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# Increase in asthma and a high prevalence of bronchitis: Results from a population study among adults in urban and rural Vietnam

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**Summary**
*Background:* While a large amount of data about the epidemiology of asthma, COPD, chronic bronchitis and respiratory symptoms are available from developed countries, the information about these diseases in developing countries in south-east Asia are scarce.
*Aim:* Assess the prevalence of respiratory diseases and symptoms and their relation with demographic data including smoking habits among adults in rural and urban Vietnam.
*Methods:* A random sample of subjects aged 21–70 years were invited; 3008 subjects living in an inner city area of Hanoi and 4000 in a rural area of Bavi in northern Vietnam. An internationally used questionnaire was delivered by field workers to the study subjects. The questionnaire was completed by the subjects, or when necessary, by the field workers after reading the questions for the study participants.
*Results:* The response rate was 92% in Bavi and 70% in Hanoi. Of men in Bavi 67.8% (Hanoi 49.7%; $p < 0.001$) were smokers, while of women 4.2% were smokers in Hanoi (Bavi 1.2%; $p < 0.001$). The prevalence of ever asthma was in Hanoi 5.6% (Bavi 3.9%; $p = 0.003$) with

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no major gender difference. The most common symptom was longstanding cough (Hanoi 18.1%, Bavi 12.0%; $p < 0.001$) followed by sputum production, while the prevalence of symptoms common in asthma was considerably lower. Although the large difference in smoking habits, respiratory symptoms tended to be only slightly more common in men than women. Family history of asthma and chronic bronchitis, respectively, were strongly associated with both diseases.

*Conclusions:* The prevalence of asthma in adults may have increased in both urban and rural Vietnam, as the few previous estimates have found 2% of adults having asthma. Half of men in Hanoi and two-thirds in Bavi were smokers versus a few percent of women in both areas. Bronchitic symptoms were common in both men and women.


## Introduction

During the second half of the past century the prevalence of asthma and allergic diseases increased considerably in most developed countries,[1,2] and today asthma and allergic diseases are the most common chronic non-communicable diseases among children, teenagers and adults up to middle-age.[3] Over the past decades, the prevalence of asthma has increased also in developing countries.[4]

There are still scarce information about the prevalence of asthma and other obstructive airway diseases from several developing countries including the countries in south-east Asia. The information is limited and of varying quality and results are often conflicting. According to a recent study conducted in a highland city of the southern part of Vietnam, the prevalence of symptoms common in asthma was low, and the prevalence of asthma was estimated at 2%.[5] In 2001, according to the ISAAC study protocol among children aged 6—11 years in schools in Hanoi, the prevalence of 'doctor-diagnosed asthma' was 14% and similar to westernized countries.[6]

As a consequence of the tobacco epidemic, COPD has become an increasing demand all over the world.[7,8] Smoking is today particularly common among men in developing countries.[8] Following a network study in 11 Asian countries, the prevalence of COPD in Vietnam was estimated as the highest based on information about smoking habits.[9] However, there are no data at all from Vietnam about the prevalence of COPD based on population studies using spirometry.

The lack of data of adults, the indices of increase in asthma and the smoking epidemic strongly motivate a population study in Vietnam. We thus conducted a cross-sectional questionnaire survey in one urban and one rural area of Vietnam. The main aim of the study was to assess the prevalence of respiratory symptoms and diseases and their relation with mainly demographic data including smoking habits.

## Material and methods

The area of Vietnam is nearly 300,000 km$^2$ and the population was 86 million in 2006. Mountains consist 3/4 of the area while lower areas are located along the Pacific seeside of the country. In 1986 an economic reform started in Vietnam. A market economy was introduced with privatisation in all economic sectors and opened the country to the outside world. As a consequence, the economy has rapidly developed and resulted in dramatic economic and social changes as well as increased air pollution. These changes may affect health and quality of life. The distance between rural and urban areas has widened. In 2002, 29% of the population lived below an internationally accepted poverty line. The literacy is close to 100%.

The study was performed in one rural and one urban area. The choice of the areas was based on geography and air pollution: Hoankiem is an inner city district of Hanoi with an area of 5.29 km$^2$ and a population of 180,000 in 2006; Bavi is a district of the Hatay province 60 km west of Hanoi covering 410 km$^2$ including lowland, highland and mountains and has 235,000 inhabitants. The major population in Bavi are farmers (81%), and their income are based on agriculture production and livestock breeding.[10]

### Study sample

The study sample was 7008 subjects aged 21—70 years (born 1937—1986). Among them, 4000 subjects were randomly chosen from 51,000 inhabitants living in Bavi. The sampling in Bavi was based on 67 clusters sampled by an epidemiologic field laboratory.[10] In Hoankiem also 4000 subjects were randomly selected from the 108,000 subjects aged 21—70 years. However, all subjects from two communes were excluded as only a small proportion (<10%) were possible to trace. The reminding 3008 subjects were living in 16 inner city communes of Hanoi with 62,960 subjects aged 21—70 years.

### Questionnaire

The questionnaire included questions about respiratory symptoms and diseases including asthma, chronic bronchitis, COPD, allergic and chronic rhinitis, use of asthma medication, profession, smoking habits and a number of exposures and life style factors, such as diet and the stuff for cooking. The questions about symptoms and diseases were taken from the FinEsS-study version[11] of the Swedish OLIN-questionnaire.[12] The questionnaire has been used in a large number of Swedish and Northern European studies