

Healthcare Innovation Incremental and Exponential

Nick van Terheyden, MD

 @drnic1

Founder & CEO, Incremental Healthcare

[@DrNic1](#)

TELEMEDICINE MARKET

Global Market Insights
Insights to innovation

Global market
share (2018)

\$38.3 BN

CAGR (2019-25)

19.2%

Global market
share by 2025

>\$130.5 BN

CAGR (2019-25):

18.9%

Teleconsultation
service
sector

20.8%

Tele-education/
training service
segment

19.6%

Telehome
market
sector

39.8%

Neurology
market
segment

REGIONAL INSIGHTS

U.S. Market share

2018:

\$19,524 MN

by 2025:

\$64.1 BN

CAGR (2019-25)

China:

23.0%

India:

22.4%

Where you can find me



Nick van Terheyden, MD

AboutMe

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Founder & CEO, Incremental Healthcare

<http://about.me/obiwan>

<http://twitter.com/drnice1>

<http://www.linkedin.com/in/nickvt>

<http://www.IncrementalHealthcare.com/>

<http://www.facebook.com/drnice1>

DrNick@IncrementalHealthcare.com

(301) 355-0877

Agenda

- Introduction
- Health Declines in the Context of Life
- Telehealth
- Innovation Opportunities Today
- Future Potential
- Questions

Consumer Statistics

- 387 Million globally live with diabetes
- 10 million live with Parkinson's
- 14 Million new cancer cases added each year
- 17 Million people will die annually from heart disease

Healthcare consumers are ready to embrace change

- 57% say hospitals as we know them will become obsolete
- 75% are willing to see a doctor via videoconference
- 70% would use pill bottle sensors & other home technology to collect data
- 84% willing to share personal health details to lower overall health costs



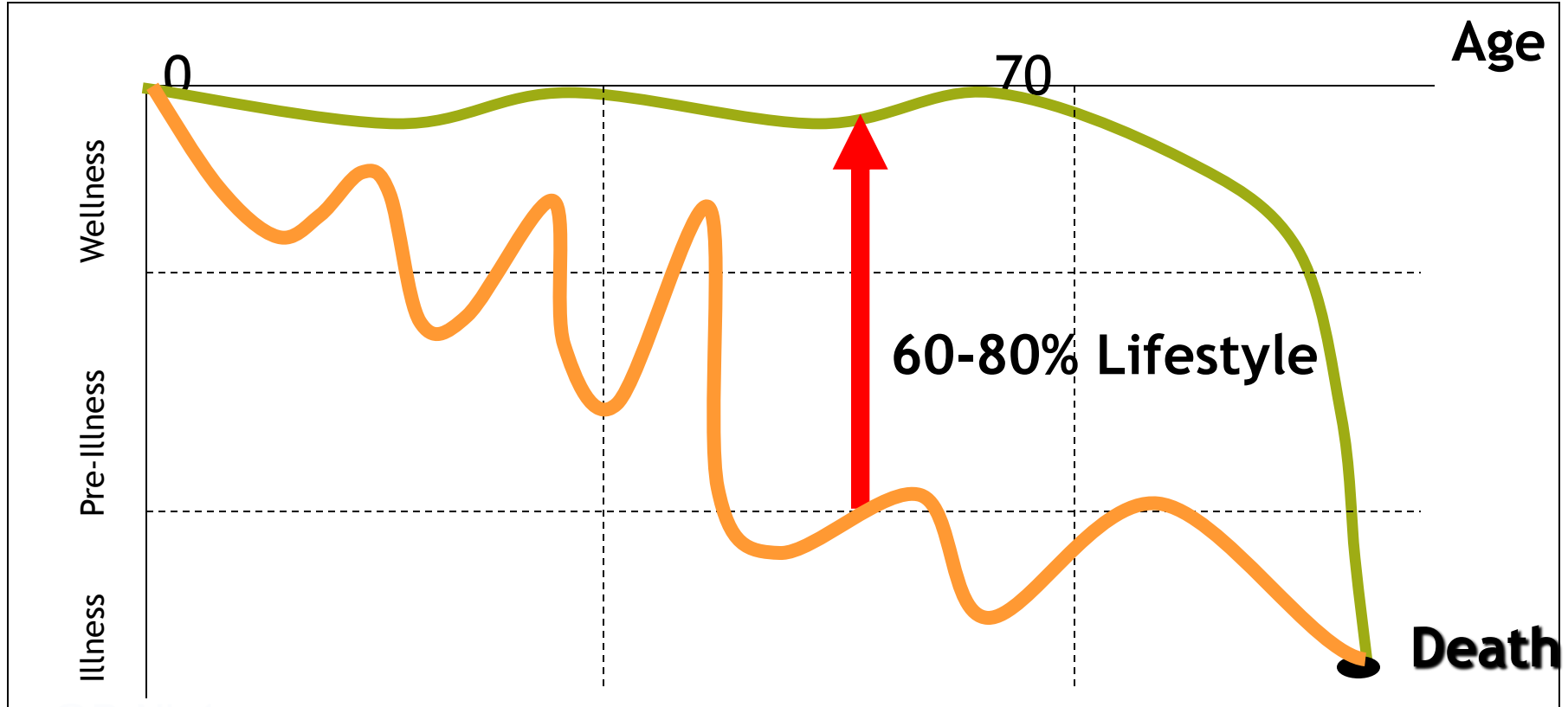
Source: Intel Global Innovation Survey, n = 12,000

