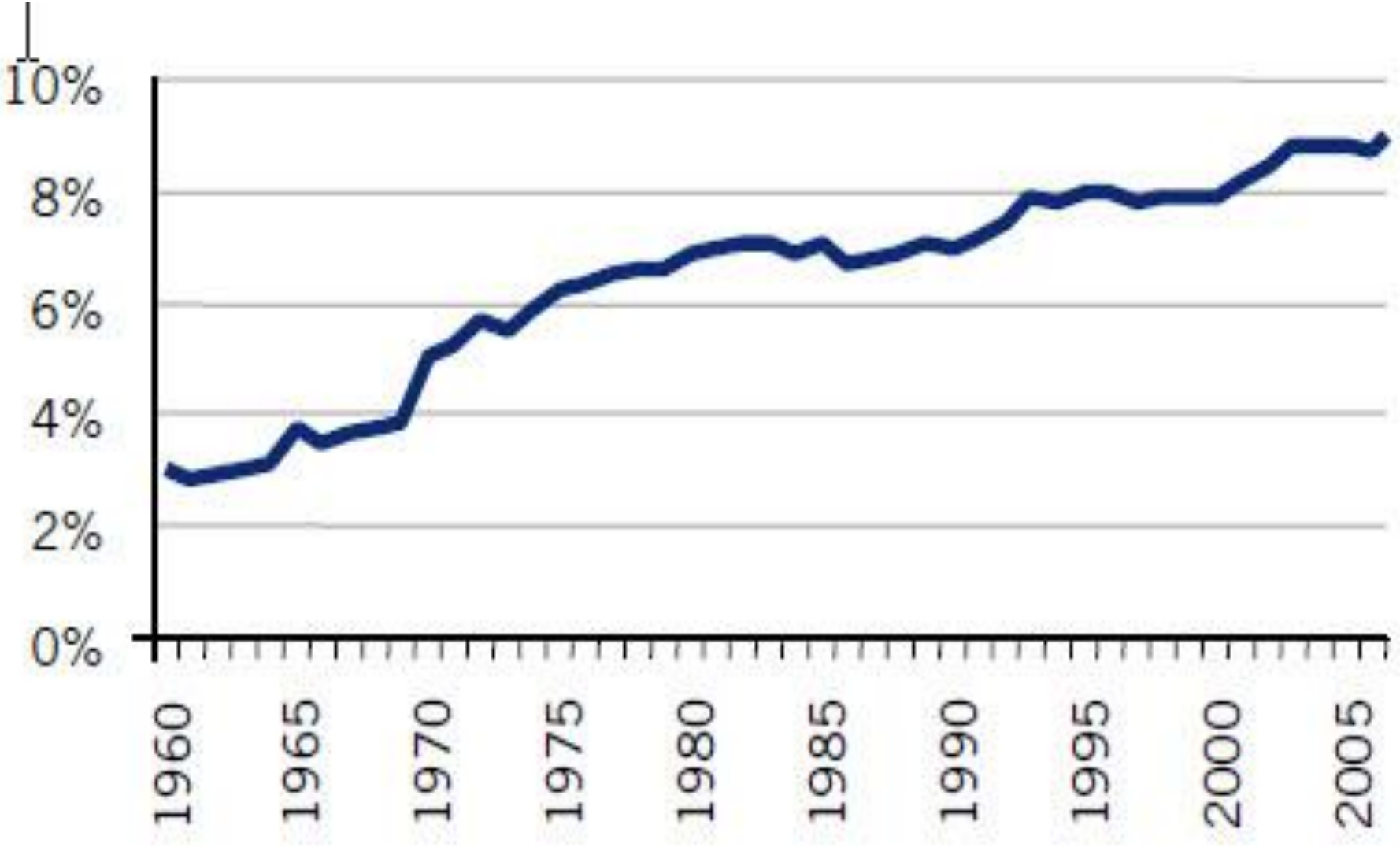
World Healthcare Problems and e-Health

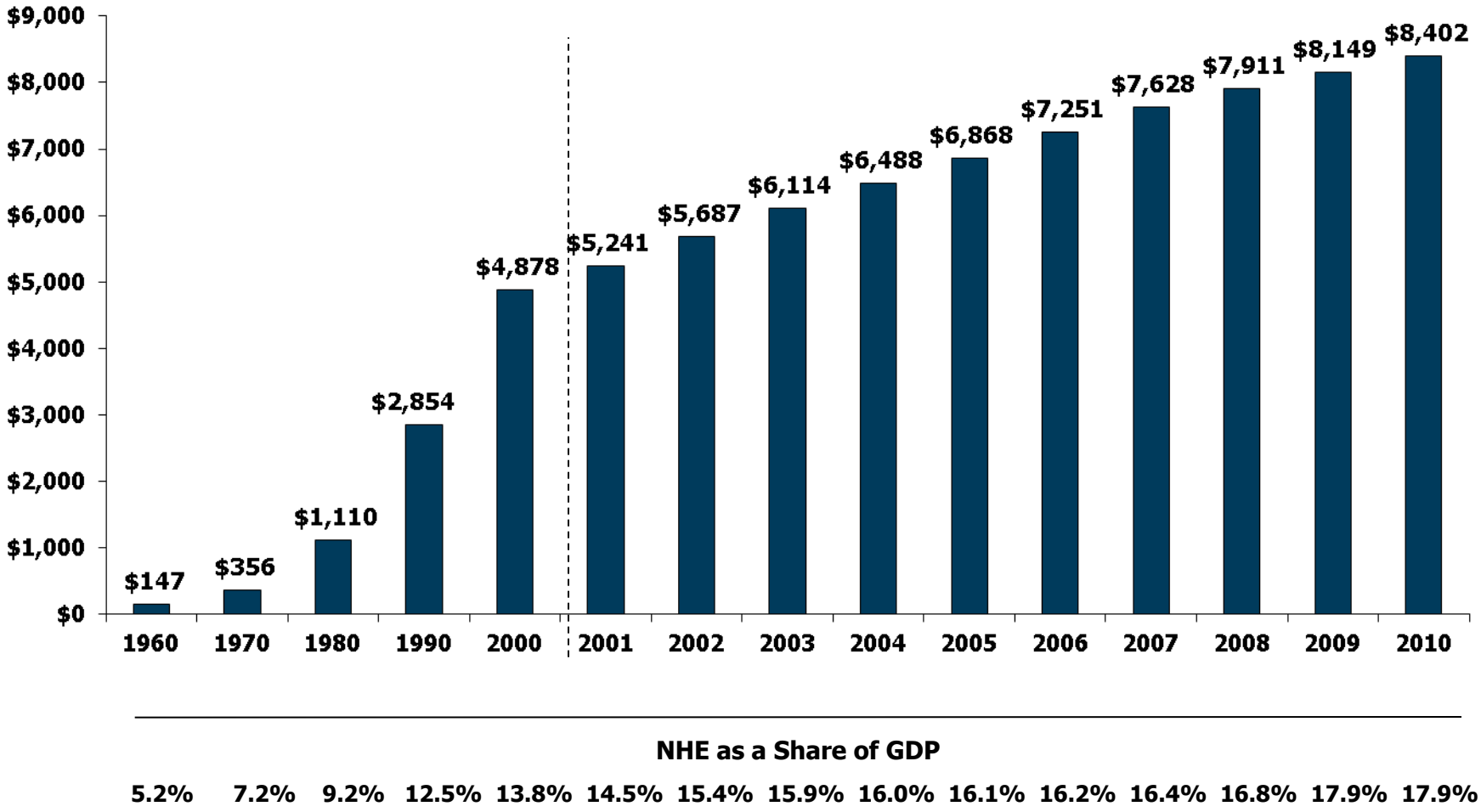
Oleg Medvedev, MD., Ph.D.
Lomonosov Moscow State University
Russia

