PERSPECTIVE

Lung cancer incidence and mortality: distribution, risk factors, and temporal trends

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ABSTRACT

Lung cancer is second in terms of cancer incidence and first in terms of cancer death. The study of its risk factors and epidemiologic patterns may aid in describing regional distribution and identifying high-risk demographic groupings. Lung cancer is the second most frequent cancer and the leading cause of cancer mortality worldwide. Lung cancer was responsible or 1.8 million new death cases in 2020, accounting for 18% of all cancer mortality. Lung cancer had a substantially poorer 5-year survival rate (7% -25%) than other major malignancies. Because of its high death rate, the distribution of mortality for lung cancer was extremely comparable to that of its incidence, resulting in a significant worldwide disease burden.

Key Words: *Smoking cessation*

INTRODUCTION

Treatment developments in several high-income nations, such as the United States, the United Kingdom, and Australia, have contributed to recent improvements in lung cancer mortality. Tobacco use is the greatest risk factor for lung cancer, accounting for an estimated 80% of lung cancer deaths. Secondhand smoking is also a major risk factor for lung cancer. Exposure to radon, asbestos, and other cancer-causing chemicals such as chromium, cadmium, arsenic, radiation, and coal products are also risk factors. Evidence-based preventative actions might be introduced to minimize the illness burden because these risk variables are highly reversible through smoking cessation, occupational protection, and clean air programmes. As a result, analyzing its updated distribution, particularly for temporal changes by age, gender, and area, is critical.

Previous research reported on lung cancer rates in a specific area or region, or showed worldwide trends based on data from outdated cancer registries. A worldwide study of the distribution of, risk factors for, and most recent temporal patterns in lung cancer incidence and death might aid in describing geographical distribution, identifying high-risk demographic groups, and informing the development of preventative treatments. The findings might potentially have implications for the future of lung cancer prevention and early detection efforts. The goals of this project are to use data from global and national cancer registries to assess the worldwide incidence, mortality, associated risk factors, and temporal trend of lung cancer by age, gender, and area.

To identify acceptable data, all of the lung cancer incidence and death statistics used in this study use the term "Malignant neoplasm of the bronchus or lung" from the International Classification of Diseases and Related Health Problems, 10th Revision, codes (C34). The data for this study came from the Global Cancer Observatory (GLOBOCAN), which has information from 185 nations throughout the world. Data on Gross Domestic Product (GDP) per capita were obtained from the World Bank. We utilised the United Nations' Human Development Index (HDI) for each country. We checked the World Health Organization's (WHO) Global Health Observatory data source for each country's age-adjusted and gender-specific prevalence of current smoking for each country. Data for the incidence rate were obtained from the following databases: Cancer Incidence in Five Continents series I-X, the Nordic Cancer Registries (NORDCAN), and the Surveillance, Epidemiology, and End Results Program (SEER). The Cancer Incidence in Five Continents series I-X database gathered cancer incidence data on a worldwide scale, including basic demographic information connected to various cancer locations, allowing for comparison of cancer incidence rates across areas. The NORDCAN database tracked cancer incidence and death rates in Northern Europe and the Scandinavian area. The National Institutes of Health, National Cancer Institute in the United States created the SEER database, which provides realistic and accurate cancer statistics in the United States. The WHO mortality database, NORDCAN, and SEER were used to derive data for each country's mortality rates. The WHO mortality database is a global repository of cancer-related deaths. The NORDCAN and SEER databases were utilised to collect lung cancer mortality in the

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United States and Nordic nations, respectively, and the WHO mortality database was used for the remainder. For grouping and comparison purposes, each country's statistics was matched with the HDI. All statistics and figures were given as Age standardized Rates (ASRs) per 100,000, adjusted for the Segi-Doll global standard population to account for variances in each age group, allowing for direct and meaningful comparison across nations and regions. The specifics of data extraction, such as description, data sources, and time range for each nation covered in this study. In the chosen WHO databases, mortality data for China, India, and Uganda were not accessible, while incidence statistics for Belgium, Latvia, Portugal, Russia, and Singapore were not available. Globally, the age-standardized rates of incidence and death were 22.4 and 18.0 per 100,000, respectively. Lung cancer incidence and death were linked to the Human Development Index (HDI), Gross Domestic Product (GDP), and smoking prevalence. In terms of incidence, more nations saw an increase in females but a decrease in men (AAPC, 1.06 to 6.43for female; 3.53 to 0.64 for male).A similar tendency was observed in individuals aged 50 years or older, although those younger than 50 years had diminishing incidence trends in both sexes in most nations. In terms of mortality, 17 of 48 nations exhibited declining trends in men and increasing trends in females (AAPC, 3.28 to 1.32 for male, 0.63 to 3.96 for female). Based on high-quality cancer registries, the current analysis included the most recent worldwide lung cancer incidence and death data, as well as temporal trends by age, gender, and country. However, there are a few drawbacks to be aware of. For starters, there might be bias due to disparities in cancer registration across developed and developing regions. Because the number of high-quality cancer registries and the corresponding number of participants in developed countries was greater than that in developing regions, statistics on incidence and death were likely to be over reported in developed regions and underestimated in developing regions.