Undiagnosed Silent Preventable Killers

- Uncontrolled hypertension leading cause of heart disease and stroke
- 1 in 3 U.S. adults (70 Mil) have Hypertension
- 13 million U.S. adults aren't even aware they have Hypertension
- 84 million people suffer from cardiovascular disease - causing about 2,200 deaths a day, averaging one death every 40 seconds
- 8 million adults have undiagnosed diabetes and 87 million have pre-diabetes



Modifiable Health



TeleHealth and TeleMedicine

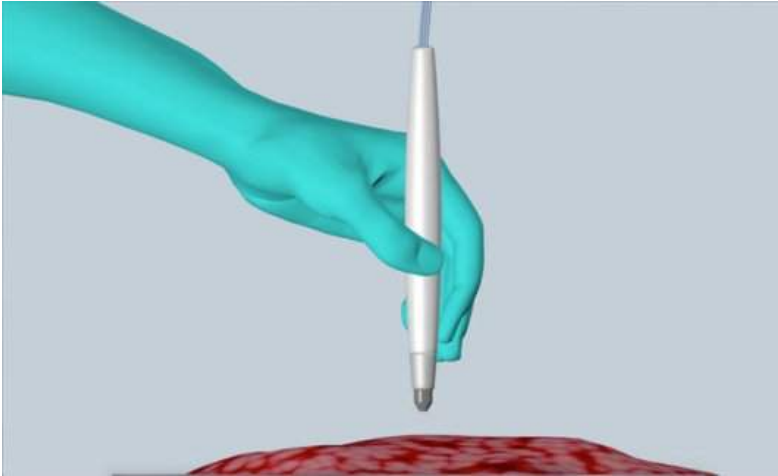
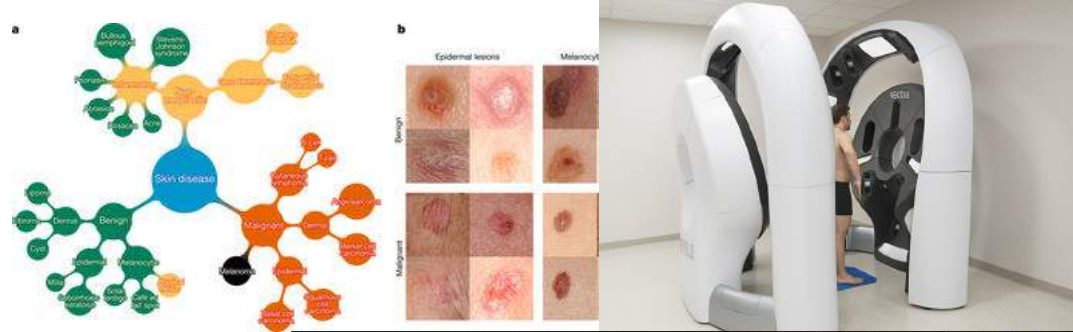
The Continuum of Telehealth

- Home Monitoring
- Advanced Monitoring Equipment
- Teledermatology
- Sensing Depression and Brain Injury
- Intelligent Assistants and Virtual Interactions
- RoboDoc/Nurse
- Remote Vitals

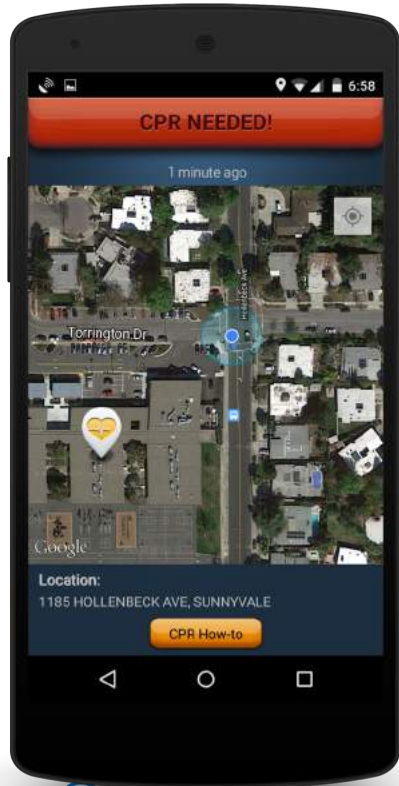


Tele Dermatology

- Whole Body Imaging
- AI Identification of Skin Cancer
- MasSpec Pen – Instant Identification of Cancer Cells

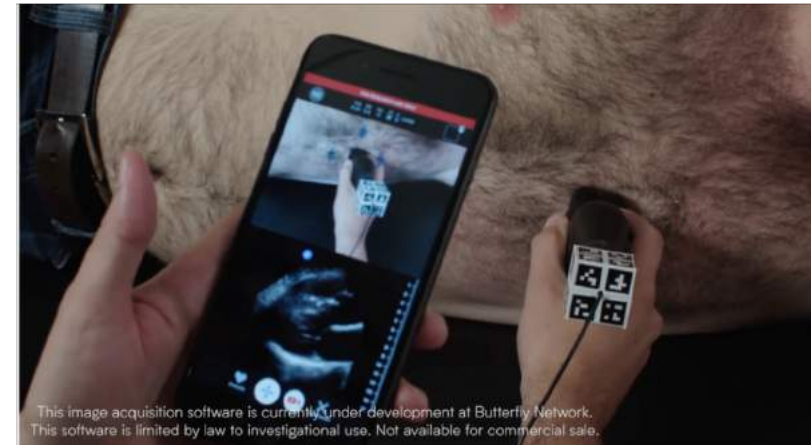
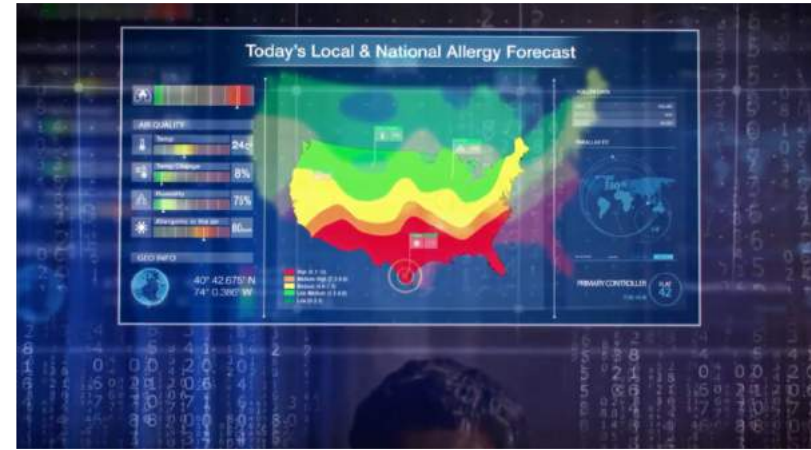


