ACSION | Advanced Care Solutions and Insights for Optimization

Optimizing Technology Applications for Health Outcomes and Financial Sustainability

Anguilla, 7 November 2019

FOR FURTHER INFORMATION

	ACSION Headquarters	ACSION Sint Maarten	ACSION Suriname
Address	Rooi Catootjeweg 1A Willemstad Curaçao	P.O. Box 719 Philipsburg Sint Maarten	Rebostraat 63 Paramaribo Suriname
Phone	+(599-9) 737-3595	+1721 5862187	+597 458160
Website	www.acsiongroup.com		
eMail	javier.asin@acsiongroup.com		

NON DISCLOSURE STATEMENT

The information in this document may not to be copied, stored in an electronic database, made publicly available in any way or form, either electronically, mechanically, by means of photocopying, recording or any other way without the prior written consent of ACSION

Agenda

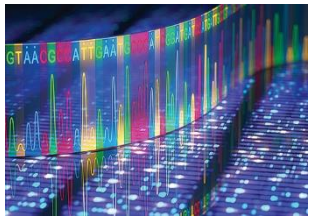
- **Most promising disruptive technology applications**

- **Innovation is not the objective …**
  - What is the objective?

- **Where are (technological) innovations most needed?**

- **How to achieve meaningful impact of innovations in our countries**

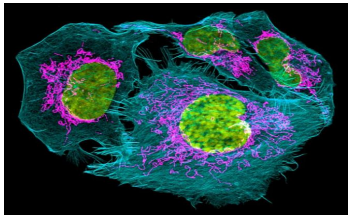
The most promising technologic developments and innovations



Next-Generation Sequencing (NGS)

Diagnostics

Robotics

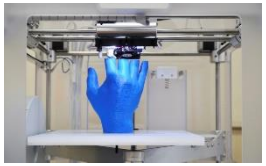


Connectivity

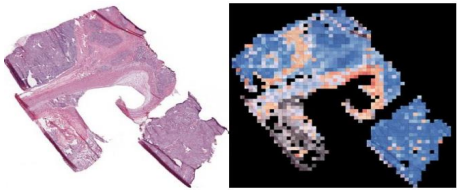
Telehealth

Artificial Intelligence

Internet of Medical Things

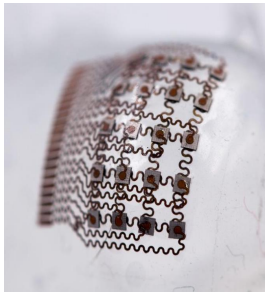


3D printing



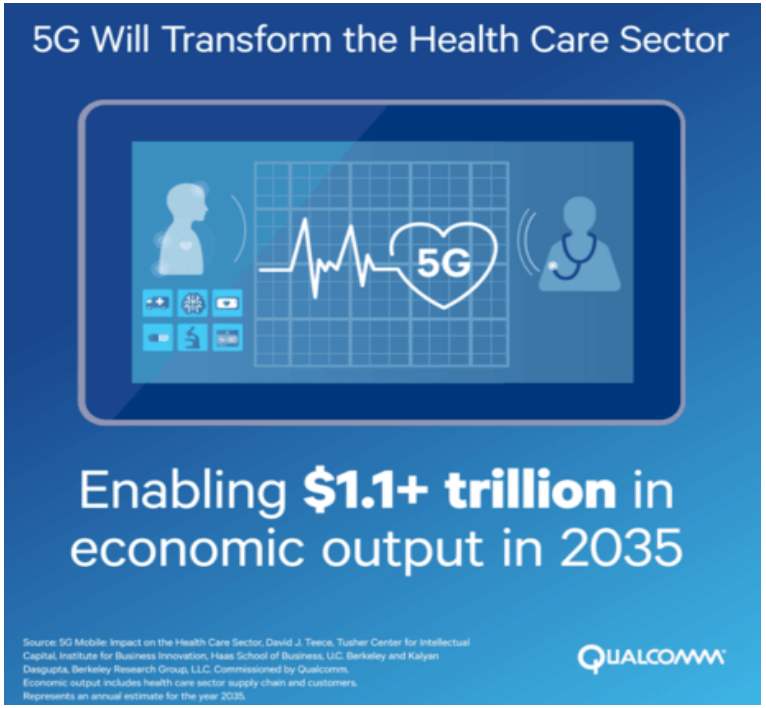
AI in diagnostics

Virtual Reality



Connectivity

Mobile technology



5G enhanced Mobile BroadBand (eMBB) data rates and hyper-connectivity will allow analysis of numerous patient medical data feeds simultaneously and the ability to provide personalized treatment for patients

Information Systems for Health (IS4H)

Share databases, to compile comprehensive personal data records. Not only care information systems, but all systems with data related to health should be included. Including the ones with data on Social Determinants of Health (SDOH)

ACSION

Source: Deloitte

Patient engagement

TELEHEALTH

Telehealth offers a more convenient way for consumers to access care while potentially reducing office visits and travel time. This convenient care model has the potential to increase self-care and prevent complications and ER visits

Source: Deloitte

VIRTUAL REALITY (VR) IN BEHAVIOR CHANGE

Virtual reality can engage patients in simulated sensory experiences that could accelerate behavior change in a way that is safer, more convenient, and more accessible. Research has shown positive impacts from VR in treating alcohol addiction and in changing behaviors to improve wellness, such as weight management and smoking cessation

