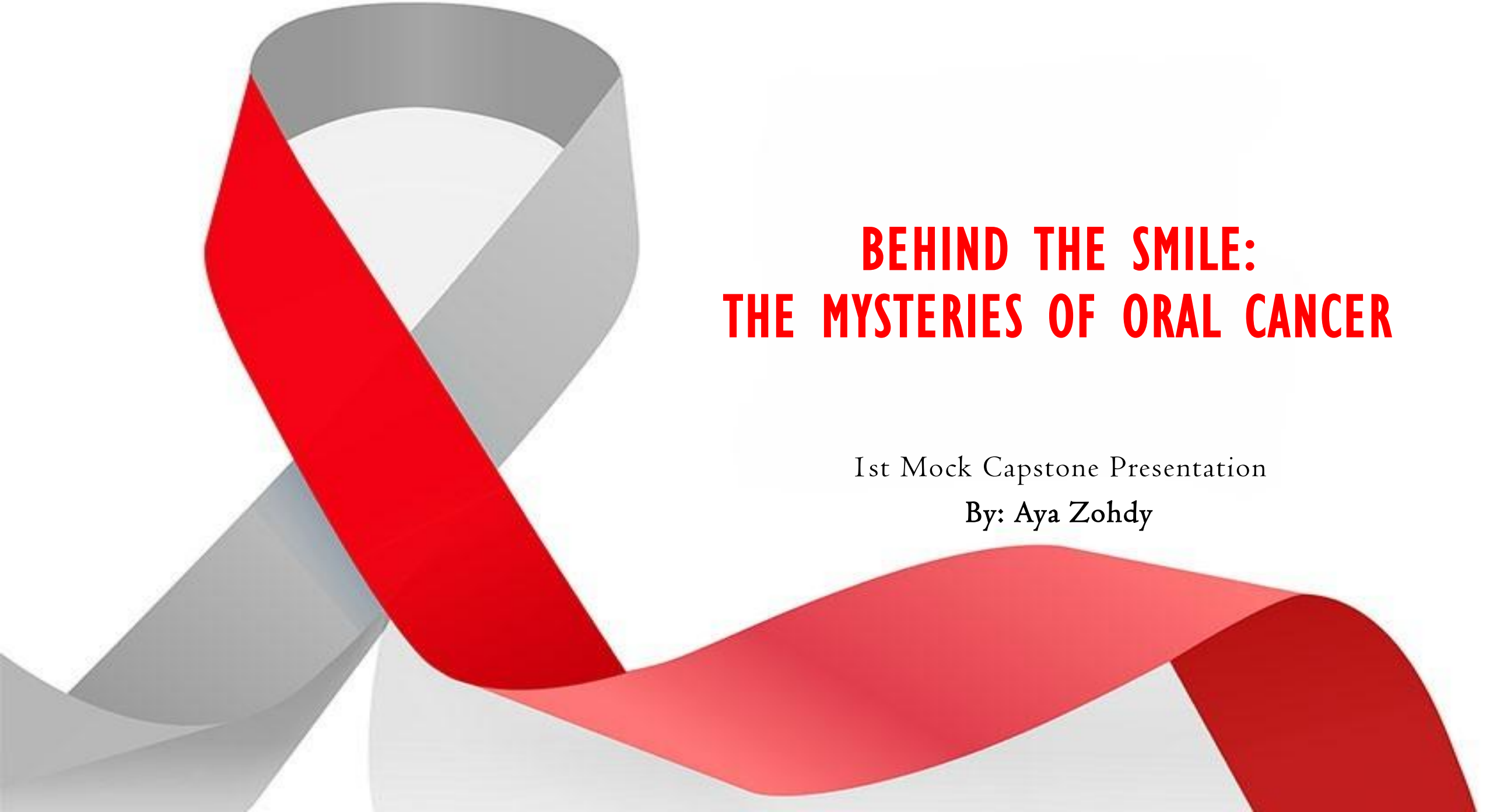
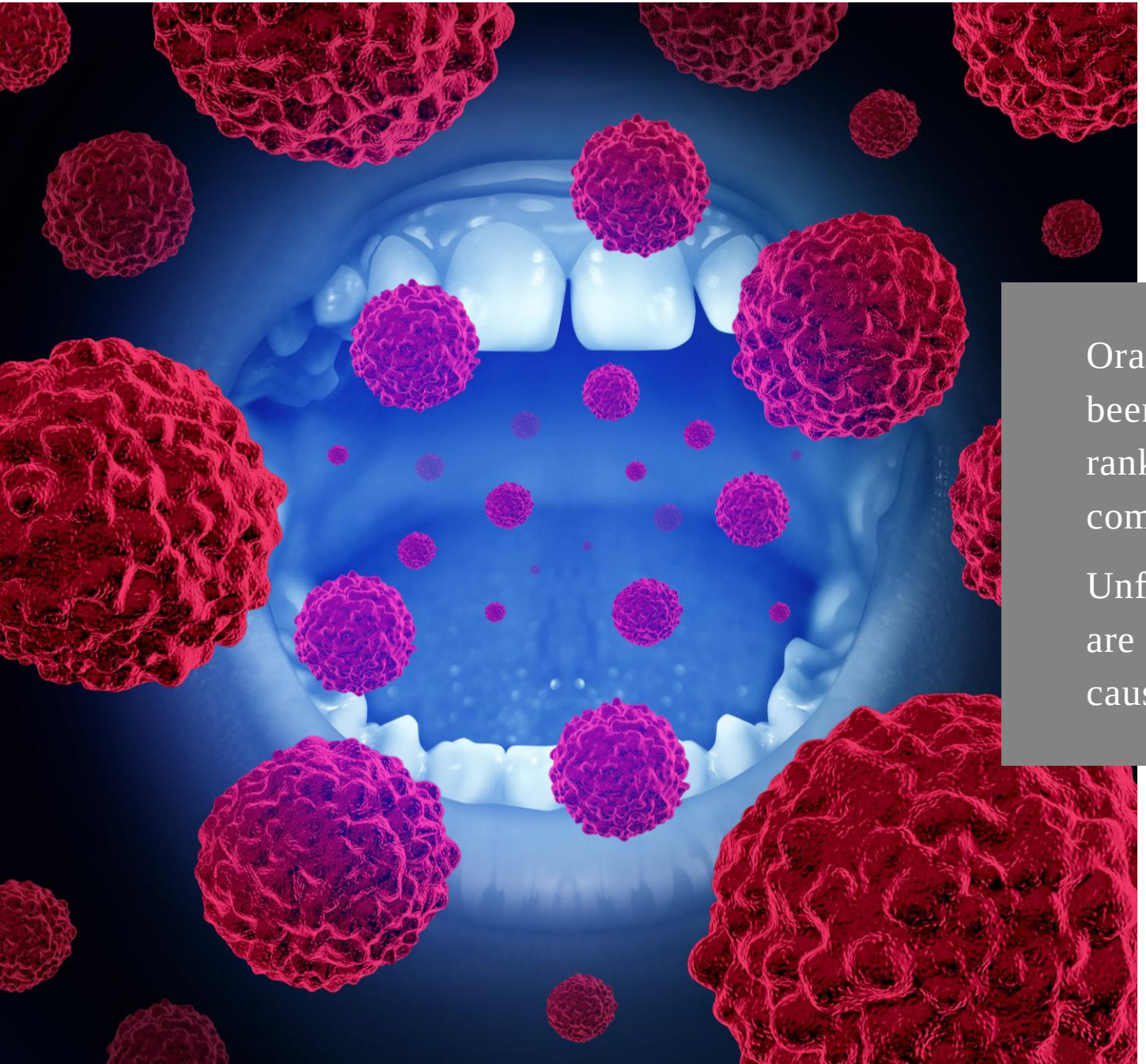


# BEHIND THE SMILE: THE MYSTERIES OF ORAL CANCER

1st Mock Capstone Presentation

By: Aya Zohdy



# STATEMENT OF PROBLEM

Oral cancer is one of the types of cancer that has been increasing among the population recently. Its ranking rose from 16th in 2022 to the 13th most common cancer worldwide in 2025.

Unfortunately, there are still groups of people who are unaware of its symptoms, incidence rate, and causes, etc.

