

# Oral Cancer Screening Through Accredited Social Health Activists- A Project Proposal

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## ABSTRACT

Oral cancer (OC) or squamous cell carcinoma of the oral cavity accounts for approximately 3% of all cancers worldwide, with increased incidence in developing countries. Oral cancer is the most common cancer in India and Karnataka amongst men, and the fifth most frequently occurring cancer among women. The use of tobacco is directly associated with approximately 80% of oral cancers especially in older men over 40 years of age. Nearly one third (30%) of Indian population over 15 years consume tobacco in one or the other forms. A recent increase is observed in OC incidence among women and young adults due to consumption of smokeless tobacco. Recent sexual behaviours of young and homosexuals have resulted in the emergence of oropharyngeal cancers due to infection with HPV 16, a sexually transmitted virus. Even though OCs are increasing in India and globally the benefits of introducing oral cancer screening for the whole population in developing countries remains controversial. As it is imperative to address the cultural barriers and societal norms, which limit the acceptability and participation in screening programs Indian Council for Medical Research (ICMR) is supporting community-based screening starting with high-risk groups in 2022 and general community in 2023. The unique challenges posed by the rise in OC morbidity in India, requires horizontal integration of the health systems with new services focused on cancer control.

**Materials & Methods:** This article is based on the situation analysis literature in India and Karnataka, and a project proposal in one of the blocks of a district in Karnataka India. This novel project is planning to empower Accredited Social Health Activists (ASHAs) for household level screening for oral lesions and building referral mechanisms for early diagnosis and treatment oral cancers. Project being in a formative stage any inputs to improve are welcomed.

**Keywords:** Oral Cancer; Leucoplakia; Erythroplakia; Squamous Cell Carcinoma; Public Health Response to Cancer Prevention and Control; Visual Screening; ICMR; Horizontal Integration of the Health Systems

**Abbreviations:** OC: Oral Cancer; ICMR: Indian Council for Medical Research; OPMDs: Oral Potentially Malignant Disorders; RCT: Randomized Controlled Trial; IGIDS: Indira Gandhi Institute of Dental Sciences; PHC: Primary Health Care; ASIR: Age-Standardised Incidence Rate; OSCC: Oral Squamous Cell Carcinoma; SLT: Smokeless Tobacco; ASHAs: Accredited Social Health Activists

## Introduction

Cancer is a non-communicable disease in which cells of any organ of the body grow out of control. The subject of our research is the cancer that occurs in the oral cavity, that includes the lips, the inner

lining of the lips and cheeks called buccal mucosa, teeth, gums, front of the tongue, floor of the mouth below the tongue, and the hard palate (bony roof of the mouth). There is usually a long natural history and most cases of oral cancer arise from pre-cancerous lesions, giving an opportunity to prevent and cure if diagnosed early [1].

## Screening for Oral Cancer

### Visual Screening Involves:

- i) Systematic visual and physical examination of the intraoral mucosa under bright light for signs of oral potentially malignant disorders (OPMDs), as well as early oral cancer.
- ii) Oral visual examination helps to detect Leucoplakia, erythroplakia, palatal changes associated with reverse smoking or beedi smoking and submucous fibrosis all of which are local pre-cancerous lesions.
- iii) Careful inspection and digital palpation of the neck for any enlarged lymph nodes.

### Oral Cancers (OCs) Include:

- i) Pharynx (the back of the mouth and the throat) comprising of three parts namely the nasopharynx, oropharynx, and hypopharynx.
- ii) In the larynx (voice box)
- iii) the lips, a type of skin cancer
- iv) the sinuses (the spaces around the nose on the inside of the skull)
- v) Inside and behind the nose
- vi) the tongue, the gums, and the roof of the mouth
- vii) the Salivary glands [2].

Even though OCs are increasing in India and globally the benefits of introducing oral cancer screening for the whole population in developing countries remains controversial. Only one Indian study that reported a randomized controlled trial (RCT) elucidated that mass screening for high-risk groups could significantly reduce the cancer mortality. Given the current knowledge on its natural history, available tests, and interventions to treat, many organizations do not see the benefits of oral cancer screening. However, Indian Council of Medical Research (ICMR) funding projects across the country.

