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ORIGINAL ARTICLE

The distribution of tuberculosis in Porto Alegre: analysis of the magnitude and tuberculosis-HIV coinfection

DISTRIBUIÇÃO DA TUBERCULOSE EM PORTO ALEGRE: ANÁLISE DA MAGNITUDE E COINFECÇÃO TUBERCULOSE-HIV

DISTRIBUCIÓN DE LA TUBERCULOSIS EN PORTO ALEGRE: ANÁLISIS DE LA MAGNITUD Y COINFECCIÓN TUBERCULOSIS-VIH

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ABSTRACT

Objective: Analyzing the geographical distribution of the tuberculosis (TB), its incidence and prevalence and TB-HIV coinfection in the districts of Porto Alegre from 2007 to 2011. **Method**: An ecological, descriptive study of time series that used descriptive and geoprocessing techniques. **Results**: In total, were recorded 3,369 incident cases and 3,998 prevalent cases of pulmonary TB. In both contexts, there was predominance of cases in males and in Caucasians. Seventeen districts showed prevalence rates above 79.2 cases/100,000 inhabitants, considering that 15 of them had incidence rates above 73.7 cases/100,000 inhabitants. The TB-HIV coinfection rates reached 67% in some districts, which is above the city average value (30%). **Conclusion**: The distribution analysis showed that the reformulation and restructuring of policies and health services in Porto Alegre are essential.

RESUMO

Objetivo: Analisar a distribuição geográfica da doença, sua incidência, prevalência e a coinfecção TB - HIV nos bairros deste município nos anos de 2007 a 2011. **Método**: Estudo ecológico de série histórica, descritivo, que utilizou técnicas descritivas e de geoprocessamento. **Resultados**: Foram registrados 3.369 casos novos e 3.998 casos prevalentes de tuberculose pulmonar bacilífera. Em ambos os contextos houve predominância de casos no sexo masculino e na etnia branca. Dezessete bairros apresentaram taxas de prevalência acima de 79,2 casos/100.000 habitantes, sendo que 15 deles tiveram incidência acima de 73,7 casos/100.000 habitantes. A taxa de coinfecção TB-HIV chegou a 67% em alguns bairros, valor superior à média da cidade (30%). **Conclusão**: A análise de distribuição apontou que são fundamentais reformulações e reestruturações de políticas e serviços de saúde em Porto Alegre.

RESUMEN

Objetivo: Analizar la distribución geográfica de la enfermedad, su incidencia, prevalencia y la coinfección TB - VIH en los barrios de este municipio en los años de 2007 a 2011. **Método**: Estudio ecológico de serie histórica, descriptivo, que utilizó técnicas descriptivas y de geoprocesamiento. **Resultados**: Fueron registrados 3.369 casos nuevos y 3.998 casos prevalentes de tuberculosis pulmonar bacilífera. En ambos contextos hubo predominancia de casos en el sexo masculino y la etnia blanca. Diecisiete barrios presentaron índices de prevalencia superiores a 79,2 casos/100.000 habitantes, siendo que 15 de esos tuvieron incidencia arriba de 73,7 casos/100.000 habitantes. El índice de coinfección TB-VIH alcanzó el 67% en algunos barrios, valor superior al promedio de la ciudad (30%). **Conclusión**: El análisis de distribución señaló que son fundamentales las reformulaciones y reestructuraciones de políticas y servicios de salud en Porto Alegre.

DESCRIPTORS

Tuberculosis
HIV
Residence characteristics
Public health nursing

DESCRITORES

Tuberculose
HIV
Distribuição espacial da população
Enfermagem em saúde pública

DESCRIPTORES

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INTRODUCTION

Tuberculosis (TB) is a disease known as a global public health problem and of wide geographic distribution. It is strongly associated with poverty and social inequalities and has affected the most different population groups[1].

In 1993, the World Health Organization (WHO) declared the alarming situation of TB, inviting governments, the scientific community and civil society to focus urgent efforts to control it[2-3]. In recent decades, there has been significant progress on actions and programs to combat tuberculosis, a curable infection that still has high rates of incidence and deaths in several countries - it is estimated that in 2012, 8.6 million people developed the disease and 1.3 million died from it[4].

Brazil is among the 22 countries estimated to concentrate 80% of TB cases in the world[5], recording 71,930 new cases of the disease in the year 2010, in a proportion of 37.7 cases / 100,000 inhabitants[6]. In the country, the homeless, deprived of freedom, indigenous and carriers of Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS) are considered the most vulnerable populations to the disease[7].

Porto Alegre, located in the state of Rio Grande do Sul (RS), is one of the Brazilian capitals with higher incidence rates of tuberculosis. In this municipality, the recent annual incidence rates of the disease have been more than 100 cases / 100,000[8] inhabitants, considered a high level of epidemiological risk[9]. Furthermore, both the state of RS as its capital Porto Alegre have been prominent in the Brazilian scenario regarding the high rates of TB-HIV coinfection, around 20% and 30%, respectively. These values far exceed the national rate (not exceeding 10%), constituting a worrying scenario that requires joint actions of prevention and care. Factors such as the growth of pockets of poverty, the breakdown of health services and the spread of AIDS may help to explain such numbers[8].

