The Future of Health

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@ZaynaKhayat #SEFutures @SEHealth_SEHC

14 November 2018
Central paradigm: The system

New paradigm: The Person

Future of Health
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New paradigm: The Person

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Central paradigm: The system

New paradigm: The Person

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500 BC - 500 AD

- Hippocrates
- Human Anatomy & Physiology
- Smallpox vaccination
- Microbes & disease
- Antibiotics
- DNA structure
- 1st "test tube baby"
- Human Genome

500-1500

- 1628
- 1670
- 1796
- 1799
- 1870s
- 1895
- 1928
- 1948
- 1953
- 1971
- 1978
- 1983
- 2003
- 2008

1628

- Black Plague
- Microscopy of cells
- Anaesthesia
- X rays
- WHO established by UN
- Medical Imaging - MRI, CAT
- HIV virus causes AIDS
- Digitization

Source: Adapted from PWC Health

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Emerging technologies in health(care)

- AI/Predictalytics
- Voice Recognition
- VR/AR
- Blockchain
- 3D Printing
- Neuro-Tech
- Omics
- Robotics/Bots
- Autonomous Transportation
- Cellular Therapy

https://gnhic.com/
Future of Health

**Today: System**
- **TIMING**: Reactive, sick care
- **PRECISION**: 1 size fits all, crude, analog
- **MODALITY**: Institution-centred
- **DURATION**: Episodic, intermittent, silo’d
- **POWER**: Provider
- **CURRENCY**: Volume, inputs, costs

**Future: Person**
- **TIMING**: Proactive, preventative, predictive
- **PRECISION**: Personalized, intelligent
- **MODALITY**: Digi-cal | decentralized
- **DURATION**: Continuous | team
- **POWER**: People-powered
- **CURRENCY**: Value, outcomes
Where health is created

Drivers of health

Access to care 9%
DNA Code 20%
Post Code 22%
Behaviour 37%
Interactions of above - 15%

Medical Care 90%
Behaviour 9%
Other 1%

Source: NEHI Analytics (2013)
"Medicine has been a clinical science supported by data. ...becoming a data science supported by clinicians"

Dr. Brad Perkins, Chief Medical Officer, Human Longevity Inc.
"Medicine has been a clinical science supported by data. ...becoming a data science supported by clinicians"  
Chief Medical Officer, Human Longevity Inc.
De-centralized
De-physicalized
De-materialized
De-monetized
Dis-intermediated
Digi-cal

Bricks People Paper & Pens Fax Machines
Where will good healthcare be delivered in the next 10 years? (n~2000)

- EVERYWHERE: 67%
- HOME: 21%
- HOSPITAL: 10%
- GP OFFICE: 2%
“70% of what is currently done at the hospital, will not be done at the hospital”

“mobile first; physical next”

New Dutch health ministry (October 2017)
- 2 billion € removed from “cure” budget [hospitals]
- 1.5 billion € added to elderly “care” budget [community, home, primary care]
TELUS Health picks Babylon to bring virtual healthcare to Canada

LONDON (Reuters) - Canada’s TELUS Health is joining forces with London-based AI

Paul Sandle
Digital companions

1st AI enabled chatbot for caregivers

"Alexa, when do I take my medication?"

Source: Lucien Engeln

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This is a hologram
Japan is embracing nursing-care robots

Around 5,000 nursing-care homes across the country are testing robots

Japanese robot Pepper can now teach and care for old people

EFIE Tokyo | 28 Jan 2016
Hours accessing formal care

Hours living with chronic illness (5,800 hrs / year)
Sensors: 24/7 remote monitoring

Bed sensors:
- presence, sleep pattern, heart rate, breathing, ...

Person or home: falls, wandering, meds, ...

Patch cardiac rhythm monitor continuously for weeks

Continuous noninvasive – glucose, other biomarkers

Formal & informal caregivers remote access to vital signs from anywhere

Source: adapted from PWC
“Patients are the (untapped) renewable resource of healthcare”
- Mark Britnell

“Most exciting innovation of our era is not access to medical information, but access to each other”
- Susannah Fox

80%

Self Care

Primary Care
Secondary Care
Tertiary Care

Personal diagnostics

- Urinalysis (colorometrix)
- Dermatology
- Anemia
- HIV Test
- Ultrasound
- Otoscope
- ECG
- X-Ray
- Pulse Ox
- Ultrasound
- Smart scale
- Smart thermometer patch
- Infection monitoring
- Ophthalmology
- Smart scale
“If you can have a social network of 1.4 billion people, why can’t you have a medical network of billions of people?”