**What Started as 'Scope:** Self Screening and Care for Oral Cancer Prevention and Eradication, under lead investigator, Professor of Department of Oral & Maxillofacial Pathology and Oral Microbiology, Indira Gandhi Institute of Dental Sciences (IGIDS), just last year (2022) aims at designing and implementing a cost-effective model to prevent oral cancer among high risk population of long-distance heavy vehicle drivers through self-examination of the mouth, tele-reporting, and tele-consultation, an ICMR- aided project of 2 years. The truck drivers, to overcome exhausting, working conditions, that cause lethargy and mental fatigue, resort to excessive chewing of tobacco and /or use of alcohol. Tobacco-related chewing products, like Khaini, Gutkha, Betel quid with tobacco and Zarda and smoking forms of tobacco like bidi, cigarette, and hookah are commonly used. Studies have reported a prevalence of tobacco-related habits from 49.2% to 83% among truck drivers [3]. The public health response to

cancer prevention and control, must address

- i) Emphasis on the critical appraisal of national programs,
- ii) Strengthening primary health care (PHC) systems,
- iii) Enhancing focus on client and community centricity,
- iv) Exploring integrative approaches to cancer management and
- v) Stepping up implementation and multidisciplinary research.

For revitalizing comprehensive PHC, Indian epidemiological capacity and surveillance systems must share information for local planning [4]. This year ICMR is supporting a few visual screening projects in general population. This article is a brief of one of such projects.

## Magnitude of Oral Cancer (OC)

4.2.1. Global Burden: Oral cancer or squamous cell carcinoma of the oral cavity accounts for approximately 3% of all cancers worldwide, with increased incidence in developing countries. In 2019, the total number of cancer deaths globally attributable to all estimated risk factors was 4.45 million (95% UI 4.01–4.94) for both sexes combined, accounting for 44.4% (41.3–48.4) of all cancer deaths. The global incidence of cancers of the lip and oral cavity is estimated to be 377 713 new cases and 177 757 deaths in 2020. Oral cancer is more common in men and in older people, more deadly in men compared to women and it varies strongly by socio-economic circumstances. Oral cancer (OC) poses a threat to human health and imposes a heavy burden on countries. A secondary analysis based on world burden of disease (WBD) data 1990-2019 the burden imposed by OC on Asian nations. The age-standardised incidence rate (ASIR) of OC increased from 1990 to 2019 with an EAPC of 0.32, and the age-standardised death rate of OC remained stable at an EAPC of 0.08. Age-standardised DALYs of OC decreased at an EAPC of -0.16. The proportion of patients older than 70 years increased yearly in terms of incidence, mortality, and DALYs from 1990 to 2019. Of the DALYs, smoking was the main contributor in the Asian regions, and the largest contributor to DALYs in most Asian regions. Other contributors were alcohol use and chewing tobacco. Although the burden of OC was declining in Asia, South Asia remained the region with the highest burden. OC caused the greatest burden in Pakistan, Taiwan China, and India.

Therefore, measures should be taken to reduce the burden of oral cancer in high-risk regions and countries with attributable risk factors Globally. Oral cancer is the sixth most common type of cancer. with India contributing to almost one-third of the total burden and the second country having the highest number of oral cancer cases [6]. In 2023, an estimated 54,540 adults (39,290 men and 15,250 women) in the United States will be diagnosed with an oral or oropharyngeal cancer. Worldwide, an estimated 476,125 people were diagnosed with an oral or oropharyngeal cancer in 2020. More than twice

men as in women are expected to suffer from these two varieties of cancers in USA. White people are slightly more likely to be diagnosed with them than Black people [7]. Together, oral, and oropharyngeal cancers are the eighth most common cancer among men. The average age of diagnosis is 64. These types of cancer can be diagnosed at any age, with about 20% of cases occur in people younger than 55. Most persons will be diagnosed with mouth, throat, or voice box cancer. Paranasal sinus and nasal cavity cancer and salivary gland cancer are much less common [8].

