

Title:

Evidence-based screening in high-risk populations.

Full Name:

Sakthi Vignesh D

Name of the Institution:

Government Kilpauk Medical College (GKMC), Chennai

State:

Tamil Nadu

Objective of your solution: (Briefly define the primary outcome of your solution to this challenge):

High risk population includes - Person with family history of breast cancer, ovarian, pancreatic cancer, colorectal cancer at a younger age, Family history of 2 or more people in 1st & 2nd degree relatives having cancer, People working in factories prone to cause cancer for more than 10 years (Dye factories, Benzene exposure, oil factory, sugarcane factory), People with specific food habits & harmful habits such as smoking, alcohol, pan-parag, masala, Hans, tobacco chewing, Certain race of people who are more prone for cancer by birth.

Current risk assessment tools are many, some of the named ones are- Gail model, ROCA score, Amsterdam criteria, Tyrer-Cuzick (IBIS) model, BOADICEA, PREMM5, PLCom2012, PCPT.

According to these models, a large number of patients must be screened to acquire a meaningful benefit & diagnose patients with cancer. This adds significant healthcare costs to the government. Also, these tests have not included the genomic part, so hereditary cancers are missed. These traditional risk models also face the problem of overdiagnosis, especially in the older age group.

In this modern advanced technology era, a move should be made toward dynamic risk assessment & minimal residual disease monitoring. Due to advancements, multiple factors have been added into cancer evaluation, but many risk models are still outdated and need to catch up to advancements in medicine.

Hence key objective is to formulate an evidence-based screening method to effectively screen high risk population by using current modern advancements and techniques.

Describe your solution / proposal: Provide a detailed account of your solution/ proposal to this challenge. You could type your solution/ proposal here. (Disclaimer: Solution/proposal should not exceed more than 300 words.):

Public awareness and advocacy measures to support at community & policy level:

Emphasis on preventive oncology – more budget allocation to strengthen infrastructure, manpower & equipment so that cancer can be detected at an early stage. This allows for an aim for cure and "stage migration" (more patients diagnosed at early stages, preventing progression to metastatic/palliative stages). This indirectly reduces hospital costs related to palliative, supportive, and end-of-life care.

Doctors & nurses should be trained to screen for cancer clinically by examination & basic diagnostic tests (Clinical breast examination, VIA/VILI, chest X-ray, USG-abdomen, urine cytology, etc. for early cancer detection). Doctors & nurses should undergo periodic quality assessment and frequent CMEs (Continuing Medical Education) for knowledge updates. Low-cost diagnostic tests should be mandatorily implemented at all Block PHCs. Facilities should be established for tie-ups with Referral centers for coordinated disease confirmation and specialist consultation in cases of diagnostic dilemma.

Training of VHN/ASHA workers to identify high-risk patients based on family history. National Cancer Prevention Programme can be implemented through these community channels. ASHA/VHN can be motivated & trained to perform house visits and screen high-risk patients (history taking regarding family, personal habits, and occupation). Identified high-risk patients should be mobilized to the nearest specialist screening center (Block PHC, Local GH) for confirmation. Incentivizing these workers for identification & mobilization can improve productivity.

Full Name:

Foram Joshi

Name of the Institution:

Kidwai Memorial Institute of Oncology, Bengaluru

State:

Karnataka

Objective of your solution: (Briefly define the primary outcome of your solution to this challenge):

As we know, cancer screening is almost impossible to implement effectively in resource-limited countries. The majority of patients presenting to Regional Cancer Centres are diagnosed at terminal stages, constituting nearly 70% of the overall patient burden. This highlights the importance of developing screening strategies focused on public education, bridging gaps in healthcare access, encouraging early symptom detection, improving access to cancer care, and educating people about reducing cancer risk factors.

Describe your solution / proposal: Provide a detailed account of your solution/ proposal to this challenge. You could type your solution/ proposal here. (Disclaimer: Solution/proposal should not exceed more than 300 words.):

Cancer screening remains a major challenge in resource-limited countries. Lack of awareness about cancer and the fact that many cancers are preventable is one of the biggest problems in economically deprived communities. During routine OPD practice, many patients still ask whether cancer is a communicable disease because of myths and social stigma. This highlights the urgent need to educate people that cancer is a non-communicable disease and to address misconceptions related to cancer in society.

Education regarding cancer awareness should begin from the school level, especially considering the increasing incidence of pediatric malignancies. Awareness programs in rural areas are extremely important to encourage public participation in regular screening. Health camps and awareness meetings are helpful, but these activities should be conducted regularly under supervision of dedicated committees to ensure continuity and equal access.

Education alone is not sufficient. People should also be taught about early signs and symptoms of cancer and guided regarding where and whom to approach for medical care. In the present era of artificial intelligence and social media, it is possible to reach even the poorest populations. There is a need for multilingual Patient Assistant Cancer Apps that can provide reliable information and help patients connect with doctors or physician assistants for timely access to care.

Doctors, researchers, and scientists should also focus on developing validated cancer risk prediction tools. If accessible to the public, these tools may encourage high-risk individuals to seek early medical consultation. Governments should actively support fund-raising activities and screening programs to improve accessibility of cancer care services.

One of the biggest challenges in countries like India is the large population combined with a poor doctor-patient ratio. Even simple screening programs, such as CT scans for lung cancer screening in chronic smokers, become difficult to implement because government hospitals already face long waiting lists for patients with confirmed cancer diagnoses. At the same time, private investigations remain unaffordable for many patients.

