

REVIEW

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Current Status of Implementation of Cancer Screening Programme in India: A Review of Policies and Practice

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Abstract

Introduction: Cancer is becoming a leading cause of death and disability across the globe and India too has a high burden of disease with poor outcomes. The national cancer screening program has been rolled out since 2010 but has not yielded the desired results so far. The objective of the present review is to perform an analysis of the strengths and weaknesses of the cancer screening component of the National Program - Non Communicable Disease (NP-NCD) program based on a scoping review of policies, organization, and status of implementation of the program at the primary and secondary levels and also on observations from field experience of the program managers and other health professionals from selected states in India. **Methods:** A mixed methodology was used to document the status of the implementation of the ongoing cancer screening program in India. The methodology included a literature review, observation of the frontline health professionals and an in-depth discussion with those in managerial capacity at the health facilities or the screening program. **Results:** Cancer screening is a complex public health initiative requiring a highly organized framework for effective implementation. Although India has implemented a comprehensive Non-Communicable Disease (NCD) screening program since 2010, the results have been minimal. The latest National Family Health Survey (NHFS 2019-21) reported that among the female population aged 30 to 49 years, only 1.9% and 0.9% were ever screened for cervical cancer and breast cancer respectively. The proportion of 30-49 year-old males reported to be ever screened for oral cancer was only 1.2%. Tamil Nadu and Kerala showed significantly better screening participation compared to other states in the country. **Conclusion:** Cancer screening is a complex public health initiative requiring a highly organized framework for effective implementation. The Ayushman Bharat comprehensive primary healthcare service package and plan to deliver cancer screening through the Health and Wellness centers (AB-HWCs) is a good opportunity to revamp the program.

Keywords: Cancer Screening and Early Detection- Policy and Practice- India

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Introduction

Cancer is becoming a leading cause of death and disability across the globe with 19.3 million new cases and 9.9 million deaths reported in the year 2020 [1]. In the same year, the National Cancer Registry Programme of India reported 1.4 million new cases in the country. [2]. Screening aims to detect early preclinical cancer and/or precancerous lesions in an asymptomatic population [3]. Screening is mainly categorized into two types -opportunistic and population-based screening. Opportunistic screening occurs without a structured invitation and is offered based on health professionals' recommendations or self-referrals, while population-based screening uses a systematic approach to reach the

majority of at-risk individuals as outlined in the national screening programme. The programme has a mechanism to send personal invitations to eligible individuals to attend the screening. Population-based screening may be implemented nationwide (preferably) or regionally [4].

A large-scale, population-based screening programme is a resource-intensive strategy since it involves inviting and testing several thousands of apparently healthy people using a suitable screening test and referring screen-positive individuals (usually 2-10% of the screened population, depending on disease prevalence and efficacy of the screening process) for diagnostic confirmation, treatment and follow-up care. Therefore, successful implementation of screening programmes requires effective governance and intersectoral coordination, considerable financial

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and human resources, an efficient information system to be able to invite eligible individuals and track the screen positives and a robust system of quality assurance based on measurable indicators [5, 6].

The Government of India (GOI) adopted a policy in the year 2010 [7] to implement breast, cervical, and oral cancer screening by clinical breast examination (CBE), visual inspection with acetic acid (VIA), and oral visual inspection (OVI) respectively through the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS). Initiated as a pilot in the year 2010 covering 100 districts across 22 states of India, this programme was scaled up in a phase-wise manner across the country. Focus of the programme implementation was only opportunistic screening for five non-communicable diseases (NCDs) (hypertension, diabetes, and three common cancers mentioned earlier) at district hospitals and community health centers through the setting up of NCD clinics. A revised operational strategy for the implementation of NCD screening as part of a comprehensive programme (NPCDCS) was launched in 2013 [8]. To increase coverage and bring these services closer to the community, GOI launched population-based screening for NCDs in 2016 targeting all individuals aged 30 years and above (Figure 1). The revised programme included community-level interventions like health promotion, population enumeration, assessment of risk factors, and mobilizing communities for screening mainly through community health workers known as Accredited Social Health Activists (ASHAs). Screening was planned at sub-centers (SC) and primary health centres (PHC) in rural and urban areas, initiation of treatment at PHCs, and referral to higher centres for further treatment [9]. In 2018, the Government of India initiated a programme for upgrading the healthcare facilities and expanding the range of services through AB-HWCs for primary care named Ayushman Arogya Mandir (AAM) [10, 11, 12] and Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana AB- PMJAY for secondary care [13, 14].

In 2023, GOI launched revised operational guidelines of the programme (NP-NCD 2023-30) having a focus on primary and secondary prevention, clinical support for NCDs and programme management to integrate NCD care at various healthcare delivery levels to meet the Sustainable Development Goals (SDGs) [15]. While the central government issues programmatic policies and guidelines, the final responsibility to implement the NCD control programme lies with the state governments. The central government provides technical and financial support for the activities at primary and secondary levels of care in each state and monitors and evaluates the programme through NCD cells set up at national, state, and district levels [16].

Despite several policy updates over the past decade, the availability of screening services at health facilities has varied significantly across states [17]. No comprehensive document has been published by the Ministry of Health, Government of India in recent years reporting the status of implementation and performance of the programme apart from the number of Ayushman Arogya Mandir (AAM) [18]. The objective of the present article is to perform an analysis of the strengths and weaknesses of the cancer screening component of the NP-NCD programme based on a scoping review of policies, organization, and status of implementation of the programme at the primary and secondary levels and also on observations from the field experience of programme managers and other health professionals from selected states in India.

