



EXPLORATORY DESCRIPTIVE ANALYSIS OF THE INCIDENCE OF NEOPLASIAS AND CONGENITAL MALFORMATIONS IN THE CITY OF TREMEMBÉ-SP, BRAZIL (1998-2017).

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Abstract

The municipality of Tremembé is in the Paraíba Valley region, in the State of São Paulo- Brazil. It has a population of 40,984 inhabitants. It houses an agricultural production mainly represented by the cultivation of rice by flooding technique and a chemical additives factory. The present study aims to analyze the incidence of neoplasias and congenital malformations in the city of Tremembé / SP; to analyze the health data of the municipality of Tremembé, referring to the neoplasias and the congenital malformations, comparing with the data of neighboring municipalities like Taubaté, Pindamonhangaba and Aguas de São Pedro, belonging to the same region of study. This is a cross-sectional descriptive study on the incidence of neoplasias and congenital malformations, based on data collected from the Health System of the Ministry of Health in 4 municipalities in the State of São Paulo / SP. The results point to a higher incidence of neoplasias and congenital malformations in the Tremembé region. The results indicate the need for analysis between the exposure of the population of the municipality of Tremembé to the chemicals harmful to health used in industry and local agriculture and the number of cases of congenital malformations.

Key Words: neoplasias, congenital malformations, environmental health, pesticides, epidemiological surveillance.

Introduction

The municipality of Tremembé is located in the State of São Paulo / Brazil, in the Vale do Paraíba region. It has the title of tourist resort. It has, according to data of the sense of 2010, of the Brazilian Institute of Geography and Statistics (IBGE, 2018), a population of 40,984 inhabitants. The municipality does not count on municipal hospital care, forcing the population to seek specialized care in the municipalities of Taubaté and Pindamonhangaba.

The municipality is home to agricultural production mainly represented by the cultivation of rice by the flooding technique and a chemical additives plant, agrochemicals.

Chemicals used in industry and agricultural production are mainly soluble in water and contaminate the soil expansively. According to the Environmental Company of the State of São Paulo (CETESB, 2017), there were two accidents involving chemicals in Tremembé, one accident in 2002 and another in 2013.

It is known that certain toxic products can reach the food chain and accumulate in greater quantity according to the trophic level occupied by the living being, placing the human being in a position of risk. Some of these chemicals (pesticides) may favor the appearance of neoplasias and the occurrence of congenital malformations, as well as the infertility of men who have had contact with these substances (Peres et al., 2003).

Goals

- To analyze the incidence of neoplasms and congenital malformations in the municipality of Tremembé - SP.
- To compare the health data of the municipality of Tremembé with data from the municipalities of Taubaté, Pindamonhangaba and Aguas de São Pedro, being the municipality of Aguas de São Pedro considered to have no history of contamination by chemical products.

Data and methods

This is an exploratory descriptive cross-sectional study. Health data from the municipalities of Tremembé, Taubaté, Pindamonhangaba and Aguas de São Pedro were analyzed, based on a survey by the Department of Informatics of the National Health System (DATASUS) of the Ministry of Health.

The data selected for analysis were: neoplasias and congenital malformations, considering its importance for the analysis of the health situation of the population of the municipality of Tremembé, facing a probable chronic exposure by chemical substances.

Considering the fact that the Tremembé municipality has poor health care, health and care data were collected in two municipalities: Taubaté and Pindamonhangaba, which provide support in the health care of the population of Tremembé. Data were analyzed by place of residence, aiming at a more reliable and reliable information base for the reality of the study population.

The numbers of cases of neoplasias and congenital malformations of the municipalities of Taubaté, Pindamonhangaba and Aguas de São Pedro were collected and analyzed, to verify the behavior of the same diseases in different populations. The data of the municipality of Tremembé, with the data of Águas de São Pedro municipality, were compared. The objective was to verify the incidence behavior of the diseases studied, with data from the municipalities of Tremembé, Taubaté, Pindamonhangaba.

The Human Development Index (IDH) and the health data of the municipalities: Tremembé, Taubaté, Pindamonhangaba and Águas de São Pedro were analyzed.