Even Assisted Telehealth Intervention



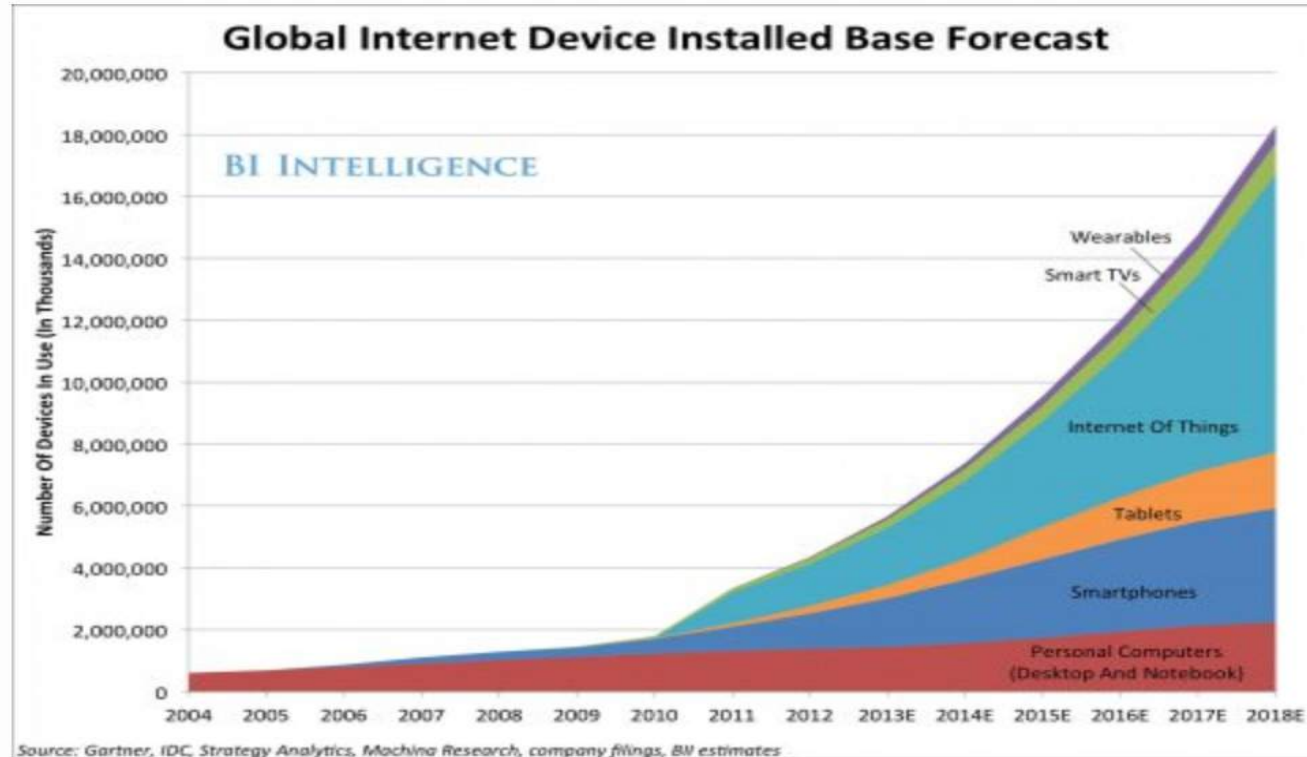
Telehealth Devices

- Predictive Analytics
- 3D Printing
- In Home Monitoring
- Ultrasound



Wearable's and Internet of Things

Wearable's and Internet of Things will surpass smartphones and personal computers by 2018