- Oral health
- Mouth and oral cancer statistics | World Cancer Research Fund

# THE AIM

The aim of this project is to analyze oral cancer from different aspects to provide **actionable insights for Dentists and public health awareness campaigns** and **improve screening strategies and the Public Health Strategies and Policies.**

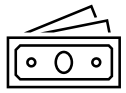
# AUDIENCES

DENTISTS

PUBLIC HEALTH OFFICIALS

RESEARCHERS

ORGANIZERS OF AWARENESS CAMPAIGNS



POLICYMAKERS

# DATA OVERVIEW

The dataset (Oral Cancer Prediction Dataset) is based on real-world oral cancer statistics, aligning with global health reports.

**Patients information**

Country – Age - Gender

**Symptoms**

Oral Lesions - Unexplained Bleeding - Difficulty Swallowing - White or Red Patches in Mouth

**Risk factors**

Tobacco Use - Alcohol Consumption - HPV Infection - Betel Quid Use - Chronic Sun Exposure - Poor Oral Hygiene - Diet (Fruits & Vegetables Intake) - Family History of Cancer - Compromised Immune System

**Diagnosis**

Tumor Size (cm) - Cancer Stage - Early Diagnosis - Oral Cancer (Diagnosis)

**Treatment, survival rate and economic burden**

Treatment Type - Survival Rate (5-Year, %) - Cost of Treatment (USD) - Economic Burden (Lost Workdays per Year)

# EXPLORATORY DATA ANALYSIS (EDA)

80,000 + Patients

17 Countries

15 - 101 Patients age

Both Gender

4 Cancer stages

6 Tumor Size (cm)

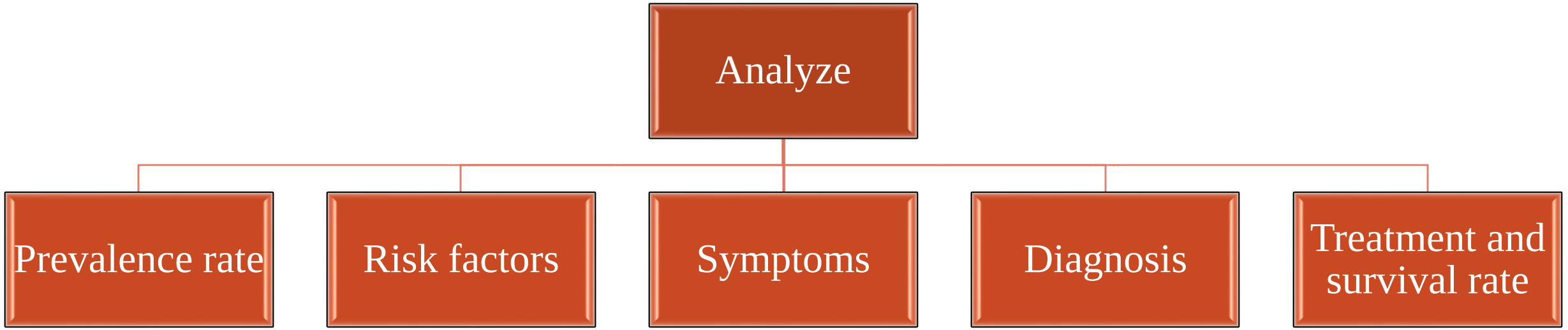
Cancered + non-cancered patients

4 Types of treatment

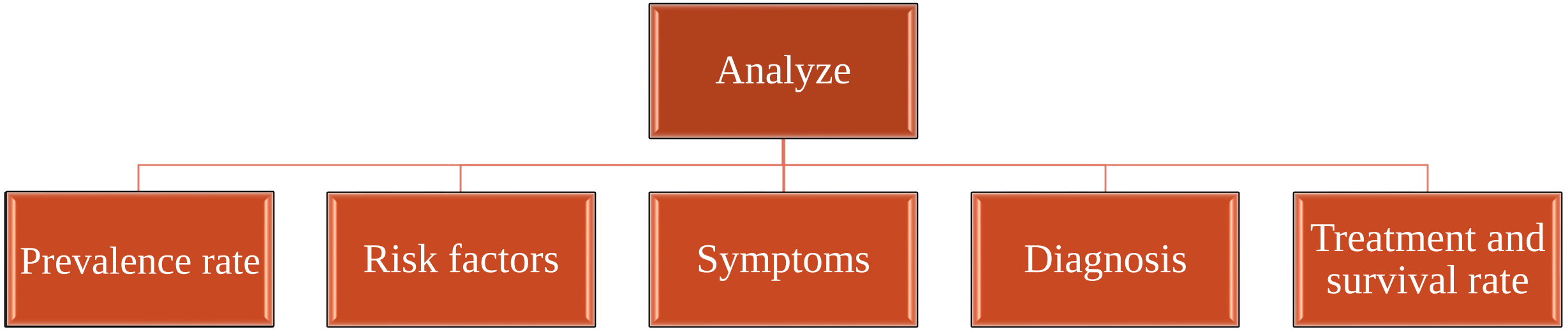
0 missing data

**Data sources:** World Health Organization (WHO) – GLOBOCAN Reports National Cancer Institute (NCI) – Cancer Data Oral Cancer Foundation – Risk Factors & Statistics Academic Research Papers & Studies on Oral Cancer Epidemiology Country-Specific Cancer Registries & Public Health Reports

# APPROACHES


Analyze
Prevalence rate
Risk factors
Symptoms
Diagnosis
Treatment and survival rate

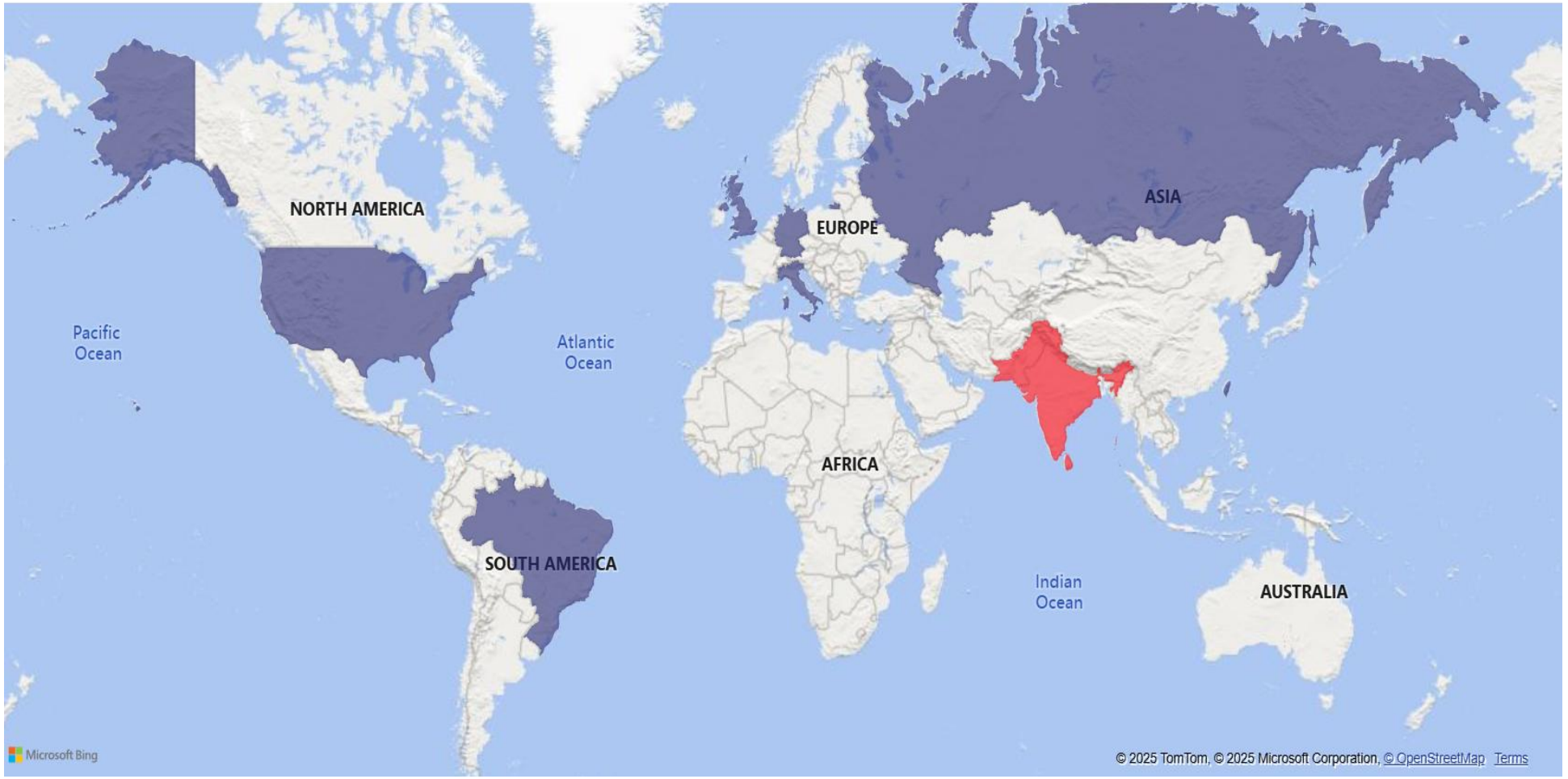
# APPROACHES


Analyze
Prevalence rate
Risk factors
Symptoms
Diagnosis
Treatment and survival rate

# Prevalence rate

Which countries are the most affected by cancer?

