NATIONAL SCHOOL OF PUBLIC HEALTH
ATHENS SCHOOL OF HYGIENE 1929-1994

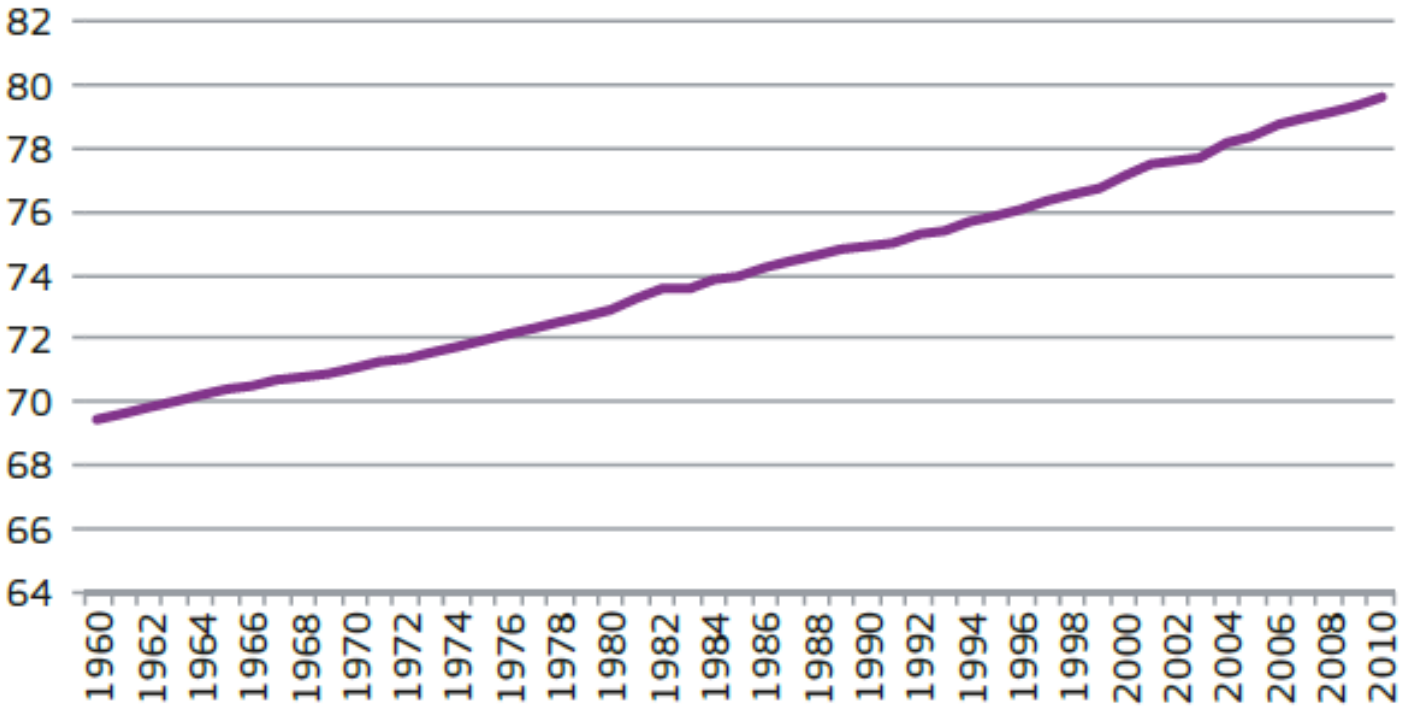
Η συμβολή της φαρμακευτικής περίθαλψης στο επίπεδο υγείας

Prof. Nikos Maniadakis

Demography report 2010

Older, more numerous and diverse Europeans

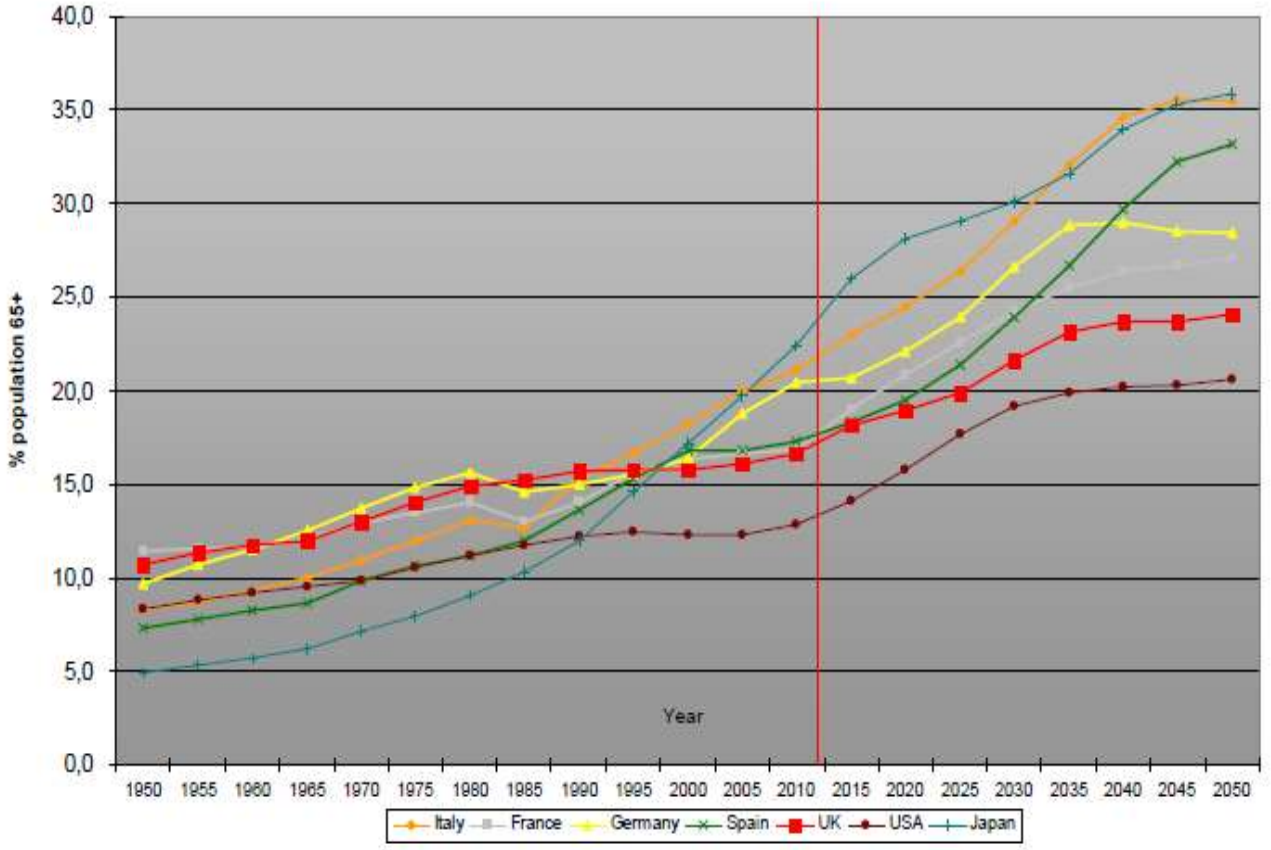
Figure 1.1: Life expectancy at birth in the EU-27