Internet of Things

Tablets

Smartphone

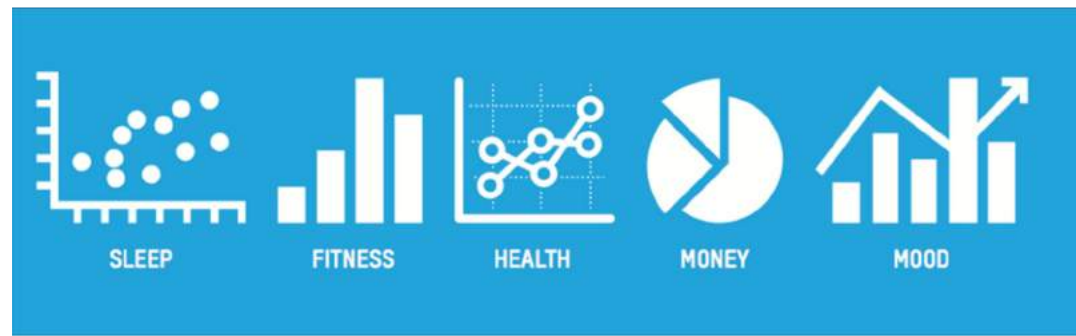
Personal
Computers

The Quantified Self

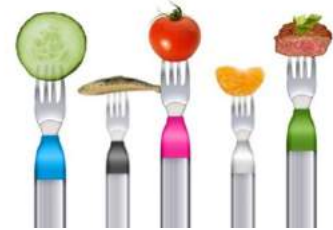
Meet Chris Dancy and His 10 devices
in his home and car



Quantified Self



- Ubiquitous, low cost, always on sensors
- Seamless tracking with minimal friction and requiring no behavior change
- Generates interactive easy to understand data and influences behavior
- What Can you Track
 - Activity and Weight
 - Sleep, Mood
 - Cardiac including Heart Rate, Blood Pressure and EKG
 - Bloods including Glucose
 - DNA and Your MicroBiome
- Incentives





Stress activation detected.
Do a breathing exercise?