Results and discussion

The results obtained from the Department of Informatics of the Unified Health System (DATASUS) of the Ministry of Health indicate that the incidence of neoplasias and congenital malformations has been growing at the beginning of the years in the cities studied. According to the IBGE (2018), the average infant mortality rate in the municipality of Tremembé is 3.45 for 1,000 live births. This rate, when compared to all municipalities in the State of São Paulo, is in positions 488 of 645 and 553 of 645, respectively. When compared to all Brazilian municipalities, this position stands at 4182 of 5570 and 5076 of 5570, respectively.

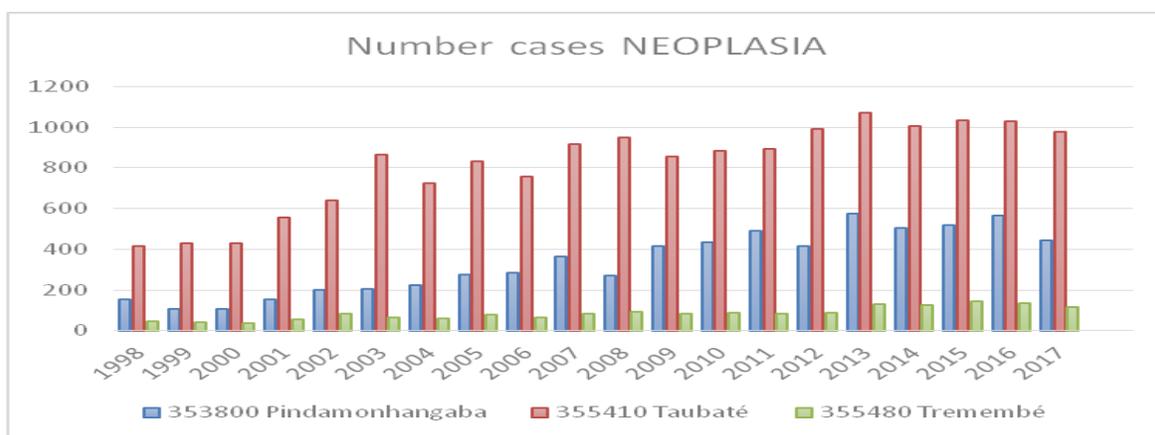
The State Department of Health of São Paulo (2013) highlights analysis from 1996 to 2010, where deaths from perinatal causes and congenital malformations are important factors in the mortality of the population under one year. This fact points out the need to strengthen and expand preventive policies, including those that contribute to a healthy environment by introducing mechanisms that allow greater accuracy in the diagnosis of these diseases.

Nery et al. (2014 and 2016) affirm that is very important the notifications for public politics at Sao Paulo st, specially to talk about environmental health.

The results of the study of neoplasias and congenital malformations, from 1998 to 2017, reveal high numbers in similar periods in the three municipalities: Águas de São Pedro, Taubaté and Pindamonhangaba. When comparing the data obtained by DATASUS, we can see the congruence between the increase in the number of cases of health problems in the municipalities of studies (Graphs 1, 2,3).

Oliveira et al. (2014) indicate 100% occurrence of congenital malformation among the children of mothers exposed to pesticides in the periconceptional period. Garcia et al. (1999) also indicate a higher incidence of some types of malformation of live births of mothers working in agriculture. In turn, Lacasaña et al. (2006) report a fourfold increase in malformations among children born to newborns.