Materials and Methods

A mixed-method approach was employed, including a scoping review of the literature, policy analysis, and stakeholder observations. The methodology adhered to PRISMA guidelines and followed these steps:

Data Sources and Search Strategy

We conducted a comprehensive search in electronic databases, including PubMed, Web of Science and Google



Figure 1. Timeline of Implementation of NCD Control Program in India

Scholar as well as grey literature from government websites and published reports. The search terms included combinations of: “Cancer screening,” “Early detection,” “Program implementation,” and “India.” The search targeted studies and reports published in English between 2010 and 2023. Manual searches of references cited in retrieved articles were also performed to identify additional relevant materials. Eligibility criteria for the study were the following inclusion criteria: a) Full-text articles, policy documents, and government reports related to breast, cervical and oral cancer screening in India. b) Publications providing data on programme implementation, workforce training, community engagement or healthcare system challenges. The exclusion criteria: a) Studies unrelated to cancer screening, b) Non-Indian contexts or studies not published in English c) abstract-only publications.

Study Selection

The selection process involved three phases: a) Title and Abstract Screening: Initial filtering based on relevance to the scoping review objectives. b) Full-text Review: Assessment of studies for eligibility against predefined criteria. c) Inclusion: Studies that met all inclusion criteria were included for analysis. The study selection process was documented using a PRISMA flow diagram, ensuring transparency (Figure 2).

In addition to the scoping review, we documented the observations from the frontline health professionals and in-depth discussions with the managers nested in a project being implemented in three states (Assam, Maharashtra and Odisha) by the Tata Trusts. Tata Trusts, a philanthropic organization set up by the Tata Group of Companies, in

Mumbai, India has been collaborating with various State Governments since 2018 to put together an action plan for strengthening the cancer screening and preventive health programme within the framework of existing national programme at the HWCs across 10 districts in the state of Assam, and one district each in Maharashtra and Odisha. While Assam is a state in the north-east part of India, Maharashtra is situated in the west and Odisha is situated in the east-central regions of the country. A dedicated team of the Tata Trusts consisting of clinical and public health community outreach staff (mobile health clinic manager, dentist, staff nurse, patient navigator and data entry operator) is working closely with the district NCD cell in the implementation of the screening programme along with the government frontline health workers (ASHAs), multipurpose workers (MPWs), auxiliary nurse midwives (ANMs), community health officers (CHOs) and staff nurses) (Figure 3).

Sampling framework

We adopted a convenience sampling technique to select the 12 districts from the three states. Only the programme manager of the ongoing project from each district was included in the interviews in the study. A total of 12 programme managers, one from each district, were interviewed using a semi-structured questionnaire. Telephonic interview from each participant was conducted monthly over 6 months, totalling 72 interviews. The data collected through the interviews were coded and analysed using thematic analysis. Based on the information obtained from the scoping review as well as feedback from the programme staff, an analysis of the strengths

