

## Track 2: AI + Health: Artificial Intelligence – a game

**Team Lead:** Marcel Salathé (EPFL); Ramesh Krishnamurthy, Senior Advisor, De (WHO); Sameer Pujari, “Be Healthy, Be Mobile” Project Manager, World Health

The banner features a dark blue background with a glowing, futuristic network of lines and nodes. In the center is a circular graphic composed of 17 colored segments, each containing a white icon representing one of the Sustainable Development Goals (SDGs). To the left of this central graphic, the text "AI for Good Global Summit" is written in large, bold, white letters. Below it, the phrase "Accelerating progress towards the SDGs" is written in a smaller, yellow, italicized font. Further down, the hashtag "#AIforGood" is displayed in white. Below the hashtag, the text "In partnership with" is followed by the logos for XPRIZE and ACM. The ITU logo is positioned in the top left corner. The bottom of the banner is a white strip containing a row of logos for various partner organizations, including CIBTO, UNICEF, UN Women, UNODC, and others.

**ITU**

# AI for Good Global Summit

*Accelerating progress towards the SDGs*

#AIforGood

In partnership with

XPRIZE

acm



# Key Message

- Application of AI in healthcare is most effective when it helps achieve national health-related SDG goals.
- National and sub-national governments are encouraged to have appropriate policy and governance mechanisms to ensure ethical and safe use of Artificial Intelligence (AI) in Healthcare without hindering innovation.

# Aim of the AI + Health track

- Identify quick-wins areas and types of AI applications that hold high-potential impact on health outcomes and that are feasible and relatively simple to deploy
- Identify bottlenecks and challenges that prevent society from taking full advantage of AI quick-wins in areas such as diagnostic, treatment, prevention or emergency response and how to possibly address those.
- Mobilize community to support a number of proof-of-concepts projects that could demonstrate impact in the short and medium term.
- To make commitment and seek feedback from health community of a global XPrize Challenge to Transform Community Health through AI' (tbc).

# **Four work streams**

1. AI for primary care and service delivery
2. Outbreaks, Emergency Response and Risk Reduction
3. Health promotion, prevention, and education
4. AI health policy

# HEALTH IN THE SDG ERA



World Health Organization

[WWW.WHO.INT/SDGS](http://WWW.WHO.INT/SDGS)



# **Project Pitches**

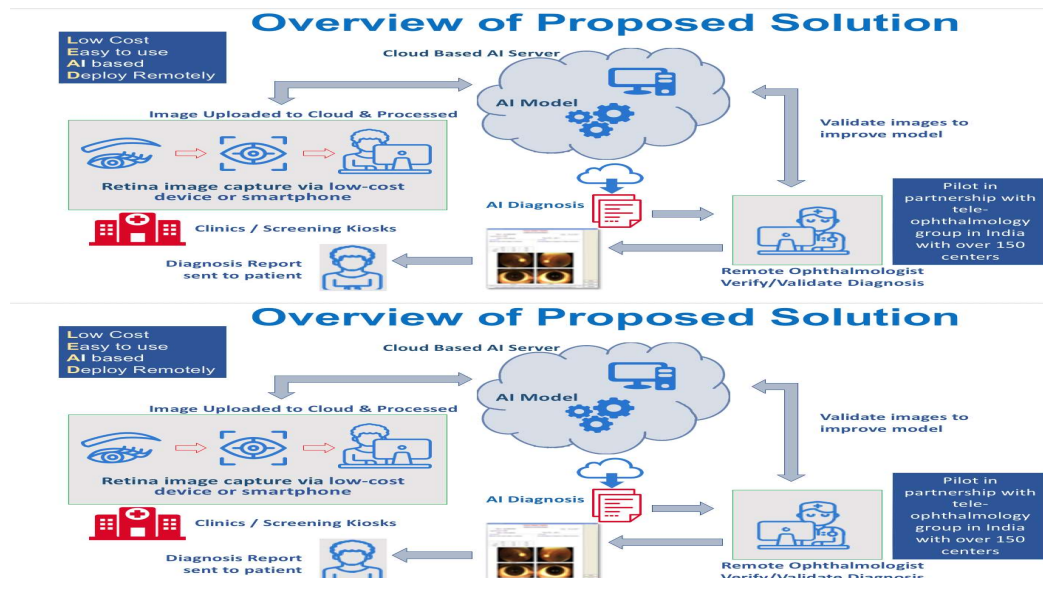
# Project Worksheet

Project Name

May 16-2018

Health in AI Track

Core Issue		Obstacles	Solution Space and opportunity	Data Needed	AI Capabilities needed
		Current KPIs		Key Stakeholders	Success Criteria
Background			Support Needed		
Proposal			Discussion		