**Indian Scenario:** Oral cancer is the most common cancer in India amongst men (11.28% of all cancers), and the fifth most frequently occurring cancer among women (4.3% of all cancers). The projected burden of cancers among males by the current year (2023) in India is tongue 62,000 and larynx 37,000). Overall mouth cancer the leading cancer site for men in India. When oral cancer is diagnosed early, the 5-year survival rate is above 80%, whereas it's less than 20-30% advanced stage of the disease, unfortunately, the majority are detected in advanced stages. Therefore, the urgency for Oral cancers screening and/or detected early and treated at an early stage [4]. The estimated number of incident cases of cancer in India for the year 2022 is 14,61,427 (crude rate:100.4 per 100,000) based on Indian Cancer Registries. The National Cancer Registry Programme Report

**Table 1.**

Regions	Age Groups															
	0-9		10-19		20-29		30-39		40-49		50-59		60-69		70-75+	
	maxi mum	mini mum	maxi mum	mini mum	maxi mum	mini mum	maxi mum	mini mum	maxi mum	mini mum	maxi mum	mini mum	maxi mum	mini mum	maxi mum	mini mum
North																
Lip	0.1	0	0.1	0	0.1	0	0.3	0	1	0.7	2.1	1.5	5.6	4.4	5.1	0.6
Tongue	0.4	0	0.1	0	1.7	0	7.4	0	14	0	26.8	0	58.4	0	40	7.3
Mouth	0	0	0.2	0	0.4	0	8.2	3.85	15.6	9.5	28.5	17.8	4.1	28.1	39	9.55
South																
Up	0	0	0	0	0	0	0.2	0	1.2	0	-1.2	0	1.1	0	1	0
Tongue	0	0	0.3	0	2.27	0	9.6	0.3	15.3	1.7	22.7	9.4	34.3	15	32.1	16.1
Mouth	0	0	0	0	2	0	8.1	0	20.9	4.2	15.4	10.9	36.5	17.5	52.3	36.5
North East																
Lip	0	0	0	0	0	0	0	0	0	0	2.3	0	0	0	37.1	0
Tongue	0	0	0.2	0	0.4	0	2.2	0	17	0	16.2	0.3	38.2	1.5	16.8	0.9
Mouth	0.5	0	0.5	0	1.6	0	28.6		38.3	0	56.2	0	58.4	0	45.1	0
West																
Up	0	0	0	0	0.4	0	1.3	0	2	0	3.0	0	8.7	0	12.3	0
Tongue	0.5	0	0.5	0	2.9	0	12.7	0	17	0	16.2	0.3	38.2	1.5	16.8	0.9
Mouth	0.5	0	0.5	0	7	0	28.6	0	42.1	0	*56.2	0	58.4	0	45.1	0
Central																
Lip	0	0	0	0	0	0	0.2	0	0.7	0	1	0.7	0.9	0.4	1	0
Tongue	9	9	0	0	3	0.9	9.5	7.8	16.8	16	23.8	22.4	26.5	26.4	30.7	28.3
Mouth	0	0	0	0	4.5	1.8	20.2	10.1	28.6	24.2	47.9	40.9	39.6	38.9	64.8	37.8

2020 reported the cancer incidence from 28 Population-Based Cancer Registries (PBCRs) for the years 2012-2016. This was used as the basis to calculate cancer estimates in India. In India, one in nine people are likely to develop cancer in his/her lifetime. Lung and breast cancers were the leading sites of cancer in males and females, respectively. Among the childhood (0-14 yr.) cancers, lymphoid leukaemia (boys: 29.2% and girls: 24.2%) was the leading site. The incidence of cancer cases is estimated to increase by 12.8 per cent in 2025 as compared to 2020 [2].

In other projections out for the various leading sites as well as for 'all sites' of cancer. In India, in 2011, nearly 1,193,000 new cancer cases were estimated; a higher load among females (603,500) than males (589,800) were reported (Table 1). It is estimated that the total number of new cases in males will increase from 0.589 million in 2011 to 0.934 million by the year 2026. In females the new cases of cancer are expected to increase from 0.603 to 0.935 million. Three topmost occurring cancers are

- i) Those of tobacco related cancers in both sexes,
- ii) Breast and
- iii) Cervical cancers in women account for over 50 to 60 percent of all cancers.