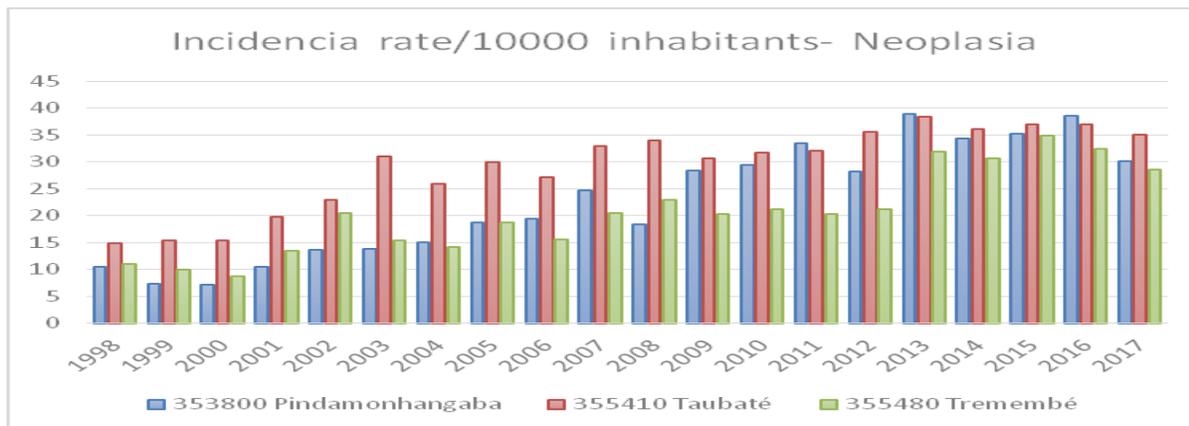
Graph 1: Number of cases of general neoplasias in the municipalities: Pindamonhangaba, Taubaté and Tremembé, from 1998 to 2017. *Source: DATASUS / MS.*



The incidence rate of neoplasias found in the three municipalities: Pindamonhangaba, Taubaté and Tremembé, shows that there was an increased risk of neoplasia in the population concomitantly. There is also a similarity achieved in the year 2015. This fact indicates the need

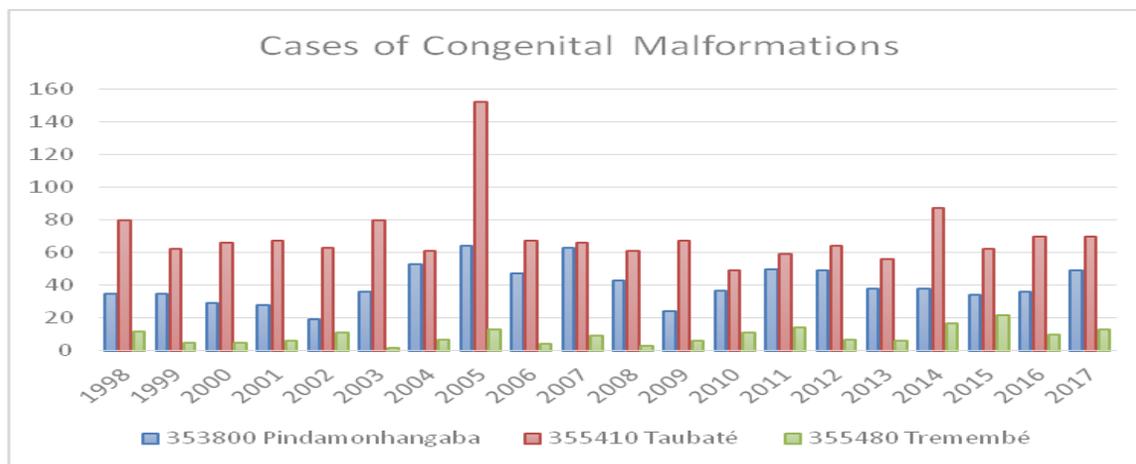
for further studies on the subject and implementation of preventive actions for health safety of the populations studied (Graph 2).

Graph 2: Rate of incidence of neoplasias, per 10000 inhabitants, in the municipalities of Taubaté, Tremembé and Pindamonhangaba, from 1998 to 2017. *Source: DATASUS / MS.*



The number of cases of neoplasias has increased over the years, with important peaks in the years 2003, 2005 and 2014 (Graph 3). According to CETESB data, in 2003 and 2013 accidents occurred with chemical substances on Rodiano Floriano Rodrigues Pinheiro, in the stretch of the municipality of Tremembé. The progressive increase observed in the period analyzed also coincides with an increase in agricultural production in the region (Brazil, 2005).