## Detection & Diagnosis of DR



Eye Exam by a trained eye-care specialist using Fundus Camera



Diagnosis by manual examination of images for DR

*Proposal Pitch*

**AI to Detect Vision Loss**

*Category*

**For profit**

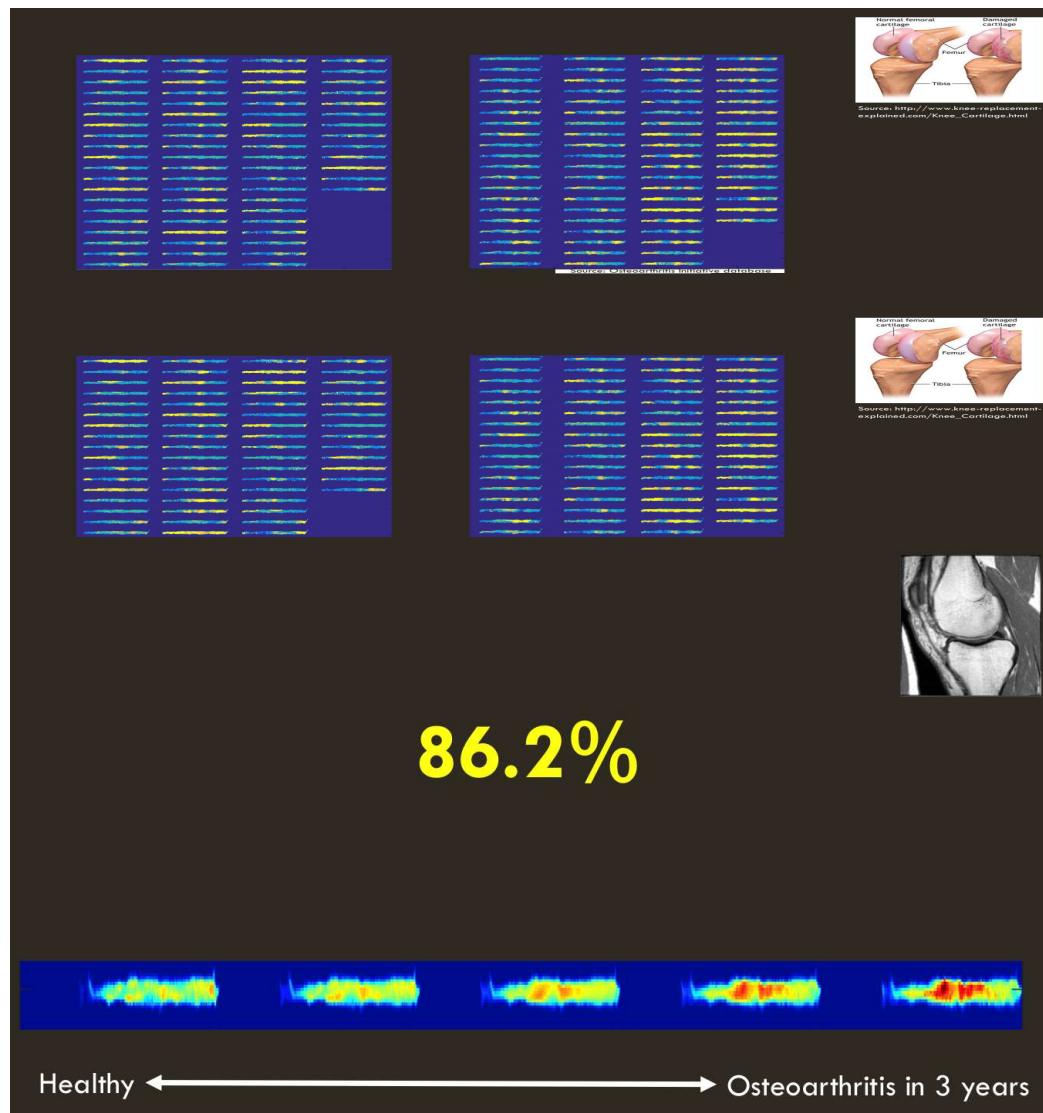
*Subject*

**Diabetic Retinopathy (DR), serious eye-disease affecting people**

001

**Credit:** Arun Shroff, Co-founder, Medindia.net

AI for Good Summit, 2018.