Molecular testing, genetic testing, and genetic counselling are still inaccessible to most people in resource-limited settings because of financial constraints, poor infrastructure, and long turnaround times. These services should ideally receive mandatory funding, especially for high-risk populations, to make screening more meaningful and effective.

Counselling individuals who are at high risk but have not yet developed cancer is another major challenge. Convincing healthy individuals to undergo annual screening or risk-reducing surgeries is often difficult because society is still not fully prepared to accept preventive strategies. As a result, default rates remain high. Shared decision-making and proper counselling are essential to ensure that quality of life is not negatively affected.

The psychological burden of identifying someone as high risk can also be significant. Fear of developing cancer may affect every aspect of life, making psychological counselling an important component of screening programs. Screening individuals with hereditary or familial cancer syndromes is especially challenging because they may be at risk for multiple malignancies. In addition, lifestyle-related risk factors such as addictions must also be addressed.

In resource-limited countries, population-level cancer screening will remain difficult unless the gap between demand and supply in cancer care is improved. However, digitization and artificial intelligence can help educate the public, improve healthcare access, and identify high-risk individuals early.

Every cancer center should ideally have a multidisciplinary screening team including oncologists, surgeons, molecular pathologists, genetic counsellors, psychologists, NGOs, and patient assistants who can track patients and reduce default rates. Health insurance policies should also include cancer screening coverage to encourage early detection and potentially curative treatment.

AI is already being used in protocol development, risk assessment, diagnosis, and treatment guidance. In screening programs, AI can assist in radiological and pathological interpretation, reduce workload on doctors, and help triage patients requiring urgent attention. However, AI still has limitations and should be used carefully until validated by larger clinical trials.

With emerging research on cancer prevention vaccines, another challenge in resource-limited countries is the gap between innovation and accessibility. Financial toxicity often prevents access to these advances. Therefore, clinical trial participation, validation studies in local populations, DCGI approvals, and equitable availability must be encouraged.

Cancer screening in resource-limited countries should not be considered impossible. However, meaningful progress will require continuous efforts, practical strategies, and gradual steps toward overcoming existing barriers.

Full Name:

Senthamizhan.VS

Name of the Institution:

Regional Cancer Center (RCC), Trivandrum

State:

Kerala

Objective of your solution: (Briefly define the primary outcome of your solution to this challenge):

HEAD-SAFE Protocol

High-risk Evidence-based Assessment & Detection for Head and Neck Cancer

Head and neck cancers are highly prevalent in India, largely driven by tobacco, alcohol, and areca nut exposure. Most patients present at advanced stages because current screening is opportunistic, non-standardized, and poorly linked to referral systems.

We propose the HEAD-SAFE Protocol, a scalable and resource-sensitive screening model designed for high-risk populations.

Describe your solution / proposal: Provide a detailed account of your solution/ proposal to this challenge. You could type your solution/ proposal here. (Disclaimer: Solution/proposal should not exceed more than 300 words.):

1. Risk-Based Identification

Adults ≥ 30 years are screened using a simple HEAD-SAFE Risk Score incorporating:

- Tobacco use (smoked/smokeless)
- Alcohol consumption
- Areca nut chewing
- Oral potentially malignant disorders

- Persistent oral symptoms (>2 weeks)
- Previous head and neck cancer
- Occupational/environmental exposure

Individuals are stratified into low-, moderate-, and high-risk groups to optimize resource utilization.

2. Community-Level Screening

Trained ASHA workers, dentists, and primary-care providers perform:

- Visual oral examination
- Oral cavity palpation
- Neck node assessment

Suspicious lesions are documented using smartphone-based imaging and connected through tele-oncology referral pathways.

3. Rapid Referral Pathway

Patients with suspicious findings receive:

- Specialist evaluation within 7–14 days
- Biopsy confirmation
- Navigation support to minimize treatment delay and loss to follow-up

4. Awareness and Prevention

The protocol integrates:

- Tobacco cessation counselling
- Community awareness campaigns
- School/workplace education programs
- Advocacy for smokeless tobacco control policies

Expected Impact: The HEAD-SAFE Protocol aims to improve early cancer detection, reduce advanced-stage presentation and treatment abandonment, lower healthcare burden, and provide a scalable national model for head and neck cancer screening in resource-constrained settings.

Full Name:

Reshma Abraham

Name of the Institution:

Manipal hospital, Bengalore

State:

Karnataka

Objective of your solution: (Briefly define the primary outcome of your solution to this challenge):

How can we effectively implement evidence-based cancer screening strategies in high-risk populations in India by accurately identifying oncology-specific risk factors (such as genetic predisposition, family history, environmental and occupational exposures and lifestyle determinants) and how we increase the role of public awareness campaigns, community engagement, advocacy initiatives, and health-policy interventions play in improving screening uptake, early detection, and access to preventive oncology services?

