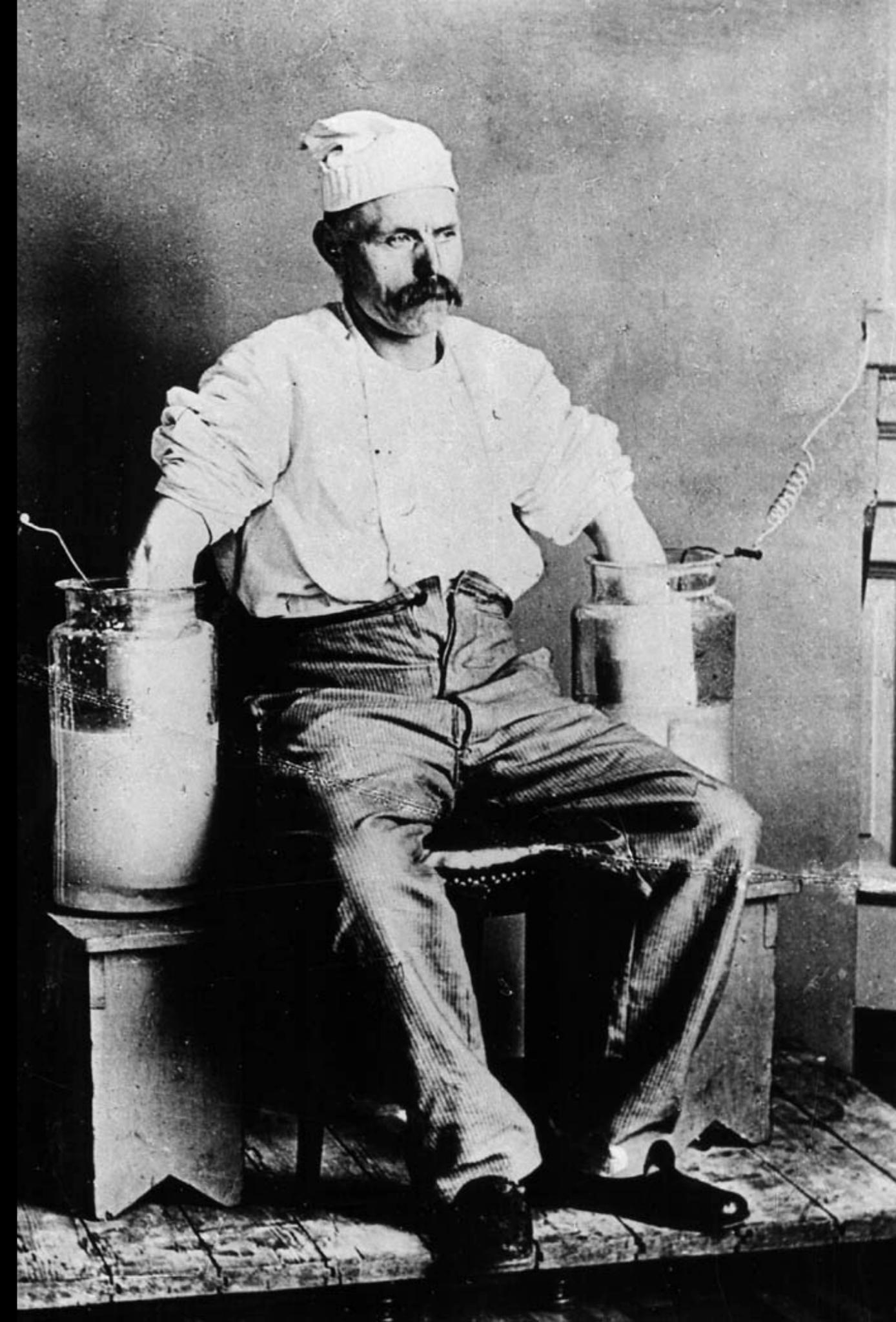


KOEN DE LOMBAERT MD MBA CO-FOUNDER YUZU LABS  
HOW NEW DIGITAL TECHNOLOGIES  
CAN BE USED TO IMPROVE  
DIAGNOSTICS REMOTELY

# THE ART AND SCIENCE OF DIAGNOSIS

- Diagnosis central to treatment, prognosis, and education
- 3 stage process:
  - history
  - examination
  - tests
- Technology leaps improve diagnostics



