

# Relationship between respiratory tract diseases declared by parents and socioeconomic and cultural factors

*Relação da doença respiratória declarada pelos pais e fatores socioeconômicos e culturais*

*Relación de la enfermedad respiratoria declarada por los padres y factores socioeconómicos y culturales*

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## ABSTRACT

**Objective:** To determine the association between children's respiratory diseases reported by parents and the following criteria: attendance at private or public school, parents' educational level; family *per capita* income; household socioeconomic class, and family ethnicity.

**Methods:** This retrospective descriptive study analyzed data collected from questionnaires responded by the parents of 959 schoolchildren between five to nine years old, living in the district selected for the study, in São Paulo, Brazil, over 2004. Respiratory diseases reported by parents were rhinitis, rhinosinusitis, ear infections, laryngitis, pharyngitis, pneumonia, asthma and asthma-like diseases. A chi-square test was used to evaluate the association between respiratory diseases reported by parents and family socioeconomic factors.

**Results:** Parents of children in private schools reported significantly more respiratory diseases in their children than those whose children attended public schools. More respiratory diseases were reported for children whose parents finished high school or college. There were no significant differences between respiratory diseases and *per capita* income, socioeconomic class or ethnicity.

**Conclusions:** A more accurate perception about the health of children is generally associated with parents' higher education, which is also expected to ensure better living conditions. This may explain why parents with a higher level

of education and whose children attended private schools reported more respiratory diseases in their children. Our findings suggest that improvement of educational level is associated with more accurate health perceptions and, consequently, better health conditions.

**Key-words:** school health services; respiratory tract diseases; socioeconomic factors.

## RESUMO

**Objetivo:** Verificar a relação entre a doença respiratória das crianças declarada pelos pais e os seguintes aspectos: instituição de ensino da criança, grau de instrução dos pais, renda *per capita*, classe de consumo e grupo étnico da família.

**Métodos:** Estudo descritivo com enfoque retrospectivo, por meio da análise de dados coletados de pais de uma amostra de 959 escolares entre cinco e nove anos, que residiam no distrito estudado, em São Paulo, em 2004. O levantamento das informações foi realizado por meio de instrumento de coleta de dados. As doenças respiratórias pesquisadas no conjunto foram: rinite, rinossinusite, otite, laringite, faringoamigdalite, pneumonia e asma. A associação entre doença respiratória declarada e aspectos socioeconômicos foi avaliada pelo teste do qui-quadrado.

**Resultados:** Os pais de crianças que frequentavam escolas privadas declararam significativamente mais doenças respiratórias em seus filhos, em comparação aos pais de crianças que

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estudavam em escolas públicas. Os pais com grau de instrução superior ou ensino médio completo declararam significativamente mais doença respiratória em seus filhos. Não houve associação entre a doença respiratória com renda *per capita*, classe de consumo e etnia.

**Conclusões:** A percepção mais apurada sobre a saúde dos filhos geralmente associa-se à maior escolaridade dos pais, o que também determina melhores condições de vida. Provavelmente, por isso, os pais cujos filhos frequentavam escolas privadas e com melhor nível de escolaridade referiram mais doenças respiratórias nas crianças. Infere-se, portanto, que conquistas na percepção de saúde e, conseqüentemente, nas condições de saúde associam-se à melhora do nível educacional.

**Palavras-chave:** serviços de saúde escolar; doenças respiratórias; fatores socioeconômicos.

## RESUMEN

**Objetivo:** Verificar la relación entre la enfermedad respiratoria de los niños declarada por los padres y los aspectos a continuación: institución de enseñanza del niño, grado de instrucción de los padres, ingreso per cápita, clase de consumo y el grupo étnico de la familia.

**Métodos:** Estudio descriptivo con enfoque retrospectivo, mediante análisis de datos recogidos de padres de una muestra de 959 escolares entre 5 y 9 años de edad, que vivían en el distrito estudiado, en São Paulo (Brasil), en 2004. El relevamiento de las informaciones fue realizado mediante instrumento de recolección de datos. Las enfermedades respiratorias investigadas en el conjunto fueron: rinitis, rinosinusitis, otitis, laringitis, faringoamigdalitis, neumonía y asma. La asociación entre enfermedad respiratoria declarada y aspectos socioeconómicos fue evaluada por la prueba del chi cuadrado.