Describe your solution / proposal: Provide a detailed account of your solution/ proposal to this challenge. You could type your solution/ proposal here. (Disclaimer: Solution/proposal should not exceed more than 300 words.):

India faces a rising cancer burden with late-stage presentation as the dominant driver of poor outcomes, and this reflects that our existing screening efforts remain suboptimal and no consistent follow up in people once identified as high risk through screening. We need a program that links every citizen to a lifelong, risk-stratified cancer surveillance pathway. With the integration of NPCDCS (revised NCCP 2.0). National Cancer Grid, ICMR-NCDIR cancer registries eSanjeevani and NMC — for tele-counseling and AI assisted technology (innovations from out IITs and IISc centres) we should build this-

1. Unique Health Identity Number (UHIN) which will form the foundation.

-Every citizen is assigned a UHIN linked to Aadhaar (can extend from the existing Ayushman Bharat Health Account and expanded to all citizens). This number should serve as an universal patient identifier across all forums, public and private healthcare facility, additional to hospital ID number. Any registered facility patient reaches, be it, tertiary, district, private, or even a standalone clinic should be able to access and update the record through a secure portal window, so updates from one centre reflect across all. This framework should comply with the Digital Personal Data Protection Act 2023 and commercial misuse must be prevented with no third-party access. Access at point of care should be secured by OTP-based patient authorization on the patient's own mobile. This should be an AI assisted platform.

- Family linkage feature —first- and second-degree relatives' UHINs are tagged to construct v pedigrees that auto-update when relatives are diagnosed with cancer.

- Initially can begin with pilot studies in adults ≥ 40 years (highest yield for common adult cancers), then can be extended to 30+, and ultimately universal enrollment. Can begin in an individual states and then build on it if it is a working model.

2. Baseline Enrollment Assessment

At UHIN issuance, every individual undergoes a comprehensive, structured evaluation:

-Clinical: Focused history, oral cavity and breast/testicular examination, systems review

-Laboratory: Basic hematological , metabolic and viral screening. HPV testing for women 30+; H. pylori serology in gastric cancer high-incidence zones (eg.North-East India)

-Pedigree: Structured three-generation family history with specific prompts for early-onset cancers, bilateral/multifocal primaries, and syndrome clustering

-Environmental and occupational module: Tobacco, alcohol, occupation, chemical exposures, residential history, cooking fuel. (all as preformed tick in options, rather than exhaustive typing). All data structured for analytics, not free text.

3. AI-Enabled Risk Stratification

The portal should have analytics built in — eg. reported maternal breast cancer at 42 should trigger a Tyrer-Cuzick/BOADICEA pathway; tobacco chewing triggers an oral cancer surveillance module and integrate validated risk models eg- Tyrer-Cuzick/BOADICEA (breast), PREMM5 (Lynch), PLCOm2012 (lung). In the end each individual should be stratified as low, moderate, or high risk for each major cancer, with an auto-generated surveillance schedule. A similar model of geographic specific risk factors can be built in from existing Indian epidemiological data.

4. Genetic Counseling and Testing Pathway

-A genetic counseling →germline testing→ cascade testing of relatives whose UHINs are already linked. Testing should be subsidized or covered under Ayushman Bharat PM-JAY for those meeting criteria. Genetic counselors, trained in culturally sensitive communication, must be present at every regional cancer centre and accessible by tele-counseling for rural patients. Confidentiality protections are central to making disclosure feel safe.

As in India, technical pathway alone is insufficient. Breast and ovarian cancer carry profound social stigma, with family history routinely hidden for fear of damaging marriage prospects, particularly for unmarried daughters and sisters, so our framework should have a sustained national messaging campaign establishing that early detection is as close to prevention as modern medicine offers.

5. Multilingual Companion App and Rural Engagement

- multilingual app with voice-based interaction for low-literacy users. It delivers automated, risk-personalized reminders for screenings, vaccinations (HPV, HBV), and follow-ups, with direct booking links to empaneled facilities and tele-counseling access.

-Urban areas: Private and corporate hospitals linked to the UHIN send additional reminders to these high risk patients.

-Rural areas: Defaulter lists auto-generate for ASHA workers and ANMs through their existing NCD App integration. The community health worker becomes the human bridge for those who don't engage with the app directly.

6. Quality Assurance and AI-Augmented Diagnostics

- Standardized national protocols are required for mammography reading, colposcopy, cervical cytology, endoscopy, and pathology, with key performance indicators (recall rates, adenoma detection rates, colposcopy positive predictive value) tracked centrally.

AI-enabled reading will assist India's radiologist and pathologist shortages. AI assistance for mammography (lesion detection and BI-RADS triage), colposcopy, cervical cytology, and endoscopic detection of pre-malignant lesions can extend specialist reach into district hospitals and screening camps.

Full Name:

Habeeb K A

Name of the Institution:

VPS Lakeshore Hospital, Kochi

State:

Kerala

Objective of your solution: (Briefly define the primary outcome of your solution to this challenge):

- Early identification of high-risk individuals
- Increase awareness on preventable cancer risks
- Encourage early diagnosis and timely intervention
- Strengthen genetic and family-based screening
- Integrate AI and innovative screening tools
- Expand screening access through primary healthcare
- Build a prevention-focused cancer care system in India.

Describe your solution / proposal: Provide a detailed account of your solution/ proposal to this challenge. You could type your solution/ proposal here. (Disclaimer: Solution/proposal should not exceed more than 300 words.):

In India, cancer screening must be risk-based, practical, and prevention-oriented. According to Indian Council of Medical Research— NCRP data, 1 in 9 Indians is at risk of developing cancer, making early identification of high-risk populations critical.

1. Identifying High-Risk Populations

Screening begins with recognizing both visible and hidden risks:

Visible risks: tobacco use, alcohol, obesity

Hidden risks: processed foods, chronic infections (Hepatitis B, H. pylori), environmental exposure

There is a need for public education—for example, warning labels for carcinogenic food ingredients and awareness that not all bleeding per rectum is benign. Patients, especially those with family history of colorectal cancer, must seek early medical evaluation.