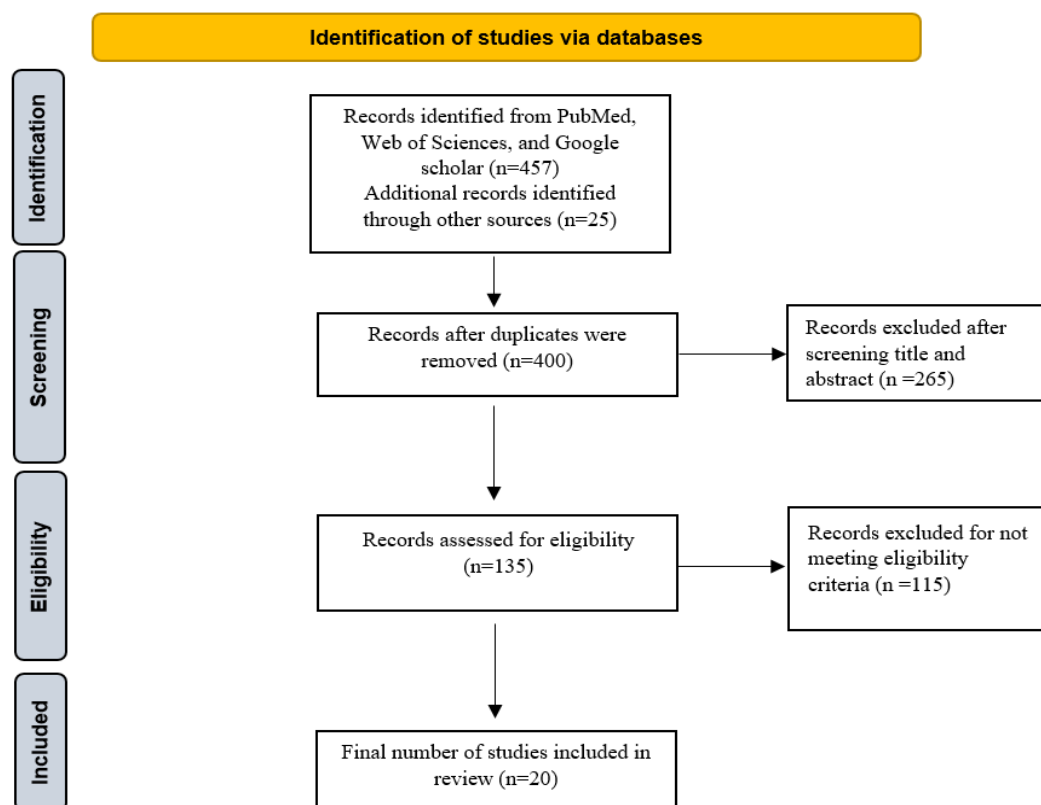


Figure 2. PRISMA Flow Diagram

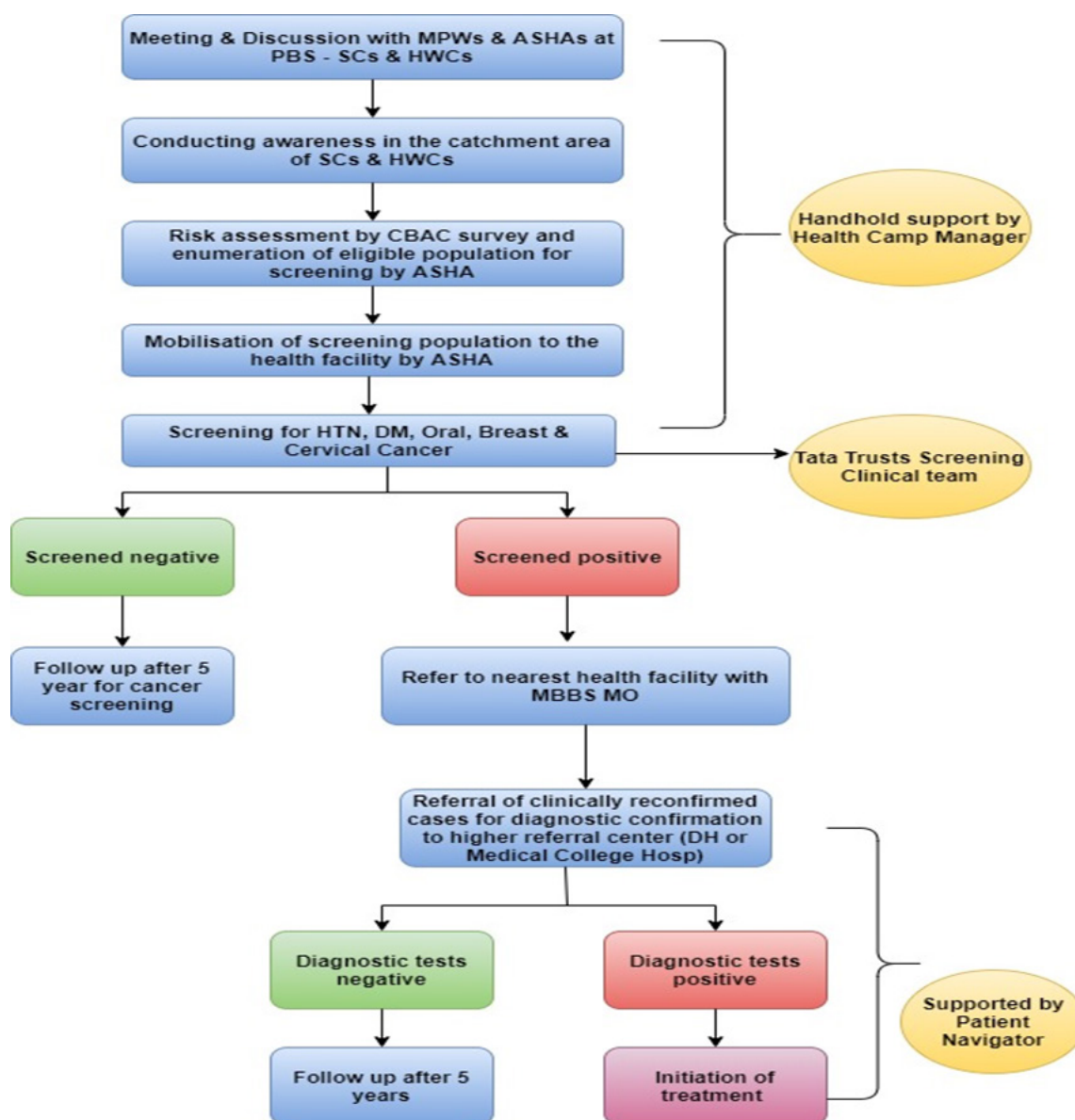


Figure 3. Process Flow of the Cancer Screening and Early Detection Program and Care Continuum Across the Tata Trusts Cancer Care Program Implemented in the 3 States of India.

and weaknesses of the programme was performed encompassing the six building blocks of health systems specified by the World Health Organization (WHO) [19], namely access to physical infrastructure and supplies, trained workforce, service delivery provisions, health information system (HIS), financing, governance and coordination.

Results

Under the Ayushman Bharat comprehensive primary healthcare service package health sub-centers and PHCs are to be gradually converted to AB-HWCs with adequate staff and resources to provide NCD services. The recommended guidelines for establishing AB-HWCs are summarized in Table 1.

At present, as part of the NCD programme guidelines, the ASHAs conduct assessment at home using a Community-Based Assessment Checklist (CBAC) and enumerate the eligible population (men and women,

aged 30 - 65 years) for screening of cancers once in 5 years. The eligible men and women are mobilized by ASHAs to attend the HWCs for screening. At the HWCs, individuals are enrolled using a data entry form, which is digitalized using the NCD-GoI application developed by Dell Technologies and implemented by Tata Trusts across the different states from 2018 onwards. The screening procedures are conducted by nurses and MPWs and involve counselling, obtaining written consent, measuring blood glucose level and blood pressure, conducting the oral visual examination, clinical breast examination, VIA, post-screening counselling and referral.

The screen-positive persons identified during the screening at HWCs are referred to the nearest referral facility such as Community Health Centre, District Hospital, or Medical College Hospital for confirmation of diagnosis and treatment. An important concept that is introduced in the programme coordinated by the Tata Trusts is a patient navigator (PN) (Figure 3).

