



SIGNALS & FORECASTS MAP

MAPPING THE LANDSCAPE OF CHALLENGES AND RESPONSES

Looking ahead over the next decade, the future of health and health care seems more uncertain than ever before. The possibilities for change are endless.

WHAT IF demands for sustainability require achieving healthy outcomes without harming the environment?

WHAT IF new technologies enable us to experience the future effects of present-day behavior choices?

WHAT IF self-tracking goes mainstream and shapes research and treatment practices?

One thing we all agree on, the challenges we face are daunting. At a glance, the United States seems to be the healthiest nation in the world, yet we rank low on longevity and other indicators of health. We spend more of our disposable income on medical care than food or housing, yet more than 130 million people suffer from chronic illness. And despite recent efforts by educators, public health officials, and the media to focus attention on the problem, one in five American 4-year-olds is now obese.

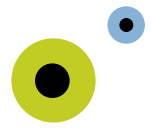
The challenges are not limited to these startling statistics and the rising cost outcomes—they also lie in the fundamental organization of our current health care system. Our traditional hospital-centered, third-party-payer health care model is simply not designed to support the continuous care chronic conditions require. By 2020, the population aged 65 or older is projected to reach 55 million, but Medicare's Hospital Trust Fund may be insolvent as soon as 2017. Overall health care spending is projected to exceed 20% of Gross Domestic Product (GDP). Even today, while the health care industry creates more jobs than any other sector of the economy, the rising costs of health benefits have eaten away at wage growth and shaken our global competitiveness.

Despite these grim realities, the future of health and health care is full of potential. Commons, market, policy, and science and technology developments will give shape to the next decade of responses and innovations. Already, stakeholders across the health and health care economy, enabled by new technologies and medical discoveries, are forging a new landscape of product and service offerings, and health management and service delivery innovations.

The signs of change are everywhere, but now is not the time to be overwhelmed by the complexity of what may lie ahead. This map of signals and forecasts was designed as a tool to help you systematically think about the future. It charts the important directions of change to help you respond to the challenges and opportunities of the coming decade.



HOW TO USE THIS MAP



Think ten years out—although most organizations have much shorter planning cycles, it is important to think further ahead in order to create a distinctive and guiding strategy for your organization. A ten-year horizon is accessible, relevant, and believable, and yet is far enough out from present-day realities to allow you to consider a wide range of future possibilities. You will be able to see patterns unfolding, even if the details are unclear. *HC 2020 Signals & Forecasts Map* describes the challenges we face in health and health care over the next decade and charts the diversity of responses and innovations out on the horizon.

THE MAP FOCUSES ON SIX CHALLENGES THAT MAKE UP THE COLUMNS:

Sustaining Environments

Transforming Bodies and Lifestyles

Making Information Actionable

Ensuring Affordability and Value

Reinventing Medical Practices

Connecting Work and Health

THE MAP ALSO TRACKS FOUR MAIN RESPONSE STRATEGIES, WHICH MAKE UP THE ROWS:

Commons—focuses on self-organized and participatory solutions.

Markets—leverages market dynamics to generate innovations, new product offerings, and experiences.

Policy—seeks government interventions to address market failures, issues of equity, funding, and oversight.

Science and Technology—looks to mobilize science and knowledge resources to address our health and health care needs.

Each of these strategies and the responses they shape will ultimately converge, interact, and cut across stakeholders at different scales. Whatever the eventual outcomes may be, together they offer us a roadmap for making sense of the coming decade.

START WITH THE FORECASTS



The first layer of the map is populated with several **forecasts**, which represent likely responses to the challenges. Imagine how various stakeholders—citizens and consumers, clinicians and payers—and systems may work with these forecasts. Connected to the forecasts are **artifacts from the future**—visual representations of possible future products, services, or technologies—to get you thinking about the possibilities for how each forecast might play out. Notice also the **critical uncertainties** surrounding each forecast; how will these affect you and the decisions you make?

SCAN THE SIGNALS AND TRENDS

Transparency



The second layer of the map goes deeper; the **signals** scattered across the map are early indicators of changes to come. They are happening in the real world today and are interesting examples of innovations or approaches to the problems we currently face. Consider the implications these signals and the trends they suggest may have for your organization. Also placed across the map are **quotes** from our experts that show how other people are thinking about these trends. They may spark new insights for you and your organization. And of course, feel free to add your own signals and trends.

