



TUBERCULOSIS: THE PROFILE IN THE NEW MILLENNIUM

TUBERCULOSE: O PERFIL NO NOVO MILÊNIO

TUBERCULOSIS: PERFIL EN EL NUEVO MILENIO

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ABSTRACT

Objective: to identify epidemiological aspects of tuberculosis (TB) in the municipality of Aracaju-SE, Brazil, from 2001 to 2010. **Method:** a descriptive epidemiological study of historical series, with data collected in the SINAN, the Mortality Information System (SIM) the city of Aracaju and DATASUS on new reported cases of TB. **Results:** found the average incidence of 37,22/100.000 and average mortality rate of 5,77/100.000. **Conclusion:** the characteristics of the study population were known and verified difficulties in SINAN, the TB control program in Aracaju, as the number of cases completed as unknown/white by the health care professional and consider whether the outcome of cases is in accordance with the goal recommended by the WHO, as well as demonstrating the importance of adequate inter-relationship between the health professional and the patient during treatment to promote healing and reduce the burden of TB in Aracaju. **Descriptors:** Tuberculosis; Epidemiological Aspects; Tuberculosis Incidence.

RESUMO

Objetivo: identificar aspectos epidemiológicos da tuberculose (TB) no município de Aracaju-SE, Brasil, no período de 2001 a 2010. **Método:** estudo epidemiológico descritivo, de série histórica, com dados coletados no SINAN, Sistema de Informações sobre Mortalidade (SIM) do Município de Aracaju e no DATASUS, sobre casos novos notificados de TB. **Resultados:** foi encontrada a média de incidência de 37,22/100.000 habitantes e coeficiente médio de mortalidade de 5,77/100.000 habitantes. **Conclusão:** as características da população estudada foram conhecidas e verificadas as dificuldades no SINAN, do programa de controle da TB em Aracaju, quanto ao número de casos preenchidos como ignorados/branco pelo profissional de saúde e analisar se o desfecho de casos está de acordo com a meta recomendada pela OMS, além de demonstrar a importância do inter-relacionamento adequado entre o profissional de saúde e o paciente durante o tratamento ao promover a cura e reduzir o ônus da TB em Aracaju. **Descritores:** Tuberculose; Aspectos Epidemiológicos; Incidência Tuberculose.

RESUMEN

Objetivo: identificar los aspectos epidemiológicos de la tuberculosis (TB) en el municipio de Aracaju-SE, Brasil, de 2001 a 2010. **Método:** estudio epidemiológico descriptivo de la serie histórica, con los datos recogidos en el SINAN, el Sistema de Información sobre Mortalidad (SIM) la ciudad de Aracaju y DATASUS de nuevos casos notificados de tuberculosis. **Resultados:** se encontró que la incidencia media de 37,22/100.000 y la tasa de mortalidad promedio de 5,77/100.000. **Conclusión:** las características de la población de estudio eran conocidos y dificultades en SINAN, el programa de control de la tuberculosis en Aracaju verificada, ya que el número de casos completado como desconocido/blanco por el profesional de la salud y considerar si el resultado de los casos es de conformidad con la meta propuesta por la OMS, además de demostrar la importancia de una adecuada interrelación entre el profesional sanitario y el paciente durante el tratamiento para promover la curación y reducir la carga de TB en Aracaju. **Descriptor:** Tuberculosis; Aspectos Epidemiológicos; La incidencia de Tuberculosis.

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INTRODUCTION

TB is a problem of major health care, is an infectious disease caused by the Koch bacillus (*Mycobacterium tuberculosis*) that mainly affects the lungs and other body organs: kidneys, bones and meninges. Individuals with Acquired Immunodeficiency Syndrome (AIDS), diabetes, chronic renal failure (CRF), undernourished, the elderly, alcoholics, drug addicts and smokers are more likely to contract this disease. The cure exists and the treatment is carried out in basic health units, for free.¹

TB relates to deep social roots that are closely linked to poverty and poor income distribution, in addition to the stigma that implies the non-adherence of patients and/or family/contacts. The emergence of the AIDS epidemic and the emergence of multidrug-resistant TB outbreaks further aggravate the problem of disease worldwide.²

Despite being a preventable and curable disease, TB is still a public health problem. WHO in 1993 designated the TB a global emergency, with the highest rates of causes of death from infectious disease in adults especially in developed countries, according to WHO, it is estimated that approximately one third of the world population is infected with the bacillus Koch the possibility of developing the disease.¹

