

Cancer prevention and control in India can get a boost through primary health care-based approach: A review

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ABSTRACT

India has a rising burden of cancer with an estimated 70% of the cancers caused by modifiable and preventable risk factors. This review was conducted to document the status, analyse the situation and propose the way forward for cancer prevention in India. A desk review of the online databases and reports from the government websites was conducted. The ongoing initiatives including cancer registries, medical and health education and training, and community-based programmes were analysed. This review was done from July 2019 to February 2021. Cancers of the breast, cervix, and lip and oral cavity are the three most common malignancies, with distinct regional variations in India and account for 34% of the 1.15 million cancer cases diagnosed annually. The major initiatives were focused initially on cancer treatment and prevention was added nearly a decade ago. Even with those, the scope and coverage of cancer prevention and treatment services has remained in hospitals and urban settings. India needs to build upon the ongoing approach which seems to be focused on “tracking the cancer, teaching the future and helping the masses” by implementing non-vertical primary healthcare cancer prevention and control approach. Cancer prevention should be made an integral part of the health interventions, rapidly extended to primary healthcare services and facilities, linked with specialised treatment facilities, as India aims for universal health coverage. The opportunity provided by the Ayushman Bharat Programme launched in 2018 should be leveraged for rapid expansion and effective coverage of cancer prevention and treatment interventions in India.

Keywords: Cancer prevention, cancer registry, India, primary healthcare, universal health coverage

Background

The burden of diseases in India has changed drastically from 1990 to 2016, with non-communicable diseases, including cancer, becoming a major cause of death in the country^[1] There were an estimated 1,157,294 new cases of cancer in India in the year

2018.^[2] A general lack of access to cancer services often results in delayed diagnosis, unaffordable expenditures on health services for cancer patients, and poor survival outcomes contribute to nearly 70% of the newly identified cancer patients dying within a year of diagnosis. The situation is commonly characterised by the poor quality of public facilities and most services in tertiary-level private sector facilities.^[3-6] The challenge is likely to increase as cancer incidence and mortality are expected to double by 2040.^[2]

It has been estimated that nearly 70% of the cancers in India are caused by modifiable and preventable risk factors.^[7] Many

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common cancers have clearly defined risk factors, available vaccines, and if diagnosed early, have better survival outcomes and less economic burden. This context suggests that cancer prevention, screening and early diagnosis are one of the most cost-effective and efficacious measures to prevent and control the cancer burden in India. India has recently launched the Ayushman Bharat Programme (ABP), which has one of the two components focused on strengthening primary healthcare, through health and wellness centres (HWCs) and the second component of Pradhan Mantri Jan Arogya Yojana or PMJAY to provide secondary and tertiary levels of treatment services. These HWCs have focused on community-based screening for some common cancers, which could be a good opportunity to integrate cancer prevention and control into primary healthcare services in the country.^[8] Those identified through screening can be referred for treatment under the second arm of ABP.^[8] In this background, this rapid review was conducted to document the current status, analyse the situation and propose the way forward for cancer prevention in India, with specific attention to the integration of primary healthcare services. This paper will give a better understanding of the status of cancer control strategies, cancer registries and community-based programmes initiated by the Government of India, especially the budding epidemiologist and the primary care physicians who work at the field level and implement the national health programmes.

Materials and Methods

A desk review of the literature was conducted, followed by interpretation and analysis. The online databases included Medline via PubMed, Scopus, Embase, IndMed, and Google Scholar amongst others for the papers published in peer-reviewed scientific journals in the English language until February 2020 using keywords including ‘cancer,’ ‘prevention,’ ‘India,’ ‘strategy,’ ‘HPV,’ ‘H-Pylori,’ ‘community-based screening,’ ‘preventive oncology,’ ‘health programmes,’ ‘Ayushman Bharat,’ ‘registries,’ ‘primary health care,’ and ‘medical education.’ We included those studies that contained information on history, epidemiology and burden of cancer, cancer registry, national programmes for cancer screening in India, educational courses available on preventive oncology and primary care approach for cancer prevention which were published up to March 2020. We excluded those studies that discussed only the genetic and curative aspects of cancer prevention. We also searched for conference abstracts for the latest information on preventive oncology. Cross-references were also searched from the eligible articles for additional information. Since this is an unstructured review, the quality assessment of the studies included in the review was not conducted. As part of the analysis, a brief overview of the epidemiology of preventable cancers and their risk factors in India was prepared. Then, the summary of the current efforts of cancer prevention and early diagnosis was organised under three broad categories: cancer registries, medical and health education, and community-targeted prevention and screening interventions. Special emphasis was made to identify potential areas for integration of cancer services in primary healthcare services.