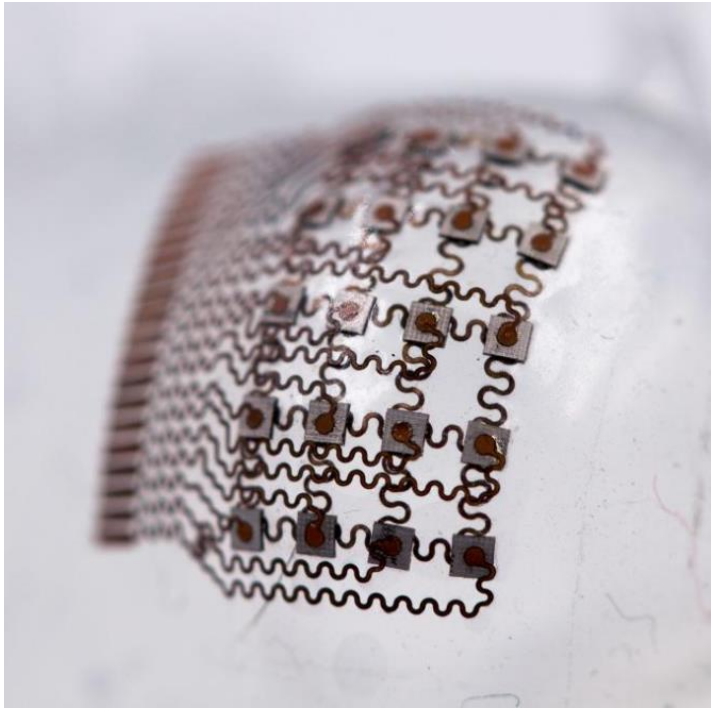
Continuous monitoring

KEEPING AN EYE ON HEALTH

Forget the finger-prick blood test. The race is on to create contact lenses that track glucose levels from tears. South Korean researchers have been able to attach transparent, flexible electronics that won't block vision while wirelessly relaying electricity to run glucose sensors. —Eve Conant

PHOTOGRAPH BY KIM KYOUNG CHAE, UNIST

A PATCH THAT READS DEEP



This wearable patch, smaller than a postage stamp, keeps the beat—heartbeat, that is. It measures blood pressure deep within the body by emitting ultrasonic waves that pierce the skin and bounce off tissues and blood, feeding data back to a laptop. —Eve Conant

PHOTOGRAPH BY CHONGHE WANG AND SHENG XU, UC SAN DIEGO

ACSION

Source: National Geographic

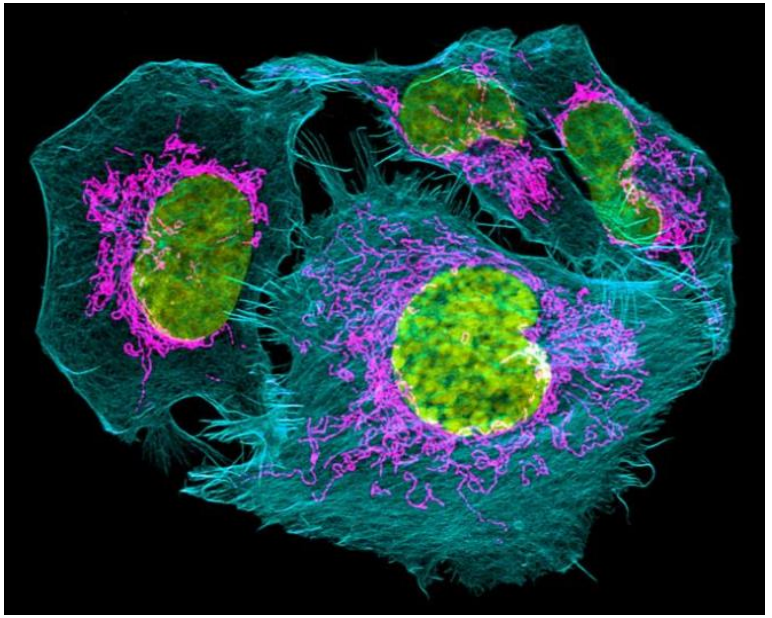
Early and better diagnosis of cancer

KEEPING AN EYE ON HEALTH

A smartphone app in development at the University of Washington could help diagnose pancreatic cancer by checking the whites of the eyes for signs of jaundice. Snap a selfie and the app would use it to spot elevated bilirubin levels, a possible sign of the disease. —Lori Cuthbert

PHOTOGRAPH BY REBECCA HALE

BETTER PROSTATE CANCER ANALYSIS



High-grade prostate cancers can be lethal, low-grade cases may need only monitoring—and both may benefit from recent advances at the Cleveland Clinic. One research team found that patients with a testosterone-based genetic anomaly had different responses to certain drugs, which could open the way to personalized treatments. Other researchers developed a new blood test that predicts prostate cancer risk more accurately than existing tests; it could dramatically reduce the need for biopsies and the treatment of cases unlikely to be lethal. —Patricia Edmonds