Real example: A 45-year-old tobacco user with a non-healing oral ulcer is screened early and diagnosed at a curable stage.

2. Risk Assessment: Use, Adapt, Innovate

While tools like Gail and Tyrer-Cuzick models are used globally, they are underutilized in India due to resource constraints.

Develop indigenous multiparametric risk models suited to Indian demographics

Promote opportunistic screening in families with hereditary cancers

Encourage genetic testing in young patients, with government-subsidized programs. If a mutation is detected, next-generation family screening should be initiated for prevention.

Modern innovations:

- HPV self-sampling
- AI-based screening tools
- Digital risk registers at PHC level

3. Awareness and Advocacy

Effective screening requires community and policy support:

Community: ASHA worker-led awareness, lifestyle modification, early symptom recognition

Policy: integrate screening into PHCs, ensure rapid biopsy reporting, expand HPV vaccination, regulate carcinogenic exposures

By combining risk identification, indigenous tools, and strong awareness systems, screening in India can shift from late detection to early, life-saving intervention.

Full Name:

Dr Mohamed Thanish

Name of the Institution:

Stanley Medical College, Chennai

State:

Tamil Nadu

Objective of your solution: (Briefly define the primary outcome of your solution to this challenge):

To establish a practical, evidence driven framework for identifying high-risk individuals across common cancers in India, using validated risk stratification tools and scalable community level interventions to enable earlier detection and meaningfully improve survival outcomes.

Describe your solution / proposal: Provide a detailed account of your solution/ proposal to this challenge. You could type your solution/ proposal here. (Disclaimer: Solution/proposal should not exceed more than 300 words.):

High-risk populations in oncology are defined by a combination of inherited predisposition, environmental exposure, and lifestyle factors but what constitutes "high risk" varies considerably by cancer type and geography, which is why a one-size-fits-all screening approach consistently underperforms. And for breast cancer, high-risk criteria include BRCA1/2 pathogenic variants, a first-degree family history in a premenopausal relative, prior chest radiation before age 30, and Tyrer-Cuzick or IBIS model lifetime risk above 20%. For colorectal cancer, Lynch syndrome, familial adenomatous polyposis, and a personal history of inflammatory bowel disease define the high-risk cohort. For cervical cancer in India, persistent high-risk HPV infection particularly types 16 and 18 combined with immunosuppression or early sexual debut drives risk stratification. For oral cancers, daily tobacco and areca nut use, particularly in combination with alcohol, defines a massive and grossly under screened high-risk population that is uniquely concentrated in South and Southeast Asia. The best-case scenario for risk assessment tools involves integrating validated models Gail, Tyrer-Cuzick for breast, PREMM5 (Prediction model for Lynch syndrome), HPV DNA testing replacing cytology for cervical into primary care workflows. Where these tools require genomic data that isn't yet accessible at scale, clinical risk scores built from family history, exposure duration, and age remain practical and effective proxies. At the community level, ASHA workers and ANMs trained in basic risk questionnaire delivery, combined with mobile screening camps for visual inspection with acetic acid (VIA) for cervical cancer and oral cavity examination for high-risk tobacco users, offer a scalable and cost-effective first-line strategy. The evidence for VIA in reducing cervical cancer mortality in low resource settings is solid and should be the standard, not the exception. Policy level advocacy needs to push for mandatory HPV vaccination completion tracking, cancer risk documentation in primary health centre records, and incentivised screening compliance because awareness campaigns alone, without structured follow-through, have consistently failed to shift screening rates.

Full Name:

Monish Balaji S

Name of the Institution:

Kilpauk Medical College, Chennai

State:

Tamil Nadu

Objective of your solution: (Briefly define the primary outcome of your solution to this challenge):

Towards greater evidence based screening in high risk patients.

Describe your solution / proposal: Provide a detailed account of your solution/ proposal to this challenge. You could type your solution/ proposal here. (Disclaimer: Solution/proposal should not exceed more than 300 words.):

Evidence-based screening in high-risk populations is essential for early cancer detection, timely intervention, and improved survival outcomes and can have higher yield and cost benefit ratio

1. Criteria for identifying high-risk populations in oncology

- Genetic predisposition such as BRCA1/BRCA2 mutations, TP53 mutations, and Lynch syndrome
- Strong family history of early-onset or multiple primary cancers.
- Environmental and occupational exposures including asbestos, radiation, arsenic, and industrial carcinogens.
- Lifestyle-related risks such as long-term smoking, heavy alcohol use, obesity, and high-risk dietary patterns.

- Chronic inflammatory or premalignant conditions such as inflammatory bowel disease, Barrett's esophagus, or cirrhosis.
- Infection-associated risks including HPV (cervical and head & neck cancers), HBV and HCV (liver cancer).
- Prior history of cancer or precancerous lesions indicating recurrence risk.

2. Risk assessment tools and need for development

- Existing validated tools include Gail model and Tyrer-Cuzick model for breast cancer risk prediction.
- Lynch syndrome prediction models for colorectal cancer risk stratification.
- Liver cancer risk scores for cirrhosis-based surveillance.
- Polygenic risk scores increasingly used for multi-gene cancer susceptibility mapping
- Best-case scenario: integration of these tools into electronic health records for automated screening triggers and personalized surveillance schedules.
- Gap areas: lung, pancreatic, and ovarian cancers where current tools lack precision and early predictive ability.
- Need for development of AI-driven, multi-omics integrated models combining genomics, imaging, lifestyle, and environmental exposure data.

