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sense **and** simplicity



“Healthcare is a people business. To be sustainable, health organizations must communicate and connect with their customers through innovative approaches and fresh perspectives...”

Top 7 Trends in Health Care, PricewaterhouseCoopers' Health Research Institute, 2007

Global Healthcare Trends 2020

The Pathway towards Distributed Health

Olaf Such, Philips Healthcare
IEEE Technology Time Machine, Dresden, Germany
23-25 May 2012

The perfect storm is brewing

We all are getting older

We don't take good care of ourselves

Chronic illness is on the rise

We expect better choices

Demand for care is growing

Health care costs are skyrocketing

The healthcare system is overloaded

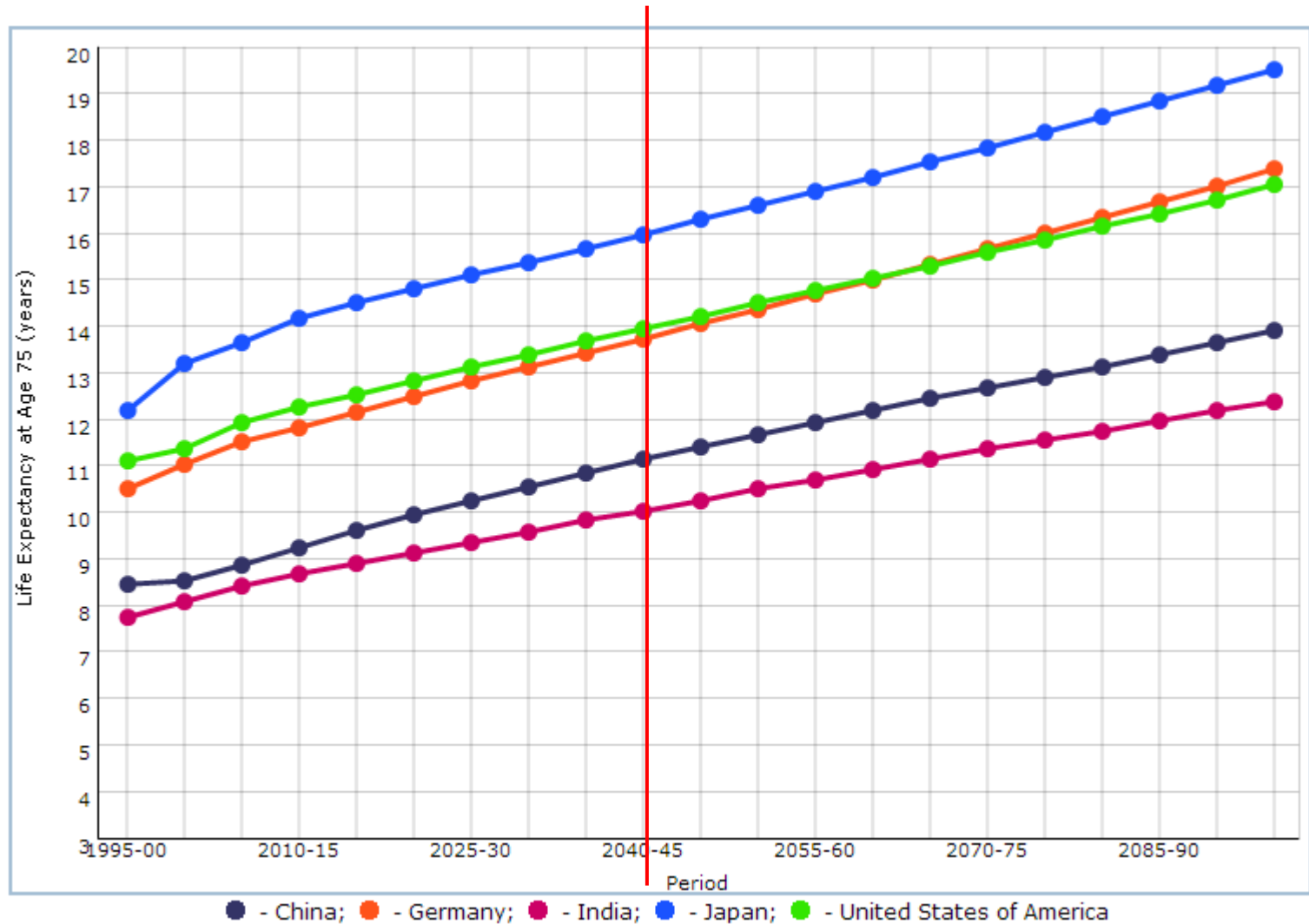
"New Retirement Rules: Caught Between the Dow and the Tao"

http://www.huffingtonpost.com/ken-dychtwald/new-retirement-rules-caug_b_691800.html; Ken Dychtwald, PhD - CEO of Age Wave



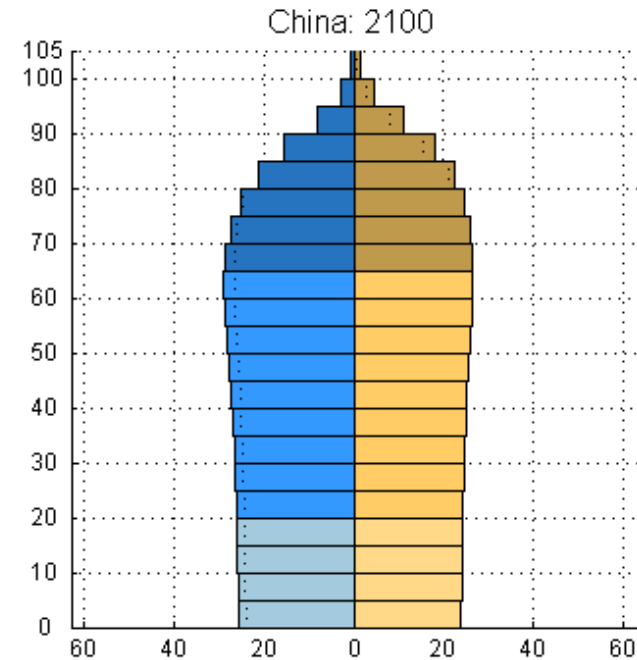
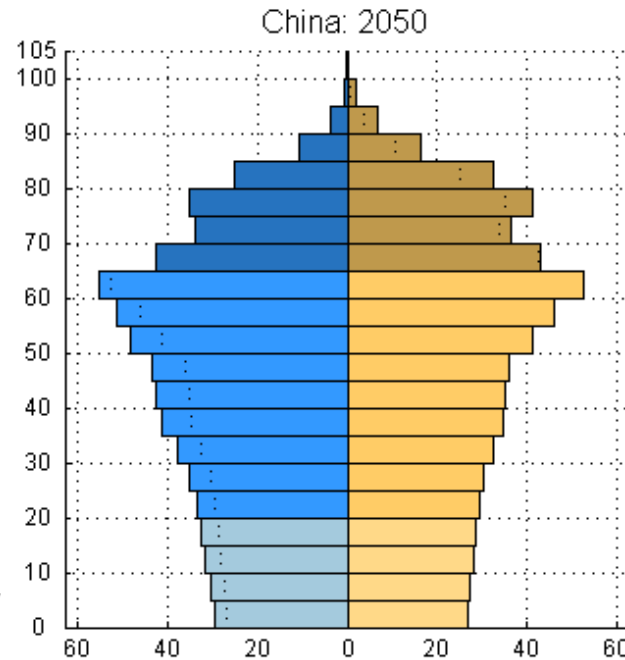
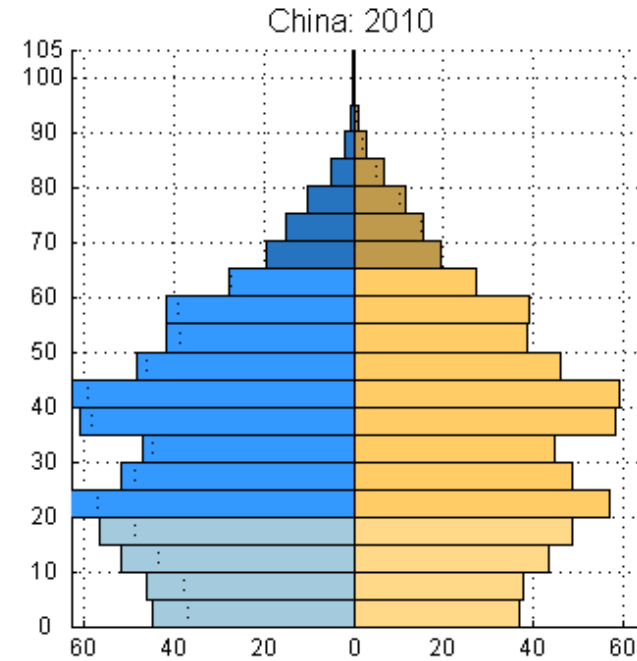
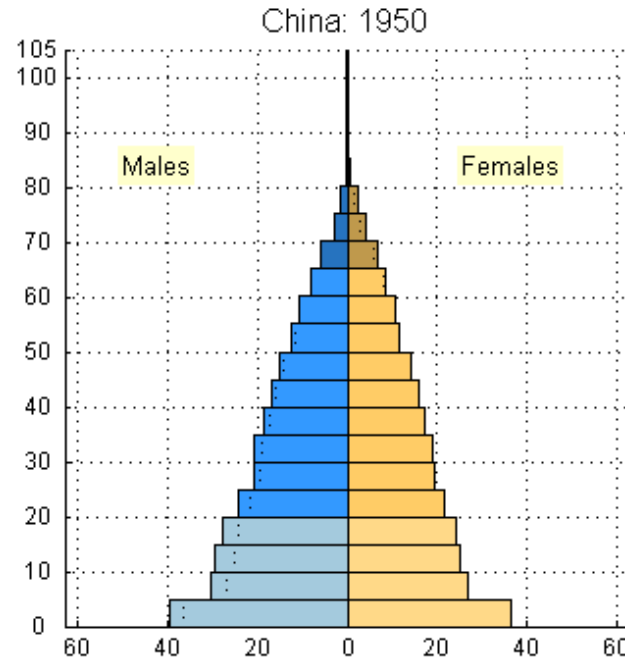
We all are getting older

Life Expectancy at age 75 (years)