*Proposal Pitch*

**AI to Detect Osteoarthritis**

*Category*

**Non-profit**

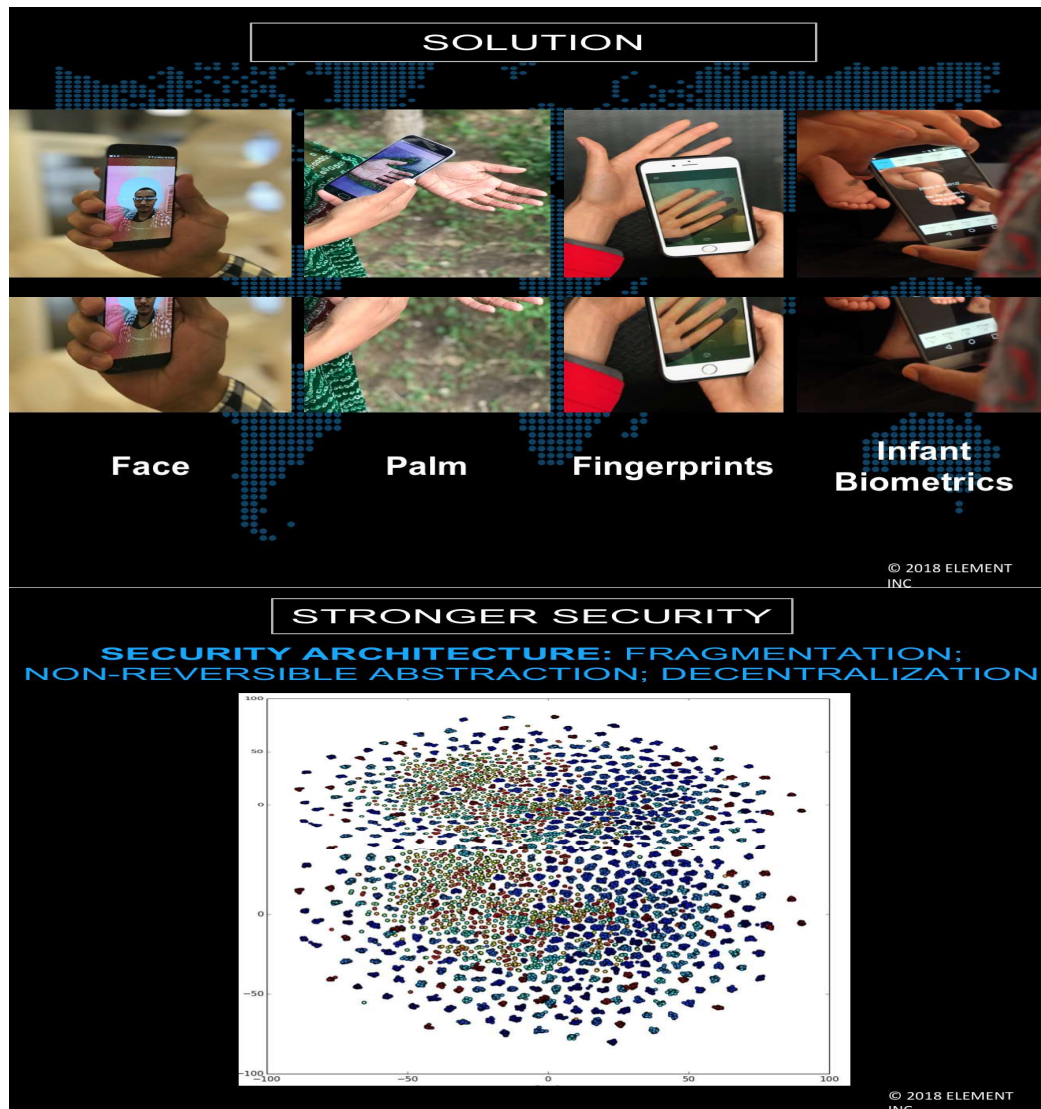
*Subject*

**Prediction of who will develop osteoarthritis**

002

**Credit:** Shinjini Kundu, University of Pittsburgh Medical Center

AI for Good Summit, 2018



*Proposal Pitch*  
**AI and Digital Identity**

*Category*  
**For profit**

*Subject*  
**Digital Identity**

**003**

**Credit:** Adam Perold, Co-founder, President and CEO, ELEMENT INC  
AI for Good Summit, 2018

## About WatIF Health Portal

It is a multi-platform, High-impact, clinical application, designed for Primary Healthcare in resource constrained communities.