3. Public awareness and advocacy measures

- National cancer screening programs promoting breast, cervical, and colorectal cancer early detection.
- Community health worker outreach programs identifying high-risk individuals at the primary care level.
- Mass media and social media campaigns increasing awareness of genetic and lifestyle cancer risks.
- Advocacy groups and cancer survivor networks supporting education and stigma reduction.
- Policy-level interventions ensuring insurance coverage for screening and genetic counseling.
- Establishment of national cancer registries to guide targeted screening strategies and resource allocation.

Full Name:

Jarfin I M

Name of the Institution:

Gleneagles Health City, Chennai

State:

Tamil Nadu

Objective of your solution: (Briefly define the primary outcome of your solution to this challenge):

To build scientifically sound and socially acceptable screening systems that identify cancers early in high-risk individuals while avoiding unnecessary fear, over testing and financial burden.

Describe your solution / proposal: Provide a detailed account of your solution/ proposal to this challenge. You could type your solution/ proposal here. (Disclaimer: Solution/proposal should not exceed more than 300 words.):

The first step is defining "high risk" clearly. In oncology, this includes strong family history, hereditary syndromes, tobacco and alcohol exposure, HPV/HBV infection, occupational carcinogen exposure, obesity, prior radiation, premalignant conditions and immunosuppression. Screening should never become a blanket exercise; it must remain targeted and evidence-driven.

For India and Tamil Nadu, the highest-impact models are practical ones: oral cancer screening in tobacco users, cervical screening with HPV-based methods, breast risk assessment in women with family history, and lung cancer screening only in carefully selected heavy smokers where infrastructure exists. Existing tools like Gail, Tyrer-Cuzick, BOADICEA and Lynch syndrome criteria can guide risk prediction, but Indian datasets are still underrepresented. We need region-specific risk calculators incorporating diet, tobacco habits, reproductive patterns and socioeconomic factors.

Public awareness must move away from fear-based messaging. Community health workers, women's self-help groups, schools, primary health centres and survivor-led campaigns can normalize screening. Government programs should integrate screening into routine NCD clinics rather than isolate cancer as a "death sentence". Mobile screening units and tele-oncology networks can help rural populations. Roche can support ethically through HPV awareness programs, affordable diagnostics, training modules and registry development.

The true success of screening is not detecting the most cancers—it is preventing late-stage diagnosis and suffering while preserving trust, dignity and access for ordinary people.

Full Name:

Dr. Chilamkurty Maitreyi

Name of the Institution:

Stanley Medical College

State:

Tamil Nadu

Objective of your solution: (Briefly define the primary outcome of your solution to this challenge):

Problem statement: cancer screening often follows a one size fits all approach, while the people at highest risk remain invisible until advanced disease. Family history, genetic predisposition, tobacco exposure, chronic infections and occupational risks are rarely captured systematically at first healthcare contact which results in preventable late-stage cancers, higher treatment costs and avoidable deaths.

Describe your solution / proposal: Provide a detailed account of your solution/ proposal to this challenge. You could type your solution/ proposal here. (Disclaimer: Solution/proposal should not exceed more than 300 words.):

Solution:

Onco Shield- Detect risk. Defend life:

A simple 3 step practical screening model for resource limited settings. Oncology Screening for High Risk Early Interception, Linkage and Detection.

1. Identify (red flag risk check 2 minutes)- At PHC OPD registration, a simple questionnaire identifies high risk individuals. For example High risk populations include family history of breast /colon/ovarian cancer, Tobacco /betel nut use, Chronic HBV/HCV, Persistent HPV infection, Heavy smoking, ethanol Dependence, Occupational carcinogen exposure.

2. Stratify (Traffic light risk system)- Green-Routine screening, Amber-Enhanced surveillance, Red-Immediate specialist referral/genetic evaluation.

3.ACT (Fast Track Evidence Based Screening)- Direct linkage to the right test: Mammogram/Breast MRI, Colonoscopy, Low dose CT, HPV/DNA screening, oral cavity examination, Ultrasound abdomen, Tumour markers.

- Use Validated tools (Tyrer cuzick, Gail, PREMM5, PLCOm2012).
- Develop India specific oral /GI risk tools where gap exists.
- Auto referral pathways for genetics, imaging, endoscopy, HPV Screening.
- Community awareness via ASHA workers, survivor advocacy, school and workplace campaigns.
- Policy integration into national cancer screening programs.
- pharma/public private partnerships for diagnostics access, education, implementation support.

Case solution: A 52-year-old male ,tobacco chewer visiting Primary health care center(PHC) for cough gets flagged RED through ONCO SHIELD and receives same week oral and lung screening instead of presenting later with advanced disease.

Best case impact-Earlier diagnosis, precision screening, reduced advanced cancer burden, lowers system costs. More lives saved.

Full Name:

Anirudh

Name of the Institution:

SAIMS

State:

Madhya Pradesh

Objective of your solution: (Briefly define the primary outcome of your solution to this challenge):

primary outcome - Early detection, reduced tumor burden, identification of high-risk individuals, ensuring cost effectiveness of resources, reduction in cancer mortality, improving awareness, ensuring precision in therapy pathway and care delivery helping policy makers in evaluation of population and current trends.

