



MADIS TIIK MD, PHD

*HOW ICT CHANGES HEALTHCARE
&
WELLBEING SERVICES*

EDUCATION

- * Tartu University, *Medical Doctor*, 1996
- * Tartu University, *Family Doctor*, 2000
- * Nordic School of Public Health (Sweden) - *Diploma in Public Health*, 2003
- * Estonian Business School, *ICT Management*, 2001-2003
- * Tallinn University of Technology, *PhD* (Healthcare Engineering) 2012
- * Scripps Translational Science Institute (San Diego, USA), *Digital Medicine intern*, 2014-2015



CAREER

- * Family doctor 1998-
- * Estonian Society of Family Doctors, *Chairman* 2001-2008.
- * Estonian eHealth Foundation (EEHF), *Board member*, 2005-2007
- * Terviseagentuur Ltd. *CEO, Owner*, 2006-...
- * Estonian eHealth Foundation, *CEO*, 2007-2011
- * *Scientific adviser of the President of the Estonia*. Preparing report for EU Commission, how to improve ehealth after 2020. 2011-2012
- * Tallinn University of Technology (TUT), *eHealth Lab, lecturer* 2014-
- * Sitra (Finnish innovation fund), *Senior Adviser*, 2012-

HEALTH 1.0

AI 1.0

DIGITALIZATION

PACS

LIS

RIS

PIS

DEVICE
1

PHR 1.0

HEALTH 2.0

AI 2.0

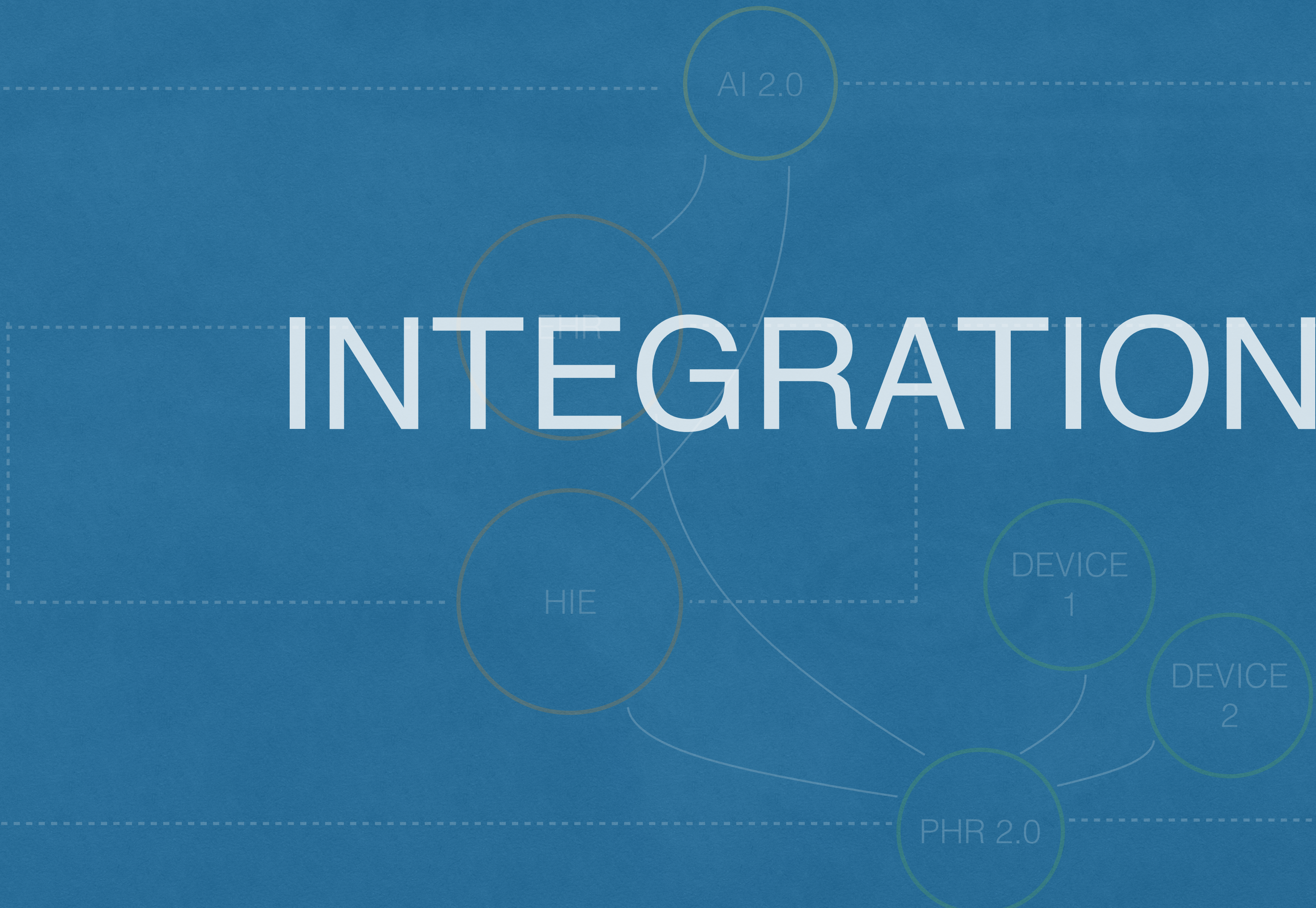
INTEGRATION

HIE

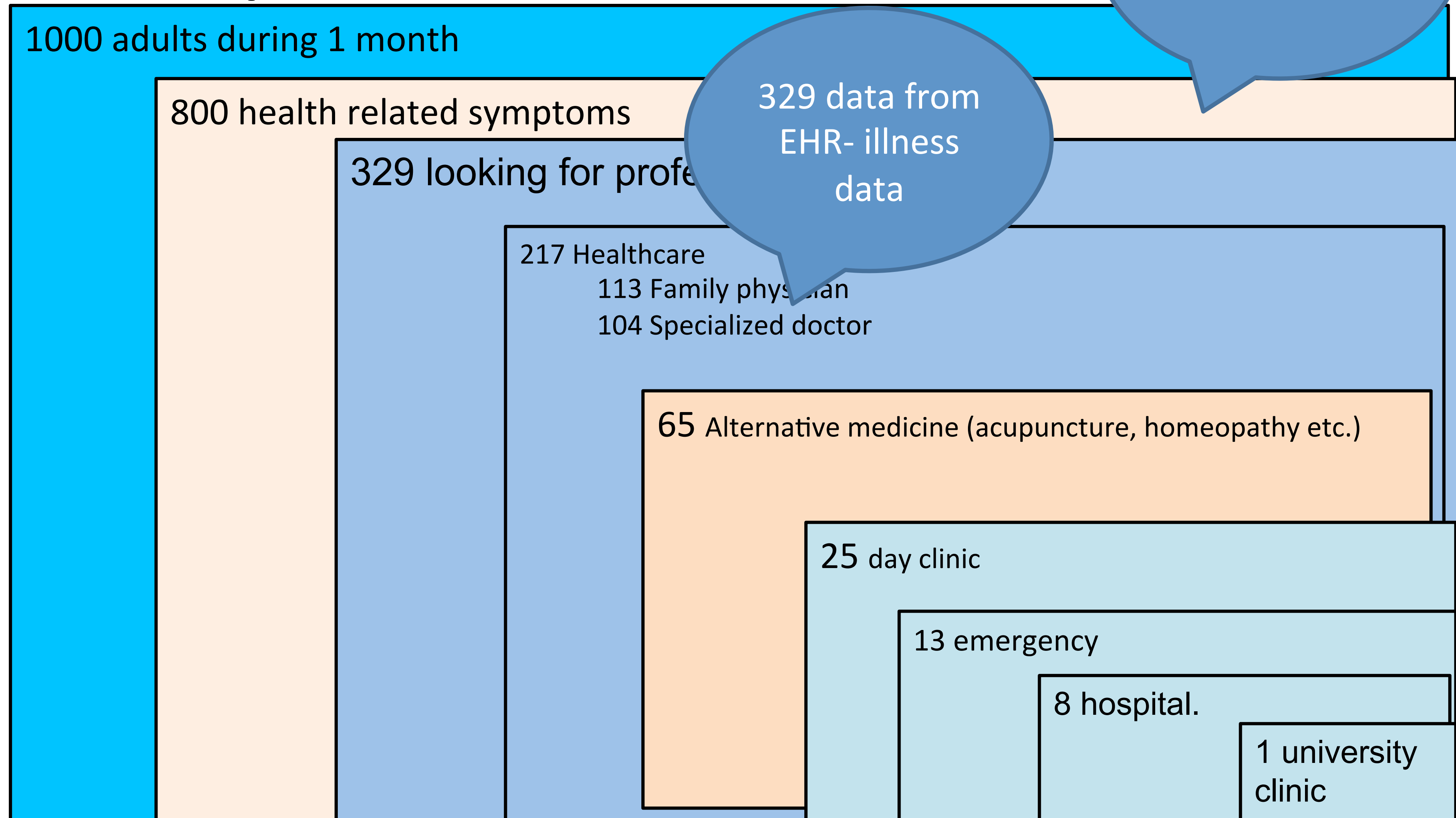
DEVICE
1

DEVICE
2

PHR 2.0

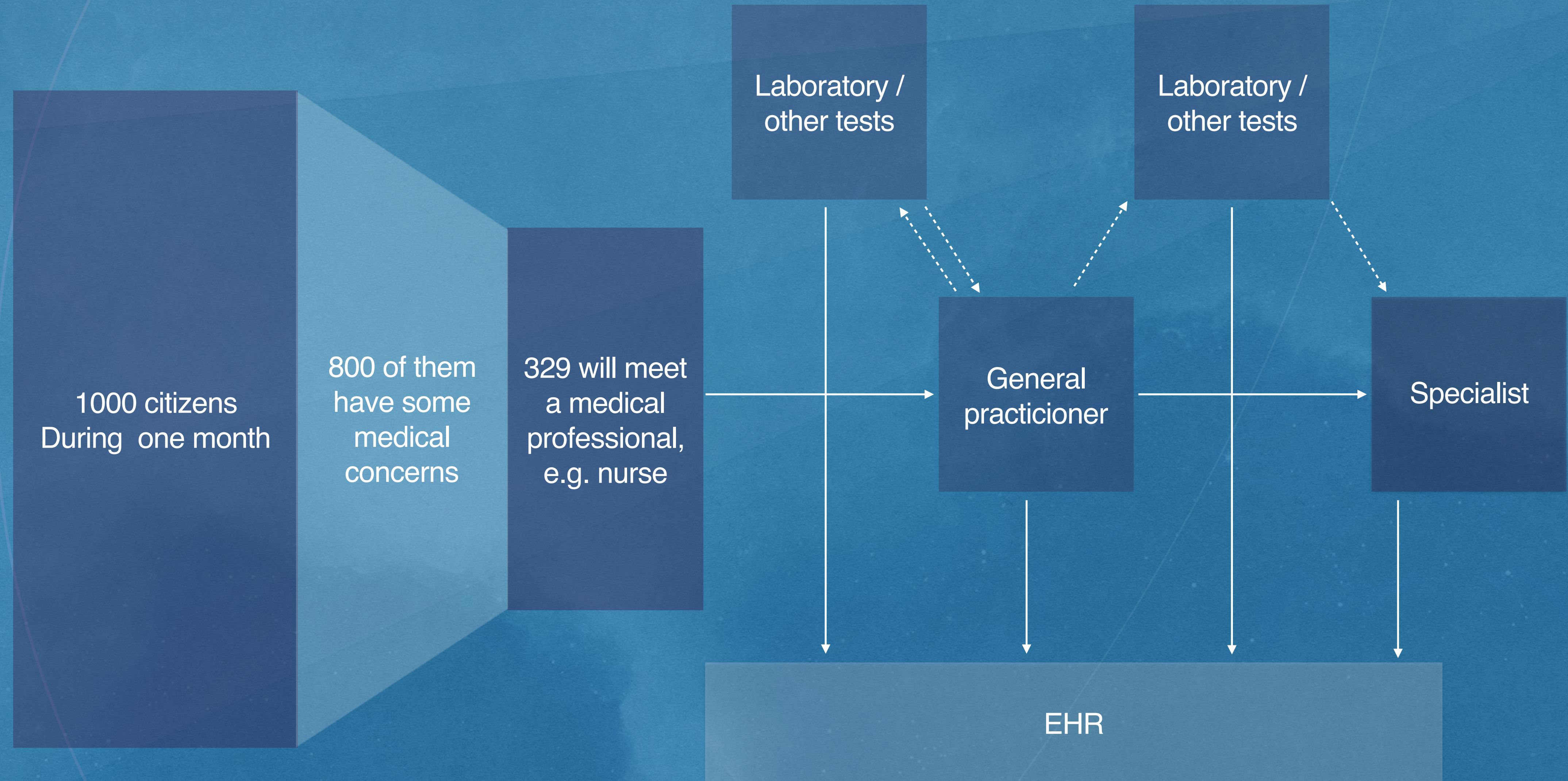


Where patients seek information



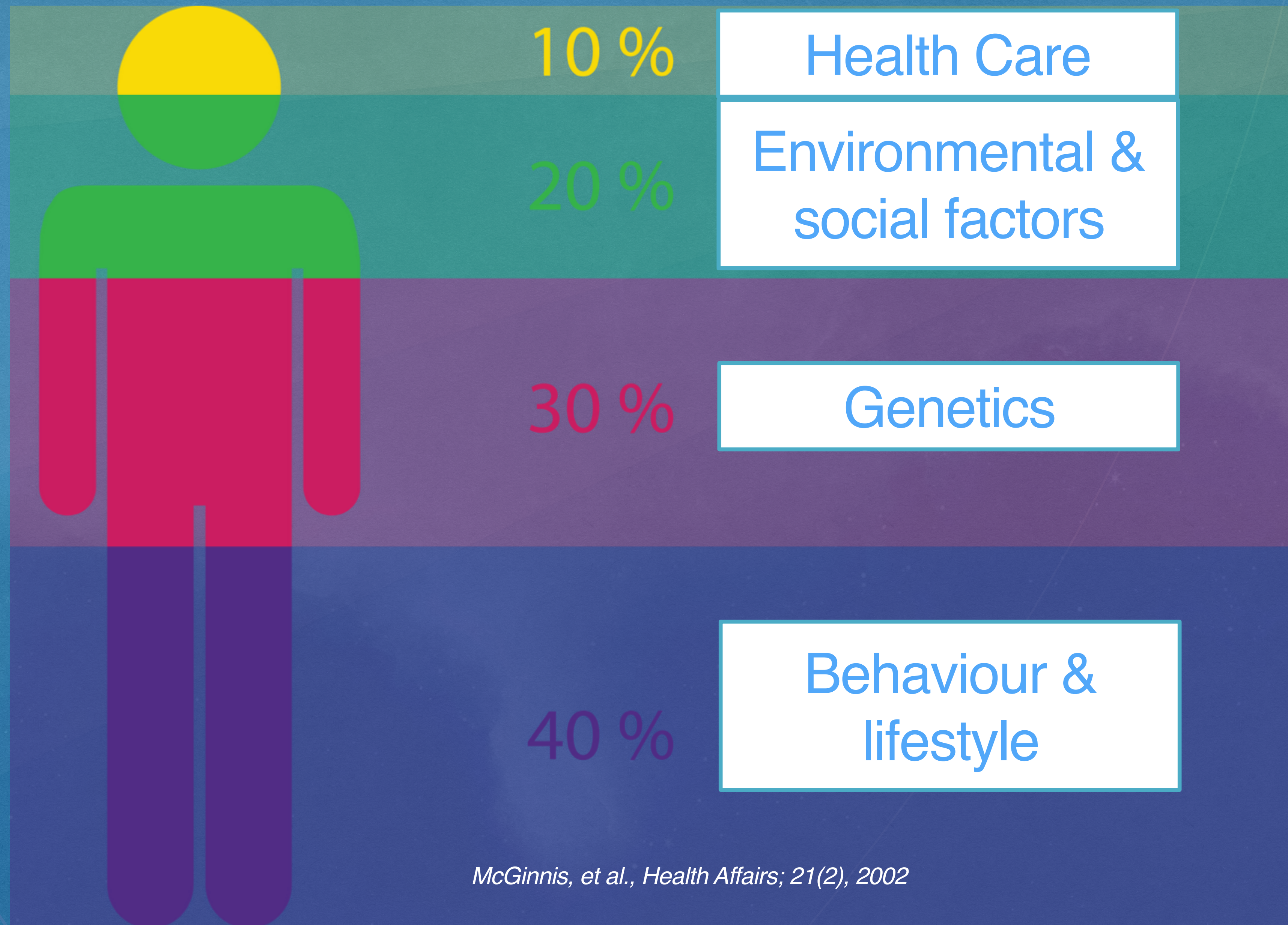
Green, LA. Fryer, GE Jr. Yawn, BP. Lanier, D. Dovey, SM (2001). 'The ecology of medical care revisited.' *New England Journal of Medicine*, 344(26): 2021–2025