East																
Up	0	0	0	0	0.5	0	0.5	0.5	0.5	0	1.7	0	3	1	1.6	0
Tongue	0	0	0	0	3.4	0	6.2	3.6	8.5	8.1	13.2	10.8	23.9	20.9	22.8	20.2
Mouth	0.8	0	0	0	1	0	4.6	4.1	15.1	11.2	23.8	19.9	26.9	22.9	20.9	18.6
Rural																
Lip	0	0	0	0	0	0	0	0	0	0	0	0	4.4	0		
Tongue	0	0	0	0	0	0	2.0	1.9	7.7	2.1	5.9	0	14.4	3.7	26.1	4.4
Mouth	0	0	0	0	1.5	0	6.0	5.8	7.7	4.2	15.5	11.9	29.9	25.1	17.4	0
All Regions																
Lip	0.1	0	0.1	0	0.4	0	1.3	0	2	0	3.1	0	9.7	0	37.1	0
Tongue	0.5	0	0.50.1	0	3	0	12.7	0	17	0	26.8	0	58.4	0	37.8	0
Mouth	0.5	0	0.5	0	7	0	28.6	0	42.1	0	56.2	0	58.4	0	64.8	0

When adjustments for increasing tobacco habits and increasing trends in many cancers are made, the estimates may further increase. The leading sites in males are lung, oesophagus, larynx, mouth, tongue and in females' breast and cervix uteri [4]. The projected cancer burden in India for 2021 was 26.7 million DALY and expected to increase to 29.8 million in 2025. The highest burden was in the north (2408 DALY per 100,000) and north-eastern (2177 DALY per 100,000) regions of the country and higher among males. More than 40% of the total cancer burden was contributed by the seven leading cancer sites — lung (10.6%), breast (10.5%), oesophagus (5.8%), mouth (5.7%), stomach (5.2%), liver (4.6%), and cervix uteri (4.3%) [9].

**Epidemiology of OC In India:** The use of tobacco is directly associated with approximately 80% of oral cancers especially in older men over 40 years of age. Nearly one third (30%) of Indian population over 15 years consume tobacco in one or the other forms. A recent increase is observed in OC incidence among women and young adults due to consuming smokeless tobacco. Recent changes in sexual behaviours of young and homosexuals have resulted in the emergence of oral and oropharyngeal due to infection with human papilloma virus, 16, (HPV 16), a sexually transmitted virus. In India Cancers of the head and neck region accounted for nearly one-third (31.2%) of the cancers among males. Oral squamous cell carcinoma (OSCC) dominates all the oral cancer cases with potentially malignant disorders, which is also recognized as a detectable pre-clinical phase of oral cancer. Tobacco consumption including smokeless tobacco, betel-quid chewing, excessive alcohol consumption, unhygienic oral condition, and sustained viral infections that include the human papillomavirus are some of the risk aspects for the incidence of oral cancer. Smokeless tobacco (SLT) products like Madhu Chhap, Hans Chhap, and Miraj and Gutkha brands of Khaleej and Rebel explicitly sold in the Indian tobacco market. The brands of vimal, hira, rajnigandha, and RMD are Pan masala products.

The health warning labels are present on the packets of most of the SLT products in the form of 'Tobacco kills/Tobacco causes mouth

cancer/ Chewing of tobacco is injurious to health/Chewing of Pan masala may be injurious to health'. SLT users who dip or chew 8–10 times a day ingest an amount of nicotine that a cigarette smoker who smokes 30–40 cigarettes per day. The consumption of smokeless tobacco is higher due to the greater social acceptance, curiosity, and culture. About 35–40% of tobacco consumption in India is in smokeless tobacco forms, most of which is *Nicotiana rustica*, while most smoking tobacco is *Nicotiana tabacum*. Promotion of SLT use has increased as non-smokers start to use SLT, as an alternative to smoking. Some of them become dual users of tobacco and SLT whose number is increasing annually [10].

### In Karnataka

In a study, 1227 cancer patient's records reviewed at the tertiary care hospital about 10% were oral cancers mouth (5.5%), and tongue (5.2%), though Lung (10.5%) was leading site of cancer among males followed by oesophagus (10%).