Describe your solution / proposal: Provide a detailed account of your solution/ proposal to this challenge. You could type your solution/ proposal here. (Disclaimer: Solution/proposal should not exceed more than 300 words.):

Considering how cancer burden is on the rise, a screening programme that is cost effective, practical, provides earlier diagnosis and detection, ensuring compliance with current diagnostic pathway, engaging the various stakeholders and keeping the best interests in mind while at the same time ensuring delivery of therapy. It involves detection based on gender, area, exposure, infection and hereditary multi gene family screening based on history of early malignancies, early death due to malignancies, prevalent of certain malignancies in family (Breast, ovary, prostate, colorectal, germ cell tumor of testes & Retinoblastoma / Wilms tumour, sarcoma), clustering, involved generations. A tier-based system based on the available health care resources. The ease of carrying out screening, like VIA for cervical cancer, mammosonography annually for women post 40 yrs, ultrasound, CT scans. To summarise - programmes based on gender, genetics, Exposure (including occupation), previous therapy, family history, infection, hereditary, area and geographic tendencies. A screening test relies on accessibility, awareness, cost effectiveness, False negative and true positive rates, sensitivity and specificity, modality of carrying out the screening, side effects of screening if any (lead and lag raises), limitations of carrying out screening. Finally, collecting data, identifying high risk individuals, using it for public awareness and flawless / seamless care pathway overall to sustain the practice of preventive oncology.

Full Name:

Mohamed Farook M

Name of the Institution:

Madurai Medical College

State:

Tamil Nadu

Objective of your solution: (Briefly define the primary outcome of your solution to this challenge):

Implement mandatory HPV vaccination programs for both boys and girls, coupled with at least one age-appropriate basic screening procedure during vaccination visits to introduce the concept of preventive screening at an early stage.

Describe your solution / proposal: Provide a detailed account of your solution/ proposal to this challenge. You could type your solution/ proposal here. (Disclaimer: Solution/proposal should not exceed more than 300 words.):

Problem statement - Most healthy individuals rarely undergo routine screening because they typically do not visit hospitals unless prompted by symptoms, illness, or a specific medical need. This lack of proactive engagement leads to missed opportunities for early detection, preventive care, and timely intervention for many chronic and asymptomatic conditions

Creating awareness among the general population about the importance of preventive screening will ultimately help identify and bring high-risk individuals to clinicians at an earlier stage.

Proposed Solution - Implement mandatory HPV vaccination programs for both boys and girls, coupled with at least one age-appropriate basic screening procedure during vaccination visits to introduce the concept of preventive screening at an early stage. For example, females may undergo breast health screening such as mammography when appropriate, while males may undergo basic chest screening based on risk and age criteria. This approach can improve public awareness regarding preventive healthcare, normalize routine screening practices, and facilitate early identification of high-risk individuals.

1. Implement mandatory HPV vaccination programs for both boys and girls through schools, public health centers, and vaccination campaigns.
 2. Integrate one basic age-appropriate preventive screening procedure with the vaccination visit to introduce the concept of routine health screening.
 3. Develop standardized screening guidelines based on age, gender, and risk factors to ensure medical appropriateness and safety.
 4. Use the vaccination encounter as an opportunity to educate individuals and families about preventive healthcare, early disease detection, and the importance of regular screening.
 5. Maintain digital health records linking vaccination and screening data for future follow-up and continuity of care.
 6. Conduct nationwide awareness campaigns to normalize preventive screening as a routine part of healthcare rather than a symptom-driven activity.
 7. Monitor participation, screening outcomes, and public acceptance to refine and expand the program effectively.
-

Full Name:

Livin T

Name of the Institution:

Madurai Medical College, Kanyakumari

State:

Tamil Nadu

Objective of your solution: (Briefly define the primary outcome of your solution to this challenge):

A best-case scenario today is plugging patient data into established models right in the clinic.

Describe your solution / proposal: Provide a detailed account of your solution/ proposal to this challenge. You could type your solution/ proposal here. (Disclaimer: Solution/proposal should not exceed more than 300 words.):

Figuring out exactly who belongs in a high-risk oncology cohort isn't just about throwing a wide net. It requires rigid clinical criteria. We usually look for proven genetic mutations, like BRCA or Lynch syndrome. Sometimes a dense family history of early-onset malignancies is enough to flag someone. And obviously, prolonged exposure to severe carcinogens like chronic heavy smoking or specific industrial chemicals plays a massive role in triaging patients.

But identifying these individuals is only the first hurdle. Making sense of their actual probability requires solid risk assessment tools. The best-case scenario today is plugging patient data into established models right in the clinic. The Gail model works reasonably well for predicting baseline breast cancer probability. The PLCom2012 model helps sort out lung nodules. These calculators are decent for well-studied demographics. And yet, we desperately need to build newer, localized genomic models. The clinical calculators we rely on right now frequently fall apart when you apply them to non-Western populations or rarer malignancies. They just lack the statistical specificity needed for localized genetic pools.

Getting people to actually show up for screening means the community has to truly grasp the stakes. Public awareness campaigns need to evolve beyond generic health camps. Targeted advocacy has to demystify complex genetic testing for average families, so they don't fear the results. But community outreach is essentially useless without hard policy backing. We have to push policymakers to mandate insurance coverage for high-risk prophylactic procedures. Because knowing your elevated risk score doesn't help at all if you can't afford the subsequent surveillance MRI. Lobbying for dedicated healthcare funding at the state level is what actually makes these intensive screening programs viable in the long run.