Average cost of healthcare in 6 European countries as % of their GDP



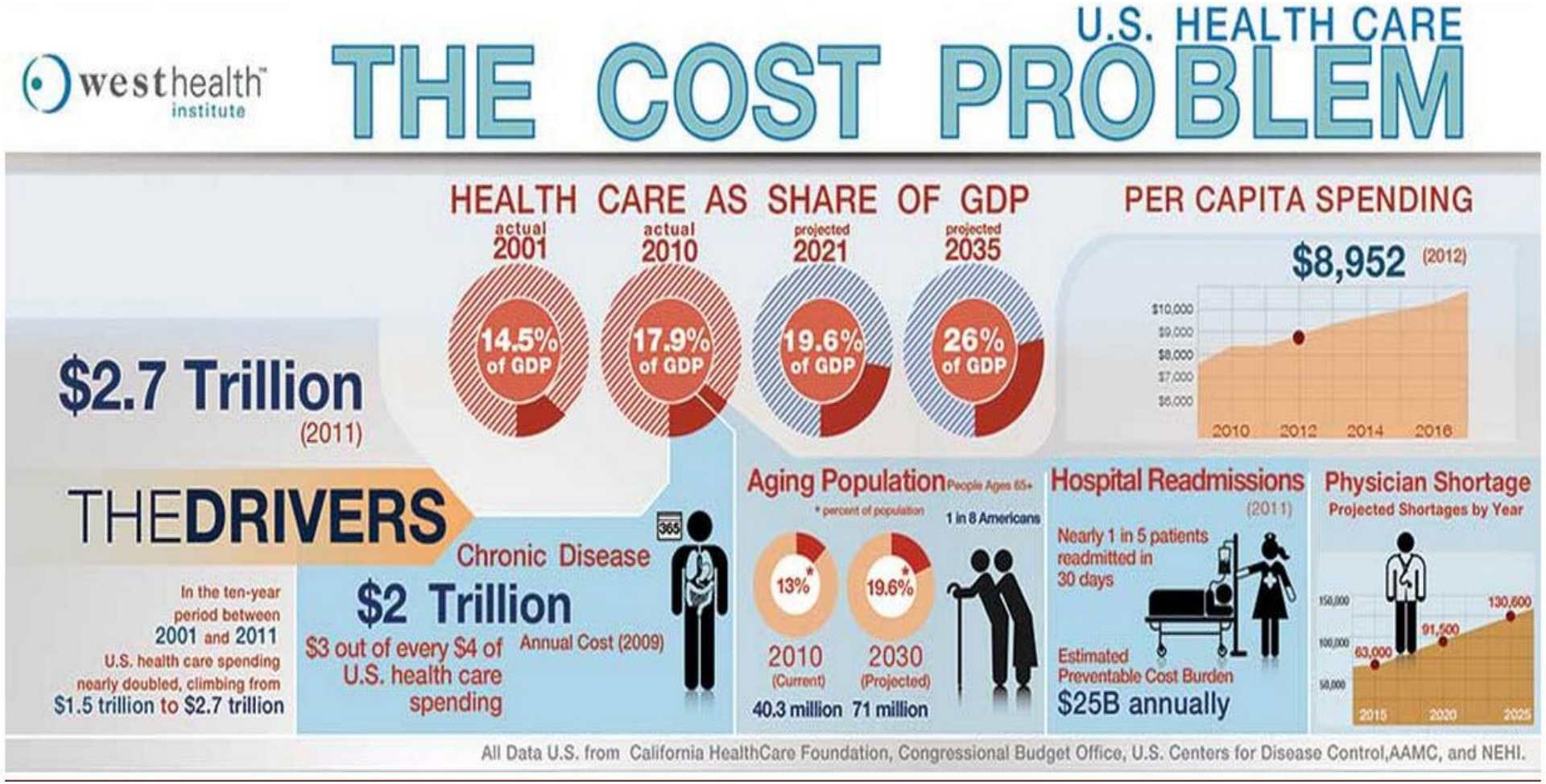
Gartner report, 2009

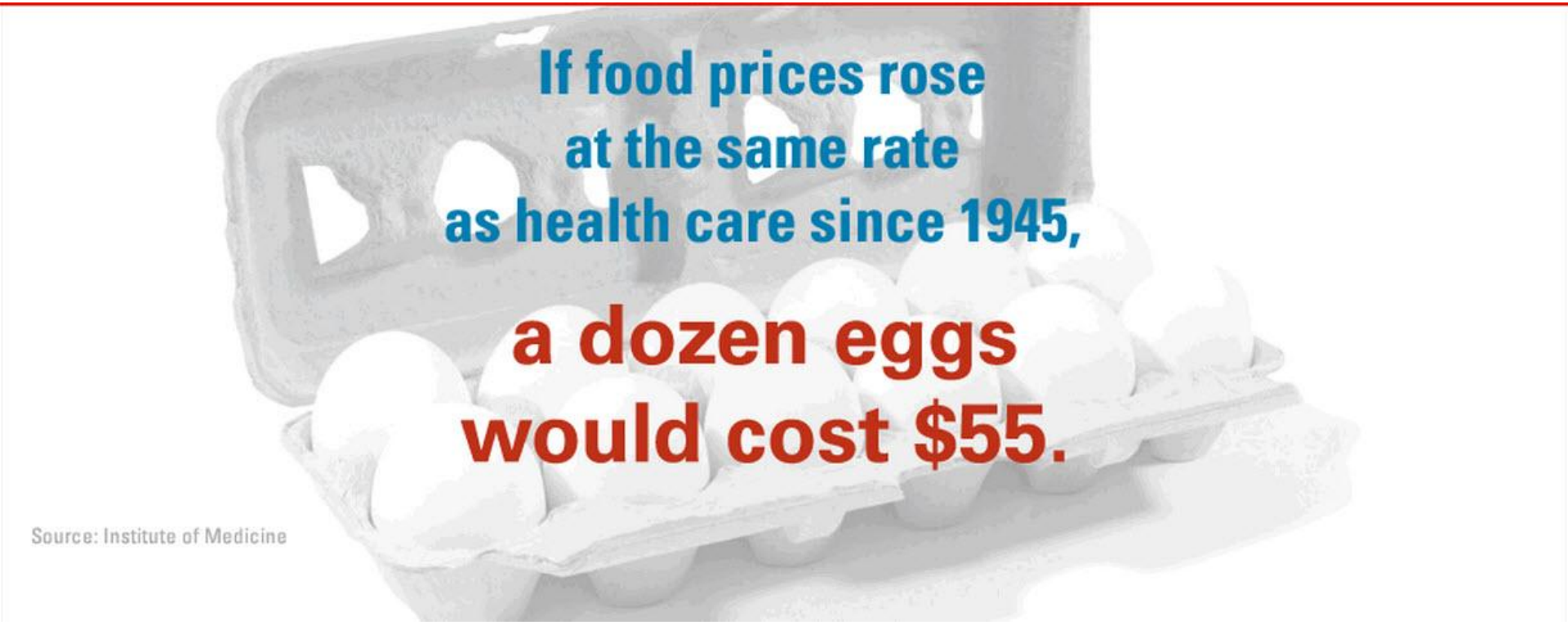
National Health Expenditures per Capita, 1960-2010



Notes: According to CMS, population is the U.S. Bureau of the Census resident-based population, less armed forces overseas and population of outlying areas, plus the net undercount.

Source: Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group, at http://www.cms.hhs.gov/NationalHealthExpendData/ (see Historical; NHE summary including share of GDP, CY 1960-2010; file nhegdp10.zip).


westhealth institute
U.S. HEALTH CARE
THE COST PROBLEM
HEALTH CARE AS SHARE OF GDP
actual 2001
14.5% of GDP
actual 2010
17.9% of GDP
projected 2021
19.6% of GDP
projected 2035
26% of GDP
PER CAPITA SPENDING
$8,952 (2012)
$10,000
$9,000
$8,000
$7,000
$6,000
2010
2012
2014
2016
$2.7 Trillion
(2011)
THE DRIVERS
In the ten-year period between 2001 and 2011 U.S. health care spending nearly doubled, climbing from $1.5 trillion to $2.7 trillion
Chronic Disease
$2 Trillion
Annual Cost (2009)
$3 out of every $4 of U.S. health care spending
365
Aging Population
People Ages 65+
* percent of population
1 in 8 Americans
13%*
2010 (Current)
40.3 million
19.6%*
2030 (Projected)
71 million
Hospital Readmissions
(2011)
Nearly 1 in 5 patients readmitted in 30 days
Estimated Preventable Cost Burden
$25B annually
Physician Shortage
Projected Shortages by Year
150,000
100,000
50,000
63,000
91,500
130,600
2015
2020
2025
All Data U.S. from California HealthCare Foundation, Congressional Budget Office, U.S. Centers for Disease Control,AAMC, and NEHI.

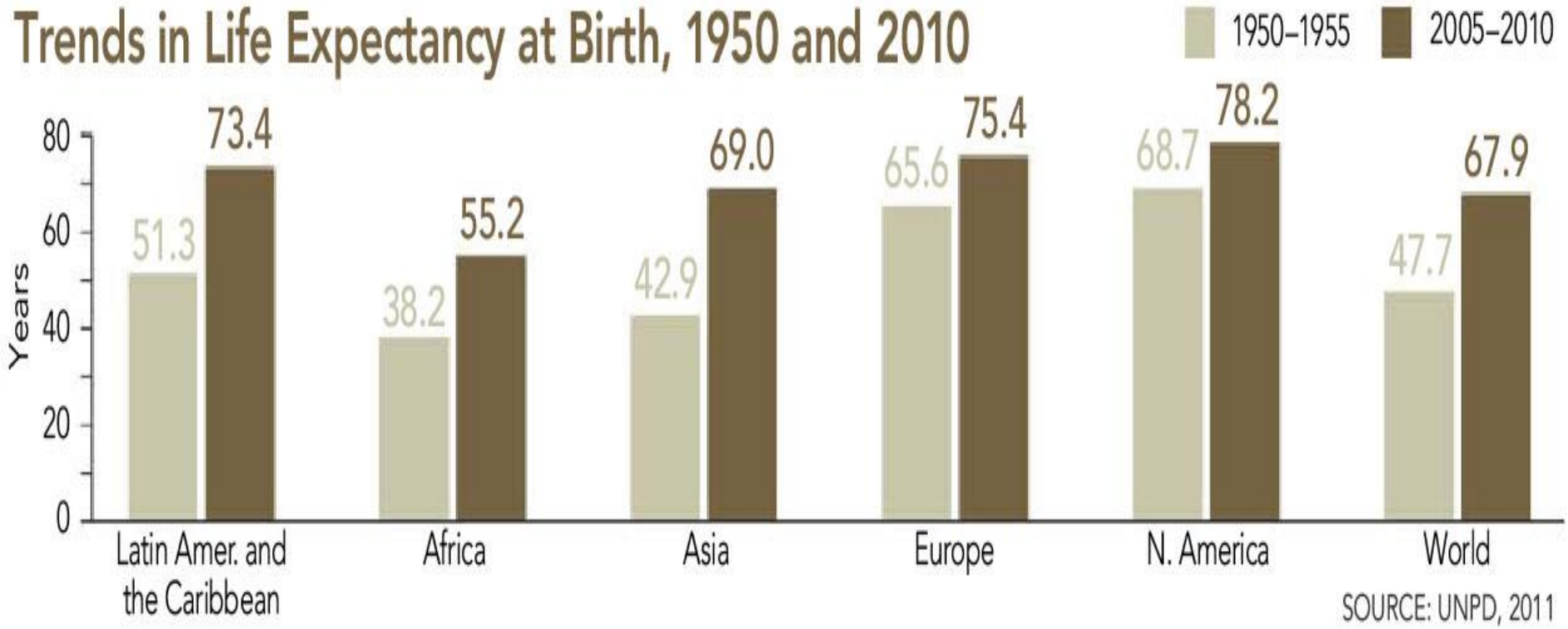


Source: Institute of Medicine

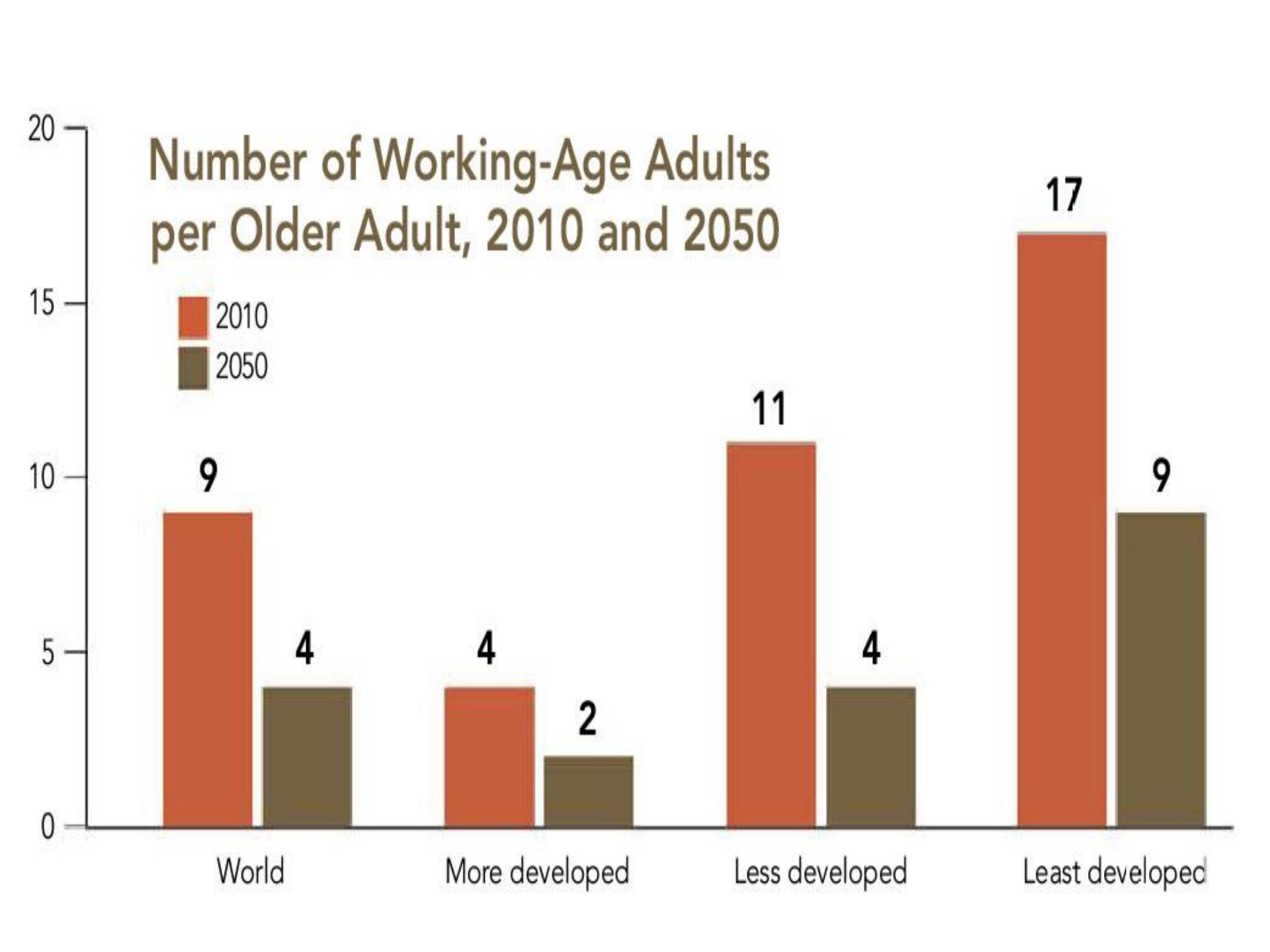
International Rankings and National Health Expenditures

	AUS	CAN	GER	NETH	NZ	UK	US
							
OVERALL RANKING (2010) *	**3**	**6**	**4**	**1**	**5**	**2**	**7**
Quality Care	**4**	**7**	**5**	**2**	**1**	**3**	**6**
Access	**6.5**	**5**	**3**	**1**	**4**	**2**	**6.5**
Efficiency	**2**	**6**	**5**	**3**	**4**	**1**	**7**
Equity	**4**	**5**	**3**	**1**	**6**	**2**	**7**
Long, Healthy, Productive Lives	**1**	**2**	**3**	**4**	**5**	**6**	**7**
HEALTH EXPENDITURES/CAPITA (2007)	**$3,357**	**$3,895**	**$3,588**	**$3,837***	**$2,454**	**$2,992**	**$7,290**

