



# Co-production and crowd sourcing for Health: Know more, do less.

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**Director, Worldwide Health IT Program Office, Intel**



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HEALTH ALLIANCE

# Continua Health Alliance



“Our Mission is to establish an eco-system of **interoperable** personal health systems that empower people and organisations to better manage their health and wellness”

Infant



Amateur Athlete



Diet/Fitness Focused



Worried Well



Chronic Patient



Acute Recovery



Elderly Living Independently



## CONTINUUM of LIFE

Continua Health Alliance enables a personal health eco-system that empowers individuals & families to better manage their own health and wellness across the continuum of life and care methods.

## CONTINUUM of CARE GIVERS

New Parents



Fitness Wellness Coach



The Family



Home Nursing Professional



Doctor/NP/Nurse



# The Challenge

- Worldwide today:
    - 1 billion adults overweight
    - 860 million chronic disease patients
    - 600 million elders age 60 or older
- 
- 75-85% of healthcare spending is on chronic disease management

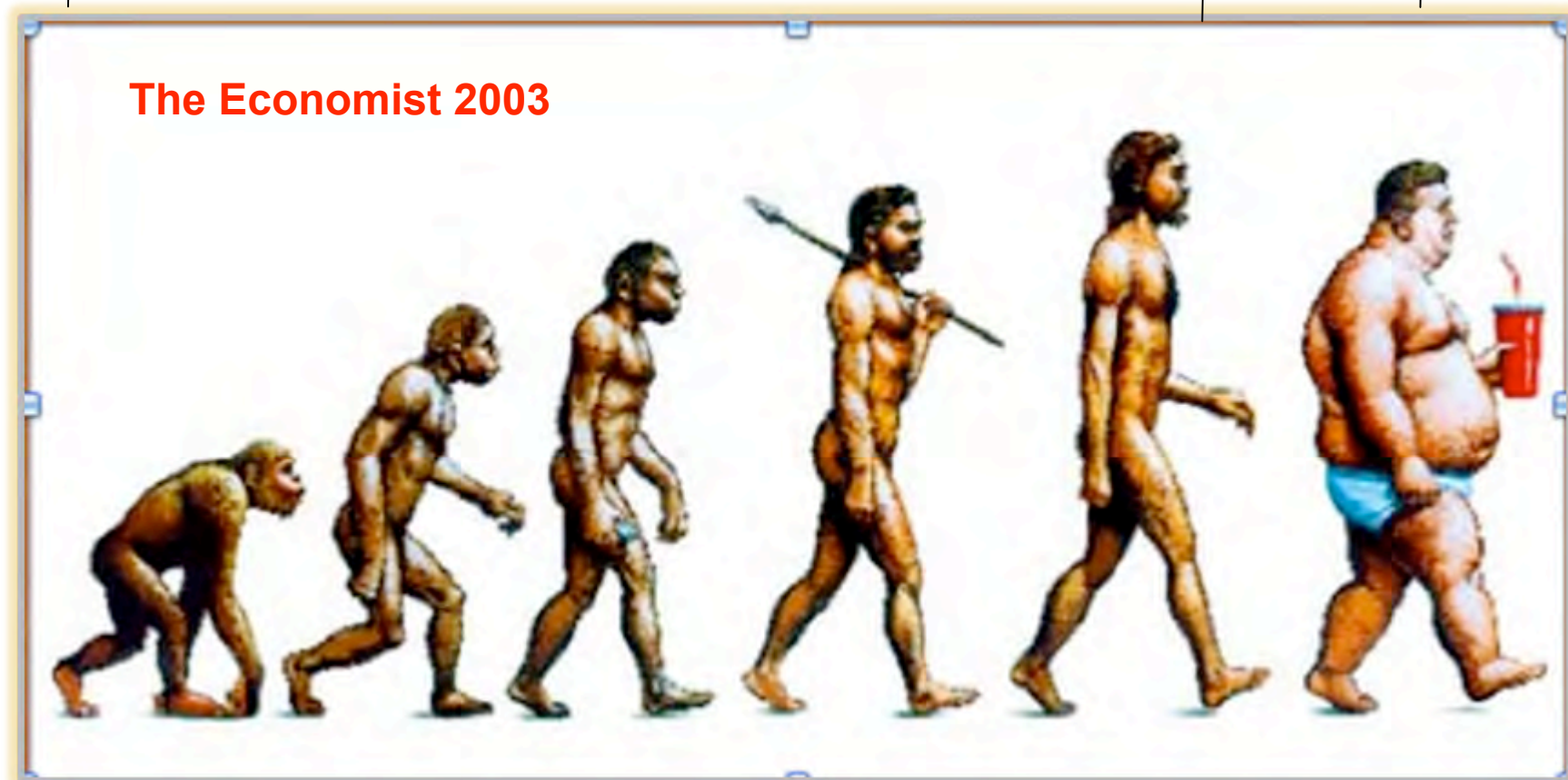




# Life Style is out-paceing biology

5-6 Million Years

30-40 Years

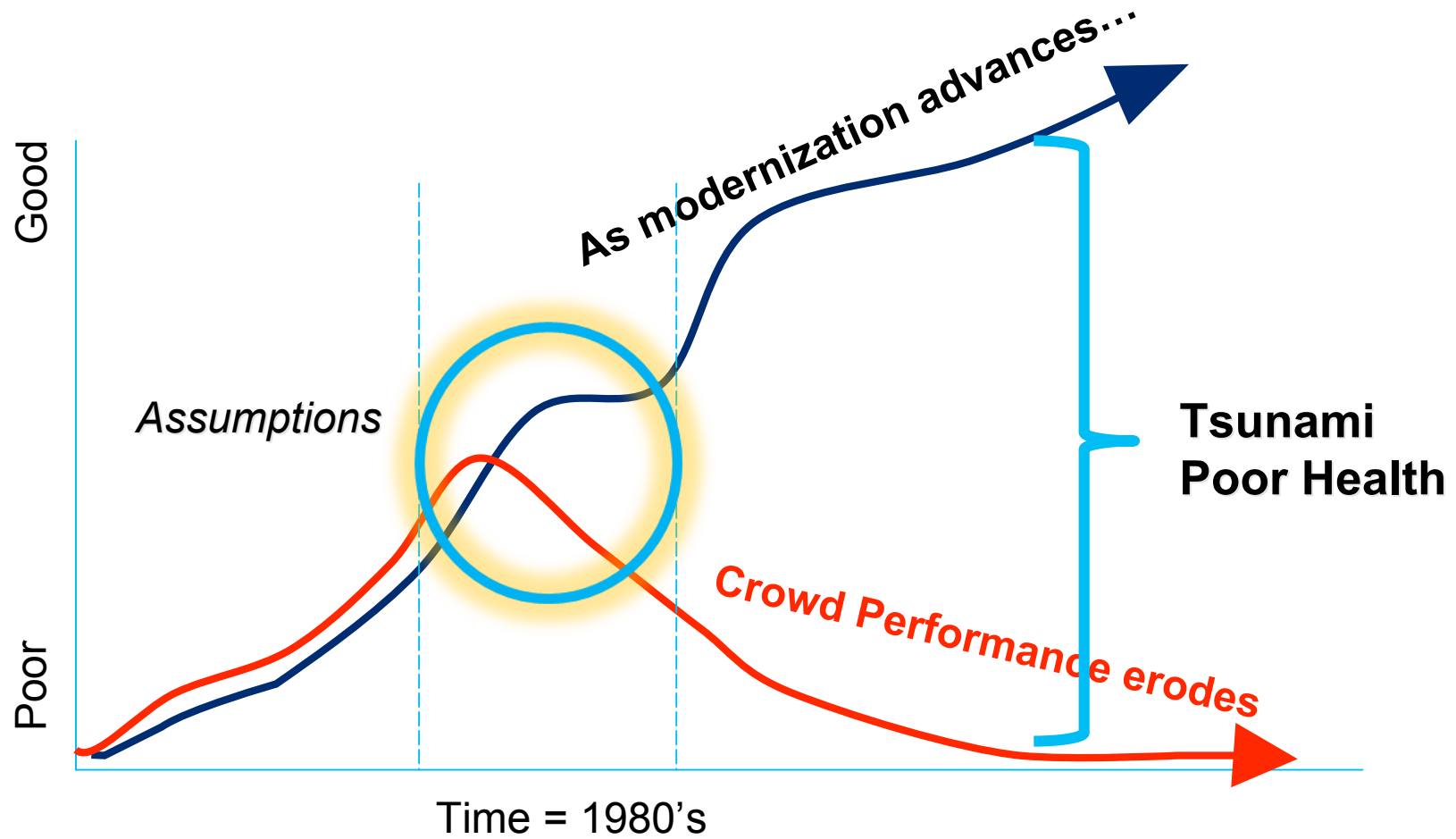


*One billion adults overweight world wide*



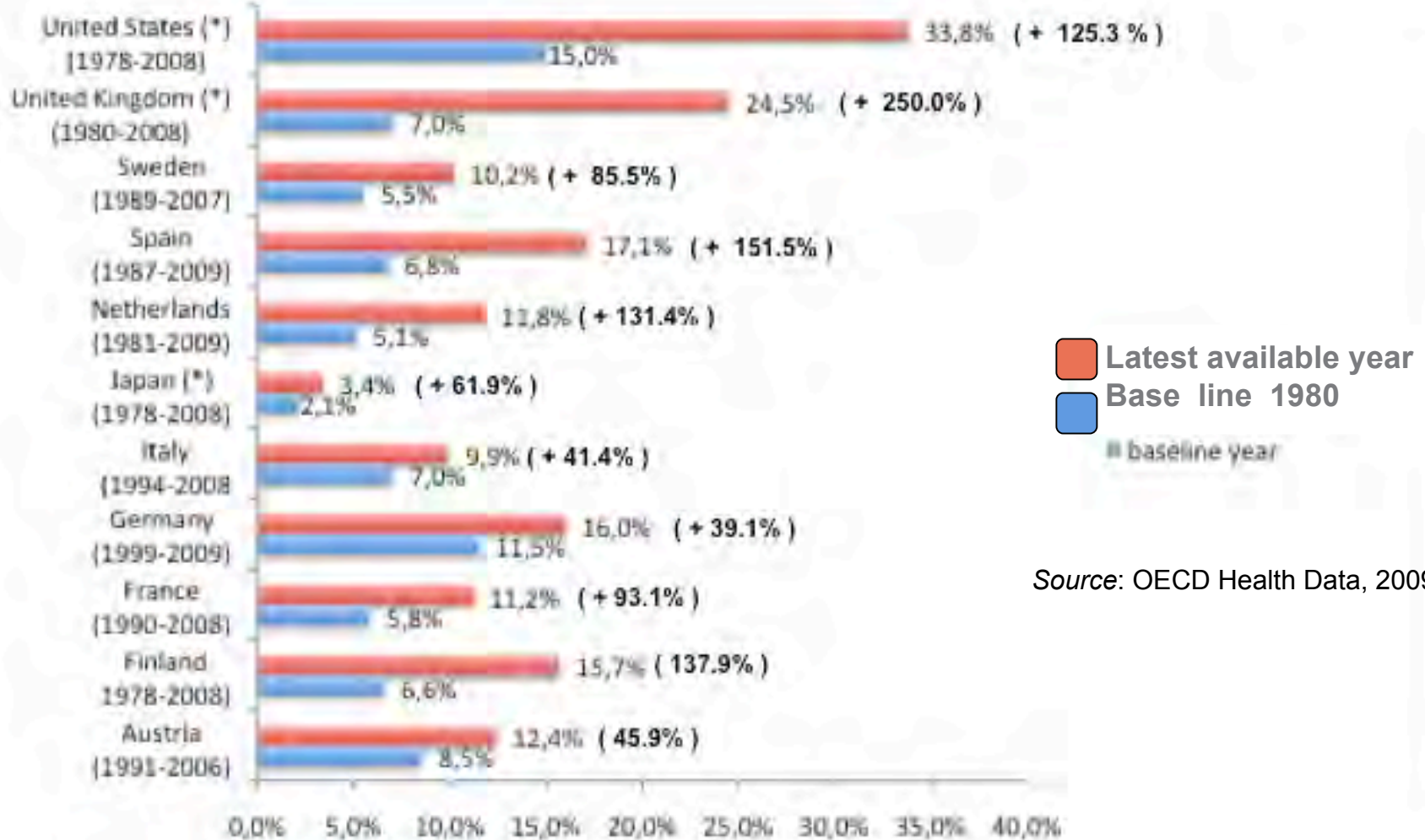
# Current Problem

*Failure to predict or prevent the health potential gap*