Full Name:

R Neelakandan

Name of the Institution:

Madurai Medical College, Kanyakumari

State:

Tamil Nadu

Objective of your solution: (Briefly define the primary outcome of your solution to this challenge):

To improve early detection of cancer by implementing evidence based screening programs among high risk population, thereby increasing the diagnosis of cancers at earlier and more treatable stages.

Describe your solution / proposal: Provide a detailed account of your solution/ proposal to this challenge. You could type your solution/ proposal here. (Disclaimer: Solution/proposal should not exceed more than 300 words.):

Evidence-based screening in high-risk populations is a critical strategy for reducing cancer-related morbidity and mortality through early detection and timely intervention. Successful implementation requires accurate identification of high-risk individuals, use of validated risk assessment tools, and strong community and policy support.

High-risk populations in oncology include individuals with hereditary cancer syndromes (BRCA1/2 mutations, Lynch syndrome, familial adenomatous polyposis), a strong family history of cancer, chronic infections such as HPV, HBV, and HCV, tobacco users, heavy alcohol consumers, individuals with occupational or environmental carcinogen exposure, immunocompromised patients, and cancer survivors at risk of second primary malignancies. Age, lifestyle factors, obesity, and previous premalignant lesions should also be incorporated into risk stratification models.

Screening programs should utilize validated risk assessment tools whenever available. Examples include the Gail and Tyrer-Cuzick models for breast cancer risk, PLCom2012 for lung cancer risk, and PREMM5 for Lynch syndrome assessment. These tools help identify individuals who would benefit most from enhanced surveillance, thereby improving cost-effectiveness and reducing unnecessary testing. However, many existing models were developed in Western populations and may not accurately reflect regional genetic, environmental, and socioeconomic factors. Therefore, there is a need to develop and validate population-specific risk prediction models using local epidemiological data, genomic information, and emerging artificial intelligence technologies.

Public awareness and advocacy are essential for maximizing screening uptake. Community-based education programs, cancer awareness campaigns, social media outreach, and engagement of primary healthcare workers can improve knowledge and participation. Patient advocacy groups and survivor networks can help address stigma and misconceptions surrounding cancer screening. At the policy level, governments should integrate risk-based screening into national cancer control programs, ensure insurance coverage or subsidized screening services, establish cancer registries, and invest in digital health systems for tracking and follow-up.

By combining precise risk stratification, evidence-based screening tools, community engagement, and supportive health policies, healthcare systems can detect cancers at earlier stages, improve survival outcomes, reduce treatment costs, and ultimately lessen the overall burden of cancer in high-risk populations.

Full Name:

Jagga Sankalp Harish

Name of the Institution:

Kidwai Memorial Institute of Oncology, Bengaluru

State:

Karnataka

Objective of your solution: (Briefly define the primary outcome of your solution to this challenge):

To identify and stratify high-risk populations based on genetic, environmental, occupational, lifestyle, and clinical risk factors for targeted cancer screening.

To promote the use of evidence-based screening tools and risk assessment strategies for early cancer detection and improved clinical outcomes.

To strengthen public awareness, advocacy, and policy support for accessible and effective screening programs in high-risk populations.

Describe your solution / proposal: Provide a detailed account of your solution/ proposal to this challenge. You could type your solution/ proposal here. (Disclaimer: Solution/proposal should not exceed more than 300 words.):

Evidence-based screening in high-risk populations is important for early cancer detection, improved survival, and reduction of cancer-related mortality. High-risk populations include individuals with strong family history, hereditary cancer syndromes, occupational or environmental exposures, tobacco and alcohol use, chronic infections, and premalignant conditions. Examples include BRCA mutation carriers for breast and ovarian cancer, Lynch syndrome for colorectal cancer, heavy smokers for lung cancer, and workers exposed to asbestos or aromatic amines for mesothelioma and bladder cancer, respectively.

Risk stratification should be based on age, duration of exposure, genetic predisposition, lifestyle factors, and comorbidities. Existing evidence-based screening tools should be used whenever available.

Examples include low-dose CT scans for high-risk smokers to detect lung cancer, mammography for hereditary breast cancer risk, colonoscopy for Lynch syndrome, Pap smear and HPV testing for cervical cancer, and PSA-based screening in selected high-risk prostate cancer patients. For occupational cancers where standardized screening is limited, further research is needed to develop cost-effective biomarkers and blood-based risk assessment tools.

Genetic counseling and testing should be offered to patients with suspected hereditary cancer syndromes, followed by family screening and preventive strategies when indicated.

Public awareness and advocacy are essential for successful screening programs. Governments, healthcare institutions, and NGOs should conduct awareness campaigns regarding cancer risk factors and the importance of early detection, similar to anti-tobacco campaigns. Industries employing high-risk workers should implement periodic health check-ups and follow occupational safety guidelines.

Community-level education, insurance support, workplace screening policies, and national cancer screening programs can improve participation and access to early diagnosis. Strong collaboration between policymakers, oncologists, public health experts, and industries is necessary to ensure effective implementation of evidence-based cancer screening in high-risk populations.

Full Name:

Dr. Chirag Gajera

Name of the Institution:

JNMC, Belagavi

State:

Karnataka

Objective of your solution: (Briefly define the primary outcome of your solution to this challenge):

To establish effective, evidence-based cancer screening strategies for high-risk populations by improving risk identification, enabling early diagnosis, increasing public awareness, and ensuring timely access to preventive and therapeutic interventions.