We all are getting older

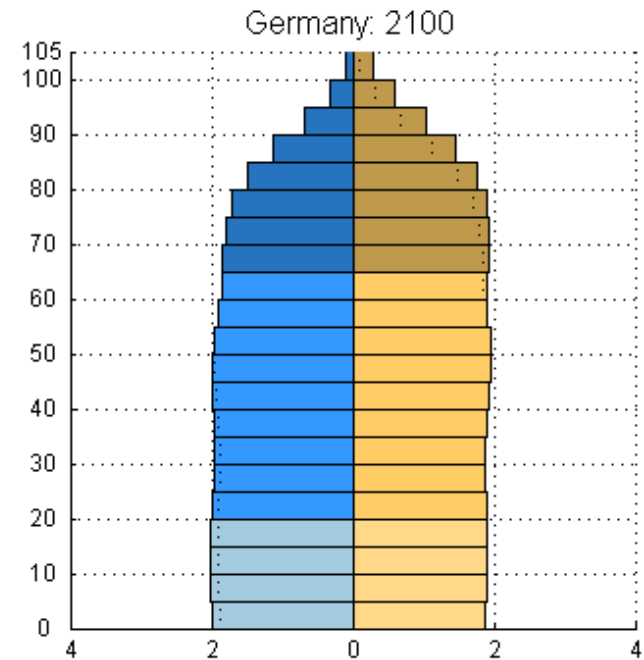
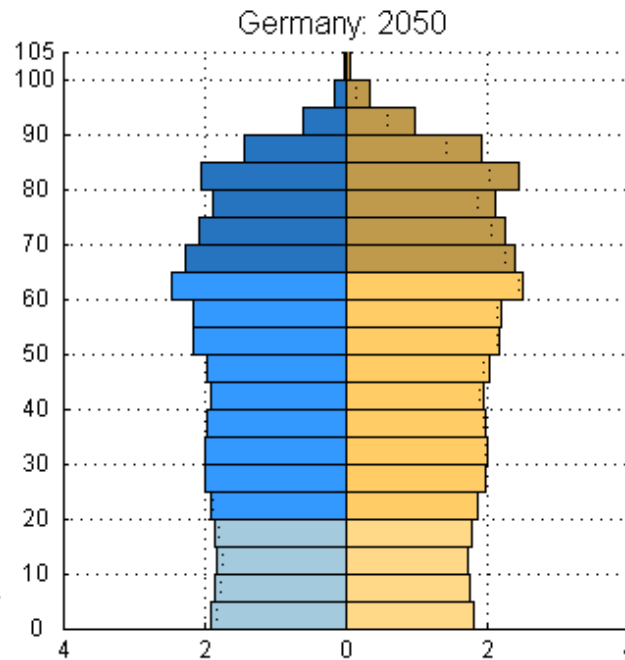
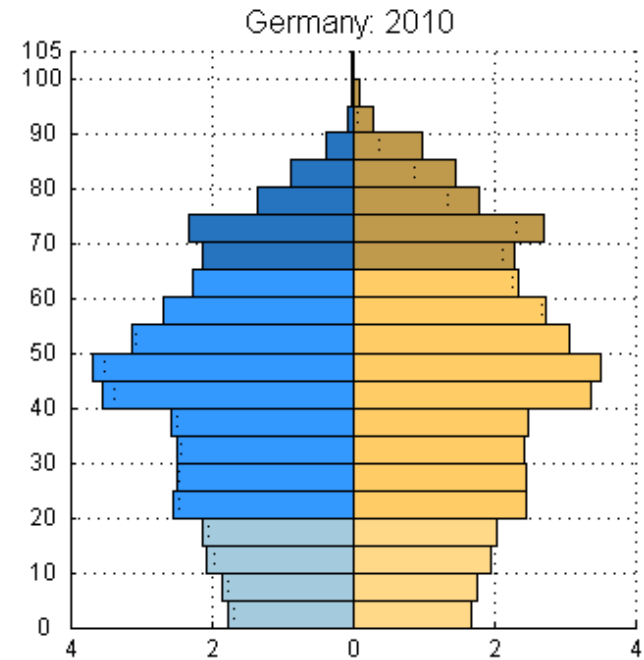
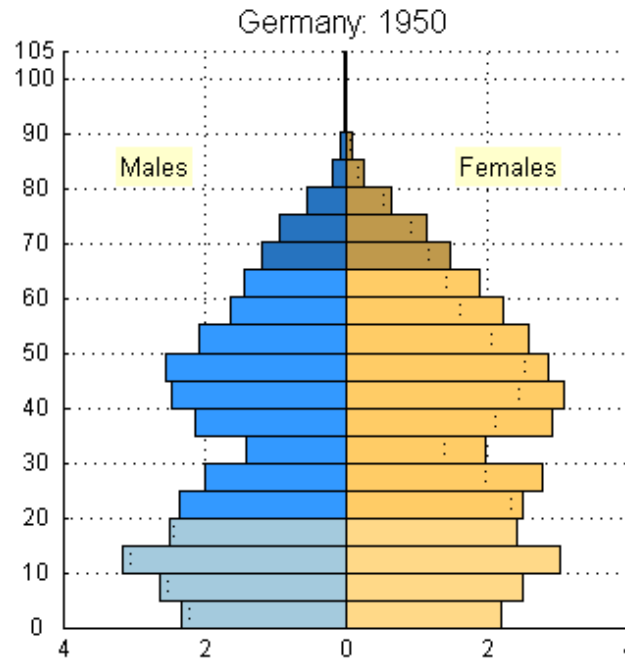
- China



Source: UN World Population Data 2011

We all are getting older

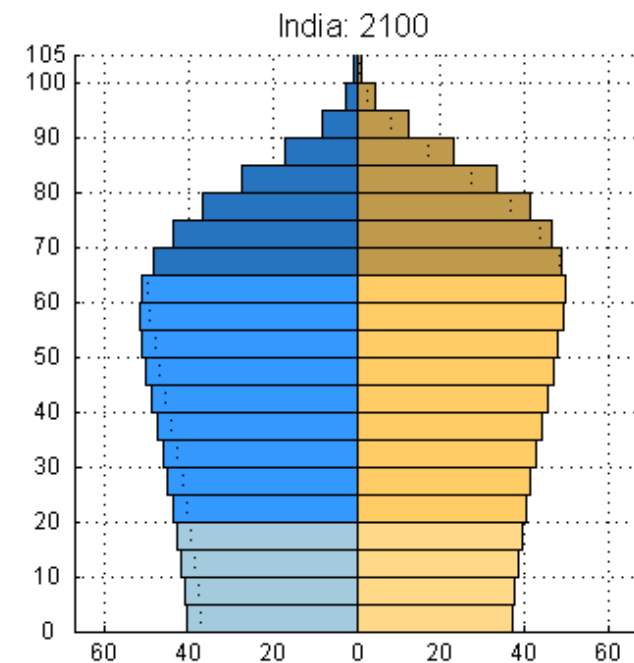
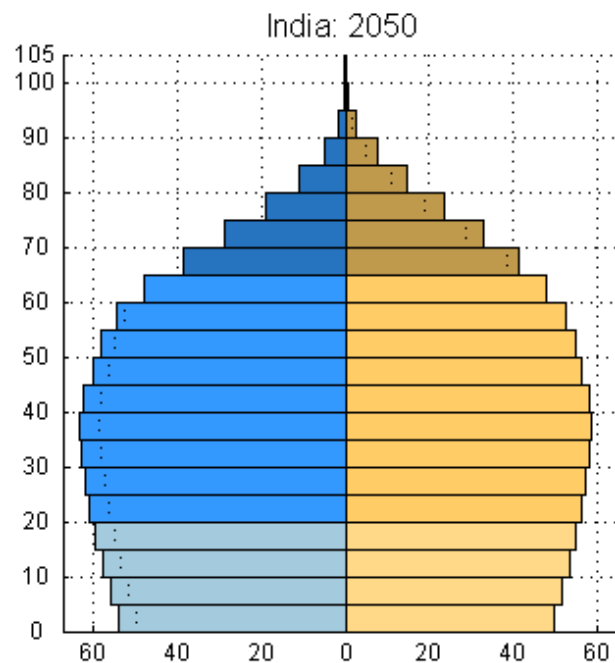
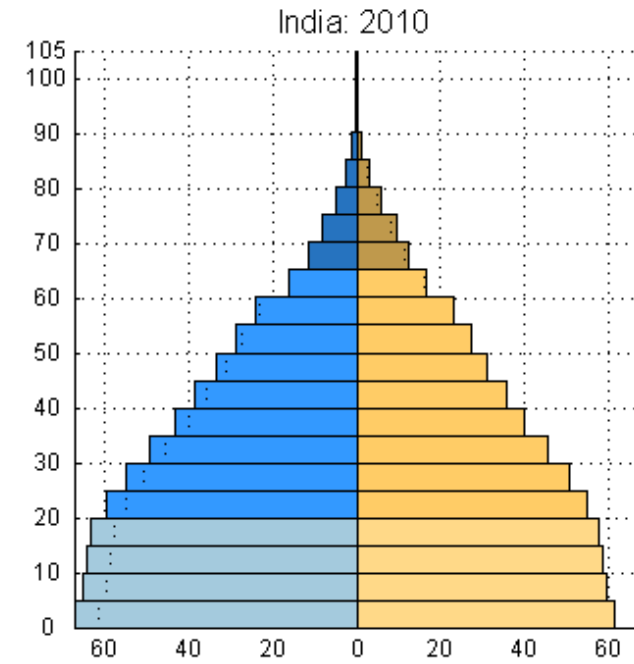
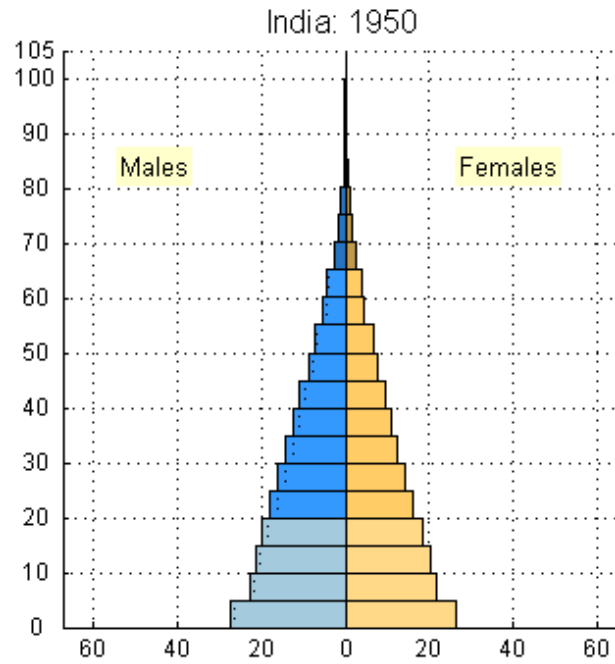
- Germany