The Global Plan to Fight Tuberculosis 2011-2015 (The Global Plan to Stop Tuberculosis 2011-2015), proposed by the WHO's vision reduce TB rates in the world. The plan is divided into six components: expand the DOTS (Directly Observed Treatment) quality; target confection TB/human immunodeficiency virus (TB/HIV), multi drug resistant tuberculosis (MDR TB) and the needs of poor and vulnerable populations; strengthen the health system based on primary care; empower people with TB and organized civil society; involve all health care providers; and enabling and promoting research.³

The main goals, the Plan also presents: reduce, by half, the incidence and mortality from TB by 2015, compared to 1990, and eliminate TB and as a public health problem by 2050.³

In Brazil, the incidence of the disease in the 90s was 56 cases/100.000 inhabitants and mortality of 3,6/100.000. It is expected that in 2015, indicators are respectively 28/100.000 and 1.8/100.000.⁴ In 2010, the number of deaths was 4.659 and the mortality rate 2,4 deaths/100.000 inhabitants. Even if there is downward trend in both indicators, Brazil has not yet achieved the target

stipulated by WHO - cure 85% of new smear positive cases. In 2010, the cure rate was 73,4% and in 2011, reached 71,6%.³

The Ministry of Health (MOH) has set as priorities for 2013, the expansion of the diagnosis with the implementation of new technology and the strengthening of TB actions and in primary care. In 2011, throughout the country have been reported 71.000 new cases of TB. Among 22 countries that still have a high number of cases of the disease, Brazil occupies the 17th position. It is the fourth leading cause of death from infectious diseases and first in AIDS patients. Through the WHO parameters, the municipality of Aracaju/SE located in the Northeast, it is estimated the appearance of 240 new cases each year.⁵

The Municipal Aracaju Health (SMS) offers TB treatment in 43 Health Units Family (HUF), which have all the medication distributed free and Specialized Reference Center. The SMS follows the entire process of information from diagnosis to final treatment of the patient. But according to the SINAN data, in Sergipe, despite the efforts of health authorities to control it, yet it is a disease with high prevalence and reported in most municipalities in the state.⁶

This study aims to identify epidemiological aspects of tuberculosis (TB) in the municipality of Aracaju-SE, Brazil, in the 2001-2010 period.

METHOD

Epidemiological, descriptive, historical series, realized through information on the reported cases of TB in the city of Aracaju, which covers the period 2001-2010.

Aracaju is the capital of the state of Sergipe and is located in the Brazilian Northeast coast. In 2010, its population was 571.149 inhabitants. According to the The Brazilian Institute of Geography and Statistics (IBGE), 72% of the population resides in urban areas. The city has a land area of 181.856 km².⁷

The choice of this town for the research was due to the fact that the state capital and present relevant number of reported cases of TB. Even with the high number of cases in 2007, the state of Sergipe recorded a drop of 20,43% in the number of confirmed cases of the disease.⁸

The study included new cases of TB residents in the municipality of Aracaju, registered in the SINAN, how TB deaths in SIM, from January 2001 to December 2010.

It is considered, according to the MS, as the case of TB, every individual with a diagnosis

confirmed by smear microscopy and one in which the physician, based on clinical and epidemiological data and results of laboratory tests, confirms the diagnosis. As "new case" is considered the TB patient who never submitted to anti-tuberculosis chemotherapy, made use of antituberculosis drugs for less than 30 days, or subjected to the treatment for TB for five years or more.⁹

The research used the SINAN Net version 7.0 that was to supply the SMS Aracaju. The variables used were those contained in TB research form: age, education, sex, clinical form, location, foreclosure situation, mortality rate, incidence rate of TB cases. The population bases by year, sex and age were obtained from DATASUS website.

The study met the requirements of Resolution 196/96 of the National Health Council (CNS), which regulates research involving human subjects and was approved by the Research Ethics Committee of the Platform Brazil, getting approval on 17/07/2012, under number of CAAE 03965312.2.0000.0058.

The processing and analysis of data, along with the construction of graphs were made from Excel software (Microsoft) 2007. The tables were constructed using the program Word (Microsoft) 2007. Results and Discussion data obtained in the SINAN were analyzed by distribution of frequencies and averages.