# Prevalence of obesity



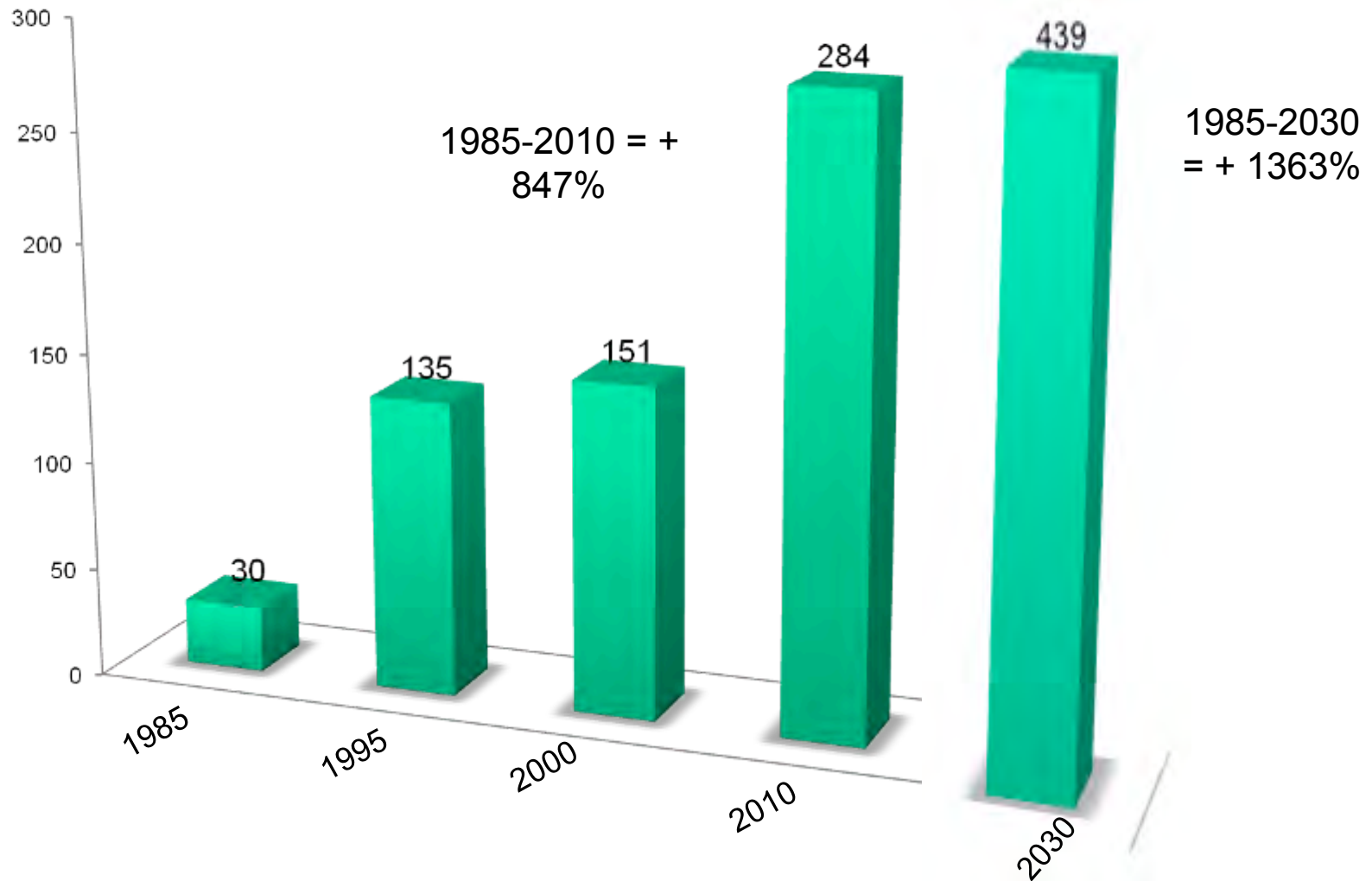
Source: OECD Health Data, 2009

(\*) data comes from measurement, all other are self-reported



# The Diabetes Epidemics

## Worldwide population with diabetes (million)



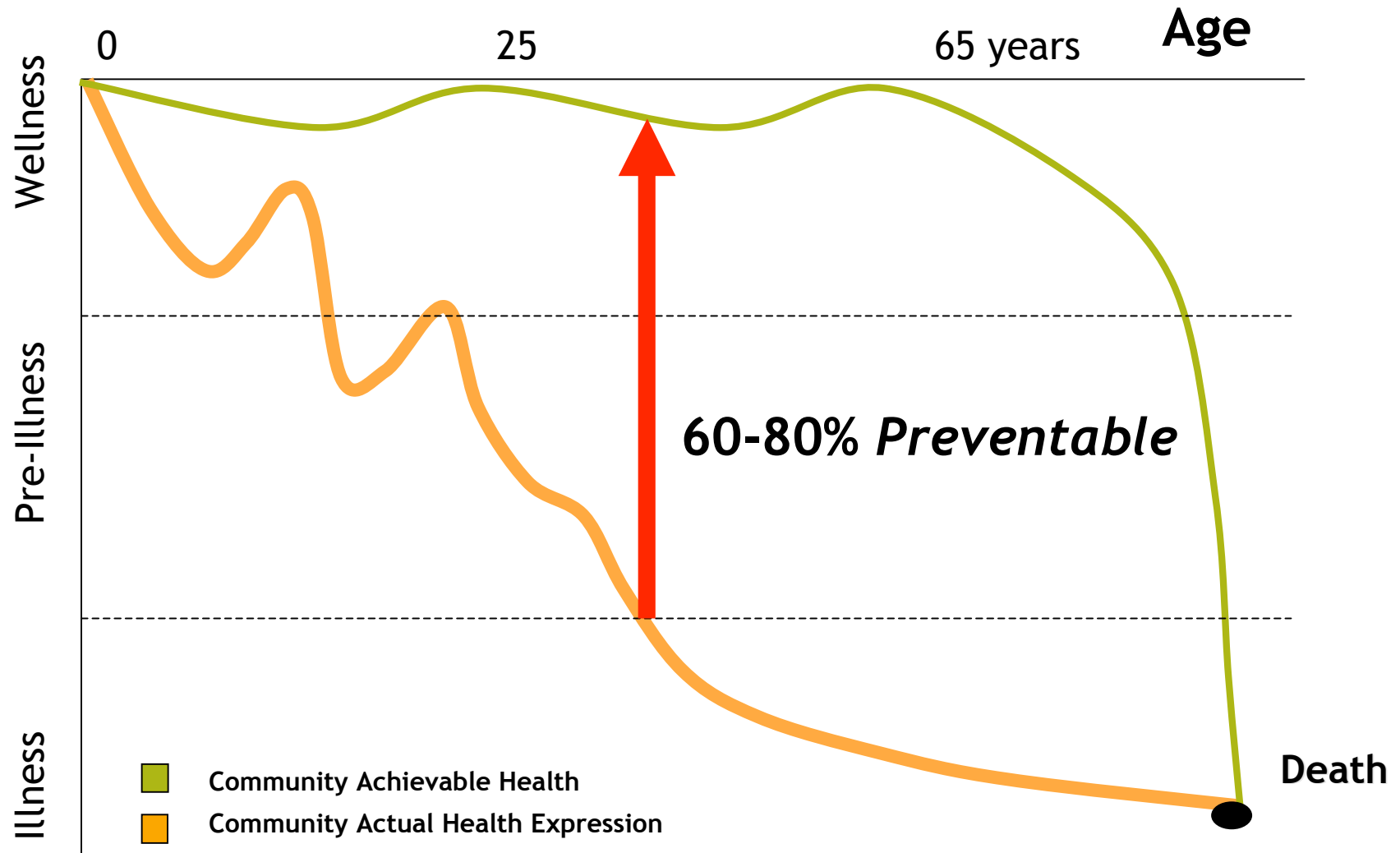
Source: IDF Diabetes Atlas (<http://www.diabetesatlas.org/>). Figures for 2010 are projections



## Why?

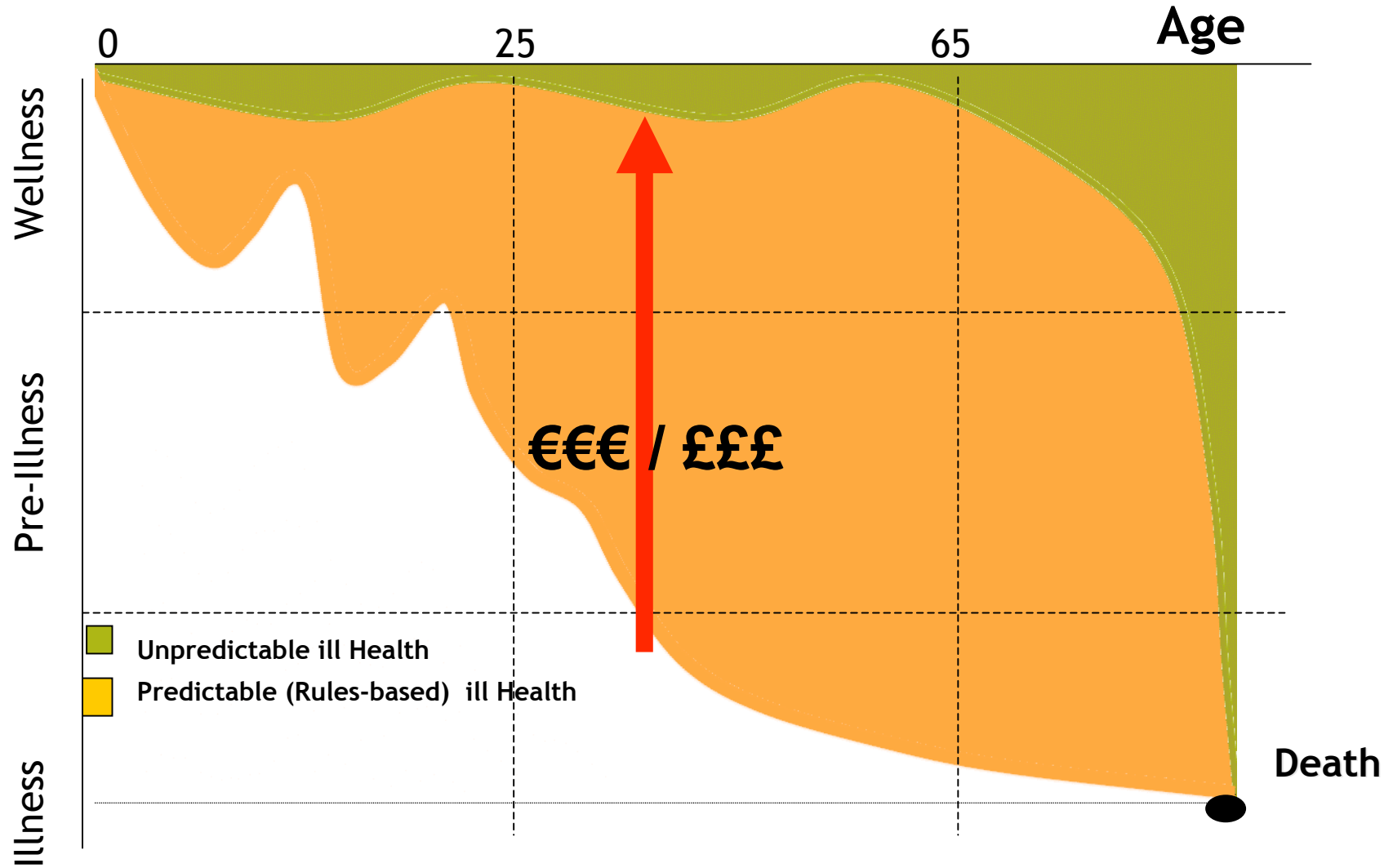


- **Coca Cola 2000: worldwide sales of the unit case (24 8-oz. servings) were \$ 17.1 billion.**
- **• Häagen Dazs 2001: franchises in more than 55 countries, with more than 800 outlets.**
- **• Pizza Hut 2001: 12,000 units and kiosks in more than 88 countries serving more than 1.7 million pizzas a day to four million customers.**





