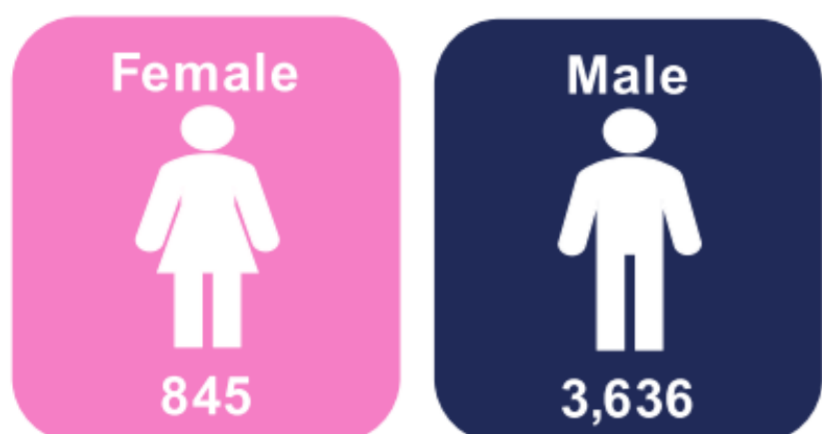


# Oral Assessment and Screening Interactive System

Sashini Liyanage, Isuri Devindi, Dinura Dissanayake, Achintha Harshamal, Nethmi Ranasinghe, Yovanthi Jayasinghe

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New cases of Oral Cancer in Sri Lanka in 2020