Source: UN World Population Data 2011

We all are getting older

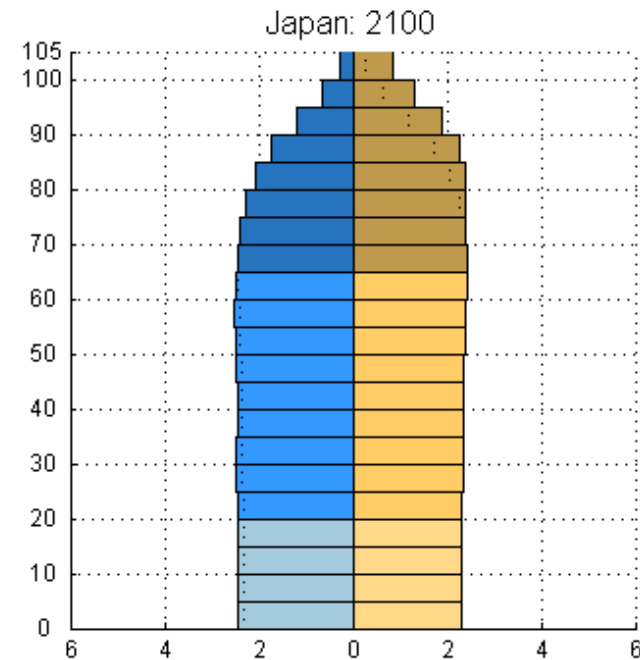
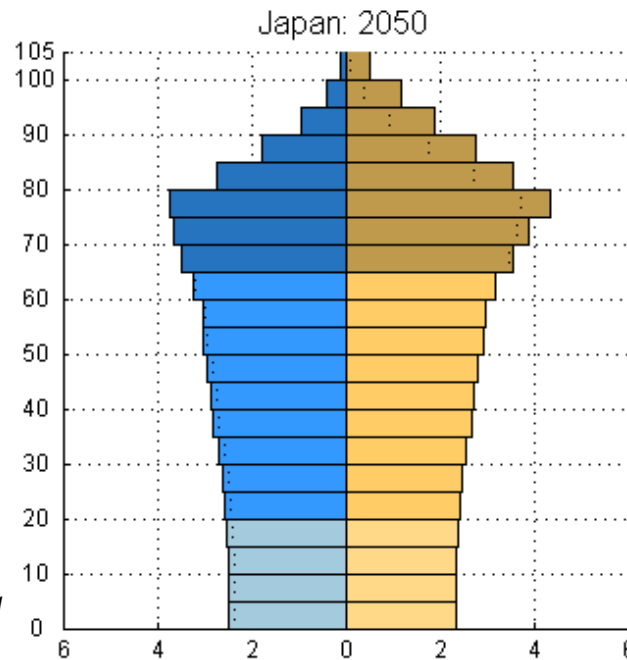
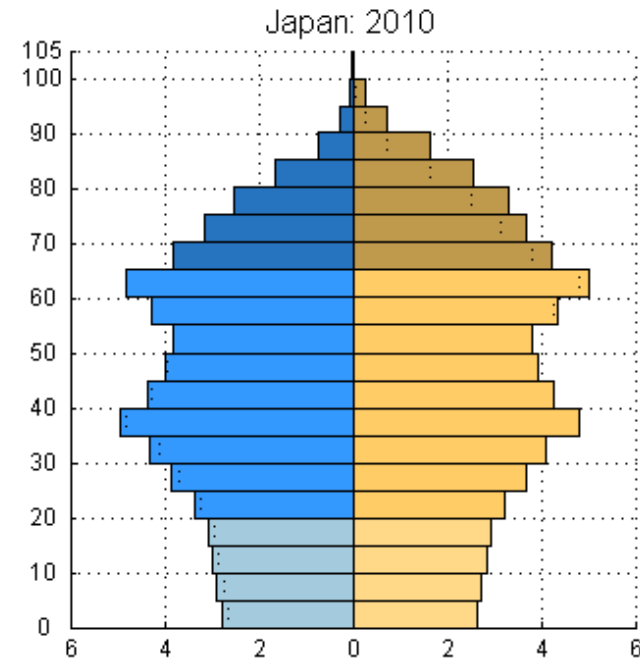
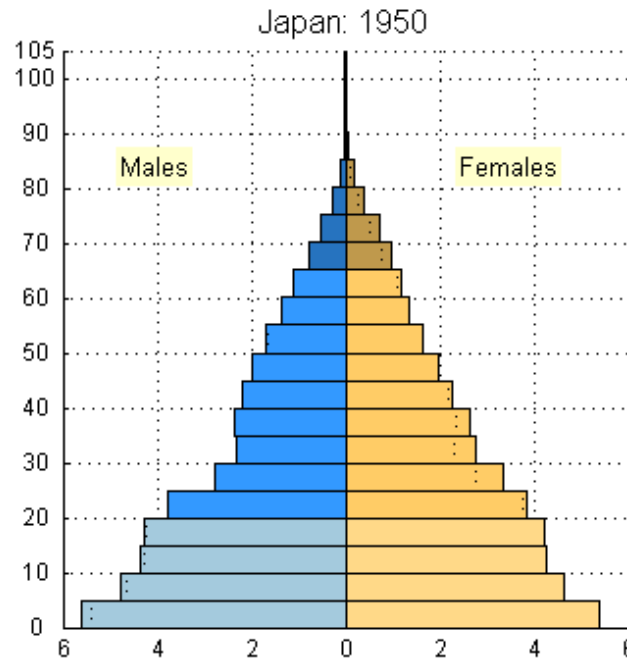
- India



Source: UN World Population Data 2011

We all are getting older

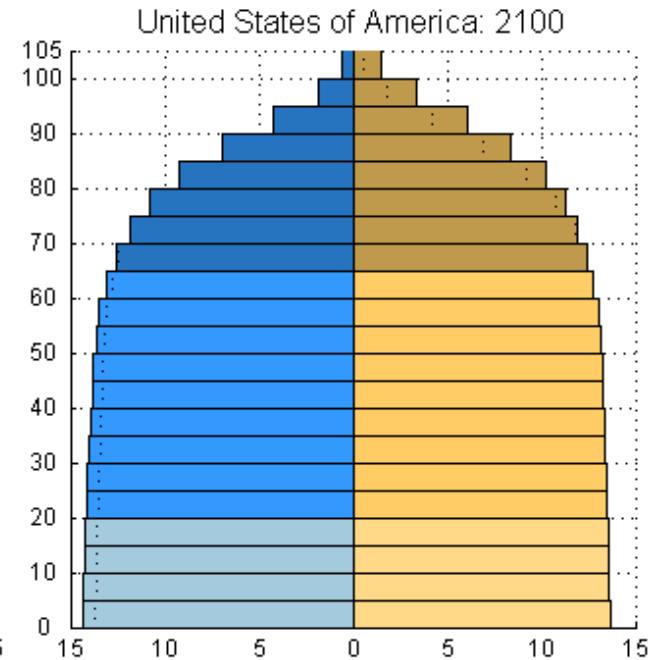
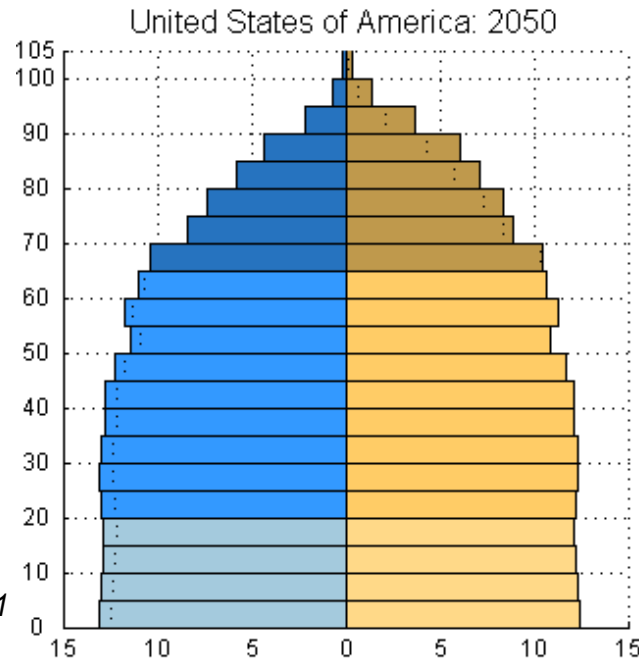
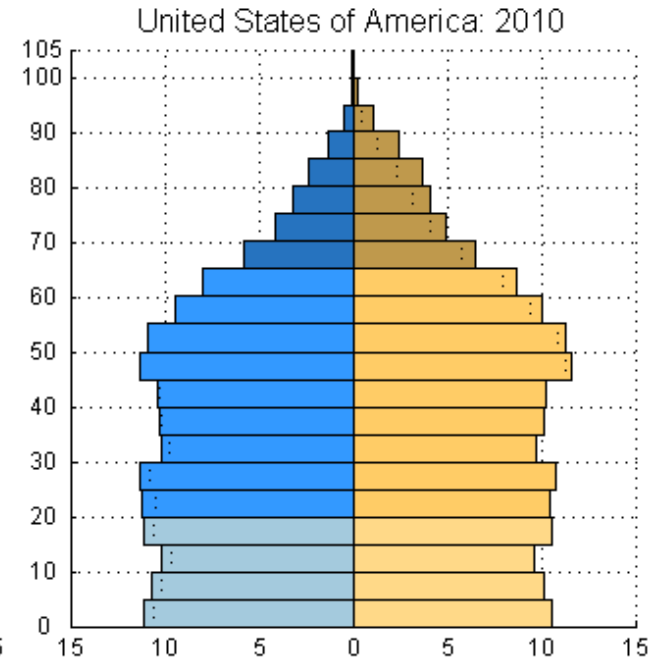
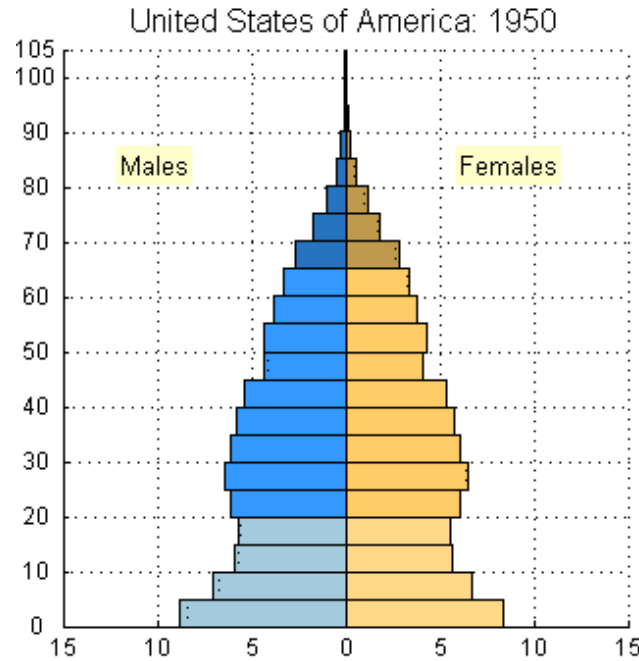
- Japan



