findings of this study reveal the maintenance of the unequal distribution of the number of cases, concentrating on disadvantaged social groups. A systematic review published in 2022 identified that the double burden of the disease, TB-HIV co-infection,

increases the catastrophic costs of the disease by up to 81%<sup>10-12,15</sup>. A study carried out in Brazil identified that 41% of people with TB experienced catastrophic costs and an increase in poverty during the diagnosis and treatment of the disease, including loss of income due to inability to work<sup>16</sup>. Connected to this situation, it is clear that not receiving income transfer resources from the government worsens the state of vulnerability, compromises access to health services and makes adherence to treatment unfeasible<sup>17</sup>.

When considering the variables related to social vulnerability, the findings of this study reveal the maintenance of the unequal distribution of the number of cases, concentrating on disadvantaged social groups. A systematic review published in 2022 identified that the double burden of the disease, TB-HIV co-infection, increases the catastrophic costs of the disease by up to 81%.

Regarding variables related to programmatic vulnerability, that is, situations in which institutions contribute to unfavorable contexts, the minority of cases had access to DOT, which is monitoring during medication intake, a strategy recommended by the Ministry of Health (MS) for PLHIV, homeless people, drug users and people deprived of their liberty, as they are more likely to give up treatment, which can result in drug resistance and increased disease transmission rates<sup>7,18</sup>. A study carried out in São Paulo, from 2010 to 2015, with 10,389 cases of TB-HIV co-infection, identified that treatment interruption is related to DOT coverage, that is, the lower the DOT coverage, the higher the treatment interruption rate will be; increasing the disease transmission chain<sup>19</sup>.

It has also been observed that more than a third of the population assessed did not use ART, unlike what has been proposed by the Ministry of Health since 2013, which recommends timely treatment with ART for all PLHIV<sup>14</sup>. Adherence to ART is related to a better prognosis of co-infection by minimizing viral replication and favoring the strengthening of CD4 T lymphocytes<sup>2,19,20</sup>.

The Ministry of Health also recommends that every user diagnosed with TB be tested for HIV, as early diagnosis will enable a better prognosis<sup>7</sup>. However, it was found that three users were considered negative for HIV in the SINAN-TB database despite having been identified in the SINAN-HIV database after linkage. This again indicates a situation of programmatic vulnerability, which can be resolved through the implementation of an interconnected information system that is capable of identifying and associating records in order to provide data evaluation through monitoring.

Upon considering the outcome, it was observed that a cure was more frequent, but this percentage did not reach even half of the cases. A cross-sectional study carried out in São Paulo, between 2010 and 2014 and using secondary data, identified that the occurrence of the cure outcome in cases of TB-HIV co-infection was lower when compared to cases with TB, which may be associated with the use

multiple medications, adverse effects, lack of family support and unpreparedness of the healthcare team in providing care for co-infection cases; thus, it is necessary to strengthen health programs, decentralize care and follow-up of cases, with the aim of increasing cure rates and minimizing unfavorable outcomes<sup>20</sup>.

Difficulties in accessing citizens' rights and other situations of vulnerability are the responsibility of the State. It is possible to verify a mobilization in terms of policies in order to promote a better relationship between social assistance and public policies for attention to infectious diseases linked to vulnerability, such as HIV infection and TB. The strategies included are: articulating health promotion and health monitoring activities, in addition to guaranteeing social protection, such as family monitoring and income transfer to users and family members affected by these public health problems<sup>21</sup>. However, it is not enough simply to have robust and comprehensive policies; it is now time for the creation of a referral system for patients in need of social assistance within SUS, in order to direct the necessary subsidies to control this public health problem.

In addition to identifying a sociodemographic profile of vulnerability, it was also possible to rethink health practices that have not yet been fully implemented, in order to provide control of this double burden of diseases. It is necessary that, combined with the strengthening of health actions, there is also an increase in inclusion and rights protection policy actions, such as social programs, as well as avoiding the growth of treatment interruption rates among PLHIV, with a focus on strategies to end TB by 2035.

## CONCLUSION

The profile of TB/HIV co-infection occurred in young men, of mixed race/skin color and with complete primary education, with the pulmonary form of tuberculosis, and type of entry as a new case. There was also a significant number of people who smoked and who did not perform the DOT. Less than two-thirds of registered cases used ART, only 40% of cases showed a cure outcome at the end of treatment, and a minimum number of people had access to the government income transfer program benefit.