HEALTHCARE SYSTEM TODAY



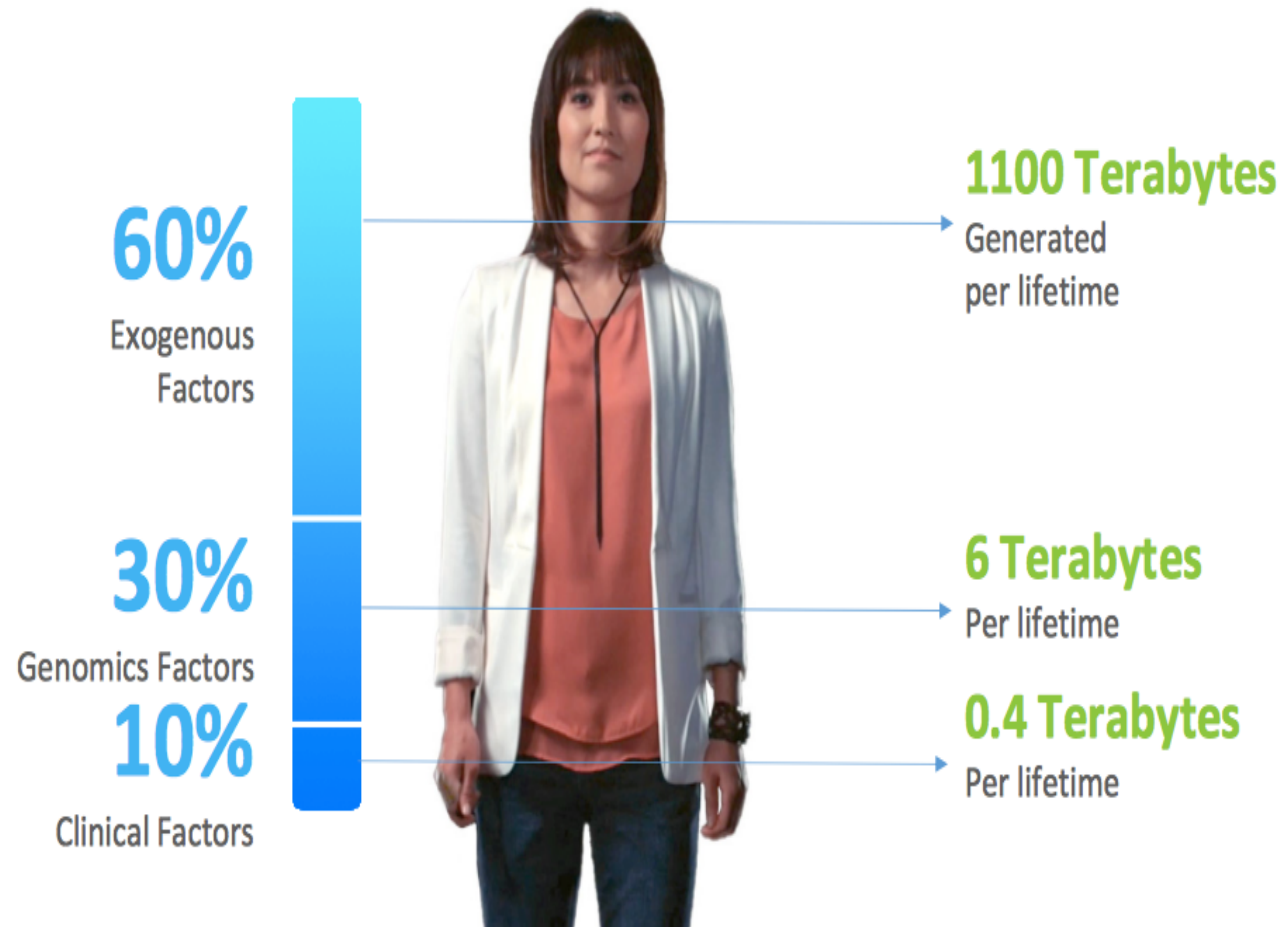
Green, LA. Fryer, GE Jr. Yawn, BP. Lanier, D. Dovey, SM (2001). 'The ecology of medical care revisited.'
New England Journal of Medicine, 344(26): 2021–2025