Evolution of cancer treatment and control in India

The focus on infectious diseases and the mother and child health services inadvertently resulted in slightly less attention being given to cancer prevention and control-related efforts in India, at least till decades ago. Though a few cancer registries were started from 1981 onwards, the scope was limited. Till the year 2000, much of the focus of cancer services in India was on cancer treatment delivered through leading speciality cancer hospitals and medical colleges. Starting from 2005, the national rural health mission in India further supported the strengthening of district hospitals for cancer treatment and specific funds were provided for augmenting these services at the medical college level as well.^[9] The first indication of the shift from treatment to broader prevention and control was noted when the Union Government of India launched the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke (NPCDCS). The NPCDCS advocated and proposed preventive, promotive, curative and rehabilitative care to cancer patients at all levels of the health system. Population-based screening for adults above the age of 30 years has been established to screen for cervical, oral, and breast cancer every 5 years by Accredited Social Health Activists (ASHA) and Auxiliary Nurse-Midwives.^[10]

Better understanding of cancer epidemiology for effective interventions

Things and possible approaches to cancer prevention and control seem to have been impacted by evolving learning and a better understanding of cancer epidemiology in India. It was documented that nearly 70% of the cancers in India are preventable; 40% of the preventable cancers are tobacco-related, 20% are infection-related, and 10% are due to other causes.^[7] Alcohol has been recognised as the second leading risk factor in India, strongly associated with gastrointestinal cancers.^[11–13] The human papillomavirus (HPV) and hepatitis B virus, which cause cervical and liver cancer, respectively, have vaccines. Overall, around 20% of all cancers may be attributable to diet and related factors including obesity.^[14] Despite this, more than 80% of the people with cancer present to the facilities at advanced stages.^[15]

A treatment-centric approach to cancer is not enough. A better understanding of cancer epidemiology encouraged several Indian states to consider a more holistic approach to cancer prevention and control as well as for rapid scale-up of NPCDCS and cancer components. The need for a community component in cancer prevention was felt when it was realised that the key challenges in early diagnosis and treatment of cancer are related to the patients receiving wrong information, having poor knowledge, poor faith in public health services, and a weak cancer health infrastructure.^[3,16–18]

Tracking cancer, teaching the future and helping the masses

Arguably, for effective prevention and control of cancer, even before treatment is initiated, a three-pronged approach of tackling

cancer, teaching in the future and helping the masses needs to be followed. In other words, establishing a well-functioning health system which focuses on cancer prevention, screening, and early detection requires attention to three specific pillars which must be strengthened: Cancer registries, medical and health education, and community-based screening and prevention interventions.

Cancer control in India has made progress in the last four decades since the Indian Council of Medical Research launched the National Cancer Registry (NCR) Programme in 1981 to aggregate data from population-based cancer registries (PBCR) and hospital-based cancer registries (HBCR) from around India.^[19,20] Later on, the Department of Atomic Energy (DAE) acted as a national stakeholder by funding six tertiary cancer hospitals across India.^[21] The Tata Memorial Centre and the DAE have collaborated on the National Cancer Grid (NCG), a network of over 100 cancer centres in India, and hosts virtual meetings for multi-disciplinary training of patient case reviews, as well other types of resource sharing.^[22] There are currently more than 30 PBCRs in India; however, these registries only cover 10% of the Indian population.^[23] The funding constraints of the registries often limit their ability to ensure the quality of the data collected. More cancer registries coming up across the country.

The importance of cancer registries cannot be over-emphasised. Representative cancer registries have the potential to improve cancer outcomes. Comparing the socio-demographic data of the patients, geographic trends in cancer incidence, and cancer types helps to assess the risk factors, identify high-risk groups, and plan interventions for cancer prevention and screening.^[24]

Operating a PBCR requires significant financial and human resources and sustained government commitment. To successfully operate a cancer registry requires collecting data from tertiary cancer hospitals, and requires consulting private hospitals, tertiary-level public hospitals, district-level hospitals, pathology labs within a defined geographic area, and other healthcare practitioners which may diagnose cancer.^[24] As government commitment to PBCRs' funding is commonly variable, this can undermine PBCR's long-term follow-up.

