

De Gezondheidszorg in 2020

Prof. Dr Renaat Peleman
Hoofddarts
UZ GENT

Gezondheidszorg is een sleutelsector

- « **werkgever** »
 - 400 000 = 9,38% van actieve bevolking
- « **begrip** »
 - welzijn wordt steeds belangrijker
 - “welzijn” ipv “curatief”
 - “gezondheidseconomie” ipv “economie”
- « **opbrengsten** »
 - bijdrage aan BNP: 13% (21,3 miljard €)
- « **kosten** »
 - België: 10,4% BNP > OESO gemiddelde: 9%
 - België: €2122 per inwoner > OESO gemiddelde: €1728

Maatschappelijke ontwikkelingen

- De zorgsector zal steeds meer **vraaggestuurd** moeten gaan werken om aan de klantwensen te kunnen blijven voldoen.
- De zorg zal steeds meer **extramuraal** plaatsvinden, dat wil zeggen in de thuissituatie en niet meer in het ziekenhuis.
- De ziekenhuizen zullen zich meer en meer **moeten verantwoorden** over de geboden hulp en de daarmee gepaard gaande kosten

De patiënt is koning

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Bumrungrad Hospitality Residence



Service apartments link directly to the hospital

▼ GALLERY

- Bumrungrad Hospitality Residence
- Bumrungrad Suites

[MAP & DIRECTIONS](#)

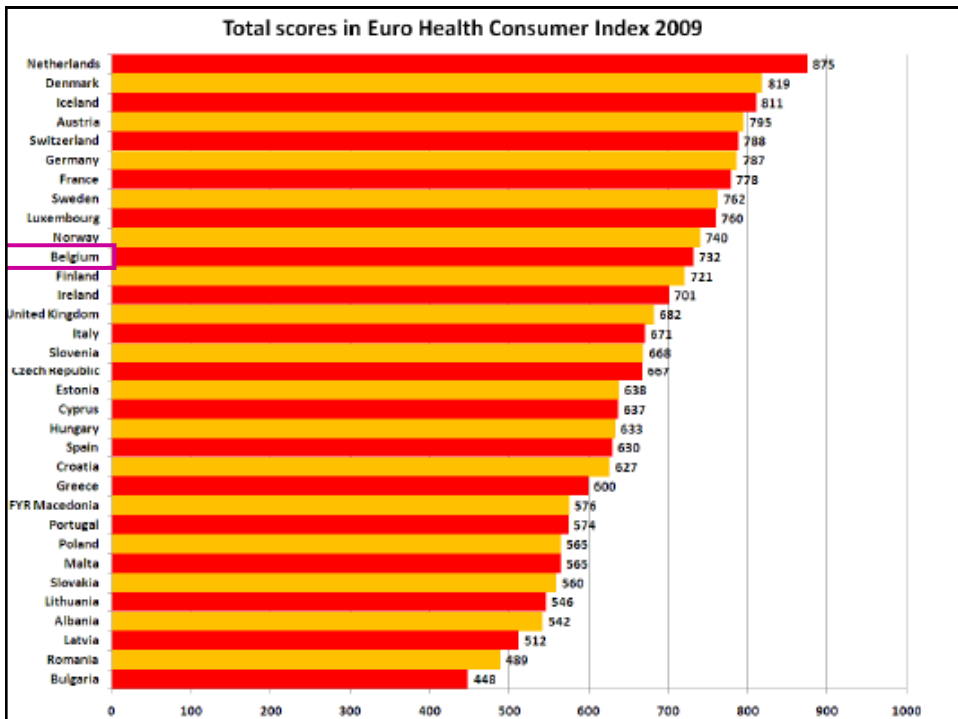




RICHARD PERRY/THE NEW YORK TIMES

Eve Linney, 5, who had an infected finger, went with her family last week to a walk-in clinic at a Duane Reade drugstore on Broadway in Manhattan. Her father, John, is at the counter.