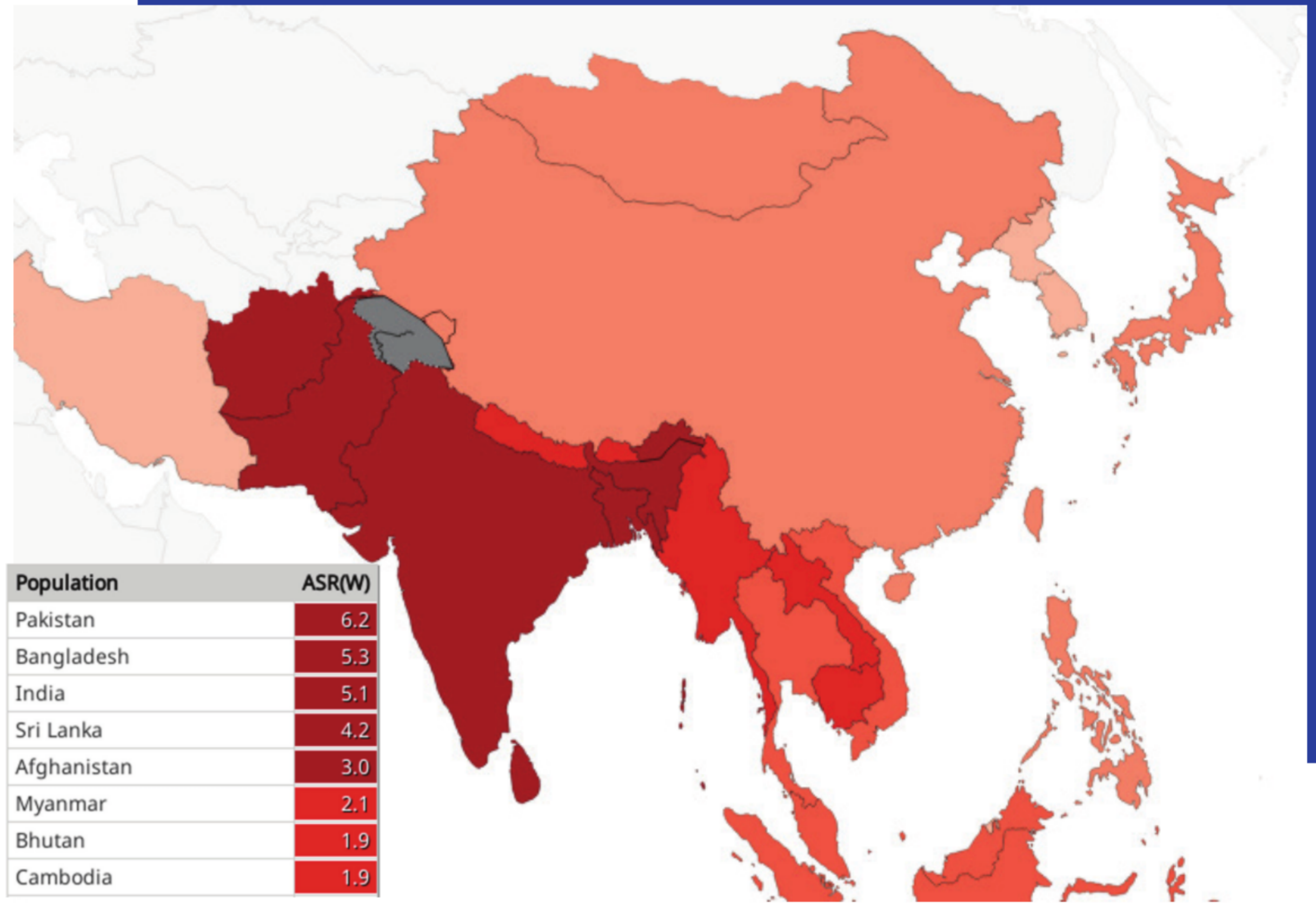


3 deaths daily



1 Dentist | 12000 Patients

Only 46 Specialists to manage oral cancer in Sri Lanka



