

Cancer Incidence and Diagnosis: The Road Ahead

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Abstract

The incidence of cancer is increasing worldwide. Patterns of cancer are also changing. Cancer affects millions of lives every year across the world. In India, the estimated number of incident cancer cases was 1.46 million in 2022, with a crude incidence rate of 100.4/100,000. The National Cancer Control Programme (1975) paved the way for the cancer registration system to monitor the disease burden, track trends, and inform public health policies and actions. Cancer is rising with an alarming warning in the Northeast India. The northeastern part of India has the highest incidence, mortality, and low survival in the country. There are many novel and pragmatic measures to address the existing challenges and propel cancer registration in India towards a more robust future. The study is an attempt to address the challenges of cancer incidence and diagnosis and measures to address the problem to reduce the cancer burden in the country.

Keywords:

Cancer, Incidence, Diagnosis, policies

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Introduction

The incidence of cancer is increasing worldwide. Patterns of cancer are also changing. The plasticity of cancer patterns denotes environmental factors as determinants of cancer and nutrition influences key cellular and molecular processes that characterize cancer. It has been estimated that diet and nutrition could account for 20%-25% of the worldwide cancer burden. The obesogenic effects of a high-calorie diet and lack of physical activity could account for about 10%-15% of the cancer burden, whereas about 5% may be attributable to alcohol and another 5% to specific dietary factors combined. Some nutritional exposures (alcohol and

processed meat) are likely to be the causative factors, but no singular factor protects against cancer (except dietary fiber for colorectal cancer). Cancer protection mainly arises from a systemic metabolic environment that promotes healthy cell replication and tissue integrity.

Since ancient times, our ancestors have made emphasis on nutrition. The Atharva Veda has mentioned the medicinal value of Indian spices and the significance of good nutrition for building a strong immune system. We live in a fast world where we often ignore the small things which may have a butterfly effect on our overall health. Good nutrition, regular exercise, and a healthy lifestyle should be a part of our daily schedule. Among the plethora of factors responsible for the causation of cancer, diet and nutrition are modifiable factors.

These potential advantages should be capitalized. Cancer affects millions of lives every year across the world. In India, the estimated number of incident cancer cases was 1.46 million in 2022, with a crude incidence rate of 100.4/100.000. The National Cancer Control Programme (1975) paved the way for the cancer registration system to monitor the disease burden, track trends, and inform public health policies and actions. The National Cancer Registry Programme (NCRP) started the assessment of the magnitude of cancer in 1981 when six cancer registries were established at suitably selected cities in different parts of the country under the auspices of Indian Council of Medical Research (ICMR). At present, the coordinating unit of NCRP is located in the ICMR-National Centre for Disease Informatics and Research, Bengaluru. Mumbai cancer registry was started by the Indian Cancer Society in 1964 and continues under the NCRP. Around the time when NCRP started, there were several well-established cancer registries in Europe (Finland, Scotland and Denmark) North America and South America (Brazil), Asia (China and Singapore), and Oceania (Australia and New Zealand). While significant strides in cancer registration have been made in recent years, there is scope for considerable improvement.

Association between lower socioeconomic status and tobacco consumption is observed globally as well as in low-and middle-income countries, including India. Four out of the top five (esophagus, lungs, pharynx, and mouth) in males and two out of the top five anatomical sites among females (esophagus and lungs) in the north-eastern region in India are associated with tobacco. A disparity in the distribution of cervical cancer is observed

globally, too, with a higher burden in the highest poverty quartile. In addition to human papillomavirus, other established risk factors include early marriage, multiparity, unsafe sexual intercourse, and low age at first childbirth; all of these are associated with low-socioeconomic status. Evidence also shows a higher proportion of gallbladder cancer (GBC) patients, one of the top anatomical cancer sites among Indian women, belonging to her lower socioeconomic status. In fact, the unique geographical distribution of GBC within India is also indicative of an association with an overall low development index. The incidence of GBC is unusually high in north and northeastern India, states with MPI lower than the national average.

Cancer is rising with an alarming warning in the Northeast India. The northeastern part of India has the highest incidence, mortality, and low survival in the country. The overall age standardized cancer incidence rate is higher in men and in women in Northeastern states of India, with rates of 270 (Aizwal, Mizoram) and 249 (Papumpare, Arunacal Pradesh) / 100,000 population. The corresponding mortality is also found nationally higher in Aizwal, Mizoram (men: 141 and women:83) / 100,000. An annual expected of around 40,000 persons (Based on the Crude rate of NCRP-ICMR, 2012-2014 report) were diagnosed with cancer every year in Northeast India, out of which around 25% (10,000) of cases were registered at the Regional Treatment Centres.