- Positioned as a Precursor to AI
  - Support clinical outcomes for PHC
  - Up-skills Ward Based Outreach Teams
  - Strengthens health systems
  - Supports **UHC** and **SDG3**
- A preconfigured clinical-Knowledge-system with clinical decision support capabilities.
- Has Predictive analytics without machine learning capabilities
- Comes with proprietary IOT devices
- Web Based and Cellphone enabled
- Works **ON** and **Off-line**
- **HL7** and **DHIS2** Compatible and
- **Highly Scalable with self supporting tools for users**



## Current Needs

1. Collaboration with a global AI organization to conduct a joint POC on the use of AI in primary healthcare
2. Use-Case
  - A **high-impact** Integrated care service for **hypertension** and **diabetes** in a resource constrained environment
  - Incorporate machine learning capability to the current application
3. Resources Required
  - Access to device agnostic **IOT** technology
  - Mobilization of partners
  - **Machine Learning Capability**
  - Ability to Handle Big Data
  - Strengthen current **HL7** and **DHIS2** compatibility
  - Strengthen current **HIPAA** and **POPI** compliance



## Proposal Pitch

### AI based Health Portal

### Category

### For profit

### Subject

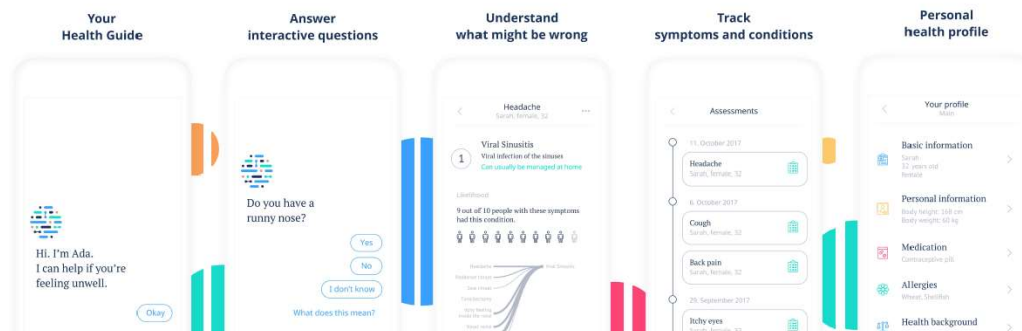
### Health Data Integration Portal

004

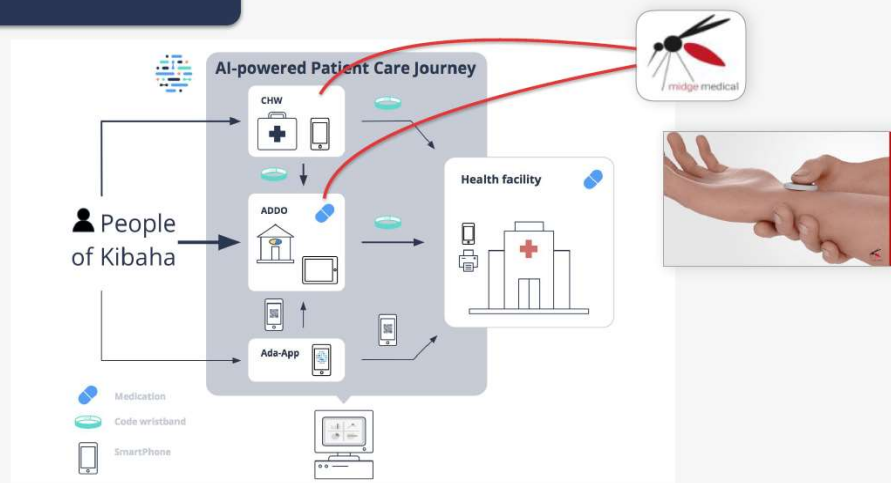
**Credit:** nao@watifhealth.com

AI for Good Summit, 2018

## The World's Personal Health Guide



## Empowering CHWs with AI



## Proposal Pitch

## AI powered infrastructure

## Category

## For profit

## Subject

## Symptom assessment and diagnoses

005

**Credit:** ADA

AI for Good Summit, 2018.

## Public Health Messaging Today



<https://facebook.com/smokefree5W>



<https://facebook.com/smokefree5W>



- limited targeting using age/gender
- “one-size-fits-all” visual and text
- social media for “fans”
- duration less than 1 year
- goal: one viral message

- different visuals
- different texts

- different visuals
- different texts
- specific to customer segment
- dynamic creatives
- goal: personalization



Starting soon

## Proof-of-Concept Studies

Advertising healthy recipes in the US on Facebook

- emphasizing taste vs. health benefits
- interest-based targeting (healthy vs. unhealthy)
- geographic targeting (high/low obesity rates)
- joint work with Christoph Trattner and Pamina Strobl



Advertising smoking cessation to US Hispanics on Facebook

- social vs. individual consequences



Advertising smoking cessation to US Hispanics on Facebook

- social vs. individual consequences
- white vs. non-white model in ad image
- demographic targeting (parents or not, married or not)
- joint work with Kokil Jaidka and Lyle Ungar



**Credit:** Ingmar Weber, Hamad Bin Khalifa University

AI for Good Summit, 2018.

