

Exposure to Secondhand Smoke at Home among Children in 21 Countries: Global Adult Tobacco Survey (GATS), 2008-2013

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Introduction

Exposure to secondhand smoke (SHS) can cause disease and death among infants and children, including sudden infant death syndrome (SIDS), respiratory problems, ear infections, and asthma attacks. . Several studies have examined the prevalence of exposure to secondhand smoke among children in the USA, but few studies have examined the exposure among children in low and middle income countries. In this study, we estimated the number of children exposed to SHS in the home in 21 low and middle income countries using data from the Global Adult Tobacco Survey (GATS).

Methodology

GATS is a nationally representative household survey of adults 15 years of age or older, which uses a standard protocol for sampling, data collection, data management and weighting. We used GATS data from 21 countries that conducted the survey between 2008 and 2013: Argentina (2012), Bangladesh (2009), China (2010), Egypt (2009), Greece (2013), India (2009-10), Indonesia (2011), Malaysia (2011), Mexico (2009), Nigeria (2011), Panama (2012), Philippines (2009), Poland (2010), Qatar (2012), Romania (2011), Russia (2010), Thailand (2009), Turkey (2008), Ukraine (2010), Uruguay (2009), and Viet Nam (2010).

GATS uses two questionnaires: a household questionnaire and an individual questionnaire. The household questionnaire collected information on the number of people in a household and number of those that were 15 years and older using two questions: (1) “In total, how many persons live in this household?”; (2) “How many of these household members are 15 years of age or older?” Based on these two questions, the number of children in each household was computed by subtracting the number of adults 15 years and older from total number of household members. For each household, a randomly selected adult was administered a questionnaire that collected information on tobacco use and SHS exposure. Tobacco use was assessed using one question (1) “Do you currently smoke tobacco on a daily basis, less than daily, or not at all?” Exposure to SHS in homes was assessed using the question, “How often does anyone smoke inside your home?” We categorized responses as none (those who responded “never”) vs. some (those who responded “daily”, “weekly”, or “monthly”).

To estimate the number of children exposed to SHS in homes, we calculated the number of households that reported exposure to SHS inside the home. Those population estimates were cross-tabulated by the number of children in the household and then summed to obtain the total number of children exposed to SHS. UN 2012 population projections were used to standardize estimates for comparability across countries and survey years. We used SPSS® version 18.0 to analyze the data and account for weighting and the complex survey design.

Results

A total of 484.2 million children (48.7% of total children) aged less than 15 years old were exposed to SHS in the home in the 21 low and middle income countries evaluated. The largest total numbers of children exposed to SHS in the home were observed in China (165 million), India (162 million), Indonesia (57 million), and Bangladesh (27 million). These countries accounted for 84.8% of the overall number of children exposed to SHS in the home. The proportion of children exposed to SHS in the home was highest in Indonesia (79.0%) and Viet Nam (75.5%), and lowest in Panama (4.5%) and Nigeria (5.4%). Adult smoking prevalence was correlated with the proportion of children exposed to SHS in the home. Countries with lower adult smoking rates, such as Panama and Nigeria, had lower proportions of children exposed to SHS in homes (Figure 1). In contrast, countries with high smoking prevalence, such as Indonesia, had larger proportions of children exposed to SHS.

Discussion

We estimated that almost half a billion children have been exposed to SHS in their homes in the countries evaluated, underscoring the importance of efforts to address SHS exposure in this environment. China, India, Indonesia, and Bangladesh accounted for 85% of the overall exposure; efforts to reduce exposure to SHS at home in countries with large populations, including the enhanced adoption of voluntary smoke-free home rules, have the potential to reduce the number of children exposed to SHS and at risk of SHS-related disease and death. We also found that countries with higher smoking prevalence generally had higher proportions of children exposed to SHS in homes. Cessation among smokers could improve the health of these individuals, and also help to reduce SHS exposure among youth in their homes.

Key Words

Secondhand smoke, Global Adult Tobacco Survey, Children, Low and Middle Income Countries, Home

References

- Borland, R., Mullins, R., Trotter, L., and White, V. Trends in environmental tobacco smoke restriction in the home. *Tobacco Control* 1999;8:266–271. Accessed September, 2013 from <http://tobaccocontrol.bmj.com/content/8/3/266.full.pdf>
- Borland, R., Yong, H.H., Cummings, K.M., Hyland, A., Anderson, S., Fong, G.T. Determinants and consequences of smoke-free homes: findings from the International Tobacco Control (ITC) Four Country Survey. *Tob Control* 2006;15 Suppl 3:iii42-50.
- Cobanoglu, N., Kiper N., Dilber, E., et al. Environmental tobacco smoke exposure and respiratory morbidity in children. *Inhal Toxicol.* 2007;19:779–785.
- Global Adult Tobacco Survey Collaborative group. Global Adult Tobacco Survey (GATS) Core Questionnaire and Optional Questions. Version 2. Atlanta, GA, Centers for Disease Control and Prevention, 2010a.
- Hawkins, S.S., Chandra, A., & Berkman, L.. The Impact of Tobacco Control Policies on Disparities in Children's Secondhand Smoke Exposure: A Comparison of Methods. *Maternal Child Health J*, 2012. 16(S70-S77 DOI 10.1007/s10995-012-0996-9
- Hovell, M. F., Zakarian, J. M., Wahlgren, D. R., and Matt, G. E. Reducing children's exposure to environmental tobacco smoke: empirical evidence and directions for future research. *Tob Control*, 20009(Suppl 2), I40-47.
- Oberg, M., Woodward, A., Jaakkola, M.S., Peruga, A. and Pruss-Ustun, A. Worldwide Burden of Disease from Exposure to Secondhand Smoke: A Retrospective Analysis of Data from 192 Countries. *The Lancet*, 2010. Accessed November, 2013 from http://www.who.int/quantifying_ehimpacts/publications/smoking.pdf
- Pirkle, J.L., Bernert, J.T., Caudill, S.P., Sosnoff, C.S., Pechacek, T.F. Trends in the exposure of nonsmokers in the U.S. population to secondhand smoke. *Environ Health Perspect.* 2006; 114(6):853–858
- Pisinger, C., Hammer-Helmich, L., Andreassen, A.H. Jorgensen, T. & Glumer, C. Social Disparities in Children's Exposure to Secondhand Smoke at Home: A Repeat Cross-sectional Survey. *Environmental Health* 2012, 11:65, pp 1-8.
- U.S. Environmental Protection Agency, Office of Research and Development, Office of Health and Environmental Assessment. *Respiratory Health Effects of Passive Smoking: Lung Cancer and Other Disorders*. Washington, DC, EPA/600/6-90/006F, December, 1992.
- Wipfli, H. et al. Secondhand Smoke Exposure Among Women and Children: Evidence From 31 Countries. *American Journal of Public Health*. April 2008, Vol 98, No. 4

Figure 1: Proportion of children exposed to SHS in homes and adult smoking prevalence, Global Adult Tobacco Survey, 2008-2013.