Graph 3: Cases of congenital malformations in the 3 municipalities studied from 1998 to 2017. *Source: DATASUS / MS.*

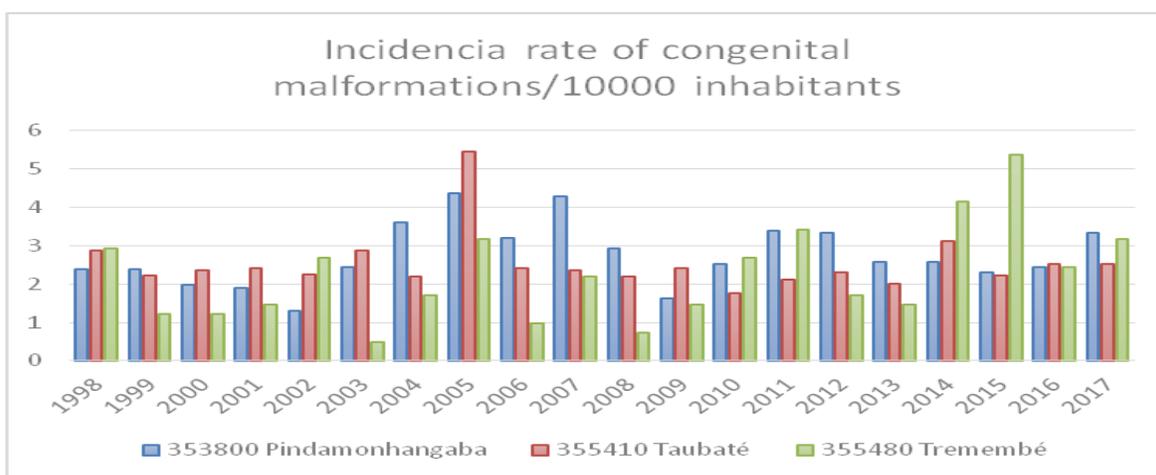


Analyzing the cases of congenital malformations, it is noted that in 2003 and 2014, therefore, one year after the accidents occurred, there is a peak of registered cases in the region. In 2005 there was an increase in case records in the municipality of Taubaté. However, this increase is not observed in the other municipalities studied, which indicates the need for studies of the probable causes.

The increase in the number of cases is maintained in subsequent years, suggesting that there is something in the environment sustaining the appearance of the health problems of the population and that is reflected in the 3 municipalities concomitantly.

Graph 4 shows a higher incidence rate of congenital malformations in 2005, in the municipality of Taubaté, in 2007, in Pindamonhangaba and in 2015, in Tremembé.

Graph 4: Rate of congenital malformations per 10000 inhabitants in the municipalities of Tremembé, Taubaté and Pindamonhangaba in the period 1998 to 2017. *Source: DATASUS / MS*



The incidence rate of congenital malformation, observed in the study, indicates the seriousness of the situation of the populations of the municipalities analyzed, since it is possible to note the higher incidence of this type of aggravation. The municipality of Tremembé stands out as having the greatest risk in the period analyzed, considering its territorial size and the number of inhabitants (Graph 2).

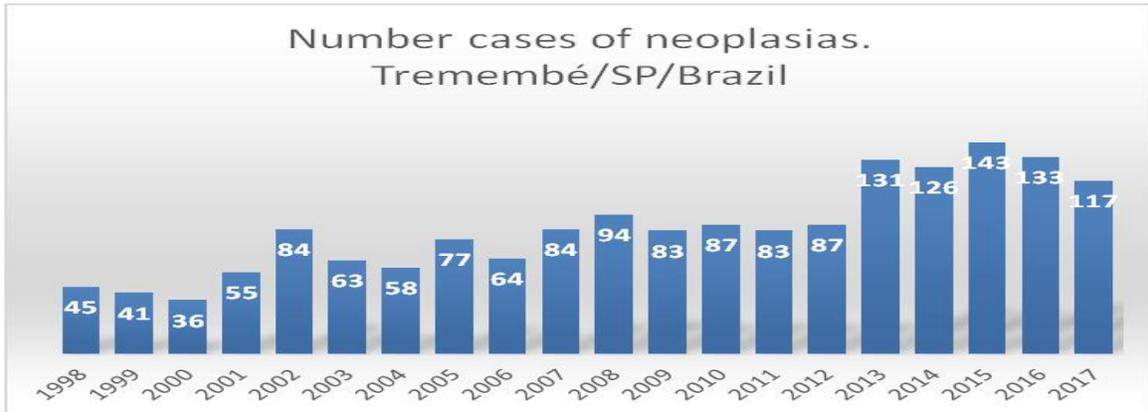
Kristensen et al. (1997), Winchester et al. (2009) also report a higher incidence of congenital malformation in children of mothers exposed to pesticides during pregnancy. Corroborating, Ramos et al. (2008) affirm that the prevalence of congenital malformation among rural mothers is higher, representing 60% of the cases, having as a risk factor for exposure to teratogenic substance, as a pesticide.