*Proposal Pitch*

**AI powered PH Messaging**

*Category*

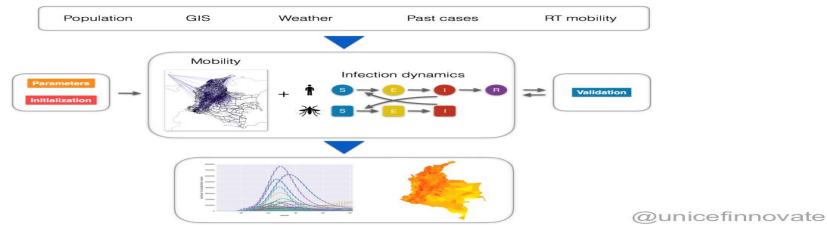
**Non profit**

*Subject*

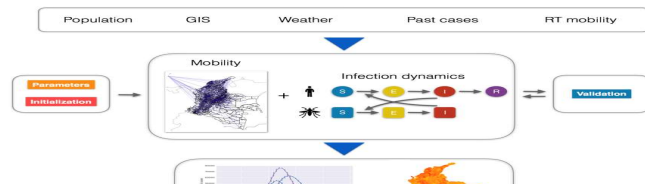
**Hyper-Targeted Advertising for Public Health Messaging**

**006**

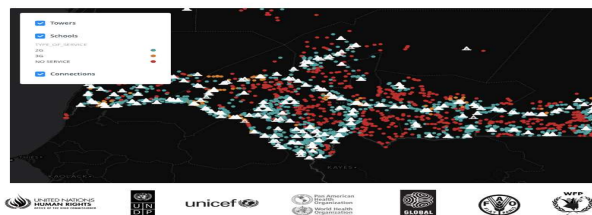
## Integrate epidemic modelling



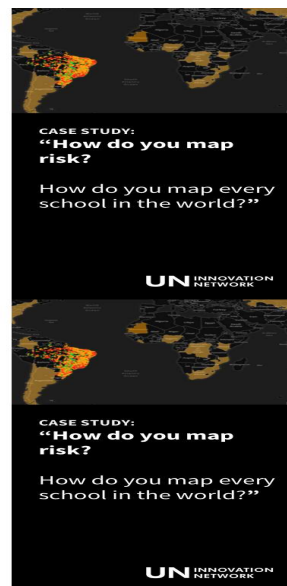
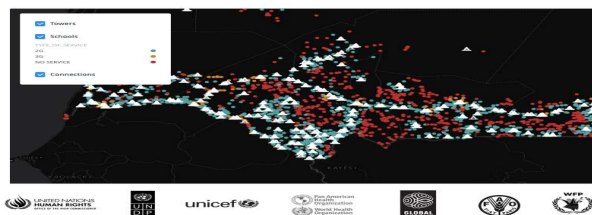
## Integrate epidemic modelling