Thus, in view of the severity of TB in Porto Alegre, the objective of this analysis was to determine the geographic distribution of the disease by city districts, its incidence rates and the average prevalence observed in the period 2007-2011, as well as knowing the TB-HIV coinfection. From the behavior of the disease in the city in recent years, we started with the assumption that there are districts with higher rates of incidence and prevalence of TB because of their social indicators.

Due to the lack of geoprocessing studies of this nature regarding the city in question, this study may be more a theoretical subsidy for future local reformulations and improvements in the local policies.

METHOD

This is an ecological, descriptive study of time series, which used geoprocessing (GIS) techniques to map the distribution of TB and TB-HIV cases in Porto Alegre. The study population consisted of patients with bacilliferous pulmonary TB notified in Porto Alegre in the period 2007-2011.

Data were extracted from the Tuberculosis Notification/Investigation Forms of the Notifiable Diseases Information System (SINAN – Sistema Nacional de Agravos de Notificação). Data collection was carried out in November 2012 with the municipal agency of General Coordination of Health Surveillance (CGVS – Coordenadoria Geral de Vigilância em Saúde) in Porto Alegre, in the Communicable Disease Surveillance team.

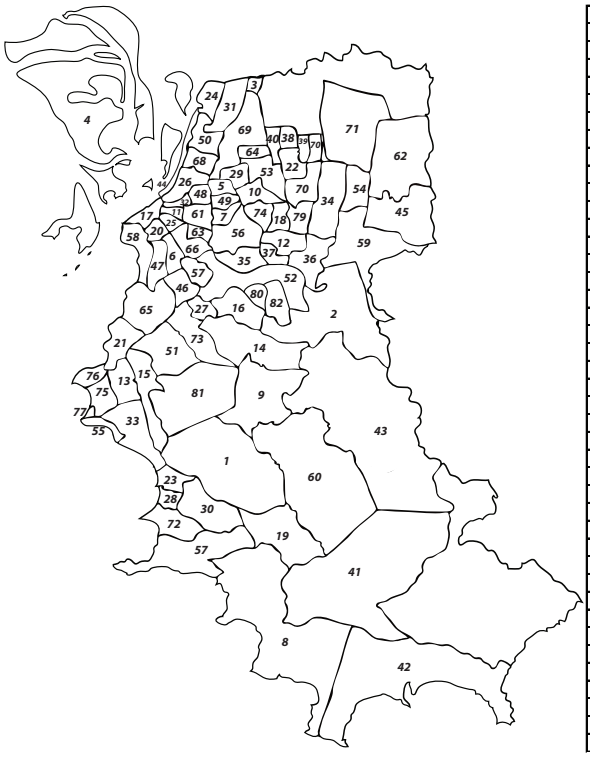
The spreadsheet and the database were organized through Microsoft Excel (2010 version) and the SPSS (version 19), also used for statistical analysis. For the GIS, it was used the TerraView software (version 4.2 and 4.2.1).

The new cases of pulmonary TB in Porto Alegre residents were selected for the incidence database. For the prevalence database were selected all types of entries, among which new cases, cases of readmissions after treatment abandonment and relapses. In both incidence and prevalence databases, were chosen the cases of bacilliferous pulmonary TB and/or pulmonary TB plus extrapulmonary TB with positive bacilloscopy (smear). The disease cases of those institutionalized in prison or social system were excluded because this population has an increased risk for TB compared to the general population. Those with diagnosis change in the case closure (for not being TB cases) were also excluded. For the calculation of prevalence were removed the death cases registered in the period of the study (2007-2011).

The incidence and prevalence of TB, TB-HIV co-infection, age, sex, race, education were analyzed, as well as the completion of the Directly Observed Treatment (DOT) of bacilliferous pulmonary tuberculosis.

It was considered the division of Porto Alegre in 82 districts, being 77 officials encoded by the Brazilian Institute of Geography and Statistics (IBGE) and five unofficial districs not yet recognized by that court but cataloged by the CGVS (districts of Aberta dos Morros, Chapéu do Sol, Jardim Floresta, Passo das Pedras and Protásio Alves). Because the data were more complete, it was used the digital grid provided by the CGVS (Figure 1) to do the analysis by districts and the digital map from the Data Processing Company of Porto Alegre – PROCEMPA, in a file named mapadosbairrosvigentes.shp, created and made available on August 3, 2010.

The cases relating to homeless were cataloged in Centro district, because they are usually assisted at health units of this region.