The HBCR have helped to fill gaps in our understanding of India's cancer burden. There are currently calls to better link HBCRs with PBCRs and efforts are underway working between the NCR, select states, and hospitals.^[25]

The teaching component of cancer prevention includes the broad domain of cancer registration, cancer screening, and preventive oncology. There is often a need to identify and include specifically focused content on cancer prevention in the graduate training curricula of all health staff. It should be included in the curriculum of Community Medicine as a series of lectures for the orientation of the undergraduate students. Post-graduates of Community Medicine and Oncology should be taught the preventive and control aspects of cancers. Fellowships and/or short-term courses should also be offered to the post-graduates of Oncology and Community Medicine.^[26]

Community medicine departments in medical colleges should place a stronger emphasis on cancer prevention. The Indian Council of Medical Research along with other health research funding agencies like the Department of Science and Technology and the Department of Biotechnology should promote research in this field. Stronger incentives should be created for MBBS graduates to enter this field. At present, motivation remains low.^[27]

To prevent and screen for cancer, community-based interventions have the most immediate impact on the patients. It is important to think about how community interventions can occur within clinical settings, to better incorporate community interventions for cancer prevention and screening across primary, secondary, and tertiary levels of care. Most community interventions that have been seen in India have been state-led initiatives, like cancer registries, the success of these interventions has been because of contextually specific political, economic, and demographic characteristics. Most state-led initiatives have been for cervical cancer prevention and screening; an extremely practical intervention due to the availability of a human papillomavirus (HPV) vaccination. Till the end of 2019, at least three Indian states, Punjab, Sikkim and Delhi had introduced HPV vaccination for identified population groups or in selected districts of a state.^[28] The state of Tamil Nadu has implemented a screening initiative for cervical cancer starting in 2007.

The resource constraints of the states have prevented many from fully integrating cancer screening into primary health care and broader rural health developments which may be much more impactful and sustainable.^[29]

One of the commonly missing parts of health programme implementation in India is missing community or people's participation, which essentially starts with awareness generation. The method of early detection of cancers in symptomatic individuals is a more practical approach in resource-constrained settings like India. However, for its successful implementation, there is a need to generate awareness among the general population and train healthcare professionals in diagnosing cancers at an earlier stage. This can only be achieved by integrating the cancer care services in the primary healthcare system as it is usually the first point of contact of the diseased individual with the health system. Visual inspection for cervical cancer and clinical breast examination (CBE) for breast cancer are the commonly used tests for the early detection of cancers in primary care settings.^[30] Similarly, the successful implementation of HPV vaccination programmes also needs the support from the primary healthcare system like any other vaccination programme. Hence, for effective cancer prevention, integration of cancer care services in the primary healthcare system is the most appropriate strategy in the Indian context. The secondary and tertiary levels of the health care system should be strengthened for the provision of curative and palliative care to cancer patients along with the provision of preventive and promotive care.

There are opportunities in the existing systems and programmes

A majority of the Indian population lives in rural areas^[31] where there are ground-level workers such as ASHA and health workers functioning as the first point of contact between the community and the healthcare. Under Ayushman Bharat, frontline healthcare workers visit houses and fill out the Community-Based Assessment Checklist (CBAC) form. Individuals having early signs of cervical and breast cancers are referred to a medical officer for further management.^[8,32] HWCs under ABP perform Community-Based Assessment Checklists [Box 1]. As per the NPCDCS Annual report 2018–2019, of the 65 million people screened at the NCD clinics for hypertension, diabetes, CVDs and common cancers, 0.2% has been diagnosed with common cancer.^[8,33] These initiatives under Ayushman Bharat will eventually help in the early identification of the risk factors and for early diagnosis of cancer and treatment as two components of the programme [Figure 1]^[8] can provide a continuum of care and it can build upon the existing initiatives and experiences. This may translate into reduced cancer-related mortality if there is a provision of timely and accurate diagnosis, appropriate management, and a strong referral chain.

There is renewed interest and attention to strengthening and expanding comprehensive primary healthcare in India through various approaches.^[34] This is an opportunity to expand cancer screening through primary healthcare services. This opportunity can be used to identify and study various approaches for such interventions. The focus and attention under the HWCs initiatives of the ABP can change cancer screening in India and the additional things which should be done. The community-based organisations and institutional mechanisms for community action for health also need to be used suitably.^[35]

Primary health care could be the right platform for cancer prevention in India

There is a strong case that cancer prevention requires a comprehensive approach which implements community

interventions, strengthens PBCRs, and medical training. For example, opportunistic screening helps to detect cases but mostly at the terminal stages. Community screening and early detection help to diagnose cancer in the early stages but require a strong cancer health system for referral and affordable treatment. Successful cancer prevention strategies need to be attuned to the inter- and intra-state variations of cancer burdens. This includes differences in the prevalence of cancer types as well as the total prevalence of cancers based upon differences in the position of the states within the epidemiological transition. Regardless of state variation, a substantial proportion of cancers are due to modifiable risk factors and can be targeted for prevention.