## Mapping risk factors



## Mapping risk factors



*Proposal Pitch*

**AI powered Epidemic Modelling**

*Category*

**Non profit**

*Subject*

**Mapping risk factors and assess epidemic risks**

007

**Credit:** Clara Palau, UNICEF  
AI for Good Summit, 2018.



*Proposal Pitch*

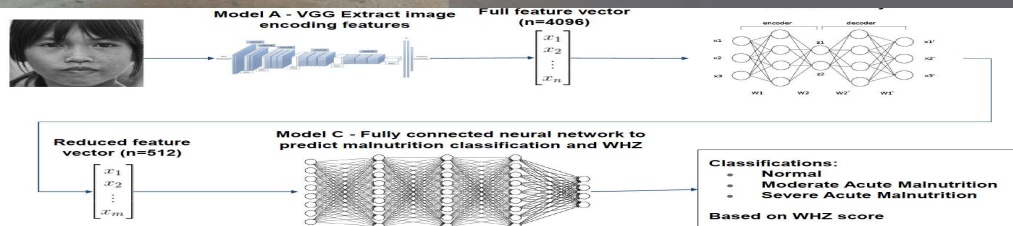
**AI powered malnutrition detection**

*Category*

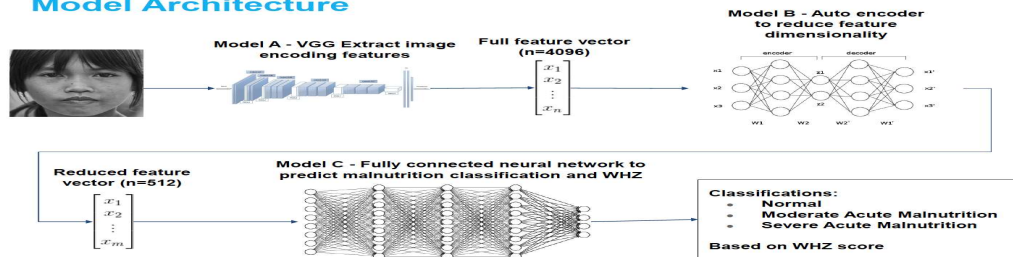
**Non profit**

*Subject*

**Extremely rapid observations of nutritional status**



### Model Architecture



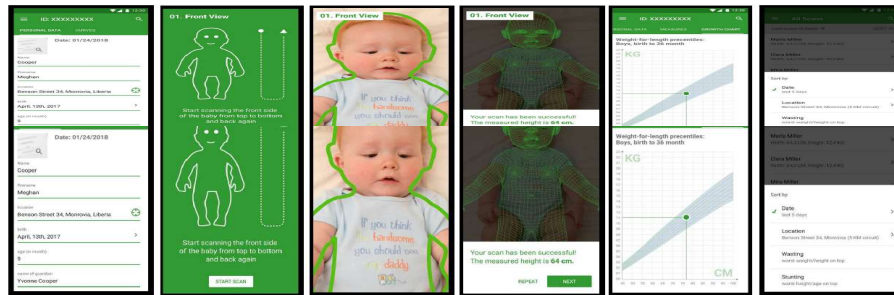
008

**Credit:** Kimetrica & UNICEF Partnership

AI for Good Summit, 2018.

## What?

- Mobile solution
- Quick and easy to use
- Provides immediate data
- High accuracy
- Non-profit
- Open Source



## Technology?

3D Augmented Reality scan plus machine learning

**Measuring data:** Google Project Tango

**Processing data:** Google Tensorflow

**Training data:** standardized nutrition surveys (SMART Methodology)



## Proposal Pitch

### AI powered child growth monitor

## Category

### Non profit

## Subject

### Mobile solution for child growth monitoring

009

**Credit:** Welt Hunger Hilfe

AI for Good Summit, 2018.



Bringing together  
**engineers, doctors, and entrepreneurs**  
to discover, develop, and deploy  
**scalable solutions for healthcare**

www: [health-ai.github.io](http://health-ai.github.io)

Łukasz Kidziński      twitter: [@kidzik](https://twitter.com/kidzik)



*Proposal Pitch*

**Strengthening and coordination of  
AI-related resources**

*Category*

**Non profit**

*Subject*

**Coordinating AI experts and  
deploying AI solutions**

**O10**

**Credit:** Łukasz Kidziński

AI for Good Summit, 2018.

# Artificial Intelligence based on real-world data

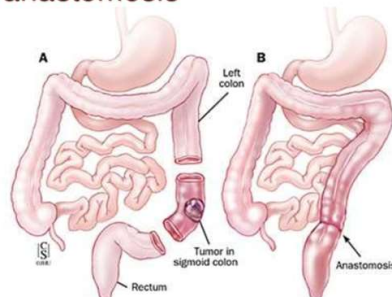
Anne Torill Nordsletta, Director Health Analytics



## What and why

- Predict anastomosis leakage
- Early detection in pre-operative planning
- Early warning and decision support
- Previous study had a sensitivity of 100% and specificity was 72% with use of bag-of-words model

### Primary colorectal anastomosis



Source: Ferris, Robert. Retrieved from  
<https://www.slideshare.net/RobertFerris5/anastomotic-leak-following-colorectal-resection>

## *Proposal Pitch*

**AI-based predictive analysis of free  
text EMR data**

## *Category*

**Non profit**

## *Subject*

**Improving predictive accuracy**

**O11**

**Credit:** Anne Torille Nordsletta

AI for Good Summit, 2018.

#### Boost capabilities at the frontlines



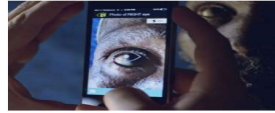
Solutions to not just improve frontline workers' and primary care givers' productivity, but to empower them with new capabilities.

#### Novel planning and information applications



Applications for surveillance and prediction. Using AI for automatic planning of manpower, supplies and operations.

#### Diagnostics in low resource settings



Prevalence of mobile phones and technology advances can enable a new class of diagnostics applications.