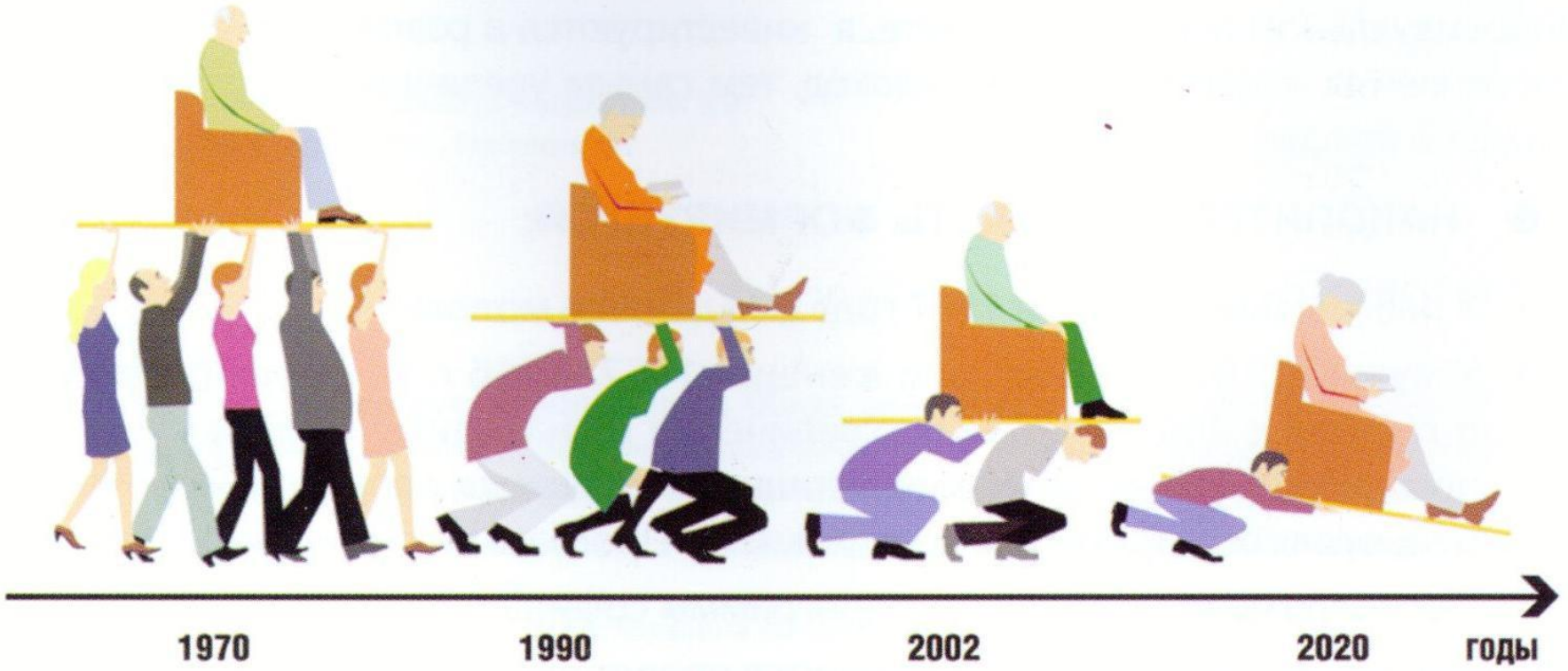
*Note: *Estimate. Expenditures shown in $US PPP (purchasing power parity). Source: Calculated by The Commonwealth Fund based on 2007 International Health Policy Survey; 2008 International Health Policy Survey of Sicker Adults; 2009 International Health Policy Survey of Primary Care Physicians; Commonwealth Fund Commission on a High Performance Health System National Scorecard; and Organization for Economic Cooperation and Development, OECD Health Data, 2009 (Paris: OECD, Nov. 2009).*



29 JULY 2011 VOL 333 **SCIENCE** www.sciencemag.org


Number of Working-Age Adults per Older Adult, 2010 and 2050
2010
2050
20
15
10
5
0
9
4
4
2
11
4
17
9
World
More developed
Less developed
Least developed

Соотношение трудоспособного населения и пенсионеров



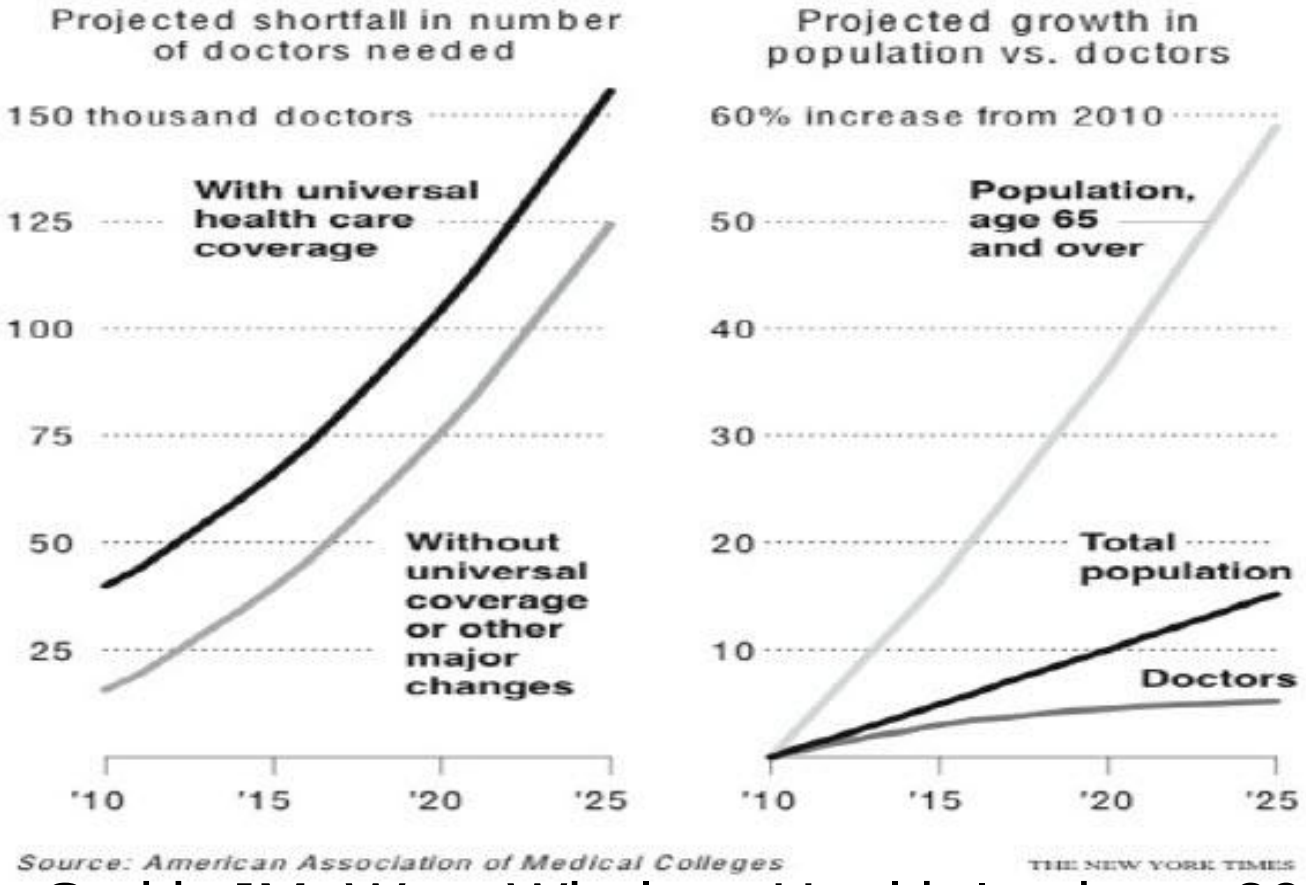
Именно поэтому в 2002 году в нашей стране стартовала пенсионная реформа,

Status quo cannot be sustained

Current health care system is unsustainable

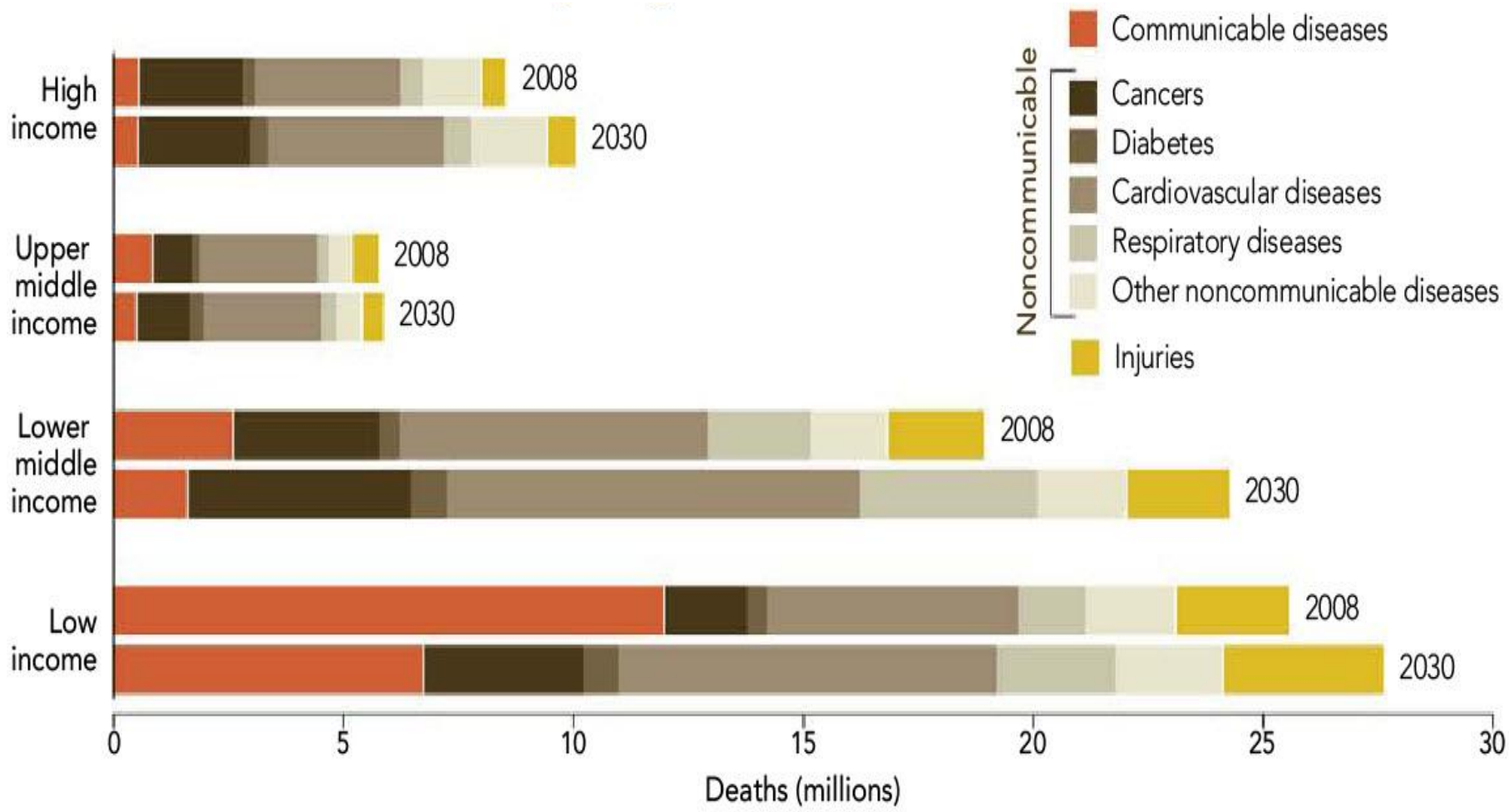
Physicians

Demand for Care

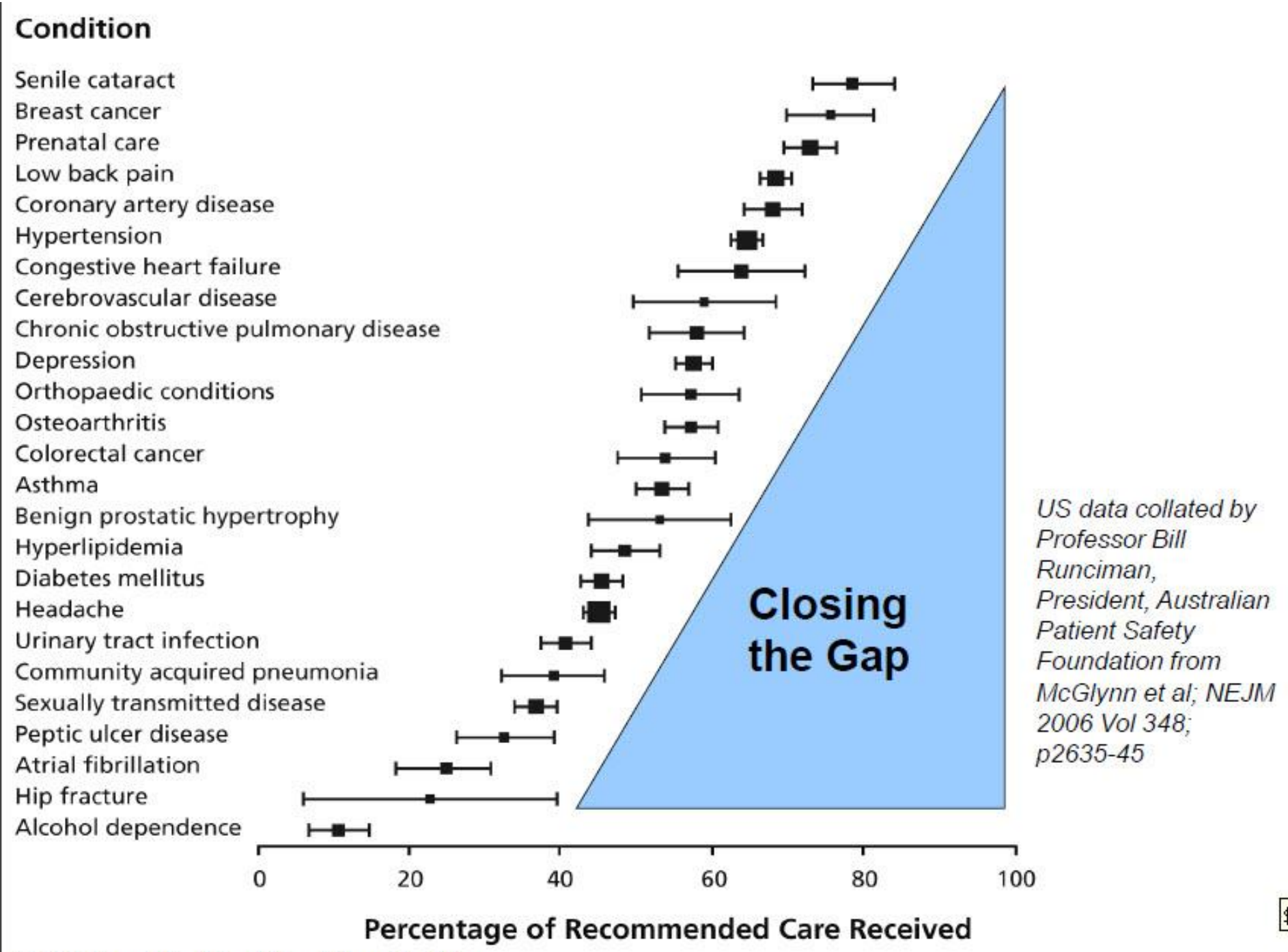


Dr. Smith JM.,West Wireless Health Institute, 2010

Unprepared. Many developing countries lack the resources to effectively treat renal failure, diabetes, cancer, and other debilitating NCDs.



