

## An Analytical Study on Inequality in Disease Burden due to use of Biofuels

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### **Abstract**

*Preservation of human health is of paramount importance. But Women's health in India has been limited to obstetrics; its holistic recognition continues to be a challenge. Traditionally much of work done by women is performed within the context of the family. The effect of which is that women are at higher risk in comparison to men in context of using solid fuels for cooking or heating. Lower-income countries like India tend to have lower access to clean fuels and technologies, and thereby a stronger reliance on solid fuels for cooking and heating. Solid fuels include wood, crop residues, dung, charcoal, and coal. Use of these solid fuels causes indoor pollution which has a wide range of negative impact, mostly on women rather than on men, because women have to face the indoor air pollution on daily basis while cooking or heating by using solid fuels. Thus, there is an inequality between men and women when question of disease burden arises.*

**Keywords:** *Indoor air pollution, solid fuels, disease, CODP, WHO, health, women, charcoal, residues, air pollution*

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### **INTRODUCTION**

The Hon'ble Supreme Court while examining the issue of constitutional right to health care under Articles 21, 41 and 47 of the Constitution of India in *State of Panjab Vs. Ram Lubhaya Begga [1]*, observed that the right of one person co-relates to a duty upon another individual, employer, Government or authority. Hence the right of citizen to live under article 21 casts an obligation on the State. This obligation is further reinforced under article 47 as it is for the state to secure health to its citizens as its primary duty. Even in another case of *Paschim Banga Khet Mazdoor Samity & others Vs. State of West Bengal [2]*, Supreme Court held that Article 21 imposes obligation on the State to safeguard the right to live of every person. Preservation of human health is thus of paramount importance. But women's health in India has been limited to obstetrics; its holistic recognition continues to be a challenge.

“Human Development Report” ranked India 132 out of 187 in terms of gender inequality. Gender inequality index is determined by

numerous factors including health [3]. With the dismissal condition of overall healthcare in India, the provisions for health are even worse when it comes to women specific diseases, which is caused by second hand smoke in households. Traditionally much of work done by women was performed within the context of the family. The effect of which is that women are at higher risk (39.3%) in comparison to men (38.1%) [4]. Besides that, as women began moving beyond outside their traditional occupations, they are facing other health hazards which add to the existing occupational hazards. Globally, psychological violence at work, especially bullying, violence, harassment (including sexual harassment) are reported to be major concerns for women. Many studies show that women are at the particular risk of physical and psychological violence both inside and outside workplace.

National Policy for women 2016, articulating a vision for Empowerment of Women Draft, May-2006, introduced by Government of India (Ministry of Women and Child Development)

emphasized on health, including food security and nutrition. But respiratory health due to pollution from household is rarely considered under the banner of occupational safety and health. As a result of neglect of women's occupational injuries which is caused from household cooking leads women at very higher risk. Women's occupational health and safety issues are mostly aggregated, and this ignores many important aspects of women's health profiles in India.

### **EVOLUTION OF THE CONCEPT DISEASE BURDEN**

Burden of disease is a concept that was developed in the 1990s by the Harvard School of public Health. World Bank and World Health Organization have described disease burden as death or loss of health due to disease, injuries and risk factor [5]. Women have to spend more time for household purposes. Due to use of solid fuels for household purposes, disease burden is higher on women rather than on men. This causes inequality even in disease burden.

#### **Cause behind Indoor Pollution (Reliance on Solid Fuels)**

Lower-income countries tend to have lower access to clean fuels and technologies, and thereby a stronger reliance on solid fuels for cooking and heating. However, there are also differences in clean energy access within countries.

Solid fuels include wood, crop residues, dung, charcoal, and coal. People from urban households as well as rural households use solid fuels for cooking. [6].

#### **Effect of Indoor Pollution (Health Hazards)**

Indoor air pollution has a wide range of negative health impacts, which can lead to morbidity but also in many cases, mortality. The Table 1 features summary data from the World Health Organization (WHO) on the extent of proven links between indoor air pollution and potential health outcomes. These health outcomes range from respiratory

infections to chronic obstruction pulmonary disease (COPD) to lung cancer and have varying effects on the population depending on factors such as age and sex.