# REMOTE DIAGNOSTICS

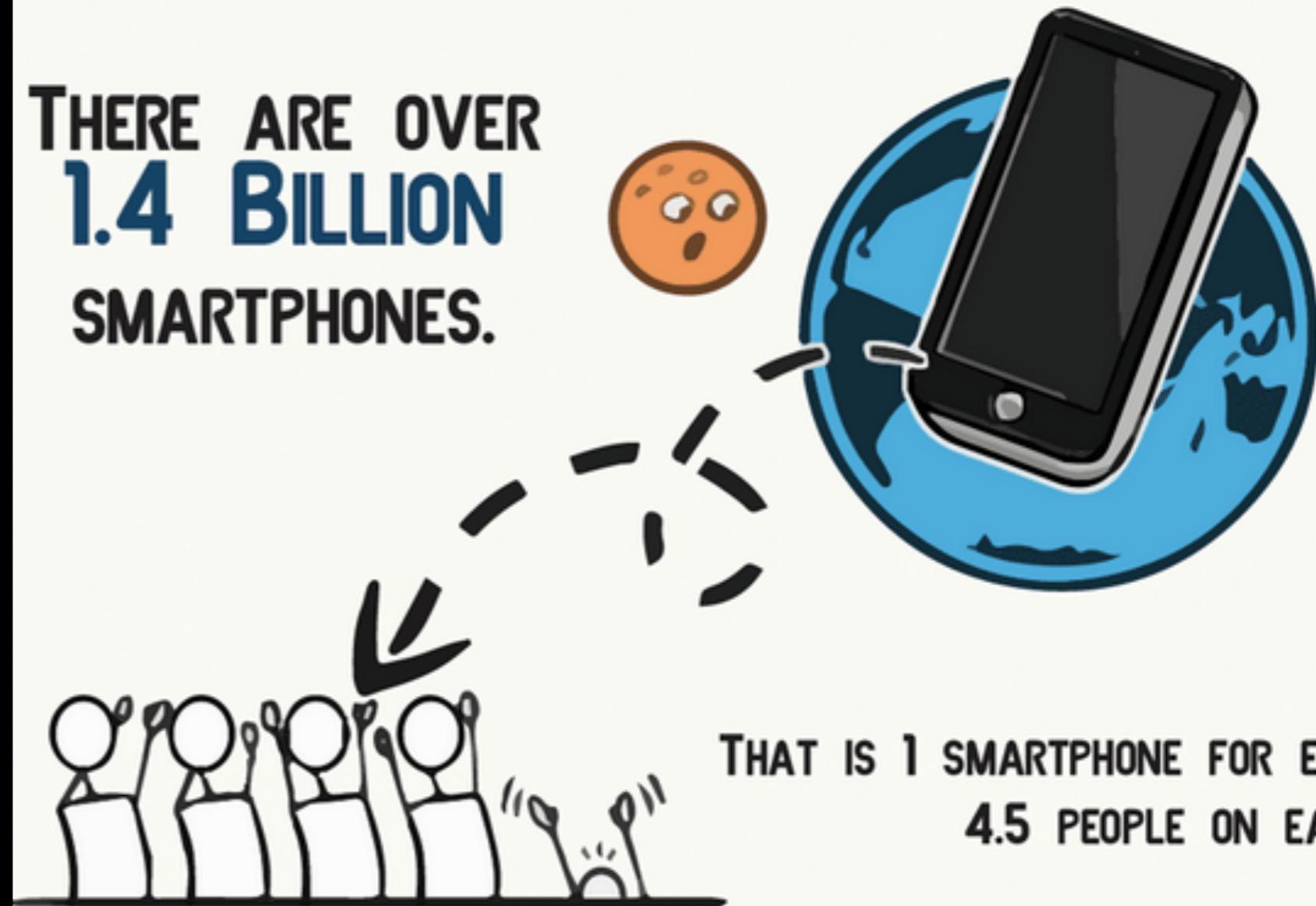
- **Effective tracking/monitoring of public health threats**
- **Chronic conditions & Infectious diseases**
- **Minimally trained personnel or consumers**
- **Cost**
- **Scale**



DIGITAL +  
REMOTE =  
SMARTPHONE

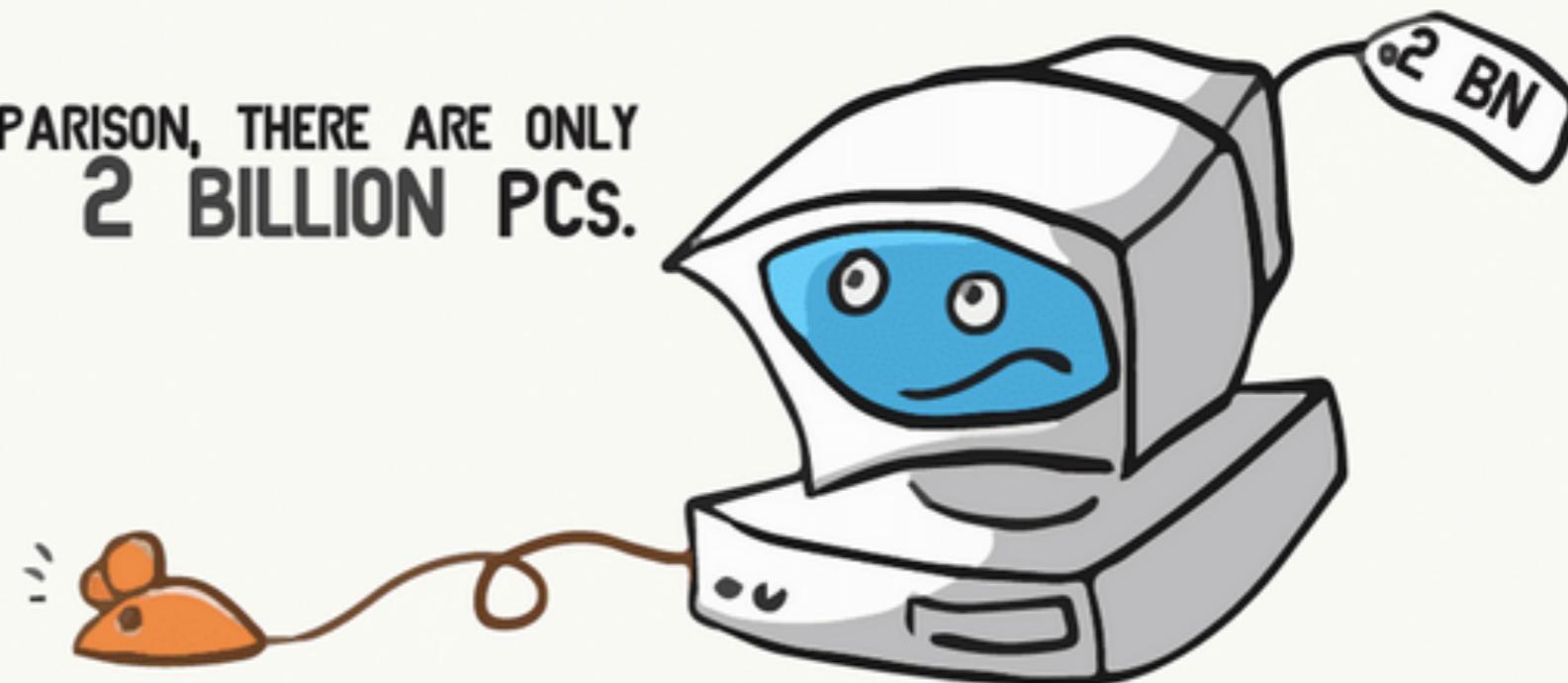
- Mobile, versatile audiovisual capability, sensors, GPS
- Incredible adoption rate

THERE ARE OVER  
**1.4 BILLION**  
SMARTPHONES.