In relation to the municipality of Tremembé there is a significant increase in the number of cases of neoplasias, in the years 2002, 2008 and 2013, maintaining a high number of cases in the following years. There is a trend of increasing cases of neoplasias, proportionally, to the increase in local agricultural production and regional development, when we compare the period from 1998 to 2002 and the subsequent period, suggesting that the population was exposed to something that induced the increase of cases over the years (Graph 5).

Stoppelli (2005) evidenced a higher prevalence of skin neoplasia (45%) and of the digestive system (36%) among rural workers. Silva et al. (2016) also indicate that among rural workers,

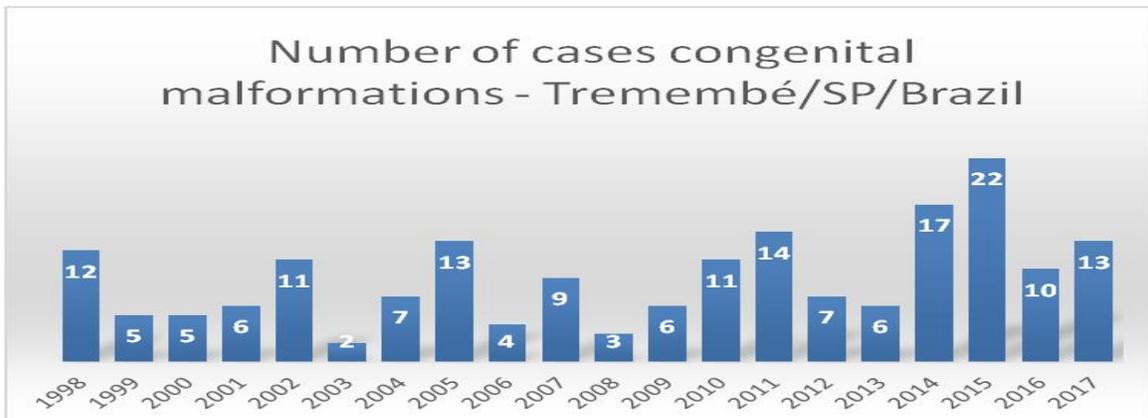
neoplasias of the digestive system predominate. Silva et al. (2016) also consider the exposure and use of agrochemicals as an occupational hazard.

Graph 5: Cases of neoplasias in the municipality of Tremembé from 1998 to 2017. *Source: DATASUS/MS.*



In relation to the cases of congenital malformations in the municipality of Tremembé, there is an increase in the number of cases, in periods coinciding with higher local agricultural production and chemical accidents, occurring in 2014 and 2015. These data strengthen the hypothesis that contamination of soil and water in the municipality of Tremembé may have affected the health of the population (Graph 6).

Graph 6: Number of cases of congenital malformations in the municipality of Tremembé from 1998 to 2017. *Source: DATASUS/MS.*