3.8 million people a year die prematurely from illness attributable to the household air pollution caused by the inefficient use of solid fuels and kerosene for cooking. Among these 3.8 million deaths:

- 27% are due to pneumonia.
- 18% from stroke.
- 27% from ischemic heart disease.
- 20% from chronic obstructive pulmonary disease (COPD); and
- 8% from lung cancer [7].

#### ***Pneumonia***

Exposure to household air pollution almost doubles the risk for childhood pneumonia and is responsible for 45% of all pneumonia deaths in children less than 5 years old. Household air pollution is also risk for acute lower respiratory infections (pneumonia) in adults and contributes to 28% of all adult deaths to pneumonia.

#### ***Chronic Obstructive Pulmonary Disease***

One in four or 25% of premature deaths from chronic obstructive pulmonary disease (COPD) in adults in low- and middle-income countries are due to exposure to household air pollution. Women exposed to high levels of indoor smoke are more than two times as likely to suffer from COPD than women who use cleaner fuels and technologies. Among men (who already have a heightened risk of COPD due to their higher rates of smoking), exposure to household air pollution nearly doubles that risk.

#### ***Stroke***

12% of all premature deaths due to stroke can be attributed to the daily exposure to household air pollution arising from cooking with solid fuels and kerosene.

**Table 1: Health Impacts of Indoor Air Pollution: WHO (2006) [9]**

Health Outcome	Evidence	Population	Relative Risk	Relative Risk (95% Confidence Interval)	Sufficient or Insufficient Evidence?
Acute infections of the lower respiratory tract	Strong	Children aged 0-4 years	2.3	1.9-2.7	Sufficient
Chronic obstructive pulmonary disease	Strong	Women aged ≥30 years	3.2	2.3-4.8	Sufficient
	Moderate I	Men aged ≥30 years	1.8	1.0-2.5	Sufficient
Lung cancer (coal)	Strong	Women aged ≥30 years	1.9	1.1-3.5	Sufficient
	Moderate I	Men aged ≥30 years	1.5	1.0-2.5	Sufficient
Lung cancer (biomass)	Moderate II	Women aged ≥30 years	1.5	1.0-2.1	Insufficient
Asthma	Moderate II	Children aged 5-14 years	1.6	1.0-2.5	Insufficient
	Moderate II	Adults aged ≥15 years	1.2	1.0-1.5	Insufficient
Cataracts	Moderate II	Adults aged ≥15 years	1.3	1.0-1.7	Insufficient
Tuberculosis	Moderate II	Adults aged ≥15 years	1.5	1.0-2.4	Insufficient

### **Ischemic Heart Disease**

Approximately 11% of all deaths due to ischemic heart disease, accounting for over a million premature deaths annually, can be attributed to exposure to household air pollution.

### **Lung Cancer**

Approximately 17% of premature lung cancer deaths in adults are attributable to exposure to carcinogens from household air pollution caused by cooking with kerosene or solid fuels like wood, charcoal or coal. The risk for women is higher, due to their role in food preparation.

### **Other Health Impacts and Risks**

More generally, small particulate matter and other pollutants in indoor smoke inflame the airways and lungs, impairing immune response and reducing the oxygen-carrying capacity of the blood.

There is also evidence of links between household air pollution and low birth weight, tuberculosis, cataract, nasopharyngeal and laryngeal cancers.

Mortality from ischemic chronic heart disease and stroke is also affected by risk factors such as high blood pressure, unhealthy diet, lack of

physical activity and smoking. Some other risks for childhood pneumonia include suboptimal breastfeeding, underweight and second-hand smoke. For lung cancer and chronic obstructive pulmonary disease, active smoking and second-hand tobacco smoke are also main risk factors [8].

### **IMPACTS ON HEALTH EQUITY**

Health impacts vary in terms of the strength of evidence linking outcomes with indoor air pollution. The WHO defines 'strong evidence' based on results from a range of studies on solid fuel using in developing countries with biochemical and laboratory evidence of health impacts; 'moderate I' has at least three studies showing strong evidence for specific age and sex groups; and 'moderate II' has at least three studies showing potential links but with more limited evidence.