RESULTS

Were reported in Aracaju, 1877 new cases of TB in all clinical forms, with an average of 187,7 cases/year and an average incidence rate of 37,22/100.000 inhabitants. As for the distribution of TB, there is predominance of the disease in the north of the city, especially the Santos Dumont neighborhood with 53 cases.

1201 male cases was evidenced (64,00%), 676 female cases (36,00%) and with a sex ratio of 1,77: 1.

It appears in Figure 1, a large number of the incidence rate of cases in 2001 and 2003, with stabilization in 2004-2006, and slight decline from 2007.

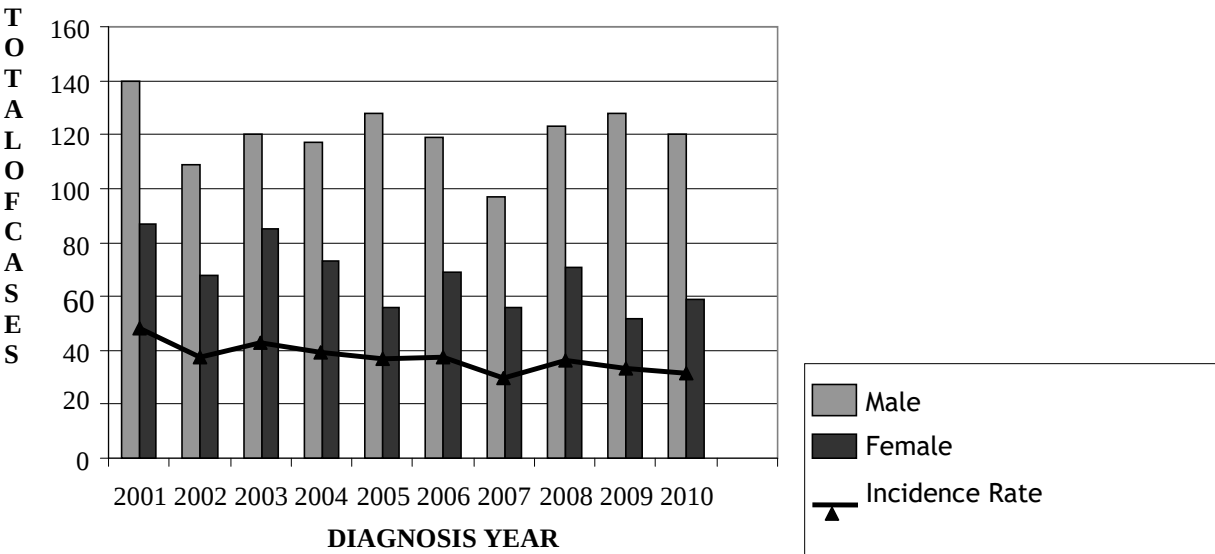


Figure 1. Distribution of cases of tuberculosis in gender and incidence rate (per 100.000 population) of tuberculosis in the city of Aracaju in the 2001-2010 period.
Source: SINANNET/SMS-Aracaju

TB in the period 2001-2010 affected more often individuals aged 20 to 29 years, 495 cases (26,37%), followed by individuals aged 30 to 39 years, 411 cases (21,90%), and is mainly composed of young adults.

The education data disclosed in Figure 2 shows that the highest percentages refer to

cases ignored/blank with 22,16% (416 cases), followed by 5th to 8th grade of elementary school incomplete with 21,10% (396 cases). The percentage of illiterate was 6,71% (126 cases), individuals with complete higher education 5,91% (111 cases) and complete secondary education 4,84% (91 cases).