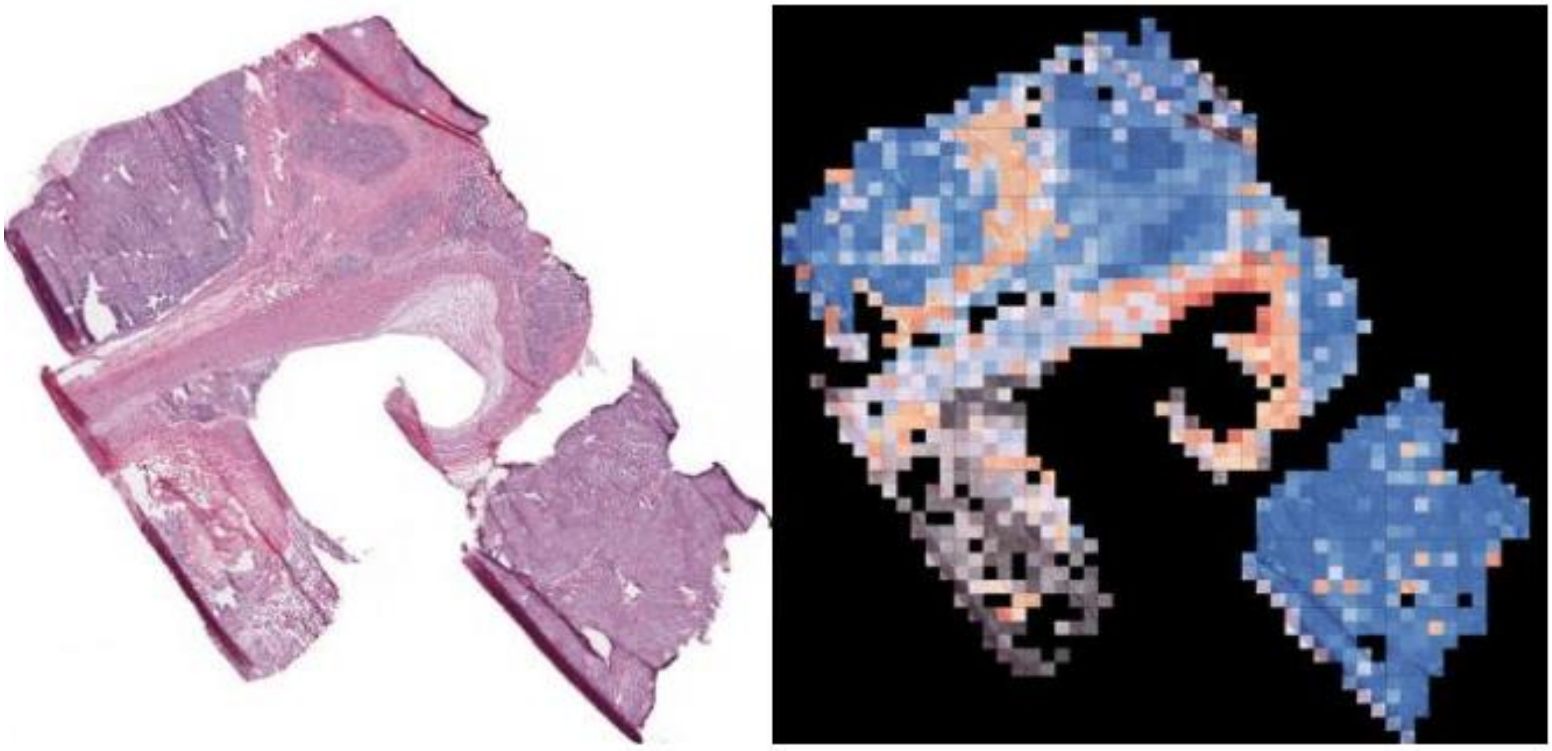
FLUORESCENCE DELINEATES THE PARTS OF THESE PROSTATE CANCER CELLS.
THREE-COLOR CONFOCAL IMAGE: JAMES HAYDEN, WISTAR INSTITUTE

ACSION

Source: National Geographic

The extra dimension with Artificial Intelligence

THE SHARP EYES OF AI



Correctly identifying the cancer cells in a lung tissue sample (left) is key to successful treatment. It's also an ideal diagnostic use of artificial intelligence. In one study, the same AI that Google uses to identify objects online was trained to recognize forms of cancer. It then found two forms in a tissue sample (right) as accurately as a human could, in seconds. AI also has been used to model the precise dosage of a cancer drug to shrink tumors but cause minimal toxic side effects. —Lori Cuthbert

For the sample at left, AI produced the analysis at right, showing normal lung tissue (gray) and two forms of cancer: adenocarcinoma (red) and squamous cell carcinoma (blue).

TISSUE IMAGE BY CANCER GENOME ATLAS

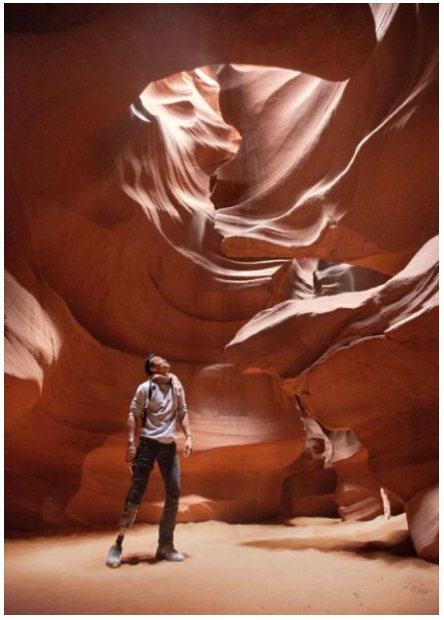
Source: National Geographic

Robots and 3D printers to restore mobility

ROBOTIC SUPPORT

For patients with severe mobility problems such as partial paralysis, scientists are developing robotics that enfold and support like an exoskeleton. The devices are programmed to guide the body through motions—such as helping a stroke victim walk—that can rebuild posture and strength. —Natasha Daly