# Cost of Avoidable Ill Health

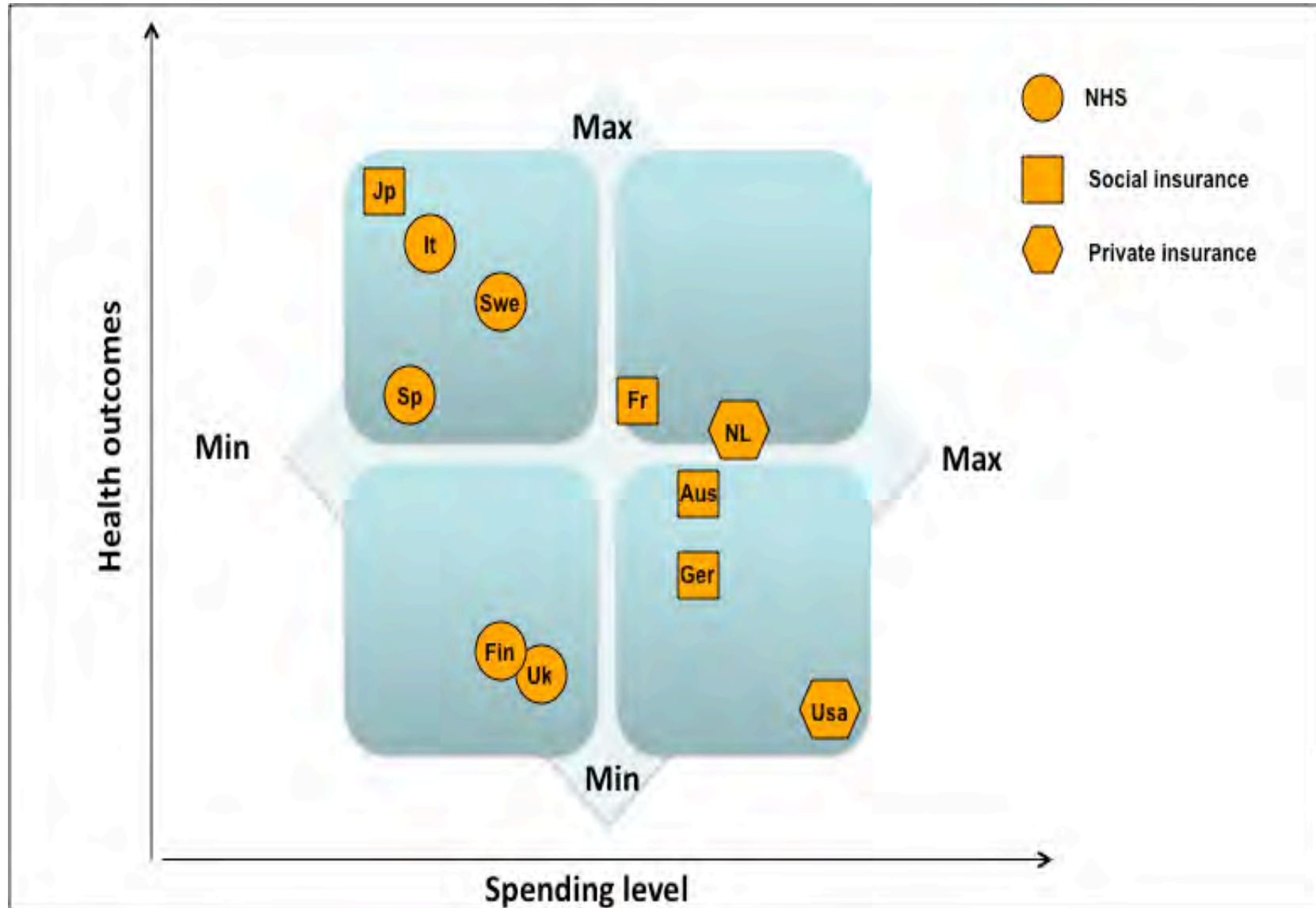


# Is spending more the answer ?

	LEB (M&F)		HALE (M&F)		Average total rank	PPP \$ per capita	Obesity prevalence (M&F)
	Value	Rank	Value	Rank			
<b>NHS systems</b>							
Finland	79,5	17,0	72,0	16,0	16,3	3008	15,7%
Italy	81,4	3,0	74,0	3,0	3,3	2870	9,9%
Spain	81,0	6,0	74,0	3,0	8,3	2902	17,1%
Sweden	81,0	6,0	74,0	3,0	4,3	3470	10,2%
<b>UK</b>	<b>79,5</b>	<b>17,0</b>	<b>72,0</b>	<b>16,0</b>	<b>18,0</b>	<b>3129</b>	<b>24,5%</b>
<b>Social insurance systems</b>							
Austria	80,1	13,0	72,0	16,0	11,5	3970	12,4%
France	81,0	6,0	73,0	8,0	8,3	3696	11,2%
Germany	80,0	14,0	73,0	8,0	13,0	3737	16,0%
Japan	82,6	1,0	76,0	1,0	2,0	2729	3,4%
<b>Systems with higher private insurance role</b>							
Netherlands	80,2	11,0	73,0	8,0	7,8	4063	11,8%
<b>United States</b>	<b>78,1</b>	<b>24,0</b>	<b>70,0</b>	<b>24,0</b>	<b>23,3</b>	<b>7538</b>	<b>33,8%</b>



# Is spending more the answer ?





Co-Production

Co-Production

Crowd  
Sourcing

Crowd  
Sourcing

Crowd  
Sourcing

Crowd  
Sourcing

Co-Production

Co-Production

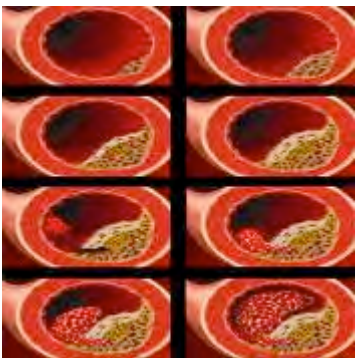




## Why crowd sourcing and co-production?

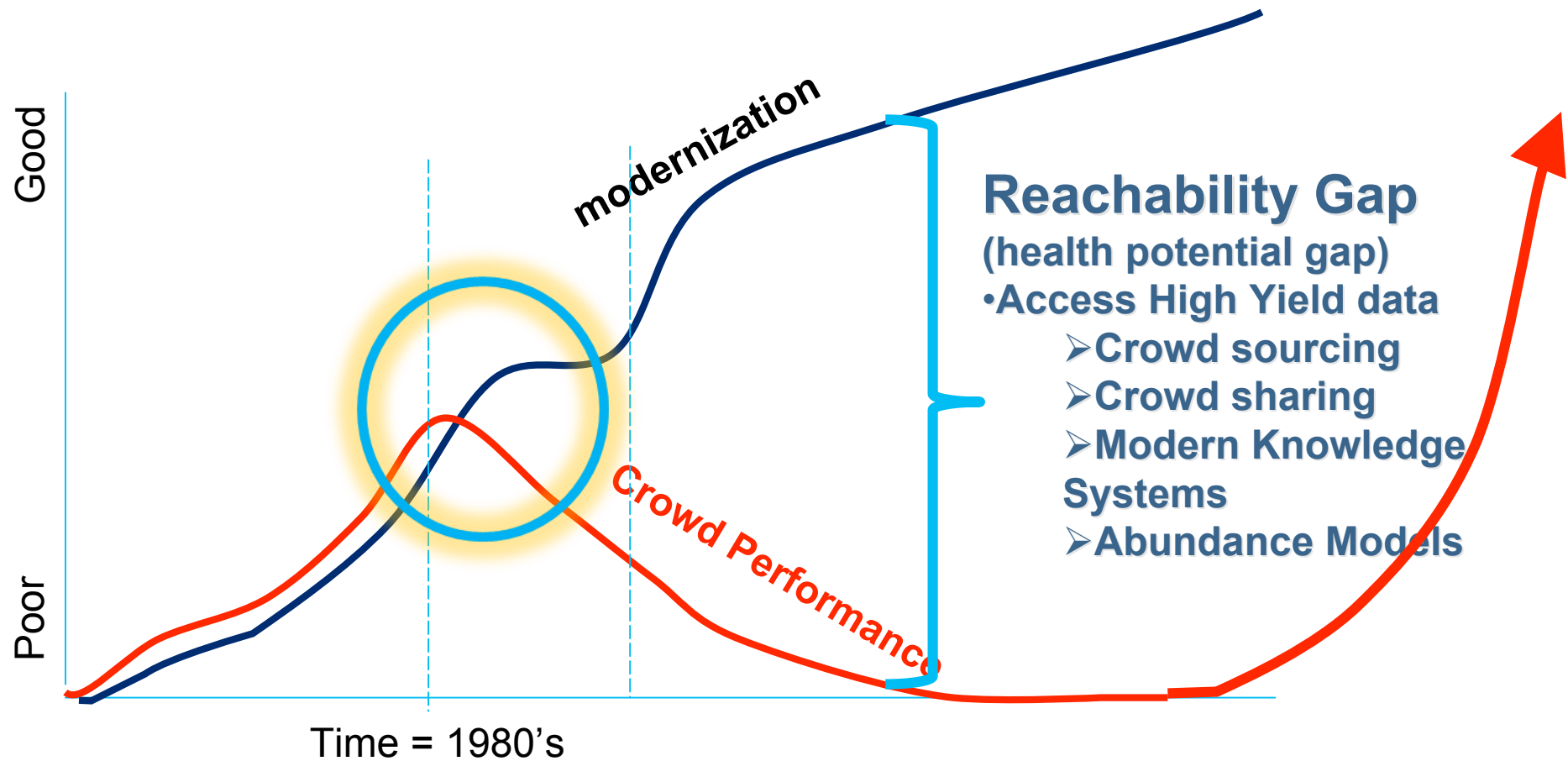
### We are no longer accidentally well

- Poor health increasingly affecting our youth
  - Diabetes T2, Obesity
  - Cardiovascular disease, stroke
  - Cognitive decline, Alzheimer's
  - Some Cancers
- 70-85% of health expression is lifestyle mediated
- Avoidable health appears rules-based across crowds but ... we do not know enough!