For High-risk Populations




## Top 3 Countries

Pakistan

India

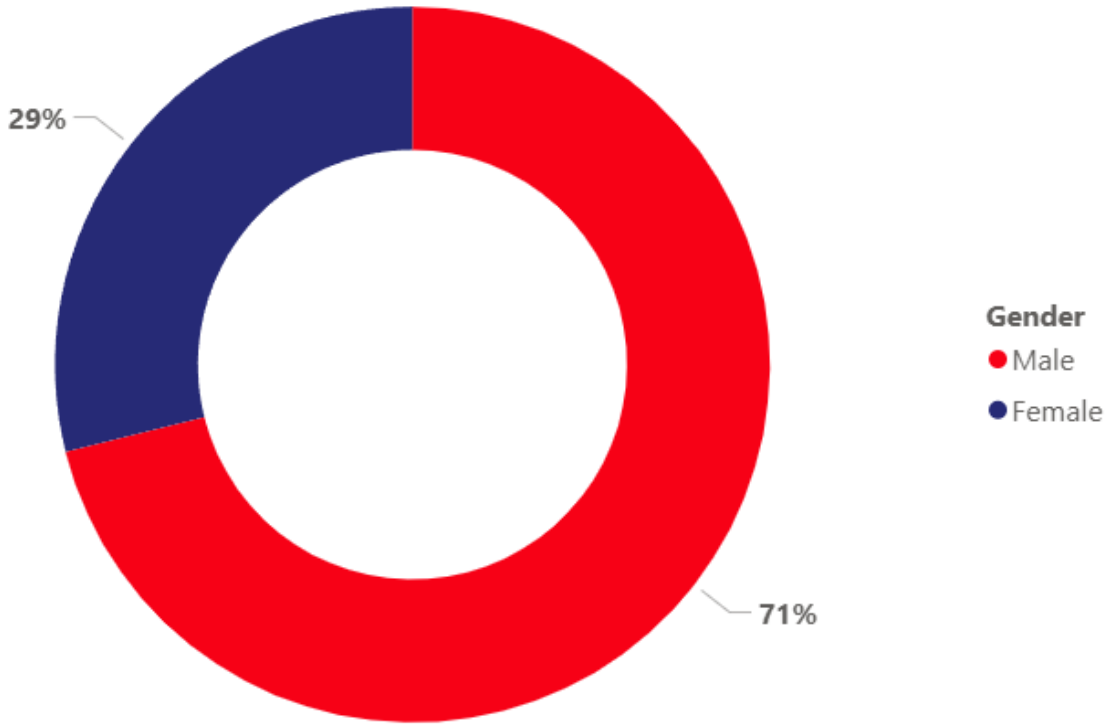
Sri Lanka

# Prevalence rate

Which gender are the most affected by cancer?

For Biological & Behavioral Risk Factors
For Public Health Strategy and Screening Programs

Male > Female

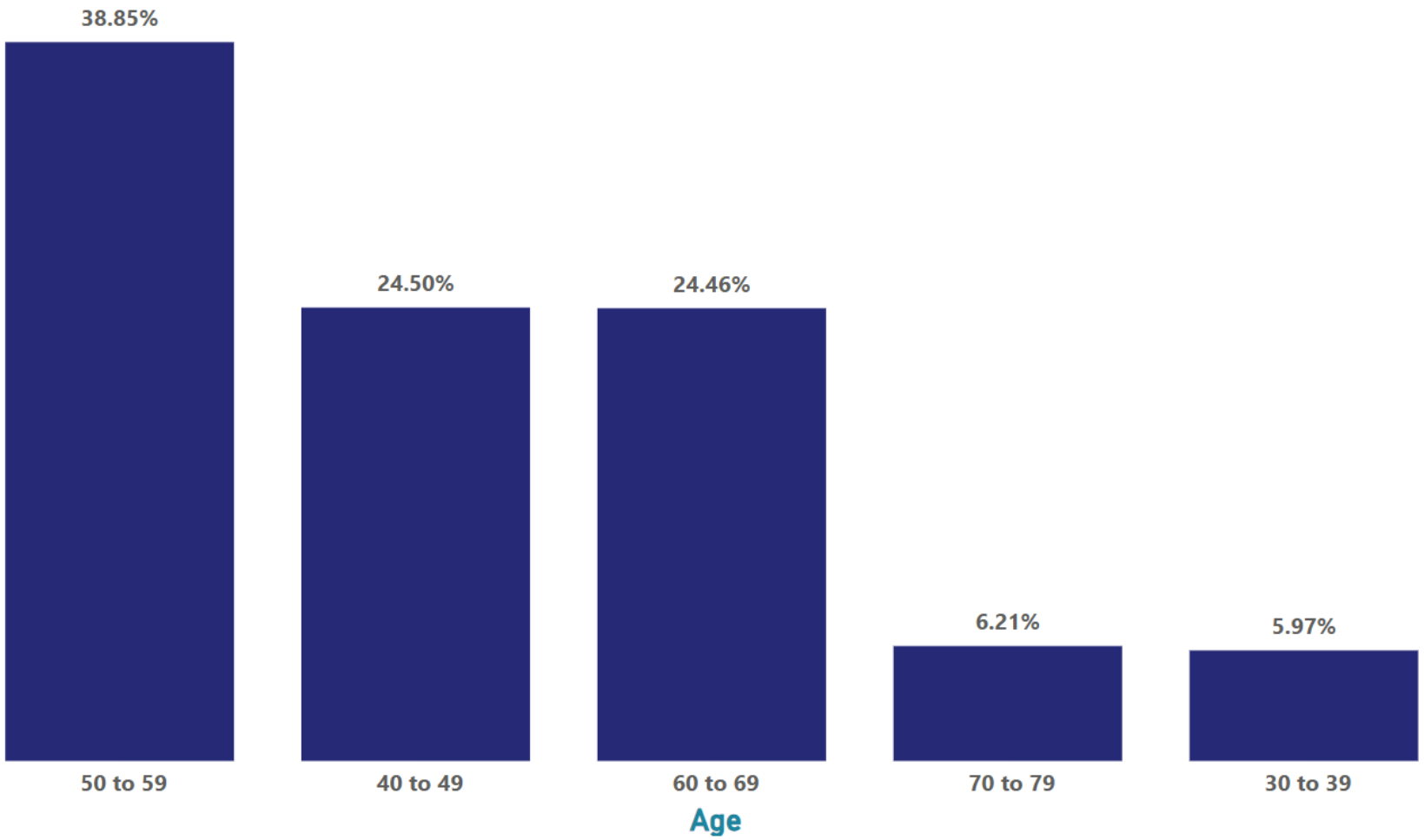


# Prevalence rate

Top 5 most affected ages?

