

ORAL CANCER

FACTS AND FIGURES

PRECANCEROUS LESION

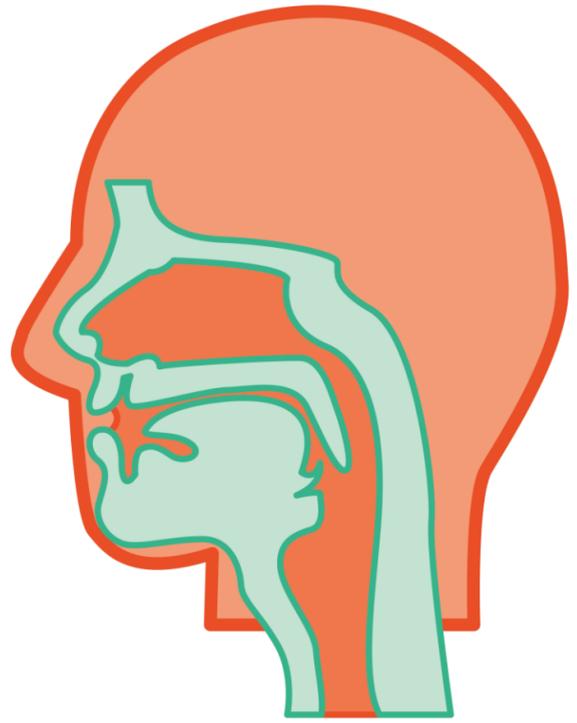
ROUGH PATCH

SWALLOWING PAIN

HPV SMOKING & ALCOHOL

BETEL NUT

Occurs in **1 of 16** patients



Survival rate: 5-year survival rate

below 50 %

In UK

5 years survival rate:

54%

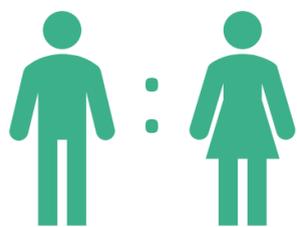
10-year survival rate

42%

90% with an early diagnosis survive, with a late diagnosis

just 50%

97% increase in mouth cancer over the last 20 years in the UK



Men: Woman

2:1

Lifetime risk

1 in 60 (men),

1 in 140 (women)