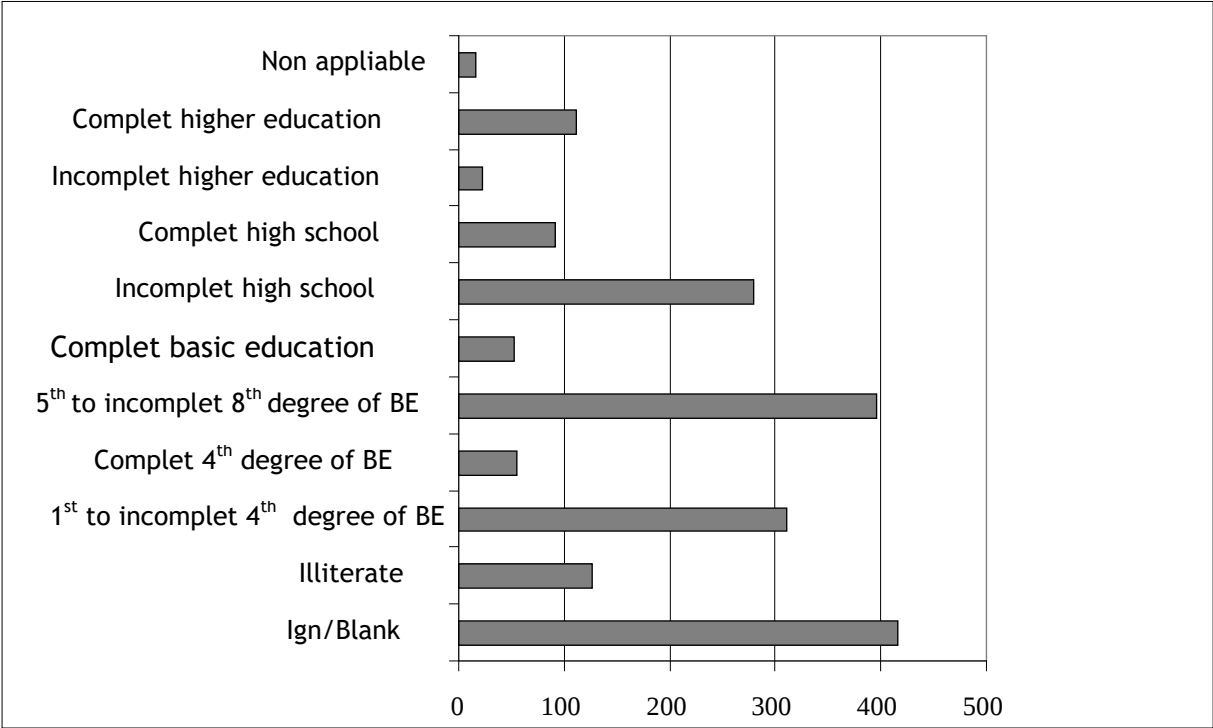


Figure 2. Frequency of new TB cases of all forms according to education in the municipality of Aracaju in the 2001-2010 period.
Source: SINANNET/SMS-Aracaju

There was a higher number of new cases of pulmonary type with 79,27% (1488 cases), followed by extrapulmonary with 17,85% (335 cases) and both forms with 2,88% (54 cases) (Figure 3).