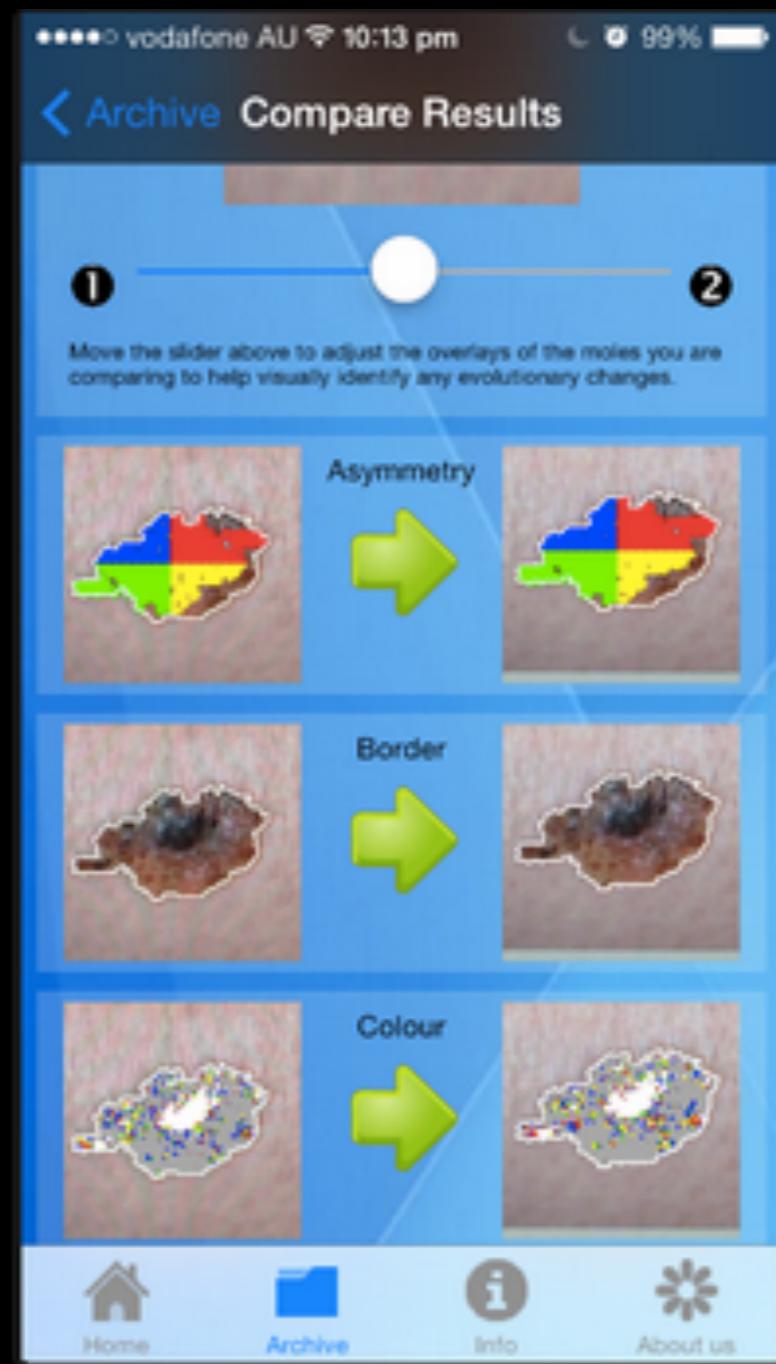
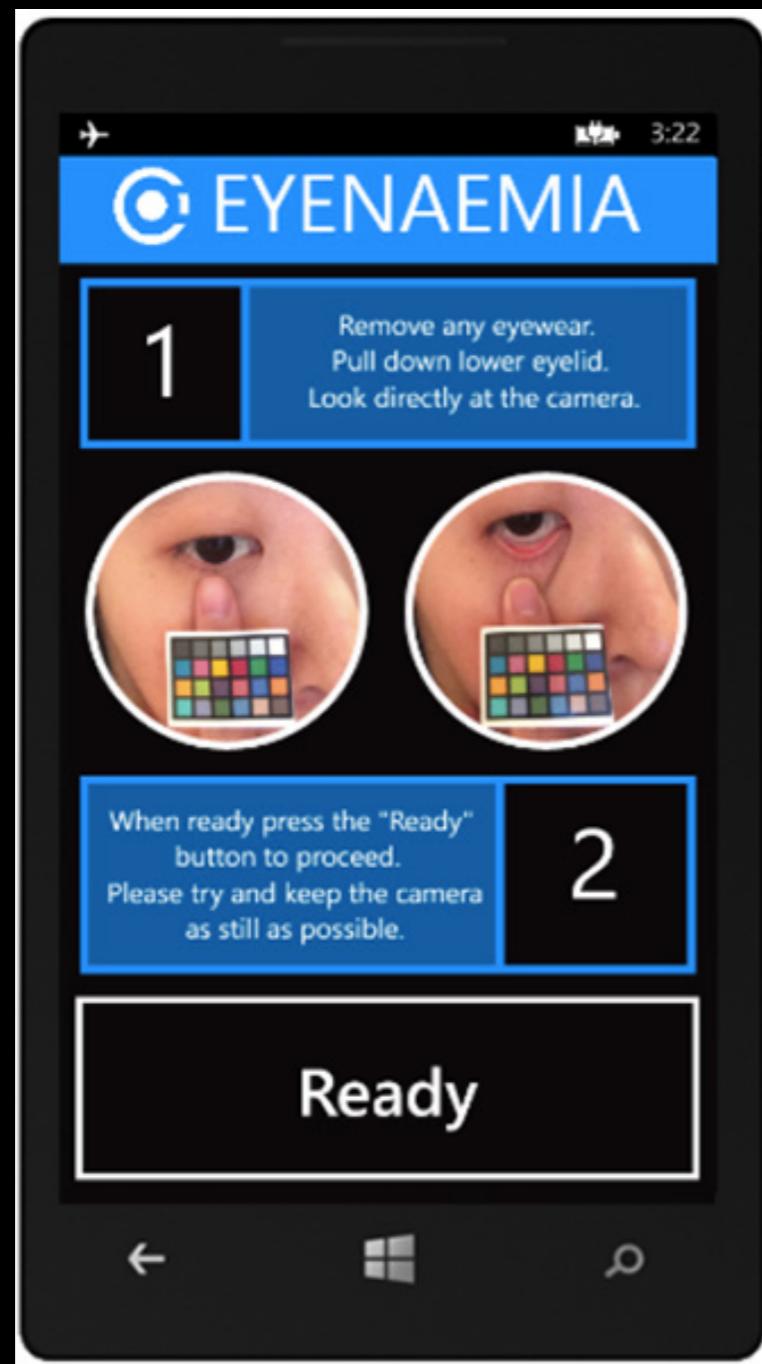


THAT IS 1 SMARTPHONE FOR EVERY  
4.5 PEOPLE ON EARTH.