The patient navigators are mainly social workers who

Table 1. Recommended Guidelines for Establishing Health and Wellness Centers (HWCs) under the Ayushman Bharat Comprehensive Primary Healthcare Service Package

Building blocks of the health system	Levels of healthcare delivery	Recommended guidelines for establishing HWC
Health workforce	In the community	One community health worker (ASHA) is employed per 1000 population in rural areas, 2500 population in urban areas, and 500 population in tribal and hilly areas. Role of ASHA – house-to-house visit for filling in health survey forms, counselling and motivating men and women to undergo sscreening in HWCs, reminding them of follow-up appointments at HWC
	Health Sub-Center (SC) converted to HWCs	One SC serves 5000 population in plain areas and 3000 in hilly areas). One Community Health Officer (CHO) and two multi-purpose workers (MPWs) are employed. CHO may be a staff nurse, general nurse midwife (GNM) or a practitioner of traditional and complementary medicine trained in community health (six months of certification course)). Role of CHOs - Range of services expected of the HWC including cancer screening. Support the team of MPWs and ASHAs on their tasks, including on-the-job mentoring, and supervision. Performance, reporting, and administrative functions. Role of MPWs- health education/counselling and health promotion, screening for cancers. Reporting, inventory management, and record maintenance.
	Primary Health Center (PHCs) converted to HWCs	A PHC serves approximately 20,000 population in both rural and urban areas. Minimum staff includes one medical officer, three staff nurses, one pharmacist, one laboratory technician, one lady health volunteer, and one MPW. Role of medical officer and staff nurse – provide screening esp Staff nurse in cervix cancer (VIA), and breast cancer.
Training of workforce	ASHAs in the community	Five days of training in a module on NCDs. (Module mainly covers risk factors for Non-Communicable Diseases, identification of risk factors, and raising awareness and mobilising the community to modify risk factors. Refresher training for about 15 days is held every year.
	MPWs at HWCs	Four days of training on screening, prevention, and management of NCD and three days of training on reporting and recording information using digital applications. 3-5 days of refresher training every year
	CHOs at HWCs	6 months certificate programme in community health in a residential programme either at an identified medical college or district hospital through IGNOU (Indira Gandhi National Open University) 5-7 days of supplementary training on new health programmes, new skills, and refreshers every year. Three days of training on the use of IT applications and telehealth Continued medical education through the ECHO platform arranged by NICPR, New Delhi
	Medical Officers/ Staff Nurses at HWCs	Three days of training in screening, prevention, and management of NCDs. Online certificate course on NCD treatment guidelines and clinical pathways. Staff nurses - VIA training in hybrid mode (Theory followed by hands-on training)
Service Delivery Infrastructure	HWCs	Each HWC is required to have space and provisions for Examination room with adequate privacy Waiting area- to accommodate at least 20-25 individuals Labor rooms at centres with provisions for childbirth Teleconferencing facility Diagnostics (different laboratory tests through the hub and spoke model) Medicine dispensation Storage of documents, health cards, and registers Provision for yoga, physiotherapy Educational materials display Separate male and female toilets Other requirements Continuous water & and electricity supply Biomedical waste management facility Internet connectivity Display boards with contact details of the team and details of referral center
Health Information System (HIS)	HWCs	A digital health information system (Comprehensive Primary Care Centre IT System) The application is built, consulting the MoHFW, GoI, and various other technical experts of reputed GoI partner institutions such as the NHSRC, ICMR, AIIMS, WHO, etc) * ASHA – does door-to-door population enumeration on paper/mobile phone * ANM – Tablet application for individual and family enrolment, screening, counselling, education, referral, and follow-ups. Also tracking of individuals and tracking of ASHA's progress. * CHO - task-based workflow and monitor the ANM plans on the care continuum for NCD cases referred to the designated HWC. * MO – PHC Portal application for individual and family enrolment, examination, protocol-based investigation, diagnosis, treatment, and management of hypertension and diabetes. Also counselling, education, referral for cancers, and follow-ups. Also tracking ANM's progress

Table 1. Continued

Building blocks of the health system	Levels of healthcare delivery	Recommended guidelines for establishing HWC
Health Information System (HIS)	HWCs	<p>* CHC, DH, and Tertiary – Portal application for examination, investigations, diagnosis, treatment, referral, and follow-ups for hypertension, diabetes complications, and all three cancers.</p> <p>* Dashboards – Portal with dashboards. Drill-down from the country to state, district, PHC, subcenters, and village level. Program performance indicators and administrative dashboards. Teleconsultation through the eSanjeevani platform is a step towards digital health equity to achieve Universal Health Coverage (UHC)</p> <p>eSanjeevani AB-HWC (a provider-to-provider telemedicine platform): this variant provides assisted teleconsultations for patients who walk into Health and Wellness Centres (HWCs), Community Health Officers in Health & Wellness Centres facilitate the teleconsultation for the patient who is connected to the doctors and specialists in hubs established in secondary/tertiary level health facilities or medical colleges.</p>
Quality Assurance	HWCs	Implement the National Quality Assurance Standards for public health facilities (https://qps.nhsreindia.org/), by focusing on eight critical areas - a) Service provision, b) Patient rights, c) Inputs d) Support services, e) Clinical services, f) Infection control, g) Quality management and h) Health outcomes.
Health Care Financing	HWCs	<p>The budget line is incorporated in the larger flagship project of the National Health Mission (NHM) and includes salaries, incentives, cost of educational campaigns, training, equipment purchase, and infrastructure development.</p> <p>Team-based incentives provided to staff of HWCs are measured based on the number of individuals (service users) empanelled with the HWCs, the range of services delivered at HWCs, coverage of HWCs, and the outputs/ outcomes achieved. (INR 75,000 per team-based guidelines and INR 25,000 for additional services).</p> <p>ASHAs are given separate incentives (INR 1000 per month/ASHA for delivery of a new range of services)</p> <p>It varies from state to state (Some states provide monthly, and some states provide bi-annually)</p> <p>Performance-linked payment – CHO (Monthly)</p>
Leadership and Governance	HWCs	<p>Quarterly meetings are held with block nodal officers at the district level and biannual meetings with district nodal officers at the state level for performance review and problem-solving.</p> <p>Jan Arogya Samitis (JAS), a multi-stakeholder facility-based committee at SC and PHC established for improved community ownership and provider accountability also reviews progress.</p>

are deployed at the medical college hospitals to facilitate prompt diagnostic workup of screen-positive cases at the hospitals. They are the link between the screening team at the HWCs and the cancer care team at the hospitals. A coordinated effort of the PN and ground team jointly to communicate with screen-positive patients is required for successful navigation.