Wound Debridement Products market in the U. S. is estimated at

US\$ 486.1

Million

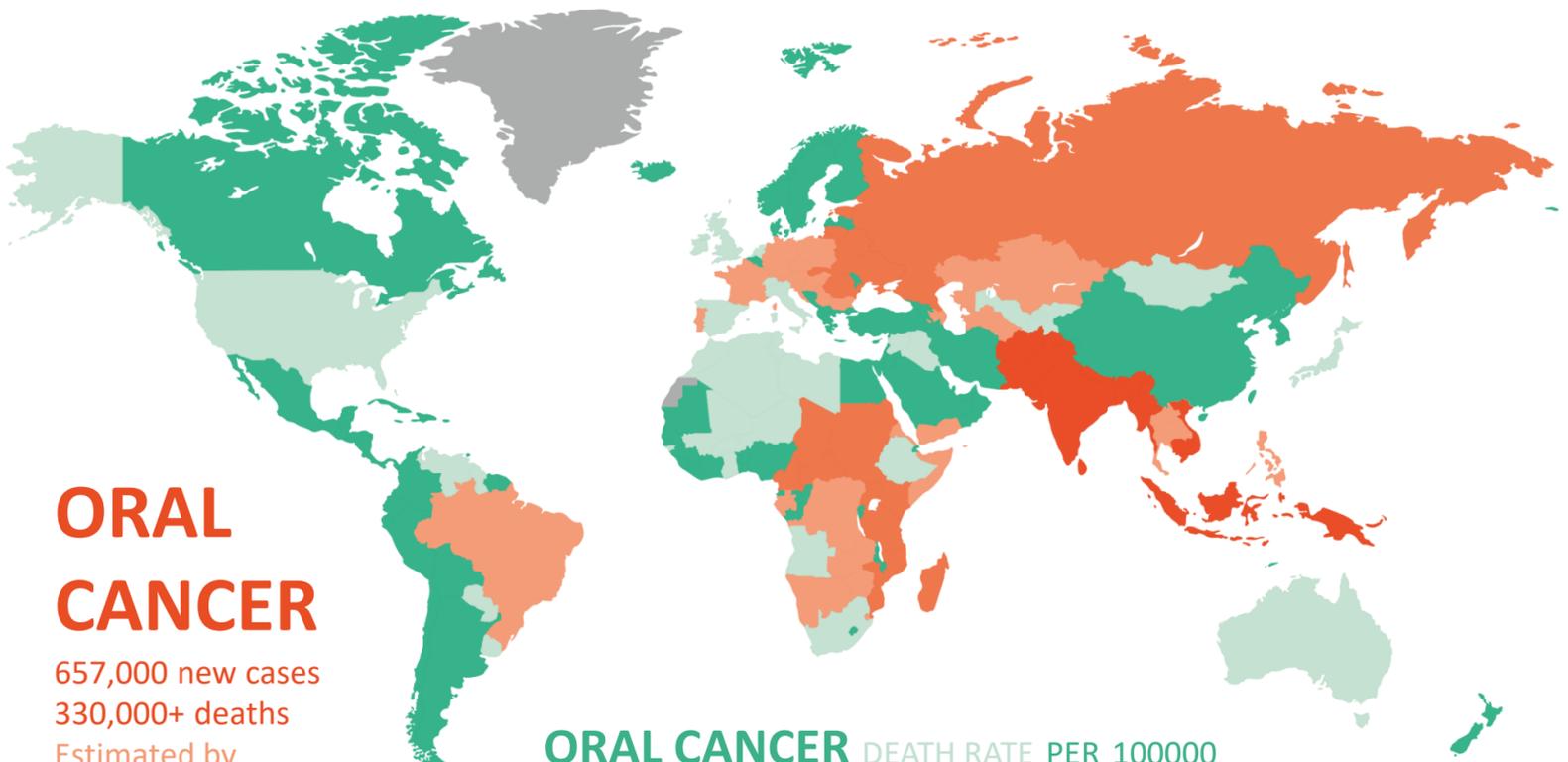
2020

Average age

around **63** years

1 of 5 younger than **55**

USA 54,010 new cases
10,850 deaths



ORAL CANCER

657,000 new cases

330,000+ deaths

Estimated by

WHO

ORAL CANCER DEATH RATE PER 100000

PEOPLE **2018**

0 - 2.1

3.2 - 4.9

9.1 +

2.1 - 3.2

4.9 - 9.1

NOT APPLICABLE

Oral Cancer

1 PRENATAL

INSIDE
In a Doctor's office

STAKEHOLDERS



If the mother is infected with HPV16, as it is an important risk factor, the infection can be transmitted aborning from the mother to the child. In case the mother is infected the Sectio caesarea is often used/vaccination of females before first sexual contact.

1 PAINPOINT

Lack of awareness regarding the early 16 infection and its associated vaccination

SOLUTION

Automation



Interactive reminder machines in women's bathrooms to ask if they remember they received the vaccine and in case they don't show places where they can go to receive it or where they can access their vaccination history

SOLUTION

Sensors

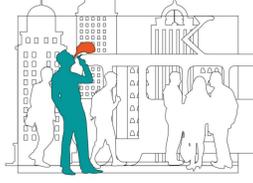


Biosensors to detect the minimum presence of the virus and that they have capsules that release substances to counteract it

2 PREVENTION

INSIDE
For control in the doctor's office

STAKEHOLDERS



The risk of getting oral cancer increases almost 15 times if it is in combination with smoking as there is a synergistic effect. Alcohol eases the absorption of carcinogenic substances contained in the smoke due to more permeable mucous membrane.

1 PAINPOINT

People do not quit smoking and drinking if they already do it

SOLUTION

Clinical innovation



Nano biodevice in the body that generates discomfort to people who smoke again, once the ingestion of this substance is detected.