For Biological & Behavioral Risk Factors
For Public Health Strategy and Screening Programs
For Personal Care (Reinforces the behavior of the person)

## Fifties top the list

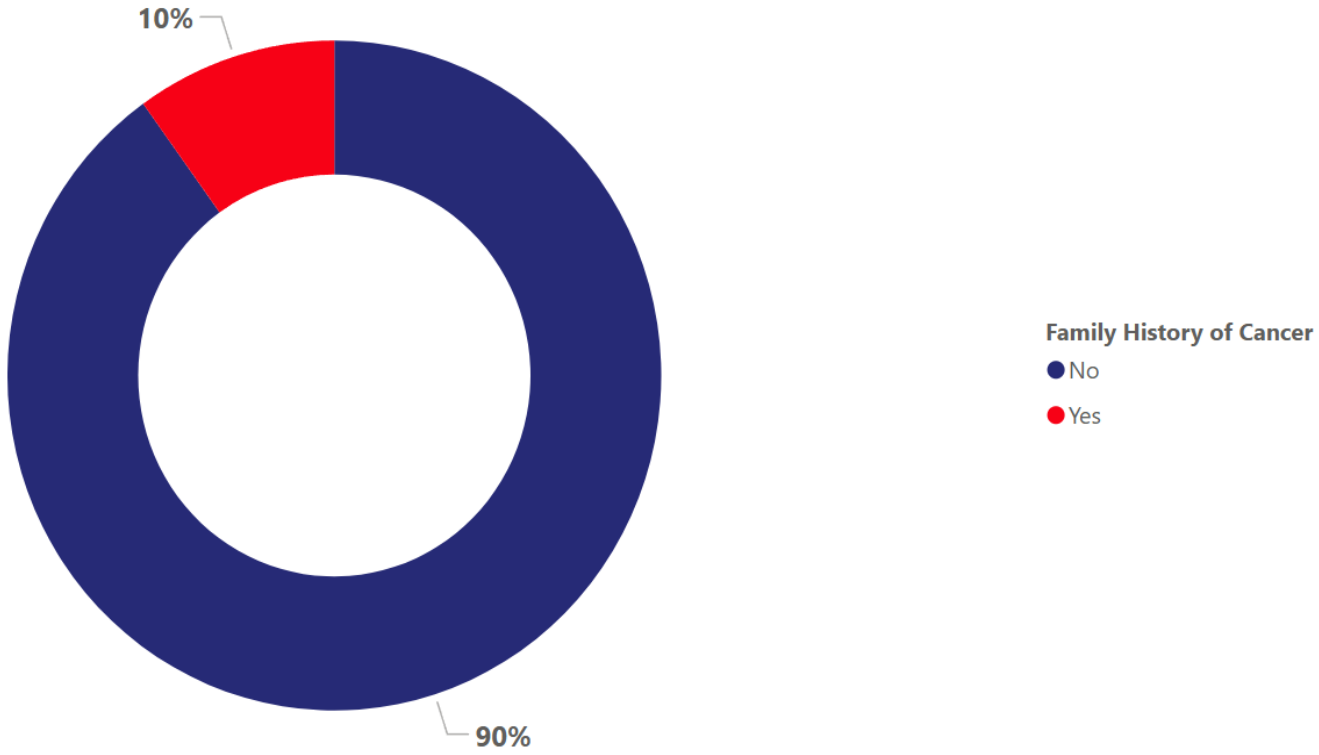


# Prevalence rate

Are the family cancer history increase incidence rate?

For Public Health Strategy and Screening Programs.
For Personal Care (Reinforces the behavior of the person)

10% of family cancer history

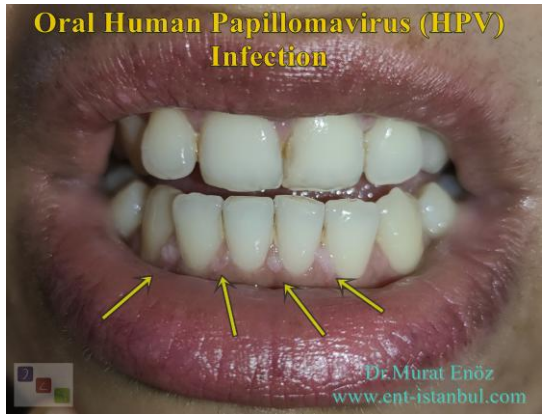


# Risk factors

Is there relation between HPV and oral cancer?

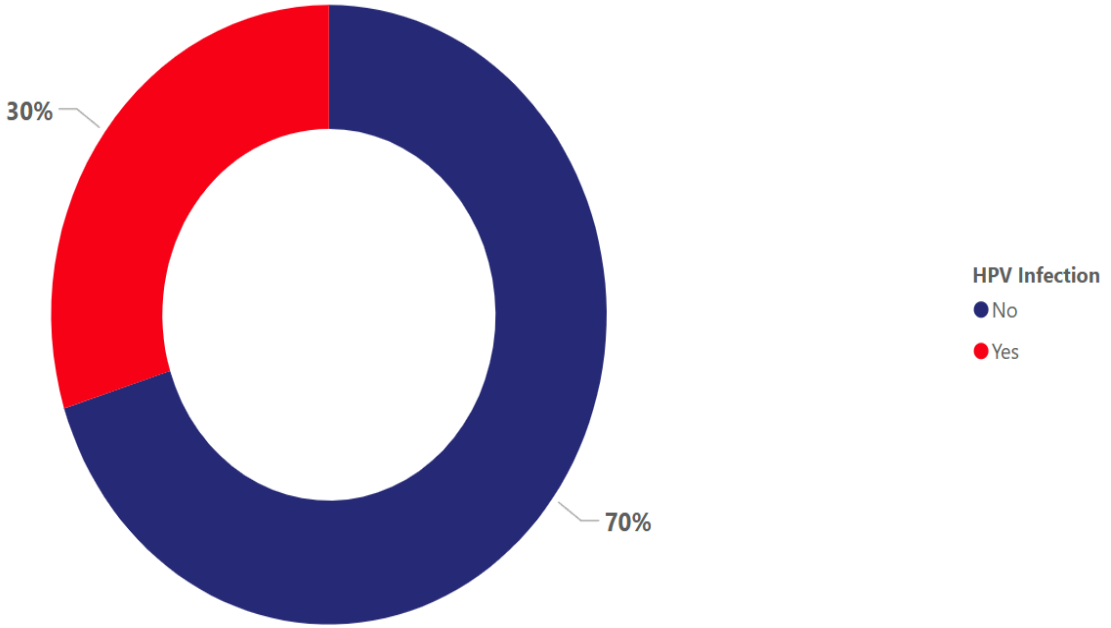
- Confirms that oral cancer is HPV-Driven.
- Prevention and vaccination.

Human papillomavirus (HPV) is a common **sexually transmitted infection.** HPV can affect the skin, genital area, mouth and throat. In some people, this can cause **oral cancer.**



