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# REVIEW OF RECENT CANCER STATISTICS: AN INDIAN PERSPECTIVE

**Oncology**

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## ABSTRACT

There has been a significant improvements in the quality of cancer care all around the world over the last decade but still remains one of the most dreaded ailments which instantly triggers a situation where the shadow of death becomes a constant companion. Obviously the risk has been mitigated significantly with the advancement of care programs and medical technology, but still the timely diagnosis and optimal treatment are the biggest challenge. The debilitating impact of a cancer incidence is catastrophic, not only to the patient but in the collective psyche of his near and dear ones, given its financial, emotional and social implications. India, with a population close to 1·3 billion, and growing, is epidemiologically interesting and challenging for health-care planners. Regarding cancer burden, the population demographics, health policies, health-data recording, access to health care, and affordability have all improved substantially during the period between 1990 and 2016, as reported by the India State-Level Disease Burden Initiative Cancer Collaborators in their Global Burden of Disease paper in The Lancet Oncology. [1]

According to estimates from the World Health Organization (WHO) in 2015, cancer is the first or second leading cause of death before age 70 years in 91 of 172 countries, and it ranks third or fourth in an additional 22 Countries.[2]

As per GLOBOCAN 2018 report, worldwide there is an estimated 18.1 million new cancer cases and 9.6 million cancer deaths in 2018 as stated in figure.1. In both sexes combined, lung cancer is the most commonly diagnosed cancer (11.6% of the total cases) and the leading cause of cancer death (18.4% of the total cancer deaths), closely followed by female breast cancer (11.6%), prostate cancer (7.1%), and colorectal cancer (6.1%) for incidence and colorectal cancer (9.2%), stomach cancer (8.2%), and liver cancer (8.2%) for mortality (Fig. 2). [3]

The same reports state that, in 2018 there were 11,57,294 new cancer cases in India in both men and women, 7,84,821 deaths and 22,58,208 people living with cancer (within 5 years of diagnosis). Top 5 cancers that affect Indian population are Breast, Oral, cervical, gastric and lung cancers.

## KEYWORDS

## INTRODUCTION:

There has been a significant improvements in the quality of cancer care all around the world over the last decade but still remains one of the most dreaded ailments which instantly triggers a situation where the shadow of death becomes a constant companion. Obviously the risk has been mitigated significantly with the advancement of care programs and medical technology, but still the timely diagnosis and optimal treatment are the biggest challenge. The debilitating impact of a cancer incidence is catastrophic, not only to the patient but in the collective psyche of his near and dear ones, given its financial, emotional and social implications. India, with a population close to 1·3 billion, and growing, is epidemiologically interesting and challenging for health-care planners. Regarding cancer burden, the population demographics, health policies, health-data recording, access to health care, and affordability have all improved substantially during the period between 1990 and 2016, as reported by the India State-Level Disease Burden Initiative Cancer Collaborators in their Global Burden of Disease paper in The Lancet Oncology. [1]

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### Cancer related facts in India [2-5]:

- One woman dies of cervical cancer every 8 minutes in India.
- For every 2 women newly diagnosed with breast cancer, one woman dies of it in India.
- As many as 2,500 persons die every day due to tobacco-related diseases in India.
- Tobacco (smoked and smokeless) use accounted for 3,17,928 deaths (approx) in men and women in 2018.
- Cancer is the second most common cause of death in India (after cardiovascular disease).
- More women in India die from cervical cancer than in any other country.
- Breast cancer is the most common cancer in women in India and accounts for about a quarter of all cancers in women in Indian

cities.
- The average age for breast cancer in India is almost a decade lower than that in the West.
- Cancers of major public health relevance such as breast, oral, cervical, gastric, lung and colorectal cancer can be cured if detected early and treated adequately.
- India has nearly three times the incidence of US and China for head, neck and cervical cancers.
- India's age-standardized cancer incidence estimated at 150-200 per 100,000 population is higher than Africa and on par with China.

**High disease burden of cancer in India**

In India the cancer care is characterized by high incidence, late detection, and lack of access to quality affordable care to majority of the population and hence high mortality. In addition to the heterogeneity in cancer incidence and outcomes between states, significant differences exist within each state, most prominently between urban and rural populations. Health data availability, access to health care, and affordability are poor and have remained almost static over the entire period in rural areas, while they have improved substantially in urban areas. The federal government of India is currently rolling out in a phased manner the National Health Protection Scheme (NHPS, also known as Ayushman Bharat Scheme). If properly implemented, this program is likely to improve health-care access for the majority of the rural Indian population in the next decade. [6]