Experience from the programme implemented across the 12 districts in the three states showed participation in training for the frontline health workers (ASHA, MPW, CHO) in the range from 56% to 98%, which also increased by screening uptake, almost twice as compared to preintervention and improved compliance to follow up at the referral centre (range 46% - 60%) (Table 2).

The reorganized NP-NCD programme aims to integrate NCD interventions with the National Health Mission (NHM) framework, the country's flagship health systems strengthening programme, for the optimization of limited resources and provision of seamless services to the end-users / patients. Under the NHM each district of the state has a District Health Society (DHS) responsible for integrating the administrative and financial structure of the NCD programme into that of the NHM (Figure 2). Further information on financing, infrastructure, workforce and governance of the programme based on the HWCs is given in Table 1.

Based on a scoping review of literature and feedback

from health professionals from the three states we have performed a critical appraisal of the reorganized screening programme, which is presented below. The strengths and weaknesses have been analysed for the six blocks of the health system identified by the WHO [20].

a) Service delivery infrastructure Strengths

All the states have a roadmap for the upgradation of all SCs or PHCs to functional HWCs providing screening services. According to the guidelines, the selection of the health facilities for upgradation needs to be planned in such a way that the population living in each administrative block under the districts have access to an SC/PHC upgraded to HWC. This may be an SC/PHC already providing screening services or a new one may be established. Community access to cancer screening services has improved in places where such an HWC has been established. Teleconsultation as a part of the package of services at HWCs using e-Sanjeevani software has been reported to be very useful for doing expert consultation. Improved infrastructure has also increased the acceptability of the facilities among men and women, which in turn increases participation in screening. The newly designed HWCs have provision of additional services such as yoga, naturopathy and physical activities to enhance better management of chronic diseases.

Post the Covid -19 pandemic there has been increased receptivity among the public to assess government health facilities' regular services.

Weaknesses

A major bottleneck in expanding existing facilities and converting them to HWCs is related to ownership of the building and/or land. Since most of the existing facilities are located on leased or rented properties, getting any expansion plan approved is time-consuming and complex. Poor maintenance of the facilities due to budgetary constraints is also a major weakness.

Referral management is still suboptimal beyond the PHCs. Documentation continues to be paper-based through registers and referral slips with minimal use of digital technology. The optimal implementation of teleconsultation services is hindered by poor internet infrastructure, poor quality video in handheld computers and the nonavailability of consultants in hubs. The nonavailability of good internet service providers, lack of data interoperability, and non-standardized data capturing at different facilities are the challenges for ensuring the care continuum.

b) Health Workforce

Strengths

There are early indications of a "team approach" evolving in the primary care workforce mainly with the addition of community health officers (CHO) and midlevel health providers (MLHP). Adding these new staff categories has enabled HWCs to deliver an expanded range of services such as vaccinations, maternal and child healthcare, NCD, palliative care, oral health, eye and ENT care, first-level emergencies and trauma and mental health.

Weaknesses

Employing new staff (CHOs and MLHPs) as per the guidelines is a big challenge in most of the HWCs and as a result, many of the facilities are having shortages of these staff. The number of health workers at sub-centres and the number of nurses and pharmacists at PHCs are quite limited. Other issues related to the deployment of staff include frequent transfer of trained staff, contractual CHOs leaving after a short stint, lack of cooperation between CHOs with a background in traditional and complementary medicine and those practising allopathic medicine etc.

c) Training and Capacity Building

Strengths

Standard training modules are developed targeted to the profiles of the workforce within the healthcare system. Modules are mainly delivered through a cascade learning wherein master trainers selected would train the staff at the local level. Each module is based on the role of the healthcare worker as defined in the operational guidelines. The training is provided through resources identified at the local level. Expert trainers are usually from local medical colleges or oncology centres. The training is imparted in close collaboration with the National Institute

of Cancer Prevention and Research (NICPR), New Delhi (NICPR) and the National Health System Resource Centre, New Delhi (NHSRC). NICPR is a nodal agency under the Government of India for providing technical assistance, training and policy guidance on cancer and prevention measures. NHSRC assists in policy and strategy development in the provision and mobilization of technical assistance to the states and in capacity building for the Ministry of Health and Family Welfare, Government of India.

Weaknesses

Major concerns related to the training of CHOs are that the training does not cover all the key areas and there is no assessment of competencies before certification. The training focuses more on diabetes care and the management of hypertension while for cancer it is more of theoretical sessions on screening and early detection. There is very little opportunity for practical hands-on training in the curriculum. The criteria for competency certification are not included in the training plan. Transfer of trained staff and a long gap between the training cycles are also major bottlenecks in ensuring consistency in cancer screening services.

d) Community Mobilization and Health Promotion

Strengths

Engagement of community-level committees/networks such as Jan Arogya Samiti at the HWC level, Village Health Sanitation and Nutrition Committee (VHSNCs), Mahila Arogya Samitis (MAS), and Self-help Groups (SHGs) have provided an impetus to the programme for raising awareness on screening for NCDs.

Weaknesses

The major challenge is the lack of an effective communication strategy on cancer. Inadequate awareness of the cancer risk factors at all levels was also reported. There was limited use of technology-based interventions (such as the availability of educational videos or the use of social media content) for the prevention and control of cancers, though such interventions were implemented through sporadic community-based activities to address substance use (tobacco, alcohol, drugs) or promoting a healthy diet and physical activities. Despite the strong presence of traditional healers in all the states, no attempt has been made to integrate them into cancer awareness programmes. Communication strategies do not take cognizance of local cultural practices and perceptions. Multiple health programmes have also diluted the focus on promoting cancer screening services in health facilities.

e) Diagnostic Services

Strengths

A hub and spoke model has been proposed in the guidelines with a central diagnostic unit at the Community Health Centre (CHC) being the hub and serving 20 -30 HWCs (spokes). The idea was to minimize patient movement, reduce access barriers and improve timeliness for reporting. The guidelines also advise considering public-private partnerships to provide certain diagnostic

services, rather than investing in setting up these facilities at each HWC.

