

Young Adults with Higher Exposure to Household Air Pollution Show Worse Lung Function

A study conducted in South India adds new evidence on the detrimental effects of cooking with biomass fuel and respiratory health

Barcelona, June 22, 2022- New study led by researchers from the Barcelona Institute for Global Health (ISGlobal), a centre supported by the “la Caixa” Foundation, has evaluated the **link between air pollution and lung function of young adults** who had recently attained their expected maximum lung function. The study, published in *Environment International*, found that participants with higher exposure to ambient and household air pollution had worse results in lung function tests.

Ambient (outdoor) air pollution comprising fine **particulate matter like PM_{2.5}** and **household air pollution (HAP)** caused by inefficient cooking methods using fuels like biomass, kerosene or coal, together cause up to [7 million premature deaths](#) every year. Yet, there is limited data on the health effects of [ambient air pollution from lower-middle-income countries](#), specifically on young adults following their lung peak growth. According to **Otavio Ranzani**, ISGlobal researcher and first author of the study: "There has been a lot of research on air pollution and its effects on the lung function of children. But this is one of the first studies looking at the population group of young adults in a low- and middle-income country setting."

Data on 1,044 participants (within the age group of 20-26 years) were collected from the Andhra Pradesh Children and Parent Study ([APCAPS](#)) cohort (2010–2012), situated in 28 villages in the **peri-urban area of Hyderabad city**. The researchers measured lung function with: i) FEV₁ (forced expiratory volume in the first second), an indicator for resistance of airflow through the respiratory tract while forced breathing; and ii) FVC (forced vital capacity), an indicator of lung capacity. Factors like sex, health behaviours, and socioeconomic factors were identified and adjusted during the analysis.

Results showed that **household air pollution (measured by use of biomass fuel) was consistently associated with decreased lung function**. This effect on lung function was especially prominent in participants who lived in households that used **unvented biomass stoves**. The average decrease of 142 ml in lung capacity due to household air pollution was magnified to 211 ml for those who used unvented biomass stoves. The analysis also revealed a link between ambient PM_{2.5} with decreased lung function, but these results were less conclusive. Overall, these findings suggest that **reducing levels of exposure to ambient PM_{2.5} and household air pollution might be effective in improving lung function in adulthood**.

[2.6 billion people](#) continue to use biomass for cooking and there is little research on how this affects lung function trajectories during childhood. This study provides a glimpse of the cumulative impact on respiratory health by focusing on young adults who recently attained their maximum lung function. "This cross-sectional study opens the doors for further longitudinal research on the effect of air pollution on lung development, especially in low- and middle-income country settings where individuals are commonly exposed to both high levels of ambient and household air pollution", concludes **Cathryn Tonne**, ISGlobal researcher and senior author of the study.

Reference

Ranzani, O. T., Bhogadi, S., Milà, C., Kulkarni, B., Balakrishnan, K., Sambandam, S., Garcia-Aymerich, J., Marshall, J. D., Kinra, S., & Tonne, C. (2022). Association of ambient and household air pollution with lung function in young adults in an peri-urban area of south-India: A cross-sectional study. *Environment International*, 165, 107290. <https://doi.org/10.1016/j.envint.2022.107290>

About ISGlobal

The Barcelona Institute for Global Health, ISGlobal, is the fruit of an innovative alliance between the "la Caixa" Foundation and academic and government institutions to contribute to the efforts undertaken by the international community to address the challenges in global health. ISGlobal is a consolidated hub of excellence in research that has grown out of work first started in the world of health care by the Hospital Clínic and the Parc de Salut MAR and in the academic sphere by the University of Barcelona and Pompeu Fabra University. Its working model is based on the generation of scientific knowledge through Research Programmes and Groups, and its translation through the areas of Training and Analysis and Global Development. ISGlobal has been named a Severo Ochoa Centre of Excellence and is a member of the CERCA system of the Generalitat de Catalunya.

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