ECO-RISK TRACKING

Participatory tools for identifying environmental health risks drive engagement around role of place and health



limits of consumer engagement

NETWORKED HEALTH

Self-organized collectives of patients, consumers, and citizens drive delivery-of-care systems, traditionally targeted at individuals, to reorient around new interactions



VALIDATION OF QUANTIFIED SELVES

Widespread self-tracking leads to integration of patient-generated information in research and development and treatment practices



willingness, efficacy of self-tracking

EMPLOYERS AS CHOICE ARCHITECTS

Employers redesign the workplace and adopt a range of persuasive strategies to deliberately influence workers' decisions around health

adverse selection of patients

BUNDLING PAYMENTS AND CARE

Payments will be grouped together and linked to patient outcomes to encourage better coordination and communication, resulting in improved quality of care

ECOLOGICAL HEALTH

Systems thinking brings together diverse stakeholders to develop interventions that go beyond narrow health choices and categories toward more adaptive, collaborative, and resilient responses



HEALTH PREVIEWS

New technologies enable individuals to experience the future effects of present-day behavior choices



evolving health literacy gaps

fragmentation of health information systems



transparency in health financing

maldistribution of medical resources

climate change's impact on health systems

NEUROINTERVENTIONS

Advances in neuroscience lead to new interventions as the brain becomes a common site for treatments, preventions, and augmentations



INFORMATION ECOLOGIES CONVERGE

Systemic barriers recede to facilitate holistic, seamless integration of health and lifestyle data to generate new insights into the relationships between daily living and health

information security and control

cross-sector collaboration

PROBABILISTIC MEDICINE

Bio-marker based tools will screen for future disease risk and produce new diagnoses based on probabilities



pace of discovery and backlash against science

new health anxieties

CHALLENGE AREAS

SUSTAINING ENVIRONMENTS
Demands for sustainability require healthy outcomes that don't harm the environment

TRANSFORMING BODIES & LIFESTYLES
Disease burdens & societal expectations drive healthier lifestyles

MAKING INFORMATION ACTIONABLE
Health-related data becomes filtered & integrated in meaningful ways

ENSURING AFFORDABILITY & VALUE
Costs & unequal access to care necessitate new services & financing models

REINVENTING MEDICAL PRACTICES
Shifts from episodic to continuous care reshapes delivery models & social norms

CONNECTING WORK & HEALTH
Health & productivity issues reshape the employer-employee relationship

RESPONSE STRATEGIES

COMMONS

Self-organized and participatory solutions

A new culture of participation, cooperation, and commons thinking generates participatory and networked responses to health and health care challenges.

MARKETS

Demand- and supply-driven offerings and experiences

Market innovations meet consumer and business needs in an evolving global health economy.

POLICY

Government oversight and intervention

Government responds to the nation's health and health care burden aimed at addressing market failures, issues of equity, funding, and oversight.

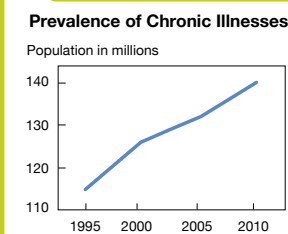
SCIENCE & TECHNOLOGY

Research- and knowledge-intensive innovations

Mobilization of science and technology resources address health and health care challenges and reach new frontiers in medicine, life sciences, and ecology.

Chronic Disease Burden

- Obesity, heart disease, diabetes, depression linked to food system
- Asthma and allergies rise with pollution and global warming



Source: NCCA State of Health Care Quality Report, 2007

Best-practice Commons

- Sustainable design, construction, and operations of health care infrastructure
- Reducing impact of pharmaceutical waste



Transparency Beyond the Label

- Competing databases: public, private, independent
- Disputed user-generated information
- Sustainability, health, and corporate social responsibility (CSR) converge

GoodGuide iPhone app for safe, healthy, and green products



Health-driven Localism

- Asset mapping and capacity building
- Fast food moratoriums and inverted quarantines
- Urban planning for walkability, pollution reduction, neighborhood food systems

Collective Health Engagement

- Communities take on obesity
- Online fitness challenges
- Games for health

Toledo, OH community weight-loss initiative



Patient-generated Information

- Self-organized clinical trials
- Social networks for patient data aggregation



Lend4Health

New Health Collectives

- Consortia of diverse health care organizations for quality improvement
- Peer-to-peer health lending

Health Insecurity Expands

- Uninsured ranks growing
- Half of bankruptcies stem from medical bills
- Rising chronic disease comorbidity

Participatory Medicine

- Peer-to-peer disease management
- Shared medical appointments
- Patient-doctor medical pacts

"Referring to providers and consumers is a false dichotomy."
—David Sobel

"Health care died when doctors became providers and patients became consumers."
—Leonard Shlain

Contagious Stress and Happiness

- Emotions travel along networks
- New healthy work practices
- New work and health identities