Carcinoma tongue
on lateral border and ventral surface

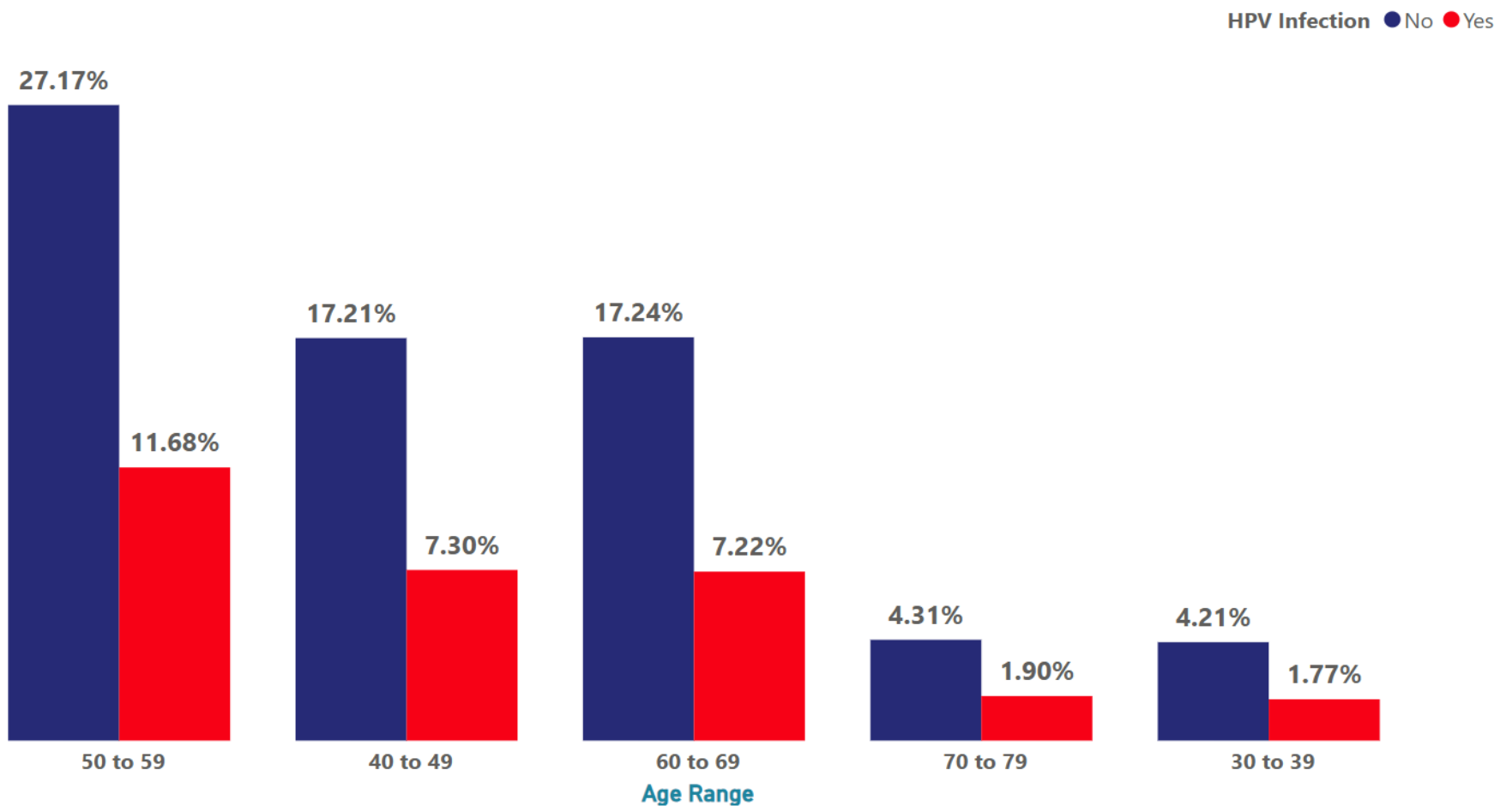
30% HPV Patients




- Human papillomavirus and cancer
- Oral human papillomavirus infection

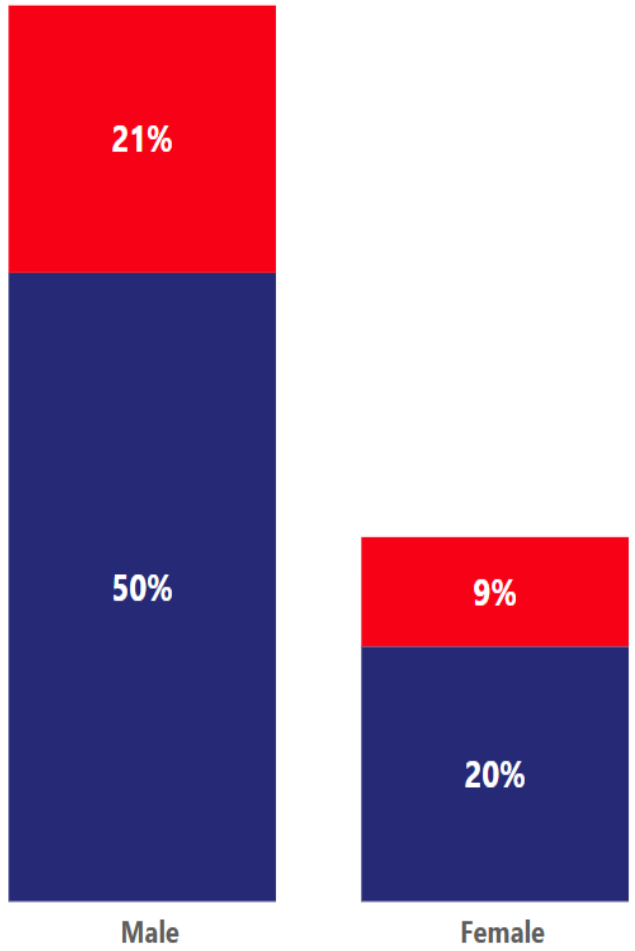
# HPV X Age

12% of HPV-Driven oral cancer patients in fifties

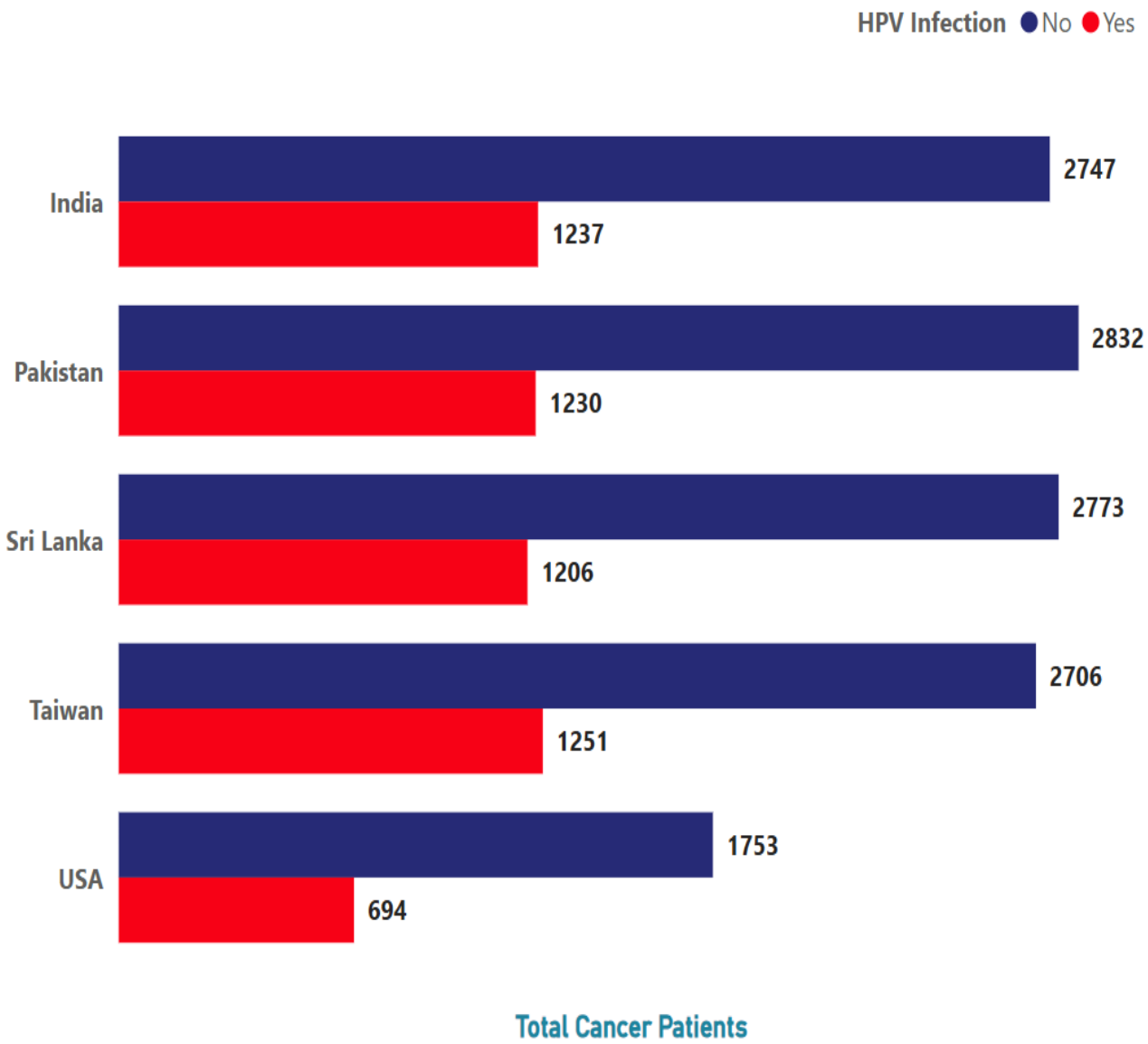


# HPV X Gender

21% of HPV-Driven cancer patients Male



# HPV X Countries



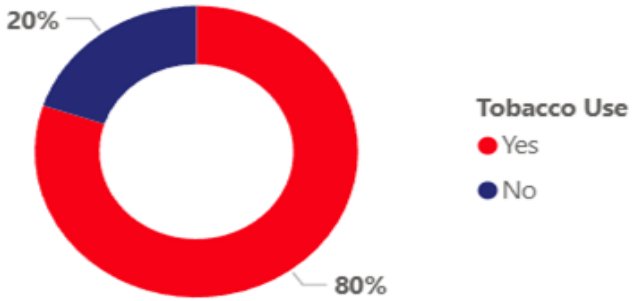

India on the top

# Risk factors

Did the habits and daily routine assume the occurrence of the oral cancer?