1	Alberta Dos Morros	43	Lomba do Pinheiro
2	Agrononia	44	Marcício Dias
3	Anchieta	45	Mário Quintana
4	Arquipelago	46	Medianeira
5	Auxiliadora	47	Menino Deus
6	Azenha	48	Moinhos de Vento
7	Bela Vista	49	Mont' Serrat
8	Belém Novo	50	Navegantes
9	Belém Velho	51	Nonoai
10	Boa Vista	52	Partenon
11	Bom Fim	53	Passo da Areia
12	Bom Jesus	54	Passo das Pedras
13	Camaquã	55	Pedra Redonda
14	Cascata	56	Petrópolis
15	Cavalhada	57	Ponta Grossa
16	Cel. Aparício Borges	58	Praia das Belas
17	Centro	59	Protásio Alves
18	Chácara das Pedras	60	Restinga
19	Chapéu dos Sol	61	Rio Branco
20	Cidade baixa	62	Rubem Berta
21	Cristal	63	Santa Cecília
22	Cristo Redentor	64	Santa Maria Goretti
23	Espírito Santo	65	Santa Teresa
24	Farrapos	66	Santana
25	Farroupilha	67	Santo Antônio
26	Floresta	68	São Geraldo
27	Glória	69	São João
28	Guarujá	70	São Sebastião
29	Higienópolis	71	Sarandi
30	Hipica	72	Serraria
31	Humaitá	73	Teresópolis
32	Independência	74	Três Fiqueiras
33	Ipanema	75	Tristeza
34	Jd. Itú Sabará	76	Vila Assunção
35	Jd. Botânico	77	Vila Conseição
36	Jd. Carvalho	78	Vila Ipiranga
37	Jd. Do Salso	79	Vila Jardim
38	Jd. Floresta	80	Vila João Pessoa
39	Jd. Lindóia	81	Vila Nova
40	Jd. São Pedro	82	Vila São José
41	Lageado		
42	Lami		

Source: General Coordination of Health Surveillance (CGVS), Porto Alegre, 2010

Figure 1 - Representative map of districts of Porto Alegre, RS

RESULTS

Regarding the incidence of reported cases of bacilliferous pulmonary TB in Porto Alegre in the period 2007-2011, there was a total of 3,369 cases of the disease and an increase of 649 (2007) to 685 cases (2011). Of the total cases, 66% were male and 65.5% were Caucasian.

As to age, 83% were patients from 20-59 years old, 9.2% were 60 years or older and 7.8% up to 19 years old. The percentage of children (up to 12 years old) infected with bacilliferous pulmonary TB increased from 0.31% (2007) to 0.44% (2011). Similar behavior was observed in relation to children and adolescents (up to 19 years old), where values increased from 6.94% (2007) to 11.82% (2011). In the observed period, there was a slight reduction in the percentage of elderly with TB from 10.17% (2007) to 8.76% (2011).

Most TB patients had not completed the 5th to 8th grades of the elementary school (35.2%). Illiterates accounted for 2.8% of this population and 2% completed higher education. Among the total, 1.4% of cases had no record of this variable and 3.1% fell in the category of *ignored.*

With respect to the HIV coinfection, 54.9% had a negative diagnosis and 23.6% were positive for the Human Immunodeficiency Virus. A portion of 21.1% of patients did not get tested for HIV.

There was no DOT for the vast majority of TB patients (89.3%). In relation to the situation of cases closure, only 64.5% progressed to healing, 22.1% abandoned the treatment, 5.8% resulted in deaths from other causes and 3.5% in TB deaths. Multidrug-resistant tuberculosis has developed in 0.6% of cases.

By analyzing the prevalence data, it was observed an increase in cases during the study period (718 in 2007 to 871 in 2011) and a predominance of TB in males (65.7%), in Caucasian individuals (62.8 %) and in those with incomplete 5th to 8th grades of elementary school (35.9%), considering a universe of 3,998 recorded cases in the period. As for education, it is noteworthy that 1.5% of cases had no records and 2.7% were categorized as *ignored.*

Most patients (85.7%) were aged 20-59 years old followed by the age of 19 (7.2%) and by those aged 60 years and over (7.1%).

The results of HIV testing were negative in 54% of cases, positive in 25.6% of them and the exam was not done in 20% of cases.

In 85.3% of cases, the DOT was not performed. Among the total, only 64.2% of patients with bacilliferous pulmonary TB were cured and 29.5% abandoned the treatment.

The following maps (Figures 2 and 3) represent the distribution of mean prevalence and incidence for the period of 2007 to 2011 by 100,000 inhabitants and by Porto Alegre districts.