IN COMPARISON, THERE ARE ONLY  
**2 BILLION PCs.**



# APP AS A DIAGNOSTIC



# ADD-ON AND APP AS A DIAGNOSTIC

- ECG
- Otoscope
- Stethoscope



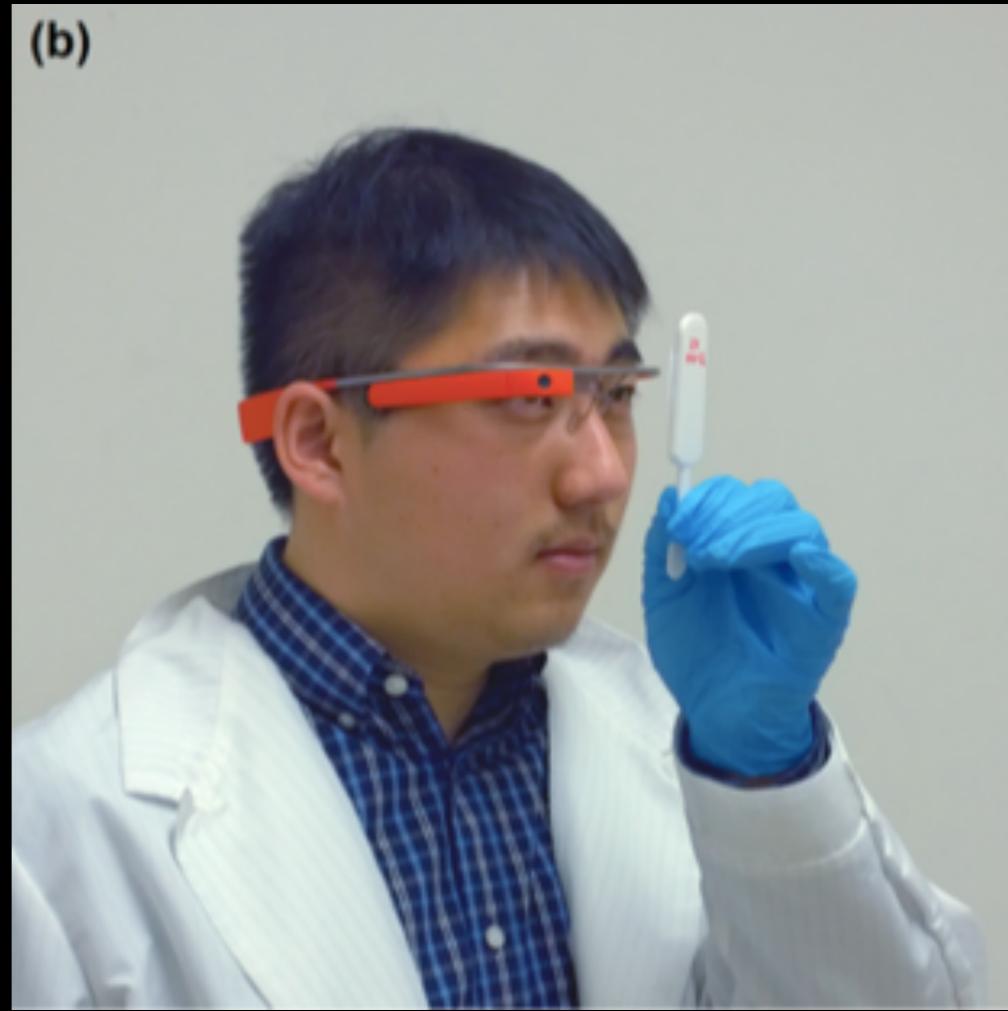


Peek Vision

[https://www.ted.com/talks/andrew\\_bastawrous\\_get\\_your\\_next\\_eye\\_exam\\_on](https://www.ted.com/talks/andrew_bastawrous_get_your_next_eye_exam_on)

# LATERAL FLOW, URINE, AND MOLECULAR TESTS

- Qualitative and quantitative RDT
- Colorimetric test
- No need for trained person
- Observer variability
- Metadata



# USE OF METADATA TO IMPROVE DIAGNOSTICS

- **Geotagging**
  - **Time**
  - **Type of test**
  - **Patient ID**
  - **Test result**

## QR Code Generation Tool

this document to generate the QR Code needed for your RDT analysis

A modal dialog box titled "QR Code result". It contains a QR code, a text instruction to print it on the ROT, and two buttons: "Print" and "Close". The dialog is centered over the main application window.

(b)