Workplace Productivity

- Absenteeism and presenteeism
- Workplace clinics

Activating the Workforce

- Behavioral economics applied to health and wellness programs
- Exercising for health, and mental acuity
- New risk assessment tools



Source: The Stanford Virtual Human Interaction Lab

Visualization, Feedback, and Simulation

- Visualizations improve diet & exercise
- Health simulations track future health status

Collaborative Technology

- Practice management and teamwork
- Filtering and curating information



Platform for patient-provider communication

"We need to do for health care what Wal-Mart has done for retailing or what Toyota has done for automobile production."
—Arnie Milstein

Expansion of Outcomes-based Payments

- Pay for performance
- Quality care bonus
- Alternative quality contract

Reorganizing Care

- Creating cultures for continuous improvement
- Global capitation
- Medical homes

Innovations Meet Entrenched Interests

- Retail clinics
- \$4 generic prescriptions
- Compensation disparity between primary care and specialists

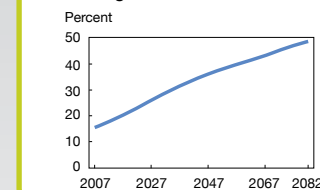
"The hardest part of health care reform will be to get doctors to give up their autonomy."
—Robert Pearl

Regulatory Intervention

- Reference pricing for pharmaceuticals
- Government mandates vs. self-directed decisions
- FDA latitude

"By a wide margin, the biggest threat to our nation's balance sheet is the skyrocketing cost of health care."
—Barack Obama

Projected Spending on Health Care as a Percentage of Gross Domestic Product



Source: Congressional Budget Office, November, 2007

Quantified Medical Practice

- Evidence-based medicine
- Comparative effectiveness
- Platforms for transparency and outcomes

"Something needs to change, and if it doesn't change, it's going to essentially tank the economy."
—Jay Parkinson

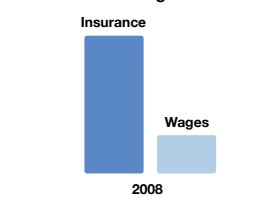
Health Job Creation



Source: Bureau of Labor and Statistics

Health Costs Outpace Wages

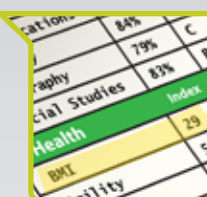
Increase in Employer-sponsored Insurance vs. Wages: 1999-2008



Source: Kaiser Family Foundation, 2008

Institutionalizing Behavior Change

- Schools re-emphasize physical education and recess
- Report cards include Body Mass Index (BMI) scores

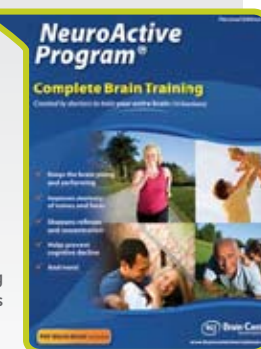


"You can't talk about the problem of obesity without talking about how we educate four-year-olds."
—Richard Bohmer

Health and the Brain

- Brain fitness grows popular
- Deep brain stimulation used for neurological, behavioral issues
- Estimated \$120 billion market for "neurotech"

Brain stimulating exercises



Bi42RDF.org

Metadata Mining

- Open standards for cross-database referencing
- Pattern recognition and data mining accelerate knowledge discovery

Cutting-edge Research and Treatment

- Synthetic biology
- Systems biology
- Regenerative medicine
- Proton beam therapy

"I don't want to stop biomedical innovation but I do want to see it proceed in a more value-conscious way."
—Victor Fuchs

Personalized Medicine

- Genotypic diagnostics and risk assessments
- Individually targeted therapies
- Sensors track drug efficacy

Proteus' ingestible micro-chipped pills



Designing Environments for Well-being

- Biomimicry and built environments used to encourage productivity
- Evidenced-based optimization of environments
- Environments and natural spaces for therapy

ECO-RISK TRACKING

What if ...

you could make the invisible visible?



ECOLOGICAL HEALTH

What if ...

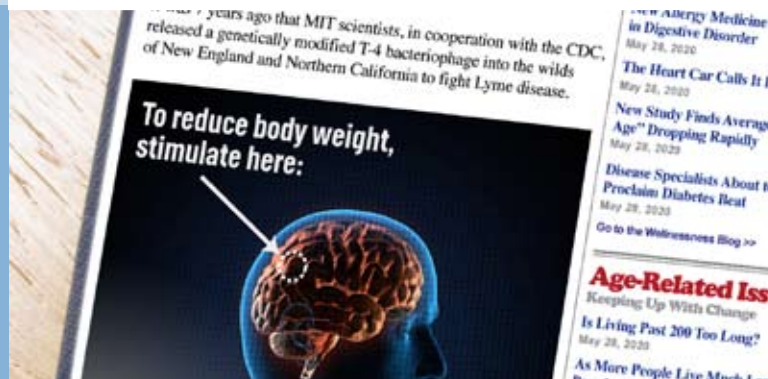
you could manage health at different scales?