Rising toll. Between 2008 and 2030, the World Health Organization projects that the burden of non-communicable diseases will continue to rise, even in the poorest countries.



US data collated by Professor Bill Runciman, President, Australian Patient Safety Foundation from McGlynn et al; NEJM 2006 Vol 348; p2635-45

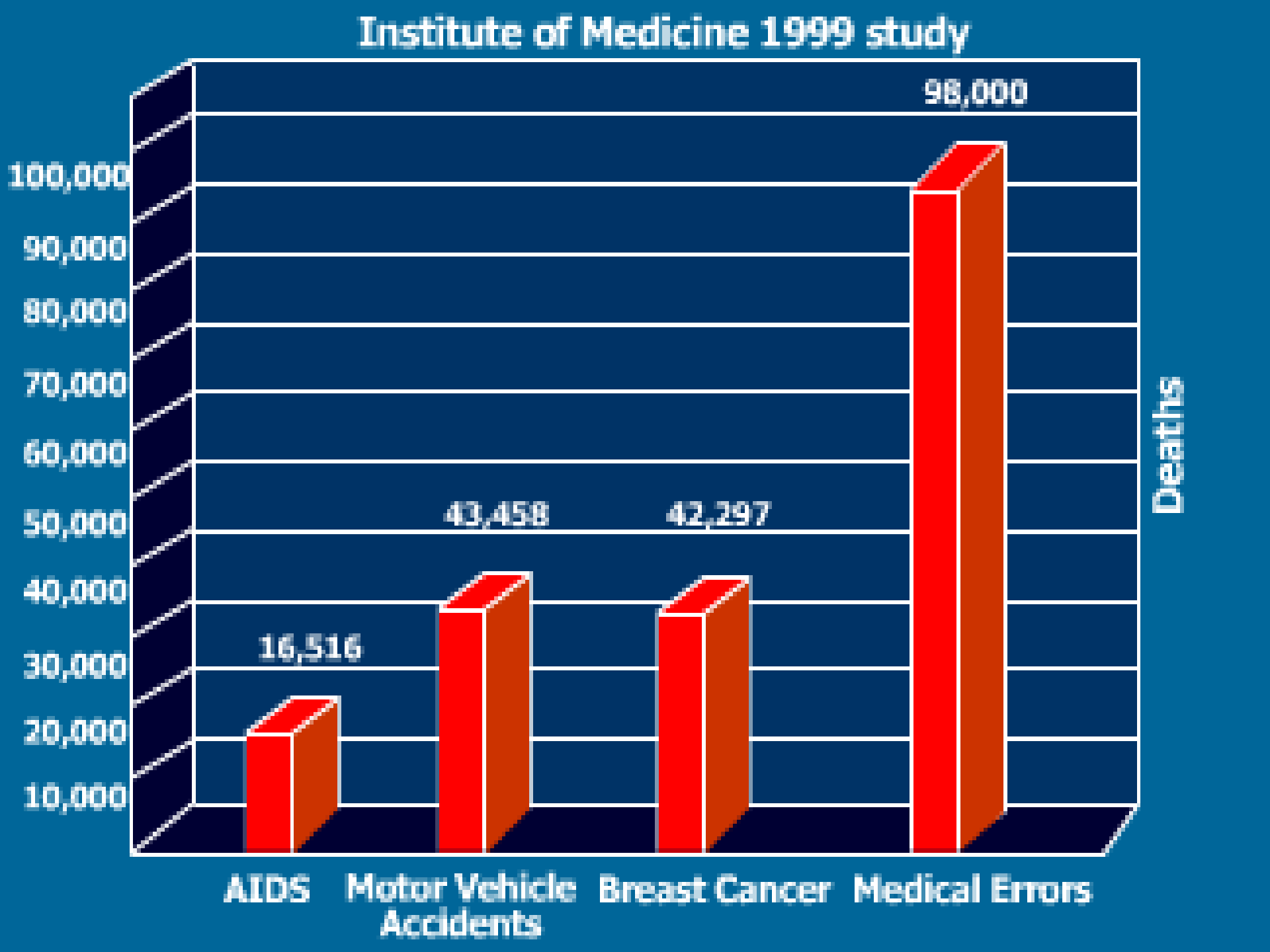
Chronic disease presents the biggest challenges

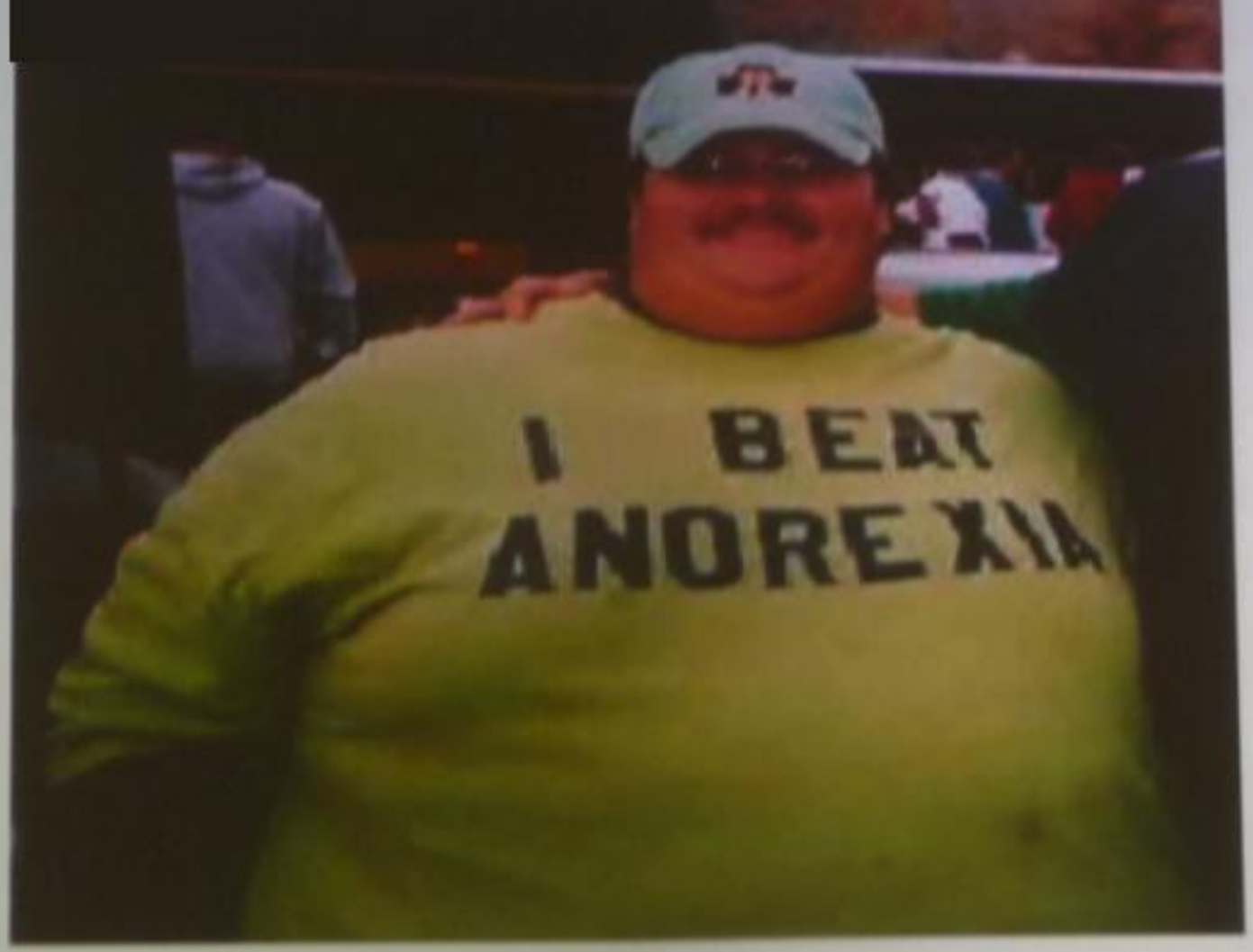
Chronic Disease Burden

- **20 million** Americans have Diabetes
- **20 million** Americans have Kidney Disease
- **50 million** Americans have Hypertension
- **65 million** Americans have Cardiovascular Disease
- **2 of 3** Americans are overweight; **1 in 5** is Obese
- **1 in 5** of Americans over 40 will develop Heart Failure

Complications from chronic disease account for ~75% of US healthcare spending

Dr. Smith JM.,West Wireless Health Institute, 2010


Institute of Medicine 1999 study
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
Deaths
16,516
43,458
42,297
98,000
AIDS
Motor Vehicle Accidents
Breast Cancer
Medical Errors

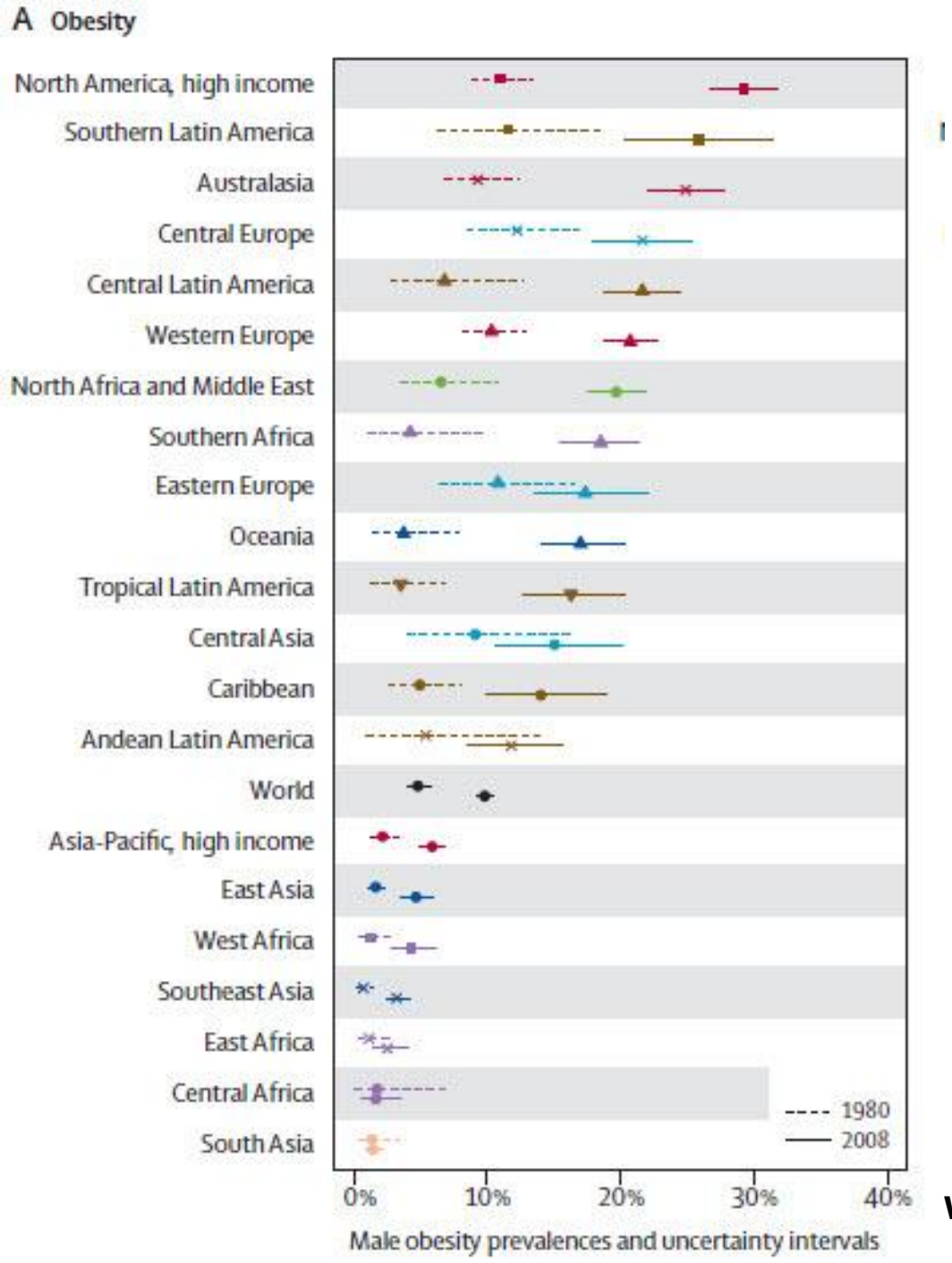


2007 Foresight Report:
£15.8bn annual cost to UK

John Powel et al.,, Warwick Medical School, 2010

Figure 26.5 Identical twins with combined weight of 1,300 pounds. Note similarity in body shape.