Objective

1. To identify the challenges of cancer incidence.
2. To seek measures for improvement in cancer diagnosis.
3. To address the challenges of cancer.

Methodology

It is a study to understand the challenges of cancer incidence and diagnosis and measures to address the problem to reduce the cancer burden in the country. The information has been collected from secondary sources.

Discussion

The northeast region of India has an overall high incidence, mortality, and lower

survival rate of cancer in the country, an annual expected of around 40,000 were diagnosed with cancer every year in this region. Mortality rate due to cancer in northeastern India is increasing mainly because of difficulties in accessing the facilities for cancer diagnosis and treatment, socioeconomic conditions, lack of awareness, taboo, misconception, and wide disparity in both diagnosis and treatment of cancers among the eight different states (regions) within northeast India. Furthermore, affordability of cancer care remains a major challenge in this part of India for effective cancer control. One of the major factors of increasing cancer-related mortality in northeastern part of India mainly because of most of the primary health center or local hospitals are ill equipped with advance treatment facilities to cope up with the growing burden of cancer.

Inequalities in access to cancer diagnosis and treatment in India exist in many ways. Northeast India lacks in proper cancer treatment and care uniformly across the region, which influence the treatment outcome and survivorship. According to the latest report of National Centre for Disease Informatics and Research, ICMR Bengaluru (A Report on Cancer Burden in North Eastern States of India, 2017) shows that even patients with early stage cancers have a lower survival rate compared to other parts of India.

Results

Despite progress, several challenges continue to hinder the complete and accurate registration of cancer cases in India. Many cancer cases, particularly those in rural and remote areas, go unreported due to limited awareness, inadequate diagnostic facilities, and lack of reporting mechanisms. Cancer notification, which refers to reporting cancer to concerned health-care provider, has been made notifiable in 16 Indian states as either a gazette notification or administrative order. This starkly contrasts many high-income countries where cancer is notifiable by law. Cancer notification data are known to substantially contribute to cancer registry data, evident from the notable NORDIC country registries, the oldest being the Danish registry since 1942.

There are many novel and pragmatic measures to address the existing challenges and propel cancer registration in India towards a more robust future. Cancer registration efforts must be expanded to cover a broader spectrum of health-care institutions, including private

hospitals, diagnostic centres, and primary care facilities including these facilities which will provide a more comprehensive picture of cancer incidence, demographics, mortality, and treatment patterns across the country. Ensuring data accuracy, completeness, and timeliness remains an ongoing concern. Training health-care professionals involved in data collection, implementing regular quality control measures, and leveraging digital technologies for real-time data capture can significantly enhance the reliability and usefulness of cancer registration data. Improving hospital case sheet entries for complete and accurate data abstraction is crucial. They also allow for automated checks, reminders, and alerts, minimizing errors, and improving accuracy.

Adequate investment in health-care infrastructure, including diagnostic facilities, in underserved regions will enable timely cancer diagnosis and reporting. This and enhanced awareness campaigns will encourage individuals to seek early medical attention and facilitate prompt reporting of cancer cases. Interoperability between various health information systems will facilitate seamless data exchange and integration. This could be done by embracing digital solutions, such as electronic health records, data management systems, and mobile applications. Furthermore, artificial intelligence and machine learning algorithms can help identify patterns, detect anomalies, and derive valuable insights from large datasets. There is an urgent need to strengthen cancer-specific death data availability and sharing through efforts that target improved medical certification of cause of death. Linkages with Ayushman Bharat and other insurance companies shall strengthen data quality and completeness.

Conclusion

Cancer registry data for publication research can be a valuable resource in driving action initiatives at the state level. Encouraging collaboration among various stakeholders, including government agencies, research institutions, and health-care providers, is crucial for effective cancer registration. Clinicians and researchers need to engage better with cancer statistics to provide meaningful solutions. Facilitating data sharing and research partnerships will foster a more comprehensive understanding of cancer epidemiology and support evidence-based decision-making. By addressing the challenges and embracing innovative approaches, India can build a robust cancer registration system that will aid in developing

targeted interventions and resource allocation, and ultimately, reduce the burden of cancer in the country.

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