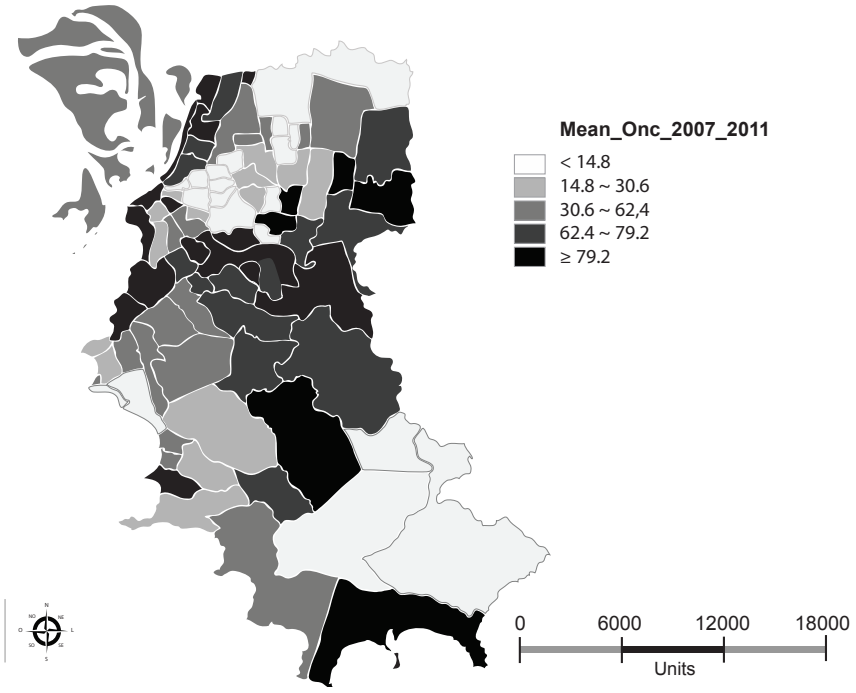


Figure 2 - Spatial distribution of the mean prevalence of bacilliferous pulmonary tuberculosis in Porto Alegre, Brazil, in the period 2007-2011.

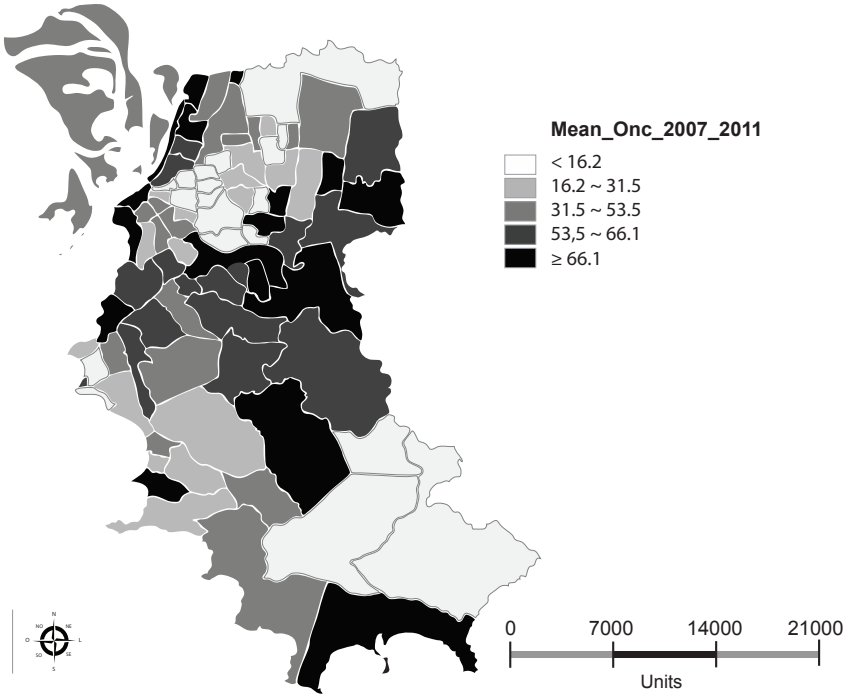


Figure 3 - Spatial Distribution of the mean incidence of bacilliferous pulmonary tuberculosis in Porto Alegre, Brazil, in the period 2007-2011.

It is observed that 17 districts had prevalence rates above 79.2 TB cases per 100,000 inhabitants, namely: Vila João Pessoa (79.22), Santa Teresa (81.58), Serraria (84.96), Farrapos (87.43), Agronomia (93.27), Cristal (93.63), Passo das Pedras (97.47), Lami (99.10), Mário Quintana (100.12), Partenon (103.57), Restinga (106.27), Vila Jardim (116.87), Centro (122.10), Bom Jesus (131.74), Navegantes (217.49), Marcílio Dias (286.23) and Anchieta (1,224.49).

With respect to the mean incidence rates, the districts with higher rates were the following: Vila São José (66.1), Praia de Belas (70.14), Farrapos (73.74), Restinga (74.08), Lami (77.55), Serraria (78.16), Partenon (79.53), Agronomia (81.82), Mário Quintana (84.27), Passo das Pedras (85.12), Cristal (85.31), Centro (95.01), Vila Jardim (103.51), Bom Jesus (109.29), Navegantes (161.96), Marcilio Dias (214.67) and Anchieta (1,088.44).

In the considered period, the percentage of homeless suffering from TB included in the Centro district was almost half of the total number of cases reported in the area (incidence 53.76% and prevalence 58.52%).

Regarding the distribution of TB-HIV coinfection rates of the prevalent cases from 2007 to 2011 (Figure 4), it is observed that the highest rates are found in the districts of Tristeza (41.67%), Praia de Belas (50.00 %), Glória (55.56%), Bela Vista (66.67%) and Farroupilha (66.67%).

Regarding the TB-HIV coinfection for the incident cases in the considered period (Figure 5), the district of Jardim Botânico (44.44%) and, again, the districts of Tristeza (41.67%), Praia de Belas (50.00%), Farroupilha (50.00%) and Bela Vista (66.67%), were those with higher rates of coinfection.