Drugstore Clinics Spread, and Scrutiny Grows



Het ziekenhuis van de toekomst



Search

Referral Line 800-216-5556 | Text Size: A+ A

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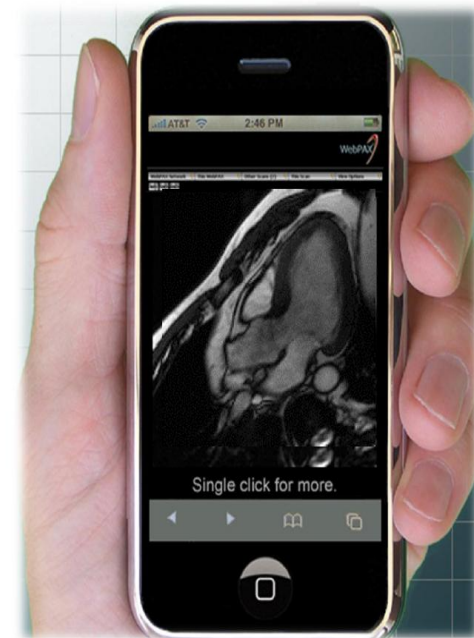
Meet some of our heroes »

At El Camino Hospital, we empower our physicians and employees to innovate, achieve and advocate for our patients. As an independent hospital dedicated to the community, we have the power to do whatever it takes to provide the best care anywhere.

Cancer Heart & Vascular Neuroscience Women's Hospital Genomic Medicine

- met vingerafdruk beveiligde medicijnkluizen
- tablet pc's
- informatica en robotica

Next: Mobile Medicine – Services for Professionals (in progress)



- e-patient files
- 3D cat scan on mobile devices
- mobile interaction
- professional resources anytime, anywhere
- online communication in the hospital

The New York Times | **Technology** | **HealthVault**

WORLD | U.S. | N.Y. | REGION | BUSINESS | TECHNOLOGY | SCIENCE | HEALTH | SPORTS | CIRCUITS | CAMCORDERS | CAMERAS | CELLPHONES | COMPUTERS | HANDHELD | HOME VIDEO

Microsoft Rolls Out Health Records

By STEVE LOHR
Published: October 4, 2007

Microsoft is starting its long-anticipated drive into the consumer health care market by offering free personal health records on the Web and pursuing a strategy that borrows from the company's successful formula in personal computer software.

Heart Health Center - Windows Internet Explorer
http://trial.microsoft.com/Health17App_HeartHealth/PhyDataDetails.aspx

Welcome to HealthVault
Be well. Protected.

When it's your job to protect your family's health, you need every advantage. Imagine if you had a secure way to collect, store, and share the health information critical to your family's well-being. HealthVault is the new and FREE way to do just that. Imagine being able to control the flow and quality of your healthcare data. Whether you need to search the Web for the most up-to-the-minute health information, catalog existing personal records, or monitor current physical readings, HealthVault gives you the control you need.

Our Health Privacy Commitment

1. The Microsoft HealthVault record you create is controlled by you.
2. You decide what goes into your HealthVault record.
3. You decide who can use and view your information on a case-by-case basis.
4. We do not use your health information for commercial purposes unless we ask and you clearly tell us we may.

HealthVault Search
The new way to search for healthcare articles, Web links, and mobile applications. [Learn more](#)

Web Health Search
diabetes

HealthVault Account
The revolutionary and FREE way to safely collect, store, and share your health information with Web sites and doctors. [Learn more](#)

Already a member? [Sign in](#) | Not a member? [Create a HealthVault account](#)
[Web sites that use Microsoft HealthVault](#)

HealthVault Connection Center
Connect a wide variety of health and fitness devices to your PC, and upload the data to your HealthVault account. [Learn more](#)

[Download device drivers](#)
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Personal Health Center
powered by Microsoft HealthVault

Summary | My Data | My Maps | News & Articles | User Profile | [refresh site data](#) | [log off](#)