John Powel et al.,, Warwick Medical School, 2010



www.thelancet.com Published online February 4, 2011

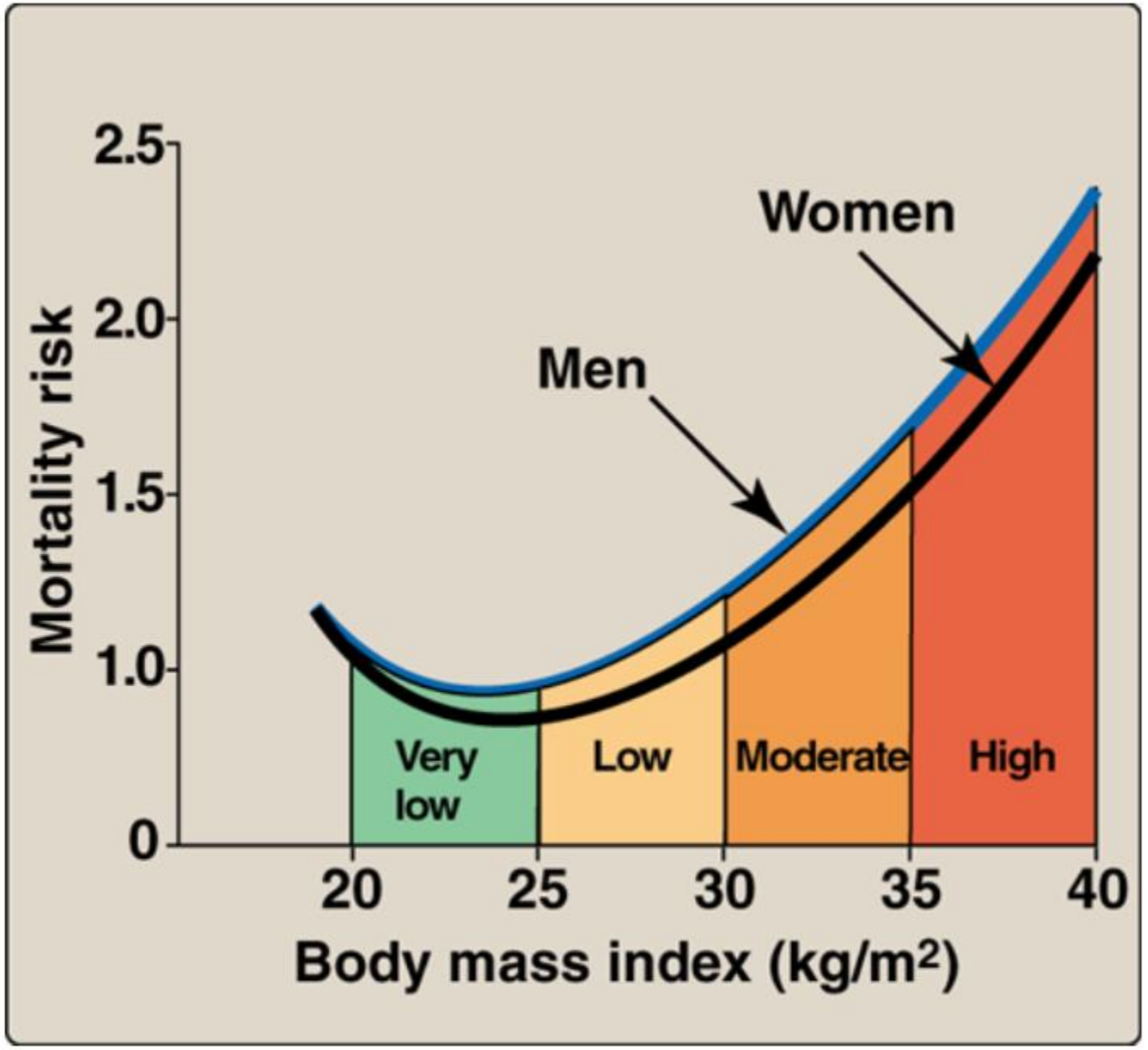


Figure 26.9 Body mass index and the relative risk of death.

MEDICINE

Running Prevents Early Aging in Mice

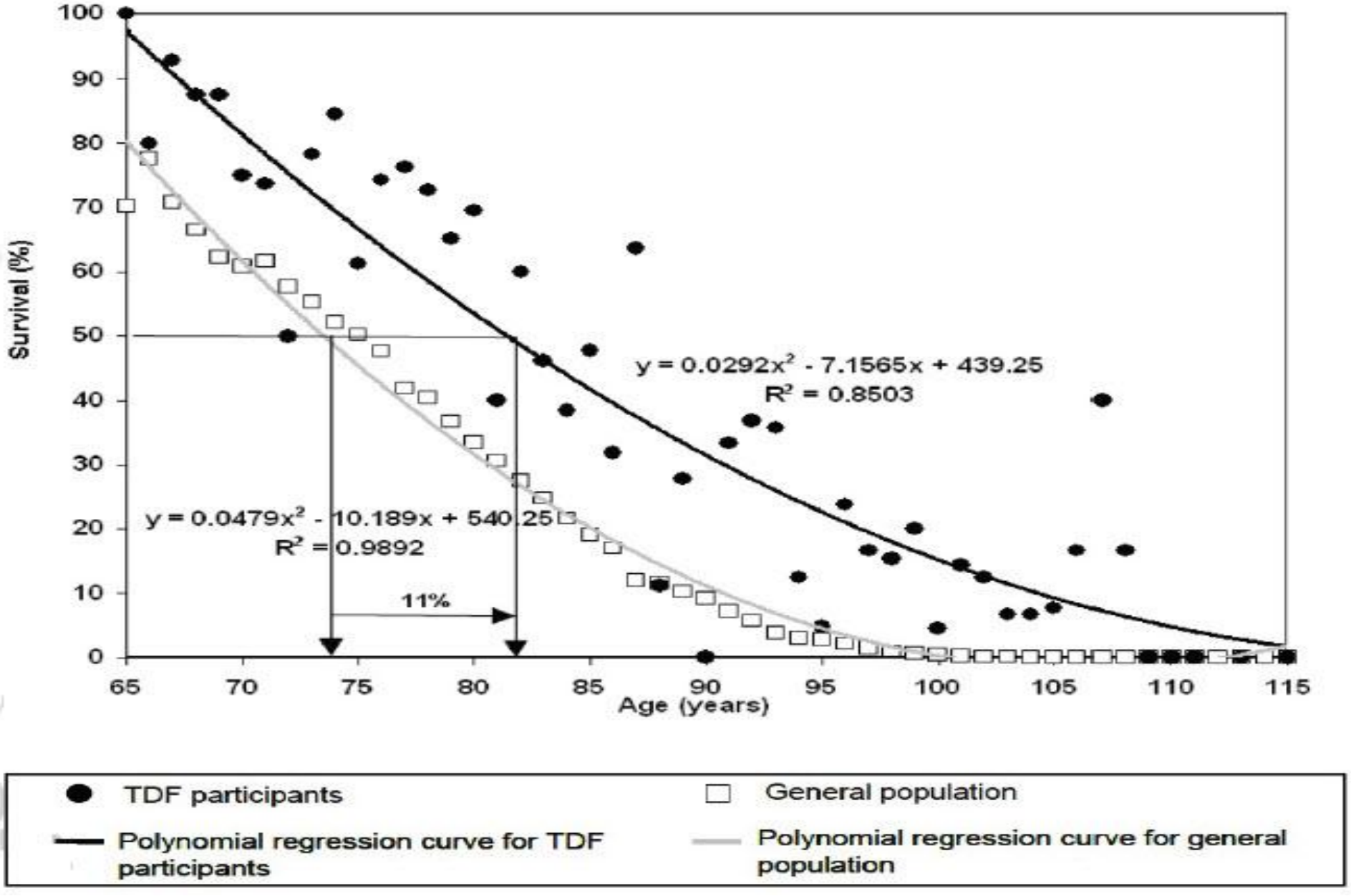
The mitochondria are the powerhouses of cells; they convert food into biological fuel. The mitochondria have their own genomes, which are highly susceptible to mutations; experiments on animals have demonstrated that mitochondria DNA mutations can cause early aging and death. Concurrent studies on humans have shown that endurance training can improve health and prolong life. Now, for the first time, a group of Canadian and American scientists has linked the two lines of research in an experiment with mice suffering mitochondria DNA mutations.

The mice with the mutation get sick, age prematurely and die earlier than normal mice, so to test the effects of exercise, the scientists had some of the mutant mice run for 45 minutes three times a week from three months of age onward. When the mice reached eight months of age, they were far healthier than their sedentary counterparts, and none died early. Endurance training could possibly prolong the lives of children suffering from rare mitochondria diseases, which cause early aging.

This mouse ran its way to a longer life.

This prematurely aged mouse has not been running.

LEFT: NASA | CC-SA/GAR & TARNOPOLSKY/MCMASTER UNIVERSITY (2)



TDF- участники Тур де Франсе

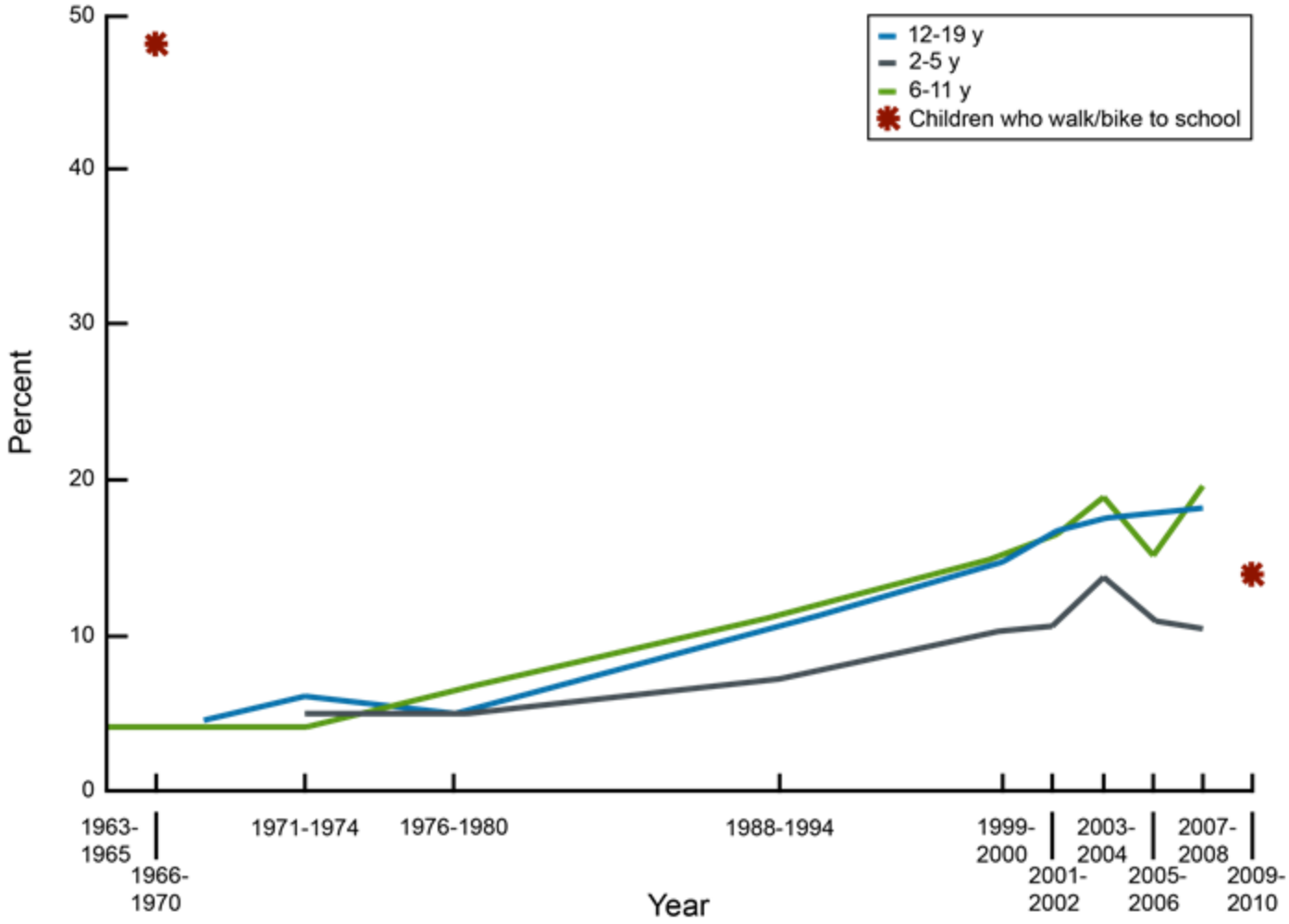
Review. Exercise acts as a drug. Pharmacological benefits of exercise. British Journal of Pharmacology © 2012