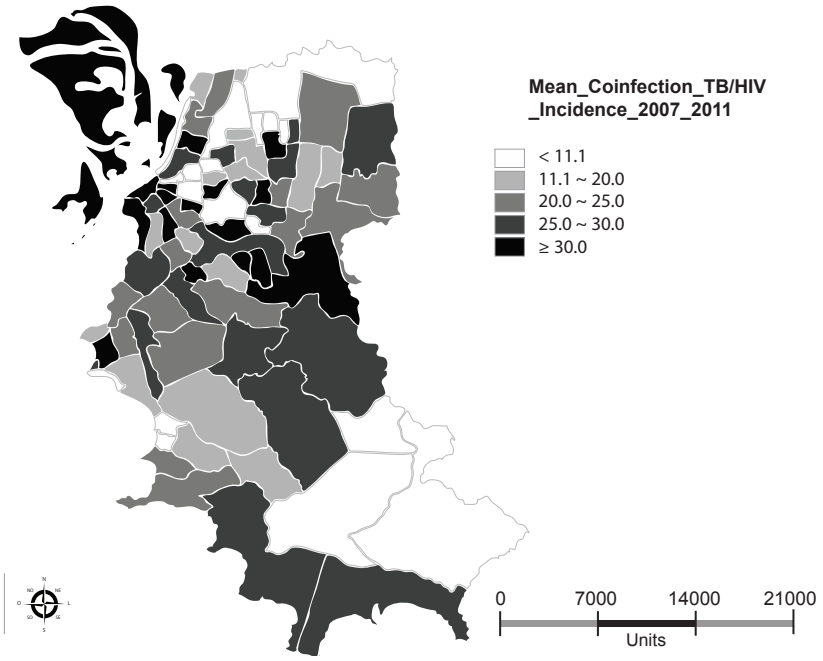


Figure 4 - Spatial distribution of the TB-HIV coinfection mean of all prevalent cases of bacilliferous pulmonary tuberculosis in this study, Porto Alegre, RS, period 2007-2011

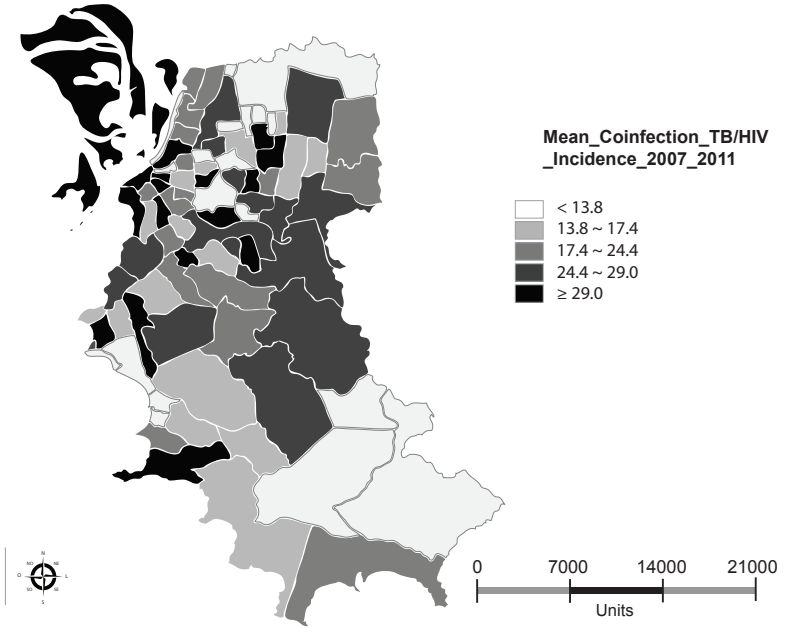


Figure 5 - Spatial distribution of the TB-HIV coinfection mean of all incident cases of bacilliferous pulmonary tuberculosis in this study, Porto Alegre, RS, period 2007-2011.

DISCUSSION

According to the 2010 Brazilian census, the city of Porto Alegre has 1,409,351 inhabitants, mostly white (79.23%)[10-11], which helps to explain the higher rates of affected individuals in this ethnic group. The prevalence of infection in males, in turn, follows the trend of spreading the disease, which tends to infect twice as many men than women[12]. The prevalence of TB, both in men and in Caucasians, was also observed in other southern states of Brazil, which is perhaps justified by the type of colonization of the region (European)[13]. However, the incidence and prevalence by race/color were not calculated in this study, it was showed just the race/color proportion of cases.

The scientific literature also highlights the prevalence of tuberculosis in the Economically Active Population (EAP) (14-54 years)[12], which is a finding also confirmed in the present study. However, the progressive increase in the percentage of children under 12 infected with *Mycobacterium tuberculosis* (0.31% in 2007 to 0.44% in 2011) and the almost doubling of TB cases in children and adolescents (up to 19 years) draw attention. The persistent increase in incidence rates in the city in the last decade (from 94.66 / 100,000 inhabitants in 2001 to 110.26 / 100,000 in 2011; all forms of TB)[14] and the aggravation of the spread of the disease in the districts may be among the reasons why other age groups are affected.