6:55 AM

BIOSENSING WEARABLES LANDSCAPE

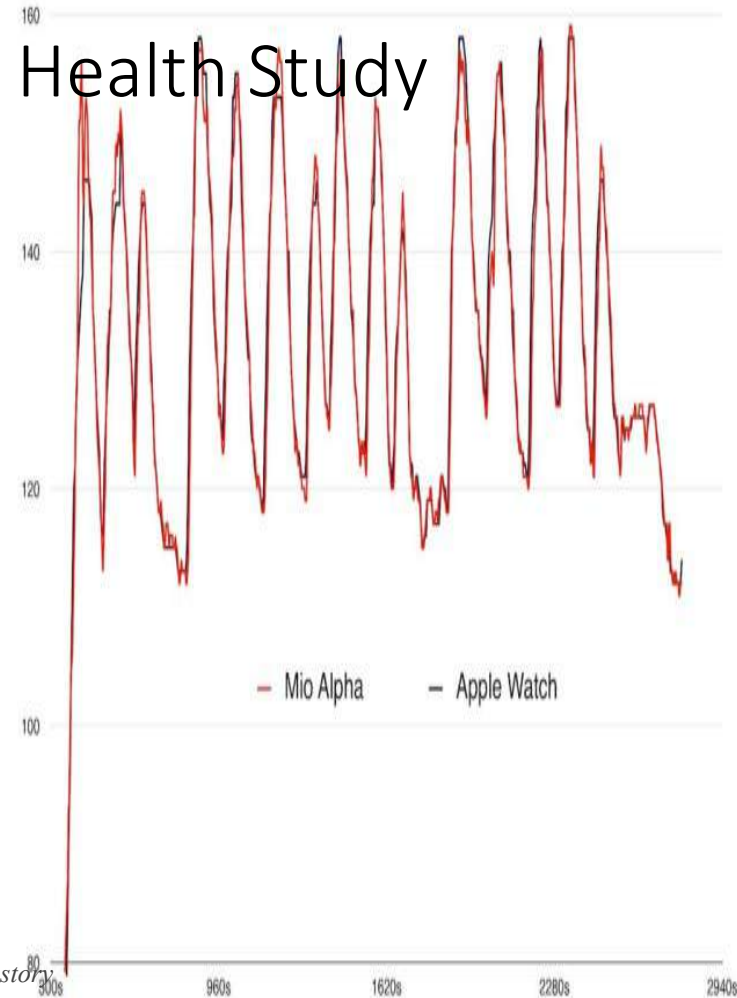


COMMODITY ZONE



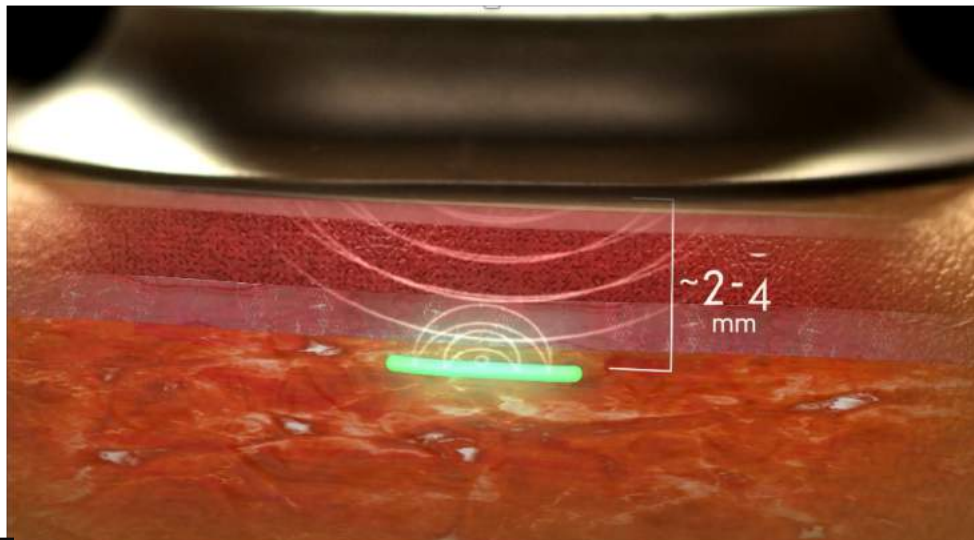
GROWING LONG TAIL

Smartphone Driving Biggest Heart Health Study



Next Gen Sensors

Continuous Monitoring



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Robotics and Automation



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RP-VITA robots, iRobot Corp

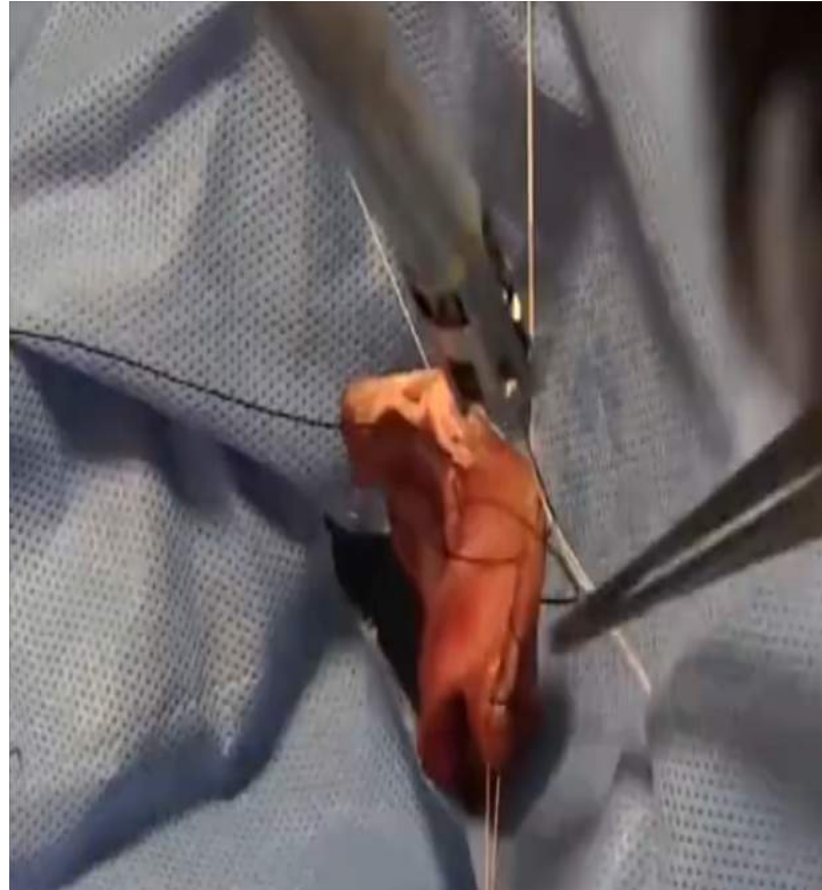
Robot Support



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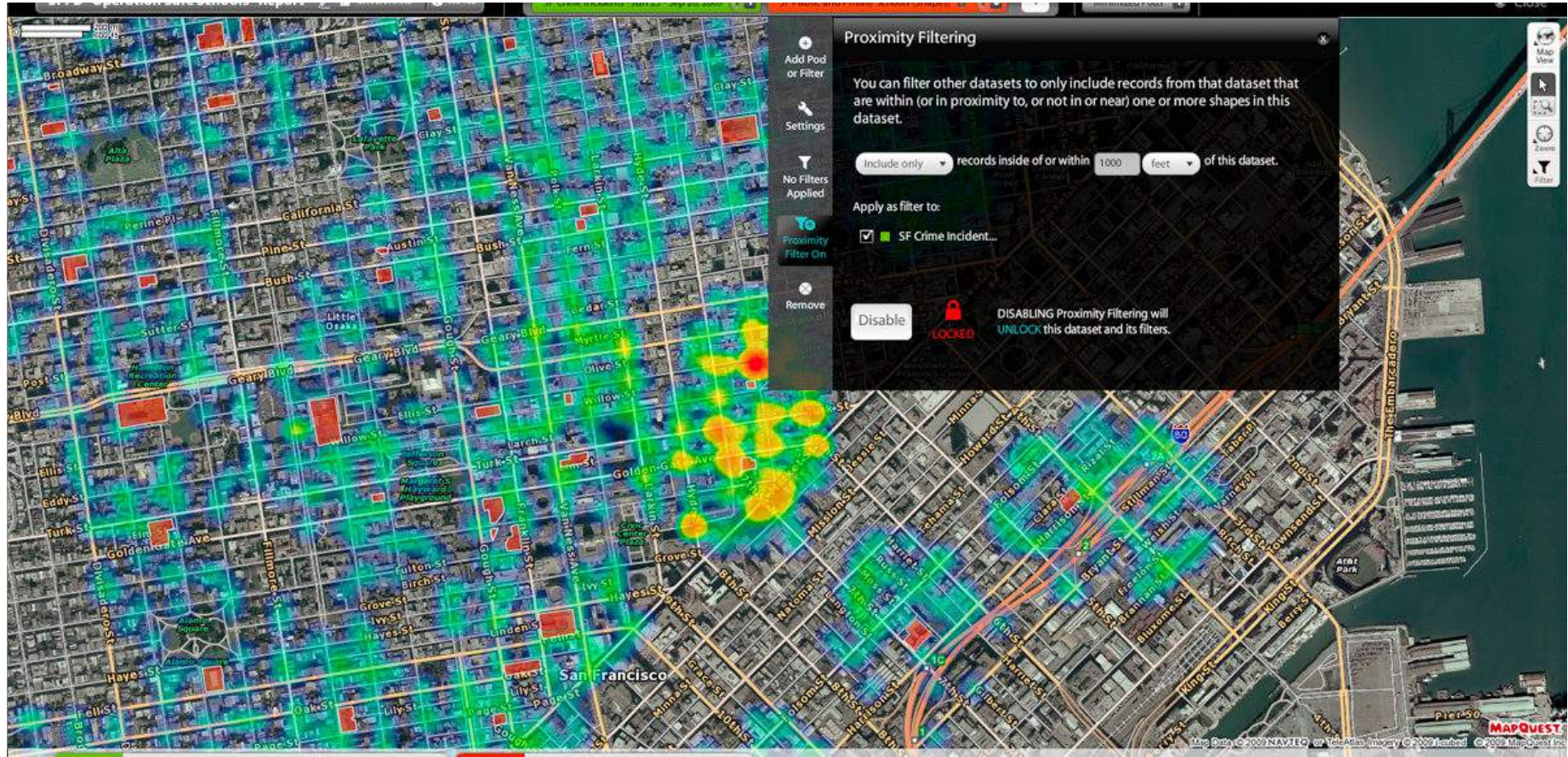
Fully Autonomous Stitching Robot