**Resultados:** Los padres de niños que frecuentaban escuelas privadas declararon significativamente más enfermedades respiratorias en sus hijos, si comparados a los padres de niños que estudiaban en escuelas públicas. Los padres con grado de instrucción superior o secundaria completa declararon significativamente más enfermedad respiratoria en sus hijos. No hubo asociación entre la enfermedad respiratoria con ingreso per cápita, clase de consumo y etnia.

**Conclusiones:** La percepción más fina sobre la salud de los hijos generalmente se asocia a la mayor escolaridad de los padres, lo que también determina mejores condiciones de vida. Probablemente, por ello se observó que padres cuyos hijos frecuentaban escuelas privadas y con mejor nivel

de escolaridad refirieron más enfermedades respiratorias en sus hijos. Se infiere, por lo tanto, que a la mejoría del nivel educacional se asociarán conquistas en la percepción de salud y, conseqüentemente, en las condiciones de salud.

**Palabras clave:** servicios de salud escolar; enfermedades respiratorias; factores socioeconómicos.

## Introduction

Childhood respiratory diseases are characterized by a wide range of clinical signs and symptoms, particularly cough, difficulty in breathing, sore throat, running nose and earache. Respiratory diseases may have an infectious (common cold, tonsillitis, otitis or pneumonia) or noninfectious (rhinitis and asthma) etiology. Their differential diagnosis is not always evident, and decisions about treatment are controversial on many occasions<sup>(1,2)</sup>.

In developed or developing countries, respiratory diseases have gained great epidemiological importance due to the impact of their high morbidity and mortality among children. According to a survey conducted by the Health Department of São Paulo in August 2003, respiratory diseases are the 4<sup>th</sup> most common cause of hospitalizations of patients in the Brazilian public healthcare system (Sistema Único de Saúde - SUS); it is the third when mean expenses are analyzed, and second in mean duration of hospital stay, after circulatory diseases only<sup>(3)</sup>.

The World Health Organization (WHO) published a report on the epidemiology and etiology of child pneumonia in May 2008. Based on the study conducted by Rudan *et al*<sup>(4)</sup>, WHO also estimated the incidence of pneumonia around the world. Mean incidence in developing countries was 0.28 per child, which corresponds to 151.8 million new cases of pneumonia per year worldwide. This estimate is important to plan health promotion and prevention programs, such as vaccination campaigns and timely antibiotic prescription. Brazil is one of the 15 countries with the highest absolute number of new cases of pneumonia<sup>(4)</sup>.

From 5 to 9 years, the main cause of respiratory diseases in children is asthma, a chronic inflammatory disease caused by genetic and environmental factors. Asthma prevalence varies substantially according to age group, location and study method. The International Study of Asthma and Allergies in Childhood (ISAAC), which included 463,801 school children and adolescents 13 to 14 years old from 38 countries, found that 4.1 to 32.1% of the children had asthma<sup>(5,6)</sup>. In Brazil, the ISAAC was conducted in 6 cities with a cohort of 13,604 children and

20,554 adolescents. Asthma was found in 7.3% of the boys and 4.9% of the girls 6 to 7 years old, 9.8% of the 13-year-old adolescents and 10.2% of the 14-year-old adolescents<sup>(7)</sup>. Asthma is responsible for some 350,000 hospitalizations every year, which makes it the fourth most common cause of hospitalization in the Brazilian health system and the third among children and young adults<sup>(8)</sup>. Current studies about asthma physiology and the development of new drugs have achieved significantly satisfactory results in controlling this disease. However, and despite current advances, morbidity and mortality due to asthma are still a matter of concern for health providers<sup>(5-7)</sup>.