## Proposal Pitch AI-for public health in India

Category  
Non profit

Subject  
Scaling AI solutions at health systems level

#### Solutions themes that are emerging



#### Boost capabilities at the frontlines



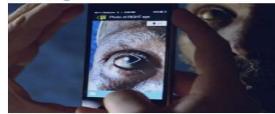
Solutions to not just improve frontline workers' and primary care givers' productivity, but to empower them with new capabilities.

#### Novel planning and information applications



Applications for surveillance and prediction. Using AI for automatic planning of manpower, supplies and operations.

#### Diagnostics in low resource settings



Prevalence of mobile phones and technology advances can enable a new class of diagnostics applications.

#### Solutions themes that are emerging



#### Iterative co-creation with partners key to impact at scale



#### Iterative co-creation with partners key to impact at scale



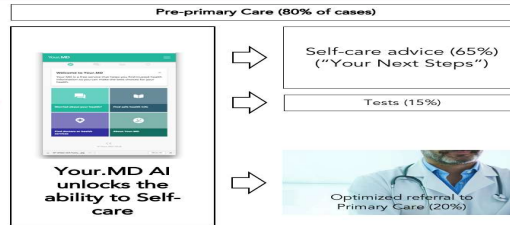
012

**Credit:** P. Anandan, Wadhvani Institute for AI  
AI for Good Summit, 2018.

## The Solution: Pre-primary Care with AI



Your.MD, an automated generalist doctor that can help millions of people self-care and relieve primary care physicians from unnecessary work



## Proposal Pitch

## Pre-primary Care with AI

## Category

## For profit

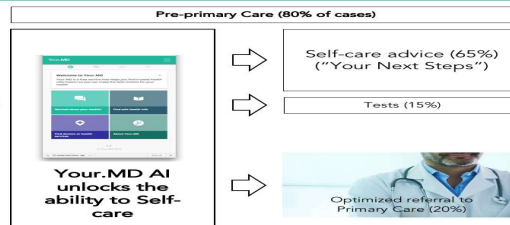
## Subject

## Primary care assistance

## The Solution: Pre-primary Care with AI



Your.MD, an automated generalist doctor that can help millions of people self-care and relieve primary care physicians from unnecessary work



Our AI helps people to:

1. Understand their **individual probability** to suffer from a condition
2. Get **safe information** in partnership with NHS
3. Know what **best to do**:
  - o Emergency
  - o See/talk to a doctor
  - o Self-care options: pharmacies, tests, apps, etc - **80% of the cases**



Understand what best to do in each case



Safe health information



Our B2C monetisation: Cost Per Click OneStop Health™

## Your.MD AI Unlocks Self-care

Our AI helps people to:

1. Understand their **individual probability** to suffer from a condition
2. Get **safe information** in partnership with NHS
3. Know what **best to do**:
  - o Emergency
  - o See/talk to a doctor
  - o Self-care options: pharmacies, tests, apps, etc - **80% of the cases**



Understand what best to do in each case



Safe health information



Our B2C monetisation: Cost Per Click OneStop Health™

013

Credit: Your.MD

AI for Good Summit, 2018.

Tackling the snakebite humanitarian crisis:

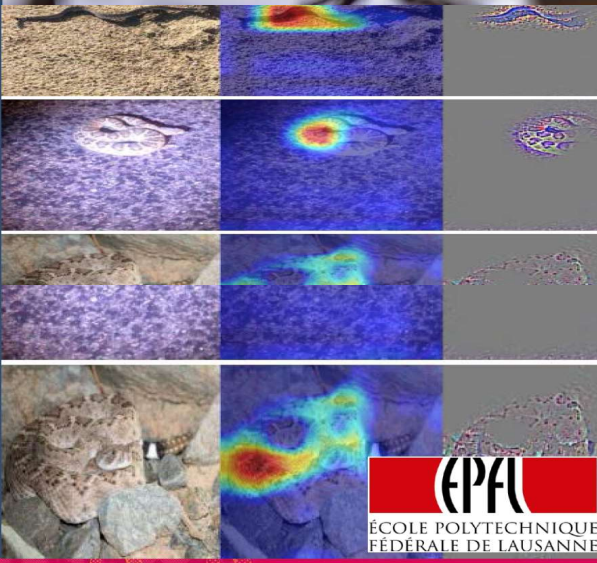
**Snapp: First medical decision-support tool for snake identification based on AI and global collaborative expertise**

Dr. Rafael Ruiz de Castañeda  
Dr. Isabelle Bolon  
Institute of Global Health  
Faculty of Medicine  
University of Geneva