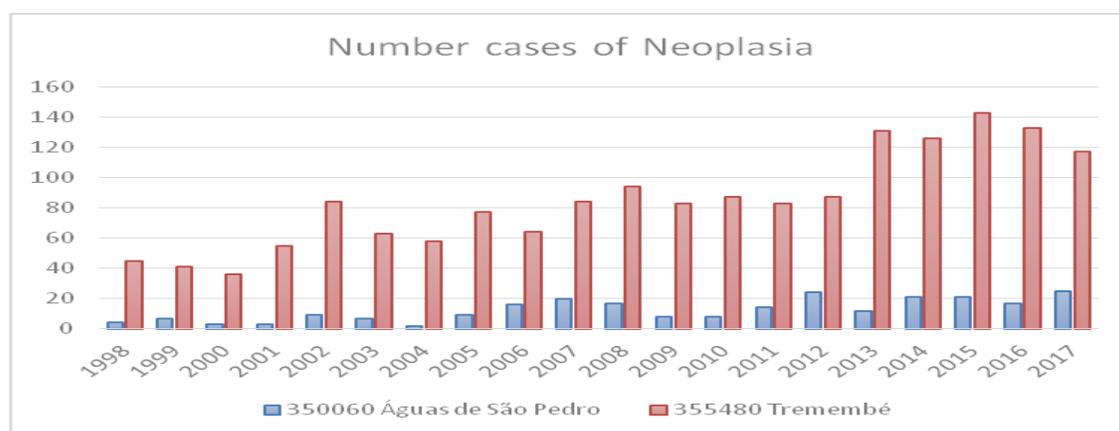
Paz de Lima (2008, 2014) point out that in agriculture, agrochemicals known as fertilizers, pesticides, herbicides and insecticides, used in pest control, when used improperly, in excess, and uncontrolled, end up being dragged into the rivers with rain. Contact of these pollutants with soil or water can contaminate groundwater.

As for the municipality of Aguas de São Pedro, it is considered the freest of chemical residues in the State of São Paulo, with no chemical factories, in addition to the absence of significant agricultural production in its territory.

According to IBGE (2018), the municipality of Aguas de São Pedro presents 97.4% of households with adequate sanitary sewage, 97.7% of urban households in public roads, with afforestation and 56.2% of urban households in public roads, with adequate urbanization (presence of manhole, sidewalk, paving and curb). When compared to the other municipalities of the State of São Paulo, it is in position 83 of 645, 201 of 645 and 55 of 645, respectively. When compared to other cities in Brazil, its position is 95 of 5570, 455 of 5570 and 287 of 5570, respectively.

Graph 7 shows a significant difference in the registry of neoplasias in Tremembé, when compared to the reference municipality. This comparison reveals that in a chemical-free environment, the number of cases of neoplasia is much lower, that is, the body normally has no cell replication failures unless there is an external stimulus. The municipality of Águas de São Pedro is "free of chemical residues", and there is no record on the use of chemical substances (pesticides), since it is basically an urban municipality.

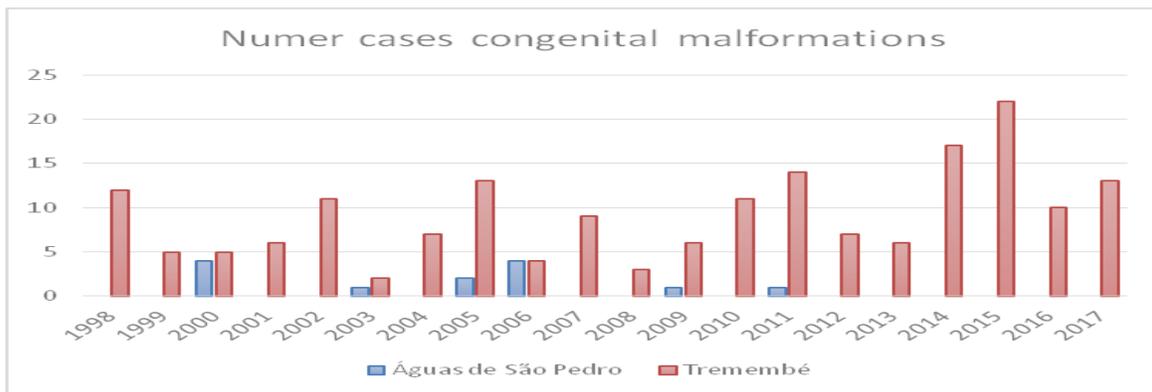
Graph 7: Number of cases of neoplasias in the municipalities of Tremembé and Águas de São Pedro in the State of São Paulo, from 1998 to 2017. *Source: DATASUS / MS.*



When comparing the cases of congenital malformations in the two municipalities: Aguas de São Pedro and Tremembé, there is once again a high discrepancy in the number of cases of incidence of registered neoplasias. While the municipality of Tremembé has an annual rate of registration of cases of congenital malformations, while the municipality of Aguas de São Pedro presents a lower rate during the entire period of study observed (Graph 8).