Source: UN World Population Data 2011

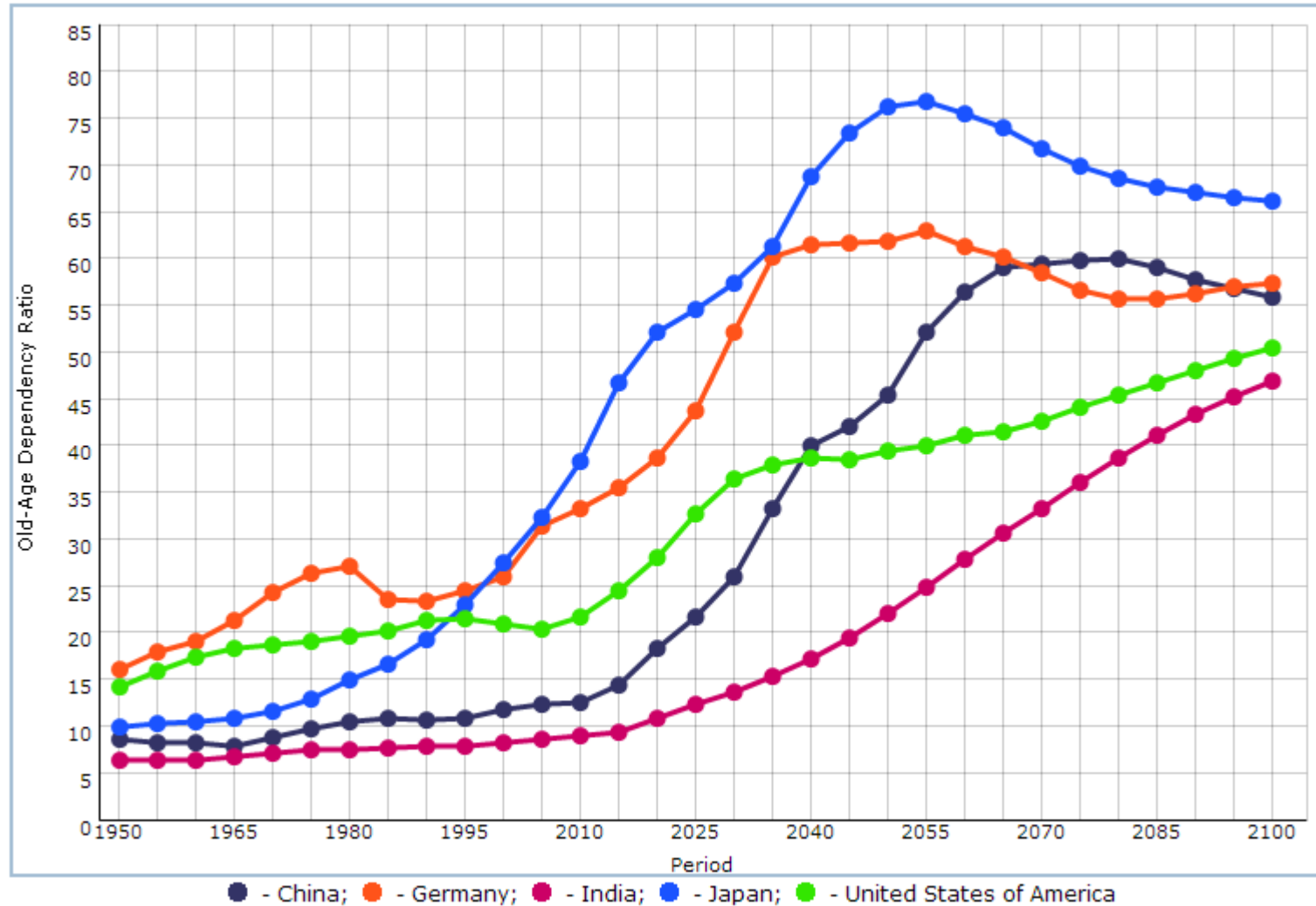
We all are getting older

- USA

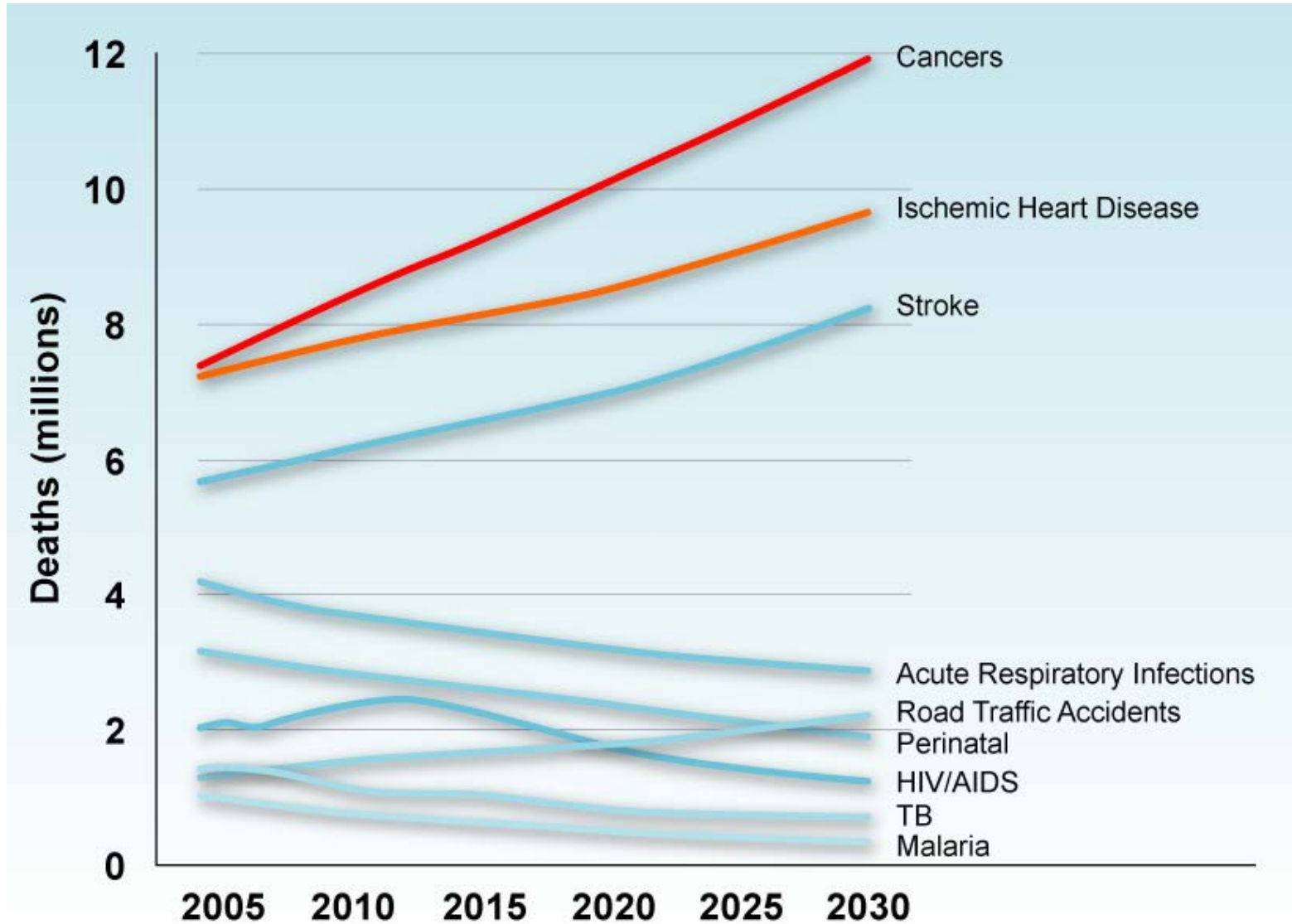


Source: UN World Population Data 2011

.. so we won't have enough people to take care
 Old Age dependency Ratios (Age group 65+)/(20..64) – “Retired/Working Ratio”

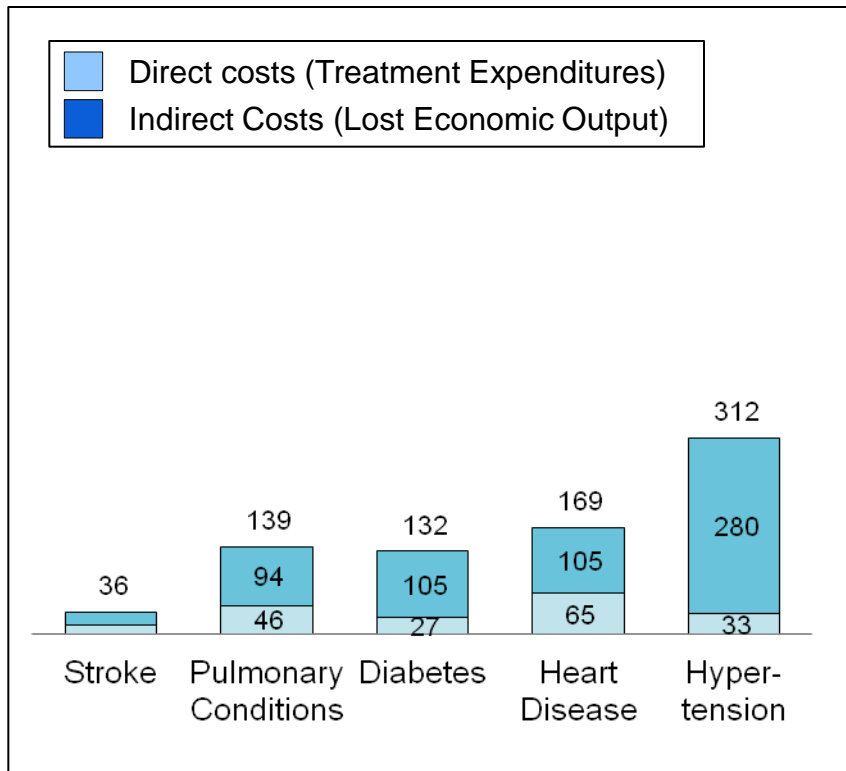


Chronic Illness is on the rise

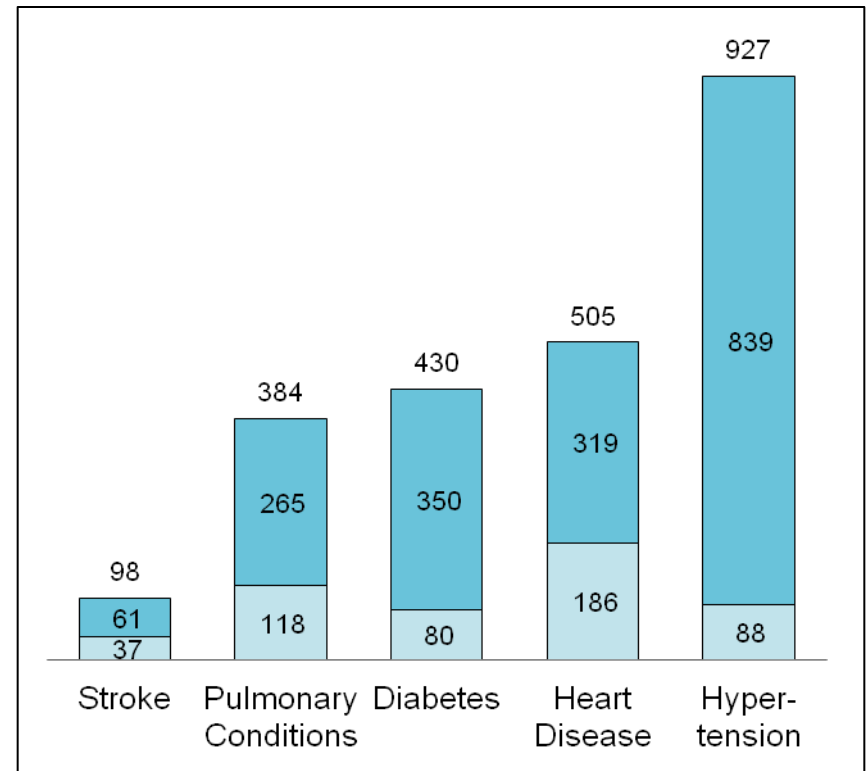


Chronic disease costs are rising rapidly (U.S., \$B)