NEUROINTERVENTIONS

What if ...

you could have brain surgery for weight loss?



HEALTH PREVIEWS

What if ...

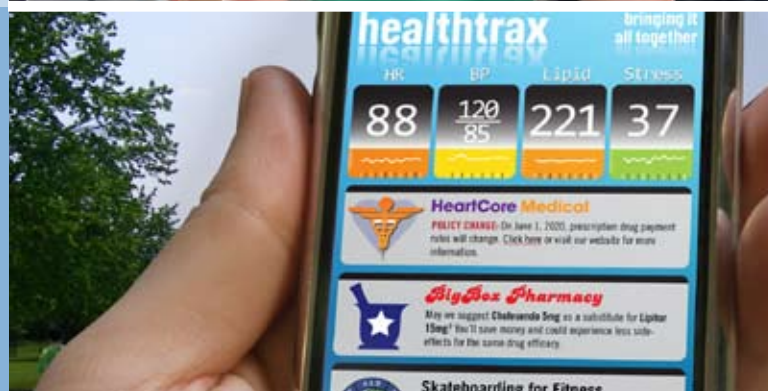
you could get a sneak preview of your future health?



INFORMATION ECOLOGIES CONVERGE

What if ...

your health data were available any time, any place?



NETWORKED HEALTH

What if ...
your genetics define your community?

C-13.org
A Not-for-Profit Cooperative, Community, and Company
Using Our Biodata to Solve Disease

58,312 current members

Welcome back, *Fatima*. (Member since: Dec 09)

Your voice:
Open issues to vote on:

- Should C-13 endorse Wisconsin Prop 78?
- Vote on new Board of Directors!

Your community:
Personal messages (3):

- "hey Fatima whazzup?"
- "Re: advice on sensors"
- "Will you support us?"

Your data:
Your overall personal biodata currently worth: **862 points**
Your medical data was updated on Apr 13 by 30 points (checkup+bloodtest)

Sponsor ad:
We're not alone.
Find other C-13ers like you for group prices on custom formulation

PROBABILISTIC MEDICINE

What if ...
you could anticipate your future risk of disease?

A chance to know more about your child's health probabilities...

FREE GENOYPE SCREENING
Aug. 11
8am - 12 noon

St. Mary's School Gymnasium

BUNDLING PAYMENTS AND CARE

What if ...
your care came with a warranty?

Accountable Care Organization
Pinnacle Greetings

JODY PANDE
5141 STEADMAN ST.
SAN CARLOS, CA 94070

| Service description | Service date | Amount billed | Not covered | Covered |
|-------------------------------------|--------------|---------------|-------------|---------|
| Angioplasty with six month warranty | 02/15/14 | \$34,757 | 10% | 90% |
| Group visit, Kimberly Carter, MD | 03/07/14 | Included | Included | 100% |
| Stress reduction therapy | 03/29/14 | Included | Included | 100% |
| Nutrition Class, Wholesome Foods | 04/02/14 | Included | Included | |

Understanding Your ACO Coverage Information
You have chosen the Pinnacle Greetings ACO which covers basic conventional medical therapy as well as manipulative and body-based practices, biologically-based treatments, energy medicine, whole medical systems. Your services are covered based on the classifications outlined by the National Institute of Health's National Center for Complementary and Alternative Medicine (NCCAM).

VALIDATION OF QUANTIFIED SELVES

What if ...
self-tracking goes mainstream?

Create a medical breakthrough while you wait for the train...

If you use your phone to sense and manage your health or fitness, you can now share this data with St. Jane Research. It helps us better understand health in the real world, reduce costs, and ultimately improve lives.

Follow the prompts on your phone near this ad. It's fast, safe, and 100% anonymous—the St. Jane name is your guarantee.

EMPLOYERS AS CHOICE ARCHITECTS

What if ...
your employer could nudge you to better health?

myHealth 9-5/24-7
The most advanced health phone for work, home, life.

- Over 27 real-time health+environment sensors
- Automatically identifies good behaviors for Employee Health Commons
- Personal coaching, wellness virtual trainers
- RiskMate alerts about risky situations on-the-go

FREE for you!
And includes minutes per month!