Describe your solution / proposal: Provide a detailed account of your solution/ proposal to this challenge. You could type your solution/ proposal here. (Disclaimer: Solution/proposal should not exceed more than 300 words.):

Implementation of high-risk cancer screening requires accurate identification of individuals who may benefit from enhanced surveillance. High-risk criteria include strong family history of cancer, pathogenic germline mutations (such as BRCA1/BRCA2, Lynch syndrome genes), previous exposure to carcinogens, chronic inflammatory conditions, lifestyle-related risks, and prior premalignant lesions. Risk assessment should be cancer-specific and based on validated clinical, genetic, and epidemiological factors.

Existing tools such as genetic counseling models for hereditary breast and ovarian cancer, colorectal cancer risk calculators, lung cancer risk prediction models, and cervical cancer screening algorithms can guide personalized surveillance. Future development of affordable, population-specific risk prediction models incorporating genetics, lifestyle factors, environmental exposures, and artificial intelligence may improve accuracy, particularly in diverse populations.

Successful implementation requires public awareness campaigns, community education, and advocacy initiatives to promote early detection and reduce cancer-related stigma. Collaboration among healthcare providers, patient advocacy groups, government agencies, and professional oncology organizations can support screening programs and policy development.

Key solutions include integrating risk assessment into primary healthcare, expanding genetic counseling services, improving access to screening facilities, establishing national cancer registries, and ensuring insurance or government support for high-risk screening. These approaches can facilitate early diagnosis, reduce cancer mortality, and create equitable access to preventive oncology care.

Full Name:

Betsy Mathew

Name of the Institution:

Regional cancer center , Thiruvananthapuram

State:

Kerala

Objective of your solution: (Briefly define the primary outcome of your solution to this challenge):

India faces a substantial cancer burden, with an estimated 2.5 million people living with cancer and over 700,000 new cases and more than 550,000 deaths annually. Oral cavity, breast, cervix, lung and colorectal cancers are the most common, and together with sex specific patterns (oral cavity and lung in men, cervix and breast in women) account for nearly half of all cancer deaths, underscoring the potential impact of prevention and early detection. High risk identification begins with comprehensive multigenerational family history, supported by validated clinical criteria and models such as the Gail model for breast cancer and Amsterdam criteria for Lynch syndrome. Individuals with suggestive histories undergo germline multigene panel testing, and cascade testing is recommended to identify at risk relatives. Additional risk stratification uses tools such as Tyrer Cuzick and Claus models and incorporates precancerous lesions, environmental exposures (e.g., prior chest irradiation, tobacco) and chronic inflammatory conditions. Those classified as high risk transition to individualized protocols including earlier and more intensive screening, chemoprevention, and risk reducing surgery, guided largely by NCCN based recommendations for hereditary breast/ovarian cancer, Lynch syndrome, high risk prostate cancer and heavy smoker lung cancer, with emerging integration of AI based mammographic risk assessment.

Cancer screening in India faces significant hurdles, primarily driven by a lack of public awareness, delayed detection (with over 70% of cases diagnosed in advanced stages), deep-seated socio-cultural stigmas, and severe disparities in rural versus urban healthcare infrastructure. As per statistics <2% of the women are screened for cervical and breast cancer in India. The root causes of this disparity when compared to the western population includes- lack of awareness, social stigma, cultural myths, low health literacy, low socioeconomic status, lack of infrastructure and health care professionals and urban-rural disparity. How can we overcome these hurdles.

Describe your solution / proposal: Provide a detailed account of your solution/ proposal to this challenge. You could type your solution/ proposal here. (Disclaimer: Solution/proposal should not exceed more than 300 words.):

1.Public awareness and educational programs -from historical data we know that a simple change in cigarette advertisements led to substantial decrease in smoking and there by lung cancer. Through public campaigns and advertisements, we can make people aware of need for routine screening and need for lifestyle modifications. We can include hospital visits and health education programs in curriculum of senior students, so that they can educate the uneducated elders at home.

2. Screening of common cancer at FWCs and PHCs: We can use volunteers and ASHA workers to screen the high-risk population for cancer screening. We can get data like history of high-risk behaviours like pan chewing, smoking, alcoholism and family history of malignancy and lifestyle diseases-like obesity and Diabetes mellitus. We should dedicate 1 or 2 days per month for clinical examination of the vulnerable group by health care professionals -oral examinations, breast examination, per vaginal examination. If any abnormalities are found during this, we can send them to nodal centers for further examination and screening. Nodal centre should keep data of the subjects and advise further follow ups.

3. Encouraging HPV Vaccination-Public should be educated about the benefits of HPV vaccination. Presently as a government program it is given to children under 15 yrs only. It should be extended to 35 yrs.

4. Government should fund research for development of newer screening modalities like Cf DNA based tests.
5. We should incorporate AI based screening tools apart from the standard risk assessment tools.
6. We should be able to provide genetic counselling and psychosocial support to people who are screened for germ line mutations.
7. Most importantly once we identify high risk population they should be encouraged for lifestyle modifications -smoking cessation, alcohol abstinence, regular exercise and management of obesity.
8. Infrastructure development- Government and public funded infrastructure development for screening is very important. We should include volunteers and NGOs for support.
9. Data monitoring system- collected should be analysed for further follow up and deficits should be identified and corrected for a better future .
10. Health is right of an individual and should be protected and admired with all possible means.