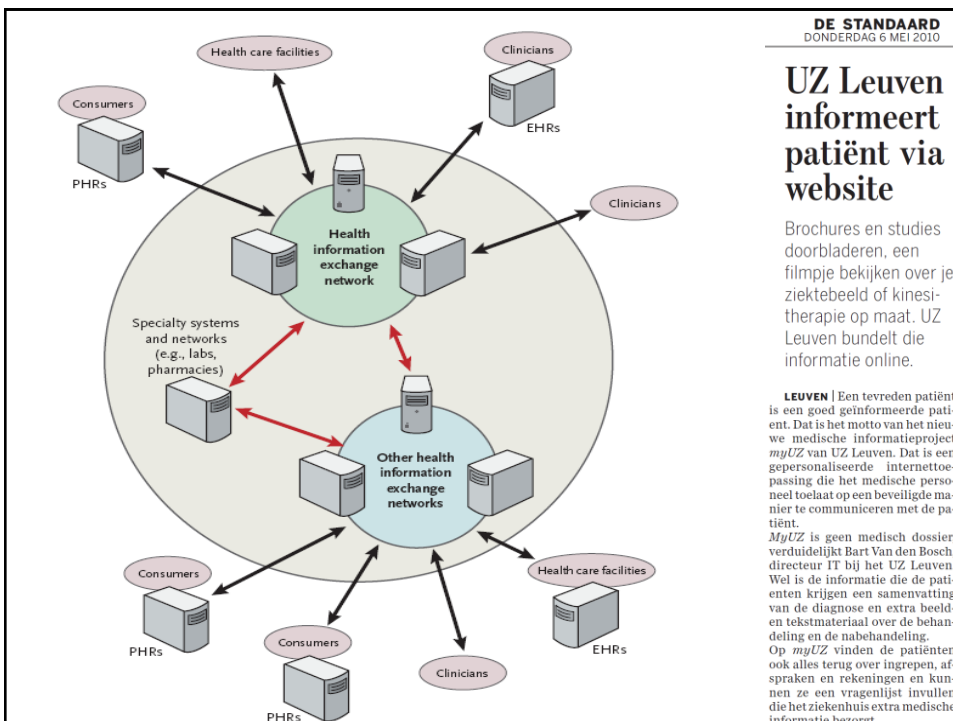
Health data details

Welcome Sean Smithson

Blood Pressure data details - 30 days and beyond
Period: Custom range | Start: 1/13/2007 | End: 9/12/2007

[record blood pressure](#) | [health incident](#)

source	date	activity	bp	notes	
	Sep 12, Wed		120 / 80		edit
	Sep 5, Wed		130 / 88	getting better...	edit
	Sep 2, Sun	wonder if this is related?	140 / 88	symptoms: dizziness, coughing	edit
	Sep 1, Sat		140 / 88		edit
	Aug 26, Sun		120 / 70		edit
Fabrikam	May 25, Fri		104 / 84		edit
Fabrikam	May 24, Thu		110 / 80		edit
Fabrikam	May 23, Wed		98 / 77		edit



- Internet wordt informatie-snelweg
- Health information providers
- Healthcare IS/IT specialisten
- Explosieve groei databases en bronnen

DOSSIER
PI

MEDNET MAGAZINE NR. 07 ■ 21 APRIL 2005

Dokters in cyberspace

Artsen bieden in toenemende mate via websites medische adviezen aan surfende patiënten. Juridisch gezien is het nog aftasten als het gaat om wie voor welke informatie verantwoordelijk is. MedNet verkent de medisch-juridische grenzen van cyberspace. 'Hoe persoonlijker het advies, hoe meer het lijkt op een individuele behandelovereenkomst.'

info@hzcl.nl

**Huisartsen
Zorgcentrum** Leeuwarden tel: 058-2164969

Home De praktijk Afspraken Uitslagen Ziekten ABC Praktijknieuws Contact

u bent hier: home

Klik [hier](#) om u voor de Webdokter-diensten aan te melden.
U dient hiervoor ingeschreven te staan binnen onze praktijk