3D PRINT REMEDIES



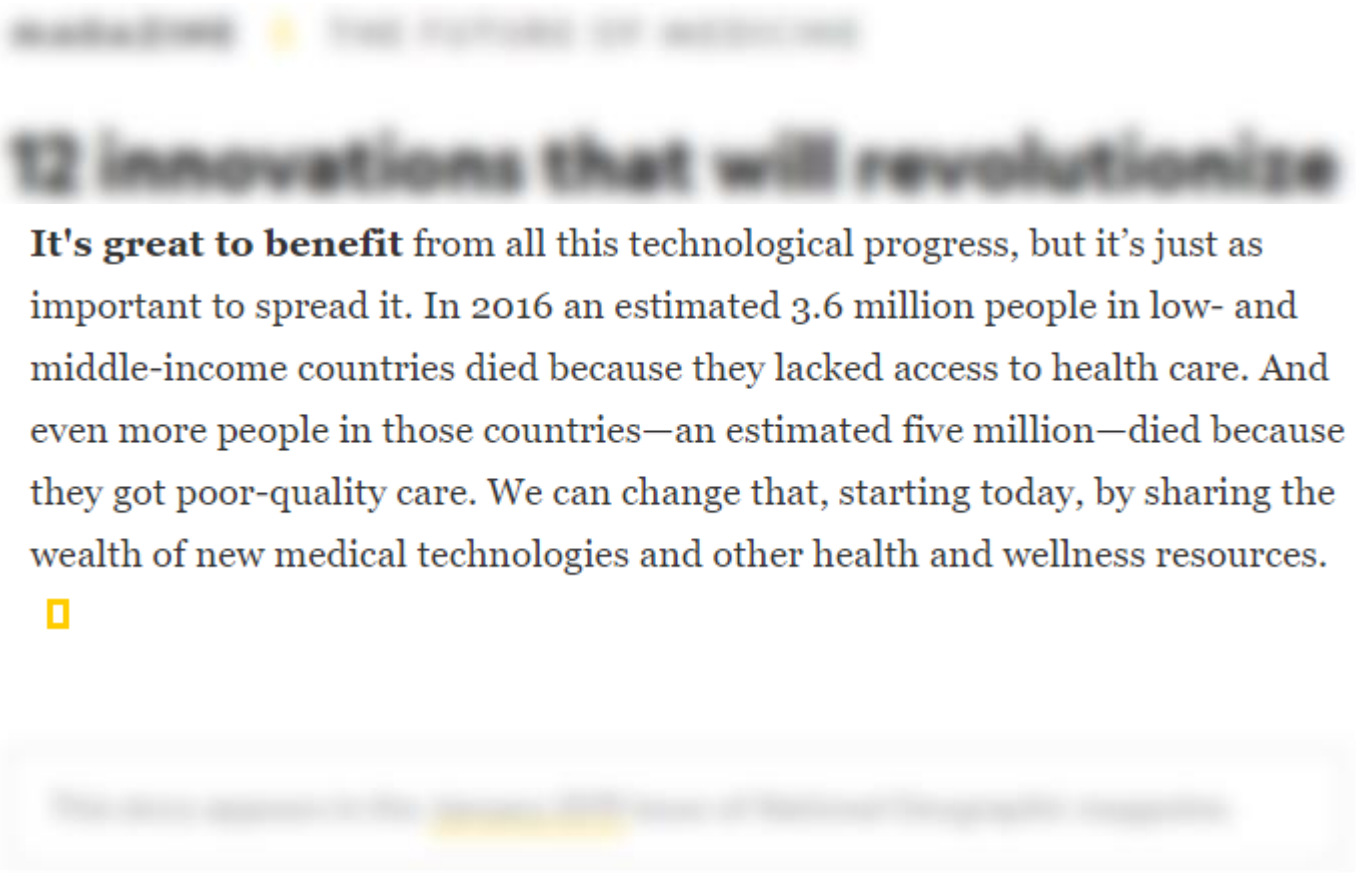
Many artificial limbs still begin with a plaster cast. Transforming that mold into a socket that comfortably fits the residual limb is an expensive and halting process—if you're lucky enough to live near a trained prosthetist. Many amputees worldwide don't have access to prosthetic limbs. Mobile phones and 3D printing may offer a solution, says Albert Yu-Min Lin (shown here at Arizona's Antelope Canyon), a National Geographic explorer who lost part of his leg in 2016. Phone cameras could scan residual limbs, providing measurements to professionals with 3D printers, who would produce matching low-cost sockets to be shipped to amputees all over the world. —Christina Nunez

PHOTOGRAPH BY BRUNA BORTOLATO

ACSION

Source: National Geographic

Nice! But how can and will it impact our health at home?



12 innovations that will revolutionize

It's great to benefit from all this technological progress, but it's just as important to spread it. In 2016 an estimated 3.6 million people in low- and middle-income countries died because they lacked access to health care. And even more people in those countries—an estimated five million—died because they got poor-quality care. We can change that, starting today, by sharing the wealth of new medical technologies and other health and wellness resources.