Medscape EDUCATION

The Science and Practice of FitnessGram

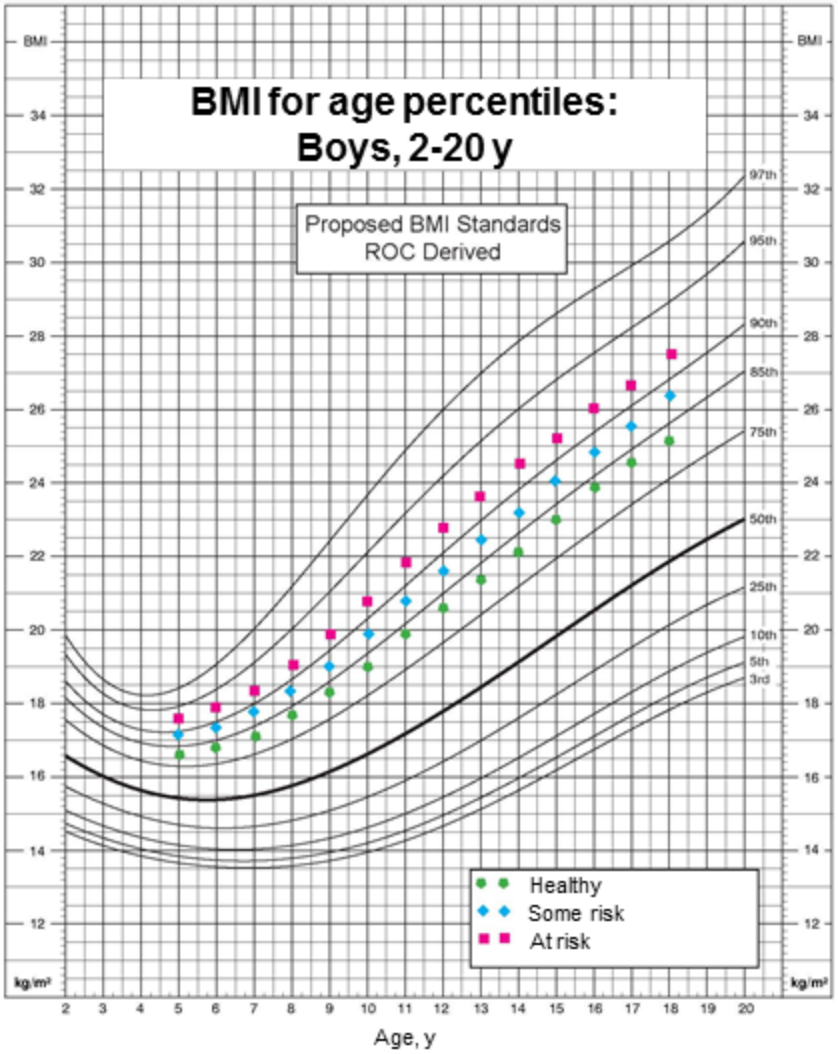
Speaker
Gregory J. Welk, PhD
Scientific Director, FitnessGram
Director, Clinical Research and Community Outreach
Nutrition and Wellness Research Center
Professor, Department of Kinesiology
Iowa State University
Ames, Iowa

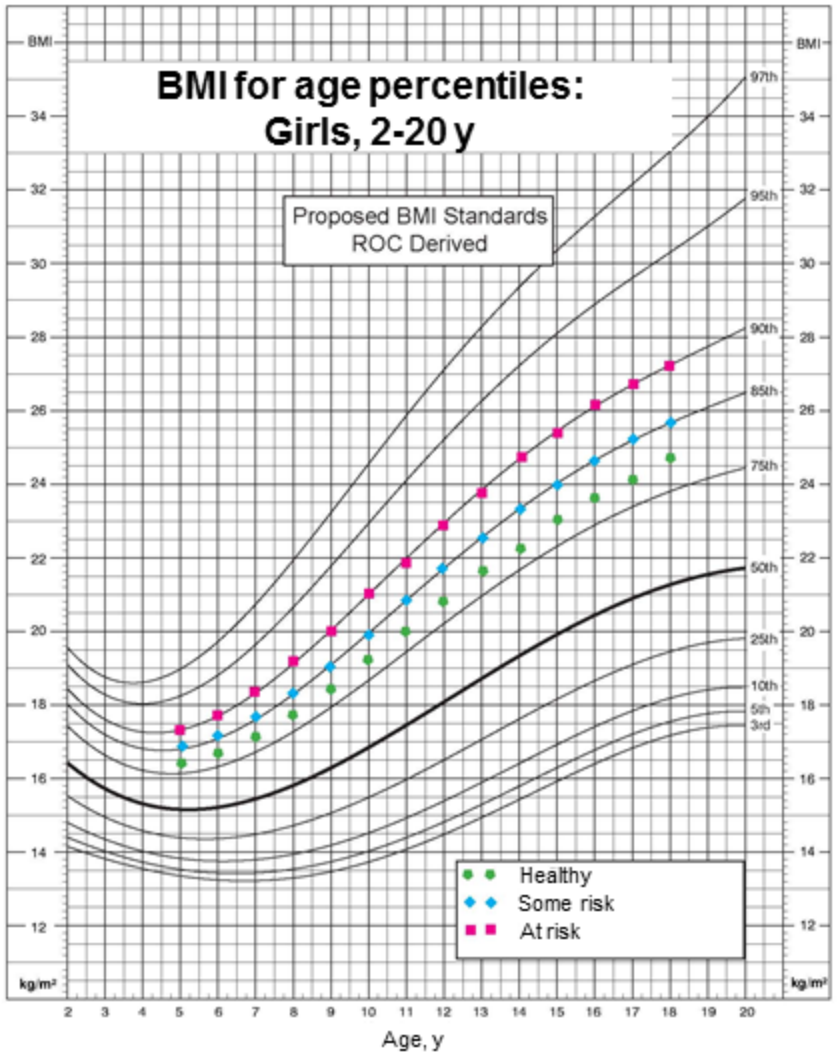
Trends in Childhood Obesity & Overweight: 1963-2010



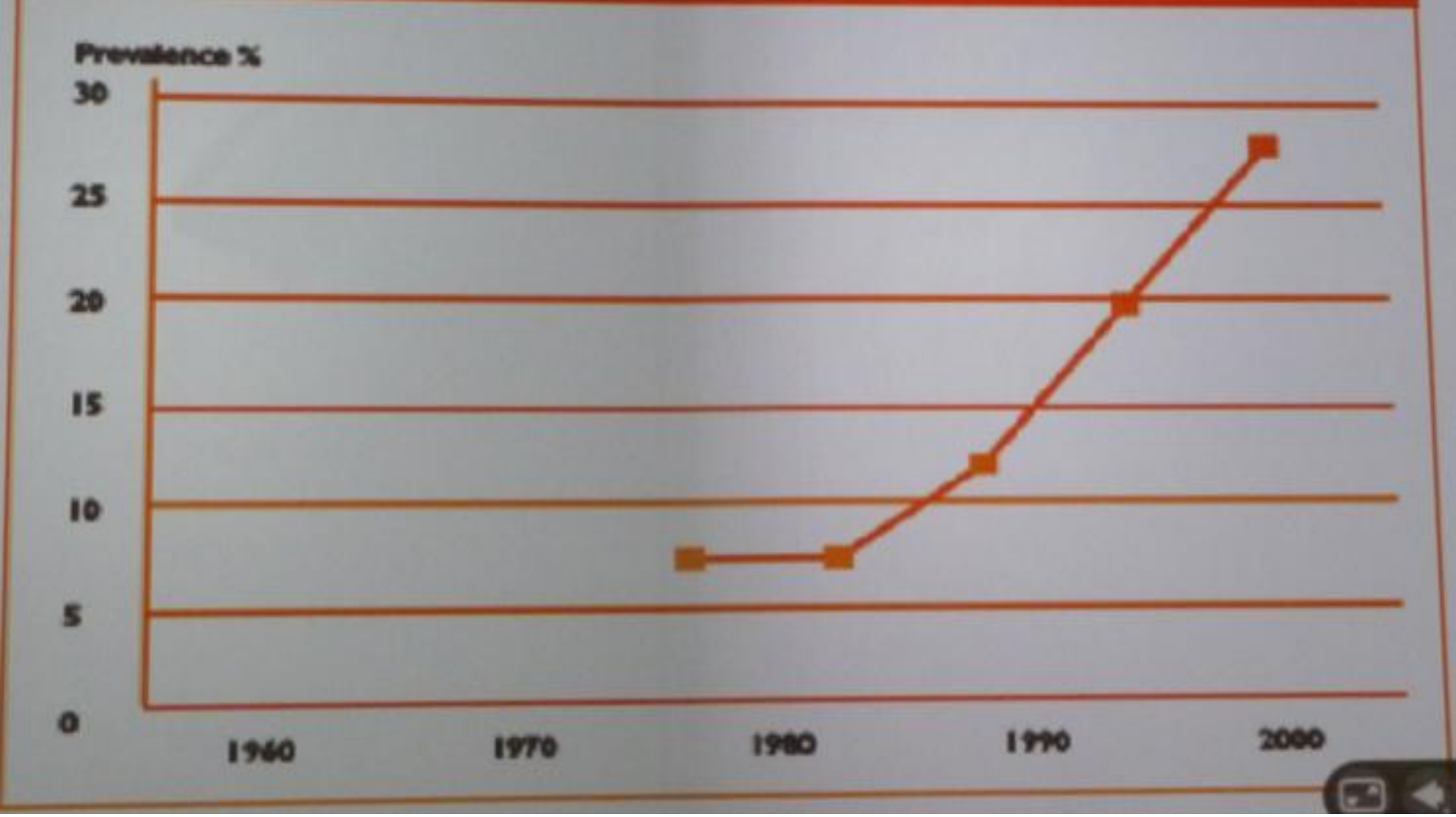
Ogden C, et al.[5]
McDonald NC, et al.[6]

CDC Growth Charts: United States





Overweight children in England
Trends in the last three decades



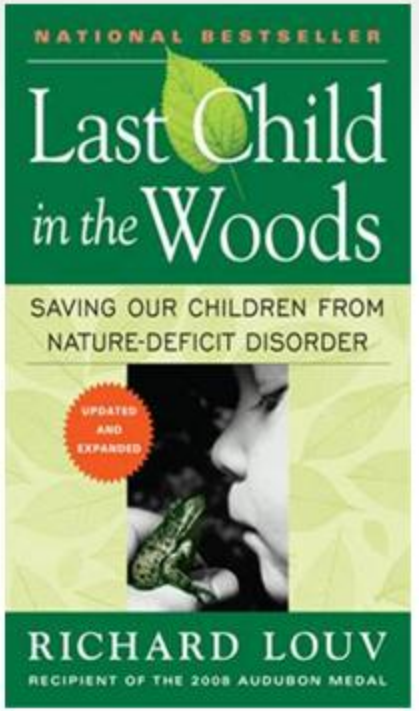
John Powel et al.,, Warwick Medical School, 2010

Medscape EDUCATION

Increasing Children's Physical Activity: Building Free-Range Communities

Speaker
Richard Mark Fenton, MS
Adjunct Associate Professor
Friedman School of Nutrition Science and Policy
Tufts University
Scituate, Massachusetts

Kids Are Less & Less "Free-Range"



Kids held back with 'over-organised' play, says Shane Gould

Pia Akerman

OLYMPIC golden girl Shane Gould has blasted children's sports programs as "over-organised" and holding back the natural development of physical skills, contributing to physical and social problems down the track.

The swimmer, who won five individual medals at the 1972 Munich Olympics, yesterday spoke out against children as young as five being pushed into team sports rather than encouraged to play naturally in the outdoors. "There's a certain age — 5, 6, 7, 8 — that is really too young for kids to be involved in organised sport, even though it is modified," she said at The Australian Institute of Public Management annual conference in Adelaide.

