

IMPLICATIONS OF INADEQUATE BASIC SANITATION ON FRUIT AND VEGETABLE PRODUCTION AND CONSUMPTION

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SUMMARY: The National Basic Sanitation Law establishes basic principles for public sanitation services, ensuring its universality and its specificities. In this sense, we tried to observe the sanitation conditions in three cities of São Paulo state, producers of fruits and vegetables, as well as the risk of contamination of this horticultural production through the use of contaminated water and its consequences for the consumers of this production. For that, statistics on sanitation services in Brazil and the occurrence of intestinal parasites were used. The results showed that in the cities observed (São Miguel Arcanjo, Tatuí and Itapetininga) sanitation public service is deficient, exposing to the risk of contamination the water collection used for irrigation of the fruit and vegetable production areas, as well as risk to the health of farmers and consumers of this production.

Keywords: Contamination. Biological Risk. Microbiology. Education

1 INTRODUCTION

The National Law of Basic Sanitation , 11,445 (BRAZIL , 2007) has established that the sanitation of public services should be provided based on some fundamental principles, especially universalizing services and its specificities such as water supply, sanitary sewage, urban sanitation and solid waste management, urban rainwater management. Within this principle of universality, these same specifics must be also present in rural area.

In other aspect, consumption of vegetables and fruits should be of five servings daily plus two, for obtaining a healthy diet (SILVA, 2011) . In most cases, the production of these fruits and vegetables are located in rural small towns located close to large consumer centers.

Teixeira ; Gomes; Souza (2011) and Tan et al . (2014) highlighted the impact of sanitation on public health in several Brazilian states, they observed a great deficiency of services and high incidence of intestinal parasites in people due to the lack of adequate sanitation.

The cities of Itapetininga, Tatuí and São Miguel Arcanjo, located in São Paulo, along the same state highway, have poor sanitation (IBGE, 2010) and at the same time are major producers of fruits and vegetables. Combining these aspects, this article sought to establish a parallel between the lack of sanitation and its consequences on the population exposed, and a possible occurrence of parasitic outbreaks in the consumers of these products.

2 MATERIAL AND METHODS

The study was conducted by analyzing data (IBGE , 2010) about the situation of the appropriateness (or the lack of it) of the basic sanitation of the cities of Itapetininga, Tatuí and São Miguel Arcanjo .

These cities were chosen by the fact that they belong to the same region (southwestern São Paulo), located close to each other, and because they are large producers of fruits and vegetables which are consumed in that region and in other urban centers.

Data from scientific papers on the subject, from magazines, newspapers and scientific periodicals of recognized importance in the academic environment was used in this work.

3 RESULTS AND DISCUSSION

Regarding the number of households in rural areas of each city, it was observed that Itapetininga and Tatuí have around 3,000 consolidated homes, twice the number of São Miguel Arcanjo (Figure 1). This characteristic shows that, even in a theoretical way , it is much easier to implement basic sanitation in São Miguel Arcanjo, due to the smaller number of households to be served (GALVÃO JUNIOR et al . , 2012) .

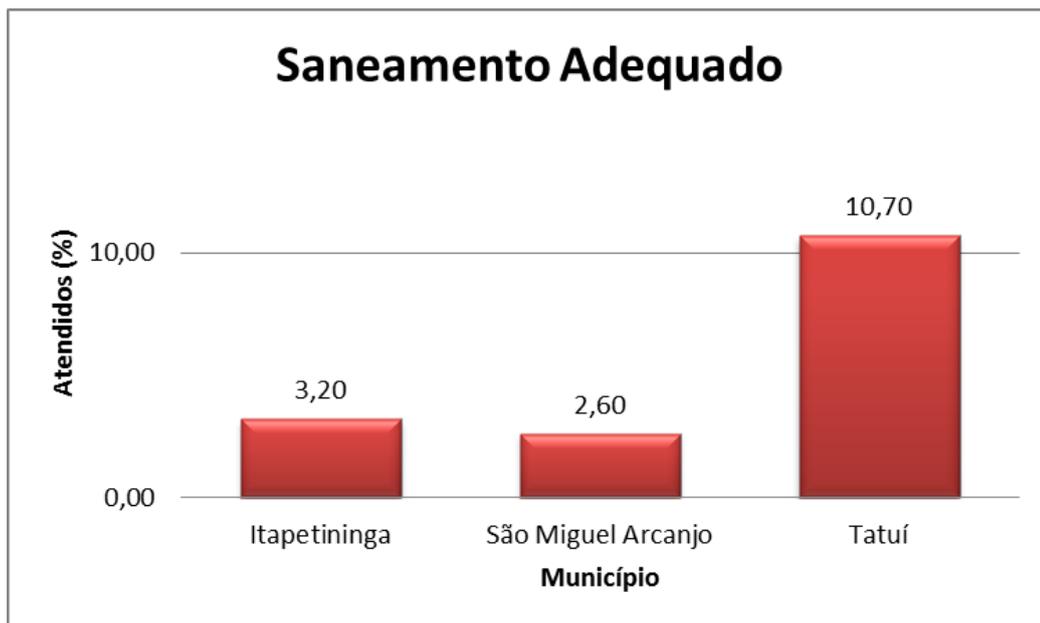
Figure 1 - Number of households in rural areas of Itapetininga, São Miguel Arcanjo and Tatuí (Source : IBGE , 2010)