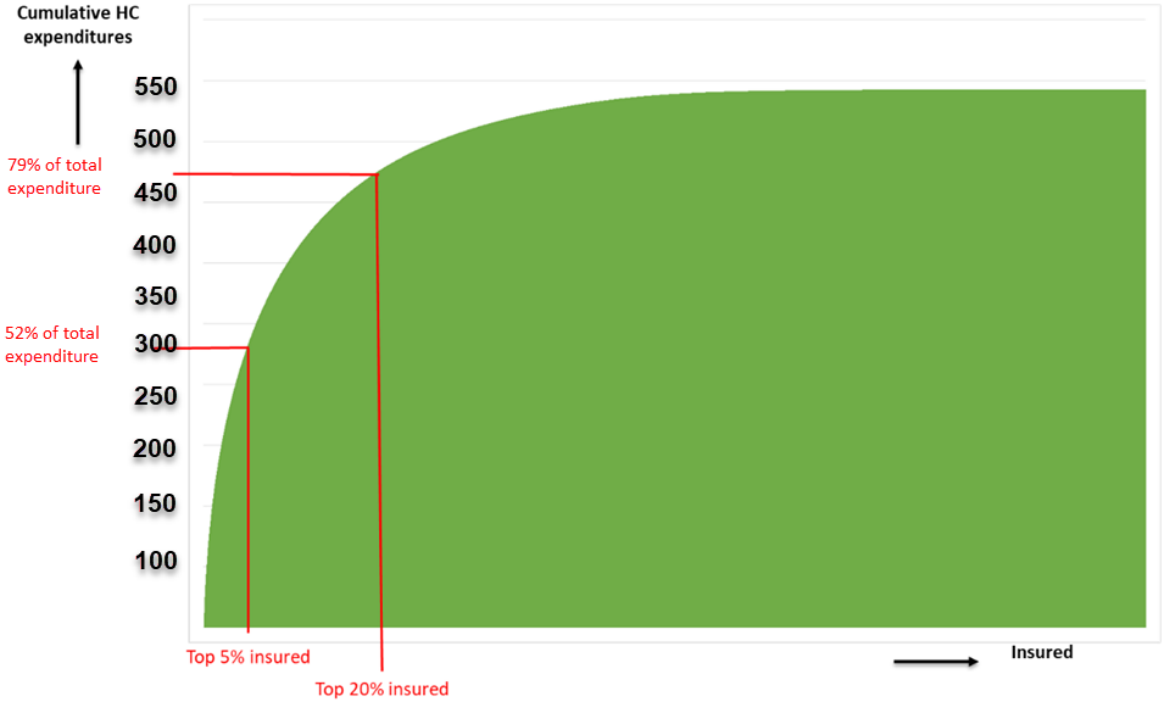
https://www.nationalgeographic.com/magazine/2019/01/12-innovations-technology-revolutionize-future-medicine/

Agenda

- **Most promising disruptive technology applications**
- **Innovation is not the objective …**
  - What is the objective?
- **Where are (technological) innovations most needed?**
- **How to achieve meaningful impact of innovations in our countries**

The money is mostly spent when it is too late

We should focus more on the (seemingly) healthy population



- Almost 80% of the budget is spent on the top 20% most expensive patients
  - More than 50% on the top 5%
- These costs cannot be saved anymore
  - They have been made already
  - 2/3 of this group is not alive or as expensive once we have these data
- Healthcare should focus more on the seemingly 'healthy' persons
  - Escalation to the top 20% can be prevented

The importance of Reforms

The business model and earnings in healthcare are driven by diseases rather than by preventing diseases and promoting health and wellness

ACSION

What are the desired outcomes?

Not only the outcomes of treatment, but also of prevention

Definition of Health (WHO – 1948)

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity

What we should aim for …
UNIVERSAL HEALTH Everyone has equal opportunities to be healthy

Our vision

PARADIGM SHIFT

Which is currently translated to …
UNIVERSAL ACCESS TO HEALTHCARE Equal access to care, whenever it is needed

Current focus

And experienced as …
UNIVERSAL HEALTH COVERAGE Right to all care, without financial barriers

Agenda

- **Most promising disruptive technology applications**
- **Innovation is not the objective …**
  - What is the objective?
- **Where are (technological) innovations most needed?**
- **How to achieve meaningful impact of innovations in our countries**

Our care is too much focused on the tip of the iceberg

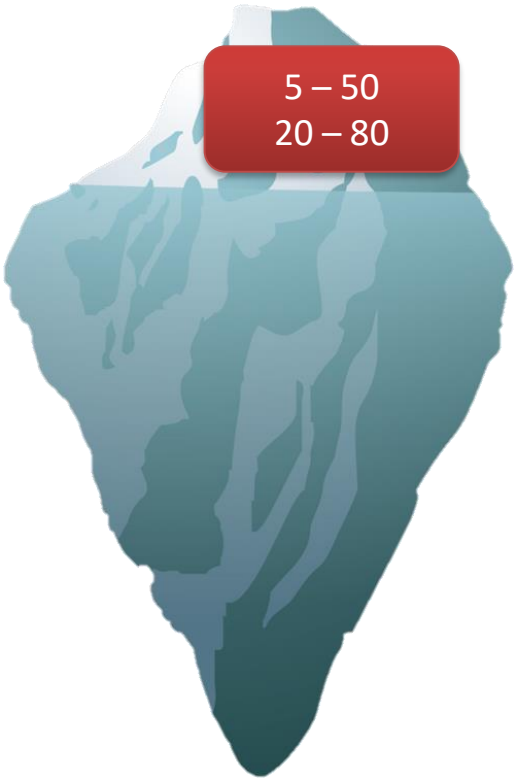
Our actual problem lies deeper

SITUATION IN OUR COUNTRIES

- **Daily young people have strokes and myocardial infarctions**
  - 40 % < 65 years old | 10% < 50 years old
  - Rising trend