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Artificial Intelligence

Can We Predict the Future



Team	Win Probability	Forecasted Outcome
Duke	27%	Winner
North Carolina	18%	Runner Up
Tennessee	14%	Final Four
Gonzaga	11%	
Virginia	10%	Final Eight
Kentucky	8%	
Michigan	6%	
Michigan State	5%	

A Word on Bias

- Reproduce the inherent biases present in the data they are provided with
- Disproportionately creating a 'feedback loop' by which the predicted outcome simply becomes a self-fulfilling prophecy
- Models Created with the Bias of the Builders either intentionally or unintentionally

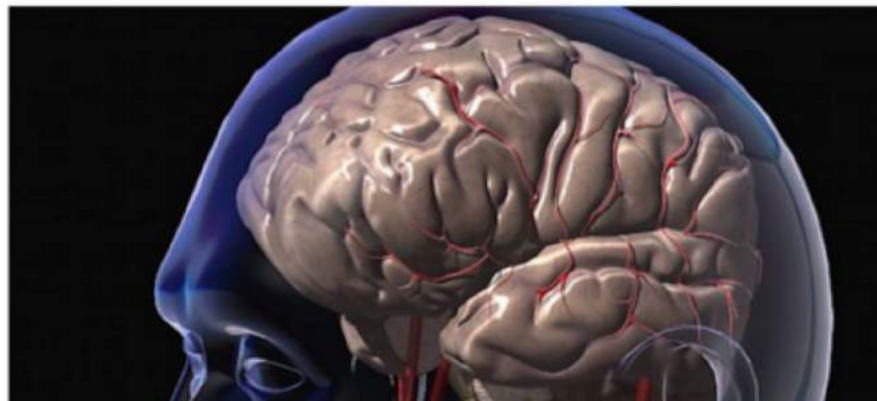


ADVERTISEMENT

Researchers Create Voice-Analyzing App to Diagnose Concussions

September 29, 2013

By GILLIAN MOHNEY via GOOD MORNING AMERICA, WORLD NEWS



FUTURE TENSE

WHAT'S TO COME?

AUG. 3 2014 11:51 PM

It's Not Just What You Say, It's How You Say It

A smartphone app listens for signs of manic and depressive episodes.

By Aimee Swartz



Virtual, Augmented Reality and Gamification

Augmented Reality and Gaming

'Pokémon Go' is so addictive that people are getting way more exercise than they're used to

An unexpected benefit

Selena Larson — 2016-07-08 04:29 p.m. | Last updated 2016-07-08 09:31 p.m.



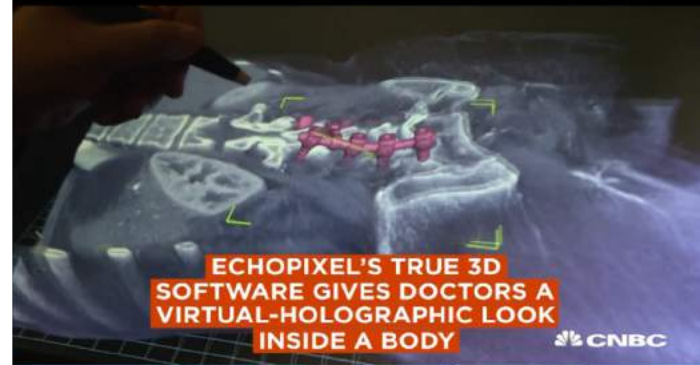
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Virtual Reality and Augmented Reality

- Simple Virtual Presentation and Visualization
 - CT Scans Projected onto Body
 - Teaching and Virtual Experience (Medical Realities, Anatomy, Virtual Surgery)
- 3D Visualization and Augmented Reality
 - EchoPixel
 - Proximie
 - Accuvein