High percentage of late detection owing to issues of access, affordability and awareness given that both the cost and success of treatment is favorably skewed towards earlier detection in a significant manner, leave alone the anguish of the family that has to negotiate with the reality of losing their loved one knowing that it is a travesty, not tragedy, of destiny. [7,8]

Further, it is of great concern to address the key risk factors that contribute to the sickness, viz. use of alcohol/tobacco, obesity, environmental pollution etc. [8]

**Late detection of cancers impacting both survival rates and cost of treatment**

The stage of diagnosis in India is generally more delayed compared to other countries with only 20-30% of cancers being diagnosed in Stages I and II, which is less than half of that in the US, UK and China. Data collected between 2009 and 2011 show that only 43% of breast cancer cases were diagnosed at an early stage (i.e. stage I or stage II) of the disease in India whereas 62%, 81% and 72% of breast cancers were diagnosed at an early stage in the US, UK and China respectively. [9,10]. Less than 1% of women in India aged between 40 and 69 years participated in recommended breast screening mammograms once in 24 months, as compared to 30% in China and 65% in the US in 2014. Lack of awareness of cancer and screening for disease are significant contributory factors for the relatively late stage of the disease presentation. [11,12]. As a result, mortality rates are four to six times higher in India than the US and with baseline cost of treatment (estimated INR 3-4 lacs) being higher than the annual household income for over 80-85% of households in India (table 1). [10]

**Acute demand-supply gap for diagnosis and treatment**

Lack of adequate infrastructure and absence of mass screening programs are key barriers to timely and accurate diagnosis in India. There are an estimated 2,700 mammograms installed in India, which represents less than 5% of that in the US. There are an estimated 120 PET-CT scanners installed in India, the majority of which are in metropolitan cities. Only 30% of the cancer centers in India have advanced imaging technologies such as PET-CT. Access to multi-modal treatment options is inadequate and 40-60% of the facilities and oncologists are concentrated in the top 7-8 metropolitan cities of India hampering equitable access to treatment. [13-14]

**Table 1.**

| Treatment modality | % patients undergoing treatment | |
|---|---|---|
| | India | International standards |
| Radiation therapy | 15-20% | 40-50% |
| Surgery | 30-35% | 60-65% |
| Chemotherapy | 30-35% | 65-70% |

Aprox. 40 out of 640 districts in India have Linac installations. India has only 200-250 comprehensive cancer care centers (0.2 per million population in India vs 4.4 per million population in US), 40% of which are present in eight metropolitan cities and fewer than 15% are government operated. In addition, there is a significant shortage of oncologists in India. India has only one oncologist per 1,600 new cancer patients in India, as against one per 100 and 400 new cancer patients in the US and UK respectively.[14-16]

**Growth in disease burden –**

Real incidence is estimated to rise by 7-8% annually driven by changes in demographics and increasing deterioration of key risk factors. The prevalence of cancer in India is expected to increase from an estimated 3.9 million in 2015 to an estimated 7.1 million people by 2020. Real cancer incidence in India is expected to increase by 30-35% over the next years driven by the following factors [17-20]:-

- **Demographic changes:** Cancer incidence rates increase with age, and particularly so after the age of 50 years. India's population is ageing, and in particular the population over the age of 50 years is expected to increase from 228 million in 2015 to 262 million by 2020. Demographic factors alone are expected to result in an increase in cancer incidence of 100,000 to 350,000 cases a year.
- **Risk factor exposure:** Factors that have been associated with increased risk of cancer including tobacco use, rising alcohol consumption, increasing use of processed food and meat, reduced fiber content in the diet, rising incidence of obesity and environmental factors are anticipated to contribute to the rising cancer incidence in India. These high risk factors are expected to result in an increase in cancer incidence of 350,000 to 450,000 cases a year. India is witnessing a gradual deterioration of key risk factors, as evidenced below:
- Prevalence of all forms of tobacco use in India in 2015 is ~17% compared to 21% and 19% in the UK and US respectively.
- Alcohol per capita consumption in adults aged over 15 years has increased by ~55% between 1992 and 2012. i.e. the third highest increase amongst 40 countries (OECD and partner countries).
- India has the third highest number of obese individuals in the world, after the US and China.
- According to a 2014 WHO report, 13 of the 20 most polluted cities in the world are in India.

