



Impact of Air Pollution on Cancer Epidemiology: A Global Perspective

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Introduction

The impact of air pollution on cancer epidemiology is a complex and multifaceted issue that has gained significant attention in recent years. This review aims to provide a comprehensive overview of the current state of knowledge on this topic, highlighting the key findings and challenges in the field.

Over the past few decades, there has been a growing body of evidence linking air pollution to various types of cancer, including lung, bladder, and breast cancer. The World Health Organization (WHO) has estimated that air pollution is responsible for approximately 13% of all cancer deaths globally, with a significant portion of these deaths occurring in low- and middle-income countries. This finding underscores the urgent need for further research and the implementation of effective public health interventions to reduce the burden of air pollution-related cancer.

The mechanisms by which air pollution contributes to cancer development are still largely unknown, but several pathways have been proposed. These include the direct effects of particulate matter (PM) and gaseous pollutants on DNA damage, oxidative stress, and inflammation. Additionally, air pollution is thought to influence cancer risk through indirect mechanisms, such as the promotion of chronic respiratory diseases and the modulation of the immune system. Understanding these mechanisms is crucial for developing targeted prevention and treatment strategies.

Despite the progress made in this field, there are still many gaps in our knowledge. For example, the relative contributions of different pollutants to cancer risk remain unclear, and the underlying biological pathways need to be further elucidated. Moreover, the impact of air pollution on cancer epidemiology varies significantly across different regions and populations, suggesting that local factors, such as lifestyle and genetic predisposition, may also play a role. Future research should focus on addressing these knowledge gaps and on developing more effective public health policies to reduce the burden of air pollution-related cancer.