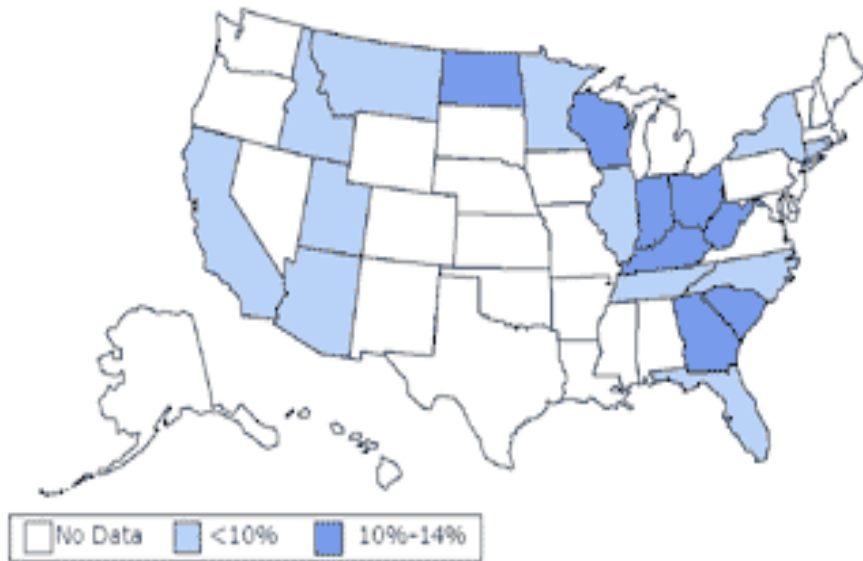
# Co-producing Health Potential





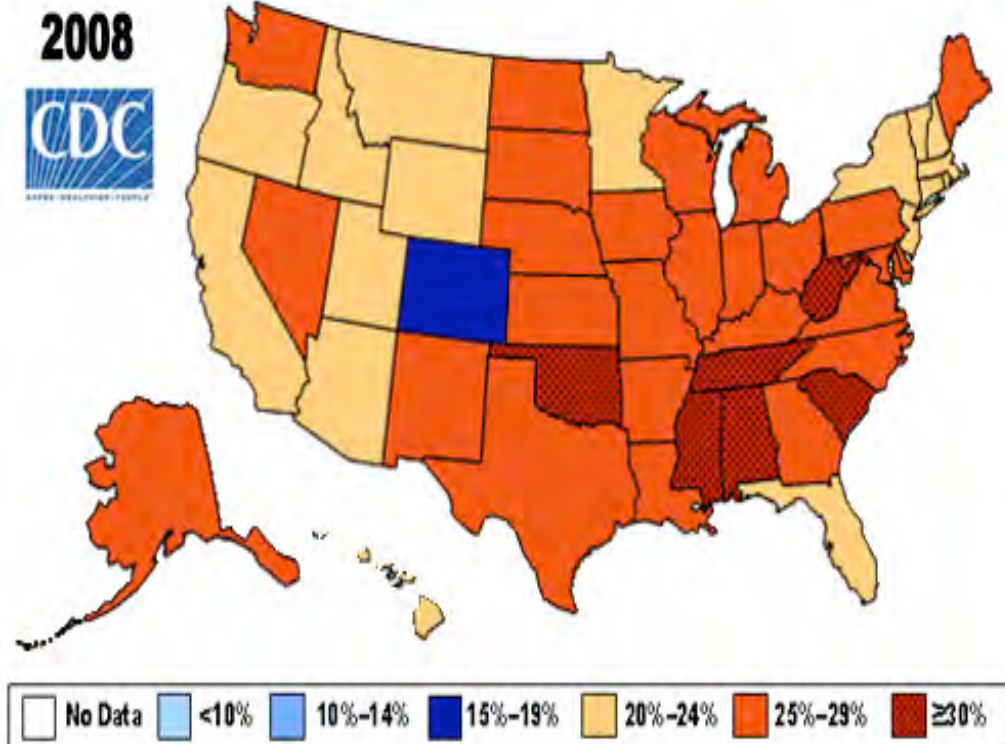
## Obesity Trends\* Among U.S. Adults BRFSS, 1985

(\*BMI ≥30, or ~ 30 lbs overweight for 5'4" woman)



Source: Mokdad A H, et al. *J Am Med Assoc* 1999;282:16, 2001;286:10.

Weight change  
+ Activity change  
+ Response to Nutrition  
= predictability





# Co-production of high yield data



Build Communities

**Join CureTogether. It's Free!**

Manage your own health. Contribute to the greater good. Feel better faster.

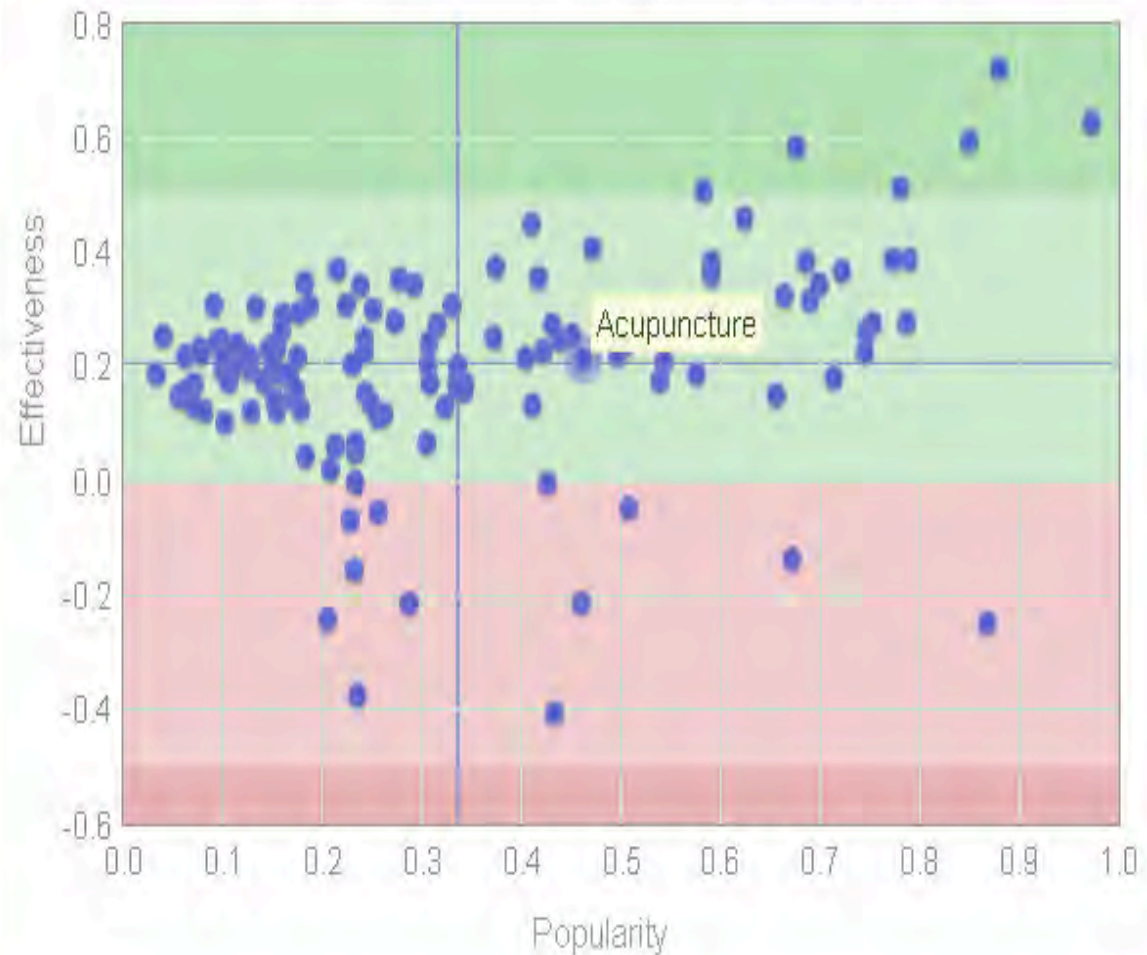
Already a member? [Sign in](#)



[Browse top conditions](#)

### 128 Chronic Fatigue Syndrome Treatments Compared

Hover over each dot to see what treatment it represents.



Notes

medhelp

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Connect

# The World's Largest Health Community

Over **12 million** monthly visitors.

Mood This Week

Sleep This Week

Average sleep this week:  
**8 hours**

Track your sleep

Exercise This Week



More Less

Activity on MedHelp

Login

Pass

Login

Join Today!

## Today's Pulse



[Are Airport Body Scanners Dange...](#)  
While the privacy debate roils on, here, radiologist Dr. Garry Choy



[Does Latisse Really Work?](#)  
Can Latisse really make your eyelashes longer, fuller and darker?



[The Vaccine-Autism Hoax: Why Di...](#)  
In the battle between sensationalism versus science, your health loses....