In order to ensure greater coverage of tuberculosis control in PLHIV, it is necessary to expand the dialogue between health and social support policies; to enable access to health services such as antiretroviral treatment for all people diagnosed with HIV, and to provide timely directly observed treatment (DOT) for people who present this vulnerability profile. Carrying out new studies is essential to contribute to technological advancement and planning in health service actions.

## Research Funding

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## REFERENCES

1. Furin J, Cox H, Pai M. Tuberculosis. *Lancet*. 2019, 393(10181):1642-1656. doi: 10.1016/S0140-6736(19)30308-3.
2. World Health Organization (WHO). *Global Tuberculosis Report 2023*. Geneva, 2023.
3. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. *Boletim Epidemiológico. Tuberculose 2022. Número Especial*. Brasília/DF. Mar, 2022.
4. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. *Boletim Epidemiológico. Tuberculose 2023. Número Especial*. Brasília/DF. Mar, 2023.
5. Hamada Y, Getahun H, Tadesse BT, Ford N. HIV-associated tuberculosis. *International Journal of STD & AIDS*. 2021, 32(9):780-790. doi:10.1177/0956462421992257.
6. Shah GH, Ewetola R, Etheredge G, Maluantesa L, Waterfield K, Engetele E, Kilundu A. Risk Factors for TB/HIV Coinfection and Consequences for Patient Outcomes: Evidence from 241 Clinics in the Democratic Republic of Congo. *Int. J. Environ. Res. Public Health* 2021, 18, 5165. <https://doi.org/10.3390/ijerph18105165>.
7. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. *Manual de Recomendações para o Controle da Tuberculose no Brasil*. 2ª edição. Brasília/DF, 2019.
8. Soares K K S, Hisatugu WH, Souza FM, Andrade RLM, Maciel ELN, Costa APR, Prado TN. Qualidade, oportunidade e tratamento de dados de tuberculose e coinfeção com vírus da imunodeficiência humana. *Revista de Epidemiologia e Controle de Infecção*. 2023. 13. 1. 10.17058/reci.v13i2.18102.
9. Maciel EL, Reis-Santos B. Determinants of tuberculosis in Brazil: from conceptual framework to practical application. *Rev Panam Salud Publica* 2015; 38(1):28-34.
10. Carvalho MVF, Silva ARS, Taminato M, Bertolozzi MR, Fernandes H, Sakabe S, Hino P. A Coinfeção tuberculose/HIV com enfoque no cuidado e na qualidade de vida. *Acta Paul Enferm*, 2022, 35. Doi: <http://dx.doi.org/10.37689/acta-ape/2022AO02811>
11. Gioseffi JR, Batista R, Brignol SM. Tuberculosis, Vulnerabilities, and HIV in homeless persons: a systematic review. *Revista de Saúde Pública* [online], 2022, 56:43. Doi: <https://www.scielosp.org/article/rsp/2022.v56/43/pt/>
12. Moreira ASR, Kritski AL, Carvalho ACC. Social determinants of health and catastrophic costs associated with the diagnosis and treatment of tuberculosis. *Jornal Brasileiro de Pneumologia* [online], 2020, 46(5). Doi: <https://doi.org/10.36416/1806-3756/e20200015>
13. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. *Vigilância epidemiológica da tuberculose: Análise de indicadores operacionais e epidemiológicos a partir da base de dados do Sinan versão 5.0*. V. 50. 2016.
14. Brasil. Ministério Da Saúde. Secretaria De Vigilância Em Saúde. Departamento de Vigilância, Prevenção e Controle das Infecções Sexualmente Transmissíveis, do HIV/Aids e das Hepatites Virais. *Protocolo Clínico e Diretrizes Terapêuticas Para Manejo da Infecção Pelo HIV em Adultos*. Brasília/DF. 2018.
15. Ghazy RM, El Saeh HM, Abdulaziz S, Hammouda EA, Elzorkany AM, Khidr H, Zarif N, Elrewany E, Elhafeez SAA. Systematic review and meta-analysis of the catastrophic costs incurred by tuberculosis patients. *Sci Rep*. 2022, 12:558. Doi: <https://doi.org/10.1038/s41598-021-04345-x>
16. Guidoni LM, Negri LSA, Carlesso GF, Zandonade E, Maciel ELN. Custos catastróficos em pacientes com tuberculose no Brasil: estudo em cinco capitais. *Esc Anna Nery*, 2021, 25(5). Doi: <https://doi.org/10.1590/2177-9465-EAN-2020-0546>
17. Freitas GL, França GEM, Souza TR, Macário VM, Camargo AF, Protti-Zanatta S. Diagnóstico e acompanhamento da tuberculose – diferenças entre população geral e populações vulnerabilizadas. *Cogitare Enferm*, 2022, (27). Doi: <https://doi.org/10.5380/ce.v27i0.83607>
18. Campoy LT, Arroyo LH, Ramos ACV, Andrade RLP, Arcoverde MAM, Alves JD, Arcêncio RA. Coverage of directly observed treatment according to the risk of tuberculosis/HIV coinfection and unfavorable outcomes. *Cogitare enferm*. [Internet]. 2019 24: e66775. Doi: <http://dx.doi.org/10.5380/ce.v24i0.66775>
19. Froes JR, Ajude LPTD, Barbosa MFS, Alves BF, Aranão HF, Furini AAC. Tuberculose pulmonar e extrapulmonar em pacientes com AIDS sob uso da Terapia Antirretroviral (TARV) de terceira linha. *RBAC*, 2020, 52 (4): 346-351. Doi: <http://dx.doi.org/10.21877/2448-3877.202100944>
20. Magnabosco GT, Andrade RL, Arakawa T, Monroe AA, Villa TC. Desfecho dos casos de tuberculose em pessoas com HIV: subsídios para intervenção. *Acta Paul Enferm*, 2019, 32(5):554-563. Doi: <http://dx.doi.org/10.1590/1982-0194201900077>

21. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Protocolo Clínico e Diretrizes Terapêuticas para Prevenção da Transmissão Vertical de HIV, Sífilis e Hepatites Virais. 2ª edição revisada. Brasília/DF, 2022.

### Resumo

**Introdução:** estudos que buscam identificar e traçar o perfil de vulnerabilidade, contribuem para o direcionamento de intervenções necessárias a serem realizadas em pessoas com a coinfeção tuberculose (TB) e HIV (sigla em inglês para human immunodeficiency vírus), para alcançar o Fim da TB.

**Objetivo:** descrever o perfil da pessoa com a coinfeção tuberculose e HIV, no período de 2016 a 2018, no Espírito Santo – Brasil.

**Método:** trata-se de um estudo transversal e descritivo, com uso de dados secundários do Sistema de Informação de Agravos de Notificação (SINAN) TB e HIV, através de um processo metodológico de preparação do banco e análise descritiva de dados, as informações foram codificadas e armazenadas anonimamente em um banco de dados no Excel for Windows®; após utilizou-se o pacote estatístico STATA, versão 16 (StataCorp LP, College Station, TX, EUA) para realização das análises descritivas com identificação dos valores relativos e absolutos, e foram geradas tabelas para análise dos dados. O estudo obteve aprovação junto ao Comitê de Ética em Pesquisa do Centro de Ciências da Saúde da Universidade Federal do Espírito Santo (CEP/CCS/UFES) sob o parecer de nº 4022892 em 12/05/2020.

**Resultados:** de um total de 4.428 casos, 325 casos eram de coinfeção TB-HIV, 322 casos foram localizados no banco SINAN-TB e três casos foram localizados após linkage com o banco SINAN-HIV que apresentaram registro de resultado negativo para o teste diagnóstico de HIV no banco SINAN-TB. Verificou-se um perfil com predomínio de homens (71%), jovens (20 a 39 anos) (52%), pardos (59%), tempo de estudo de até 8 anos (25%), do qual 29% relatam etilismo 26% faziam uso de drogas ilícitas, 37% eram tabagistas, que apresentavam a forma pulmonar da doença (66%), relatam adesão à terapia antirretroviral (65%) e apenas 44% com desfecho de cura no encerramento e 20% interromperam o tratamento; a maioria dos casos (61%) não realizaram o tratamento diretamente observado e apenas 6,9% dos casos relataram receber auxílio pelo programa de transferência de renda do governo.

**Conclusão:** a fim de garantir uma abrangência maior no controle da tuberculose em PVHIV, é necessária a ampliação no diálogo entre as políticas de saúde e de suporte social; possibilitar o acesso aos serviços de saúde como o tratamento antirretroviral à todas as pessoas diagnosticadas com HIV, e tratamento diretamente observado (TDO) oportuno às pessoas que apresentam esse perfil de vulnerabilidade. A realização de novos estudos, é imprescindível para contribuir no avanço tecnológico e planejamento nas ações de serviço em saúde.

**Palavras-chave:** tuberculose, HIV, epidemiologia, perfil de saúde, saúde pública.

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