Gould

"I believe that children are over-organised and they don't have enough opportunity just for free play, creative play, particularly in nature. Someone has coined the term 'nature deficit disorder' — it's not actually a true disorder, but we are going to start to see problems in children like concentration, [and] ability to regulate their emotions."

Currently working on a masters degree in social geography at the University of Tasmania, Gould will publish her thoughts on children's physical activity in the December issue of the Child publications in state capitals.

She blames the loss of traditional Australian backyards and the "stranding" of public playgrounds as factors reducing children's ability to play naturally.

"Public liability seems to be the main focus for the design of our children's playgrounds and all of us need to take some responsibility for this," Gould writes.

"The race to blame someone for a child's fall from a piece of playground equipment has had the appalling knock-on effect of almost criminalising child's play and led to this deadening impact on our public spaces.

"Children prefer a log and a ditch to play structures."

Speaking after her address, Gould said home-improvement TV shows emphasising aesthetically pleasing courtyards had encouraged people to ditch traditional backyards.

"Kids need backyards — they need to dig dirt and pull up plants and see the roots. They need to find worms and beetles and make tracks and build cubbies and pull them down again," she said.

A mother of four, Gould raised her children on a property at Margaret River in Western Australia, where outdoor activity was an important part of everyday life.

In her article, Gould argues the Howard government's focus on after-school sports to address childhood obesity was "well-meaning" but failed to attract most children who often feel a "can't do" attitude to sports.

"Children, particularly under eights, do not, in my opinion, need to be involved in organised sports," she writes.

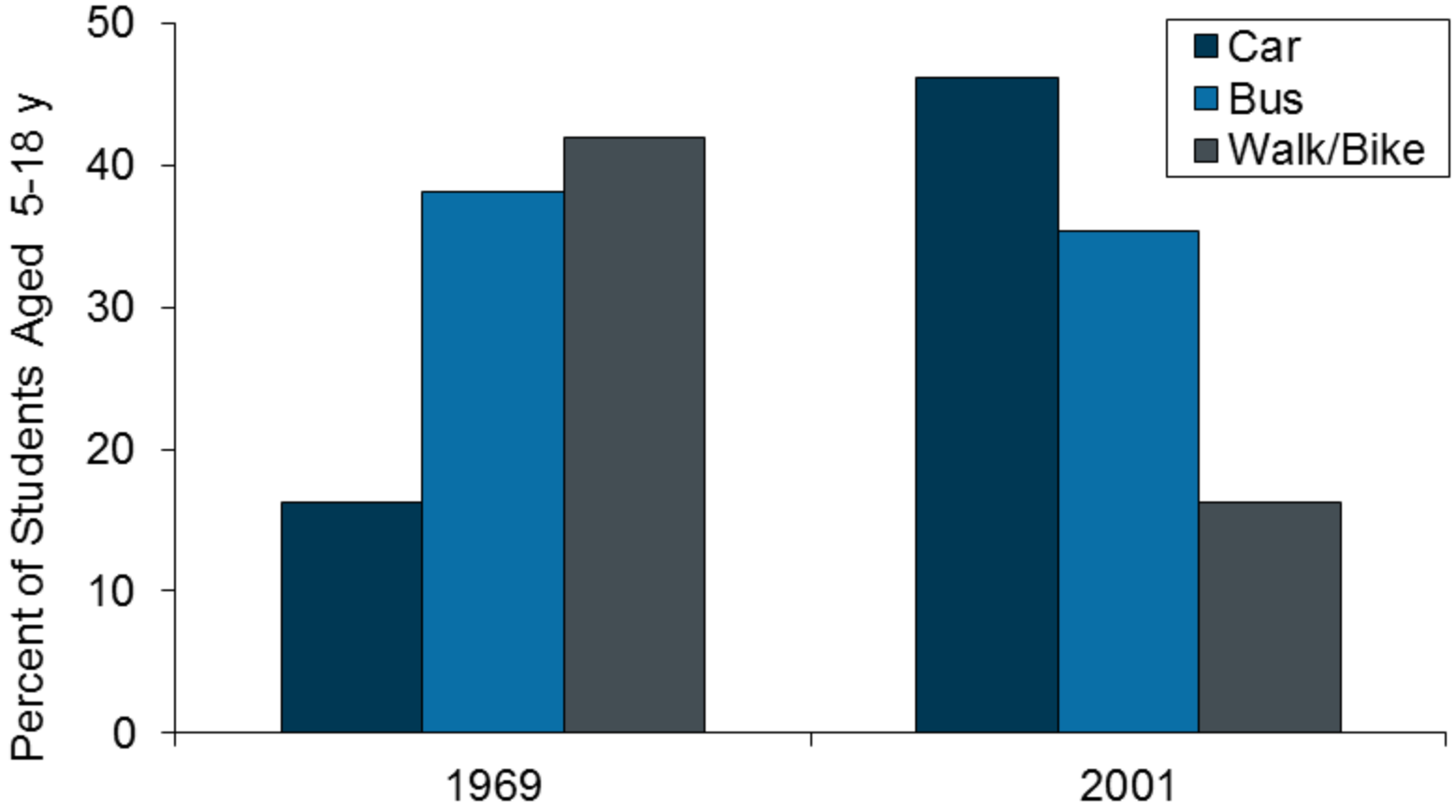
Gould said children today were victims due to "lack of movement experiences" such as reaching, climbing, hopping and spinning.

Have your say at thecourier.com.au

Gibbs N[1]; Louv R[2]; Akerman P.[3] All 3 images republished with permission.

Slide courtesy of Mark Fenton, MS.

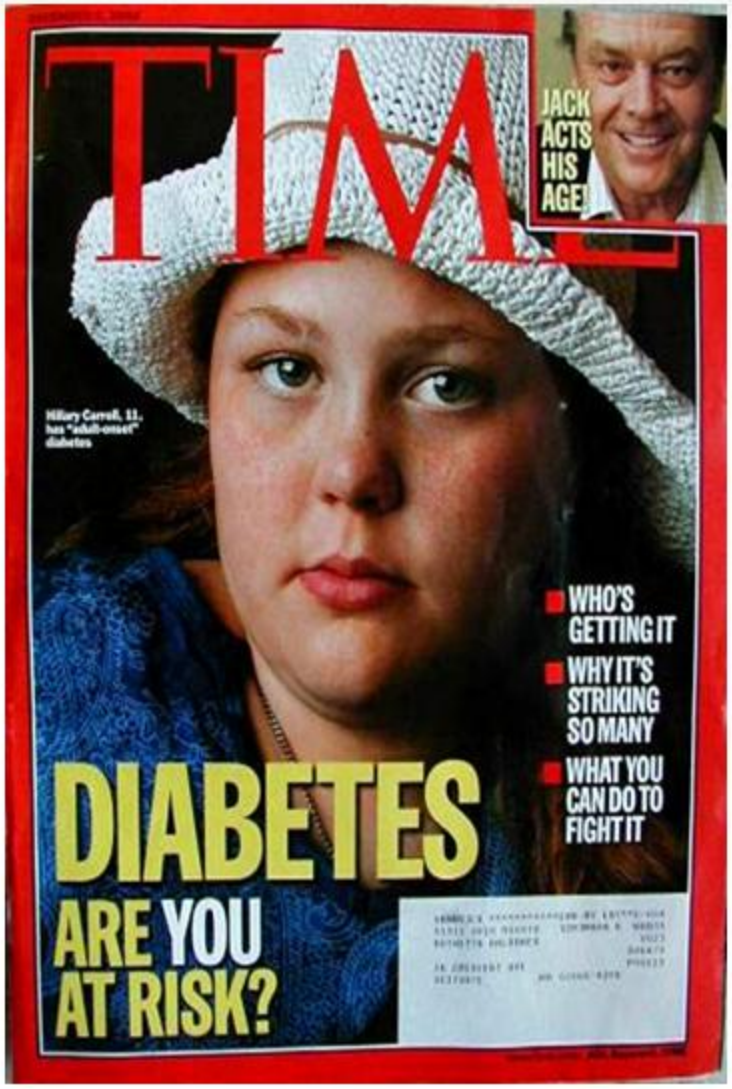
Changes in Walking & Cycling to School, 1969 to 2001



Data from Ham SA, et al.[4] Courtesy of Mark Fenton, MS.

America's Looming Chronic Disease Apocalypse . . .

We talk about drugs, genetics, diet ... Is an obvious factor being overlooked?



Gorman C, el al.[8] Republished by permission of the publisher. Slide courtesy of Mark Fenton, MS.

Health and Social Care Costs

NHS
Connecting for Health

THE WALL STREET JOURNAL.
WSJ.com

10 April, 2010

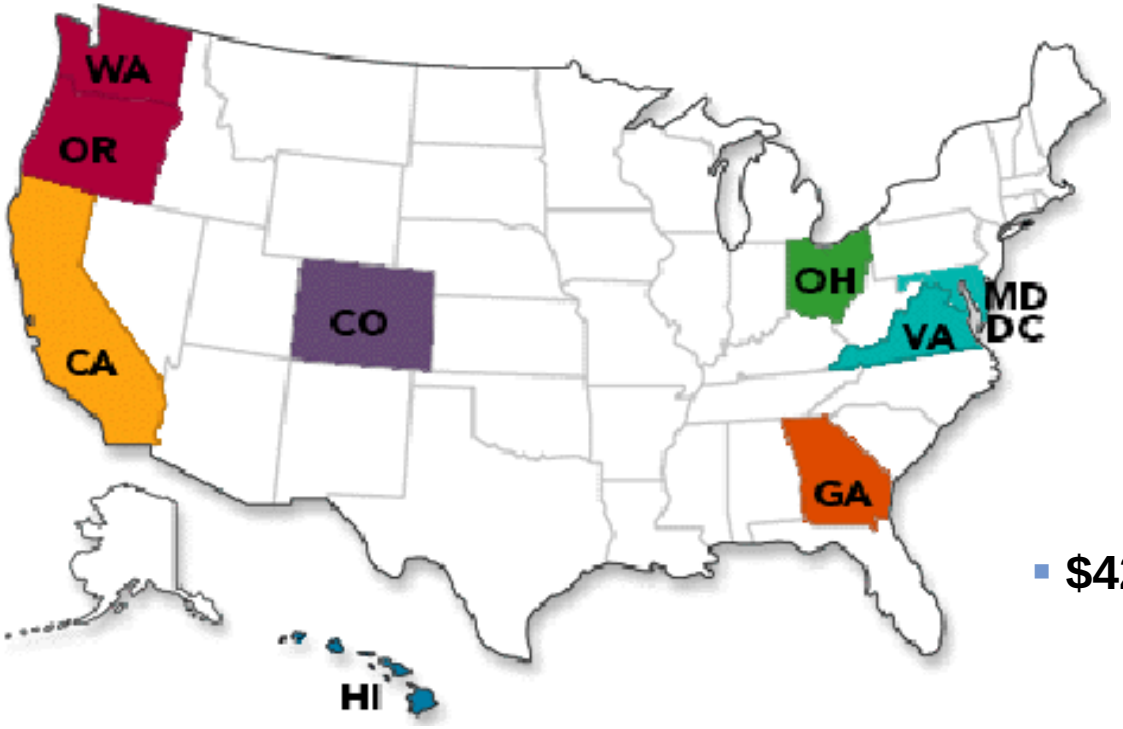
Study: VA's Computer Systems Cost Billions, but Have Big Payback

Anyone who follows health IT knows that the Department of Veterans Affairs often gets high marks for being an early adopter of electronic medical systems in the U.S. Now a study in Health Affairs tries to put a price-tag on what the VA systems collectively called Vista, for Veterans Health Information Systems and Technology Architecture.

The bottom line: "We conservatively estimate that the VA's investments in the four health IT systems studied yielded $3.09 billion in cumulative benefits net of investment costs by 2007," say the authors, a team from Center for IT Leadership at Partners Healthcare in Charlestown, Mass. The results looks at measures such as reduced workloads, freed workspace and savings from items such as unneeded medical tests and avoided hospital admissions.

The biggest VA outlay — and its biggest savings generator — was the Vista's Computerized Patient Record System, the home-grown system for electronic health records that was found by the study to cost $3.6 billion. Other IT networks for administering medications with bar codes, picture archiving and communication systems and the Laboratory Electronic Data Interoperability application together cost $470 million.

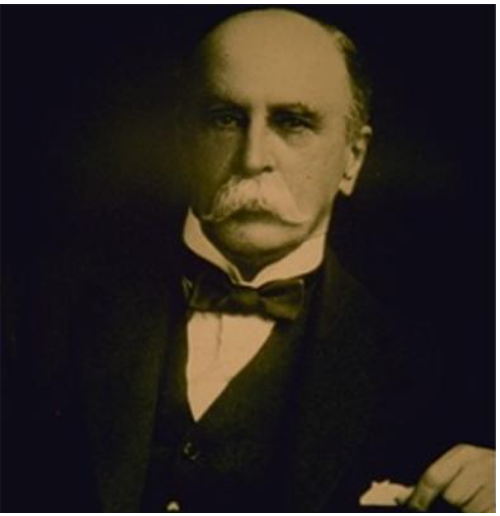
Largest Integrated Health Care System in U.S.