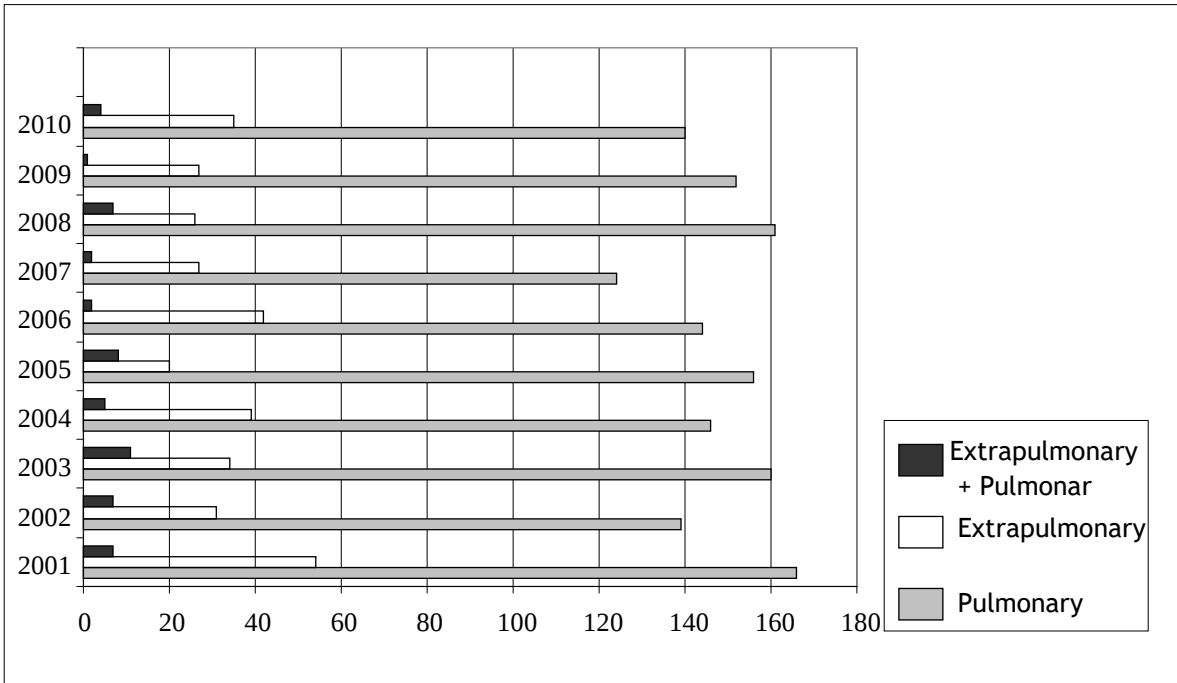


Figure 3. Frequency of new cases of tuberculosis in the clinical form in the municipality of Aracaju in the 2001-2010 period.
Source: SINANNET/SMS-Aracaju

On the closure of the cases there is the proportion of 77,20% followed by the abandonment of healing with 13,38%. Only 2,66% had transferred to another municipality and 0,05% had multidrug-resistant TB, as seen in Table 1.

Table 1. Distribution of cases of tuberculosis in foreclosure situation of cases in the municipality of Aracaju in the 2001-2010 period.

Variable	n	%
Foreclosure situation		
Cure	1449	77,20
Abandonment	251	13,38
Death by tuberculosis	24	1,28
Death by other causes	102	5,43
Transference		
Multi resistente tuberculosis	50	

Source: SINANNET/SMS-Aracaju

The distribution of TB deaths lies with a total of 293 in the period studied. The mortality rate ranged from 4,43 to 7,35 with an average of 5,77 deaths per 100.000 inhabitants in the years of study (Figure 4).

About 1,28% of all new cases evolved to death, especially patients aged 40 to 49 years (22,41%), followed by individuals aged 60-69 years (18,10%).

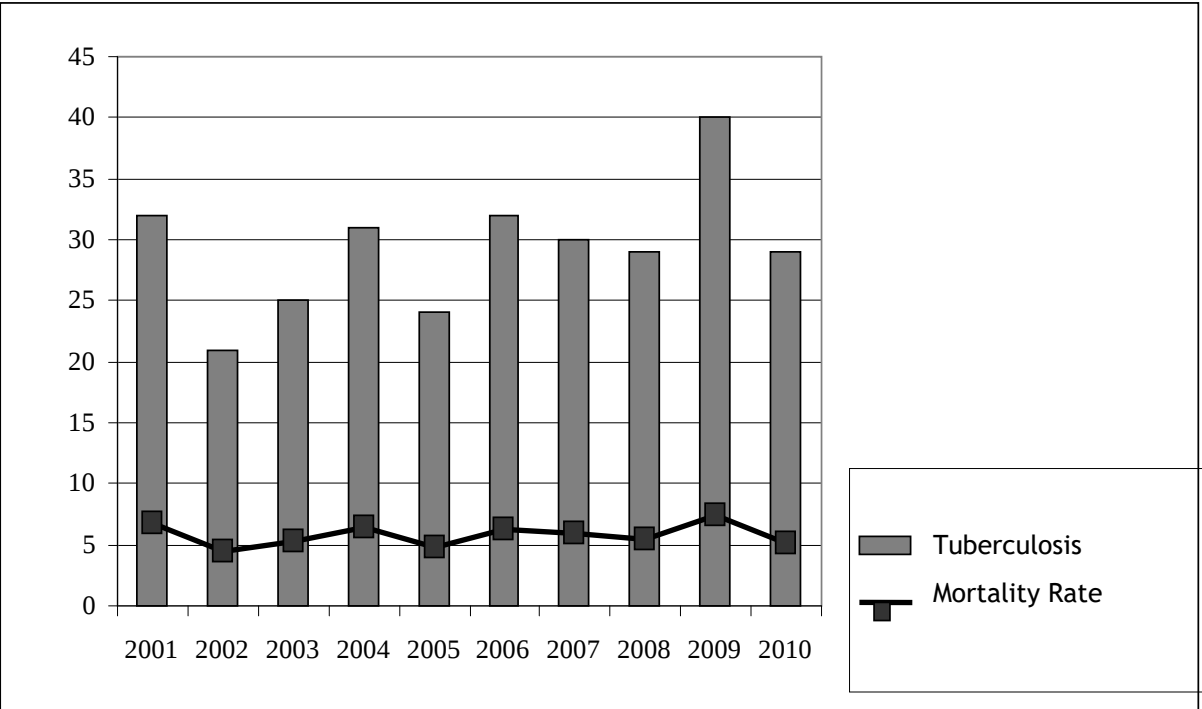


Figure 4. Mortality Rate (per 100.000) for tuberculosis in the municipality of Aracaju in the 2001-2010 period.

