Title: Smoke Free Homes: The Final Frontier

1. **Rumana Huque**

Department of Economics

University of Dhaka,

Bangladesh,

And

ARK Foundation

House No. 6, Road No.109, Gulshan 2

Dhaka 1212

Bangladesh

Email: [rumanah14@yahoo.com](mailto:rumanah14@yahoo.com)

**Kamran Siddiqi**

Professor in Global Public Health

Department of Health Sciences

University of York,

Heslington

YO10 5DD

UK

Email: [kamran.siddiqi@york.ac.uk](mailto:kamran.siddiqi@york.ac.uk)

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***Editorial***

Over 1.2 billion tobacco users worldwide and almost eight million tobacco-related deaths make tobacco control a high public health priority.1 While number of smokers has fallen in high-income countries (HIC) in recent years, the number of tobacco users in many low- and middle-income countries (LMIC) has steadily increased.2 In addition to active smoking, inhalation of second-hand smoke (SHS) is a major cause of premature death and disease, especially among women and children.3,4 More than one-third of women5 and half of children6 are exposed to SHS worldwide. The exposure to SHS during pregnancy is also high in many countries; the prevalence ranging from 6% in Nigeria to 73% in Armenia.7

The adverse health consequences of SHS exposure are well documented4, 8,9,10. Exposure to SHS increases the risk of acquiring lower respiratory tract and middle ear infections, invasive meningococcal disease, TB and incident cases, recurrent episodes and increased severity of asthma among children.10 Children living in smoking households are at risk of lower academic performance, and a high smoking uptake in later life. 11 SHS exposure during pregnancy can cause pregnancy complications, a modest reduction in birth weight, preterm delivery, stillbirths, and infant deaths.10

**Level of SHS exposure at home**

Private homes remain a major source of SHS exposure particularly for women and children. According to Global Adult Tobacco Surveys in Bangladesh, China, India and Indonesia, 36.5%11, 38%12, 39.3%13 and 75.4%14 adult women are exposed to SHS at home, respectively. Globally, about 40% of children younger than 14 years of age are also exposed to SHS within their homes15 and these estimates are much higher for LMIC in the South-East Asia, Western Pacific and Eastern Mediterranean regions. Studies that validated the SHS exposure level using bio-marker found even higher level of SHS exposure among women and children. 3,17; 18 In Bangladesh, 95% school-children in urban and peri-urban areas were found positive for recent SHS exposure.18 There is therefore an urgent need to reduce exposure to SHS in women and children through implementing effective, affordable, inclusive, feasible and sustainable solutions.

**Smoking restrictions at home**

The WHO Framework Convention on Tobacco Control (FCTC) recommends countries to enforce comprehensive smoke-free laws as one of the effective demand-reduction tools (Article 8). However, comprehensive smoke-free legislation is only in place in 55 countries covering just 20% of the world’s population19 Among LMIC, only 35 have adopted smoke-free legislation covering all categories of public places such as work sites, bars, restaurants, schools, universities and health care institutions.19 However, even the most comprehensive legislation would not address SHS exposure in households. Though some evidence suggests that smoke-free legislation has a positive effect on promoting smoke-free households,20 enforcing smoke-free legislation remains weak in LMIC. Low-levels of voluntary restrictions on smoking in households and a high percentage of smokers, predominantly men, smoking in front of women and children are common in LMIC especially, in patriarchal societies. Although comprehensive smoke-free laws can protect non-smokers from SHS in public places and promote adoption of voluntary restrictions in homes, other measures are also required to protect people from SHS exposure at home. For women and children in particular, only smoke free homes alongside smoke-free legislations in public places can ensure full protection.

**Smoke free home interventions**

Creating awareness of the adverse consequences of SHS exposure3, and encouraging voluntary smoke-free rules in homes have been recommended to reduce SHS exposure among women and children and prevent SHS-related diseases and deaths. Clinical interventions delivered in ante-natal care settings appear to reduce SHS exposure as pregnancy provides a window of opportunity for the entire family to change harmful behaviours. Schools, primary health care facilities and mosques have been considered as acceptable settings to raise awareness, promote changes in smoking behaviours and reduce SHS exposure at homes. 4,8 The smoke-free interventions delivered through school-based and ante-natal care settings relies on motivation and ability of children and women, respectively, to persuade smokers to change their behaviour. This is particularly challenging in countries where smoking is predominantly a male behaviour; for example, in South East Asia male–female smoking ratio is 16:1.21 In such places, gender norms favouring male education, health and personal autonomy22, with limited voice of women and children, make confronting smoking at home even more difficult. A number of systematic reviews also concluded that despite several studies on education and counselling programmes, their effectiveness in reducing women and children’s tobacco smoke exposure were not clearly demonstrated. 17, 23

Reducing SHS exposure among women and children would require context-specific interventions that accounts for the differences in culture, social norms and smoking behaviours across countries. 4,8,24Rigorous studies, using biochemical validation, are needed to identify the most suitable and relevant strategies for reducing SHS exposure in women and children. Further research is required to test comprehensive community-based interventions through community health workers, religious leaders and schoolteachers to influence smoking behaviours in their communities. A multisectoral approach and further investment is required to enforce smoke free legislation and promote smoke free homes. This will help achieve the goals set forth in the Sustainable Development Goals (SDGs) of reducing maternal mortality, preventing deaths of new-borns and children and reducing premature mortality from non- communicable diseases.

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