2003 Cost of Chronic Disease



2023 (Est.) Cost of Chronic Disease

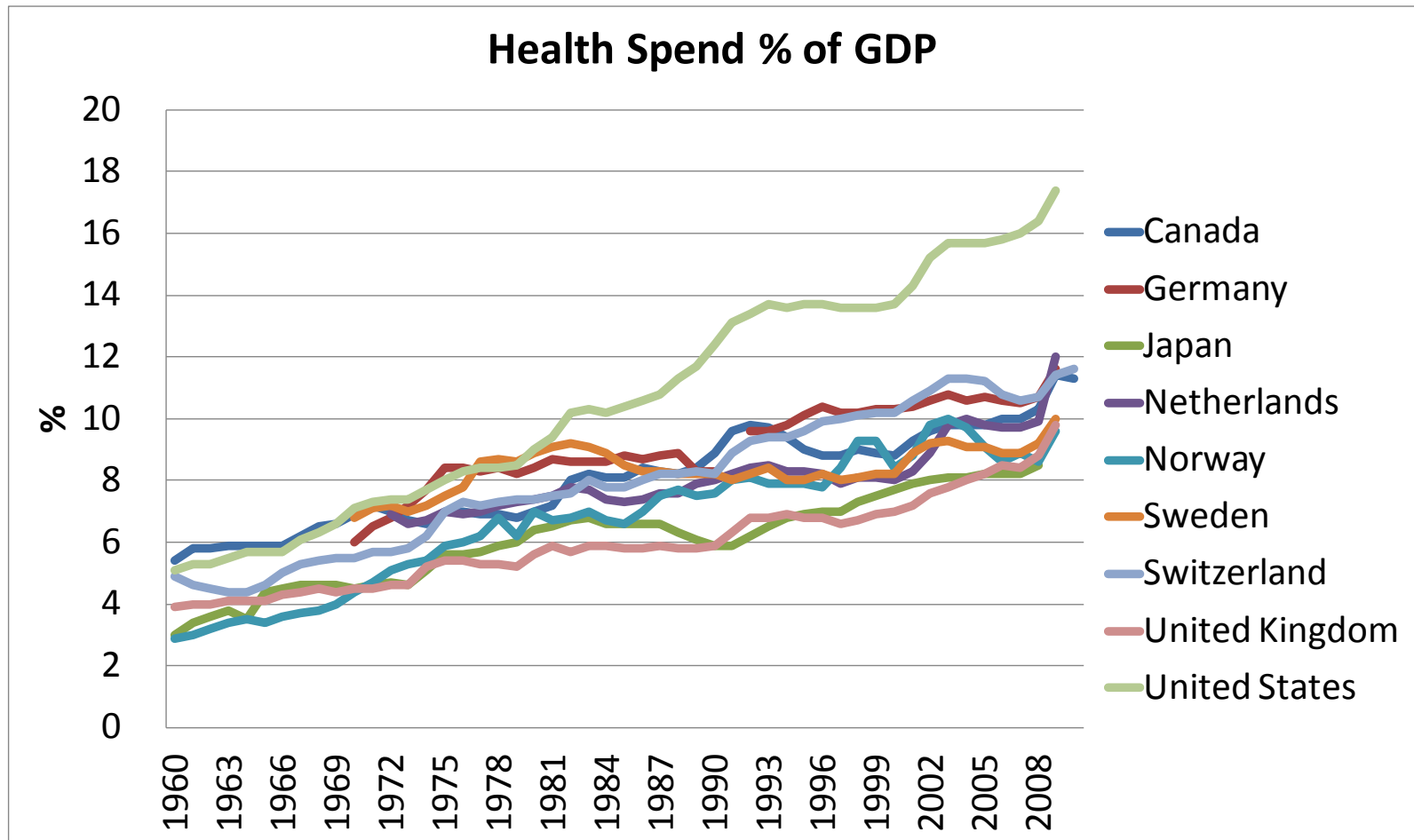


CAGR ('03-'23)
 Stroke: 5.2% Pulmonary Conditions: 5.2% Diabetes: 6.1% Heart Disease: 5.6% Hypertension: 5.6%

Source: Milken Institute Report: An Unhealthy America, The Economic Burden of Chronic Disease

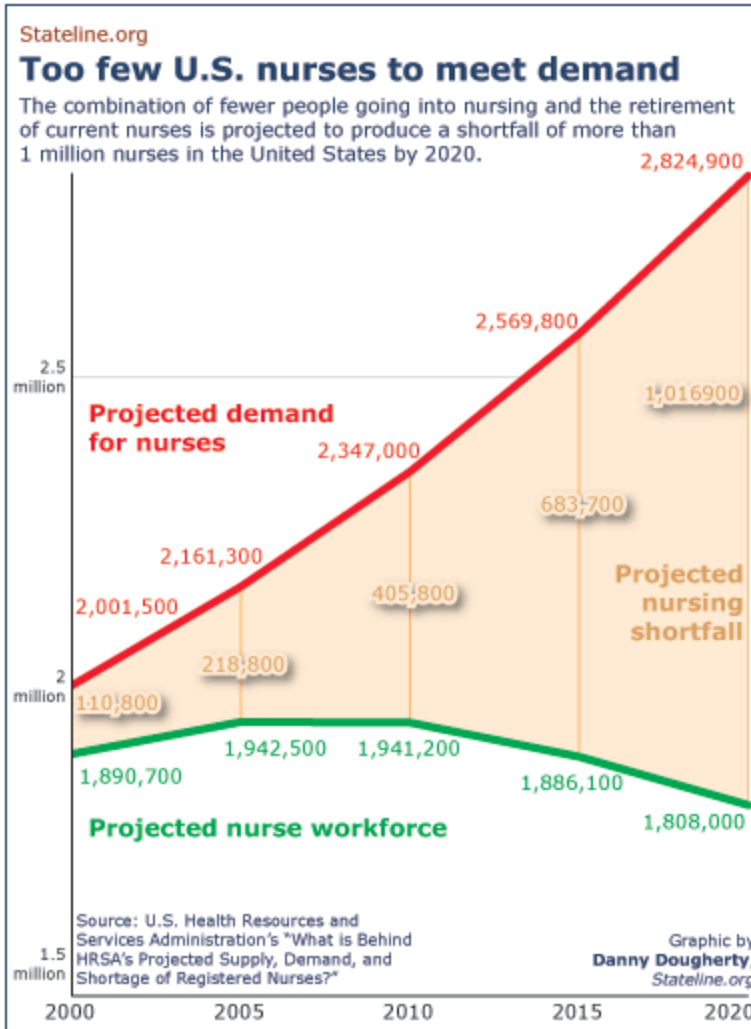
23-25 May 2012

Healthcare costs are skyrocketing



Source: OECD Data 2011

We have insufficient nurses to provide our care



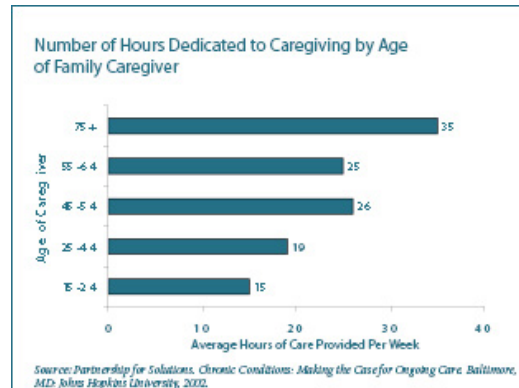
Caregiving is becoming an informal, and risky, profession

- **Psychological health** of the family caregiver is most affected by providing care.
- Studies consistently report higher levels of **depressive symptoms** and mental health problems among caregivers than among their non-caregiving peers.
- Depression appears to be the most common psychological disorder, with 20% to 50% of caregivers reporting depressive disorders or symptoms.
- Studies show that 30% to 40% of dementia caregivers suffer from depression and emotional stress.

[Source: http://www.caregiver.org/caregiver/jsp/content_node.jsp?nodeid=439]



Relationship to Older Person	% of All Caregivers (caring for person 65+) ³³	% of All Caregivers (caring for person 50+) ⁴⁰
Child	41%	44%
Spouse	23%	6%
Other relative	27%	24%
Nonrelative	8%	14%

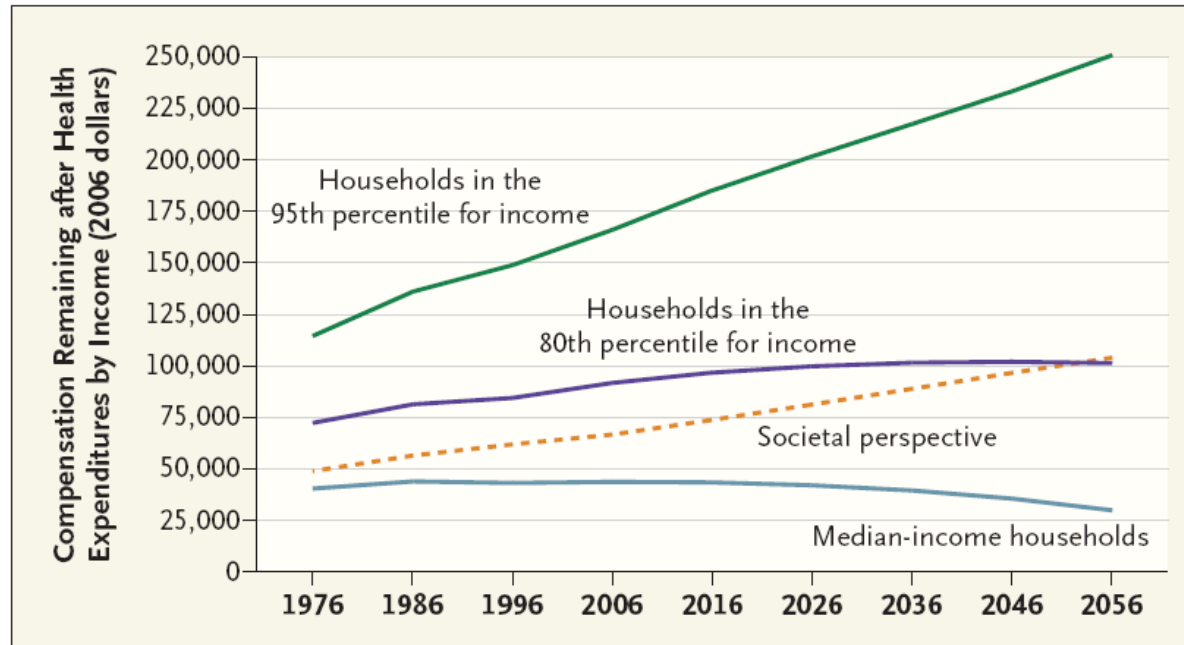


Source: <http://aspe.hhs.gov/daltcp/reports/carebro2.pdf> (1998)

10 TIPS FOR FAMILY CAREGIVERS

- 1 Caregiving is a job and respite is your earned right. Reward yourself with respite breaks often.
- 2 Watch out for signs of depression, and don't delay in getting professional help when you need it.
- 3 When people offer to help, accept the offer and suggest specific things that they can do.
- 4 Educate yourself about your loved one's condition and how to communicate effectively with doctors.
- 5 There's a difference between caring and doing. Be open to technologies and ideas that promote your loved one's independence.
- 6 Trust your instincts. Most of the time they'll lead you in the right direction.
- 7 Caregivers often do a lot of lifting, pushing, and pulling. Be good to your back.
- 8 Grieve for your losses, and then allow yourself to dream new dreams.
- 9 Seek support from other caregivers. There is great strength in knowing you are not alone.
- 10 Stand up for your rights as a caregiver and a citizen.

Not only a cost, also an equality risk



Compensation Remaining after Health Care Expenditures for U.S. Households with Various Income Levels.

The proportion of total compensation devoted to health care includes expenses for health care for the worker and his or her family, forgone wages due to the employer’s expenses for health insurance premiums, and the proportion of taxes that support government health care programs. Our assumptions about real income growth (0.6% for the median income level, 1.0% for the 80th percentile of income, and 1.5% for the 95th percentile of income) and growth in health care spending (3.0%) are based on 30-year historical trends.