The smaller number of households also indirectly, results in less amount of sewage to be collected and treated, however, it should be taken into account other factors such as the distribution of these households in the city, the local topography, and also the observation of possible specific areas to receive an effluent treatment plant without environmental contamination and of course, the availability of funds for investment in this area (Lisbon ; HELLER ; . Silveira , 2013) .

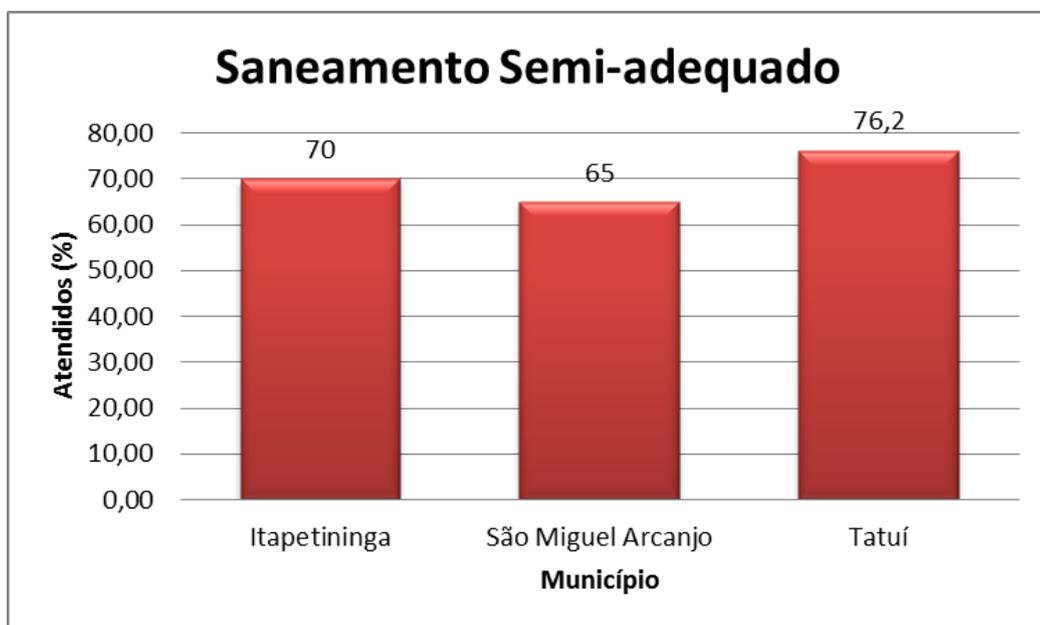
Regarding the systems available for sanitation in these cities, it is observed that about 10% of households have adequate treatment in Tatuí, and this rate is around 3% in Itapetininga and São Miguel Arcanjo (Figure 2)

Figure 2 - Percentage of households with adequate sanitation system in Itapetininga, St. São Miguel Arcanjo and Tatuí (Source : IBGE , 2010)