Source: SINANNET/SMS-Aracaju

DISCUSSION

In Aracaju TB, occurred more often males, 64,00%, a similar situation found in Brazil, where the man falls ill twice more than women.⁹ These results are similar to a study conducted in Salvador/BA.¹⁰

The greatest risk of the disease is in the age group of 20-49 years, similar to the study in Teresina/PI¹¹, which is a public health problem due to population growth in this age group.

In developed countries, even with an adequate control of the disease, there is a change in the epidemiological characteristics of TB with an increase in the elderly group, as a result of increased life expectancy, the different results found in this study. Whereas the proportion of people aged 65 or more in Brazil has increased, it is likely that the specific age of TB incidence modify further, which combines the difficulty of diagnosis that leads to realization of a delayed treatment

and increased mortality. In the future, nosocomial transmission, in nursing homes, can also contribute to higher rates of incidence of TB.¹² Probably the trend in increased incidence in larger cases 60 may be associated with a high proportion of individuals with low and high immunization latent infection TB.¹⁰ However, the findings of this study also observed higher rates in young adults.

Among the variables collected in this study can best report on the socioeconomic status is schooling.³ Data for this variable found in Aracaju, are consistent with the literature, and resembles the context of TB that in studies in Piripiri/PI¹³ in the period 1997-2000 and Teresina/PI¹¹, from 1999-2005, who reported low education, the majority of cases, and therefore considered a risk factor for the disease, which can contribute to non-adherence to treatment, as well as the possible increase in dropout rates. The low educational level of the population is possibly

a reflection of a whole set of poor socioeconomic conditions that increase vulnerability to TB and are responsible for the higher incidence of the disease, which favors lower adherence to their treatment.¹³

The high percentage of ignored/blank cases (22,16%), found in the study, demonstrates the failure to fill out the investigation form, which can mask the reality, the level of education found among TB patients and may compromise the evaluation of the development of the National Program for Tuberculosis Control (NPTC).

It should be noted that the existence of flaws in the information system, mainly in the power and data transmission should be taken into account in the evaluation of the indicators. The improvement of the information system was a priority established by the NTCP in 2011 with the aim of making more reliable the information used by the country to plan their actions.¹⁴

Geographically, 22 countries, including Brazil, account for 81,00% of all TB cases, with India, China, South Africa, Indonesia and Pakistan, the top five. The largest quantities of TB cases are in Asia and Africa. Countries like India and China together account for about 40,00% of the world's TB cases. About 60,00% of cases are in Southeast Asia and Western Pacific regions. The African region has 24,00% of cases in the world, and the highest rates of cases and deaths per capita. Since 82.00% of TB cases among people living with HIV worldwide live in Africa.¹⁵

Since 2002, the TB incidence rate reduced by 1.30% per year worldwide. The estimated new cases of TB the world were 8,8 million in 2010, equivalent to 128/100.000. In the period between 2008 and 2010, Brazil has reduced from 73.673 to 70.601 the number of new TB cases, 3000 new cases within the period and a reduction in the incidence rate of 38,82/100.000 to 37,99/100.000 population. This reduction in the country as is similar to that found in the municipality of Aracaju, where there was also a decline in TB incidence rate in the same period from 36,14/100.000 to 31,34/100.000. In Sergipe, in the period 2001 to 2010 the incidence rate in the state ranged from 23,9/100.000 to 34,4/100.000.³ In 2010, the state of Sergipe notified 511 new TB cases, with an incidence rate of 24,7/100.000 and the state capital, Aracaju, the incidence of 31,7/100.000, above the recommended by WHO it expects in 2015 a rate of 28/100.000.¹⁶

In 2001, the incidence rate in Brazil was 42,8/100.000 and dropped to 36,0 in 2011, which means a drop of 15,9 percentage points

over the past decade. Although the Southeast concentrates the largest number of TB cases, the northern region has the highest incidence rates in the country. In 2011, the states of Amazonas (62,6) and Rio de Janeiro (57,6) had the highest incidence rate in the country, while Goiás (13,6) and the Federal District (11,1), the smallest ones.³