IMPACT OF DIFFERENT FACTORS TO WELLBEING



McGinnis, et al., Health Affairs; 21(2), 2002

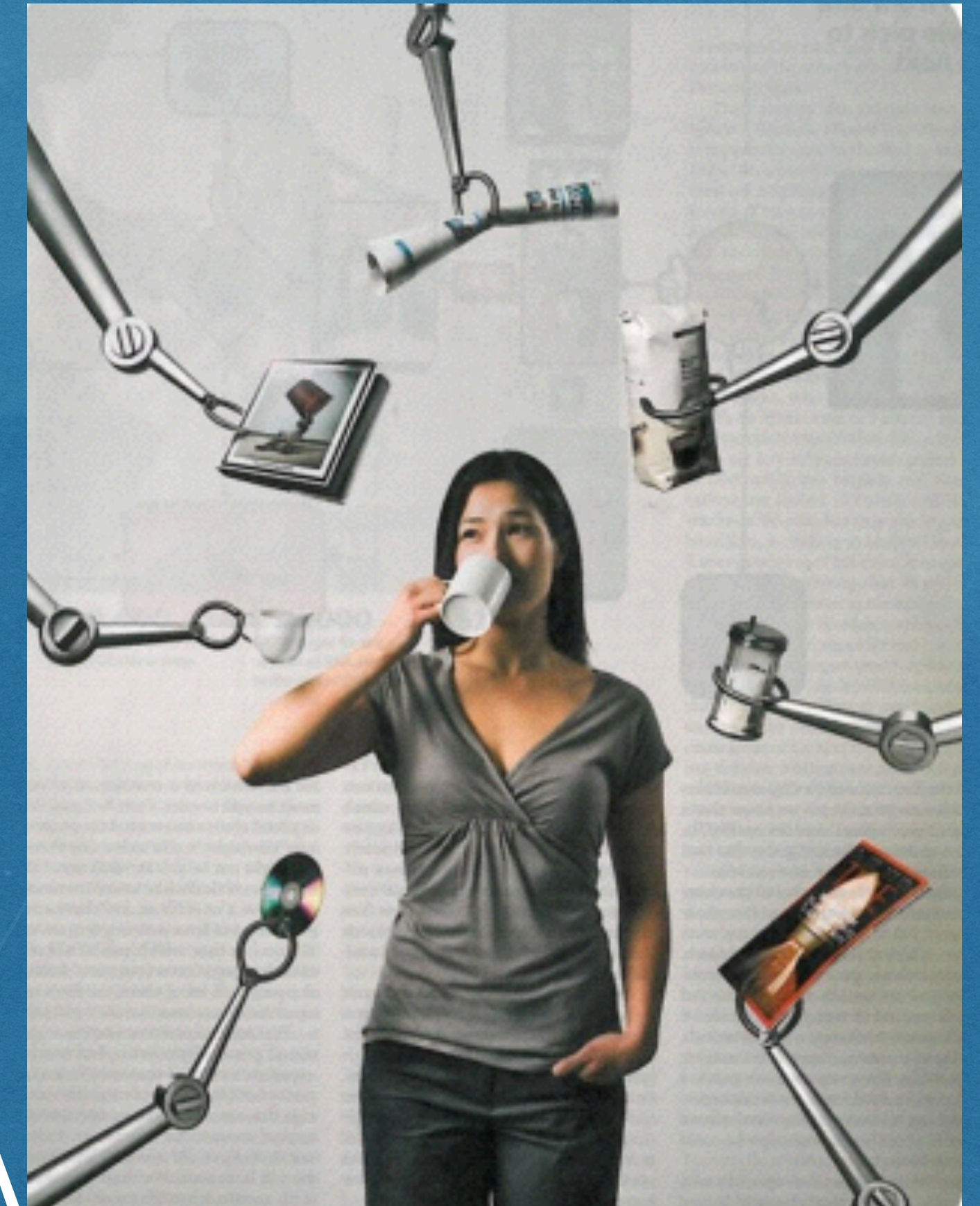
A VAST AMOUNT OF UNTAPPED DATA MAY HAVE A GREAT IMPACT ON OUR HEALTH



Source: J.M. McGinnis et al., "The Case for More Active Policy Attention to Health Promotion," Health Affairs 21, no. 2 (2002):78-93
<http://content.healthaffairs.org/content/21/2/78.full>

IMPACT OF PREVENTION

- Cardiovascular disease: 73-83% (Nurses Health Study, NEJM 2000;343:16-22, NEJM 2001;345:790-97)
- Diabetes type II: 58-91% (Tuomilehto, 2001 NEJM 344(18): 1343-50 Nurses Health Study, NEJM 2000;343:16-22, NEJM 2001;345:790-97)
- Cancer: 60-69% (De Lorgeril, Arch Int Med 1998;158:1181-87 HALE Project. Knoop JAMA 2004;292:1433- 1439)



READINESS TO USE E-HEALTH - CITIZENS

In 2013, Sitra conducted an interview survey that included 1085 Finnish citizens:

- **70 % think eHealth services are beneficial for them**
- **74 % want more eHealth services**

More than 2,400 Canadians participated in PwC's research: "What does the future of health care delivery look like?"

- **79% of Canadians indicate that they are comfortable with virtual monitoring** for chronic conditions
- **54% of Canadians indicate that virtual visits, home monitoring, and virtual wards are good care delivery options**

DOCTORS

80 % of US physicians believe **virtual assistants will drastically change healthcare by 2018** Nuance Communications survey 02/2013)

80 % of Spanish health professionals would be willing to use telemedicine if it were available to them (Telefonica 2013)

59 % of Canadian physicians believe that the use of mHealth tools and virtual care is inevitable, but adoption will take time (PwC's survey 09/2013)



REMOTE CONSULTATION

- MD live (US)
- BabylonHealth (UK)
- Meedoc (FIN)
- Netiarst (EST)
- Virtuwel (US)

Eye
Glucose-sensing lens
Digital fundoscope
Smartphone visual-acuity tracking
Automated refractive error
Noninvasive intraocular pressure

Ear
Smart hearing aids
Digital otoscope

Lung
Home spirometry
Pulse oximetry
Inhaler use
Breath-based diagnostics
Breathing sounds
Environmental exposure

Blood
Continuous glucose
Transdermal Hb
Pathogens (genomics-based)
PoC blood tests

Skin
Temperature
Gross lesions
Pressure sensor (wound care)
Sweat chemistry
Cutaneous blood flow

Other sensors and monitors
Pill-box and -bottle
Posture
Body position
Activity
Sleep

Bladder and urine
Comprehensive urinalysis
STDs (genomic detection)
Diaper-based sensors

Brain and emotion
Wireless mobile EEG
Seizure
Autonomic nervous activity
Head-impact sensor
Intracranial pressure (noninvasive)
Stress recognition (voice, respiration)

Heart and vascular
Continuous BP tracking
Handheld ECG
Heart rhythm
Cardiac output
Stroke volume
Thoracic impedance (fluid)

Gastrointestinal
Endoscopic imaging
Esophageal pH
Medication compliance
Fecal blood or bilirubin
Gut electrical activity
Chewing

Watching over one's health
Pulse
BP
Temperature
Activity
Hydration
Sleep stages
Seizure
Respiration rate
O₂ saturation
Blood CO₂
Blood glucose
ECG (single-lead)
Cardiac output
Stroke volume
Stress:
Heart-rate variability
Electrodermal activity

How Tiny Sensors Are Driving Innovation in Medicine



Sources:
ScienceTranslationalMedicine.org 15
April 2015 Vol 7 Issue 283 <http://www.stsiweb.org/wp-content/uploads/2015/04/Sci-Transl-Med-2015-Steinhubl.pdf> & <http://www.kqed.org/futureofyou/2015/09/02/how-tiny-sensors-are-driving-innovation-in-medicine/>;

IPHONE AS A ...