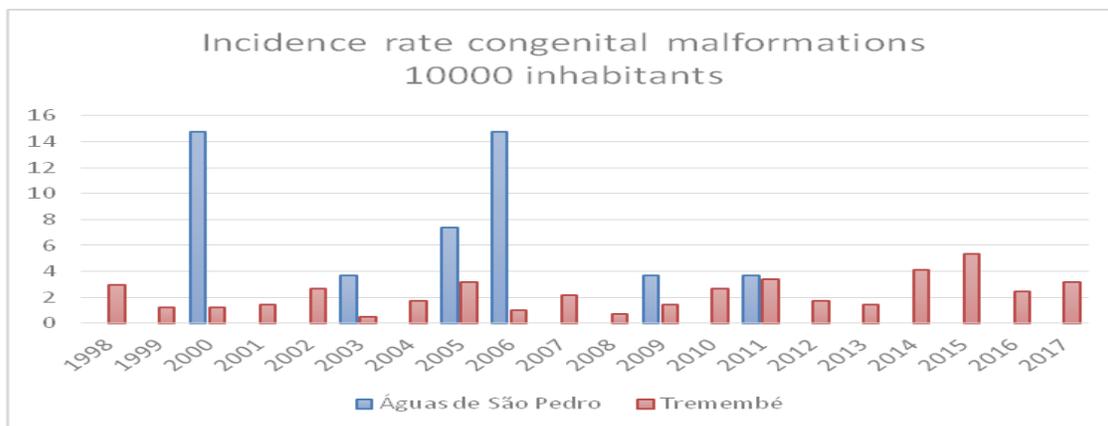
This fact indicates that the population's constant exposure to harmful chemicals used in industry and local agriculture substantially interferes with the numbers of cases of congenital malformations. Thinking of a population of 45,904 people (IBGE, 2018), this number of cases per year is very high and reflects the seriousness of the situation of the local population.

Graph 8: Number of cases of congenital malformations in the municipalities of Tremembé and Águas de São Pedro in the State of São Paulo, from 1998 to 2017. *Source: DATASUS / MS*



The incidence rate found points out that there is a need to implement public policies for the prevention of neoplasms and that the municipality of Águas de São Pedro has more diagnostic resources of this type of disease compared to that of Tremembé (Graph 9).

Graph 9: Incidence rate of congenital malformations per 10000 inhabitants in the municipalities of Águas de São Pedro and Tremembé, from 1998 to 2017. *Source: DATASUS / MS.*



The incidence rate of congenital malformations found evidences the constancy of aggravation in the population of Tremembé. This fact allows us to consider a probable supportive factor in the environment, since this type of injury can occur through the action of pollutants present in the region.

Conclusion

Contamination of the environment Brazil (2013), from water pollution can move through the rivers and the influence of rainfall. Irregular and excess use of chemical products (pesticides) in the sources of the Paraíba do Sul River can affect many neighboring municipalities and the incidence of a health problem related to the contamination of the environment. Therefore, a similar behavior in neighboring populations. The region may be affected by these standards. The increase in agricultural production and, consequently, the increase in the use of pesticides in the region of study, points to a negative reflection also on the health of the populations in the study regions.

The cases of neoplasias and congenital malformations in the study regions revealed high numbers in similar periods in the neighboring municipalities analyzed.

The results indicate, therefore, the necessity of an analysis between exposure of the population of the municipality of Tremembé the harmful chemical substances used in industry and local agriculture and the number of cases of congenital malformations. In view of the results pointed out, it is necessary to implement public policies, as well as basic health care services for the local population. Also worthy of note was the need for greater control, monitoring and monitoring of agro-chemical industries and producers, with a view to controlling the use of pesticides and the correct disposal of chemical residues.

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