SOLUTION

Process innovation



The system includes different sensors able to capture hand-to-mouth gestures and the tidal volume during respiration. The patient wears a radio frequency (RF) sensor on the wrist, and a receiver (i.e., antenna) on the chest. The sensor signals are analyzed by a Support Vector Machine (SVM) classifier to detect smoking actions.

2 PAINPOINT

People are not aware of the threshold limit of alcohol consumption above which cancer risk increases

SOLUTION

Automation



Home device where you can view the hours and days that you have been without drinking, the device calculates the money you have saved on tobacco, if you have anxiety it sends you motivational messages, and shows how your health has improved

3 PAINPOINT

In India, where chewing betel is more common, 45% of all cancer cases are oral cancer cases. Lack of knowledge about the risk factors.

SOLUTION

Clinical innovation



Chewing tobacco, a widespread alternative for people hooked on nicotine. The risks for cancer in general and oral cancer specifically are lower.

SOLUTION

Digitalization



AI enabled mirror device for betel risk factors. Miniaturized mirrors like device with artificial intelligence that detect the state of the teeth of people who chew betel, give warnings/risks associated with it, and immediately alert the need to go to the doctor

4 PAINPOINT

During quarantine and isolation, the consumption of alcohol and smoking increases

SOLUTION

Sensors

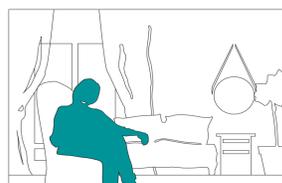


New system that senses smoking movements, sends motivational text messages and videos to help users quit smoking. Using wearable sensor technology to develop an automatic alert system to help people quit smoking.

3 SYMPTOMS

AT HOME
Resting at home

STAKEHOLDERS



Classic warning sign is a persistent rough patch with ulceration with a minimally painful raised border.

1 PAINPOINT

Small precancerous lesions could be not recognized. Some symptoms are asymptomatic

SOLUTION

Digitalization



Machine learning such as google lens that can connect photos of the person mouth with medical bibliography associated with oral cancers (ex. images of mouths in the first stages of cancer)

2 PAINPOINT

Lack of early diagnosis

SOLUTION

Digitalization



Digital twin technology to create patient models and perform simulations to reveal the occurrence/sign of disease & any severity

3 PAINPOINT

Patients may be anxious because of the potential consequences when they go to the doctor

SOLUTION

Process innovation



AR based virtual visualizations, making patients familiar with the medical routine.

SOLUTION

Automation



Intelligent robots in hospitals for emotional talks, and patients can have meditation sessions guided by them

4 PAINPOINT

Patients with bad oral hygiene or health related habits don't look into their mouth

SOLUTION

Automation



Use of devices such as electronic toothbrush for complete oral cleaning

4 DIAGNOSIS

AT THE HOSPITAL
Initial observation/control

STAKEHOLDERS



The changes in squamous cells are visible at some point and can be recognized by the doctor.

1 PAINPOINT

Biomarker testing is non-invasive but more difficult to access. The diversity of bacterial habits in the oral area must be considered. Differences in microbiome between different culture media and different consumer behavior

SOLUTION

Clinical innovation



The use of a visually enhanced lesion scope system that is a revolutionary handheld device that provides an easy-to-use adjunctive mucosal examination system to the oral health care professionals for the early detection of abnormal tissue

2 PAINPOINT

Diagnostic imaging and shaping are done after the lesions are visible. There's a big chance the tumor already spread or is at least at a late stage

SOLUTION

Automation



An electronic toothbrush type model that the patient puts in their mouth and it takes a video/pictures which are sent to the medical professionals.

SOLUTION

Clinical innovation



Portable low dose X-ray machine like dental radiographic system used for tumor incidence inside oral cavity tissues.