**Significant focus is needed to bridge the demand-supply gap**

To address the rising demand of reported incidence, India requires significant physical and human infrastructure addition with a focus on correction of the distribution inequity through increased investments in Tier 2 cities and below and in select states such as Madhya Pradesh, Chattisgarh, Rajasthan, Uttarakhand, Bihar etc (table 2.). [20]

**Table 2.**

| Infrastructure | Current estimated numbers | Estimated requirement in 2020 | Theoretical requirement (in absence of constraints of affordability and access) |
|---|---|---|---|
| Linac (No. of installations) | 350 | **750 - 900** | 2,000 |
| Dedicated cancer beds | 5000-6000 | **12000-13000** | 32,000-37,000 |
| Comprehensive cancer centers | 200-250 | **450-550** | 1,500-1,600 |
| Oncologists<br>►Medical<br>► Surgical | <br>750<br>500 | <br>**2800-3000**<br>**1900-2000** | <br>4,500<br>2,500 |

**The Economics of Cancer Care**

**Economic burden**

The economic burden of cancer is considerable and is increasing significantly. As per American Cancer Society Report, the total economic impact of premature death and disability from cancers worldwide was $895 billion in 2008, representing 1.5 per cent of the world's Gross Domestic Product (GDP). This figure increased to approximately $1.16 trillion as per the World Cancer Report 2014 by International Agency for Research on Cancer. [11]

**The Indian scenario**

With limited sustained funding and only a few centres of expertise in India, the domestic situation is much worse in comparison to the global

scenario. Indian Council of Medical Research (ICMR), in its 2016 projection, said that the total number of new cancer cases to reach nearly 17.3 lakh in 2020. Data also revealed that only 12.5 per cent of patients come for treatment in early stages of the disease. The fact that often cancer is diagnosed only at critical stages adds to the already steep economic burden that the ailment poses on the nation. A survey done at All India Institute of Medical Sciences (AIIMS) in 2011 among patients with the most prevalent cancers like head and neck, cervix and breast reported that the average monthly per capita income of households was Rs 1749. Half the households had monthly per capita income of less than Rs 1000. Although the cost associated with treatment of cancer is predominant, another considerable economic impact of cancer is in terms of loss of life and productivity. [8, 17, 20]

**Public sector contribution**

In 2011, World Bank reported through World development indicators that India spent an estimated 3·9 per cent of its gross domestic product (GDP) on healthcare (both public and private funding) and only 21 per cent of which was contributed by the public sector. Though the contribution is relatively low, the sector can be revitalised to improve cancer care significantly. On the positive side, the Government of India has instigated some commendable initiatives, for instance the National Cancer Grid (NCG). NCG, funded by the Government of India through the Department of Atomic Energy, is amongst the largest cancer networks in the world. It aims to work towards uniform standards of care by adopting evidence-based management guidelines, which are implementable across these centres. This plan is to bring parity of cancer treatment in various tiers of the society and provide uniform cancer in all parts of the country. Other central schemes to financially support specific population groups include Health Minister's Cancer Patient Fund (HMCPF), Central Government Health Scheme (CGHS) for retired Central Government employees & dependents and recently launched Ayushman bharat scheme. This way the government plans to ensure availability of quality medicines at affordable prices to all. Though the government is putting in all these efforts through initiatives and schemes, there is still a long way to go. The biggest public sector contribution should be to increase universal insurance for cancer care and increasing the GDP in healthcare. [15, 21]

**The role of the private sector**

India has come a long way from where it was two decades ago. But many challenges are yet to be addressed. The private sector, being a vibrant force, accounts for 82 per cent of the total $30.5 billion health sector expenditures in 2003 according to one reported survey. Taking into consideration the share held by the sector, the role of the private sector is very crucial. In the private sector, many not for profit organizations needs to be established to spread awareness, detection and cure of those who are affected with the disease. Such initiatives along with the collaboration with private or corporate players should create a pool which can be used for the treatment of cancer affected patients.

**Learnings from the globe**

In the US, total healthcare expenditure is pegged at $3.3 trillion and is more than 15 per cent of its GDP in 2016. Back in 2010, cancer care only constituted $124 billion dollars. Similarly, in the UK, the NHS reported that the total cancer care expenditure was around 5-6 per cent of total health spending. While many argue that increasing care treatment costs could become responsible for increasing healthcare spending, it would be unwise to deny that such spending has resulted in better infrastructure and access to better treatment methods. As each country has its own legal hurdles and policies for healthcare, strategies to tackle cancer vary greatly. With the number of uncertainties surrounding India's healthcare ecosystem, a top-down approach is needed where the government intervenes at every level to work towards improving infrastructure and more importantly, making such facilities more accessible.

As per the report of Euro Pancreatic Cancer Index (EPCI) 2014, published by the Sweden-based research organization Health Consumer Powerhouse (HCP)-Netherlands comes out top with 879 of a possible 1,000 points, followed by Denmark (872), France (812), Ireland (807) and the UK in fifth position. Reason for this is very high quality of cancer research.