- **65 percent of population has overweight[2]**
  - Nevertheless would 75% of the population rate their health as '(very) good' and 20% as mediocre
  - Over 1/3 indicates to have a chronic disease

- **Main causes of strokes and kidney failure (dialysis)**
  - High blood pressure and diabetes mellitus
  - Both can be caused and worsened by lifestyle factors
  - Obesity is an important indicator for health problems



[1] GGz: Curaçao Stroke Questionnaire 2010-2017 Helisur (Suriname)
[2] VIC: Nationale Gezondheidsenquête 2017

The most important innovation pertains to our Health System:
Focus from cure to prevention and care

HEALTH SITUATION

End of Life

Chronically ill

Short-term illness episodes

'Healthy'

CURRENT CARE

Intensive (catastrophic) care → **Case management** Coordination of intensive care and *psycho-social support for* patient and family

Fragmented chronic care / 1-size-fits-all chain care → **Integral care** *Collaboration* within and between cure, care and TCM, guided by *Individual Care Plan*

Divisions between the disciplines → **Patient focused care** *Automation* with reforms of *reimbursement system* to enforce patiënt centered care

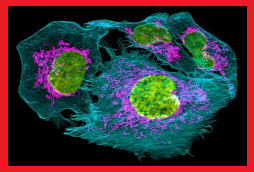
Collective prevention Life course 0-12 years → **Prevention**: Life course approach/ Wellness approach / HiAP: Prevention is better than cure and focus on hidden problems

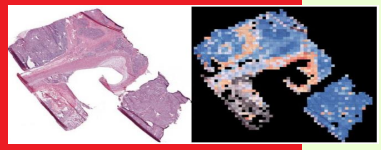
[1] TCIM = Traditional, Complementary and Integrative medicine

Innovations to enable Population Health Management

3D printing

Robotics





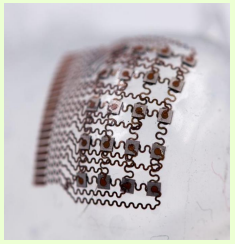
AI in diagnostics

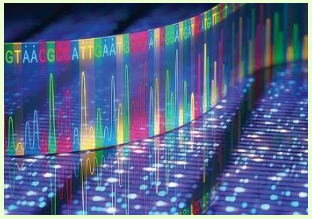
Telehealth

Internet of Medical Things

Artificial Intelligence

Virtual Reality





Next-Generation Sequencing (NGS)

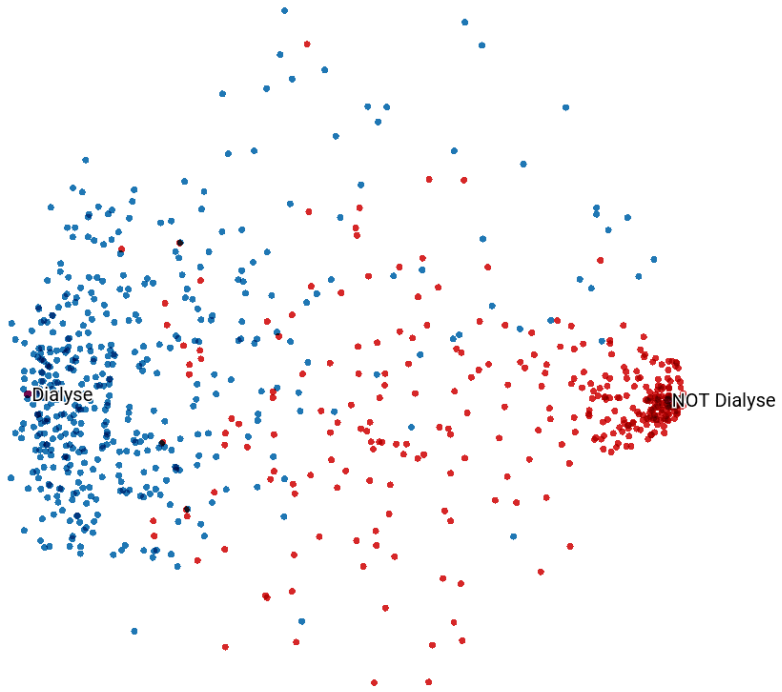
Diagnostics

NHI → HMP

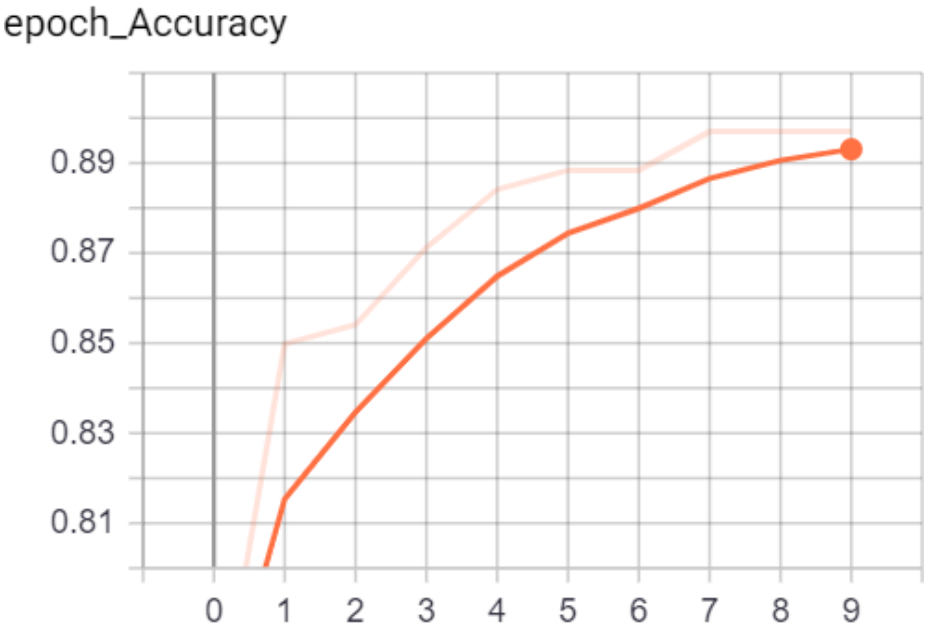
The case for Health Management Programs rather than NHI

