

Abstract:

Introduction

Environment has become a topical subject in recent years due to concerns about its impact on the climate change and health of the people in both the developed and developing countries. Micro and macro level environmental factors along with individual lifestyles such as smoking aggravate the health conditions as like respiratory infections.

In this paper, an attempt is made to study the effects of household environment on respiratory health among the children and adults such as the Acute Respiratory Infections (ARI), particularly as childhood morbidity, and asthma as adult morbidity. The air pollution is increasing day by day intensifying the susceptibility of respiratory diseases like- asthma and others, whereas the indoor air pollutants, the major determinants of household environment, can originate both from outdoor and indoor sources. The household environment is characterized by the indoor pollutants generated through the type of fuel/fire use, source of lighting, and ventilation and It also gets polluted by human activities and lifestyles such as smoking of tobacco and crowding as indicated by number of persons sharing a room. As stated by Kumar (2001), 'when indoor sources or human activities emit pollutants at rates exceeding their removal rates by ventilation or surface reactions, the indoor pollution level can be more toxic than outdoor concentrations'.

In general, the association between exposure to Environmental Tobacco Smoke (ETS) and increased respiratory disease is stronger in young children than in adults. Epidemiologic studies have linked passive smoking in children to increased occurrence of lower respiratory tract illness during infancy and childhood demonstrating an increased risk of bronchitis and pneumonia during the first year of life in infants with smoking parents (mostly maternal) (Kumar H. et al 2001).

Need for the Study

As per WHO estimates, worldwide 300 million people suffer from asthma and 255,000 people died of asthma in 2005. Over 80 % of deaths occur in low and lower-middle income countries and WHO warns that Asthma deaths will increase by almost 20 % in next 10 years if urgent action is not taken. The prevalence of asthma has approximately

doubled in the last 20 to 30 years for reasons that have not yet been satisfactorily explained (Last 2007). In 2003, 22 % urban and 89 % people use solid fuel and 42 % males and 8.5 % females use tobacco (Mackay & Eriksen, 2002). According to WHO, India is home to 15-20 million asthmatics (World Health Statistics, 2007) and most deaths due to asthma and bronchitis in rural India occurred among the elderly person (83%) and ARI accounts for 25 % of all deaths due to communicable diseases (HII: 2004). Regarding ARI, WHO (1999) depicts a shocking figure as 4.1 million children in the world died of ARI in 1998 and 40 % of them were from India, Bangladesh, Nepal and Indonesia. In India, 13 % of all deaths in hospitals are ascribed to ARI.

Thick acrid smoke rising from smokes and fires inside homes is associated with around 1.6 million deaths per year in developing countries-that's one life lost every 20 seconds to the killer of the kitchen. Nearly half of the world continues to cook with solid fuels such as dung, wood, agricultural residues and coal (WHO/UNDP, 2004). In WHO member countries, 6.7 percent out of total male deaths and 7.3 percent of total female deaths are caused by respiratory infection, (WHO, 2004).

People in developing countries are commonly exposed to very high levels of pollution for 3–7 hours daily over many years. Because of their customary involvement in cooking, women's exposure is much higher than men's. Young children are often carried on their mothers' backs while cooking is in progress and therefore spend many hours breathing smoke (Bulletin of WHO, 2000). Dense crowding of indoor sleeping quarters during cold and wet seasons has been proved to be one important factor to cause respiratory virus transmission in children. (Bang, et al. 1975) and with the rise in pollution level and population, the circumstances may deteriorate. Home dampness and traditional houses with no windows (OR=1.6) was found to be significantly associated with respiratory health symptoms of children in rural Taiwan (Yang, et al. 1997b) and in Ethiopia (Shaembo, et.al. 1993) respectively.

Objectives

This study based on NFHS-3 data has the following objectives:

1. To examine the household environment and its impact on the respiratory health (through asthma and ARI) among children and adults,

2. To understand the prevalence of asthma among adults by sex, and
3. To examine the extent of regional variation in the prevalence of ARI and asthma by selected households and individual characteristics.

Data and Methodology

This paper is based on National Family Health Survey (NFHS), mainly the third round (NFHS-3) conducted during 2005-06. Unlike in previous rounds, in NFHS-3 information on asthma is collected through a direct question asked to the respondents (women age 15-49 and men age 15-54) whether he or she has currently suffered from asthma or not. NFHS-3 provides information on 109,041 households comprising of 124,385 women aged 15-49 and 74,369 men aged 15-54, representing entire India. With respect to Acute Respiratory Infections (ARI), the questions are asked to the mothers regarding their children of five years or less than five years of age, that whether the child has had a cough in the last two weeks preceding the survey and was experiencing short and rapid breathing faster than usual or facing any difficulty in breathing and at the same time whether the child was suffering from a problem in the chest. Based on these 3 questions, information on ARI were collected for the last 2 weeks preceding the survey.

To understand the regional differential in asthma and ARI the prevalence rates with respect to different background and household characteristics were computed for each region, as per NFHS-3. Binomial logistic regression is carried out to indicate the odds in the risk of the two diseases. The regional variations in the prevalence have been mapped using GIS.

Characteristics of households and smokers by region

Bio-fuels are mostly used in Central states, followed by East and Northeast, where three quarters of the household use these hazardous fuels for cooking. In case of fire also, a small proportion of population is using stove in all over India. In Central, East and Northeast India the figure is even less, three percent. The proportion of kachcha and semi-pucca houses is also very high in these regions compared with other regions. Almost half of the houses in Central and Western India have more than 3 persons sharing a room. In most Northeastern states, households have a provision for separate room as

kitchen, but over half households in Central and East India. Electricity situation is really appalling in the rest of the states, where the proportion is about 50 percent only. About 44 percent in the East belong to the low SLI category. The data show that in India the chimney is not popular and not commonly used, despite the fact that it can reduce the risks of respiratory diseases. Interestingly, NFHS-3 data also indicate that in Central territory almost half of the houses have no windows.

Worldwide about 1.3 billion people are smoking and in India 29.4 percent adult men and 2.5 percent women are currently smoking (WHO; 2004). According to NFHS-3, 34 percent men and 1.5 percent women smoke in India. Among the regions, men in Northeast are more likely to smoke (41.4%) followed by men in central region (37.3%). In the case of women, the proportion of women smoking is highest in the east (2.5%), followed by north (2.3%).

Results and findings

The analysis clearly affirms the relationship between household environment, including risky individual behaviours, with prevalence of ARI among children and asthma among adults. Most states in the east, northeast and a couple of states of the south are very much prone to asthma than other states. Asthma increases as age increases. Tobacco smoking and absence of electricity emerge prominently as factors influencing asthma as well as ARI. Females and the children of the households in which bio-fuels are used are 24 % and 49% more likely to be asthmatic than households using clean fuels. Use of chimney appears to be significant in reducing the risk of asthma, particularly among the females. Higher the age, greater is the chance to be infected with asthma. Older men age 50-54 are nearly five times likely to be asthmatic compared to younger groups age 15-19 whereas the children less than 2 years are more likely to suffer from ARI. Compared to the north, the odds to be infected with ARI for a child is higher in all other regions except the south. India's National Health Policy and National Rural Health Mission do not highlight on either Asthma or ARI. Beside the efforts to reduce TB, there is also an urgent need to focus on asthma and ARI as well.