Klik hieronder voor Webdokter-diensten van het Huisartsen Zorgcentrum Leeuwarden (HZL)

Herhaalrecept Webcam Spreekuur Spreekuur Reservering Mijn Ketenzorg

E-mail Consult Consult Samenvatting Lifestyle Sms Servicedienst

Reizigers advies Second opinion Inzage medisch dossier

**DE FRIESLAND
ZORGVERZEKERAAAR**
Zorg voor uw gezondheid

The future is here



A guide robot moves through a hallway of the Aizu Central Hospital in Aizu-Wakamatsu city in Fukushima prefecture, some 200km north of Tokyo.
Photo: AFP

Een patient met kanker wordt geopereerd door een robot in het Antoni van Leeuwenhoek Ziekenhuis.



The 'cyberknife'



Los Angeles Times
latimes.com

October 12, 2007



Marine, 20, drops an M&M candy into cookie dough. The chore teaches control of his artificial arm and hand.

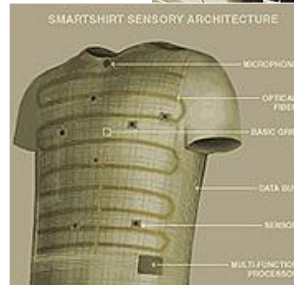


Overall Technologie

- Niet-invasieve acoustische hersenmonitor
 - Bloeding vs ischemie
- Sensor in kleding
- Sensor in implantaten
- Sensor GSM, iPod
- Ingebedde sensor in meubels, tapijt
- CHF monitor voor dagelijks beleid
- Bed met ingebouwde sensors: portable ICU



Glucocell



Bio- Neuro- Nanotech

Nanotechnology crucial in fighting infectious disease

In the past decade, scientists' ability to manipulate materials at the molecular and atomic levels using nanotechnology has moved from science fiction into scientific fact. Now, nanotechnology is being developed to prevent, diagnose, and treat infectious diseases, with some products in or nearing clinical trial stage. Progress in this field is exponential, so "we can't imagine" the scale of progress in the next decade, says Brenda Wilson (Illinois Center for Nanoscale Science and

teams are working on point-of-care disease detection, or lab-on-a-chip technology, such as that led by Rashid Bashir (Illinois Micro and Nanotechnology Laboratory, IL, USA). This collaboration to detect pathogens needs to improve sample preparation before field trials can begin, says Wilson. Bashir expects these products to reach the market "in the next few years", although replacement of petri dishes with silicon chips and detection of DNA, proteins, and virus using nanotechnology "are within reach".



HIV budding from cells may be a target for nanotechnology

www.thelancet.com/infection Vol 9 April 2009

De adem onderzocht!



The screenshot shows the journal's header with the logo and a search bar. Below the header is a breadcrumb trail: "Journal home > Advance online publication > Letter > Abstract". A sidebar on the left lists navigation options: "Journal content", "Journal home", "Advance online publication" (highlighted), "About AOP", "Research Highlights", "Current issue", and "Archive". The main content area is titled "Letter abstract" and includes the journal name, publication date (30 August 2009), DOI (10.1038/nnano.2009.235), and the article title "Diagnosing lung cancer in exhaled breath using gold nanoparticles". The authors listed are Gang Peng, Ulrike Tisch, Orna Adams, Meggie Hakim, Nisrean Shehada, Yoav Y. Broza, Salem Billan, Roxolyana Abdah-Bortnyak, Abraham Kuten, and Hossam Haick.