When assessing the clinical forms and its evolution over the years, it appears that although TB is a systemic disease and can affect all organs of the human body, pulmonary TB bacillus has greater epidemiological importance, since it keeps the spread of the disease in the population, since it is aerobic bacillus and enters the lungs where there is a high amount of oxygen, which facilitates its development.¹⁷ Of the total number of reported cases observed in this study, approximately 80.00% of patients presented this clinical form, similar to the study carried out in in Bacabal/MA.¹⁷

The highest frequency of new cases of TB is at neighborhood located in the north of the city of Aracaju, which is composed of poor areas that facilitate the population in acquiring this condition, possibly through the misdistribution of income, since such disease is inter-related to socioeconomic factors. As in the study in Peru, where the individuals who are part of the poorest populations are at increased risk to develop TB due to high exposure and vulnerability to infections.¹⁸ These individuals have diminished ability to deal with the consequences of the disease because of the precariousness of health services, sometimes with access preventive, diagnostic and curative.¹⁹

As regards the closure of the cases, the results of this study confirm that TB remains a major public health problem, as the WHO healing and abandonment goals have not been achieved getting similar results to the study in Belo Horizonte/MG.²⁰ The percentage healing of the new smear positive cases of pulmonary TB is the main indicator used to assess TB control actions in the national, state and municipal levels.³

The average for the period examined for the cure rate in Aracaju was 77,20%, considered below the recommended by WHO, since the goal is to reach 85,00% cure rate of diagnosed cases. Already the abandonment average in Aracaju was 13,38%, far from the WHO goal of which is less than 5,00%.¹⁵

In 2010, Brazil has detected 88.00% of cases estimated by the WHO for the year 2010; however, the percentage of the range recommended by WHO for the cure indicator is still a challenge for the country. From 2001

to 2004, Brazil showed gradual increase in cure indicator, and from 2005, it remained steady around 70,00%. In 2010 the Southeast region (73,80%) had the highest value and the states of Acre (85,90%), Federal District (81,20%) and São Paulo (80,40%) had values greater than 80,00 % of cure.³ Since the state of Sergipe, in 2010, obtained 79,94% cure rate, with 139 cases belonging to the municipality of Aracaju.⁶

It is considered abandonment of treatment when the patient fails to attend the Health Unit for more than 30 consecutive days after the due date for your return. In supervised treatment, the period is 30 days, counting from the last shot of the drug. Treatment dropout and incomplete treatment favor drug resistance and are factors that have a negative impact on disease control which possibly leads the various regions of Brazil have a dropout rate ranging from 4,50% to 20,30%.²⁰

In Aracaju is observed that the results of healing indicators need to increase and abandonment of treatment need to reduce compared to the national average and take more effective action to control the disease as the active search for people living on the streets with suspected TB, through the Centre of Reference of the Street Population (CREAS-POP) that are forwarded to the Medical Specialties Center of Aracaju (CEMAR), to follow up.⁶

In the study, Aracaju presented a mortality rate with an average rate of 5,7 deaths/100.000 inhabitants. lower results were found in the study in Teresina/PI¹¹ an average rate of 3,3 deaths/100.000 and superior results were observed in the study conducted in Salvador/BA¹⁰ with 8,5/100.000 inhabitants, and is considered a high result compared with the TB mortality rate in Brazil had a reduction of 16,70% between the years 2002 to 2008, reducing from 3,0 to 2,5 cases/100.000 inhabitants. It is important to note that every year still die in Brazil around 4.700 people because of TB, a curable and preventable disease. Since 2002, the cure rate has gradually increased and reached the percentage of 73,00% in 2008.²¹

In Brazil, TB is associated with poverty, social inequality, poor living conditions and housing and, more recently, AIDS. Moreover, the association of TB to the death of patients with other diseases is still high: 14,00% of deaths from AIDS between 2002 and 2003 had TB as an associated cause.²² In Aracaju, was conducting HIV testing in TB patients, up from 60,00% in 2011.⁶ Currently, the association (HIV/TB) is a serious public health problem

and may lead to increased morbidity and mortality from TB in many countries.⁹

In the period 2001-2010 in Aracaju 5,40% of the cases were deaths from other causes, a higher percentage than that found in TB deaths (1,20%), demonstrating that probably can be related to patients with the HIV. It is expected that by 2015 half to reduce the rates of TB deaths worldwide.¹⁵