Studies have shown that health is closely associated with socioeconomic conditions. Recent evidence points to the existence of a social gradient that applies to falling ill and dying: the lower the position in the social scale, the higher the risk<sup>(9,10)</sup>. The Brazilian Association of Market Research Institutes developed the ABIPEME criteria to classify the Brazilian population into categories according to consumption patterns or potentials. These criteria led to the development of a socioeconomic scale based on the assignment of different weights to a number of household consumer items, as well as the educational level of the head of the family. The population is classified according to five socioeconomic classes: A, B, C, D and E, and each class corresponds to a certain score. Some of the household consumer items, such as video recorders, washing machines, refrigerators, refrigerator-freezers, and vacuum cleaners, were scored regardless of the number of units in the household. Other items, such as cars, color TVs, bathrooms, hired housekeepers and radios, received scores according to the number of units in the household. The educational level of the head of the family also received a score according to schooling.

Respiratory diseases have been a constant source of concern for health care professionals because of their high morbidity rates worldwide and their high mortality rates in developing countries<sup>(11)</sup>. This study evaluated the association between the social and demographic conditions of a representative sample of children that live in the area chosen for the study and respiratory diseases reported by the parents, family per capita income, socioeconomic class according to ABIPEME criteria and family ethnicity.

## Method

The study area comprised 5 neighborhoods in the city of São Paulo: Butantã, Vila Sonia, Raposo Tavares, Morumbi and Rio Pequeno, located in the west region of Sao Paulo city.

This retrospective descriptive study analyzed data collected from study participants<sup>(12)</sup>. In 2004, 28,649 five- to 9-year-old children lived in the study area, and 30,045 children were regularly enrolled in 202 local public and private schools. The number of children selected from both public and private schools followed the proportion of schoolchildren in the subareas that make up the study zone. The final sample size was calculated assuming a maximum error margin of 3% for each questionnaire item answered by parents or legal guardians at 95% confidence interval. Sample size should be at least 942 interviews, but 959 families actually answered the items about socioeconomic conditions and respiratory diseases in their children. The parents answered the following question: "Have you ever been informed by a teacher, school employee, nurse or other health professional that your child has any of the following conditions: rhinitis, sinusitis, otitis, laryngitis, pharyngitis-tonsillitis, pneumonia, asthma or asthma-like symptoms?"

The selected schools were visited by the authors, who explained the goals of this study and made clear that participation was not obligatory. The schools raffled the names of 5- to 9-year-old children whose parents later responded the study questionnaire.

The Pearson chi-square test was used to evaluate the association between respiratory diseases reported by the parents or legal guardians and school, educational level of parents or legal guardians, per capita income, socioeconomic class according to ABIPEME criteria and ethnicity. The level of statistical significance was set at 5%.

Parents or legal guardians signed an informed consent term. This study was approved by the Ethics Committee for Research Project Analysis of the institution where it was conducted.

## Results

The birth mother (92.8%) was the most frequent respondent in the sample of 959 children; 67.3% of all respondents were married; 50.4% were unemployed; 23% had a job; 25.9% were homemakers; 49.5% finished high school; 49.5% had a college degree; 79.9% received more than the minimum wage; 86.6% reported to be Caucasians, 26.3%, Afro-descendants, and 3.2%, Asians. Most of the children (53.9%) were girls.

The analysis of respiratory diseases revealed that 6.9% of the parents or legal guardians mentioned asthma in their children, and 8% mentioned other respiratory problems.

**Table 1** - Respiratory diseases reported by parents or legal guardians according to type of school, respondents' level of education, family per capita income, socioeconomic class (ABIPEME criteria), and ethnicity

	Respiratory disease		No respiratory diseases	
	Frequency	%	Frequency	%
<b>Type of school<sup>a</sup></b>				
Public	82	11.4	636	88.6
Private	52	21.6	189	78.4
Total	134	14.1	815	85.9
<b>Level of education<sup>b</sup></b>				
Incomplete high school	51	10.7	424	89.3
Completed high school or had college degree	83	17.5	392	82.5
Total	134	14.1	815	85.9
<b>Per capita income<sup>c</sup></b>				
Family per capita income up to 1 minimum wage	21	11.9	155	88.1
Family per capita income greater than 1 minimum wage	111	14.5	655	85.5
Total	132	14.1	801	85.9
<b>Socioeconomic class (ABIPEME criteria)<sup>c</sup></b>				
A/B	60	18.8	260	81.3
C	51	12.6	353	87.4
D/E	23	9.8	212	90.2
Total	134	14.0	825	86.0
<b>Ethnicity<sup>e</sup></b>				
Caucasian/white	99	15.0	559	85.0
Not Caucasian/not white	32	11.1	257	88.9
Total	131	13.8	816	86.2

aPearson X2 = 15.483 (p=0.000); bPearson X2 = 8.897 (p=0.003); cPearson X2 = 0.778 (p=0.378); dPearson X2 = 2.659 (p=0.103)