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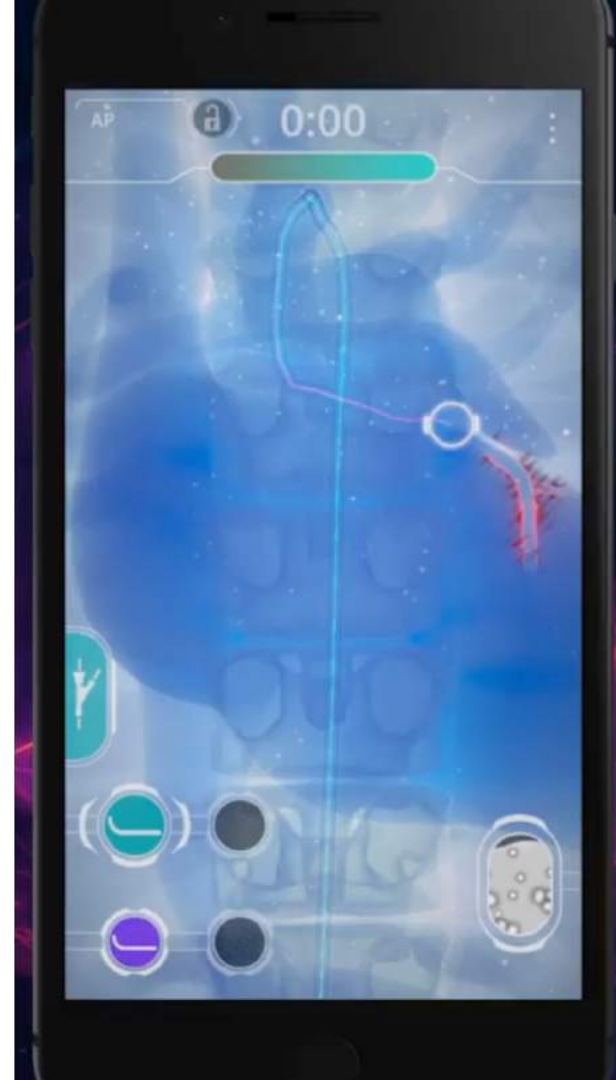


Massive Multiplayer Online Role Playing Games (MMRPOG/MMO)

- \$31 Billion Market
- League of Legends – 100 Million
- Heroes in World of Warcraft – 70 Million
- WoW \$5 Million in Subscription Fees Every Day
- Steam Concurrent Player Peak – 13 Million
- Gaming is Voluntary and Does not Pay
- WoW Average Player 17-22 Hours per week
- WoW Total of 5.93 Million Years of Player Time
 - Equivalent to the time taken for the Human species to evolve



Virtual Education and Gaming



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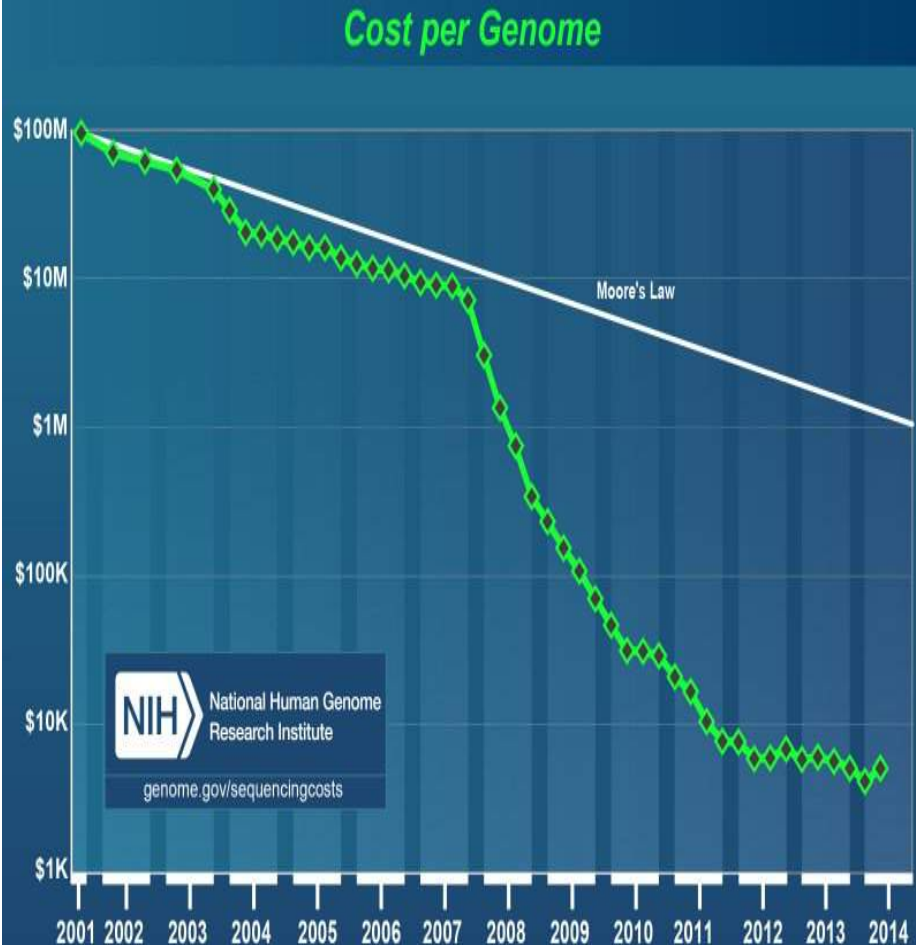
Future Innovations