**nature
nanotechnology**

Journal home > Advance online publication > Letter > Abstract

Journal content

- Journal home
- Advance online publication**
- About AOP
- Research Highlights
- Current issue
- Archive

Letter abstract

Nature Nanotechnology
Published online: 30 August 2009 | doi:10.1038/nnano.2009.235

Diagnosing lung cancer in exhaled breath using gold nanoparticles

Gang Peng^{1,2}, Ulrike Tisch^{1,2}, Orna Adams¹, Meggie Hakim¹, Nisrean Shehada¹, Yoav Y. Broza¹, Salem Billan², Roxolyana Abdah-Bortnyak², Abraham Kuten^{3,4} & Hossam Haick^{1,2}

- Minimaal invasieve heelkunde
- “Bionic Man” model
- Hulporganen en vervanging

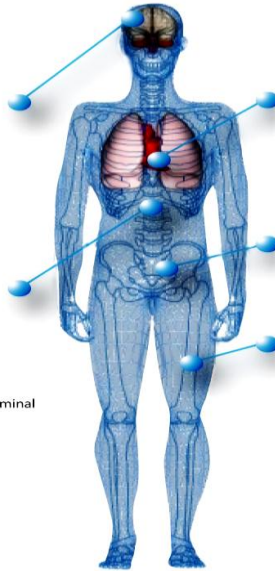
Smarter, Smaller Surgical Devices Drive Volume to MIS

Neurology

Microcatheter intervention for stroke treatment
Neurovascular stenting
Carotid artery stenting
Endovascular embolic coiling of aneurysms
Radiosurgery of brain tumors and AVM's

Gastrointestinal and General Surgery

Gastric pacing
Gastric bypass
Gastric lap-banding
Endoluminal treatment of GERD
Renal stenting
Endovascular stent-graft of abdominal aortic aneurysms



Cardiology

Robot-assisted beating-heart cardiac surgery
Endovascular ablative treatment of arrhythmias
PTCA with biodegradable stent

Urology

Uterine artery embolization of fibroids
Cryosurgery and HIFU of prostate cancers
Laparoscopic radical prostatectomy

Musculoskeletal

Minimally invasive hip and knee replacement
Intervertebral disc replacement

P4 Geneeskunde

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INTRO TO ISB & SYSTEMS BIOLOGY SYSTEMS BIOLOGY IN DEPTH SCIENTISTS & RESEARCH RESOURCES & DEVELOPMENT CENTER FOR INQUIRY SCIENCE

Home: [Intro to ISB and Systems Biology](#): Predictive Preventive Personalized and Participatory

print page

- INTRO TO ISB AND SYSTEMS BIOLOGY
- 10 SYSTEMS BIOLOGY -- THE 21ST CENTURY SCIENCE
 - 10 PREDICTIVE PREVENTIVE PERSONALIZED AND PARTICIPATORY
 - 10 WHY SYSTEMS MATTER
 - 10 USING MODEL ORGANISMS
 - 10 DISEASE
 - 10 TOUR ISB

PREDICTIVE PREVENTIVE PERSONALIZED AND PARTICIPATORY



"In the Pacific Northwest we dream big dreams—Grand Coulee Dam, the information age—but none quite on the scale of the 'predictive and preventive medicine' envisioned by Dr. Lee Hood, president of the Institute for Systems Biology."

Joel Connelly
Columnist, Seattle Post-Intelligencer
Seattle, Washington

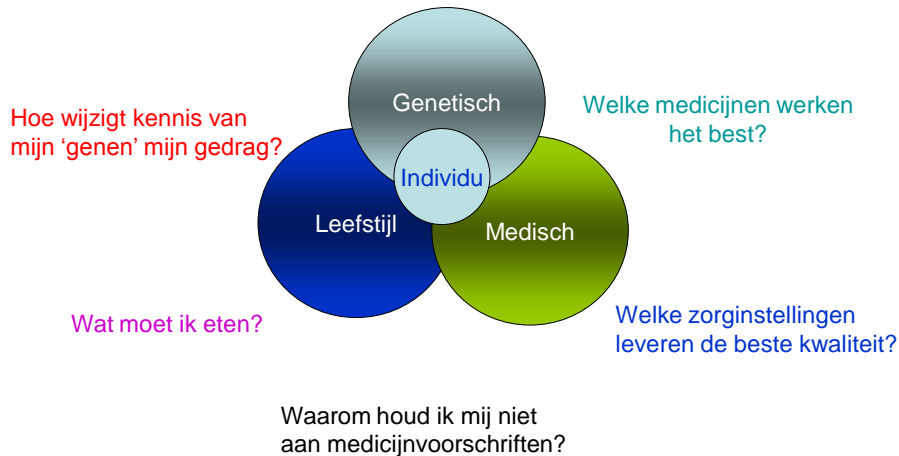
Health Care in the 21st Century:
P4 Medicine™: Predictive, Preventive, Personalized, and Participatory