Table 1 shows the association between reported respiratory diseases and school, parents' education, family per capita income, socioeconomic class according to ABIPEME criteria and ethnicity of the 5- to 9-year-old children included in the study.

The parents of children that attended private schools reported significantly more respiratory diseases in their children than the parents of children who attended public schools.

Differences were found in reports of respiratory diseases analyzed according to the level of education of the parents or legal guardians. Parents that had a college degree or completed high school reported significantly more respiratory diseases in their children than parents that did not complete high school.

There were no significant differences between reported respiratory diseases and family per capita income, socioeconomic classes, or ethnicity.

## Discussion

The area where this study was conducted is located on the West Zone of the city of São Paulo and measures 56.1 km<sup>2</sup>,

which corresponds to 3.75% of the total area of São Paulo county<sup>(13)</sup>.

The study area follows the standards of São Paulo, which is characterized by extremely different neighborhoods, such as Raposo Tavares and Morumbi, where people of different social, economic and cultural levels coexist, which generates important conflicts<sup>(13,14)</sup>. The socioeconomic characteristics of our study families reflect this situation<sup>(15)</sup>.

In São Paulo county, epidemiological data for 2002 (Pro-AIM database) indicated that respiratory diseases were the most frequent pathologies among children and one of the main causes of childhood mortality, especially in the first year of life<sup>(3)</sup>.

According to Benício *et al*<sup>(2)</sup>, there has been a significant increase of respiratory diseases in São Paulo in the last twenty years and this increase seems to be unrelated to the cultural and socioeconomic level of the population. They suggested that increasing levels of pollution and early children schooling may explain these facts. They also called attention to the fact that, unlike most infectious-contagious conditions, respiratory diseases become more prevalent as family incomes increase. This is probably due to the fact that a higher

purchasing power allows people to have curtains, tapestry or teddy bears, for example, objects that concentrate a great amount of dust and house mites and contribute to the increase of respiratory diseases at all social levels.

In this study, parents whose children attended private schools reported significantly more respiratory diseases in their children than parents whose children attended public schools. Also, parents with a college degree or completed high school reported significantly more respiratory diseases in their children. A more accurate perception of children's health is usually associated with a higher level of education of parents, particularly mothers, the most frequent respondents in this study. Moreover, a higher education brings better life standards<sup>(16,17)</sup>. This might be the reason why parents whose children attended private schools and who had a higher educational level reported more respiratory diseases in their children. As Benício *et al*<sup>(2)</sup> pointed out, respiratory diseases occur in every socioeconomic class, and also tend to increase as living standards improve. Therefore, our findings may be self-explanatory because, on one hand, parents with a higher education may actually have a more accurate perception, and, on the other hand, respiratory diseases, in fact, increase among individuals with better life conditions.

Family income, analyzed according to per capita income and the ABIPEME criteria, did not affect the number of reports of respiratory diseases by parents. This result suggests that the parents' perception of their children's health may be more closely associated with their level of education rather than their socioeconomic condition. In a similar way, the ethnicity reported by the family did not affect the number of reports of respiratory diseases by the parents.

The main objective of this study was to characterize the respiratory disease reported by parents and caregivers under the socioeconomic and cultural perspectives. Therefore, there were no specific questions about respiratory diseases among the children. This is the main reason why a multiple regression analysis was not done, what can be considered a limitation of the study.

A better education may lead to the improvement of many health conditions that determine our children's development, such as respiratory diseases, important causes of morbidity and mortality in our environment. Understanding the multiple aspects that affect respiratory diseases is fundamental to plan and implement effective health promotion actions.

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