1 2

Ask One of Our Experts



Advice from leading medical experts

Get Support Today



Real stories, shared experiences, good advice

Manage Your Health



Health apps...wherever, whenever

MAP



Graph

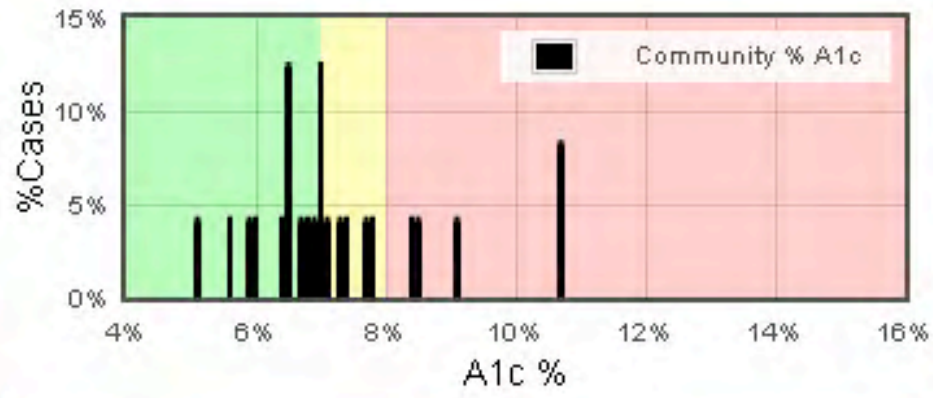
Table 1

Table 2

**United Kindom**



A1c %:	#Cases	Avg	Low	High
	24	7.3	5.1	10.7

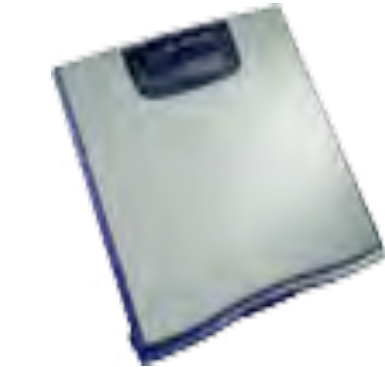


# Crowd sourcing Data

*Device Interface*

*XHR Interface*

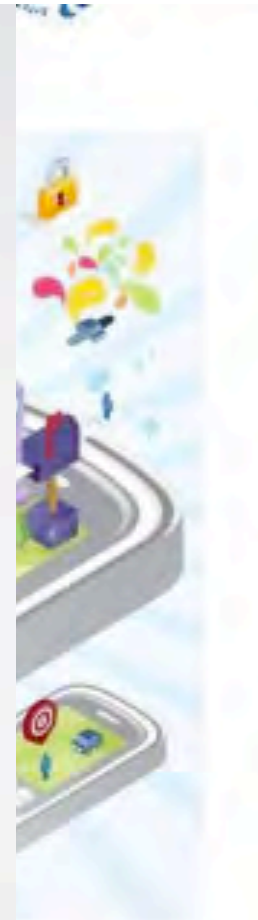
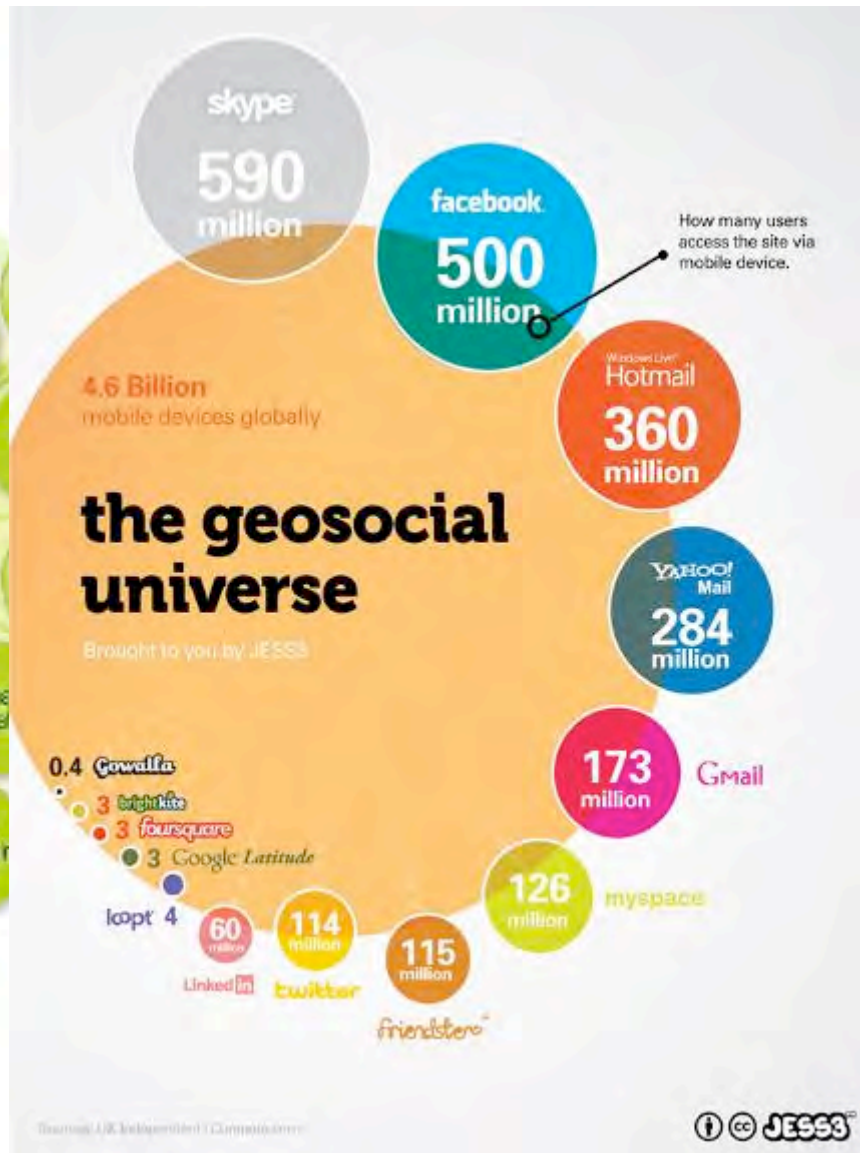
Community  
Data Commons



Secure PHR

Wireless  
Ultra Low Power  
Ultra low cost

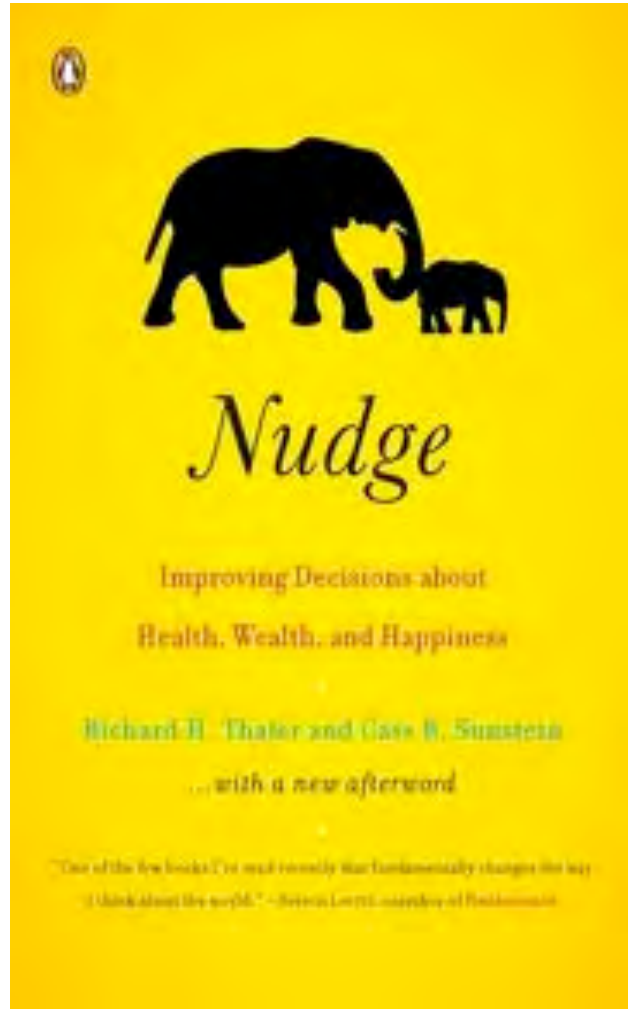






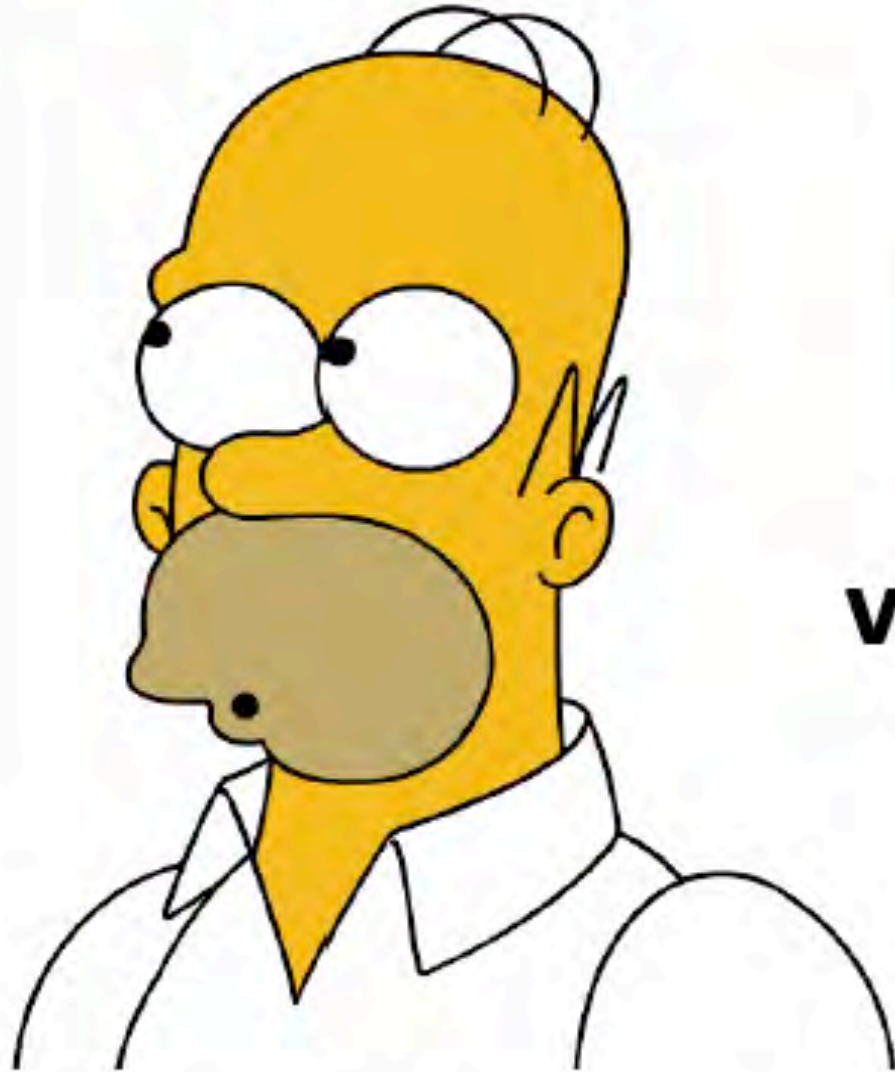
## Asthmapolis





iNcentives  
UUnderstand mappings  
DDefaults  
GGive feedback  
EExpect error  
SStructure complex choices