Weaknesses

Implementation of the hub and spoke model is very limited and only a few districts have initiated this activity. The focus of procurement for the HWCs is mainly on consumables required for the detection and management of diabetes and hypertension as these are more in demand and available relatively easily. Equipment and consumables required for cancer screening are often not included in the regular procurement list of health facilities. Limited availability of examination light, speculum, acetic acid, wooden swabs and cotton swabs hampers screening with VIA for cervical cancer or with OVE for oral cancer. There is a challenge of replenishment of stocks and supply chain which results in disruption of the regular supply of consumables.

f) Health Information System

Strengths

Provision is made for ASHAs to have smartphones, MPWs to have tablets, and CHOs and Medical Officers (MOs) to have either tablets or computers in many districts. The NCD application has role-based specific modules for ASHA, ANM and MOs. The objective of the application is to enable a continuum of care - from screening to diagnosis and management. This is expected to enhance productivity and service quality through unified and integrated medical records and provide programme managers with actionable information for effective monitoring and planning. The recent advocacy for the ABHA card (Ayushman Bharat Health Account) has resulted in increased adoption of unique health IDs for each citizen.

Weaknesses

There are significant challenges to implementing the integrated information system due to issues related to hardware, software (multiple applications and lack of interoperability), and most importantly, internet connectivity. State-specific IT applications used in a few states are not integrated with national applications, thus flagging interoperability-related concerns. Poor digital literacy especially among senior staff is a barrier to rolling out digital solutions. Lack of sufficient training for the field staff and issues with the use of the devices were noted. While many facilities continue to use paper-based documentation, reporting both through paper and digital mode is a challenge. The clinicians in particular are not keen to enter data on a real-time basis due to their high volume of clinical work. User-friendliness of the application varies from state to state due to the heterogeneity of digital literacy among the healthcare workforce resulting in limited adoption in a few states, especially in Central and North India.

Healthcare Financing

Strengths

Funds to run the HWCs are provided through the NHM and are incorporated in the annual budgets. In addition, some states have mobilized funds from other

departments of the state government (Rural Governance Institutions also known as Panchayati Raj, Tribal Affairs), international agencies (World Bank Health System Fund), and Corporate Social Responsibility (CSR) funds from private corporations. Performance-linked payment to the HWC team has been introduced as an incentive based on identified targets. In addition, the health insurance coverage of AB-PMJAY also covering the tertiary care illness at the empanelled hospital has benefitted the cancer patients.

Weakness

Though the disbursement of funds from the central health ministry to states is generally reported to be timely, some have experienced delays. Allocation of funds from the states to the district for routine activities is reported to be delayed quite often and is inadequate to meet the requirements. Currently, the budget is allocated to the medical officer in charge of PHCs, who is supposed to distribute to SCs. The calculation of the performance-based incentives is a complicated opaque process and the beneficiaries have little understanding of this. Delays in processing the payment of incentives have been reported as a major barrier to its effective implementation across all the states. The lack of financial management capabilities of the in-charge and staff at PHCs and SCs has also been pointed out as a problem for effective financial management implementation.

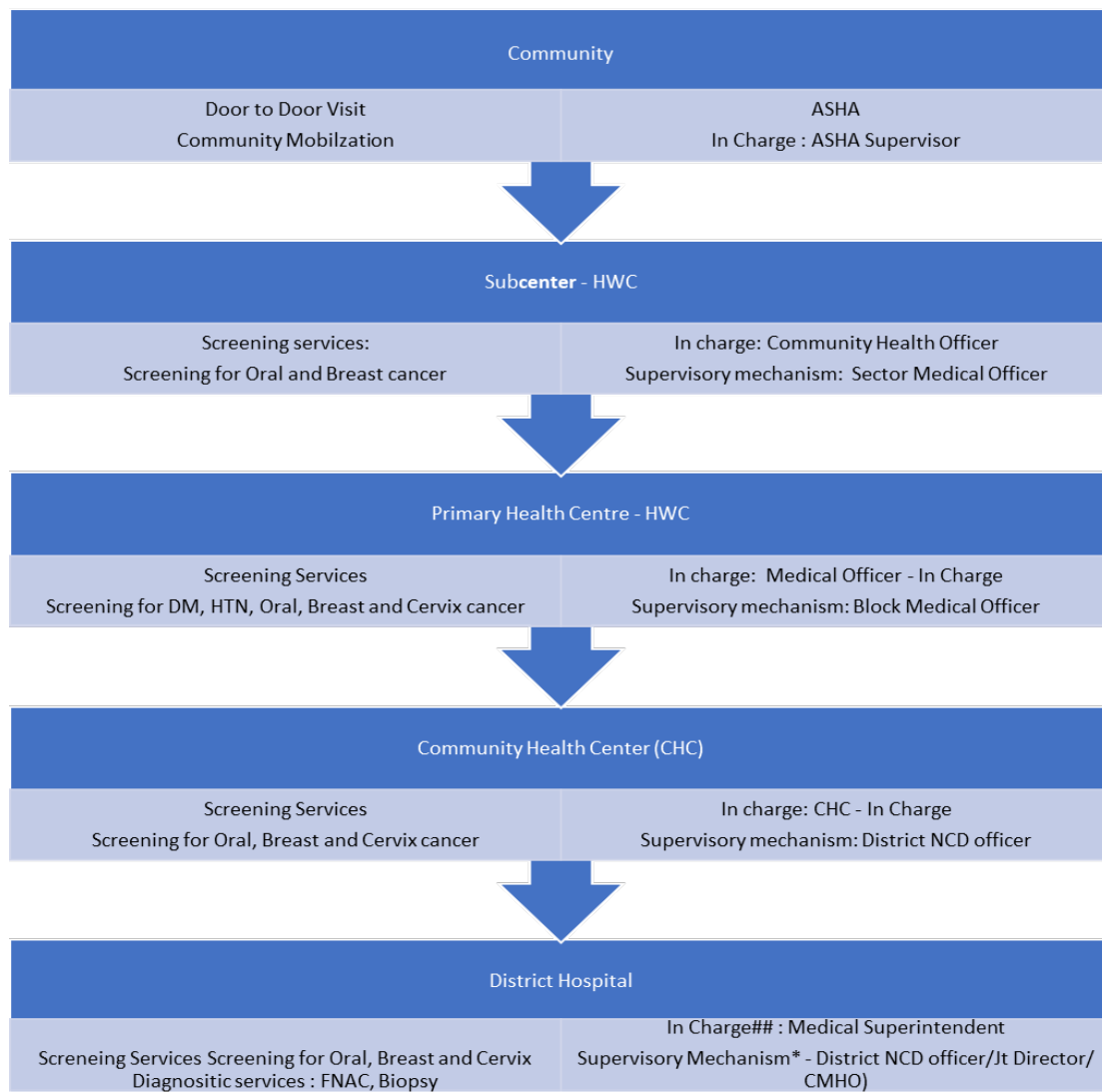
i) Program Management and Governance (Figure 4)