Age Standardized mortality rates for Oral Cancer in 2020

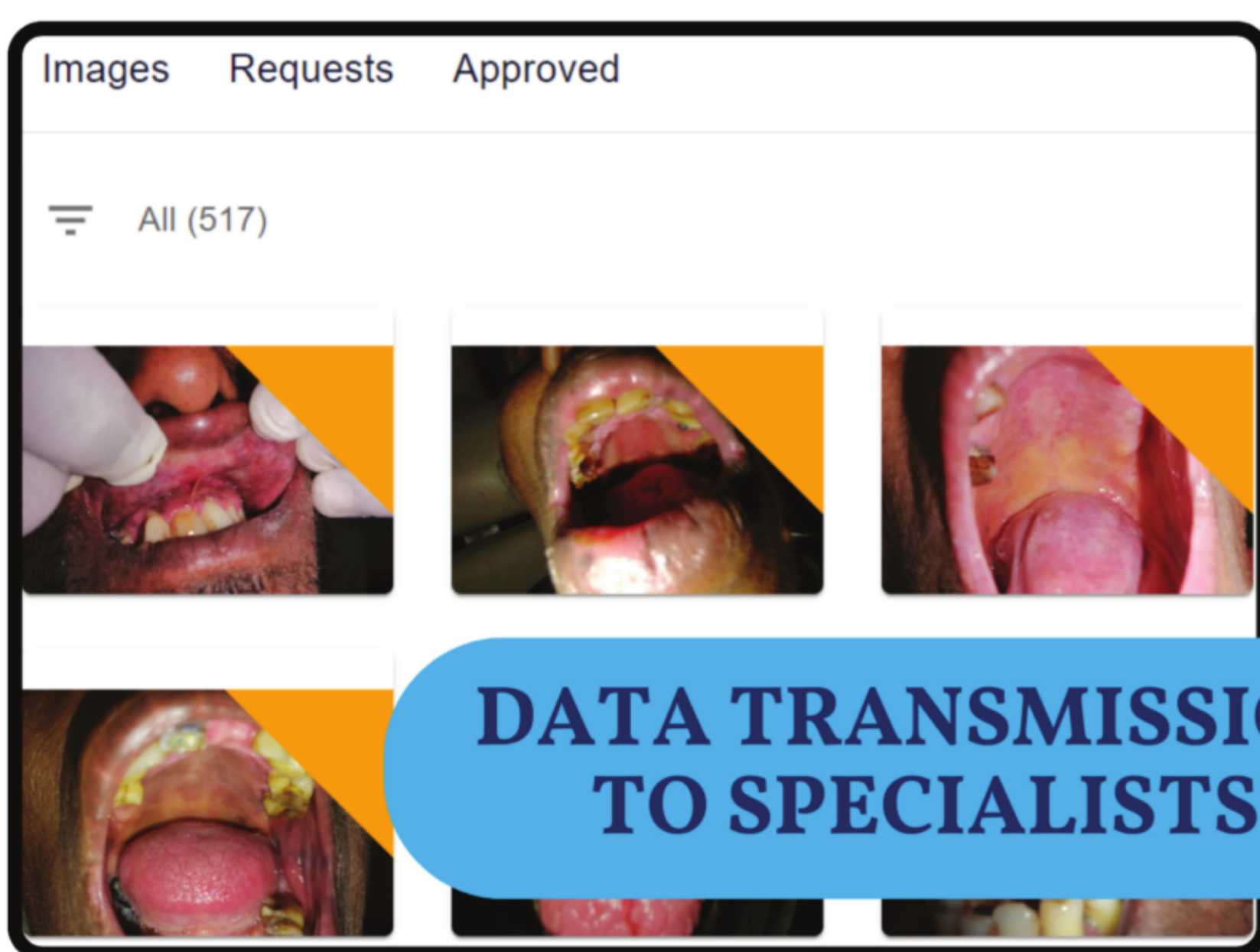
Survival rate can be increased up to **80%** with early detection