Control of TB depends on improvement of the factors related to health services: reliable information system, expansion of decentralized care that enable the implementation of supervised treatment, professional training and strengthening of teamwork, and optimization of references and counter-reference. The individualized approach and appreciation of educational activities provide information easier to be understood about the disease and encourage the patient to be treated.²⁰

MS states that are under implementation in the year 2013-2014 a TB diagnostic test results quickly, easily performed with high sensitivity (97,20%) and specificity (98,10%), indicating the possibility of resistance rifampin, which will favor the actions for the control of tuberculosis in Brazil.²³ This innovative technology will probably be the main tool for the diagnosis of pulmonary TB, and reduce the risk of occupational contamination and allow diagnosis in just two hours by DNA (deoxyribonucleic acid) identification of *Mycobacterium tuberculosis*, replacing bacilloscopy in health care network that takes about 60 days for its completion.⁵

Study in Bogota demonstrates that increasing incidence of multidrug resistance hampers the control of the disease since it requires the use less effective and less well tolerated by alternative medicines, the required long treatment regimens and reduce chances of cure.²⁴ Aracaju in the period 2001-2010 showed 0.05% of multidrug-resistant TB which possibly demonstrates difficulty in controlling the disease by health professionals.

Thus, over the years there has been an evolution in public health policies with respect to assistance to TB. Also drugs and new forms of administering were created for greater control and / or elimination of the disease.²⁵ In addition, knowledge of the need for the use of contact precautions measures by health professionals, prevents the spread of microorganisms to other patients, resulting in a safe and quality care.²⁶

The reduction in the incidence of TB may suggest that, in Singapore, there is a better adherence to treatment of patients at the

time, medical care, a good impact of awareness campaigns about the disease and the programs involved in the control of TB can be effective, reducing the prevalence and incidence of disease.³

The partnership between the NTCP and FHS is a transformer and relevant instrument for the control of TB in the country and could possibly contribute to the expansion of actions in TB control established in NTCP by improving adherence and avoid abandoning treatment.²⁷ Strengthening the implementation of integrated lifelong learning to educational institutions in health aimed at the population's needs, would enable the professionals better identification of respiratory symptoms, diagnostic procedures, therapeutic management and monitoring of the contacts, contributing to addressing the health problems found in the community.²⁸

Since 2012, MOH provides distance learning course for professionals entitled actions for TB control in primary care in order to qualify teams and improve patient care.²³

The coverage of the Family Health Strategy (FHS) doubled in Brazil in the years analyzed, from 25,40% in 2001 to 52,20% in 2010. Although a lower percentage increase in 2001, 50, 10% of smear positive pulmonary cases were diagnosed in Primary compared to 56,30% in 2010. The NTCP advocates the decentralization of active search actions, diagnosis, treatment and monitoring for primary care, in order to facilitate user access treatment and cure.⁴ Knowledge of socioeconomic aspects of TB grievance is crucial to guide public policies and direct primary care actions by the FHS.¹¹

Although these results are positive, TB is still a major public health problem in Brazil which worries the MS and requests greater forces to reduce the number of new cases by requiring the development of strategies to control considering humanitarian, economic and public health.⁴

CONCLUSION

The profile of TB patients in Aracaju in the new millennium is consistent with the national and world stage, and is mainly composed of men, young adults (20-29 years) and prevalence of pulmonary form of the disease.

Holders of TB had low education, with the disease evolving to cure, despite the high proportion of patients who abandon treatment. The average percentage related to the outcome of the cases as healing and abandonment are still far from the WHO recommended target.

Among the limitations of this study, it highlights the use of secondary data that often show inconsistency in relation to the quantity and quality of information. There is the occurrence of high proportion of ignored/blank cases evidenced in the education data, which limits an attention of quality assessment of health to patients.

It was demonstrated high percentage of cases found in SINAN often not met, which may lead to a hidden prevalence, masking possibly the reality in the city of Aracaju, therefore makes it necessary to raise awareness among health professionals of the need for diagnosis early, notification of new cases, monitoring of patients during the therapeutic process, and to evaluate the patient during the closure of the case and record all the data in the information system.

This study may contribute to the municipal management strategically plan governmental actions, as well as a scientific basis for further studies in this subject, allowing national and global bodies to achieve the proposed goals regarding eradication and consequent reduction of spending on pathology. Without an effective and efficient public management there is no way to improve public health in Brazil.

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