Is our Healthcare System Sustainable?

Increasing costs and reduced reimbursement

- Healthcare costs have increased by 50% in the US to \$1.9 trillion since 2000,¹ and outpace GDP growth
- World Wide health care spending expected to grow from 9% of world wide GDP to 15% by 2015 ⁴
- US Deficit Reduction Act severely reducing reimbursement

Changing demographics

- By 2050, the world's population > 60 years will triple from 600 million to over 2 billion.²

Chronic illnesses

- Number of people in US with a chronic illness grows from 118 million in 1995 to 157 million in 2020 ³

Emerging Markets

- Expenditures on healthcare lags the rest of the world today, and is expected to explode by 2015 ⁴

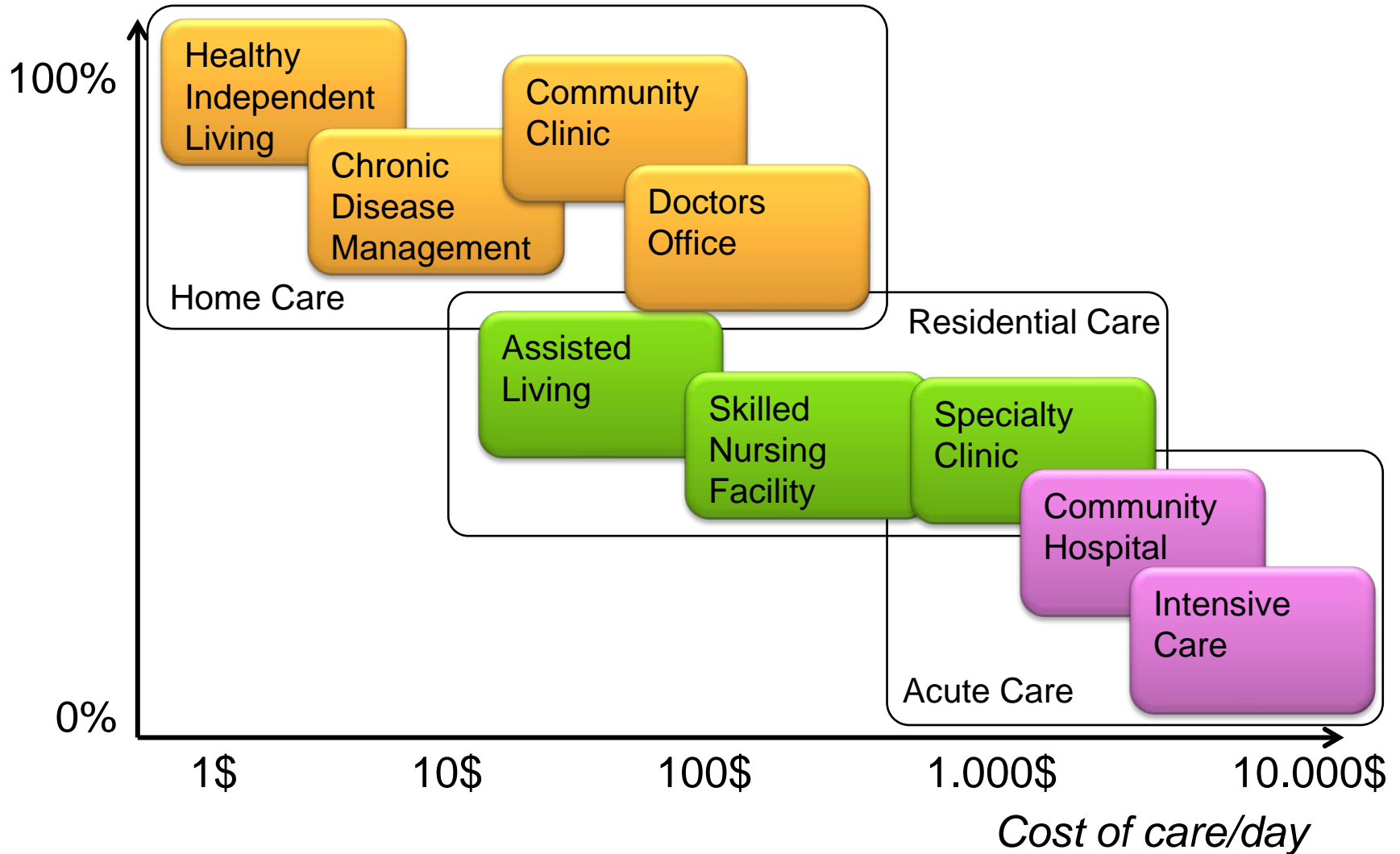


“Many healthcare systems around the world will become unsustainable by 2015. The only way to avoid this critical situation is to implement radical changes...”

Institute for health improvement

Cost of Care correlations

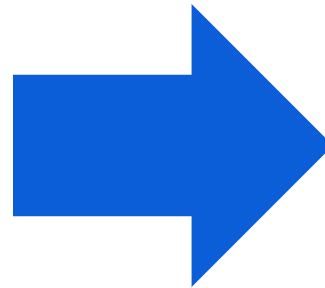
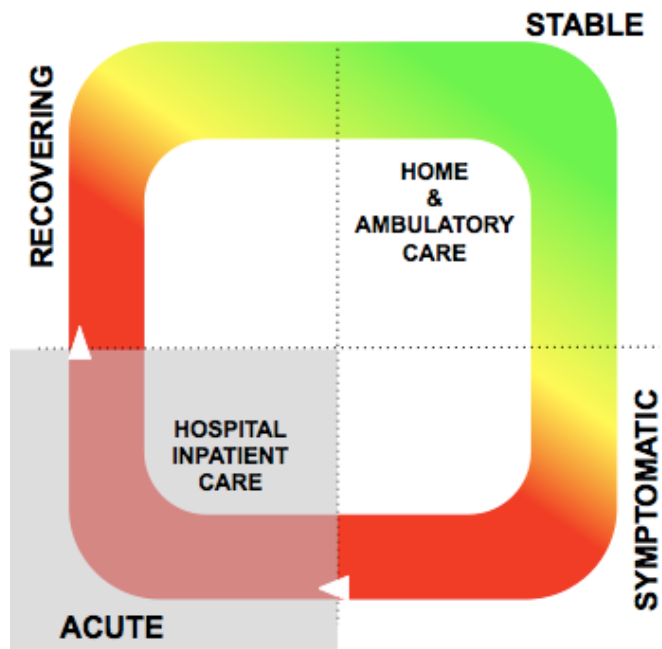
Quality of Life



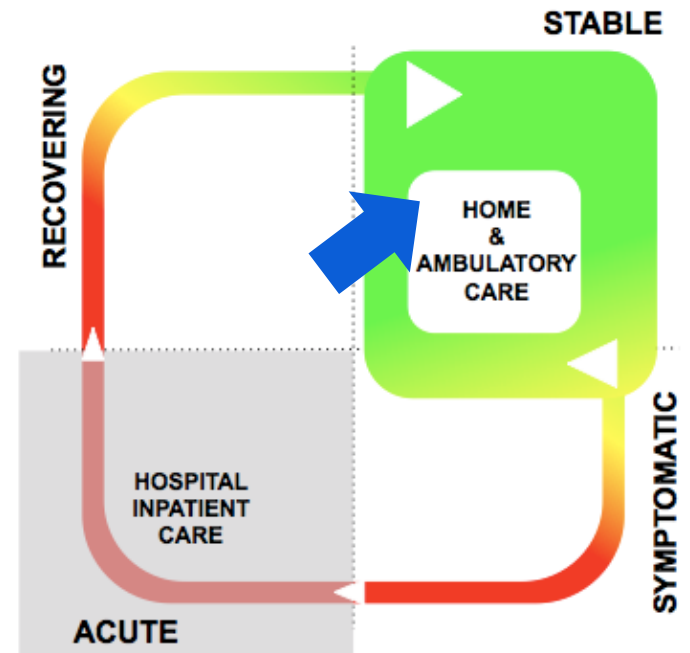
Better Quality of Life and Outcomes @ Sustainable Costs?

Self-Management & Primary Care Based Patient Centric Coordination

2010

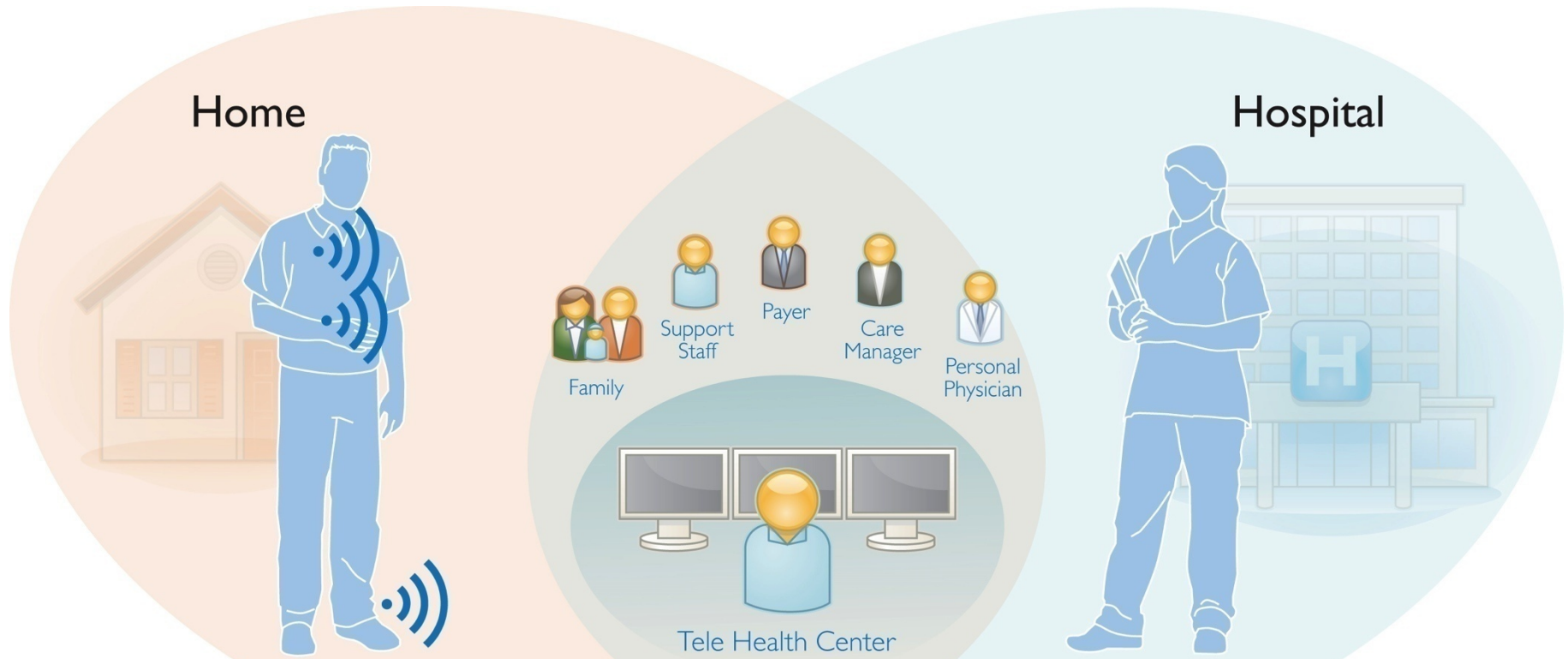


2020



Hospital-to-Home – what and where

Distributed Healthcare blueprint



Chronically ill patients and their families

We empower patients and their families with personalized information and tools to help them understand their hospital discharge and adhere to ongoing care.

