

Conference Abstracts

Global Disparities in Non-Tobacco–Associated Lung Cancer Mortality: Implications for Lung Cancer Screening

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Introduction

Amid shifting tobacco policies and escalating air pollution levels, lung cancer (LC) risk factors have changed notably. Continuous assessment of these evolving risk factors is essential to inform equitable lung cancer screening strategies. This study compares trends in tobacco, air pollution, and asbestos-associated Age-Standardized Mortality Rates (ASMR) from Trachea, Bronchus, and Lung Cancer (TBLC) across the top ten most populated countries (2023 censuses).

Methods

We utilized the Global Burden of Disease database (GBD) to extract ASMR and risk factor-associated ASMR for TBLC from 1990-2019. Tobacco, occupational exposure to asbestos, and air pollution [ambient particulate matter (PM) and household air pollution] associated with TBLC mortality data were extracted to evaluate the trends based on risk factors. Joinpoint regression was performed to calculate the Estimated Annual Percentage Change (EAPC). Data is reported per 100,000 population.

Results

Globally, TBLC mortality declined by 8%, driven by decreases in males but increases in females. Particulate matter trends diverged, with a 25% rise in ambient pollution and a 62% reduction in household air pollution. TBLC ASMR attributable to identified risk factors decreased from 84% to 81%, with corresponding declines in

males (90% to 88%) and females (70% to 65%). On Joinpoint evaluation, Bangladesh (EAPC 4.6, 20018-2019), India (2.4, 2014-2019), Pakistan (1.3, 2014-2019), and Nigeria (0.9, 2014-2019) observed a significant increase in ASMR. China and the USA observed juxtaposing trends, with China exhibiting the highest ASMR in 2019 (8.8), which contrasts with the USA's substantial decline (-68%) despite reporting the highest ASMR in 1990 (4.5). Despite a decline from 8.91 to 6.0 per 100,000, U.S. asbestos-related TBL cancer ASMR remained twice the global rate. In sex-stratified analyses, PM-associated ASMR declined in recent years among males in six countries, but remained elevated in the USA, India, Pakistan, and Bangladesh; in contrast, females demonstrated rising PM-associated ASMR in all countries except Mexico and Brazil, with the steepest increases in India. Similarly, asbestos-associated ASMR increased in only four countries among males, whereas increases were observed in nine among females, highlighting widening sex-based disparities.

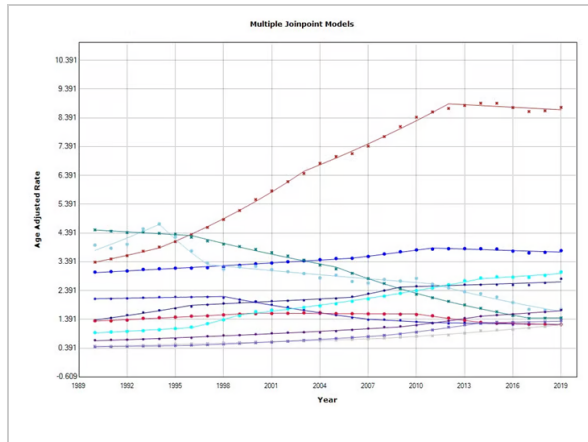
Conclusion

Lung Cancer mortality demonstrated geographic and sex-based disparities, with a rising burden in developing countries and among females. As tobacco-related mortality declines, non-smoking and non-attributable risk factors increasingly contribute to ASMR, highlighting limitations of tobacco-centric screening approaches. Dedicated screening trials targeting high-risk populations

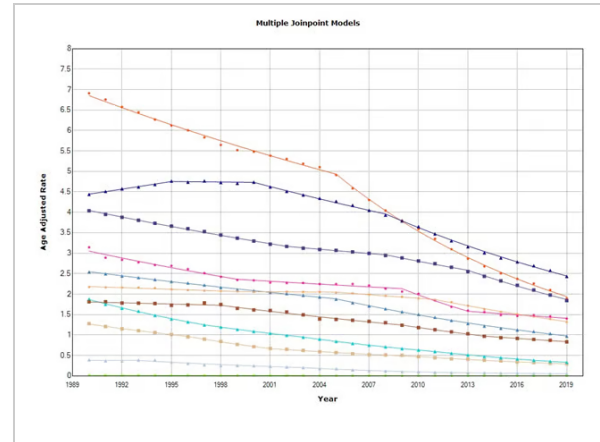
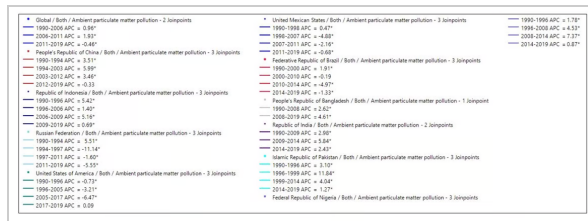
defined by environmental, demographic, and sex-specific factors, and expansion of trials such as CALM to include females, would significantly improve early detection and reduce global and sex disparities in lung cancer.

Figure 1. Comparison of risk factor-associated Lung Cancer ASMR

Ambient Particulate Matter



Household air pollution from solid fuels



Occupational exposure to Asbestos