Richard H. Thaler and Cas R. Sunstein



**"Gut"**

**(Automatic Cognitive System)**

**VS.**



**"Mind"**

**(Reflective Cognitive System)**



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# Co-production through nudging



Geoloqi



Don't eat that



LoveMySkin



# (5) New Knowledge Engines





*Crowdsourcing of high yield data, data intensive modelling, and nudging through persuasive technologies:*

*a paradigm shift toward using ICT to produce better health outcomes*

Brigitte Piniewski, Cristiano Codagnone, David Osimo

European Joint Research Centre  
Scientific and Technical Reports



# Natural Resistance to Innovation





# Innovation

- The adoption of something **new** which creates **value** for the people or organization that adopts it
- People creating **value** by implementing **new** ideas



Change:  
Crisis-driven, technology  
enabled innovation



# Three Types of Innovation

- **Radical**
  - Thinking out of the box
  - Shifting the paradigm
  - Leaping ahead
- **Incremental**
  - Taking the next logical step
  - Making something better and better
- **Reapplied**
  - Thinking laterally
  - Using something in a whole new way

Source: Gene Meieran  
(All Rights Reserved)



1 person  
4 mph  
60 days;  $6 \times 10^6$  seconds/pe



4 people  
40 mph  
6 days; 100,000 seconds/person



300 people  
600 mph  
5 hours; 60

Fundamental changes in the way people travel  
Fundamental impact on world economy



# Incremental Innovation: The Airplane



1903



1920



1940



1980

Faster

Better

Cheaper

Safer

More convenient



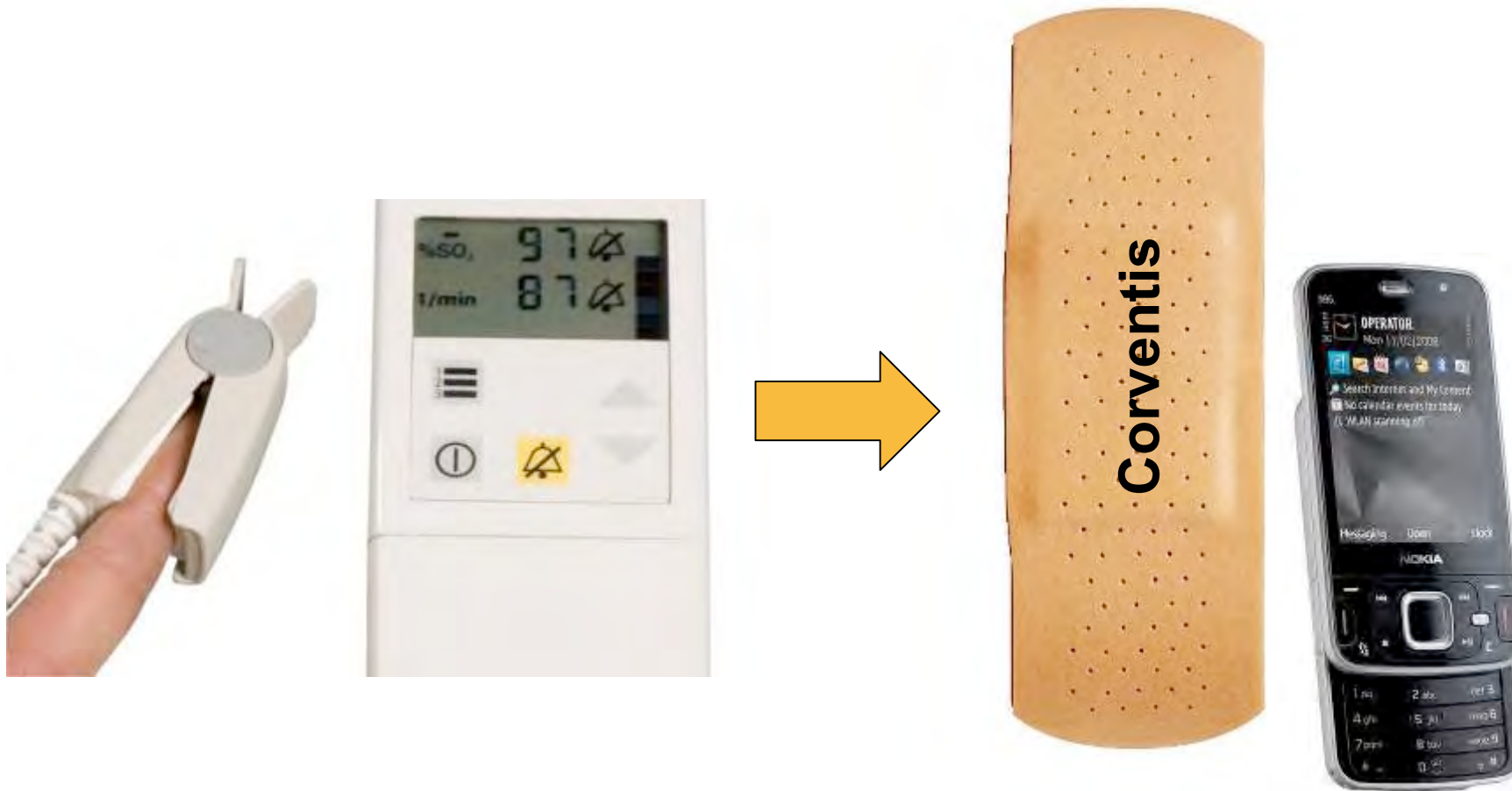
# Reapplied Innovation: Super Glue



Superglue was used as surgical stitches



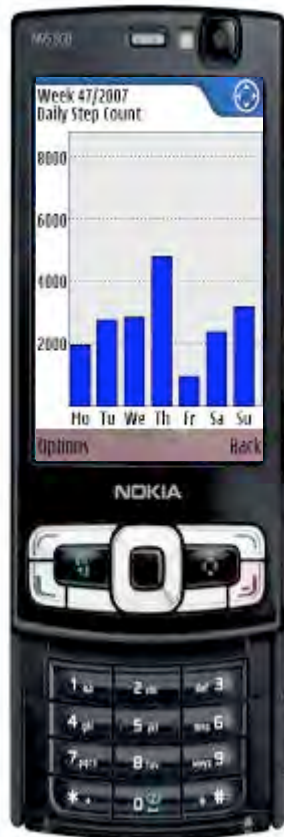
# ***Innovation Examples (Towards Crowd Sourcing)***



Integrated Disposable Pulse Ox



# Weight, Activity, Sleep in an Obese World





## Wireless Health: Senior Care



- **Mobile + GPS tracking solution:**
  - A watch-like bracelet (Columba) with embedded GSM modem, GPS chip and an emergency button to call for help
  - Targets Alzheimer's Disease patients to prevent wandering off
  - Wireless data network service provided by Orange in France, Telefonica in Spain, Vox Mobile in Luxemburg
  - Wireless carriers help promote and distribute it at local operator stores or pharmacies
- **Business model: like a mobile service**
  - €199 for the device
  - €49 per month for the data service with a 3-year contract
- **New Model Urgency:**
  - Fine-tune the business model
  - Improve functionalities





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# Weight, Activity, BP in Chronic Diseased World...

## Sensor Devices

## Healthcare Services



## PC & Gateway Devices



gOO からだログ

VV V-CUBE

あっとからだ

Web @からだ

shin tai sou kou bou 深体創工房

イージカルテ Web2.0

Kzoku ケーソクはチカラ!