Dr. Eric Topol

“When you think of medicine, you won’t think of 1 doctor, you’ll think of a global community of experts aggregated to make sure that every patient gets their answer quickly and inexpensively”
## Future of Health = Innovation

### Today: System

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Health is created in the community

- Care of sick
- Preventing disease
- Creating health

Formal Medical System vs. Self & Community
Strategy: Niche out

**Chinese immigrant communities**
- Int’l District Healthy Communities (Seattle)

**Children in school**
- Promise Neighbourhoods (Harlem)

**Chronically homeless**
- Community First! Village (Austin)

**Digital natives**
- Sidewalk Labs (Toronto Quay)

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De Hogeweyk – Dementia Village in Netherlands (1993)
- Now: Denmark (Bryghuset), California (Town Square), Australia (Korongee), BC (2018)
- Barrie? TBD
Strategy: SDOH + primary care

“Primary care plus”

Move way upstream to tackle social complexity
“Management-free” care models

Buurtzorg: the Dutch model of neighbourhood care that is going global

Innovative nursing model cuts bureaucracy and gives nurses more freedom and time with clients

- 2006: 1 team of 4 nurses
- 2017: 850 teams (10,000 nurses) ... with no recruitment

- Independent, autonomous
- No management ... but coaches

- 50% reduction in hours of care, quality, happier staff

- Scale: national, USA, Japan, Korea, Sweden, Germany ... Canada?
From hospital → “health village”

Farmer’s markets - target neighborhoods

Healthy Sustainable Food Vision: Farmers Markets to Sustainable Food Purchasing to Food Rx

Farmers Markets and Farm Box Distribution
Healthy Food Criteria
Sustainable / Local / Fair Food Purchasing

UnitedHealthcare®
COMMUNITY & STATE

Housing | Transportation | Employment

This Children's Hospital in Dallas is Reimagining the Healthcare Business Model

Children's Medical Center

By any measure, Children's Health in Dallas is a world class institution. It boasts a top notch medical staff, is consistently ranked among the best children's hospitals in the country and features a Level 1 Trauma Center. Yet by 2011, despite the accolades, its CEO, Chris Durovich, was beginning to have doubts about the center's impact on the community.
Lessons learned building healthy communities movements in US

- Multi-sector
- Data
- Policy
- Sustainability plan up front
Why Hospitals Are Getting Into The Real Estate Business

August 19, 2018 - 9:00 AM ET

Paul Chisholm

Bruyère Village

An innovative response to the needs of our aging population and community.

Located on the banks of the Ottawa River in the east end of the city, the Bruyère Village includes...
Strategy: Multi-stakeholder consortia ... with unusual suspects

HEALTHY BUILDINGS
Bronx Healthy Buildings Program

Address the social determinants of health through education, organizing, work force development, and building upgrades

Northwest Bronx Community and Clergy Coalition
Montefiore Medical Center
The New York City Department of Health and Mental Hygiene
BlocPower
Emerald Cities Collaborative
NY Lawyers for Public Interest
Councilman Ritchie Torres

Libraries, restaurants, barbershops – vectors of scale for MH care

Welcome to barbershop therapy
CELESTE HAMILTON DENNIS 23 September 2018

Barbers in the US South are training as first responders to assist men with their mental health concerns.
New players delivering care in the community

Postal workers deliver meds and check on health of seniors
An innovative program expands role of mail carriers to look for signs of illness
Oct 2, 2015

French postal workers are doubling as elderly caretakers
By Alex Campbell Dec 20, 2017

Ontario extends paramedic house-call program for seniors
Pilot project employing paramedics to make health-care visits helped reduce 911 calls and emergency room visits.

A new role for first responders: providing in-home health care
@ leah samuel / November 17, 2017
New Entrants: customer obsessed, savvy with exponentials, patient
FORD LAUNCHES GORIDE SERVICE TO GET PATIENTS TO THEIR MEDICAL APPOINTMENTS

APR 18, 2018 | DEARBORN, MICH.
Telecoms and banks – bundling health services with other services
Apple's latest Watch can sense falls and heart irregularities

It's like a high-tech version of the "I've fallen and I can't get up" gadget.

“Apple Watch is moving from a trendy option to a clinical imperative”

“intelligent guardian for your health”
Humana Deal Could Bring Walmart Into Homes For Care

Bruce Japsen, CONTRIBUTOR
I write about healthcare business and policy FULL BIO

TWEET THIS

Talk of a deal with Walmart comes with Humana on the verge of expanding its “Humana At Home” operation.