UNIVERSITÉ DE GENÈVE HUG UNIVERSITÉ DE GENÈVE INSTITUTE FOR ENVIRONMENTAL SCIENCES citizen cyberLab EPFL ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE THE UNIVERSITY OF MELBOURNE MEDECINS SANS FRONTIÈRES DOCTORS WITHOUT BORDERS

**Objective 2:**

Develop and test a system to **identify snakes from photos based on AI** (led Prof. Salathé, EPFL)



Source: Mohanty from Digital Epidemiology Lab - EPFL

*Proposal Pitch*

**AI-based snake identification**

*Category*

**Non profit**

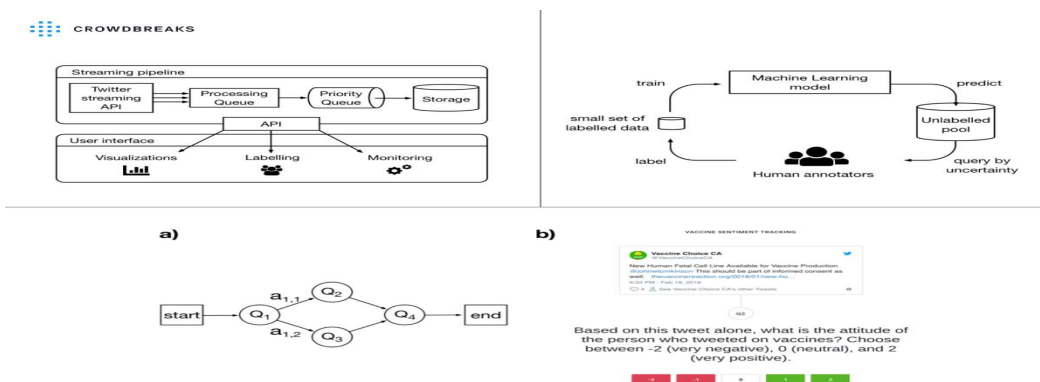
*Subject*

**Rapid response support to health workers to treat snakebites**

**014**

**Credit:** Ruiz Castaneda, Marcel Salathe

AI for Good Summit, 2018.



## Proposal Pitch

## AI-based social media mining to track health trends

## Category

## Non profit

## Subject

## Tracking health trends relevant for public health



### Digital Epidemiology Lab

- Develops and maintains the **Crowdbreaks** platform
- Coordinates the overall project

#### INCENTIVE:

- To develop an partnership between public health organizations and academia in the field of digital epidemiology

### Stakeholders, Public Health Partners

- Use **Crowdbreaks** to track health trends of interest in dedicated projects
- Provide project-relevant resources

#### INCENTIVE:

- To partner with academia to solve digital epidemiology problems openly and transparently

### Academic Partners & Contributors

- Contributes to the overall pipeline of **Crowdbreaks**: Development of algorithms, methods, platform, backend, etc.

#### INCENTIVE:

- To partner with public health stakeholders to help solve their problems, and get scholarly credit for it (i.e. publications)

**O15**

**Credit:** Crowdbreaks Marcel Salathe  
AI for Good Summit, 2018.

# **Focus Group**

# What's a Focus Group

- An open Platform for collaboration on new topics
- No Membership required
- Needs terms of reference, a management team, and a set of target deliverables
- Has secretariat collaboration support: website, malign list
- Meets physically and/or electronically (remote participation)
- The work is self funded

## Examples of ITU Focus Groups

### Current

FG ML5G

Machine Learning for Future Networks including 5G

FG DLT

Application of Distributed Ledger Technology

FG DFC

Digital Currency including Digital Fiat Currency

FG DPM

Data Processing and Management to support IoT and Smart Cities & Communities

### Recent

FG DFS

Digital Financial Services

FG IMT

Network aspects of IMT-2020

FG AC

Aviation Applications of Cloud Computing for Flight Data Monitoring



# Proposed FG on AI + Health

- Many of the pitches in the AI + Health Session have common issues that benefit from a structure to share information, collaborate and deliver on their goals until the next AI Summit 2019. Some of the common issues include:
  - Use case description
  - Data collection, models, quality, etc.
  - Interfaces and architecture
  - Service and Business models
  - Open Source
  - Country deployment
  - Impact evaluation
  - Assessment and validation criteria and Framework
  - Algorithms enhancements

# Feedback on proposal

- WHO supports and need further development of Terms of Reference, experts, and stakeholders (health and technology)
- Convert pitches into deliverables to the next Summit
- What is the funding model of the FG?
- Success KPI: go from idea to implementation/deployment
- Validation of source code

**If interested to continue the dialogue join the Mailing list:**

**[ai4health@lists.itu.int](mailto:ai4health@lists.itu.int)**