All members of the care team

We help caregivers treat a growing number of patients by providing the information and tools they need to confidently and efficiently deliver high-quality humanistic care across the continuum.

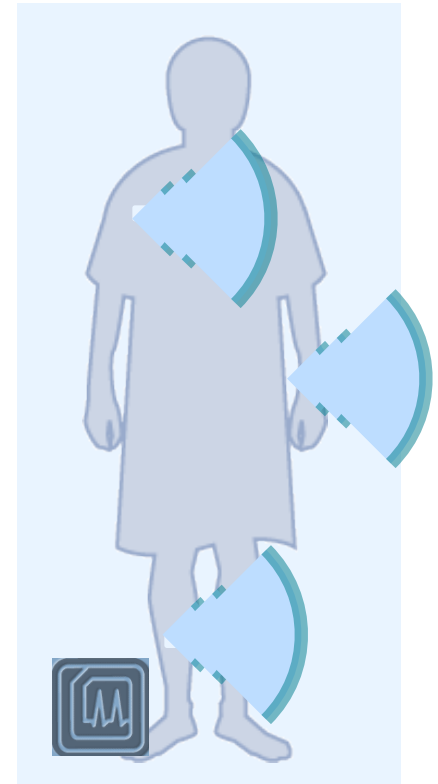
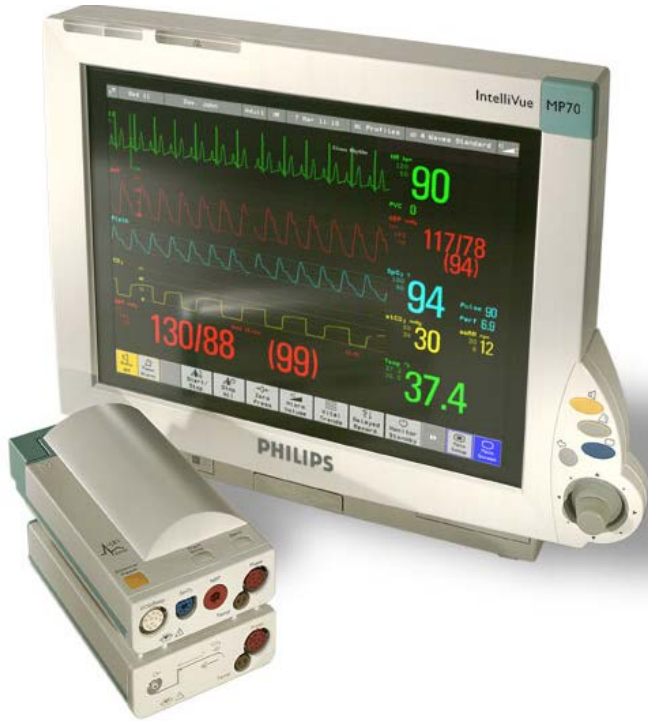
Analogy – Technology Trends

- from wired, central intelligence to distributed wireless



Analogy – Technology Trends

- The same is applying to monitoring



It's real: Telemonitoring across the continuum

Acquire



We start with the patient.

Small, wireless sensors acquire your patient's physiological data.

Analyze



VISICU* effortlessly assesses basic vital signs. Anywhere.

This critical data is assessed and analyzed by intelligent algorithms.

Interpret



Smart alarm messages are sent throughout your system with Emergin.*

Intelligent information is then sent throughout your infrastructure, supporting the best of clinical decisions.

Present



We support the caregiver.

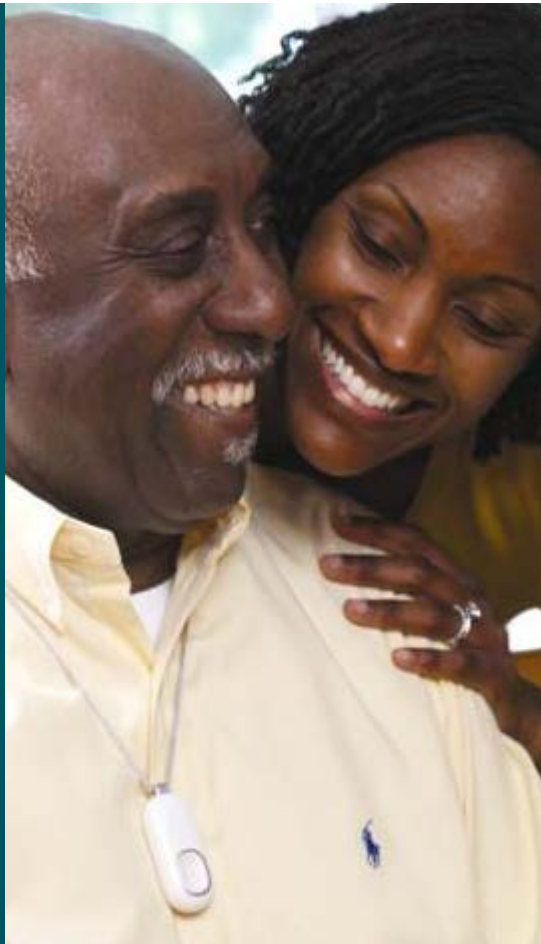
Comprehensive reporting in one useful, intuitive view. Available wherever you are.



Results stream directly into your EMR.

Examples: Bringing Health Care Home

For our customers and the patients they serve



We believe that life is best lived on
your our terms.

Wherever you might call home.

This is what matters to us.

**We are Philips Home Healthcare
Solutions.**

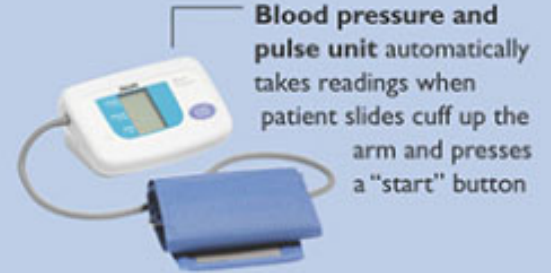
Post-discharge Telemonitoring

The Philips Patient Telemonitoring Set



Standard platform scale
(or Steady handlebar scale for extra balance.) Weight scale is easier to use than an ordinary bathroom scale. It has a low step; a wide, steady platform; a large digital display; and even a voice announcement of weight

TeleStation asks simple health questions. Responses are communicated to the care manager



Blood pressure and pulse unit automatically takes readings when patient slides cuff up the arm and presses a "start" button



Glucose meter connection from LifeScan ONE TOUCH® BASIC® or ONE TOUCH® Profile®

ECG/Rhythm strip recorders are simple wristbands with snap-on connectors



Empowering Patients

Improving compliance through education



motiva

**Inform Nurse
with Daily Health
Surveys**

**Timely
Reminders and
Goal Setting**

Check-ups
During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

- Not at all
- A little bit
- Moderately
- Quite a bit
- Extremely

To pick a response use **↑** **↓**, then **✓** or **↩**

Messages Mar 22 | Message

Dear Bill,
How are you doing on your goal to eat less salt? You may want to review your 'Nutrition for Diabetes' video. Remember how important it is for you to control your blood pressure since

↓ scroll down
To scroll text use **↑** **↓**, to return to list use **↩**

Knowledge

Motivation

Feedback on Goals

VIDEOS ECHOCARDIOGRAM

Use **▶** **⏸** to PLAY or PAUSE, **⏹** to STOP video.

MEDICATION TODAY MORNING

↑ scroll up

- 25mg Aldatone** Do not take with alcohol
- 40mg Lasix** Do not drive for at least 4 hours
- 250mg Tolazamide**
- 40mg Zestril** Do not take on empty stomach

↓ scroll down
Use **↑** **↓** to pick a time period, then press **SELECT**

CHARTS WEIGHT 14 READINGS

170 lbs Wed. 1/7/04 8:03AM

Use **↑** **↓** to view info. To return, press **GO BACK**

A Personal Health Book to improve patient compliance

healthbook Home Calendar Message Progress Education Emergency Cards More Logout

Hi Bart, you have upcoming appointments

New appointment
New To Do task

Thursday 13 September 2012

08:30 Appointment with Doctor Jones University Medical Center

11:00 Time to check your blood pressure!

15:00 Your daughter comes to visit

17:00

Wednesday 12 September 2012

Sun Mon Tue Wed Thu Fri Sat

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

September 2012

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Patient compliance is among the top issues surrounding readmission management.

Philips is developing Personal Health Book, a web-based, personalized health solution that supports patients and their families in managing health and well-being from Hospital to Home by bringing together their care community and information and services that are relevant for their condition.

The Personal Health Book enables:

- better readmission management;
- better patient satisfaction;
- and better patient self-management to avoid costly readmissions and escalating healthcare costs.

The Personal Health Book is targeted at patients who are at high risk of readmission, or those with chronic conditions, who can benefit from improved support, guidance and education.

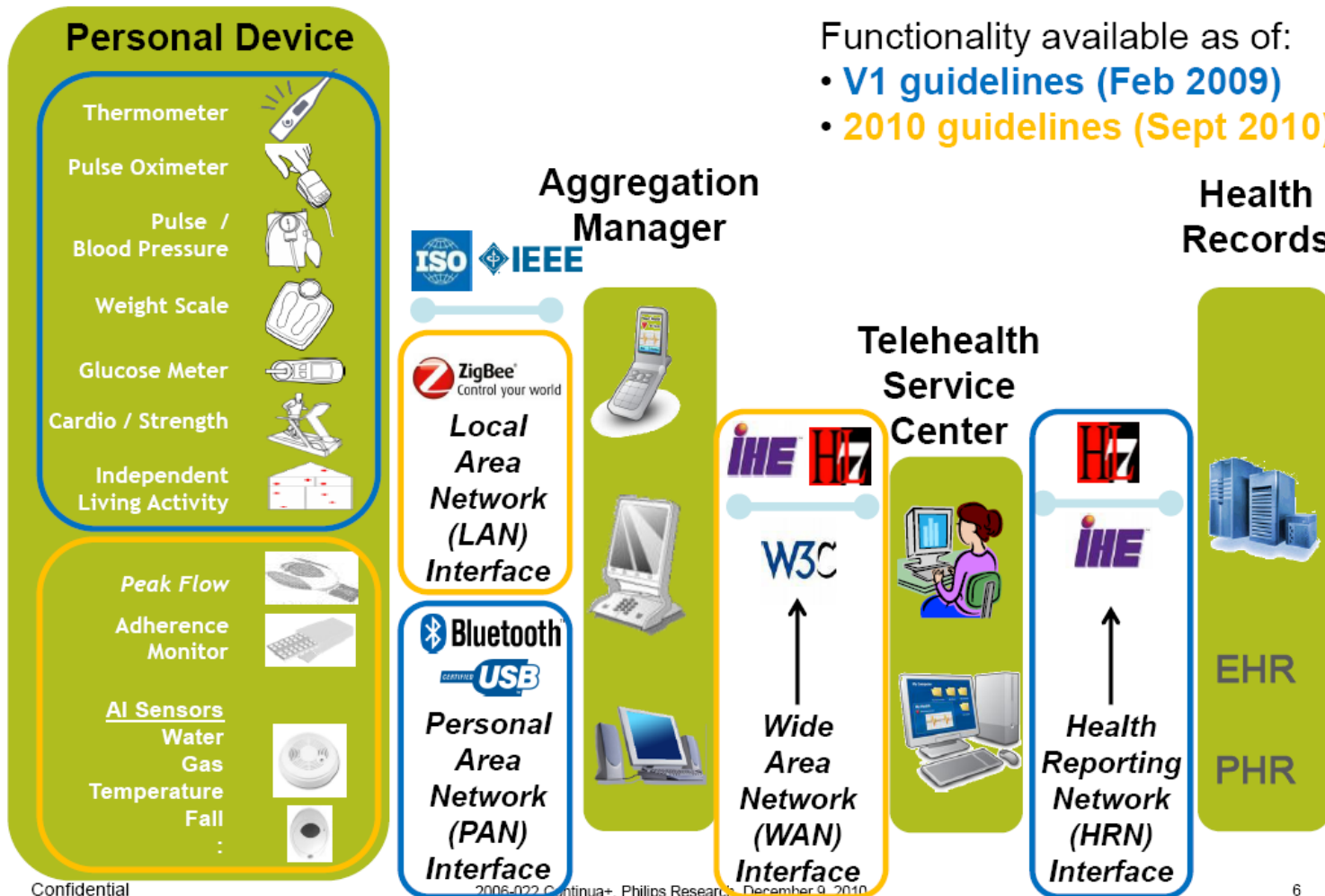
Standardization: Philips is a co-founder of Continua