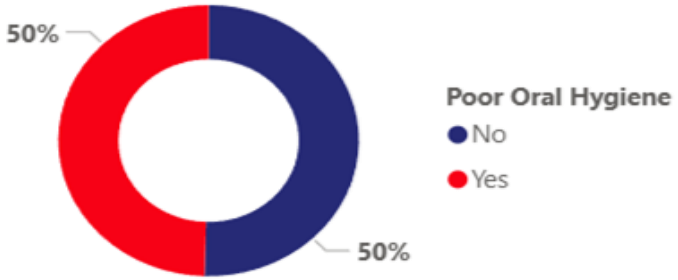
Rank the most dangerous habits
Regional and cultural risk patterns
For Public Health Strategy and Screening Programs

## Smoking X OC

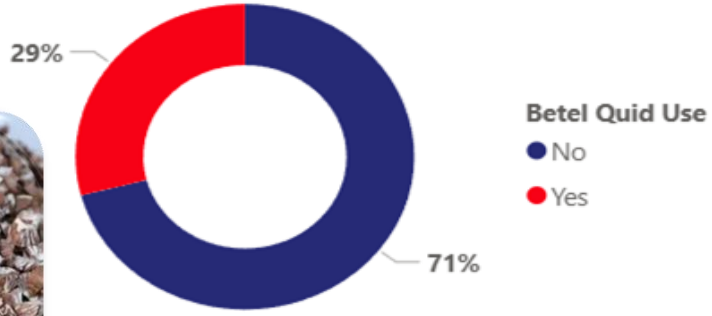



## Alcohol Consumption X OC

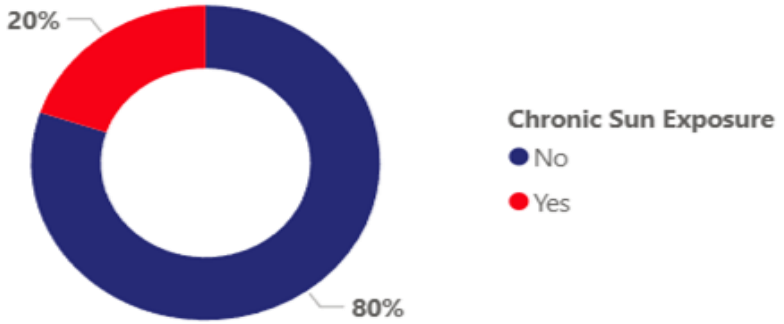
## Poor Oral Hygiene X OC




## Betel nut chewing X OC

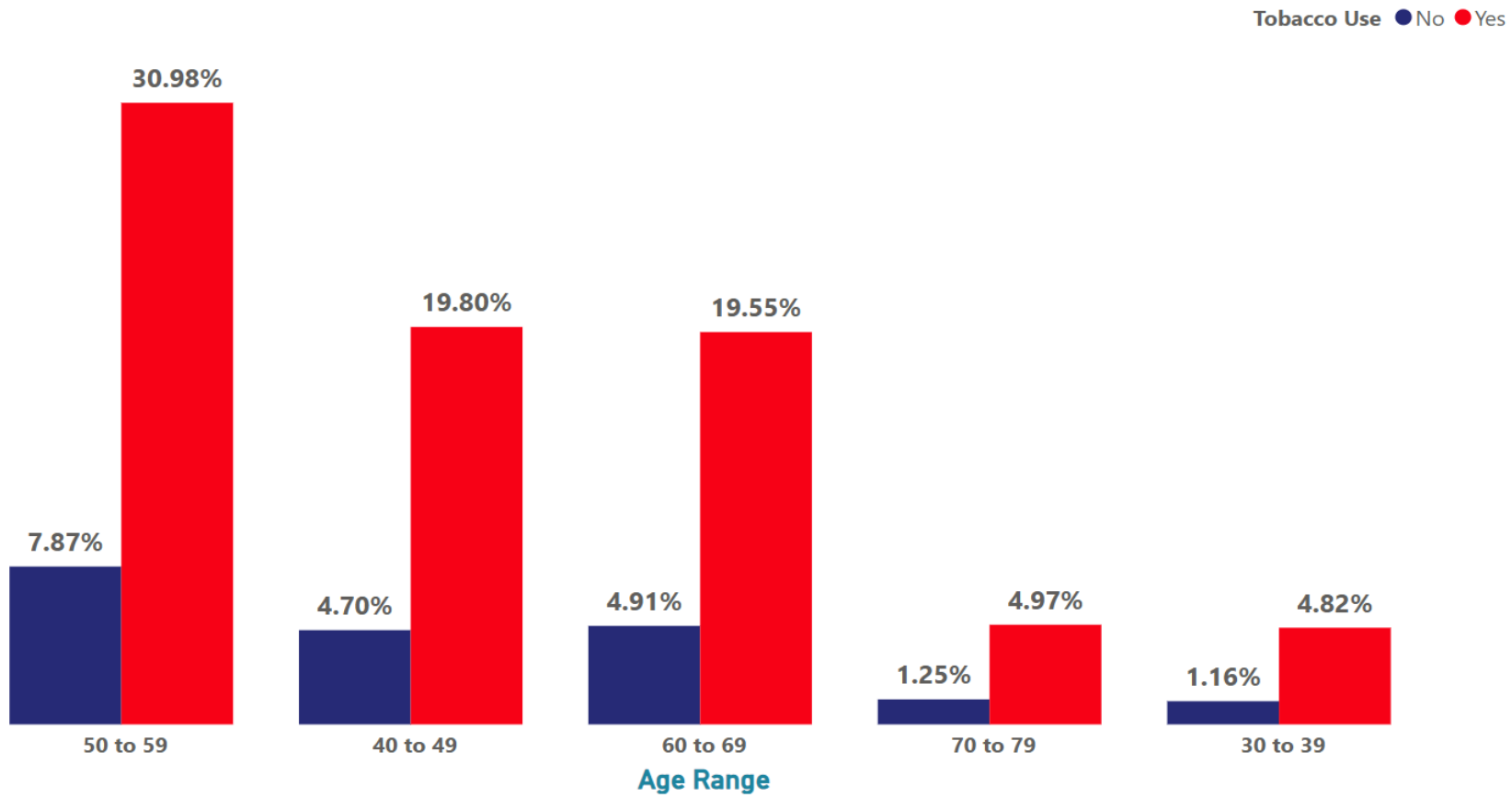