### **Health Impacts of Indoor Air Pollution: WHO (2006) [9]**

### **DATA ANALYSIS**

The data prepared by WHO on health impacts of indoor pollution, considering the age, gender, types of health hazards and its effect clearly shows that there is an ailment of health hazards towards the women in comparison with men and children. Hence the risk of

different health hazards due to indoor pollution is higher on women. The reason is obvious because of the reliance on solid fuels for cooking and heating and lighting and the trend to spend more time on household functions by women in developing and under developing countries. These create absolute platform for inequality in disease burden.

### Indian Scenario

According to the Indian National Census (2001), 75% of households use solid fuels (primarily firewood and cow dung) with the prevalence of solid fuel use as high as 90% in rural areas. Currently about 70% of India's population lives in rural areas (estimated to decline to 55% by 2030). In India, an estimated 400,000 deaths from acute lower respiratory infection (ALRI) in children younger than five and 34,000 deaths from chronic obstructive pulmonary disease (COPD) in women are attributed annually to household solid fuel use, making this the third leading risk factor amongst all risk factors contributing to the national burden of disease and exceeding the burden attributable to outdoor air pollution [10].

### INDIAN CONSTITUTION ON HEALTH AND HEALTH CARE

India is a welfare state and being a signatory to UDHR, has adopted several health measures for health care. The Indian constitution recognized the importance of health and health care for the attainment of its socioeconomic goal. Article 21 of the Indian Constitution ensures Right to Health and pollution-free environment [11]. Article 39(e) directs the state for the health and strength of workers, men and women, and the tender age of children are not abused and that citizens are not forced by economic necessity to enter evocation unsuited to their age or strength [12]. Article 39(f) provides that children are given opportunities and facilities to develop in a healthy manner and in conditions of freedom and dignity and that childhood and youth are protected against exploitation and against moral and material abandonment [13]. Article 41 of the Constitution ensures protection in old age, sickness, and disablement of the persons irrespective of their status [14]. There are

several provisions in the constitution which ensure the protection of health. Articles 38, 42, 43, 47, and 48(A) of the Constitution, direct State for the promotion of health of citizens.

Various principles are adopted as guidelines for the state to provide just and human conditions for living. It forms the responsibility of the state to raise the level of nutrition and standard of living and improve public health and maternity relief. It becomes the constitutional obligation of the state to improve the environment for better protection of life.

Under 7th Schedule, the states are empowered to make legislation in different aspects, which will provide better health care and protection. The entries 6, 8, 17, and 51 of the State List provide that the state may make law for betterment of public health sanitation, water supply etc. Article 243(G) empowers panchayats to deal with health and sanitary measure [15]. It becomes the responsibility of panchayats to improve the health condition. The panchayats may establish and manage hospitals and dispensaries for the better health and family welfare. Under Article 243(W), municipalities are empowered to make safety provisions for sanitation and health protection of the public [16]. The municipality is under obligations to supply water for domestic, industrial, and commercial purposes. It is the responsibility of the municipality to remove public nuisance and take steps for the improvement of slum. They are duty bound to construct drain and parks for better living. The above discussion establishes that the government is under constitutional obligation to protect the health and living conditions of the people.

### INTERNATIONAL PERSPECTIVE ON WOMEN'S HEALTH

Health and health care is not only a major concern for India but also in international level; civilized countries are thinking and taking care of it. Article 2 of the Universal Declaration of Human Rights, 1948, declares that *"everyone has the right to a standard of living adequate for the health and well-being himself and of his family, including food,*

clothing, housing and medical care, and necessary social services and the right to security in the event of unemployment, sickness, disability, widow-hood, old-age, or other lack of livelihood in circumstances beyond his control". Further, it provides that "motherhood and childhood are entitled to special care and assistance [17].

Article 1 of the **Convention on Elimination of All Forms of Discrimination Against Women** defines discrimination against women as: "*any distinction, exclusion or restriction made on the basis of sex which has the effect or purpose of impairing or nullifying the recognition, enjoyment or exercise by women, irrespective of their mental status, on a basis of equality of men and women of human rights and fundamental freedom in the political, economic, social, cultural, civil or any other field*" [18].