Another point to be considered is the association between level of education and tuberculosis. It is known that low educational level is classified as one of the risk factors for acquiring the disease and is a social determinant of health. Nevertheless, according to the 2010 census, Porto Alegre has a high Human Development Index (HDI) (0.805), an illiteracy rate of only 2.27%[11], and paradoxically, appears as one of the first capitals in numbers of TB cases in Brazil. Furthermore, the percentage of new cases of pulmonary TB in the period 2007-2011, in illiterates, was right next to the group with higher education (2.8% and 2%, respectively). Based on this, several possibilities can approach an explanation of the high rate of TB in a city with high HDI, as pockets of poverty, high endemic rates exposing the entire population, and other factors that would require further analysis of the topic.

The Ministry of Health has encouraged the Directly Observed Treatment (DOT) to fight tuberculosis and set targets to achieve 85% cure rate and decrease the dropout rate of the regimen to 5% or less[15]. Still, Porto Alegre failed to achieve these levels, maintaining a low cure rate (both in cases of incidence and prevalence, with 64.5% and 64.2%, respectively) and a high dropout rate (22.1% and 29.5% respectively), not counting the non-performance of DOT in 89.3% of new TB cases, which shows the predominance of adopting the self-administered treatment in the city[5]. This may reflect a disorganized and deficient public health system with only 36.77% of population coverage by the Family Health Strategy (data relative to May 2014)[16]. In fact, a substantial decrease in the effectiveness of Tuberculosis Control Programs was observed in Porto Alegre in recent years[17].

There is a lot of evidence that some of the factors responsible for the worsening of tuberculosis in Rio Grande do Sul may be the following: the administrative political disintegration of the health system in the region since the 80s, the lack of motivation of public health professionals, the insurgency of HIV in the state in 1988, the expansion and intensification of the TB-HIV coinfection, the troubled municipalization of health in the 1990's, and the replacement of the traditional approach and coordination responsible for combating TB in the state[18].

Whatever the reasons, it is urgent to develop and implement effective strategies to control and combat the disease, because its dissemination is already evident and alarming in cities like Porto Alegre. The analysis of maps of TB prevalence and incidence from 2007 to 2011 shows the existence of any disease cases in virtually all regions of the municipality, despite the predominance in the north and east-central axis.

It is noteworthy that districts like Cavalhada, Ipanema and Cidade Baixa had an incidence rate greater than the prevalence already reported during the study period. In other places such as Jardim Floresta, this difference was even more remarkable with an average incidence of 30.24 and prevalence of 6.05. The proximity of surrounding areas with considerable rates of TB prevalence and incidence such as Jardim São Pedro (42.38 and 31.79 respectively) may represent one of the contributing factors to the spread of the disease in the region.

Although the districts of Vila João Pessoa and Santa Teresa presented remarkable prevalence rates, the same was not true for the incidence rate in the period 2007 to 2011. However, in previous years, there were records of high incidence rates for these districts[19]. Thus, in the study period, the entry of cases in such districts may have occurred with a higher percentage of readmissions after treatment abandonment and relapses. Therefore, as there was no analysis on the type of entries of prevalent cases, it was not possible to confirm the accurate percentage of such stratified entries in the system.

The districts of Anchieta, Marcílio Dias, Navegantes, Bom Jesus and Centro draw the attention because of their high averages of both prevalence and incidence of bacilliferous pulmonary TB. The high rates of the Anchieta district (1,088.44 incidence and 1,224.49 prevalence) can be explained by its small resident population (147 inhabitants)[10] that influences the calculation of indicators. However, this does not explain the spread of cases in the region. It could be linked to the fact that such district (along with Navegantes and Marcílio Dias) is located in the region of Navegantes/Humaitá that has considerable

values of population density, reaching 2,891.40 inhabitants per km². The same happens with Bom Jesus district (eastern region), in which the population density reaches 14,226.73 inhabitants per km²[11].

There is scientific evidence about the direct correlation between the transmission of TB and human populous conglomerates, the same applying to poor housing conditions[20]. The previously mentioned regions of Navigators/ Humaitá and East, have on average 3.36 and 3.58 residents living in substandard housing[11], which may be an influential factor in the spread of the disease.

The Centro district belongs to the region also called Centro that consists of 17 more districts and concentrates 19.64% of the population of Porto Alegre. It has a population density of 10,646.12 people per square kilometer and an average income of heads of households in the range of 8.20 minimum wages[11]. TB cases of homeless people who were added to this district certainly contributed to the rise in average rates of incidence and prevalence of this disease in the region, however, even excluding the cases of homeless, we would still get considerable final rates (43.93 of incidence and 50.57 of prevalence).

These rates could be related to a possible influence of the economic indicators of the Centro district, such as the increase of heads of households with income of up to one (1) minimum wage, an indicator that jumped from 2.08 in 2000 to 5.15 in 2010, representing a worsening of 147.60% in the period, since for the purpose of classification, the higher the value, the worse the situation[11]. Here two hypotheses could be considered with regard to risk factors for TB: insufficient financial resources and the resultant deprivation, and the increase of the EAP, with the entry of new heads of households in the labor market. It is known that 'Many patients are afraid that if identified at work they can be fired despite the specific legislation that guarantees the right to treatment. So, the stressful intensification of pace and poor conditions of work, the threat of unemployment, characteristics of the current reconfiguration of the Brazilian social-economic formation, contribute to aggravate the situation'[21].