## Chronic Sun Exposure X OC



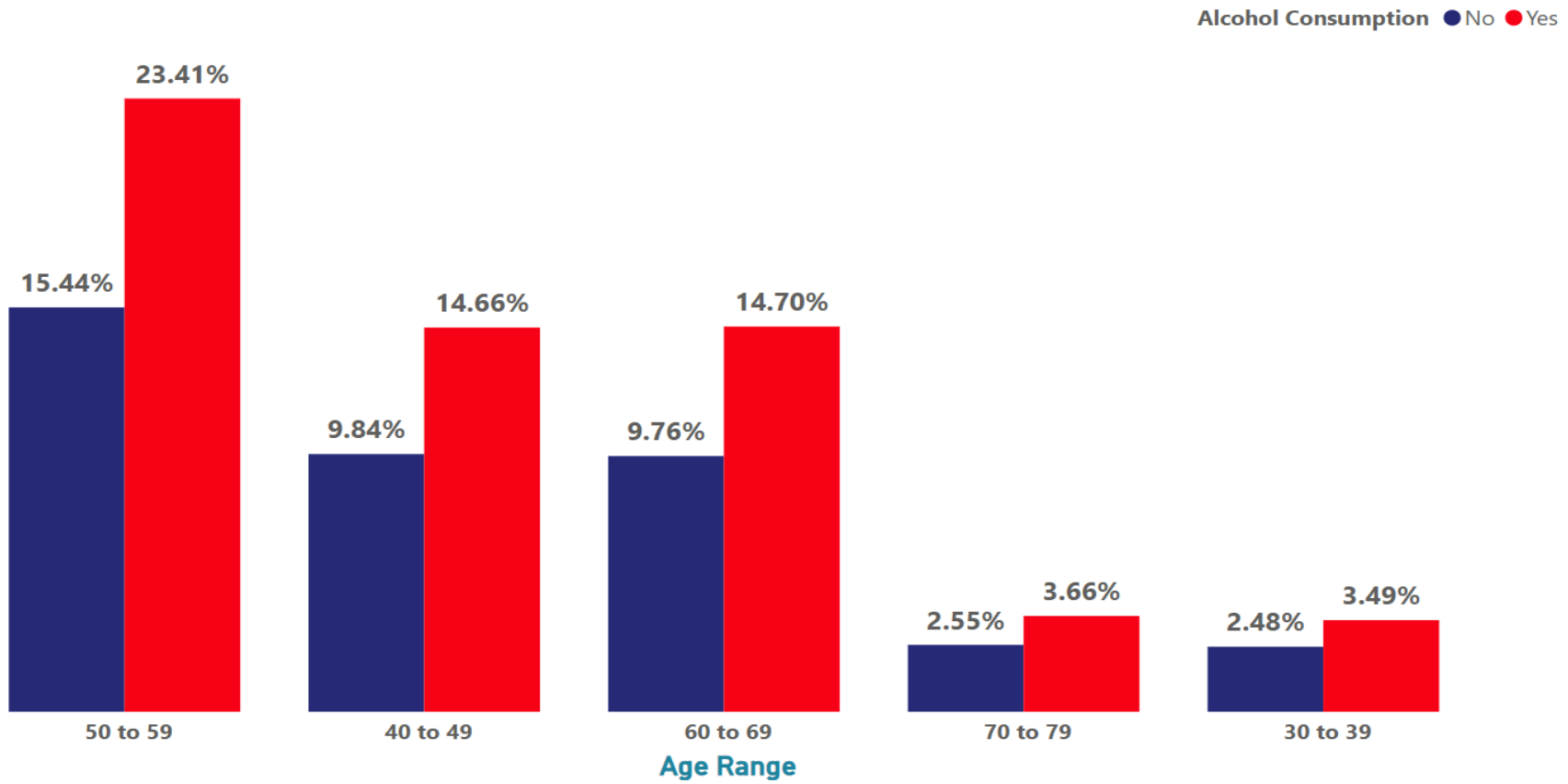
# A. Smoking

31% of Oral Cancer patients are Smoker over the age of fifty



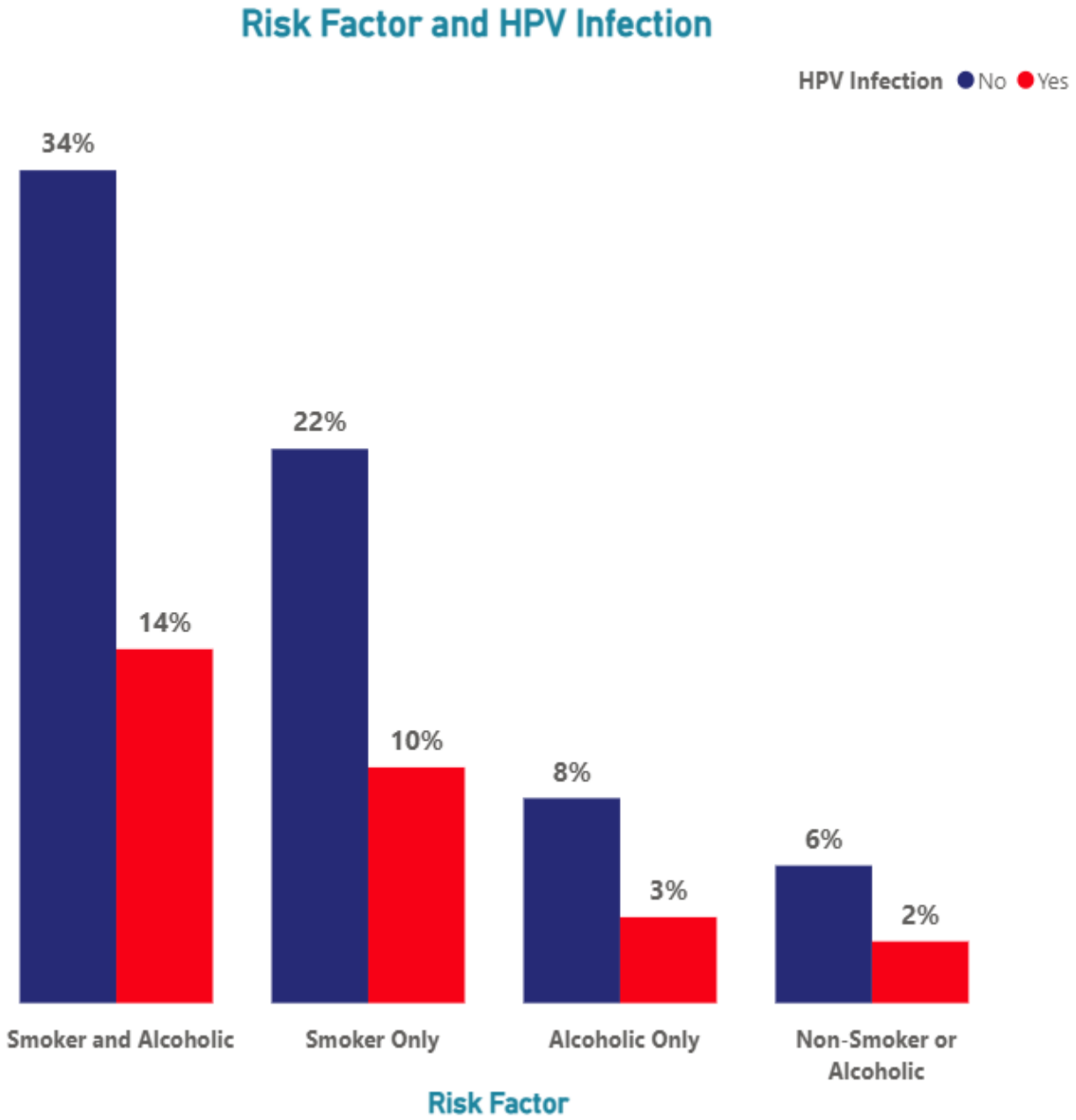
# B. Alcoholism

23% of Oral Cancer patients are Alcoholic over the age of fifty



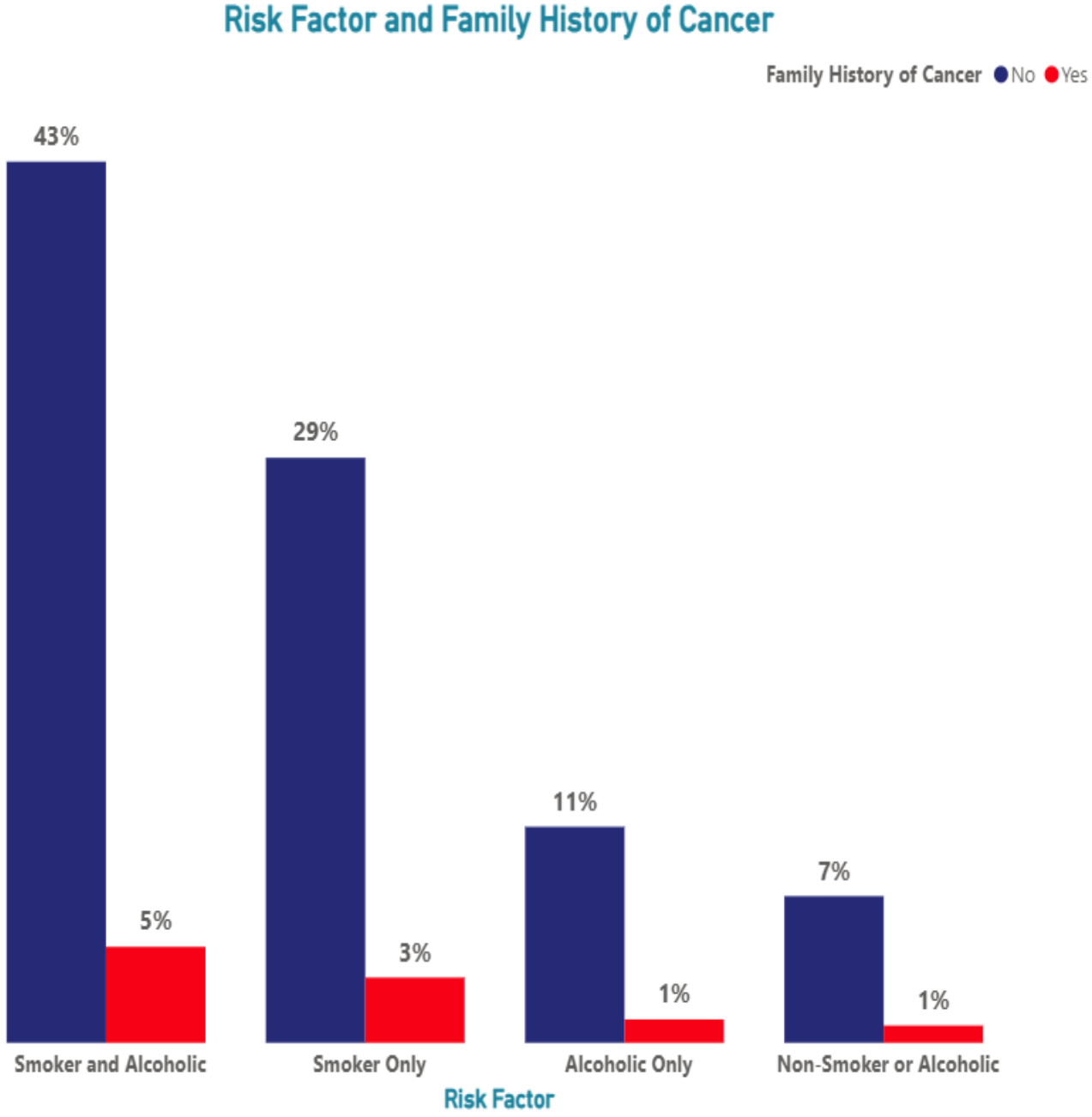
# C. Combined Risk

14% Oral Cancer in HPV + Smoker + Alcoholic Patients