Machine learning on data of SZF (covers 80% population of Suriname)

Identify data patterns of people who will dialyze in 600 days

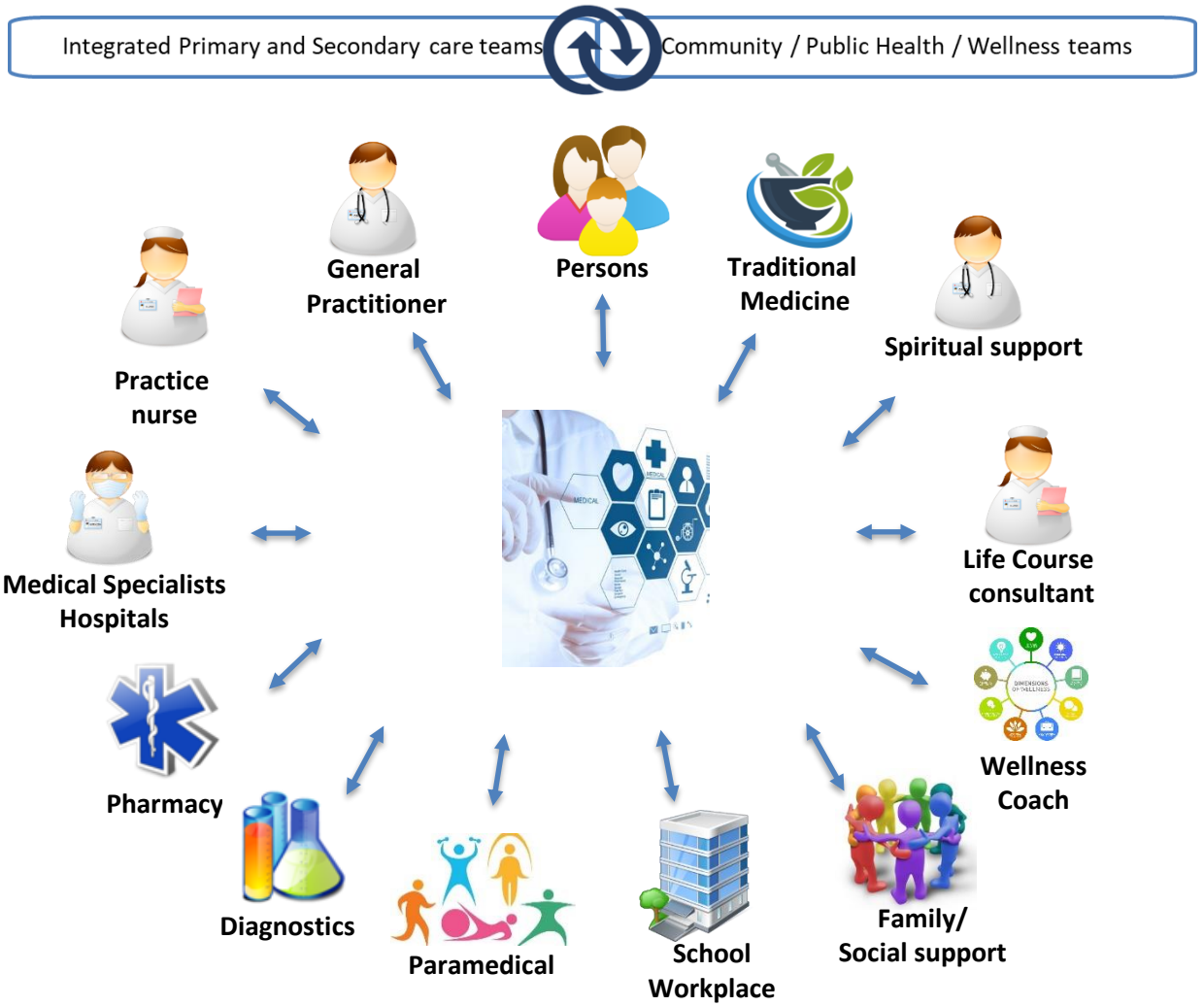


Training makes perfect



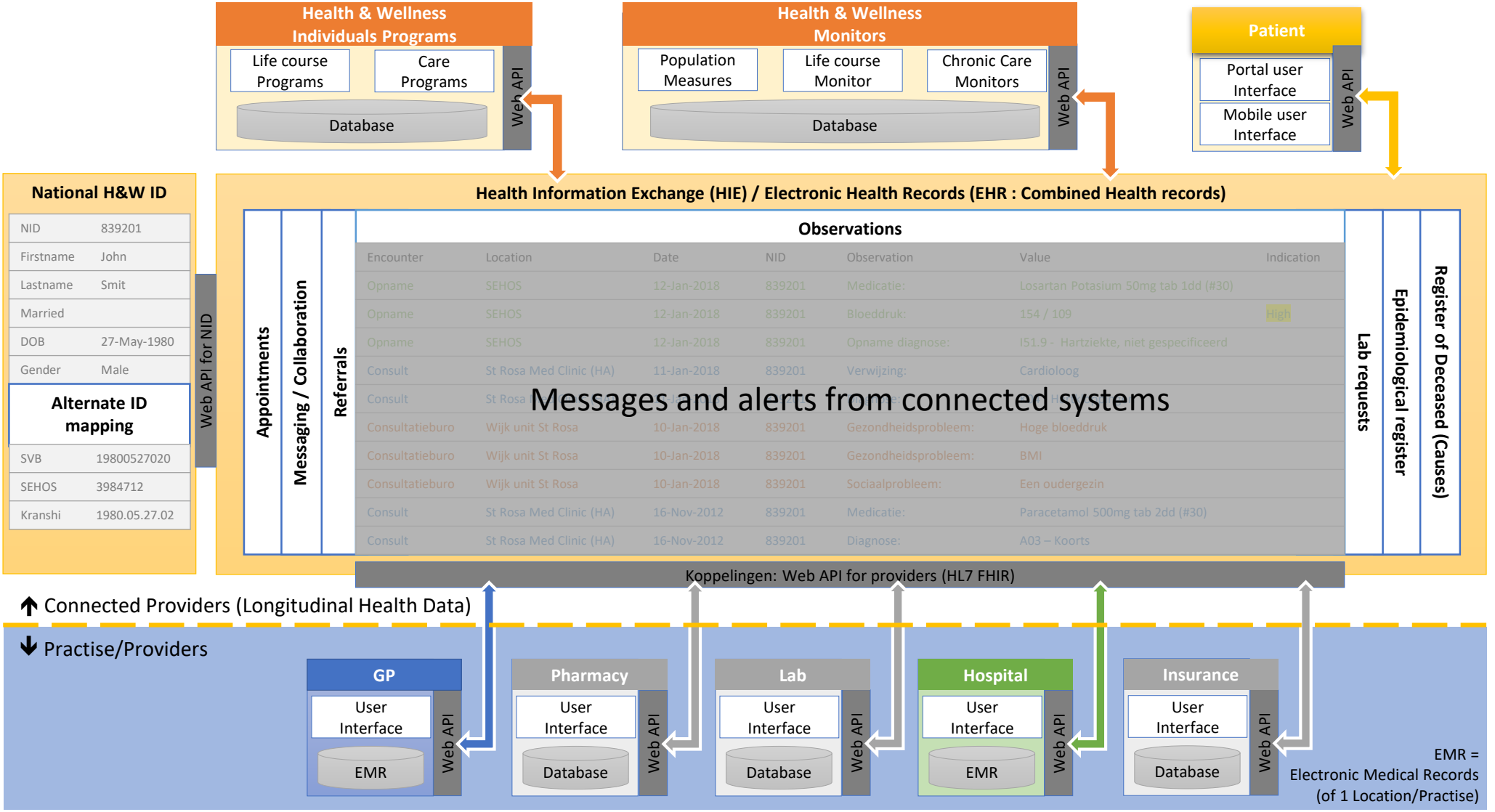
ACSION

Innovations make no sense when they are not integrated around the individuals making up a population



Goal: Care (Health&Welness) ➔

Keep us Healthy



Goal: Cure ➔

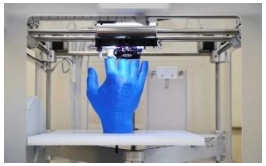
De-escalate burden

Agenda

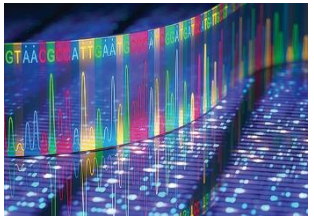
- **Most promising disruptive technology applications**
- **Innovation is not the objective …**
  - What is the objective?
- **Where are (technological) innovations most needed?**
- **How to achieve meaningful impact of innovations in our countries**

Innovations enable each other

Prioritize also on impact and reach



HMP



Next-Generation Sequencing (NGS)

Artificial Intelligence

What do you need for disruptive innovations

1. **Strategy**
   - Objectives: Healthier populations
   - Room for improvement: identify health risks and impending escalation timely
   - Prioritize interventions & innovations: *impact / time to impact / complexity*

2. **Policy**
   - Remove barriers: technology / illiteracy / ignorance / distrust / lack of finances / unregistered people (NHI)
   - Implement enablers: funding / innovation networks / private sector & academia / public-private partnerships

3. **Financing**
   - Reimbursement system: From paying for treatment to investments in health
   - Incentives for innovation

4. **Technology**

5. **Change management:**
   - Individuals will have to adopt the innovations in daily practice and life

ACSION

The most important innovation for the short term, is innovation of our health system

The case for leapfrogging

There is a triple opportunity to follow a different path in emerging countries

1. **Developing economies can use radical innovations to surpass established economies**
   - Critical innovations: new technologies | new operating models | new behavior patterns
   - Examples: mobile financial services in Africa | mHealth
2. **Increasing investments in health**
3. **Fewer sunk costs of existing infrastructure and equipment and lower fixed costs from building overcapacity**