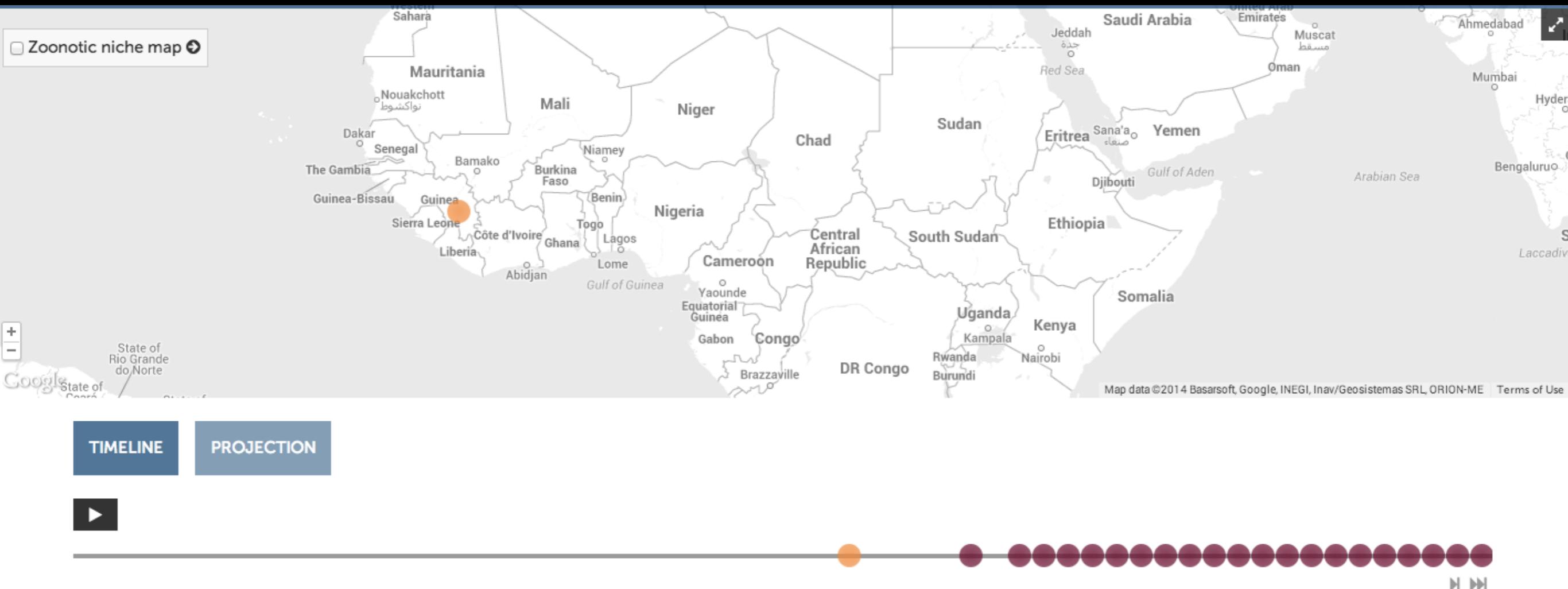
## RDT on Glass Mapping Tool

■ October 31, 2013 - Jan



# Immunochemical Diagnostic Test Analysis Using Google Glass, Fen et al., UCLA, 2014

# AMBIENT AWARENESS “SMART” MEDICAL DEVICES



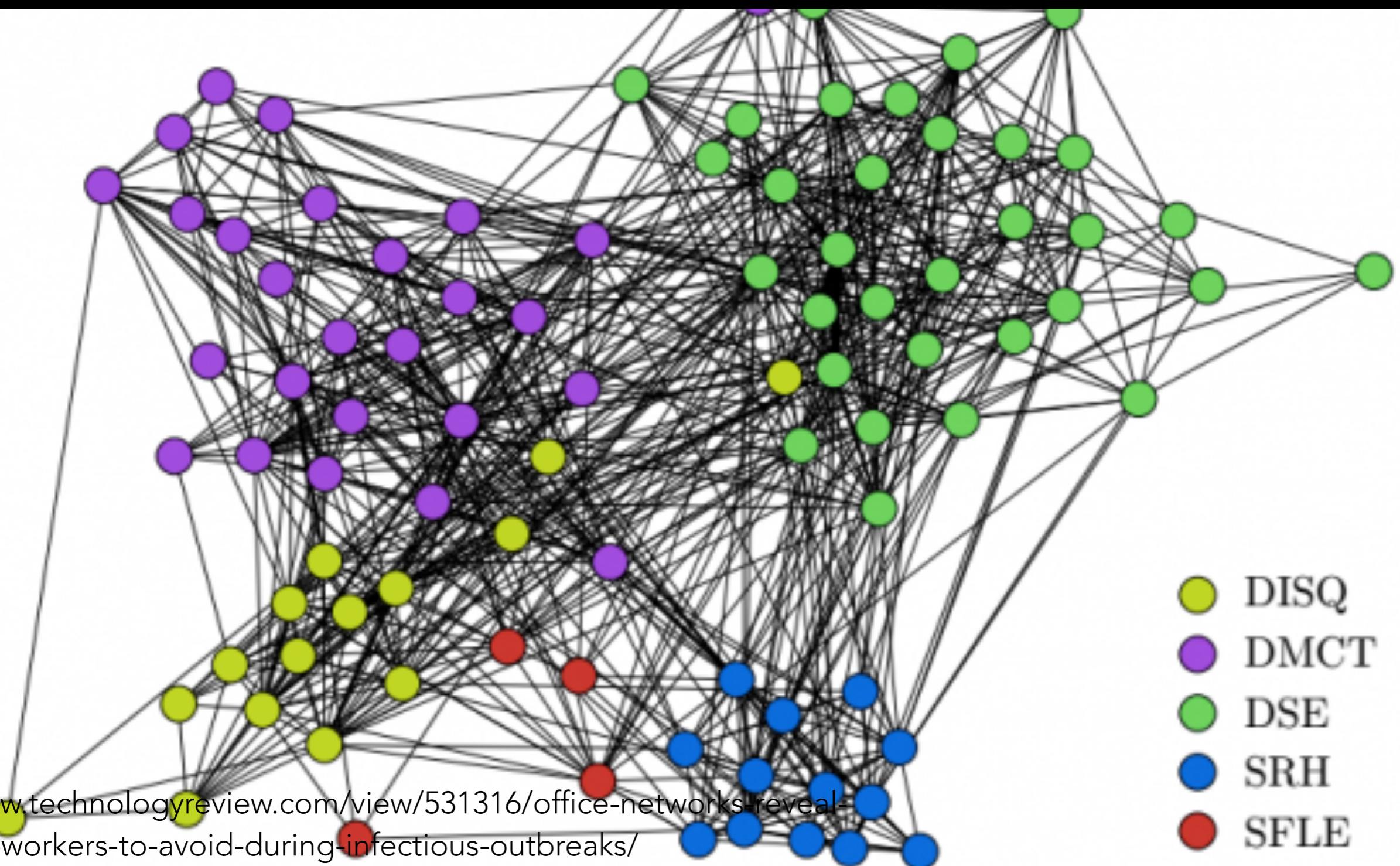
March 14

Santé : Une étrange fièvre se déclare à Macenta, plusieurs cas de ... - Africaguinee.com

- "A new disease that we do not know the name was reported in the prefecture of Macenta located 800 KM from Conakry, killing 8 people dead and several others contaminated learned Africaguinee.com."
  - Symptoms "manifested by anal and nasal bleeding."
  - Seems to resemble Lassa Fever.