3 PAINPOINT

There can be differences in the interpretation of a biopsy amongst pathologists, other healthy tissue could be removed without any need or carcinoma tissue could be not removed and the tumor keeps growing

SOLUTION

Digitalization



App/Online platform for pathologists to have discussions of biopsy results (group forums) and contribute to a final diagnosis

4 PAINPOINT

Due to the isolation patients are afraid of going to the hospital due to the infection risk and do not use the tests

SOLUTION

Digitalization



This app could locate the nearest ambulance providing the required medical test service to patient home and book the same.

5 TREATMENT

AT THE HOSPITAL
General treatment recommendations are given

STAKEHOLDERS



Surgery is the primary modality of treatment. Surgery can be divided in resective and reconstructive

1 PAINPOINT

Removal of healthy tissue and important functional structures due to the obligatory safety distance to the identified border of the tumor. Big wounds in the Mouth or neck.

SOLUTION

Sensing



The surgeon could use a device that can detect degenerated cells of the patient during the surgery/operation to remove all tumor cells with minimum possible error

2 PAINPOINT

Result and treatment plan depend on experience, technical equipment, and knowledge of the participating physicians. Also, size of the prosthetic surgery could be depending on the clinics capacity

SOLUTION

Digitalization



A connected dispensing pillbox and telehealth software. The whole system is a smart and mobile medication dispenser including patient identification, medication serialization, teleprescription, tele-dispensing and telemonitoring functions.

3 PAINPOINT

Chance of recurrence is high

SOLUTION

Digitalization



AI for platforms that do probabilistic studies to predict a future recurrence and thus take preventive action

4 PAINPOINT

The COVID-19 patients may not find appropriate isolation diagnosis facilities in the hospitals for disease checkups

SOLUTION

Digitalization

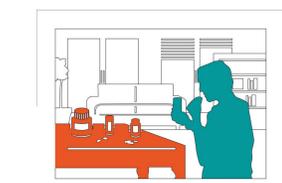


The patient can book appointments and isolation beds in advance through the app by checking vacancy.

6 FOLLOW-UP

AT HOME
Daily Life

STAKEHOLDERS



Exercising with physiotherapists/ergotherapists to accelerate mobilisation and to learn swallowing and speaking again.

1 PAINPOINT

Preventive antibiotic therapy can lead to complications with the digestive system and result in weakness

SOLUTION

Clinical innovation



Create a clinical treatment that at the same time solves the consequences of the digestive system, nanobiosensors that regulate this

2 PAINPOINT

Due to COVID-19 it is not possible or hard to get a doctor's appointment for check-ups

SOLUTION

Digitalization & Sensing



Wearable technology enabled with IoT for important parameters with real time data transmission and processing.

3 PAINPOINT

Patient choses he/she overcame the disease and there is no need of seeing the doctor for regular check ups

SOLUTION

Digitalization



Scheduling assistant to remind the regular follow up visits with the highlighting note saying the importance of the regular follow up and the possible risks which may arise if not maintained

4 PAINPOINT

In more rural areas it takes long for the patient to get an appointment, in addition to that the hospital might be far away, from the residence of the patient so that it costs him a lot of time getting there and back

SOLUTION

Process innovation



Mobile CT and MRI facilities which can visit the rural and remote places periodically and the reports are digitalized

5 PAINPOINT

Invasive blood testing, can cause infections, or vasculitis

SOLUTION

Clinical innovation



Non-invasive blood analysis with the help of nanobiosensors to detect the presence of viral infection.

Mouth cancer refers to cancer that develops in any of the parts that make up the mouth (oral cavity). Mouth cancer can occur on the:

- Lips
- Gums
- Tongue
- Inner lining of the cheeks
- Roof of the mouth
- Floor of the mouth (under the tongue)

Cancer that occurs on the inside of the mouth is sometimes called oral cancer or oral cavity cancer. Mouth cancer is one of several types of cancers grouped in a category called head and neck cancers. Mouth cancer and other head and neck cancers are often treated similarly.

THROUGH THIS CAREPLAN WE HIGHLIGHT DATA FROM A COLLECTION OF

42 painpoints

62 respective solutions

are connected to 14 different stakeholders