### Presenting Symptoms

The most common cancer seen in the oral cavity is squamous cell carcinoma. It presents as a painless discoloured patch or ulcer, or mass or fissure. As the disease advances, patient may have excessive salivation, trismus, and difficulty in chewing, swallowing or cervical lymphadenopathy. Mouth ulcers that persist for more than three weeks or a persistent pain in the mouth or a lump or thickening in the cheek are the key symptoms. Other symptoms include a white or red patch on the gums, tongue, tonsil, or lining of the mouth, a sore throat, or a feeling that something is stuck in the throat, difficulty in chewing or swallowing, in moving the jaw or tongue must alert. Difficulty in tolerating spicy foods, bleeding or numbness of the tongue or other area of the mouth, swelling of the jaw that causes dentures to fit poorly or become uncomfortable, loosening of the teeth or pain around the teeth or jaw, changes in voice or having speech problems, a lump or mass in the neck, weight loss, constant bad breath, excessive salivation, repeated biting of cheeks because of sharp teeth are other indications to suspect OC [11].

## Screening for Oral Cancer

### Visual Screening Involves:

1. Systematic visual and physical examination of the intraoral mucosa under bright light for signs of oral potentially malignant disorders (OPMDs), as well as early oral cancer (Figure 1).
2. Oral visual examination helps to detect different typed of oral lesions. Leucoplakia, erythroplakia, palatal changes associated with reverse smoking or beedi smoking and submucous fibrosis all of which are local pre-cancerous lesions (Figure 2).
3. Careful inspection and digital palpation of the neck for any enlarged lymph nodes.

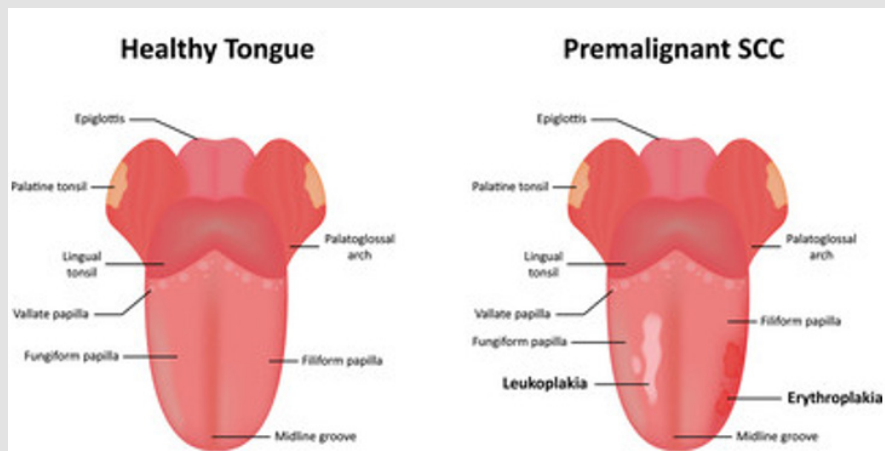


**Figure 1:** Homogeneous Leucoplakia involving dorsum and right lateral border of tongue.



**Figure 2:** Erythroplakia.

**Leucoplakia:** This is defined as a white patch that cannot be characterized as any other disease clinically or pathologically, characterized as any other lesion clinically or pathologically. About 90% of these lesions show cellular dysplasia or malignancy. Any abnormal finding on oral visual examination should be considered as positive and patient should be managed according to screening and management algorithm for oral cancer. Visual examination as part of a population-based screening program reduces the mortality rate of oral cancer in high-risk individuals; in addition, it could result in diagnoses of oral cancer at an earlier stage of disease and improvement in survival rates across the population as a whole population. Oral cancer is predominantly a loco-regional disease that tends to infiltrate adjacent bone and soft tissues and spreads to the regional lymph nodes in the neck. Distant metastasis is uncommon at the time of diagnosis. A thorough inspection and palpation of the oral cavity and examination of the neck is mandatory. CT and MRI imaging are widely used to assess the extent of involvement of adjacent structures, such as bones and soft tissues (Figure 3).



**Figure 3.**



## Brief of Current Project

ICMR funded project titled “effectiveness of training of ASHAs for community screening of Oral Cancers in a Block of Udupi District, Karnataka”. The Professor of Community Medicine Department of a Private Medical College will be the principal investigator, assisted by a research associate a Nursing graduate with MPH from the KSRDPRU, Gadag. The project has been cleared by the institutional ethical board and waiting for the State Research Board’s clearance. Inputs from the readers will add-value to the project.