# PREDICTION OF SPREAD OF INFECTION

# NETWORK ANALYSIS

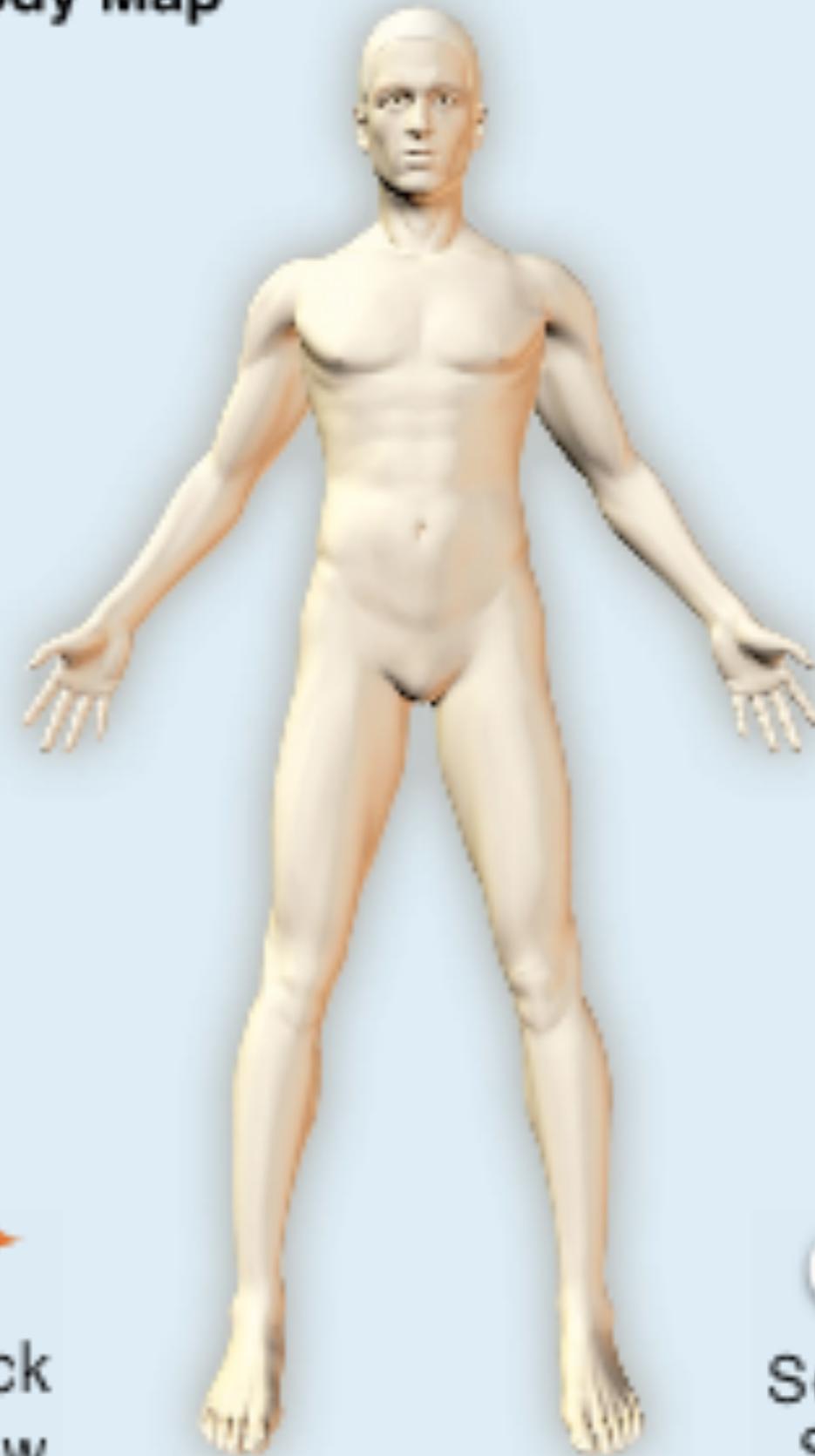


# WEB BASED TOOLS

- Symptom checkers
- Health assessment form
- Google included diagnosis in 58% of cases after manipulation by specialists