# C. Combined Risk

5% Oral Cancer in Cancer History + Smoker + Alcoholic Patients



Smoking

Alcoholism

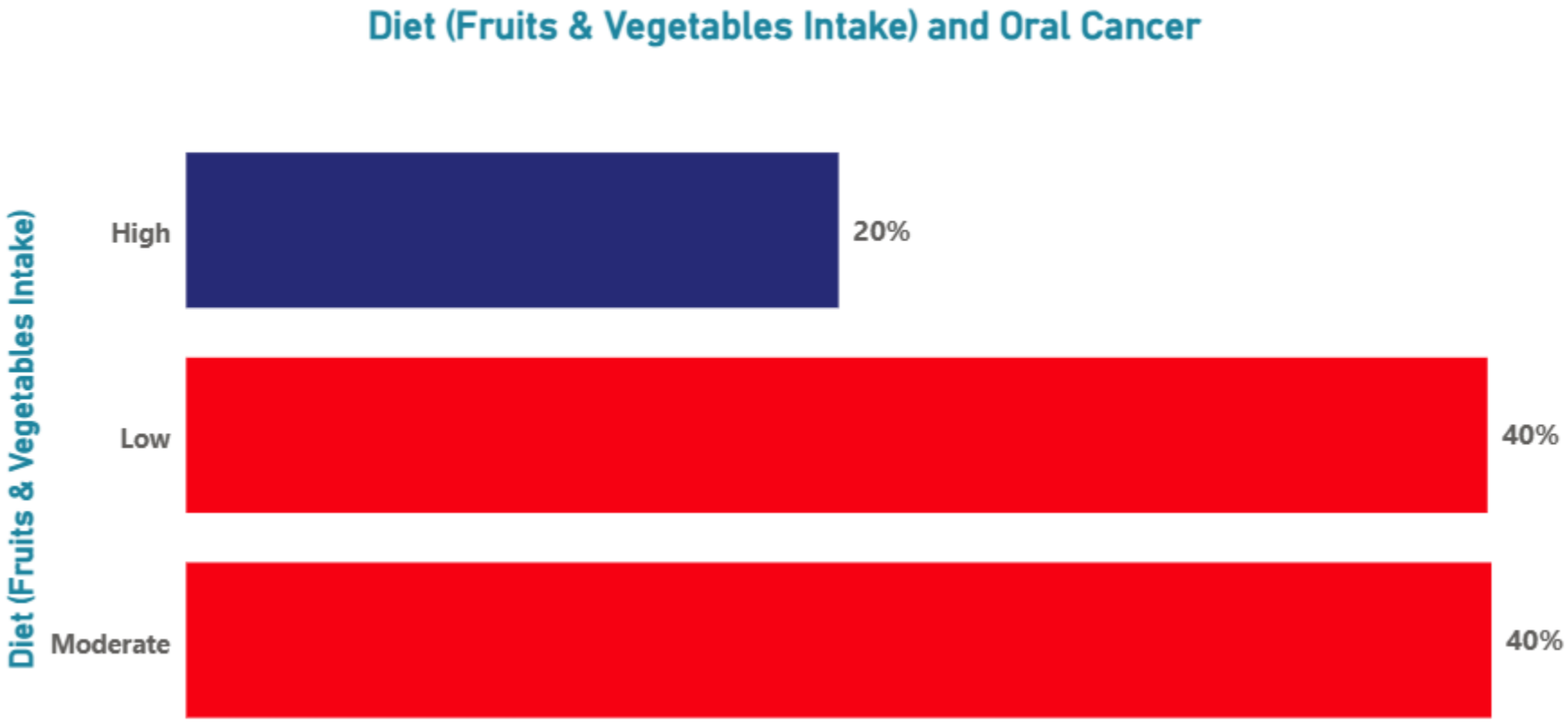
Oral Cancer

# Risk factors

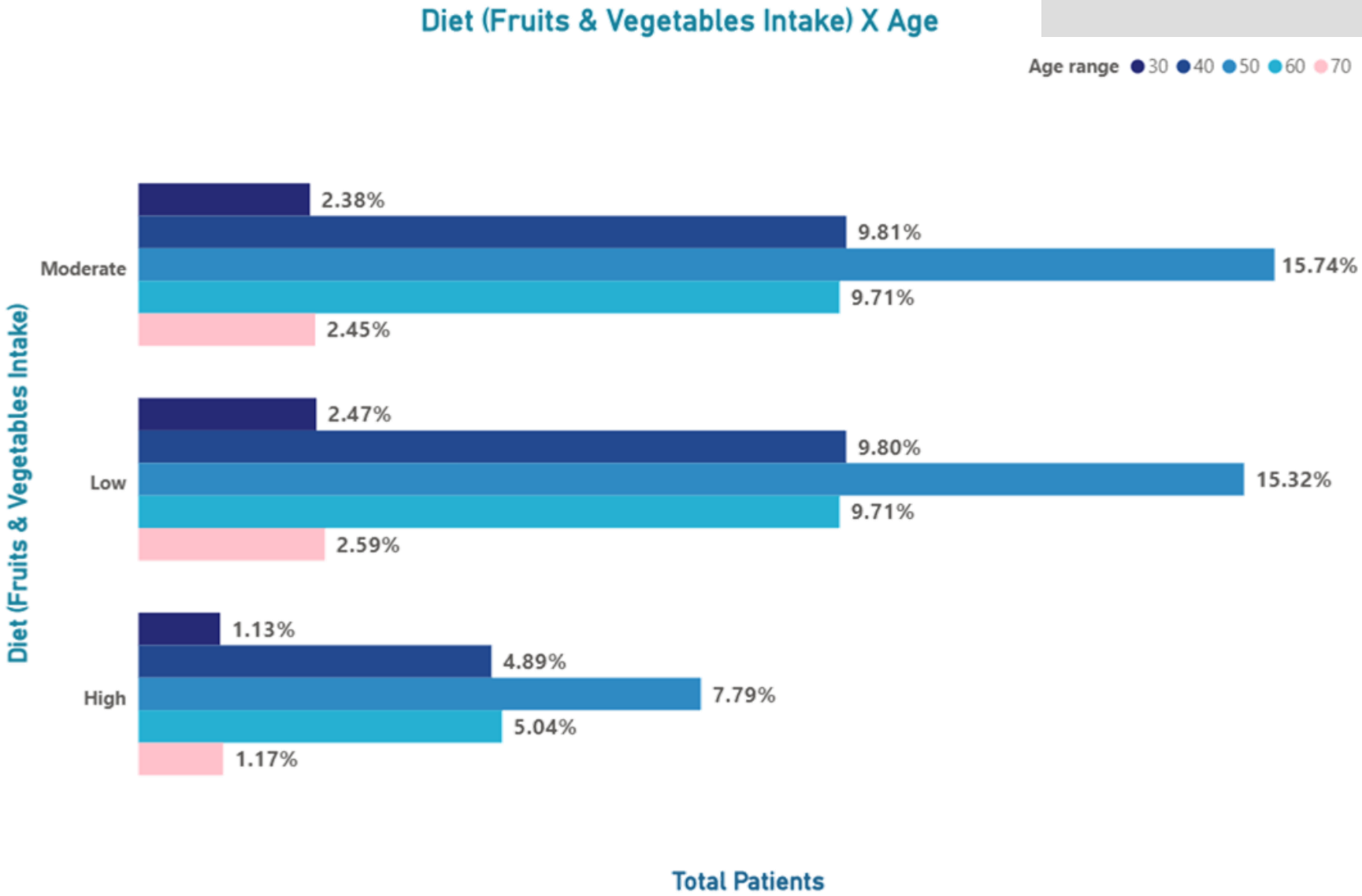
Did the diet decrease the occurrence of oral cancer?

Diet as a source of protective compounds
Public health recommendations
Economic considerations

## Oral Cancer < High Intake



# Risk factors



# THANK YOU