## Objective

The project aims to empower (train) 100 Accredited Social Health Activists (ASHAs) of a block catering 100,000 population for early identification and screening of Oral and neck cancer. This involves building capacity for:

1. Collating a basic information’s from individuals aged 30 years and above (as one of the study data for the State indicates the oral cancer cases only in 30 years and above age cohorts. in their routine household visits, which include apart from basic identifications like name, age, gender, Cancer risk lifestyles like chewing tobacco in nay form or smoking tobacco and alcohol [12].
2. Systematic visual and physical examination of the intraoral mucosa under bright light for signs of oral potentially malignant disorders (OPMDs), as well as early oral cancer. Oral visual examination helps to detect different typed of oral lesions. Leucoplakia, erythroplakia, palatal changes associated with reverse smoking or beedi smoking and submucous fibrosis all of which are local pre-cancerous lesions.
3. Careful inspection and digital palpation of the neck for any enlarged lymph nodes.

## Project Plan of Action

1. Nearly 100 ASHA’s of the selected block working with the department of Health and Family Welfare will be trained in batches of 20 each (5 training sessions). The training schema would include theory classes, demonstration of Oral symptoms in the Medical College Oncology department over a period of 3 days.
2. Each of the trained ASHA will Screen all adults (30 years plus) as most oral cancer in South India are seen among 30+ years and individuals with history of tobacco/areca nut/ alcohol habits irrespective of age. Identifying any abnormal finding on oral visual examination according to screening and management algorithm for oral cancer. ASHA workers are the link between community and health care system. One ASHA covers 1000 population. She is a female candidate, a resident of the same community and trained for 100 days for health information sharing and community mobilization to

accept the services provided. Being a part of the community access to the families is easy for them to screen for oral lesions at the community level.

3. The workload of screening works out to be around 600 (60%), to start with. Assuming nearly 30% of the population using tobacco, there would be about 200 high risk population. Most oral cancer in South India were seen among 30+ years in south India [13].
4. ASHA is expected to visit minimum of 5 families (15-20 adults of 30 + age) in a day and complete her initial screening in 35-40days.
5. Abnormal findings on oral examination will be first confirmed by research associates at homes and then referred for evaluation.
6. Evaluation will be by the Dentist/surgeon/ENT specialist/ MO at PHC/ CHC/DH.
7. Clinically suspected Malignant lesions must be Referred for appropriate histopathology and management to tertiary care centres.
8. Routine follow up of patients until they seek appropriate cancer treatment and thereafter will be done by the project staff.
9. Treatment will be totally free of cost for the families.

## Diagnosis

A thorough inspection and palpation of the oral cavity and examination of the neck is mandatory. CT and MRI imaging are widely used to assess the extent of involvement of adjacent structures, such as bones and soft tissues.

## Treatment

Surgery and radiotherapy are the main treatment modalities. The expertise, and infrastructure required for staging and treatment with minimal physical, functional, and cosmetic morbidity, is available in the Medical College. Oral cancer treatment will be provided in specialized Oncology department of the Medical College or referred to Kidwai Memorial Cancer hospital Bengaluru a tertiary care Hospital in the Public Sector

## Conclusion

1. Oral cancer is the most common cancer in India and Karnataka amongst men, and the fifth most frequently occurring cancer among women.
2. The use of tobacco is directly associated with approximately 80% of oral cancers especially in older men over 40 years of age. Nearly one third (30%) of Indian population over 15 years consume tobacco in one or the other forms. A recent increased is observed in OC incidence among women and young adults due to consuming smokeless tobacco.

3. Recent sexual behaviours of young and homosexuals have resulted in the emergence of oropharyngeal cancers due to infection with HPV 16, a sexually transmitted virus.
4. Even though OCs are increasing in India and globally the benefits of introducing oral cancer screening for the whole population in developing countries remains controversial.
5. It is imperative to address the cultural barriers and societal norms, which limit the acceptability and participation in screening programs. The unique challenges posed by the rise in OC morbidity in India, requires horizontal integration of the health systems with new services focused on cancer control.
6. ICMR India needs to be complimented for supporting community-based screening projects for Oral cancers.
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