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**Breast cancer mortality and prediction trends in Pakistani women: alarming public health concern**

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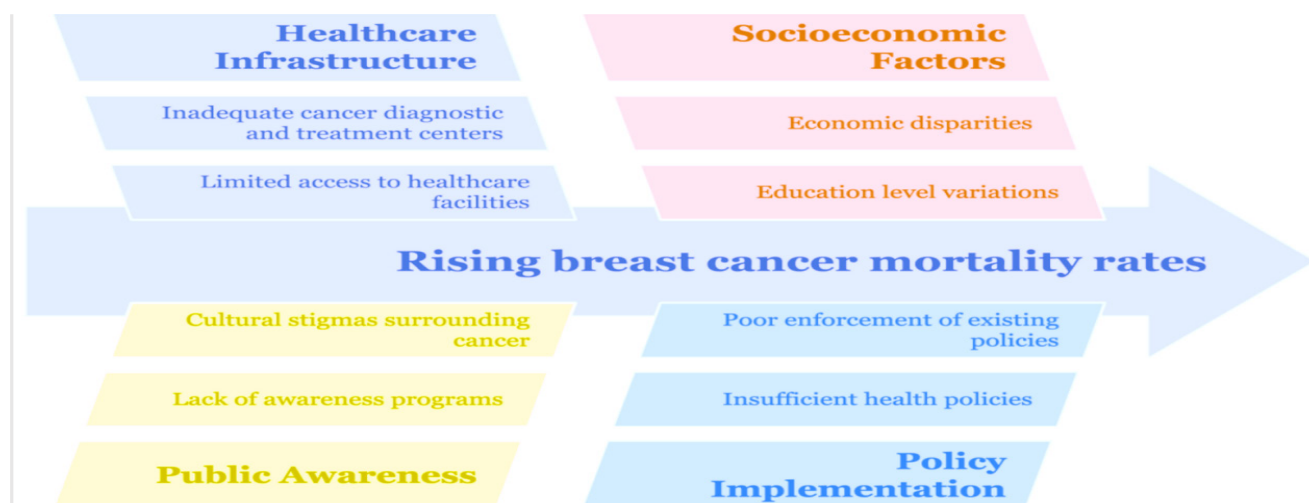
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**ABSTRACT**

Breast cancer is the most common cancer in Pakistani women. The incidence and mortality rates have been continuously increasing over the last three decades in the country. The number of estimated new breast cancer cases in Pakistan will increase to 66562 (R<sup>2</sup>= 0.9928) by the end of 2050. However, strengthening local collaboration between public authorities and clinical settings is a way forward for early cancer detection and proper treatment.

**Graphical Abstract**



**KEYWORDS:** Breast Cancer, Mortality, Incidence, Pakistan.

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## INTRODUCTION

Breast cancer is the most prevalent malignancy among women, with an estimated 2.3 million new cases diagnosed each year<sup>[1]</sup>. It is the leading cause of death among females, and low- and middle-income countries account for more than 70% of breast cancer-related fatalities<sup>[1]</sup>. However, there has been a significant decrease in breast cancer mortality rate of about 40% in high-income countries over the past two decades<sup>[2]</sup>. Figure-1A illustrates the global breast cancer deaths in females.