Kindred shareholders over the next three days are voting on whether to sell to Humana and two private equity firms.

Amazon's secretive health team talking with AARP about making products for older people

- Amazon is interested in developing technologies targeted to aging populations.
- Its vice president of special projects, Babak Parviz, made a very rare public appearance last month where he described this as something “we deeply care about.”
- Sources say that Amazon has approached groups like AARP, a lobby that represents older Americans.

Best Buy makes an $800M investment in aging America

BY JACKIE CROSBY
STAR TRIBUNE (MINNEAPOLIS)

Best Buy Inc. is preparing to ride the age wave.
Strategy: creative financing vehicles

**THE CALIFORNIA ENDOVEMENT**
Building Healthy Communities.

**Healthy Neighborhoods Equity Fund I LP**
$22 million PE fund investing in building blocks of healthy communities in Massachusetts

**Wellness Trusts**

**Prevention & Wellness Trust Fund**
Disease prevention initiatives impacting >370k residents in MA

**HealthyFutures Fund**
$200M
Co-op bank + Kresge Foundation + Morgan Stanley
Focus on housing.

**Kaiser Permanente**
$200M Impact Fund – housing stability
Omada is a digital behavior change program that can help you lose weight, reduce your risk for chronic disease, and feel better than you have in years.

How does Omada Health make money?
The company's model is outcome-based: the more weight the patient loses the more money it makes.
Canada’s 1st Health Social Impact Bond

Groundbreaking MaRS funding initiative takes aim at high blood pressure

Public Health Agency of Canada to pay investors up to $4 million only if Heart and Stroke Foundation program succeeds.
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Medicine Will Advance More in the Next 10 Years Than It Did in the Last 100

By Vivek Wadhwa - Oct 26, 2016  75,029
Time to reach 50 M users

- 35 Days
- 3.5 Years
- 4 Years
- 13 Years
- 38 Years
- 75 Years

Average time from evidence to practice in medicine: 17 years
Required: exponential mindset

Digitized  Deceptive  Disruptive  Dematerializing  Demonetizing  Democratized

Adapted from Peter Diamandis' 6 D's of Exponential Development
“It will be retro to have your blood pressure taken by a human again”
“Radiomedicine” (1925)

The Jetsons (1962)
This Room Is Equipped With

Edison Electric Light.

Do not attempt to light with match. Simply turn key on wall by the door.

The use of Electricity for lighting is in no way harmful to health, nor does it affect the soundness of sleep.
Most innovations under-perform ... at first

Performance

Current path (largely QI)

Next practice or biz model

Time

What people need, want, expect ... and can afford

performance gap
3. Every Locomotive propelled by Steam or any other than Animal Power on any Turnpike Road or public Highway shall be worked according to the following Rules and Regulations; etc.
Firstly, at least Three Persons shall be employed to drive or conduct such Locomotive, and if more than Two Waggons or Carriages be attached thereto, an additional Person shall be employed, who shall take charge of such Waggons or Carriages.
The only people using the machines were *prostitutes* and *gamblers* who didn’t want to deal with tellers face to face.”
Current disruption

Source: Accenture Research Disruptability Index— in HBR.org, How Likely Is Your Industry to Be Disrupted? (Jan 2018)
Horse vs. Automobile

BEFORE you discard your horse and buy an auto, it is well to think of the cost. Figure how much you spend for harness and then think of what new tires amount to. Figure up what it takes to feed Dobbin in a year and then think of gasoline, repairs and storage charges. Dobbin is worth what you paid for him two years ago, where’s the man with an auto that can say the same? Come in and get a new harness instead of a new car and remember that Dobbin will take you through snow and mud as well as on good roads and that his carburetor is never out of order.

Ed. Klein

732 Massachusetts Street
In 1912, traffic counts in New York showed more cars than horses for the first time.
Unbundling of incumbent providers
New Entrants: customer obsessed, savvy with exponentials, patient
“If you can have a social network of 1.4 billion people, why can’t you have a medical network of billions of people?”
Dr. Eric Topol

“When you think of medicine, you won’t think of 1 doctor, you’ll think of a global community of experts aggregated to make sure that every patient gets their answer quickly and inexpensively”
Your mission:
Create the conditions for exponential thinking & change

Adapted from Peter Diamandis’ 6 D’s of Exponential Development
KEEP CALM & KEEP INNOVATING

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