**Article 12** requires that "*State parties shall take all appropriate measures to eliminate discrimination against women in the field of health care in order to ensure, on a basis of equality of men and women, access to health services, including those related to family planning*". In the review of reports, the committee has thus paid special attention to the obligations of state parties and actions that have been taken in the following health related areas: Maternal and infant mortality, primary health care services for the prevention of childhood diseases, malnutrition, anemia, sexually transmitted diseases, including HIV/AIDS and communicable diseases such as diarrhea, malaria, tuberculosis, family planning, abortion, safe motherhood, access to and affordability of health services, health statistics, harmful traditional practices, sexual violence including rape, female malignancies, ratios of male/female medical practitioners and recent knowledge of women's human rights by health services providers as well as the law enforcement agencies. The committee also raises questions about allocations of Government expenditure on women's health services and requesting information on the implementation of the ICPD program of action and the Beijing Platform for Action [19].

### **Geneva (17 June 2016)**

The United Nations Working Group on Discrimination against Women in Law and Practice called on Governments to take urgent, immediate and effective actions to address the global challenge of safeguarding women's right to health, including their reproductive and sexual health. Throughout their life cycle, women's bodies are often instrumentalized and their biological functions and needs stigmatized, suggests noted human rights expert Frances Raday, who currently heads the expert group; "The instrumentalization of women's bodies lies at the heart of discrimination against women, obstructing their achievement of the highest attainable standard of health" [20].

### **Response from WHO**

WHO provides technical support to countries in their own evaluations and scale-up of health-promoting household fuels and technologies. WHO is building capacity at the country and regional level to address household air pollution through direct consultations and workshops on household energy and health. This is further complemented by the ongoing development of the Clean Household Energy Solutions Toolkit (CHEST) to support the implementation of *WHO Guidelines for indoor air quality: household fuel combustion*. CHEST is a suite of tools and information resources that help countries identify stakeholders working on household energy and/or public health to design, implement and monitor policies addressing household energy.

To ensure healthy air in and around the house, WHO's Guidelines for indoor air quality are: Household fuel combustion: They provide health-based recommendations on the types of fuels and technologies to protect health as well as strategies for the effective dissemination and adoption of such home energy technologies. These constitute existing WHO outdoor air quality guidelines and WHO guidance on levels of specific indoor pollutants [21].

### **SUGGESTIVE REMARKS**

It is evident that irrespective of constitutional protection and health rights protected under

different international conventions are not sufficient to control the inequality in disease burden caused to women due to use of solid fuels. In this respect, governments have to step forward to implement the legal framework stringently and to take action against use of solid fuels by providing subsidy on liquefied petroleum gas (LPG) or any other substitute for cooking. There must be a check on women's health by creating awareness among the people who belong to below poverty line because lower income sector of the society has the trend to use solid fuels for their daily cooking purposes.

### CONCLUSION

The air we breathe affects our health much more significantly than we can imagine. The 2017 US EPA and the EU EEA reports have attributed hundreds of thousands of deaths last year to air pollution. Poor health due to poor air quality is increasing medical debt by millions every day. While the outdoor is regulated, indoor air is not [22]. Indoor air may contain over 900 chemicals, particles, and biological materials with potential health effects. Since their concentrations are usually higher than outdoors and people spend more time indoors than outdoors [23]. Measurement of household air pollution needs individual, rather than fixed in place, monitoring because exposure varies by age, gender, location, and household role. Women and children are particularly susceptible to the toxic effects of pollution and are exposed to the highest concentrations. Interventions should target these high-risk groups and be of sufficient quality to make the air clean. To make clean energy available to all people is the long-term goal, with an intermediate solution being to make available energy that is clean enough to have a health impact [24].

Ensuring universal access to clean fuel and technologies is a target of the sustainable development goal. Achieving this goal could prevent millions of deaths including disease burden on women due to household pollution and improve the health and well-

being of the billions of people relying on polluting technologies and fuels for cooking, heating and lighting.

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**Cite this Article**

Ankita Mukhopadhyay. An Analytical Study on Inequality in Disease Burden due to use of Biofuels. *National Journal of Environmental Law*. 2020; 3(1): 8–14p.