HealthPlanet ヘルスプラネット

ママCafe Maternity Mama Cafe

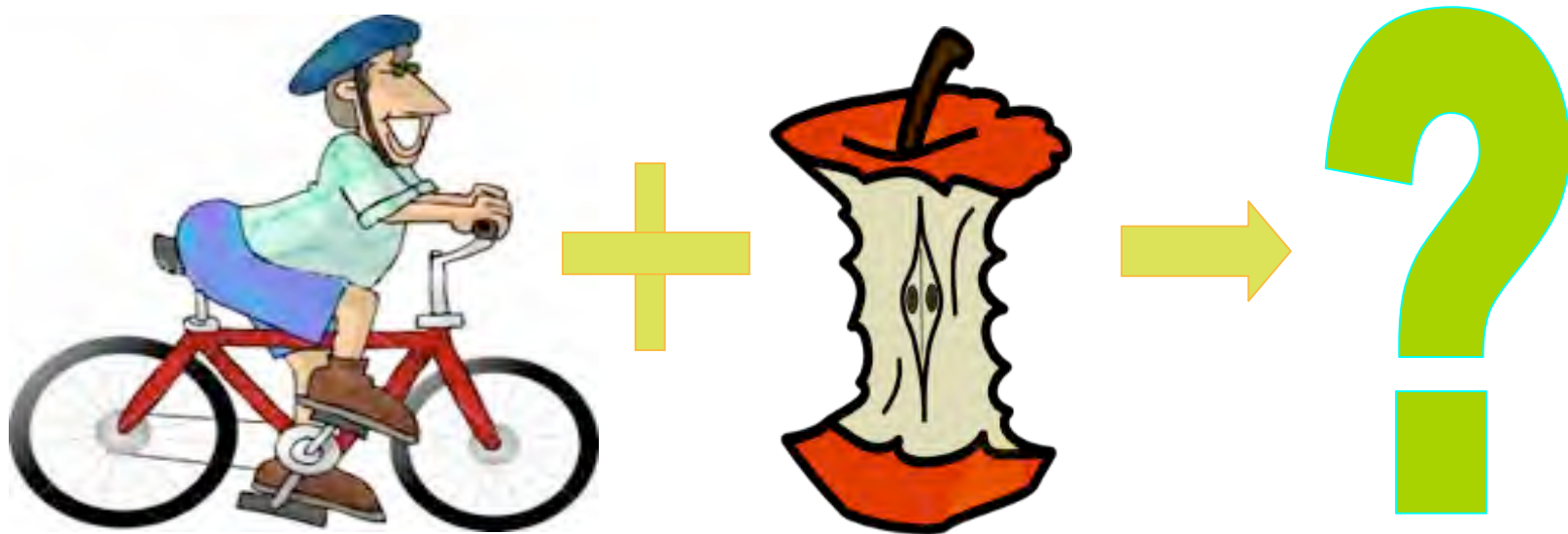
ダイエット日記

Unavi

Wellness PLUS Elderly Monitoring

eBalanceDiet.com

- High blood pressure since 2001
- Started blood pressure meds in 2004
- Gradual weight gain 2000-2007
- Post 2007 HRA improved biking, running, nutrition





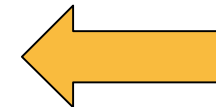
# HRA Data Trending

Biometric Data	Guideline	Aug-07	Jan-09
Time in months		t=0	t= 16 mos
Blood Sugar (Glucose)	Less than 100 mg/dL (fasting)	81 mg/dL	90 mg/dL
Your total Cholesterol level	Less than 200 mg/dL	203 mg/dL	179 mg/dL ★
Your LDL Cholesterol level	LDL : Less than 100 mg/dL	121 mg/dL	107 mg/dL ★
Your HDL Cholesterol level	HDL : Greater than 40 mg/dL	39 mg/dL	53 mg/dL ★
Triglycerides	Less than 150 mg/dL (fasting)	217 mg/dL	95 mg/dL ★
Blood Pressure	Less than 120/80 mmHG	134/92	138/92
Height	N/A	5' 10"	5' 10"
Weight	N/A	200 lbs	185 lbs ★
BMI - Body Mass Index	BMI : 18.5-24.9	<b>28.6939</b>	<b>26.5418</b> ★
Body Fat %	Men < 25%	24.7	23.4 ★
HRA reported Risks		<b>6</b>	<b>5</b>



# Results: Risks go from 6 to 5 !!

Date completed	Aug 27, 2007	Jan 26, 2009
Overall risk level	High	High
Alcohol Use	Strength	Strength
Blood Pressure	Risk	<u>Risk</u>
Blood Sugar	Strength	Strength
Cholesterol	Strength	Strength
Emotional Health	Risk	<u>Risk</u>
Exercise	Strength	Strength
Nutrition	Risk	<u>Risk</u>
Safety	Risk	<u>Risk</u>
Tobacco Use	Strength	Strength
Triglycerides	Risk	Strength
Weight	Risk	<u>Risk</u>



*“In a **Connected world**, we are no longer responsible for **what is reasonably known**, we become responsible for **what could have been reasonably known** had we collected and organized the data appropriately.”*

Brigitte Piniewski, MD  
[bpiniewski@peacehealthlabs.org](mailto:bpiniewski@peacehealthlabs.org)

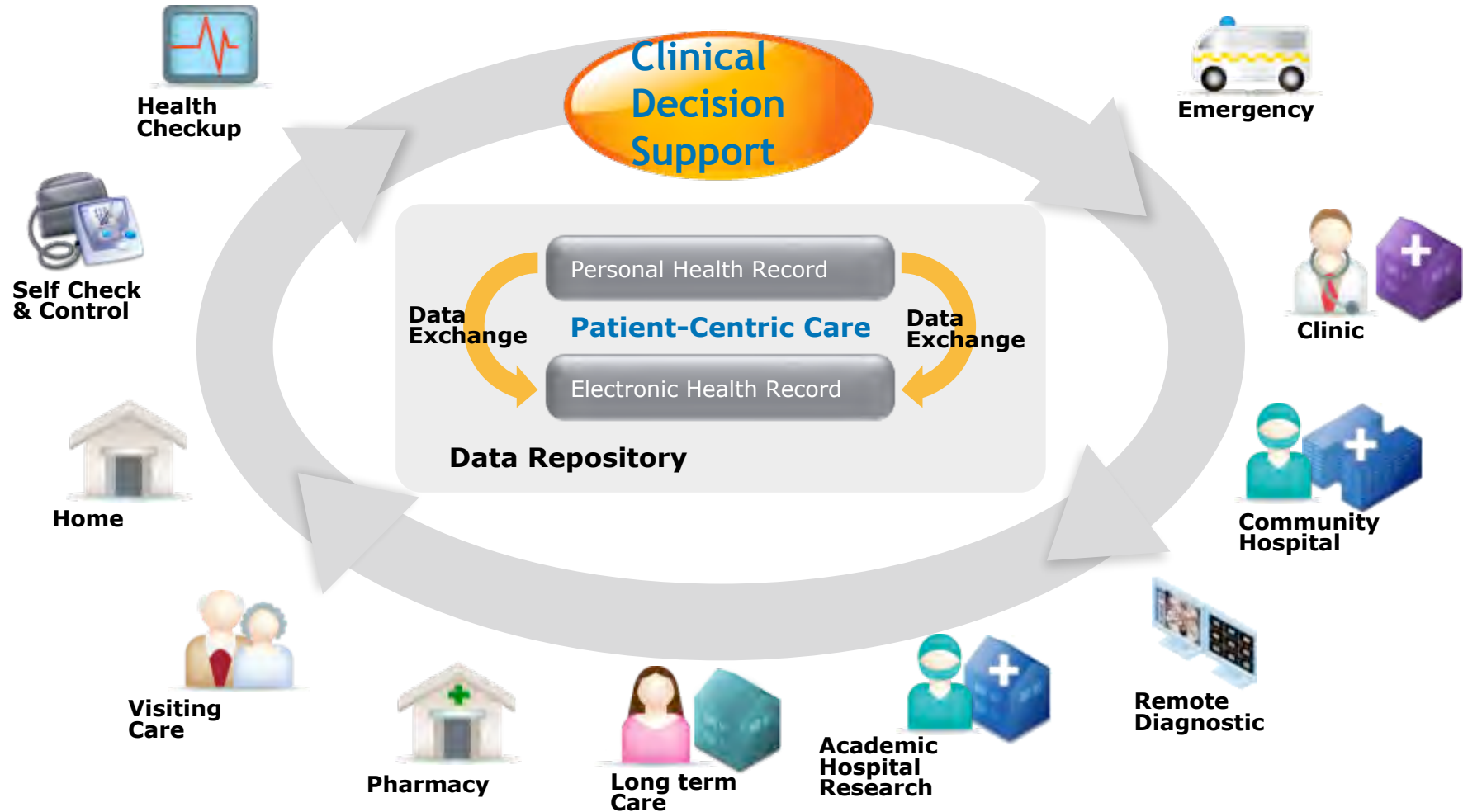


- Majority of health experience is daily-habit mediated
- “Normal” means prevalent not “Optimal”
- “Optimal” across populations appears rules-based and thus **Digitalizable!**
- Connectivity across user experience will link clinically relevant co-occurrences and advance the fabric of evidence-based investment in health



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# Integrated Care Delivery Networks Data for Clinical Decision Support



Efficient, Secure , Access to Data Anywhere



Focus  
on Individual

Industry  
Standards





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# Thank you!



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**Continua Health Alliance:** [www.continuaalliance.org](http://www.continuaalliance.org)