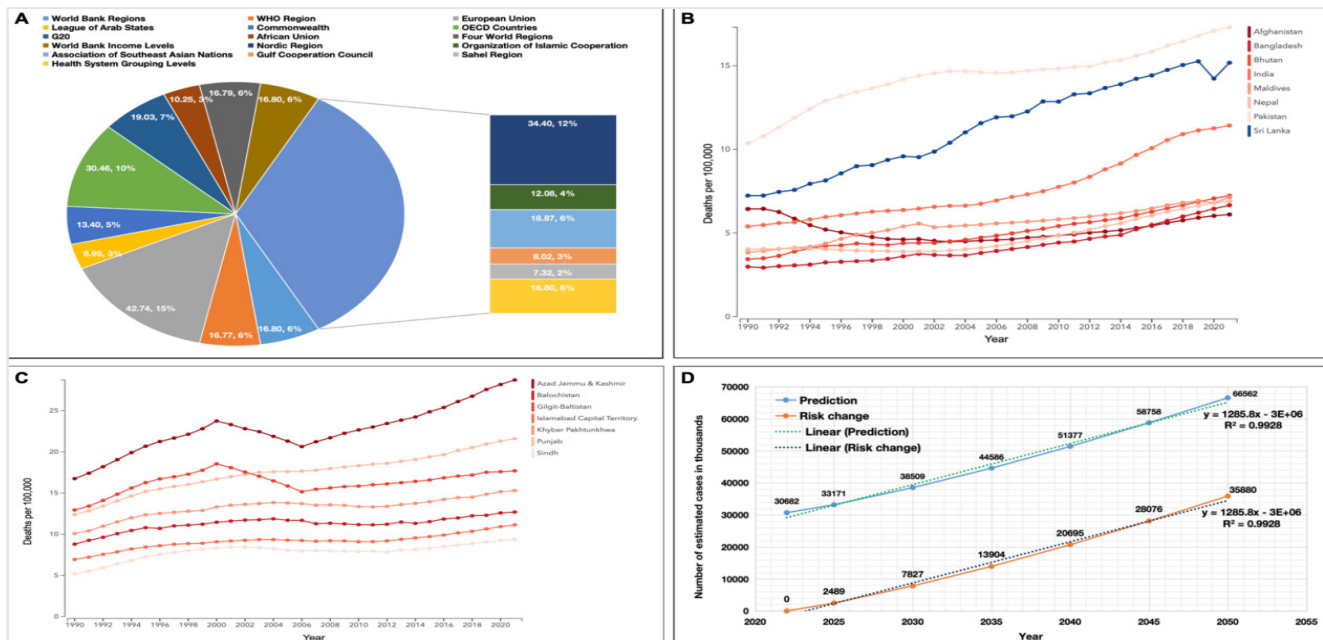
Our study examined the breast cancer mortality trends between 1990 and 2021 and prediction rates from 2022 to 2050 in Pakistani women. In some areas of Pakistan, the mortality rate has been steadily increasing, posing serious health concerns and burdens. In South Asia, Pakistan and Sri Lanka had the highest breast cancer mortality rates in 2021 (Figure-1B). Additionally, within Pakistan, Azad Jammu and Kashmir had the highest mortality rate (Figure-1C).

In Pakistan, the incidence and mortality rates have been continuously increasing over the last three decades, and the projection till 2050 is highly alarming for the entire population. Our analysis predicts that the number of estimated new breast cancer cases in Pakistan will increase to 66562 ( $R^2 = 0.9928$ ) by the end of 2050 (Figure-1D). A study reported that the availability of proper healthcare centers and lack of knowledge were the main factors for the delayed identification of breast cancer in Pakistan<sup>[3]</sup>.

Many other factors, such as lack of high-standard infrastructure and specific diagnosis and treatment centers, cultural barriers, unemployment, lack of social security, and poverty, are the key contributing factors to cancer diagnosis and treatment. However, the primary cause is the lack of diagnostic resources for breast cancer and the high cost of treatment, leading patients to seek alternate options such as folk medicine and/or spiritual healing. In the far-flung areas of Pakistan, a significant number of patients are unable to reach cancer hospitals due to financial constraints. The incidence and death rate might increase if these cases are included in the national data.

Strengthening local collaboration between public authorities and clinical settings is a way forward for early cancer detection and minimizing data gaps. There is a dire need to strengthen the health system to accommodate patients who cannot afford diagnosis or treatment costs. The number of cancer treatment centers and hospitals needs to be increased, as most patients often have to endure long waits for treatment due to lengthy queues.

The World Health Organization “Global Breast Cancer Initiative” aspires to decrease the annual breast cancer mortality rate of 2.5% and prevent 2.5 million breast cancer deaths globally by 2040<sup>[4]</sup>. This goal can only be achieved through extensive community education about breast cancer using printed booklets in local and national languages, social media, magazines, newspapers, and community dissemination sessions, among other methods.



**Figure-I:** A) Breast cancer deaths among females per 100,000 in different regions in 2021, B) breast cancer deaths among females per 100,000 in South Asia between 1990 and 2021, C) deaths per 100,000 due to breast cancer in different regions and provinces of Pakistan between 1990 and 2021, D) projection rates of estimated new cases of breast cancer in Pakistan from 2022 to 2050.

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