- Otoscope (CellScope)
- Portable EKG (AliveCor)
- Microscope
- GLUCOMETER : (IBGStar)
- DERMATOSCOPE (Handyscope)
- Ultrasound (Mobisante)
- BLOOD PRESSURE Monitor (Withings)
- SPIROMETER (SpiroSmart App)
- Alcohol Breathalyzer (iPega)
- Brain SCANNER
- Eye Clinic (PEEK VISION)
- Ophtalmoscope (Welch Allyn)

How Africa's mobile revolution is disrupting the continent

By **Nmachi Jidenma**, Special to CNN

January 24, 2014 — Updated 1347 GMT (2147 HKT)



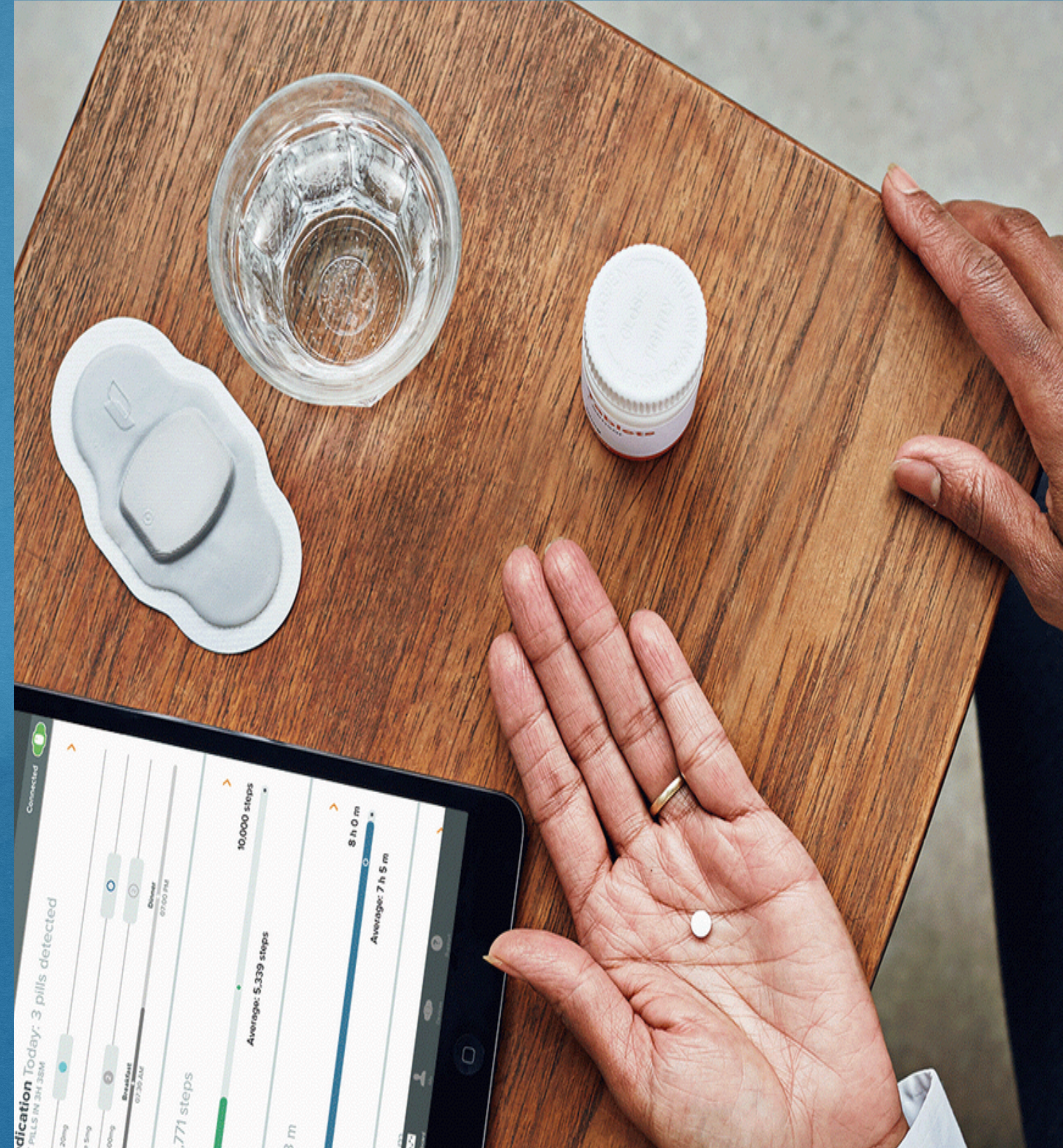
eHealth is transforming healthcare and **potentially saving lives**, especially in low-income countries

A technician scanning the eye of a woman with a smartphone application in rural Kenya.