De invloed van leefstijl op gezondheid

Chronische ziekten worden beïnvloed door sociale, economische, genetische en leefstijlfactoren die veel te weinig aandacht krijgen in ons actuele zorgstelsel

Welke genen maken mij ziek?

Welke genen houden mij gezond?



Geneeskunde 2020

- Gepersonaliseerde diagnostiek
- Gepersonaliseerde behandeling
- Genetisch paspoort
- Nieuw concept:
ziekte = genetica +/- omgevingsfactoren

Geneeskunde 2020

Predictief

- Volledige genetische kaart laat inschatting 'medische toekomst' toe
- Eiwitmarkers in bloed reflecteren huidige toestand en de effecten van omgeving

The New York Times
Try Times Reader Free

Science

WORLD U.S. N.Y. / REGION BUSINESS TECHNOLOGY SCIENCE HEALTH SPORTS OPINION
ENVIRONMENT SPACE & COSMOS

In the Genome Race, the Sequel Is Personal



Thor Switt for The New York Times

A team led by J. Craig Venter, above, has finished the first mapping of a full, or diploid, genome, made up of DNA inherited from both parents. The genome is Dr. Venter's own.

By NICHOLAS WADE
Published: September 4, 2007

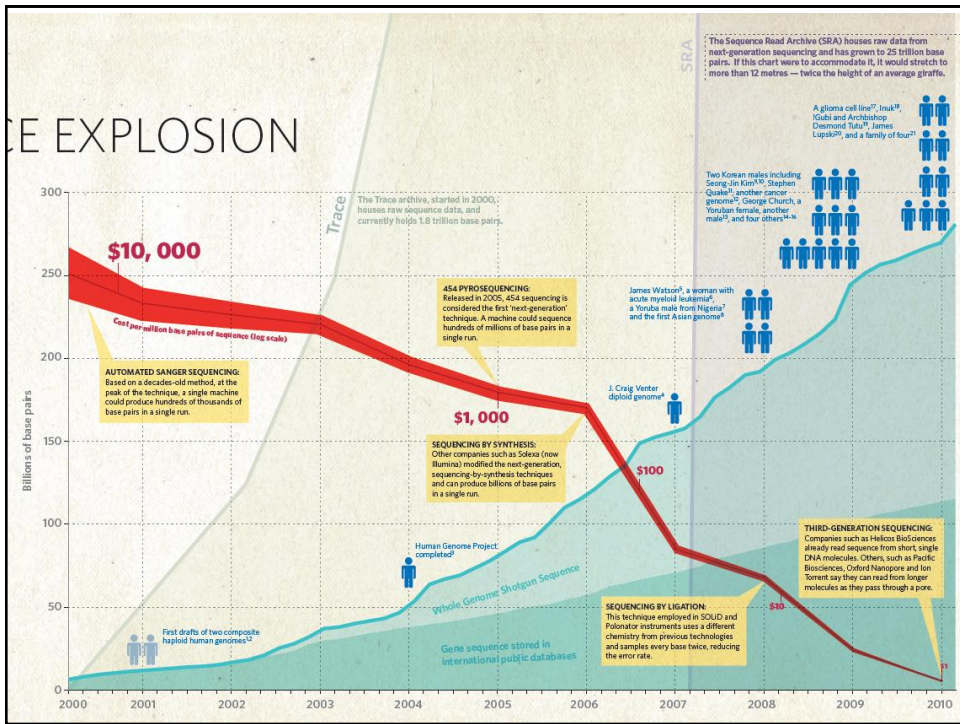
DECODING HIMSELF A team led by J. Craig Venter, above, has finished the first mapping of a full, or diploid, genome, made up of DNA inherited from both parents. The genome is Dr. Venter's own.