Interoperability is key: "Enabling connected personal health for the world"

Continua Interfaces & Standards

Functionality available as of:

- **V1 guidelines (Feb 2009)**
- **2010 guidelines (Sept 2010)**



“So Why Has The Obvious Taken So Long?”

New health care technologies are **adopted gradually**

The pattern of adoption fits a **logistic “S” curve**

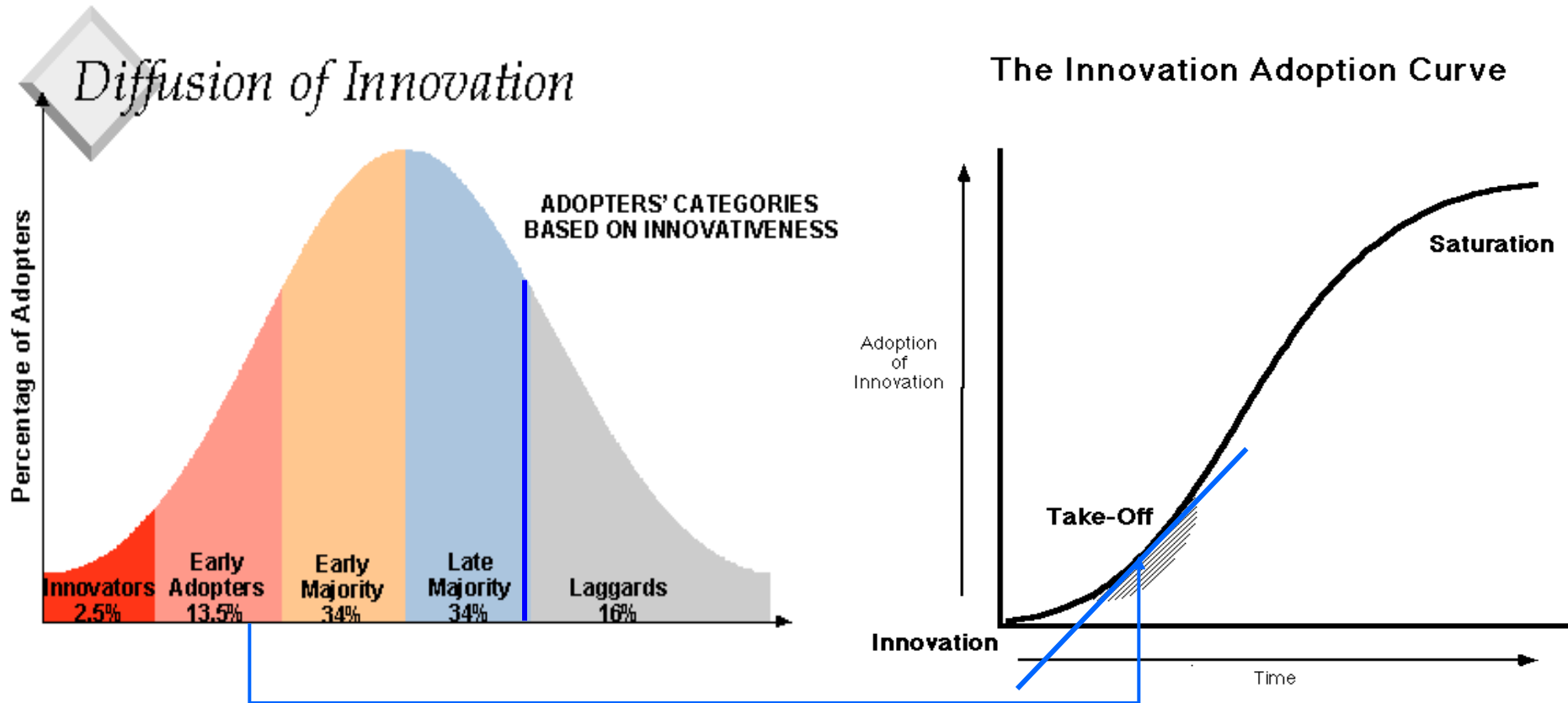
Adoption patterns are influenced by **regulation in reimbursed systems**

Adoption patterns are also defined by **training cycles of medical education**

The shift in the **locus of control** is uncomfortable, and in most cases connected with local monetary losses

Shortliffe EH. Strategic action in health information technology: why the obvious has taken so long. *Health Affairs*. 2005;24(5):1222-1233

“The 17 Year Rule”



Rogers EM. *Diffusion of Innovation 4th ed.* New York: Free Press; 1995.

Balas EA and Boren SA. Managing clinical knowledge for health care improvement. *Yearbook of Medical Informatics*. 2000

Der Weg des Geldes

Sie haben sich schon immer gefragt, wo das ganze Geld bleibt, das Sie für Gesundheit ausgeben? Hier sehen Sie, auf welchen Wegen die rund 250 Milliarden Euro im Gesundheitssystem fließen

Einnahmen der Krankenversicherungen

Ausgaben der Krankenversicherungen

sonstige Geldflüsse

Hartz IV: Der Bund zahlt die Krankenversicherung für ALG-II-Empfänger, ca. 4 Mrd. Euro

Arbeitslosenversicherung: Die Sozialkasse zahlt die Krankenversicherung für ALG-I-Empfänger, ca. 3 Mrd. Euro

Rentenversicherung: Die gesetzliche Versicherung trägt für Rentner 50 Prozent des Beitragssatzes zur GKV, ca. 14 Mrd. Euro

50 Prozent des Beitrags für Arbeiter und Angestellte, ca. 52 Mrd. Euro

50 Prozent des Beitrags, + 0,9 Prozent zusätzlicher Beitrag, Praxisgebühr, Zuzahlungen in Krankenhäusern und für Arzneimittel, ca. 73 Mrd. Euro

Gesetzlich Versicherte und Rentner

Steuerzuschüsse: „Gesamtgesellschaftliche Aufgaben“ wie Mutterschaftsgeld oder die beitragsfreie Versicherung während der Erziehungszeit werden durch Steuermittel finanziert, ca. 5 Mrd. Euro

Gesundheitsfonds
Alle Einnahmen fließen in den Fonds. Jede Krankenkasse erhält daraus eine Pauschale, je nach Alter, Geschlecht und Krankheiten der Versicherten, ca. 167 Mrd. Euro

Zusatzbeiträge von 8 Euro bis zu 37,50 Euro monatlich möglich, ca. 4 Mrd. Euro

Nicht verschreibungspflichtige Arzneimittel: Frei verkäufliche Medikamente (z. B. gegen Schnupfen) muss der Patient selbst bezahlen, ca. 4 Mrd. Euro



Investitionen in Krankenhäuser: Die Länder tragen die Investitionskosten (Bauten und Geräte) für Krankenhäuser, ca. 7 Mrd. Euro

Budget
Jede Krankenkasse handelt mit den Kassenärztlichen Vereinigungen ein Gesamthonorar aus und überweist ihnen den Betrag. Aus diesem Budget werden die Ärzte bezahlt, ca. 11 Mrd. Euro

Fallpauschalen und Medikamente
Die Krankenhäuser erhalten je nach behandelter Erkrankung pauschale Vergütungen, sogenannte Fallpauschalen, ca. 53 Mrd. Euro

Medikamentenkosten ca. 29 Mrd. Euro

Krankengeld ca. 7 Mrd. Euro

Medikamente

Kassenärztliche Vereinigungen (KV)

Honorare
Die Ärzte rechnen ihre Leistungen nicht mit der Krankenkasse ab, sondern mit ihrer Kassenärztlichen Vereinigung. Sie erhalten Anteile aus dem Gesamtbudget.

Kassenzahnärztliche Vereinigungen (KZV)

Honorare

Ambulante Behandlungen

Zahnarztbehandlungen

Krankenhausleistungen

Arzneimittel: Die meisten Krankenhäuser haben eigene Apotheken, die ihre Medikamente direkt beim Großhandel beziehen. In den Zahlungen der Kasse für die Krankenhausbehandlung sind die Kosten für Medikamente bereits enthalten, ca. 3 Mrd. Euro

Arztkosten ca. 5 Mrd. Euro

Zahnarkosten ca. 3 Mrd. Euro

Krankenhauskosten ca. 6 Mrd. Euro

Medikamentenkosten ca. 2 Mrd. Euro

Private Krankenversicherer

Zusatzversicherungen von gesetzlich Versicherten ca. 4 Mrd. Euro

Beiträge von Vollversicherten ca. 22 Mrd. Euro

Privat Honorare an Ärzte
Leistungen, die von der Kasse nicht bezahlt werden, rechnet der Arzt direkt mit dem Patienten ab.

Privatversicherte

Privatversicherte, die in einem Unternehmen angestellt sind, erhalten maximal 262,50 Euro vom Arbeitgeber, entspricht dem Höchstbeitrag in der gesetzlichen Kasse.

Infografik: Martin Frailing

Innovation Challenges for Biomedical Technology

product vs process innovation

Cost-reduction:

Improve the productivity of health care resources

Cost-increasing:

Increase the level of care or introduce new and costlier products

Distinguish between **process** innovations that decrease cost

versus

product innovations that generally increase cost

Newhouse JP. Medical care costs: how much welfare loss? *Journal of Economic Perspectives* 1992;6(3):3-21.

Closing Statements

- Distributed Healthcare will come: There is no alternative - we can identify proxy industries as reference models
 - A question of “where” and “when”, not of “if”
 - Bad news: it’s usually not about missing technology
 - Having a legacy reimbursed Health System certainly doesn’t help speed up the process
- Personal prediction: The main drive for innovation will come from tomorrows mass markets: Asia, Latam, Africa