CLINICLOUD'S SMART STETHOSCOPE AND THERMOMETER LET DOCTORS CHECK YOUR VITALS FROM THE CLOUD



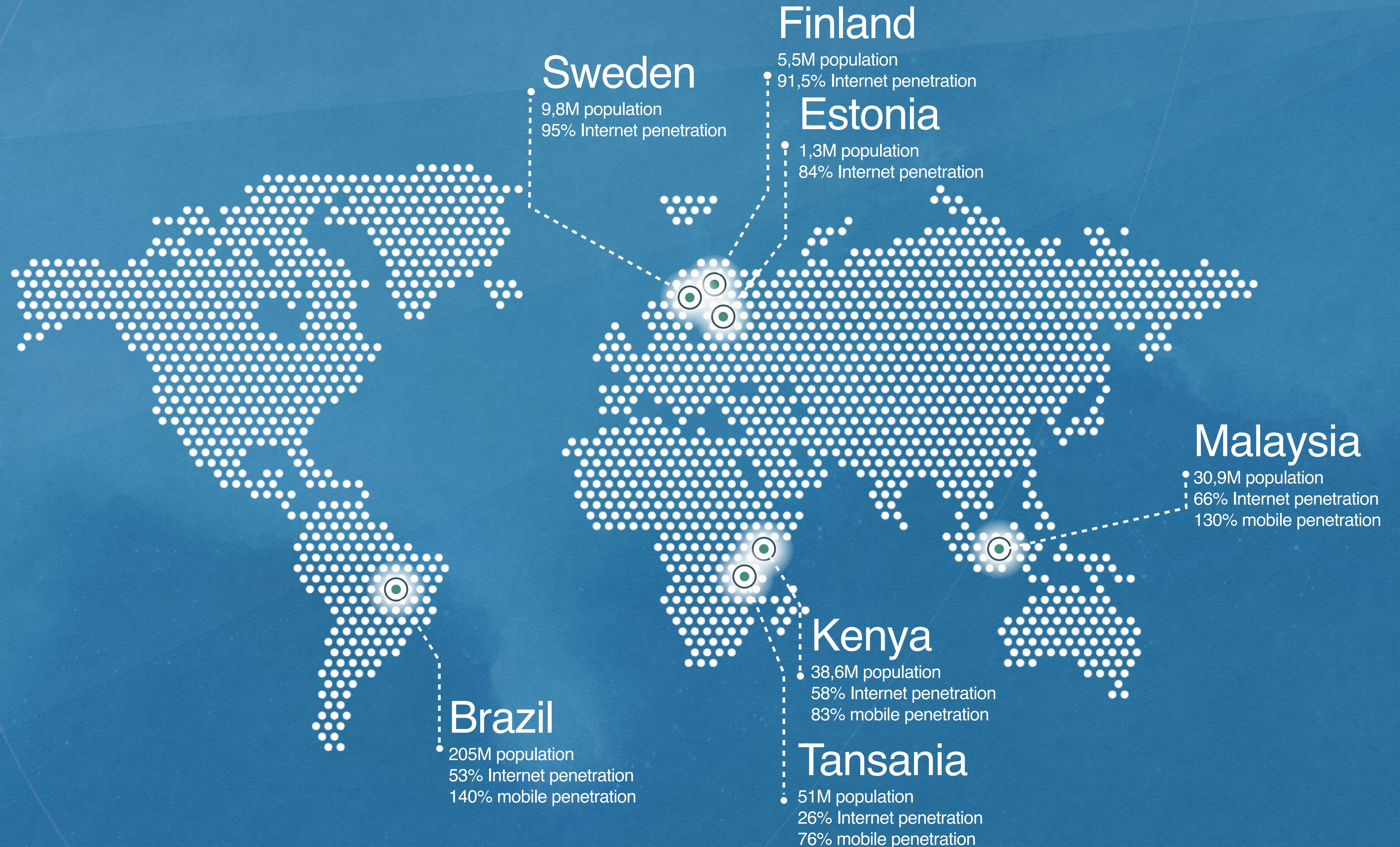
PROTEUS DIGITAL HEALTH

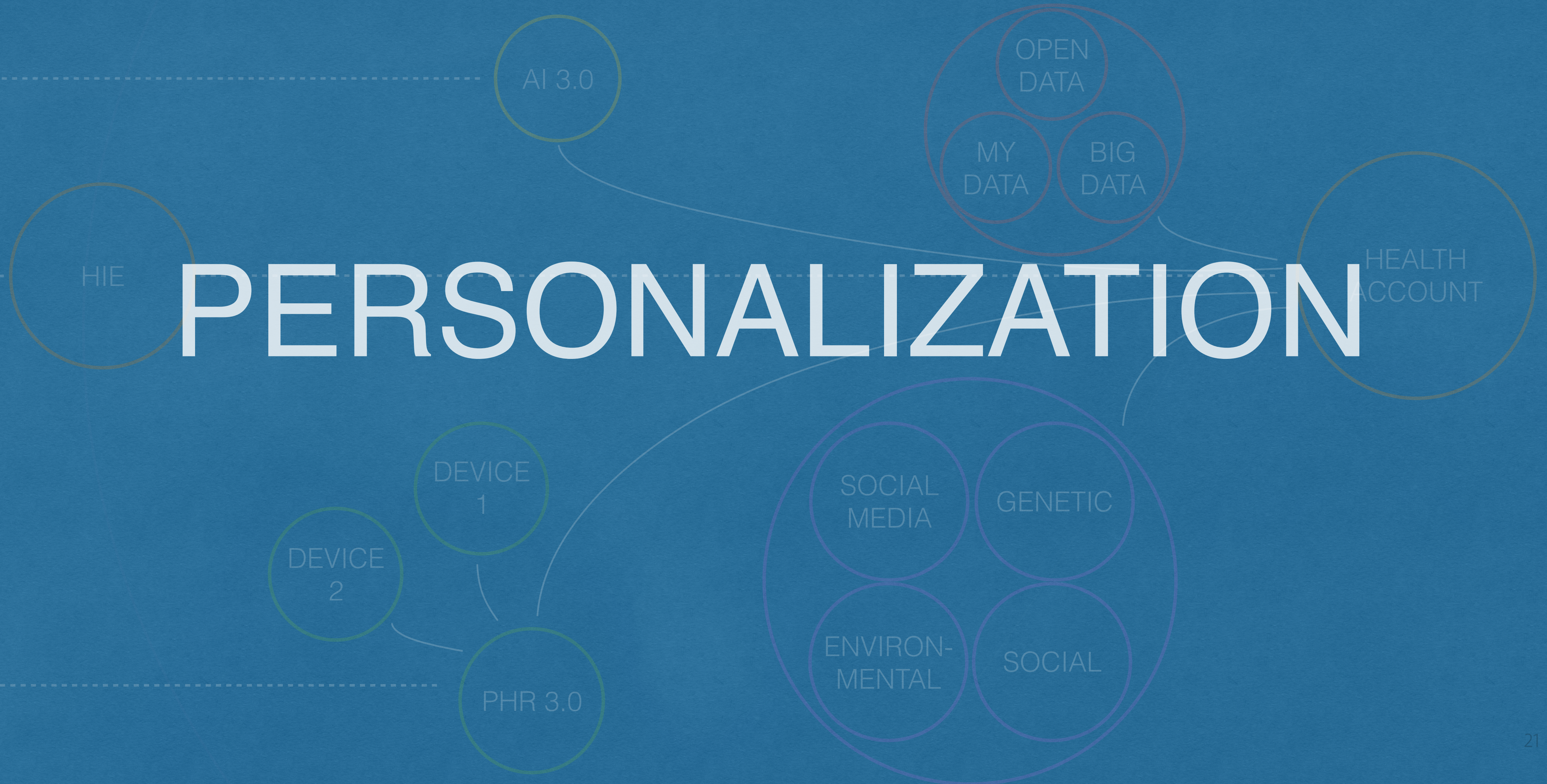


NEW MARKETS

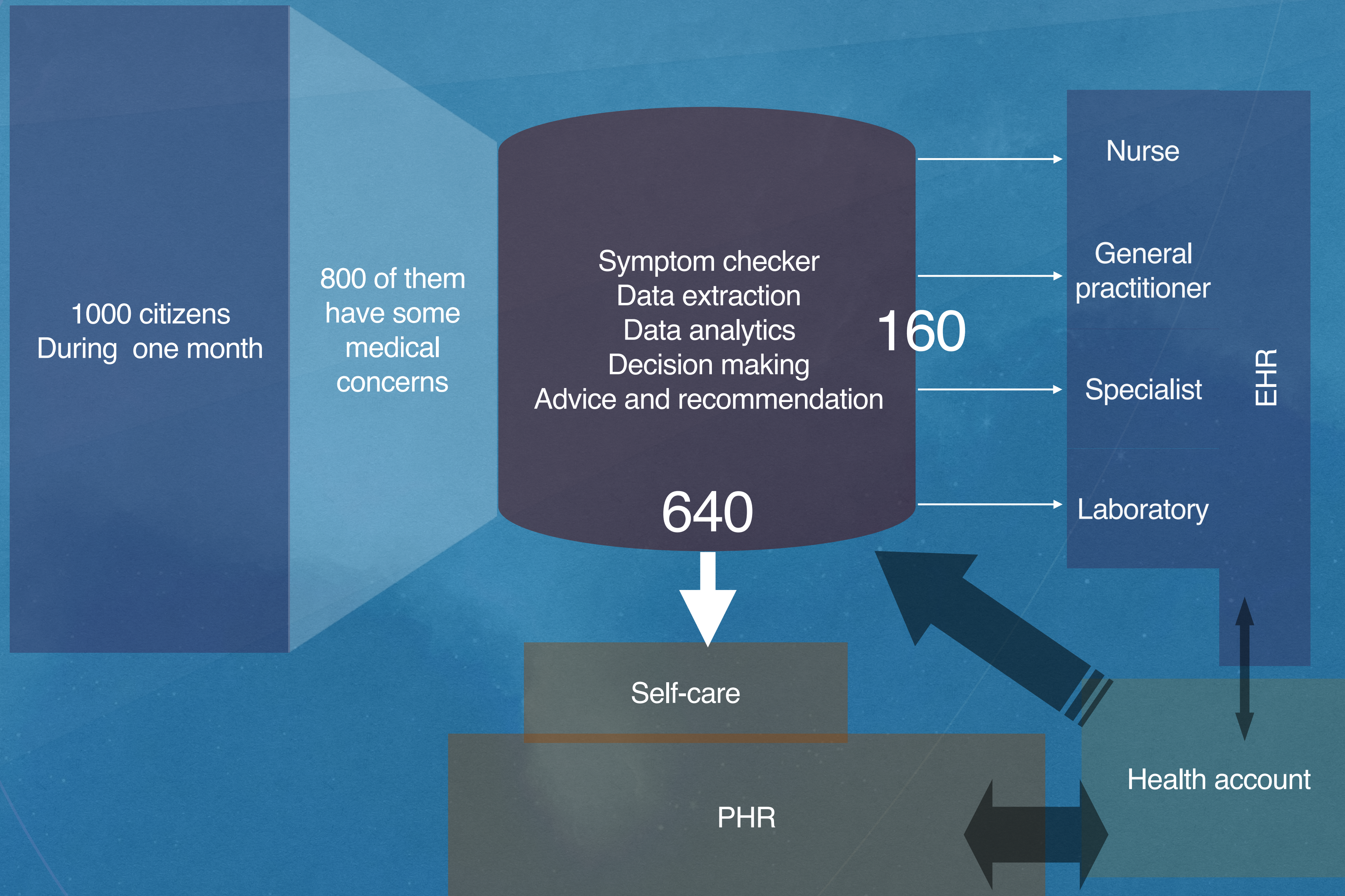
- “DURING THE NEXT 10 YEARS 5 BILLION NEW CLIENTS WILL ENTER INTO THE HEALTHCARE SERVICES MARKET” - FORBES
- MOBILE TECHNOLOGIES ARE INCREASINGLY ACCESSIBLE AND CHEAPER

MOBILE TECHNOLOGY AS A ENABLER





WORKFLOW IN HEALTH 3.0



HEALTH 1.0 TO HEALTH 3.0





The solutions feature Sophie, an empathetic avatar to collect data about the user and share it with healthcare providers and caregivers. Sophie utilizes Watson's cognitive resources to provide curated information about medical conditions and health & wellness.

InterConnect Demo: <https://vimeo.com/156499030>

Pilot program with Veterans Health Association:

- 8 million veterans
- 350k medical & administrative staff

Ability to connect with biometric devices

CONTACT INFORMATION

GET IN CONTACT FOR FURTHER COOPERATION

- * Key-note presentations
- * Company and government consultations
- * Business proposals
- * Round tables and discussion groups

*“Accelerating innovation
saves healthcare”*

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