With respect to TB-HIV coinfection, the exam for detecting the Human Immunodeficiency Virus was not done in 21.1% of incident cases and in 20% of prevalent cases. These numbers may be considerable to a municipality that has high rates of TB-HIV coinfection and occupies the first place in the ranking of the Brazilian capitals in terms of incidence of AIDS (95.3 / 100,000 inhabitants in 2011)[22]. However, there is an imminent change in this scenario, given that Porto Alegre was considered a pioneer in offering the rapid HIV test in the basic health network, launched in June 2012, what will possibly influence the detection of cases.

We also notice that TB-HIV coinfection is not an occurrence that reaches only peripheral regions, a fact confirmed by the high rates (both incident and prevalent cases) of the Bela Vista district, whose residents have privileged socioeconomic conditions, with average income of heads of households of approximately 16.11 minimum wages[11]. Although there is a considerable link between high rates of coinfection and low socioeconomic development, there are evidences of spread of the disease to a scenario of remarkable social development, setting precedents to consider two perspectives of the occurrence of TB: the traditional, linked to poverty and the excluded and marginalized groups, and the coinfection with HIV and AIDS, which includes integrated groups[23].

With respect to the low-income and vulnerable population, the district of Praia de Belas (tied with Farroupilha in second place for the incident cases of TB-HIV coinfection) had a village (Vila Chocolatão) with also high rates of TB. Currently, for urban restructuring reasons, this needy population was relocated and settled in the north of the city. The Farroupilha district (first in prevalent cases of TB-HIV coinfection and second in incident cases) in turn, has reduced dimensions and represents only 0.07% of the city population (961 inhabitants)[11], which may influence the statistical results.

In search of new strategies for detecting, preventing and combating TB and TB-HIV coinfection, the State Department of Health of Rio Grande do Sul published a proposal for an action plan for 2011 based on strategies of decentralization of tuberculosis control actions for the Primary Care, integrated actions with the STD/AIDS program, actions in prisons, actions in vulnerable populations, training on Tuberculin Test, actions with civil society organizations, among others[24]. It is expected to achieve positive results after that.

CONCLUSION

Porto Alegre faces a double burden, both in relation to TB as TB-HIV coinfection and AIDS, placing it in a serious epidemic situation in the Brazilian scenario. The spread of TB in the county has put at risk not only the group commonly affected by the disease (admittedly the EAP), but also children and adolescents.

The TB incidence has worsened in some districts and surrounding areas, reflecting an increase in new and prevalent cases in 2007- 2011 period. The high HDI of Porto Alegre becomes a contradictory data when confronted with the alarming disease scenario of the city.

Unquestionably, the expansion and qualification of public services are priority needs of the society. The decentralization of services and actions for TB and HIV/AIDS to make them effective requires not only political will but a structured and functional basic network, adequate funding, properly trained and motivated professionals, and the involvement of the population, without which a satisfactory level of success will be hardly achieved.

The factors that have contributed to the alarming epidemiological picture of Porto Alegre in relation to TB and TB-HIV coinfection, whether they are political, cultural, socioeconomic or structural, cannot be precisely affirmed. We recognize, however, the need of formulating, planning and monitoring the health actions that result in transformations of impact in public health policies, making them appropriate, effective and efficient. In this sense, the present study can serve as a tool for planning, formulating and implementing new local public policies, restructuring services to the community, and for the adoption of strategic approaches to improve the whole situation of conjunctural health.

REFERENCES

1. Barbosa IR, Costa ICC. A emergência da co-infecção tuberculose – HIV no Brasil. Hygeia. 2012;8(15):232-44.

2. Barreira D, Grangeiro A. Avaliação das estratégias de controle da tuberculose no Brasil. Rev Saúde Pública. 2007;41 Supl. 1:4-8.

3. Otu AA. Is the directly observed therapy short course (DOTS) an effective strategy for tuberculosis control in a developing country? Asian Pac J Trop Dis. 2013;3(3):227-31.

4. World Health Organization. Global Tuberculosis Report, 2013 [Internet]. Geneva: WHO; 2013 [cited 2014 June 13]. Available from: http://www.who.int/tb/publications/global_report/en/

5. Campani STA, Moreira JS, Tietbohel CN. Fatores preditores para o abandono do tratamento da tuberculose pulmonar preconizado pelo Ministério da Saúde do Brasil na cidade de Porto Alegre (RS). J Bras Pneumol. 2011;37(6):776-82.

6. Oliveira GP, Torrens AW, Bartholomay P, Barreira D. Tuberculosis in Brazil: last ten years analysis - 2001-2010. Braz J Infect Dis. 2013;17(2):218-33.