Googling for a diagnosis—use of Google as a diagnostic aid: internet based study

Body Map



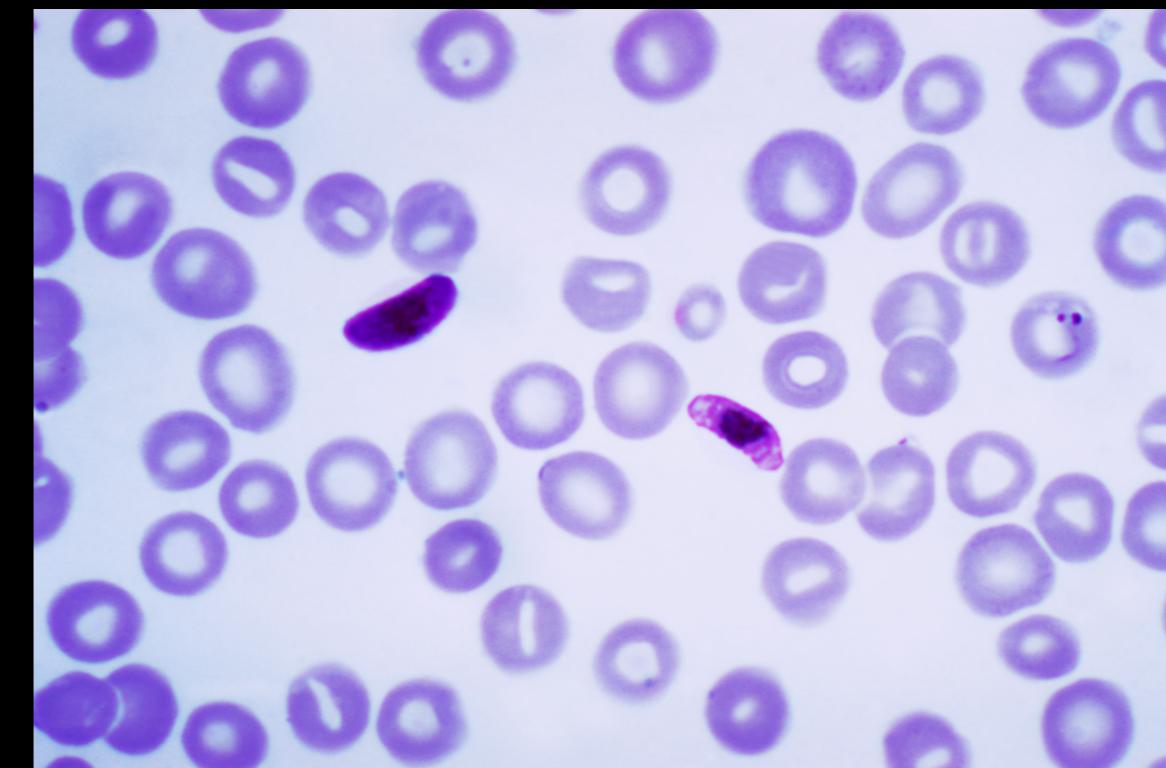
Back  
View



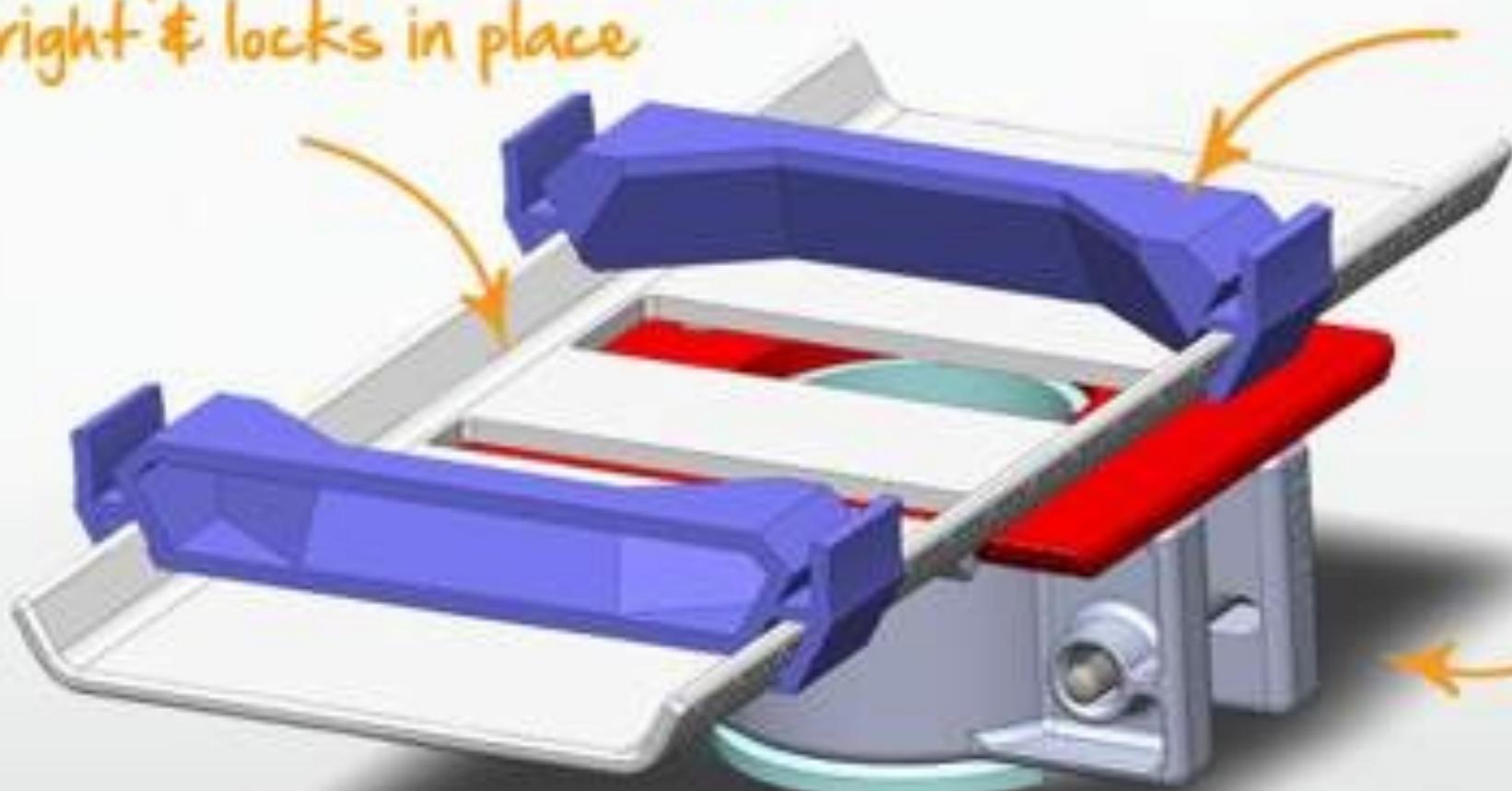
Select  
Skin

Don't know where

# LOW TECH SOLUTIONS

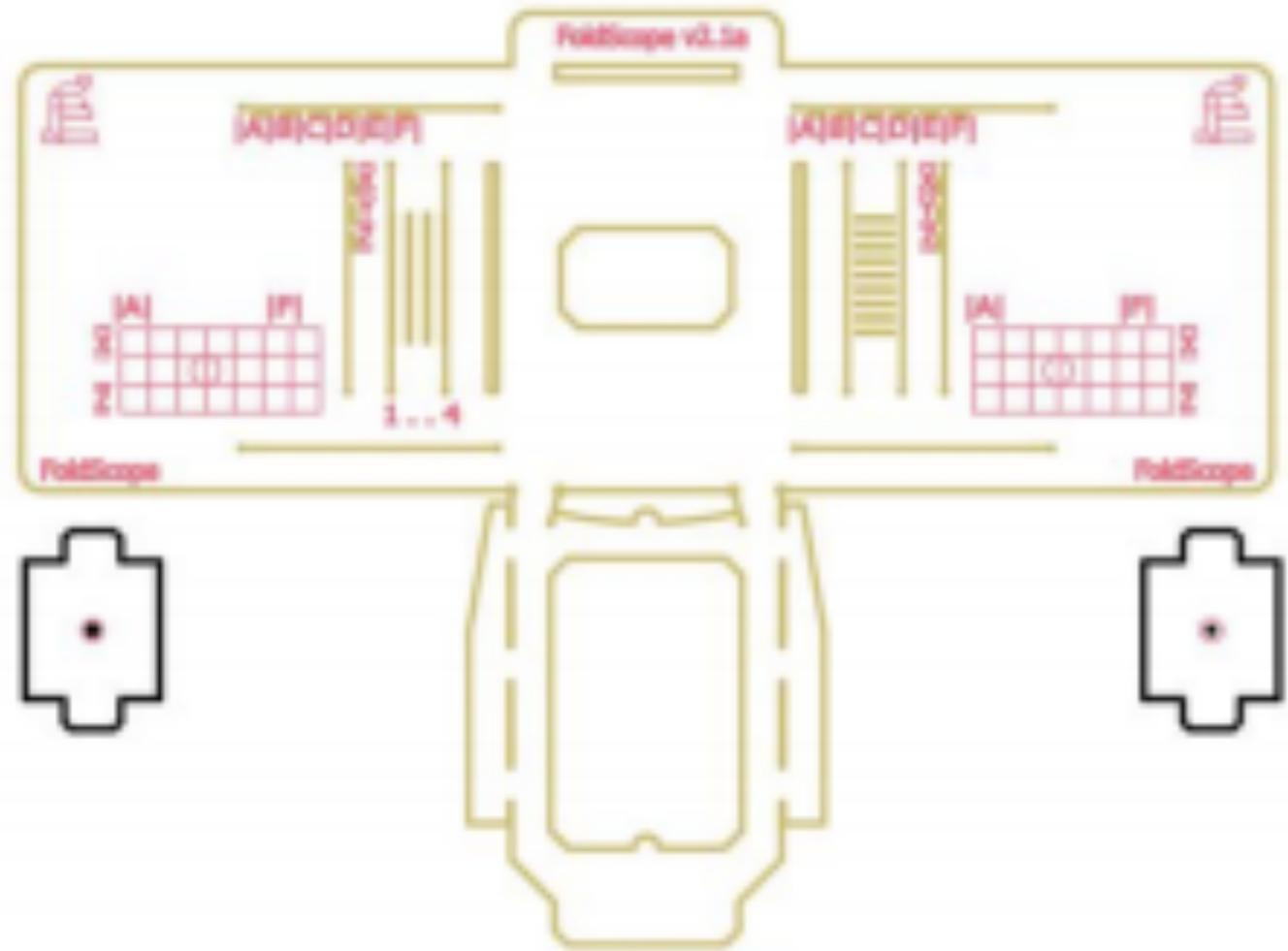


This platform slides left & right & locks in place



These clips slide up & down & lock in place

This base slides up & down & locks in place on any eyepiece

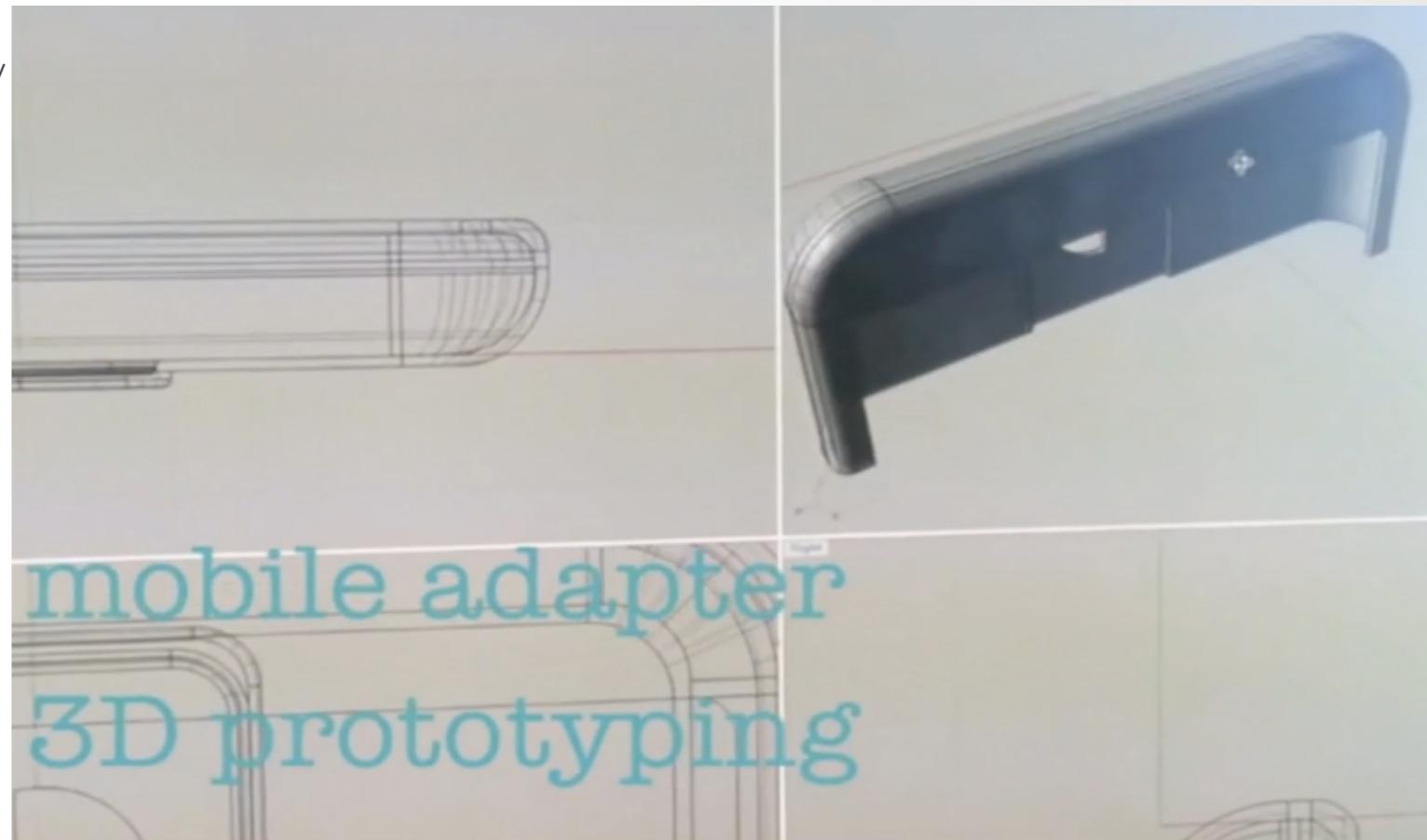


# THE DISTRIBUTION OF MEDICAL DEVICES

THE ORIGAMI MICROSCOPE

<http://www.technologyreview.com/view/525471/the-1-origami-microscope/>

3D PRINTING OF ADD-ONS



“Making health care more accessible and diagnosis possible, outside of doctor’s offices, is one of the key themes of digital health ”

<HTTP://VENTUREBEAT.COM/2013/09/11/HOW-NEW-DIGITAL-DIAGNOSTIC-TOOLS-CAN-HELP-REPAIR-HEALTHCARE/>



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