Genomics and Precision Medicine

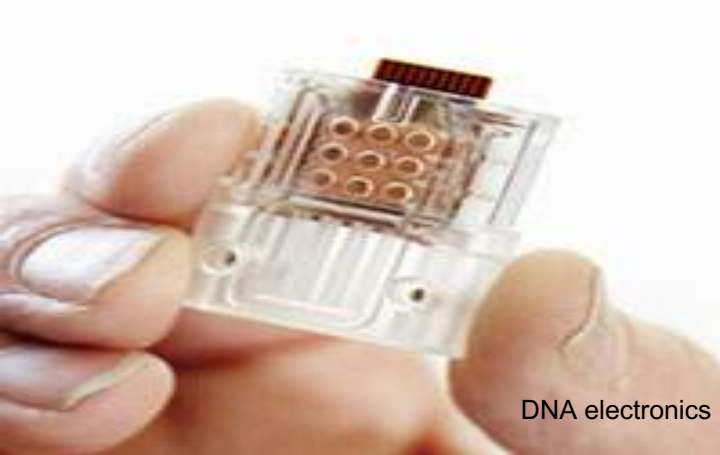
Genomics, Sequencing

- Took \$3 Billion and 10 years to sequence one genome
- Sequence in days even hours and for <\$1,000
- Explosion of data just to sequence the genome
 - Plans to sequence 14M new cancer patients every year which would generate 5.6 Exabytes of information.
- But there's even more data in -omics



The era of Personal genome analyzers

A PARADIGM SHIFT IN GENOMIC DIAGNOSTICS

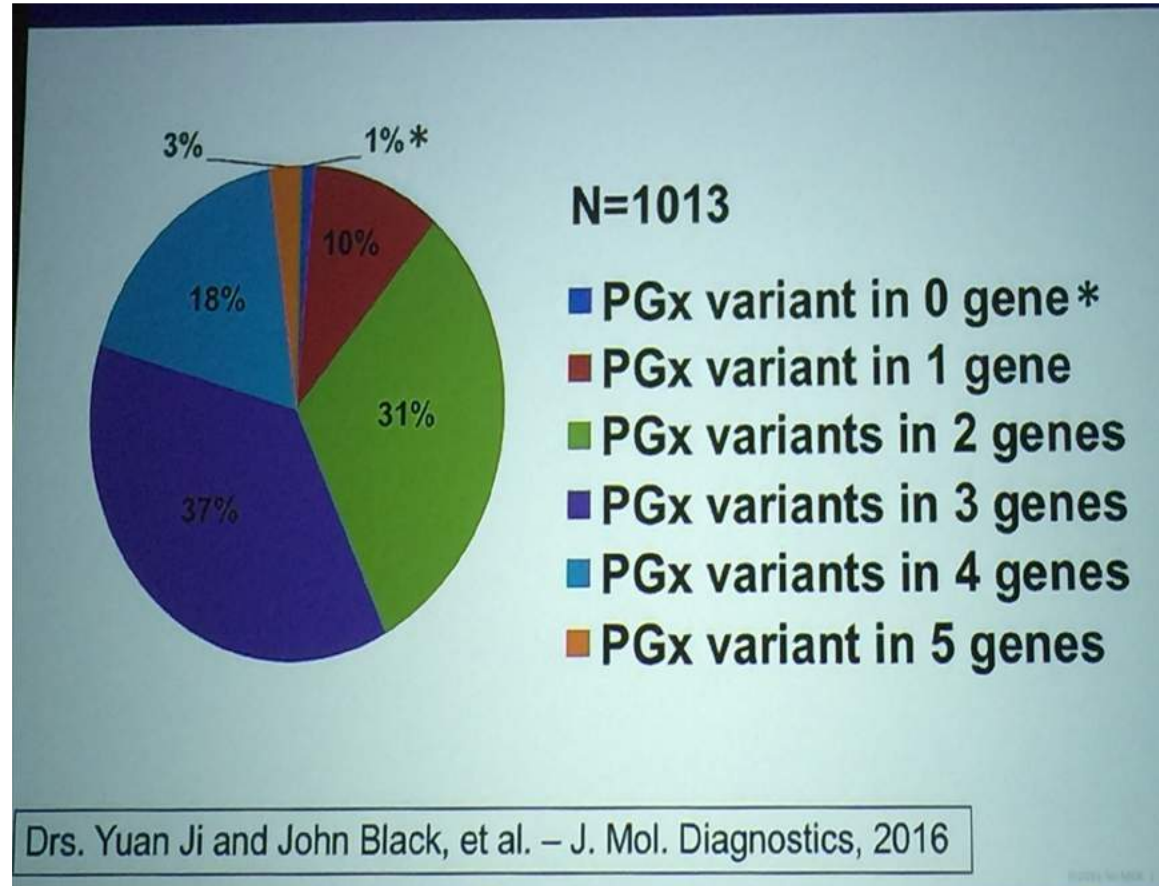


Early Impact - Pharmacogenetics

99% of population surveyed in
Preemptive Testing of Patients
had an Actionable Variant

J Mol Diagn. 2016 May;18(3):438-45. doi:
10.1016/j.jmoldx.2016.01.003. Epub 2016 Mar
3. Preemptive Pharmacogenomic Testing for
Precision Medicine

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Final Thoughts

- Healthcare is in Crisis – Technology and Telehealth is central component to solving
- Healthcare Needs to be Wellcare
- New Sensors and data Acquisition of Biometric data occurring at an exponential rate
- For Every 1 Piece of Knowledge we Understand another x50 Questions will Arise
- Genomics and the Biome will revolutionize our Diagnosis and Treatment of Disease
- The Future Lies in Augmentation of Human Capability with Technology

Questions



Nick van Terheyden, MD

AboutMe

Twitter

LinkedIn

Blog

FaceBook

E-Mail

Google Voice

Founder & CEO, Incremental Healthcare

<http://about.me/obiwan>

<http://twitter.com/drnice1>

<http://www.linkedin.com/in/nickvt>

<http://www.IncrementalHealthcare.com/>

<http://www.facebook.com/drnice1>

DrNick@IncrementalHealthcare.com

(301) 355-0877

Thank you

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[@DrNic1](#)