Strengths

A National Level Committee (NLC) headed by the Secretary, Ministry of Health and Family Welfare comprising of the Principal Secretaries of all states has been created to ensure a timeline for delivery of programme outcomes with proper utilization of funds. In most states, the programme management structure for Comprehensive Primary Health Care (CPHC), of which HWCs are part, is well defined. A senior official is appointed as the State Programme Officer. A nodal officer from other programmes is designated as the CPHC Nodal Officer of the district. A State-Level Committee (SLC) and a District-Level Committee (DLC) have also been established to coordinate HWC activities better. The district committee mainly comprise officials of health, panchayat raj, urban affairs and representatives of rural and urban local bodies.

CHOs visit the field areas to supervise the work of the ASHAs and ANMs, though to a limited extent. Jan Arogya Samitis (JAS), a multi-stakeholder facility-based committee at SC and PHC is being established for improved community ownership and provider accountability. Review meetings are conducted as a part of the supervision and monitoring process.

Programme managers responsible for overseeing and evaluating the NCD programme at the state and district level compile monthly and quarterly aggregate data to assess the programme's performance and measure performance-linked incentives for the team. Aggregate data is collected to estimate the following indicators: the percentage of men and women above 30 years old residing



Nomenclature varies from state to state, * Nomenclature varies from state to state, DM – Diabetes Mellitus, HTN- Hypertension

Figure 4. Process Flow for Type of Screening Services and Supervision based on the Type of Facility

in the district screened for oral cancer, the percentage of women above 30 years old residing in the district screened for breast and cervical cancer, screen-positivity as the percentage of those who were screened for each cancer, number of cancers detected, and the percentage of those who underwent treatment for each cancer. These figures

Table 2. Key Finding from Cancer Care Program in Assam, Chandrapur, Cuttack as a part of Health System Strengthening

Key indicators	Assam#	Chandrapur	Cuttack
A) Training and capacity building*			
ASHA	68%	83.70%	96.40%
CHO	81%	80%	30%
MPW	58%	56%	98%
B) Screening and early detection**			
Average screening at HWC/month before our intervention	39	116	298
Average screening at HWC/month after our intervention	108	332	570
Average % of eligible population coverage at HWC/month (eligible population - between 30 - 65yrs)	15%	38%	16%
C) Referral and follow-up	60%	52%	46%

*Percentage of healthcare workers present at the HWC (SC, PHC) during the visit; ** Average participation in the screening clinic = 48; #Implementation of cancer care program in 10 districts of Assam

are reported at the state and national level.

Weaknesses

Given their multiple responsibilities, the district nodal officers reported not being able to devote sufficient time to CPHC-related activities. There are gaps in coordination between the various committees set up to ensure regular review of the programme.

Discussion

Cancer screening is a public health initiative requiring a highly organized framework for effective implementation. Despite a comprehensive NCD screening programme in India since 2010, very little has been achieved on the ground. The latest National Family Health Survey (NHFS 2019-21) [21] demonstrated that of the total female population aged 30 to 49 years, only 1.9% of women reported being ever screened for cervical cancer and 0.9% reported being ever screened for breast cancer. The proportion of 30-49-year-old males reported to be ever screened for oral cancer was only 1.2%. The southern states of Tamil Nadu and Kerala showed significantly better screening participation compared to all other states in the country.

There are several reasons for the poor performance of the programme. The pilot launched in 2010 in more than 100 districts was a good opportunity to document and understand the ground-level implementation challenges. Unfortunately, the pilot was never evaluated and no report was published. Several attempts were made to change the organization of the programme without addressing key issues like governance, coordination, monitoring and evaluation etc. The protocol itself is not evidence-based even though major randomized trials evaluating VIA screening for cervical cancer, CBE screening for breast cancer and OVE screening for oral cancer have been implemented in India. There is no evidence that visual screening for oral cancer is effective in persons who are not habitual users of tobacco and/or alcohol. Starting CBE at the age of 30 years and repeating the test only at 5-year intervals is also not backed by evidence. A study undertaken among healthcare workers expected to provide NCD screening identified the key challenges in implementation due to a lack of adequate healthcare personnel, staff overburdened with other routine activities unaware of their roles in cancer screening and a lack of clear guidance on the referral pathway [22].