In Finland, there is a long tradition of collecting samples in bio- banks, which makes genetic information readily accessible. These samples can be linked to comprehensive digital databases of donor health data, which benefits cancer research enormously. Bio-bank samples can be used, for instance, to examine the molecular features of cancer cells in order to find out which treatment works best for different types of cancer. With the help of this model, Finland, which was way behind many other European countries in cancer treatment, has come a long way and is now leading in cancer research and treatment. This research model proved a boon for the patients who were in distress due to higher cost of treatment.

In a country like India where health insurance system is still in its initial phases of popularity, majority of patients settle their bills in cash. The research model adopted by countries like Finland can help enormously in reducing the treatment cost. More and more researches lead to better and cheap methods of treatment. Also, doctors/ clinicians, with the help of research papers, can identify the problem at the right stage leading to lesser diagnostics and investigations.

Most countries that are ranked by WHO in the top 15 countries in health care rankings either follow the Bismarck or the Beveridge Model. Hence, they find themselves rated so, since both of them follow a policy that falls under taxation, National Health Service, mandatory Insurance and public and private service with public taking the lead . India is a highly populated country with a WHO rating below 150. So it will need to study these models to find out how the public enterprise and the private enterprise have worked together to ensure better care and quality of life.

Diagnostics sector plays an integral element in providing cost efficiency during both diagnosis and treatment. There is a need to diagnose effectively with limited set of diagnostic tests rapidly so as to start the accurate treatment immediately. And even though there are vast innovations in the technology which can reduce the burden of the disease through precision and quality, these personalised treatments are expensive and frontloads the cost involved. [4-6, 22]

**Ramping up insurance**

Despite these improvements, one major lag remains in the insurance sector, with India's current insurance penetration rate standing at 3.42 per cent, which is far below the global average of 6.2 per cent. Moreover, cancer insurance, being a novel form of coverage, is a relatively new trend in the insurance industry. Even though it aims to mitigate the cost of cancer treatment, the market share is very less.

**Collaborations to conquer cancer**

The loss of productivity and life can only be managed by innovation and extensive research, but escalating costs of treatment can definitely be handled through joint efforts put in by multiple sectors. The way forward in cancer lie in meaningful collaborations between public and private enterprises or between private enterprises. The benefit of this and its aggregation will ensure that cancer treatment is addressed appropriately to create better access and outcome that leads to a better quality of life. The next few years of collaborative work will need to be in research, innovation, sharing of resources, protocols, data analysis, early detection, precision medicine, empathy and accessibility. If we ensure to work together, the current cancer burden of over 1.1 million plus newly diagnosed cancer patients can be better managed and ensure the quality of life. If not, the burden of these 1.1 million patients and those already under treatment will be a stark reality. [21-22]

**Key requirements for effective management of the disease**

**I. Optimize care**

1. Cost effective, early diagnosis and screening.
2. Focus on health outcomes by ensuring quality of treatment.
3. National planning based on robust cancer registry.

**II. Expand care**

1. Innovative integrated delivery care models to take care to where the patient is.
2. Public private partnerships to decentralize cancer care delivery and nurture Centres of Excellence.
3. Addressing physical and human infrastructure gap with focus on correcting distribution inequity.
4. Strong focus on “cost of care” in areas of medical technology and drugs.

**III. Reduce the burden:**

1. Primary and secondary prevention (awareness and advocacy)

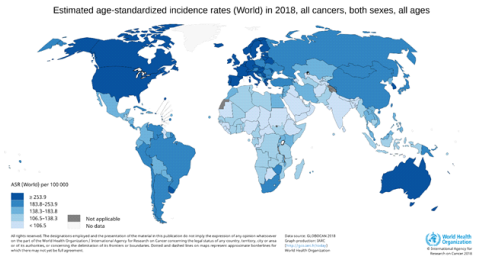


**Figure 1.**

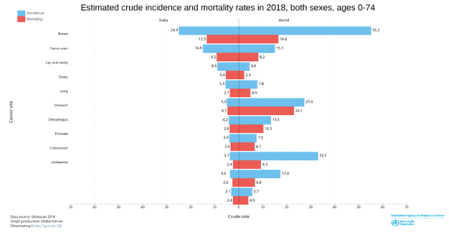


**Figure 2.**

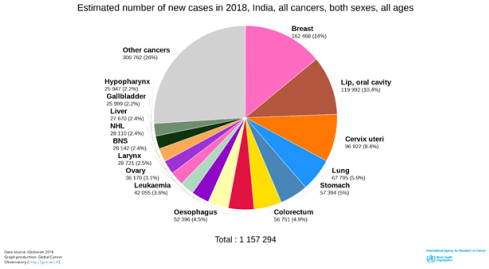


**Figure 3.**

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