## OASIS

A **web-based**, automated screening system, which can boost the treatment process by **early detection** of high-risk oral cancer patients



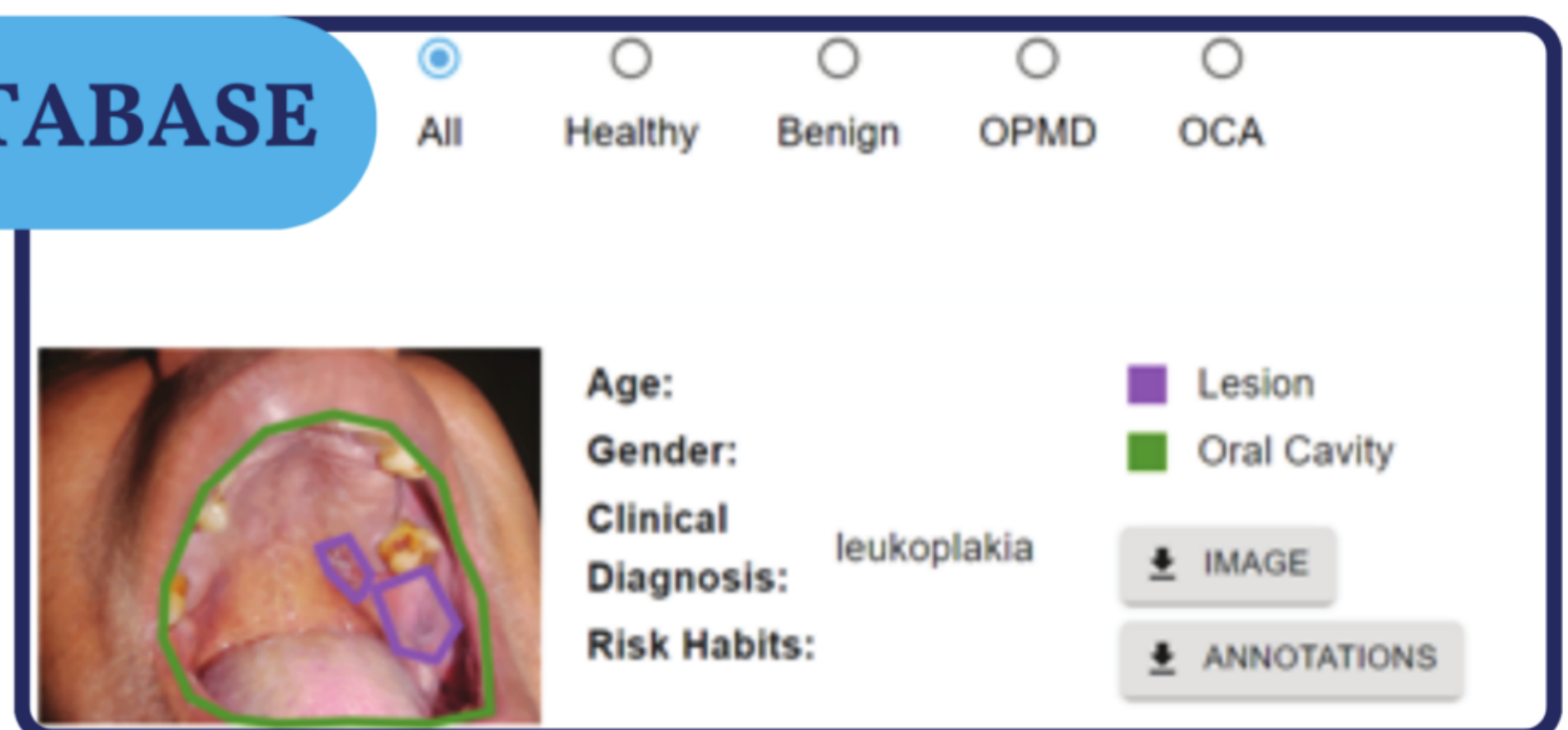
## Features



### DATA TRANSMISSION TO SPECIALISTS

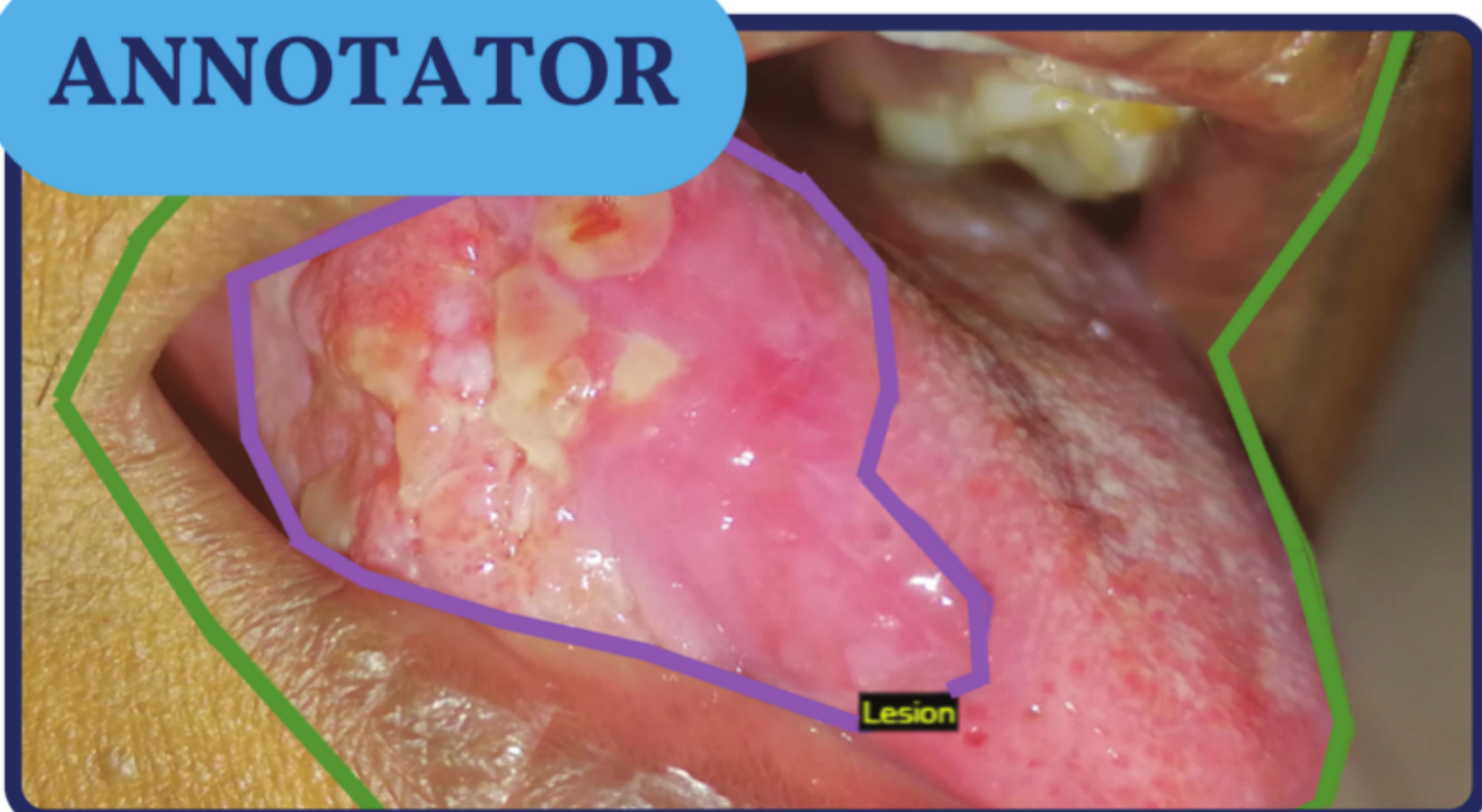
Gather and manage data from primary care dentist and transmit to specialists for referrals