The Ayushman Bharat comprehensive primary healthcare service package and plan to deliver cancer screening through the HWCs is a good opportunity to revamp the programme, expand screening services to the last mile and strengthen key elements of the organization. Our study shows several advantages of the new scheme like a better governance structure, dedicated financing, a plan to improve trained workforce and better infrastructure. However, our study also unearthed several implementation challenges. Our observations are similar to those of Brar et al. [23] who reported that despite a significant move towards upgrading the infrastructure to provide required services at HWCs, lack of medicine

and consumables, absence of tracking of patients, missing community participation and not having funds on time were major deficiencies. India, having a federal structure of governance is extremely heterogeneous in the implementation of various health programmes across the states. We observed such heterogeneity in the setting up of the HWCs in the few states included in our study. An interesting observation from our study was that though cancers are included in the comprehensive NCD screening services, in reality, the HWCs are providing only check-ups for hypertension and diabetes as a routine while screening for cancers is dependent on the availability of infrastructure, trained manpower and supplies. Cancer screening was observed to have low priority compared to other NCDs in many districts. The mechanism of supervision and coordination across various levels of services was not uniform across the districts and the states leading to poor implementation of cancer screening.

Quality assurance is key to successful implementation of cancer screening. Poorly organized screening is not only ineffective in having the desired impact of reducing the cancer burden at the population level but also may cause harm to the participating individuals (due to false positive and false negative tests) and lead to wastage of healthcare resources. There is no protocol for quality assurance in the Indian screening programme. The key performance indicators (KPI) that the facilities are expected to measure are grossly insufficient. Screening is a process that needs to be repeated on the same population. Estimation of the proportion of the resident population having a screening test (as stipulated in the Indian programme) has very little value as a KPI. There are no KPIs to estimate the number of cervical precancers detected and treated. Measuring KPIs alone is of little value unless the performance is compared to established standards (e.g. expected screening test positivity or detection rate). No such standards have been determined to assess programme performance. Implementation of quality assurance using regular monitoring of KPIs requires the collection of individual-level data (not aggregate data alone), measuring the performance against set standards, identifying the gaps in implementation and taking corrective actions. This is entirely lacking in the Indian screening programme. The collection of individual-level data requires proper implementation of the information system. The new HWCs are equipped with capabilities to collect data using the common software. The programme leaders at the national level need to pay attention to this huge deficiency in the programme and make a concerted effort to have a unified information system collecting cancer screening data from all health facilities and to have a quality assurance protocol as an integral part of the programme implementation. The screening programme in the state of Tamil Nadu incorporated a health information system developed by Tata Consultancy Services tailored to monitor cancer screening from the pilot phase. The pilot project implemented in the two districts of Theni and Thanjavur achieved coverage of 74 % of the targeted women. The major shortcomings were in the care continuum as only 50% of the cervical cancer screen-positive women underwent colposcopy,

fewer precancers were detected compared to cancers (103 high-grade precancers and 887 invasive cancers), and only 13% of women requiring treatment received it through the programme [24]. The pilot phase was later expanded across the state in a phased manner (16 districts in Phase 1 and the remaining 16 districts in Phase 2) between 2010 and 2012. The performance of screening programmes in the state is significantly better than in other states. The information system permits the Tamil Nadu programme to track screen-positive individuals and ensure their further management – a crucial part of the well-organized cancer screening programme [25].

The model of integrating cancer screening with primary care services through the establishment of HWCs is timely and has the potential to establish an effective and sustainable way for the government to provide effective cancer screening services at the primary level of care. Mandal and Basu [5] suggested that all LMICs should improve the capacity for early diagnosis of breast cancer along with other common cancers through community education, training of frontline health workers, facilitating prompt referrals and improving the infrastructure for cancer diagnosis and treatment. Similarly, a study done in a tribal block of Maharashtra showed that engaging primary care providers for cancer screening programmes is feasible, provided mentoring and adequate training support are essential for effective delivery [26]. Further, engaging alternate workforce mainly the frontline healthcare workers and task shifting will add value in addressing the gaps of shortage of skilled manpower in LMICs [27].

Our observation of program implementation at HWCs in a few states suggests that close coordination is required between state-level and district-level programmes for the deployment of staff (ASHA, ANM, and CHO), scheduling their training and making their service available for screening services. Procurement of equipment and consumables conducted at the state level needs to be planned and monitored closely in coordination with the districts to ensure the delivery of essential items for proper screening procedures. Documentation and referral linkages need to be strengthened at each level with close coordination of ASHA, ANM, and PN. The IT system, documentation and reporting have improved over time but need a close and constant handholding with the field team. Review and appraisal at each level would ensure improved programme performance.

A Non-Governmental Organization (NGO) and Government came together in making the initial effort in capacity building and stabilizing the programme and sharing the resources required for infrastructure, human resources, and training. This kind of synergistic partnership to work towards a shared vision of cancer control not only resulted in a demonstrated increase in the confidence of the primary-level healthcare providers but also led to an effective and judicious use of the resources. An integrated approach and a strong monitoring system are essential for the successful implementation of the program and for achieving universal healthcare for all.

In conclusion, the cancer screening programme requires good coordination with all stakeholders and

effective delivery can be ensured through continuous support of the government as well as the implementation partners. The synergistic effect can ensure sustained delivery of programmes with effective utilization of resources of government as well as implementing partners who could function as a catalyst to drive a good comprehensive quality cancer screening programme that is integrated into the health system.

Author Contribution Statement

Conception and Design – KO, PB, Manuscript writing – KO, AP, KG, KO wrote the first draft, AP, PS, PB, VR and KG provided inputs in the manuscript, KG- contributed to health system aspects. All the authors contribute to the discussion and finalization of the manuscript.

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Disclaimer

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Conflict of Interest

None.

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