- **Largest nonprofit health plan in USA**
- **Largest civilian deployment of EHR**
- **8.6 million members**
- **15,000+ physicians**
- **164,000+ employees**
- **Serving 9 states and the District of Columbia**
- **35 hospitals**
- **454 medical offices**
- **$42.1* billion annual revenues**

**2009 revenues*

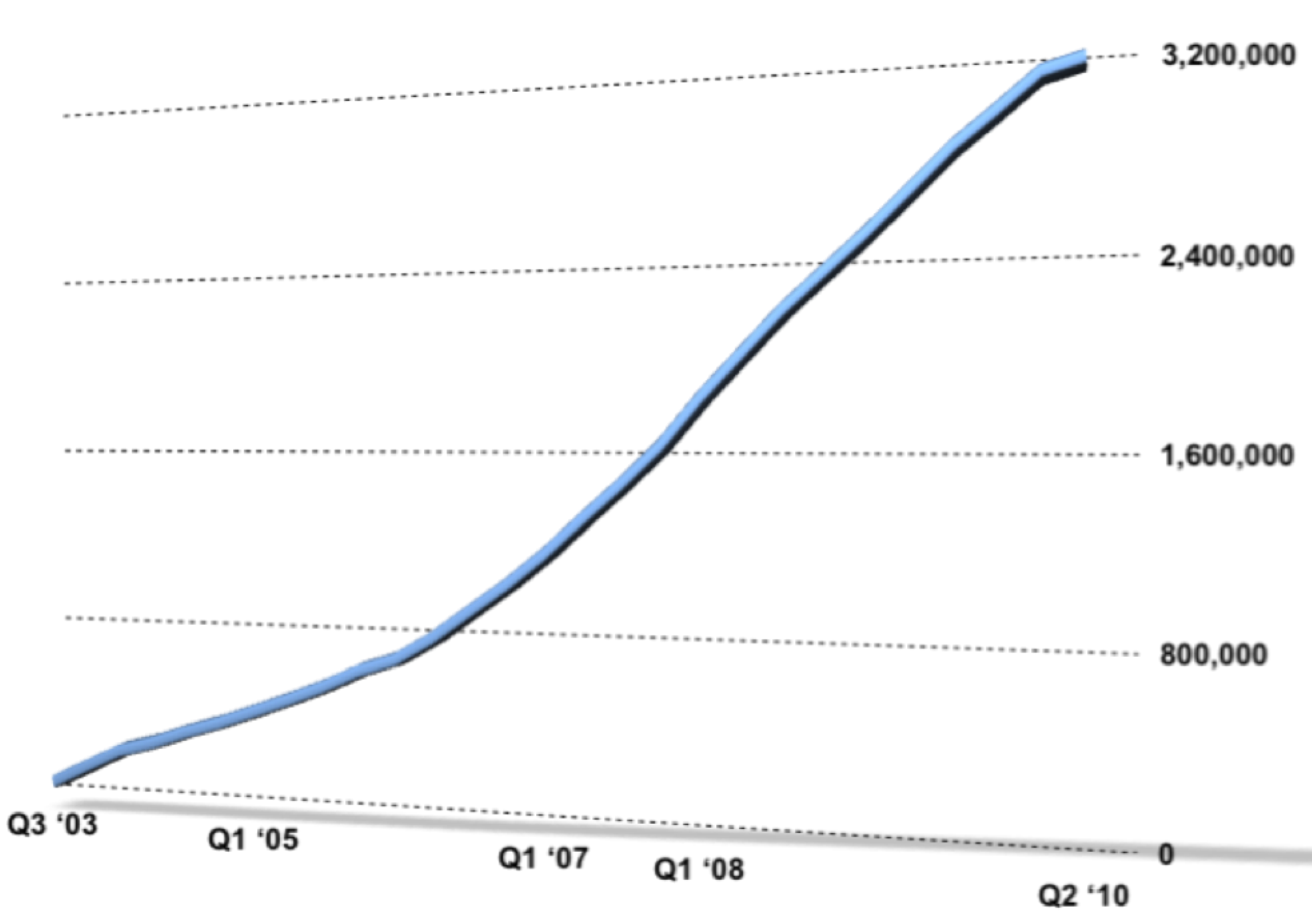
The Physician Role Changes…



- Traditional Model of Care
  - One patient at a time
  - Only know about patients who appear in your office
  - No use of IT
  - Limited use of “extenders”

- New Model Elements
  - **Accountability for panel/population**
  - **Transparency**
  - **Use of EMR, registries, internet**
  - **Team care (including patient)**
  - **Moving care out of Dr. office**

We Are Connected with Over 3.2 Million Members



Second Quarter 2010

2,663,429 e-mails sent to doctors

2,034,488 prescriptions refilled

And...

Patient-Physician e-mail associated with better quality scores

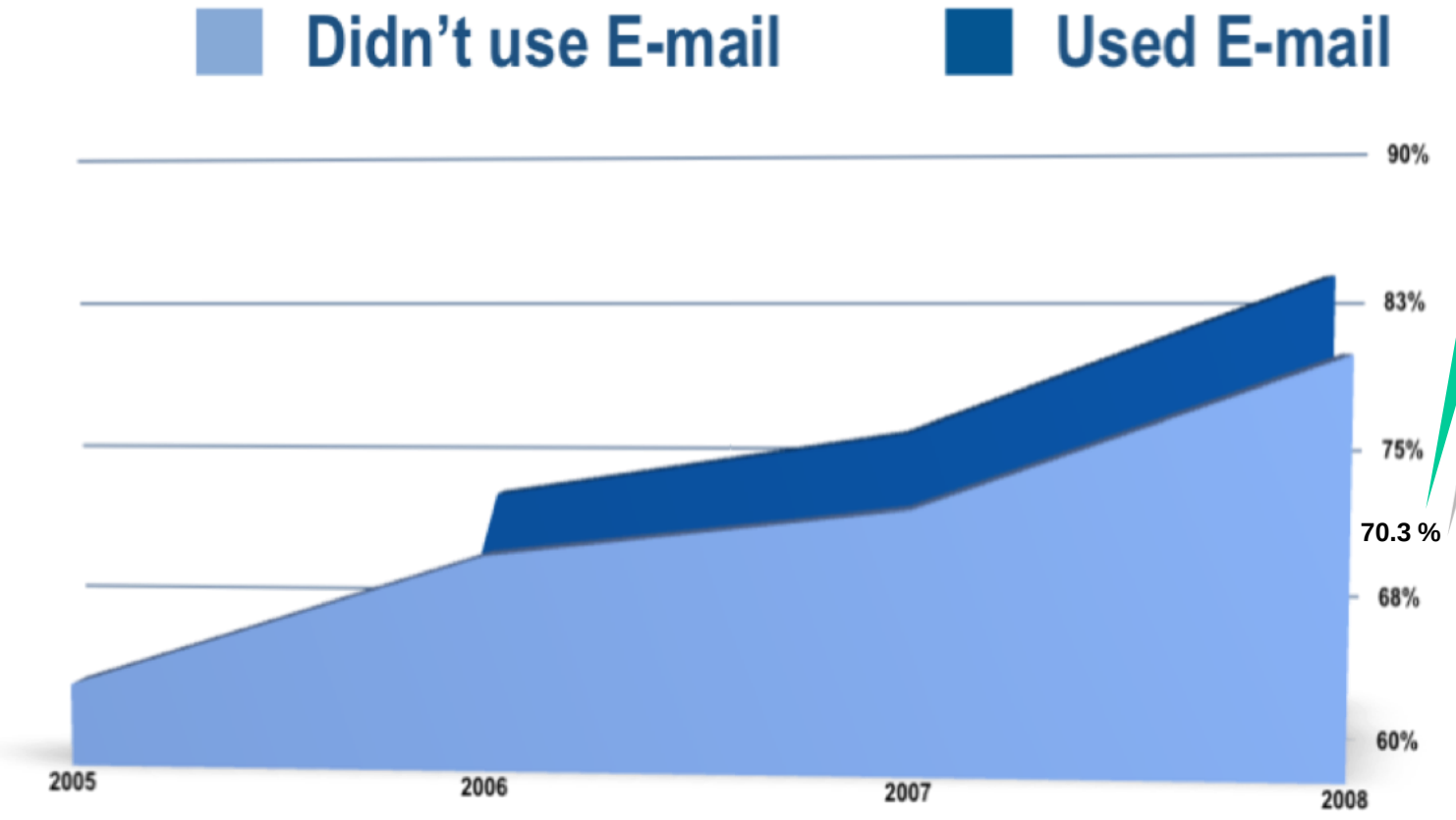
(Zhou YY, Kanter MH, Wang JJ, Garrido T. Improved Quality At Kaiser Permanente Through E-Mail Between Physicians And Patients. Health Affairs. 2010 ;29(7):1370-1375.)

Source: Kaiser Permanente Internet Services Group Web Analytics

KAISER PERMANENTE®

The Permanente Federation

We Use Technology To Improve Care



HEDIS 90th Percentile, 2008

Kaiser Permanente Southern California

% Members with high blood pressure under control

2005 - 2008

Source: (Zhou YY, Kanter MH, Wang JJ, Garrido T. Improved Quality At Kaiser Permanente Through E-Mail Between Physicians And Patients. Health Affairs. 2010 ;29(7):1370-1375.)

KAISER PERMANENTE®

The Permanente Federation

Leveraging Social Media

- Twitter
  - @kpnewscenter (Dec. 2009): 3,407 followers, 1,085 tweets
  - @kphistory (summer 2009): 136 followers, 165 tweets
  - @kpthrive (summer 2009): 488 followers, 431 tweets
  - @kpvivabien (summer 2009): 41 followers, 123 tweets
- Facebook (launched summer 2008)
  - Kaiser Permanente Thrive: 8,668 “fans”
  - 150 Wall posts (i.e., articles/links we posted for our fans)
  - 105,000 page views
- YouTube (launched summer 2008)
  - Total videos: 119
  - Total views: 294,400
  - Most popular: "When I Grow Up," 135,900 views

Remote Monitoring – Benefits in Numbers

US VHA study:

- Diabetes: 20.4% utilisation decrease;
- CHF: 25.9% utilisation decrease

Reduced hospitalisation

Application of telemedicine and home health monitoring could avoid 5.6 million admissions to hospitals for chronically ill patients in MS

Reducing diabetic death

11,000 deaths caused by complication ensuing from diabetes could be reduced in MS through the combined applications of EHR and disease management

Source: EU Swedish Presidency, (2009) ***eHealth for a Healthier Europe!* , p. 36**

UK NHS on potential of self-care:

- **Reduce GP visits by 40%**
- **Reduce outpatient visits by 17%**
- **Reduce hospital admissions by 50%**
- **Reduce hospital stay length by 50%**
- **Reduce days off work by 50%**

Philips Heart Failure Statistics UK:

Clinical Evidence from RMT trials on Cardiovascular disease: 20-40% reduction in length of hospitalisation

Ericsson and HealthServices24:

Clinical Evidence from RMT trials on Cardiovascular disease:

- *60% reduction in admissions*
- *90% of patients claim reassured*

Investment in IT & Benchmarking

Financial Year 2010/11	
New IT Development in support of HA priorities and organizational objectives	**31%**
HA IT Recurrent Operations	**47%**
Total HA	**78%**
Development work requested and funded by other organisations	22%
Total Investment	**~$1,000M**

Recent Benchmarking

HA total annual IT expenditure was only 10% of the comparable NHS London Region in the UK

HA total IT investment of HK$2.4B since 1991 against the HK$32.6B for Clinical Systems at the comparable Kaiser Permanente in the USA

HK$1B project in Singapore to share all public hospitals electronic patient records by 2012 (that HA has been doing since 2001)

mHealthSummit

TECHNOLOGY • BUSINESS • RESEARCH • POLICY

December 5–7, 2011

The Gaylord National Resort
and Convention Center
National Harbor, Washington, DC Area

Shaping the Future of mHealth

Where Technology, Business, Research and Policy Connect.

The largest event of its kind, the 3rd annual **mHealth Summit** brings together leaders in government, the private sector, industry, academia, providers and not-for-profit organizations from across the mHealth ecosystem to advance collaboration in the use of wireless technology to improve health outcomes in the United States and abroad. **More**

Economical benefits of remote patient monitoring (RPM)

Heart Failure Care Comparison:
RPM vs. Standard Care and Disease Management, Per Patient Per Year

	Management Cost	Average Readmissions	Cost of Readmissions‡‡	Gross Savings v. RPM	Net Savings v. RPM
RPM	$2,052 - Technology* $2,082 - Technology & DM†	0.552§	$5,632		
Disease Management	$750‡	1.116**	$11,387	$5,755	$3,703
Standard Care	0	1.320††	$13,468	$7,836	$5,034

New England Healthcare Institute, 2009
Remote Physiological Monitoring