Revealing key insights into the trends of asthma mortality

November 22 2023

The prevalence of asthma has been on the rise, and its burden on individuals and countries is increasing. Analyzing asthma mortality rates, as done in this article, can help reveal potential areas of improvement. Credit: NIAID

Asthma is among the most common chronic respiratory diseases in the world. Characterized by inflammation and narrowing of the airways, it

can trigger serious bouts of coughing and breathing problems. Unfortunately, asthma is becoming increasingly prevalent, with a total of over 262 million cases reported worldwide in 2019.

Interestingly, both the prevalence and mortality rates of asthma vary greatly across different regions. For example, its prevalence in the United States (US) was ~11% in 2019, which is four times greater than its prevalence in China in the same year. On the other hand, asthma mortality rates have been consistently higher in China than in the US.

Understanding how well these countries are dealing with this disease is challenging because most studies have used rather basic analytic methods that provide limited insights.

Against this backdrop, a research team from Huazhong University of Science and Technology and NHC Key Laboratory of Respiratory Diseases, both in Wuhan, China, decided to conduct a more detailed comparative analysis of asthma mortality in China and the US. Their study, led by Professor Xiansheng Liu, was published in the *Chinese Medical Journal*.

"The risk factors for asthma mortality in China and the US were investigated to provide public health recommendations for reducing mortality," says Prof. Liu.

To carry out their analysis, the team used data spanning the period 1990–2019 from the Global Burden of Disease Study 2019, one of the largest assessments of the impact of various diseases and their associated risk factors throughout the world. To gain deeper insights into asthma mortality, the researchers employed an age–period–cohort (APC) model.

This approach has been gaining traction as a valuable method to analyze the incidence and mortality trends of chronic diseases. Simply put, this

model allowed them to use an advanced approach to study the effects of age, time period, and birth cohort on asthma mortality separately, unlike simple descriptive methods.

The results revealed substantial differences in asthma mortality between China and the US. First, China had higher asthma mortality rates than the US from 1990 to 2019. However, this gap markedly narrowed over time. Second, men had higher asthma mortality rates than women in China, whereas in the US, the case was just the opposite.

A finer analysis showed that asthma mortality rates were also different between the two countries when grouped by age. Infants, young children, and the elderly were the most affected groups in China, whereas in the US, asthma mortality rates increased slowly with age, exponentially increasing after the age of 80 years.

The researchers also found that smoking, a high body-mass index (BMI), and occupational exposure to asthmagens (asthma-inducing or -triggering particles) were the factors most strongly related to asthma mortality. In China, smoking was the leading risk factor related to asthma mortality, especially for males.

The situation was different in the US, as Prof. Liu remarks: "Compared with China, high BMI is a larger public health challenge in the US, where it ranked first in the risk factors of asthma-related death."

Interestingly, asthma mortality rates in China, albeit higher than in the US, have shown a considerably larger decline over the past three decades. This highlights the effects of China's transition to a middle-income economy and improvements in the management of asthma risk factors at the individual and societal levels.

Taken together, these findings paint a more complete picture of how

asthma mortality varies over time in China and the US. The novel insights provided by the researchers could be leveraged to further reduce asthma mortality.

Prof. Liu concludes, "This study on asthma mortality can help focus on at-risk populations who might benefit the most from targeted interventions, such as tobacco control, obesity prevention and treatment, available medical services for the aging population, and practical and pragmatic guidance in the assessment and management of occupational asthma by clinicians and so on."

More information: Xiaochen Li et al, Secular trends of asthma mortality in China and the United States from 1990 to 2019, *Chinese Medical Journal* (2023). DOI: 10.1097/CM9.0000000000002855

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