### DATABASE



Oral cavity White Light Image (WLI) database with annotations of the oral cavity and lesion boundaries and metadata (age, gender, habits)

### ANNOTATOR



- Polygon shaped regions
- Customizable labels
- Annotations in COCO format
- Multi-level assessment

### PREDICT

Healthy: 0.01  
Benign: 0.99  
OPMD: 0

Category: **benign**

### PREDICTOR

Ensemble machine learning model for classification, incorporating visual analysis and risk factors



## Database of Annotated White Light Images for Oral Cancer Detection: Leveraging OASIS-Annotator a Web-Based Tool for Image Annotation

Sashini Liyanage, Isuri Devindi, Dinura Dissanayake, Achintha Harshamal, Yovanthi Jayasinghe, Dr. Nadisha Piyarathne, Dr. Sumudu Rasnayaka, Dr. Kalani Hettiarachchi, Prof. Ruwan Jayasinghe, Prof. Roshan Ragel, Ms. Dhanushki Mapitigama, Dr. Isuru Nawinne

**Introduction:** A white light image database of oral cavities derived from the Sri Lankan population with comprehensive annotations, and a user-friendly annotation tool. This publicly available database contains 3942 high-quality images classified into healthy, benign, oral potentially malignant disorders (OPMD), and oral cancer (OCA) categories

### Methodology

**Ethical approval** – Adhered to ethical standards specified by the Declaration of Helsinki, the ethical clearance was obtained from the ethics review committee, Faculty of Dental Sciences, University of Peradeniya, Sri Lanka (ERC/FDS/2022/03).

#### Image collection –

Subjects	Patients attending to the Teaching hospital Peradeniya, and the bystanders and relatives
Collected by	Dental surgeons in the clinic supervised by oral medicine specialists
Image conditions	Using mobile phones, under the natural light/light source of the dental chair
Images labeled, categorized, and annotated by	Two mid-career dental surgeons, supervised by two oral medicine specialists

### Annotation Tool

The OASIS-Annotator (Oral Assessment and Screening Interactive System - Annotator) is a specialized and customized tool developed with the purpose of facilitating image viewing, annotation, and download. With the OASIS-Annotator, users are able to navigate through the extensive image collection and annotate them by applying customized labels according to their research requirements.