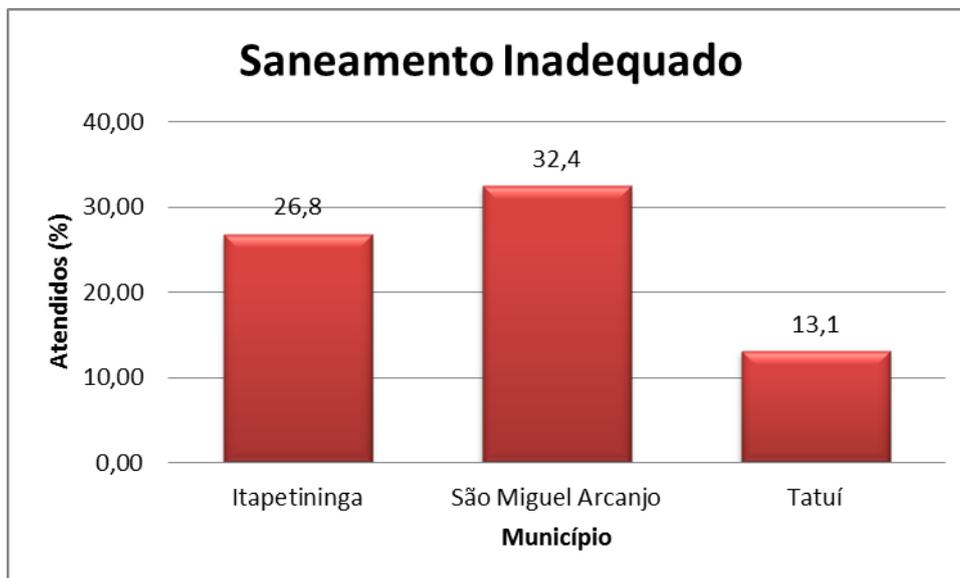
It was also observed that, in relation to the semi-adequate system (Figure 3) , the cities of Itapetininga, São Miguel Arcanjo and Tatuí have about 2/3 of the houses served by this kind of system.

Figure 3 - Percentage of households with semi-adequate sanitation system in the cities of Itapetininga, São Miguel Arcanjo and Tatuí (Source : IBGE , 2010)



Regarding the inadequate sewage treatment (Figure 4), it was observed that the cities of Itapetininga and São Miguel Arcanjo present about 30 % of households using this system, whereas in Tatuí this type of sanitation is present in about 13 % of households .

Figure 4 - Percentage of households with inadequate sanitation system in the cities of Itapetininga, São Miguel Arcanjo and Tatuí (Source : IBGE , 2010)



Lisboa, Heller, Silveira (2013) observed that several factors hinder the effective planning of actions for proper installation of basic sanitation, and that on the city managers perception, the main problems are the lack of financial resources, the professional qualification limitations and technical capacity of the cities. These authors also clarified that once the first problem has been overcome, it is possible to proceed to the hiring of specialized professionals and mitigate or definitively eliminate the second one.

The indirect consequence of the lack or inadequacy of sanitation in these cities is the fact that in these cities occur great agricultural production of fruits and vegetables (IBGE, 2010).

The problems observed are related to poor water quality used for irrigation of these crops. The use of this water with a great amount of biological contaminants predisposes the population to parasitic intestinal diseases.

According to Giatti et al. (2004), parasitic intestinal diseases are serious public health problems, especially in developing countries. Intestinal parasites constitute a major public health problem which is a debilitating factor to the people, leading to cases of chronic diarrhea and malnutrition, compromising the physical and intellectual development, especially among the younger ones. (PEDRAZZANI et al., 1988).

According to Teixeira et al. (2014) although being the seventh world economy in 2008, Brazil had sanitation coverage ratios of developing countries. To the World Health Organization (WHO, 2007), about 233,000 people died per year in Brazil due to exposure to factors such as air pollution, untreated water and lack of urban and rural infrastructure, and 19% of these deaths could be avoided with more effective public policies.

The educational level of the individual and their health knowledge are directly linked to the worsening of the problem (GIATTI et al . , 2004). Moreover, Ludwig et al . (1999) emphasized that the higher investment in sanitation, the lower the rates of cases of intestinal parasitic diseases in the population .

It has also been highlighted by several authors , that the occurrence of these parasites generates a social cost in production due to the occupation of hospital beds , number of hours not worked and medication use.

It has also been observed that the lack of hygiene of the average citizen (GIATTI et al, 2004) leads many consumers not to properly use prevention measures at home, like properly washing vegetables that will be consumed (especially raw), in that way increasing the chances of contracting some intestinal parasites .

Teixeira ; Gomes; Souza (2011) and Mattos, Mota ; Dreyer (2008) highlighted that even in places with high incidence of intestinal parasites, the use of educational campaigns and improvements in sanitation have become crucial to reduce these occurrences and should be taken into account not only by the population but also by the government

Soriano et al . (2013) highlighted the lack of attention of city managers / candidates to the occurrence of natural disasters, and also in relation to basic sanitation. Overall, there are a lot of empty or unenforceable proposals, in order to just cherish those who listen and get votes.

4 CONCLUSION

According to the analyzed data , it is concluded that :

- The cities of São Miguel Arcanjo, Tatuí and Itapetininga have deficiencies in basic sanitation services.
- Lack of adequate sanitation can contaminate water collections of crop irrigation with intestinal parasites.
- The occurrence of intestinal parasites may compromise the productive power of the individual, as well as their intellectual development.
- Lack of health education of the population can cause parasitic infection outbreaks among consumers of fruits and vegetables.
- Investment in sanitation and in education is essential to try to remedy this situation.

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