GENE: **TNFSF4** **LCT** **Per2** **Clock** **SLC6A3** **NOS3** **CHRNA6** **DRD4** **MMP3** **GNB3** **OCA2** **APOE** **MAOA**
 TRAIT: Linked to heart attacks Lactose intolerance sleep phase syndrome Evening preference Substance abuse Heart attack, constricted arteries Linked to tobacco addiction Novelty-seeking personality Linked to heart attacks Hypertension, obesity, insulin resistance Blue eyes, fair skin Linked to Alzheimer's disease Antisocial behavior, conduct disorder

KL Stroke, coronary artery disease
ABCC11 Brown, sticky, wet earwax
CHRNA4 Protection from tobacco addiction
COMT Linked to alcoholism

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 X Y

www.nytimes.com ©2007 NYTIMES Genes highlighted above are linked to specific traits but do not mean the conditions are avoidable. See nytimes.com



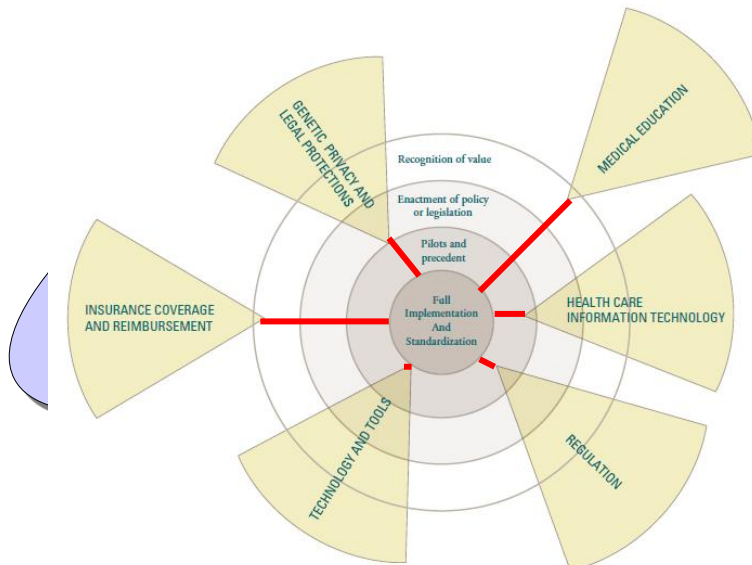
Geneeskunde 2020 Preventief

- Genetische kaart
 - Bepaalt kans op bepaalde ziekte
 - Bepaalt de respons op behandeling
 - Leidt tot gepersonaliseerde behandeling
 - Stuert preventieve maatregelen

Geneeskunde 2020 gePersonaliseerd

- Genetische kaart verschilt $< 1 \%$
 - maar we verschillen fysisch
 - we lijden aan andere ziekten
- De 'genetisch kaart' is nodig voor een 'aanpak op maat'

State of personalized medicine adoption



Geneeskunde 2020 Participatief

- Mensen willen
 - mee-denken
 - mee- beslissen
- Integratie
 - persoonlijke informatie
 - medische wetenschap

2030: Pro-actieve zorg

- preventie > behandelen
- kosteninzicht > kosteninschatting
- beloning naar prestatie > van beloning naar capaciteit
- mensgericht > aandoeningsgericht
- continue monitoring > incidenteel contact
- zelfsturing > arts adviseert patient
- wetenschap en technologie zijn belangrijke drivers