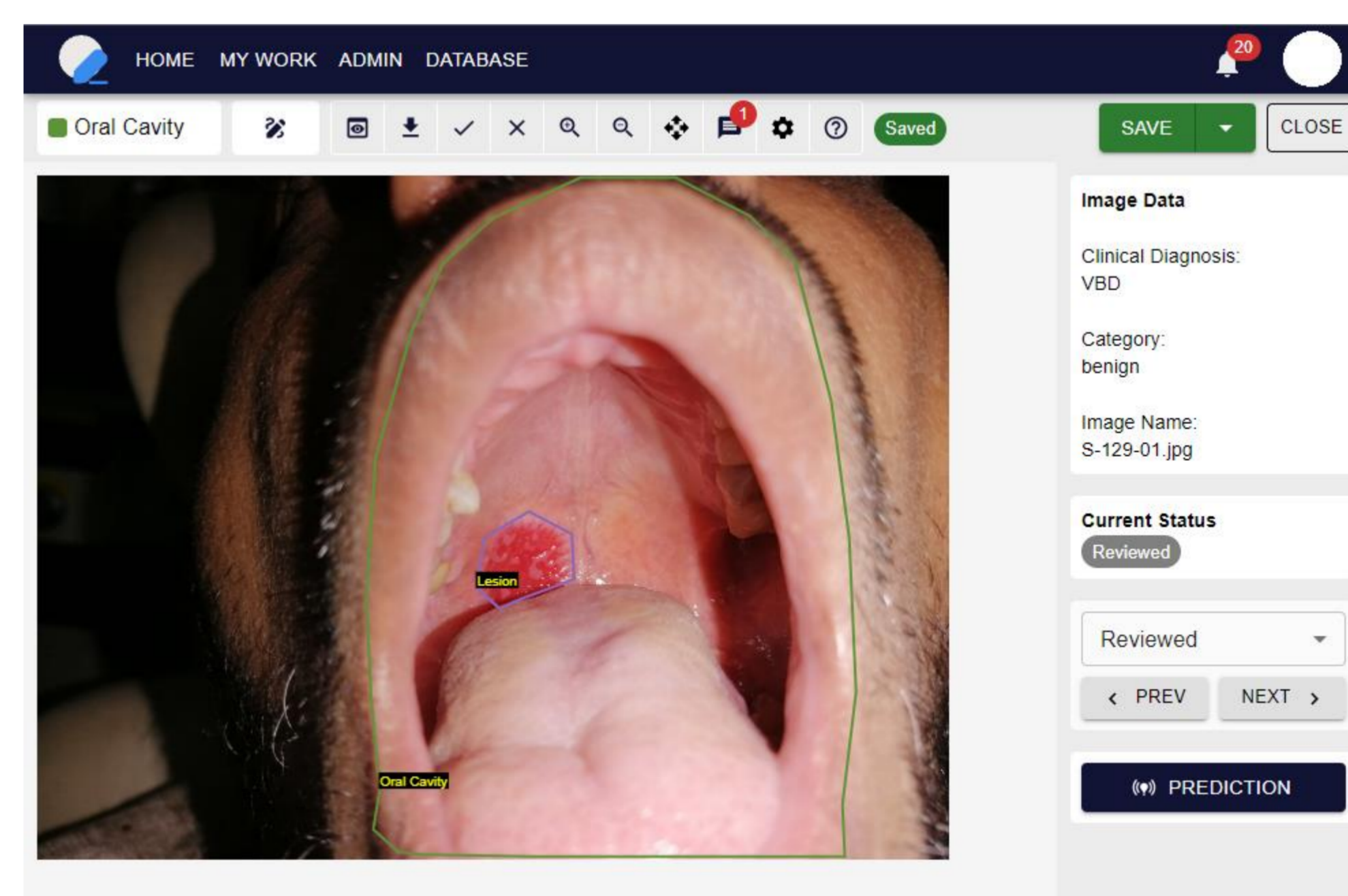


Figure 1. – Annotator Tool

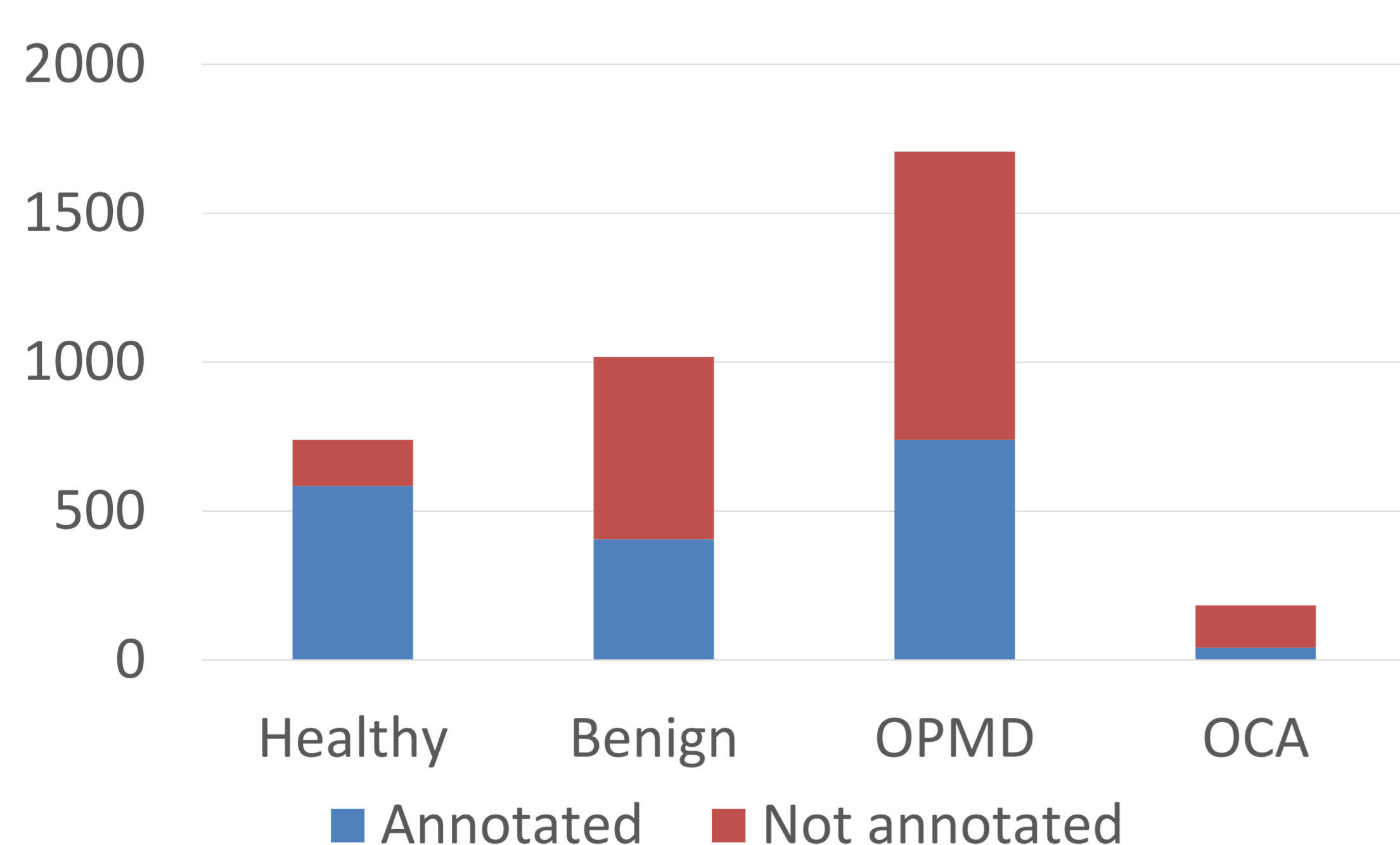


Figure 2. – Breakdown of the current image database

**Conclusion** - This comprehensive white light image database of the oral cavity derived from the Sri Lankan population with annotations holds great potential for advancements in ML and AI algorithms to develop automated tools for early diagnosis. This will ultimately lead to improved clinical outcomes through minimizing diagnostic and treatment delays, and provide resolutions for socioeconomic inequalities in oral cancer diagnosis.

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