7. Boletim Epidemiológico. Especial tuberculose. Brasília: Ministério da Saúde, Secretaria de Vigilância em Saúde [Internet]. 2012 [citado 2013 set. 12];43. Disponível em: http://www.saude.rs.gov.br/upload/1337634001_Tuberculose-Boletim%20Epidemio.pdf

8. Brasil. Ministério da Saúde; Grupo Hospitalar Conceição. Tuberculose na Atenção Primária à Saúde [Internet]. Porto Alegre: Hospital Nossa Senhora da Conceição; 2013 [citado 2013 set. 12]. Disponível em: http://www2.ghc.com.br/GepNet/publicacoes/tuberculosenaatencao.pdf

9. Fundação Oswaldo Cruz; Escola Nacional de Saúde Pública Sergio Arouca. Controle da tuberculose: uma proposta de integração ensino - serviço. 22ª ed. Rio de Janeiro: EAD/ENSP; 2008.

10. Instituto Brasileiro de Geografia e Estatística (IBGE). Censo 2010. Rio Grande do Sul [Internet]. Rio de Janeiro; 2011 [citado 2013 out. 25]. Disponível em: http://www.ibge.gov.br/estadosat/perfil.php?sigla=rs#

11. Porto Alegre. Observatório da Cidade [Internet]. Porto Alegre; 2013 [citado 2013 out. 28]. Disponível em: http://www.observapoa.com.br/

12. Assunção CG, Seabra JDR, Figueiredo RM de. Percepção do paciente com tuberculose sobre a internação em hospital especializado. Cienc Enferm. 2009;15(2): 69-77.

13. Furlan MCR, Oliveira SP, Marcon SS. Fatores associados ao abandono do tratamento de tuberculose no estado do Paraná. Acta Paul Enferm. 2012;25(n.esp 1):108-14.

14. Acosta L, Peruhype RC. Os mapas da tuberculose pulmonar bacilífera de Porto Alegre. Bol Epidemiol [Internet]. 2013 [citado 2013 out. 28];15(50). Disponível em: http://lproweb.procempa.com.br/pmpa/prefpoa/cgvs/usu_doc/boletim_50_fevereiro_2013_2.pdf

15. Brasil. Ministério da Saúde; Secretaria de Vigilância em Saúde, Departamento de Vigilância Epidemiológica. Manual de recomendações para o controle da tuberculose no Brasil [Internet] Brasília; 2011 [citado 2013 out. 28]. Disponível em: http://www.cve.saude.sp.gov.br/htm/TB/mat_tec/manuais/MS11_Manual_Recom.pdf

16. Brasil. Ministério da Saúde, Departamento de Atenção Básica. Histórico de Cobertura da Saúde da Família [Internet]. Brasília; 2013 [citado 2014 jun. 13]. Disponível em: http://dab.saude.gov.br/portaldab/historico_cobertura_sf.php

17. Micheletti VCD, Moreira JS, Ribeiro MO, Kritski AL, Braga JU. Tuberculose resistente em pacientes incluídos no II Inquérito Nacional de Resistência aos Fármacos Antituberculose realizado em Porto Alegre, Brasil. J Bras Pneumol. 2014; 40 (2):155-63.

18. Ott WP, Jarczewski CA. Combate à tuberculose sob novo enfoque no Rio Grande do Sul. Bol Epidemiol (Porto Alegre) [Internet]. 2007 [citado 2013 out. 28];9(5). Disponível em: http://www1.saude.rs.gov.br/dados/1326721496607v.%209,%20n.%205,%20dez.,%202007.pdf

19. Acostav LMW. O mapa de Porto Alegre e a tuberculose: distribuição espacial e determinantes sociais [dissertação]. Porto Alegre: Faculdade de Medicina, Universidade Federal do Rio Grande do Sul; 2008.

20. Davies PDO. Risk factors for tuberculosis. Monaldi Arch Chest Dis. 2005;6 (1):37-46.

21. Pugliesi MV. A violência da tuberculose no Brasil: 6.000 mortes/ano [Internet]. 2013 [citado 2013 out. 29]. Disponível em: http://www.cecac.org.br/MATERIAS/Tuberculose.htm

22. Boletim Epidemiológico Aids/DST. Brasília: Ministério da Saúde [Internet]. 2012 [citado 2013 out. 30];9(1). Disponível em: http://www.aids.gov.br/sites/default/files/anexos/publicacao/2012/52654/vers_o_preliminar_boletim_aids_e_dst_2012_14324.pdf

23. Souza AG, Fukushima M, Pereira TB, Tatsch JFS, Picanço MRA, Miranda Junior UJP. Contextualização de aspectos sociais da coinfecção TB/HIV no Distrito Federal. Rev Eletr Gestão Saúde [Internet]. 2013 [citado 2013 out. 28];4(1):1516-29. Disponível em: http://www.gestaoesaude.unb.br/index.php/gestaoesaude/article/view/261

24. Rio Grande do Sul. Secretaria Estadual de Saúde; Centro Estadual de Vigilância em Saúde, Divisão de Vigilância Epidemiológica. O Plano Estadual de Controle da Uuberculose [Internet]. Porto Alegre; 2010 [citado 2013 out. 31]. Disponível em: http://www.saude.rs.gov.br/upload/1339784445_Plano%20Estadual%20de%20Controle%20da%20Tuberculose.pdf

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