This rising focus on cancer prevention and screening has led to several recent studies which have called for India to strengthen its prevention and screening efforts. A number of cost-effective prevention and screening interventions have been detailed in a recent review in the *Lancet Oncology*.^[28] The literature also suggests that to effectively prevent and screen for cancers, we must go beyond implementing cost-effective interventions, and understand the heterogeneous health systems which patients navigate and under which these interventions are implemented within.^[28] If preventive strategies are not designed within the contexts of the health system to provide holistic care from prevention to palliation, this could potentially worsen health inequities.

The new approaches to primary healthcare services are emerging and being documented in India. These can be optimally used for strengthening cancer prevention and treatment services. Alongside, there is a need for using appropriate engagement of civil society organisations, which are playing an increasingly important role in these efforts and initiatives. The new models for delivery of cancer prevention and treatment services need to be explored and the role of community and civil society organisations in such a process should be fully harmonised.

Behavioural and modifiable factors like smoking, alcohol and alterations in the diet pattern are risk factors for cancer.

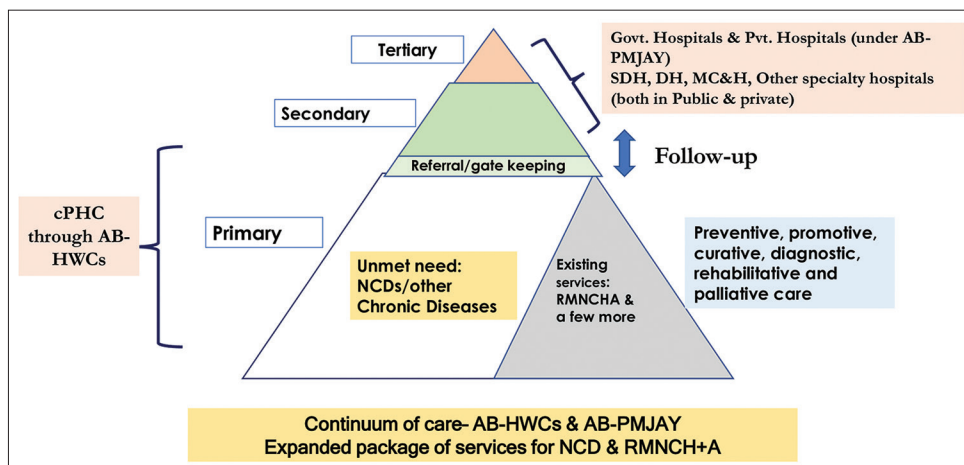


Figure 1: Ayushman Bharat Programme in India: A schematic

Community-based preventive measures should be taken in all states to reduce the complications and burden of cancers. The cancer health system needs to establish better coordination mechanisms between national stakeholders, state-level stakeholders, and the public and private sectors to specifically focus on cancer prevention. Undergraduates and post-graduates should be taught cancer prevention and medical colleges should introduce courses for preventive oncology.

Conclusions

There is a need and benefit to focus on cancer prevention, and this should be done as part of a programme to comprehensively strengthen and integrate cancer prevention in the primary healthcare system in India. As the incidence of preventable cancers decreases in India, the incidence of less easily diagnosed cancers will increase which will require the current gaps in secondary and tertiary care to be filled. Prevention of cancer (along with other diseases), health promotion in general, delivered through the primary healthcare system, and strengthening of treatment services should be seen as a comprehensive intervention that will accelerate India's journey towards universal health coverage. The opportunity provided by the ABP launched in 2018 should be leveraged for rapid expansion and effective coverage of cancer prevention and treatment interventions in India.

Author contributions

AL & CL conceptualised the paper. AL, RAD and CL conducted the literature review and prepared the first draft. RDS conducted additional literature review and provided detailed critical inputs on first draft, which was revised by all authors. MN and AS provided inputs for revision. All authors approved the final draft.

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Conflicts of interest

There are no conflicts of interest.

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Annexure

Box 1: Cancer screening under health and wellness centres (AB-HWCs)^[33]

AB-HWCs is a flagship programme of the Health Ministry started with the underlying commitment “leaving no one behind”. It provides an expanded range of services including screening of cancers under NCD screening. As of September 2019, 82,45,292 women have been screened for breast cancer, 49,79,183 have been screened for cervical cancer and 1,22,17,040 people have been screened for oral cancer, where Telangana, Tamil Nadu and West Bengal topped the list in screening more number of people for cancer. A majority of the southern states have >80% operational AB-HWCs.