Source: World Bank, health database (http://data.worldbank.org/topic/health).

Demographic trends

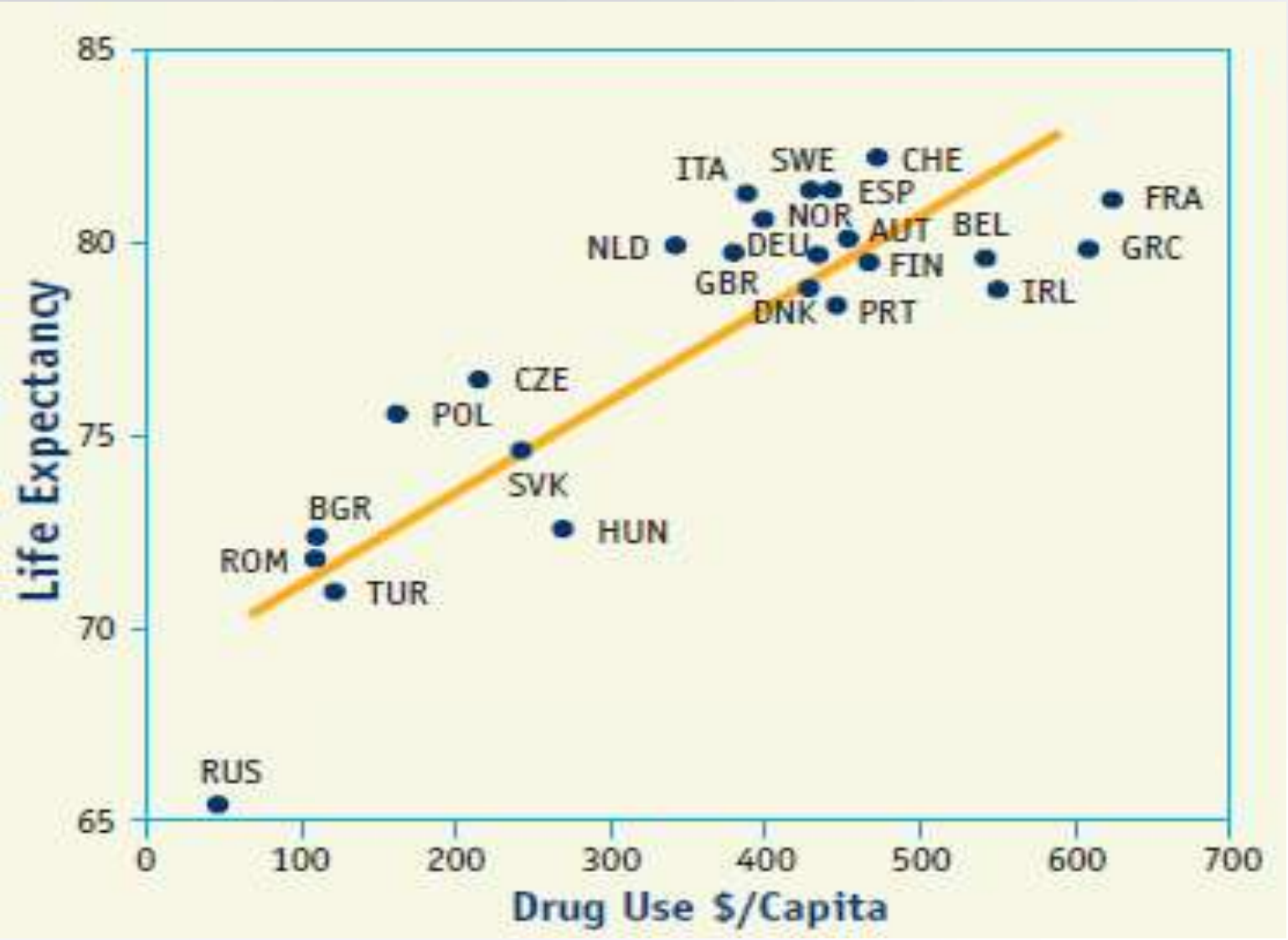
World population evolution (% of +65)



Source: United Nations' Dept Economic & Social Affairs, 2006

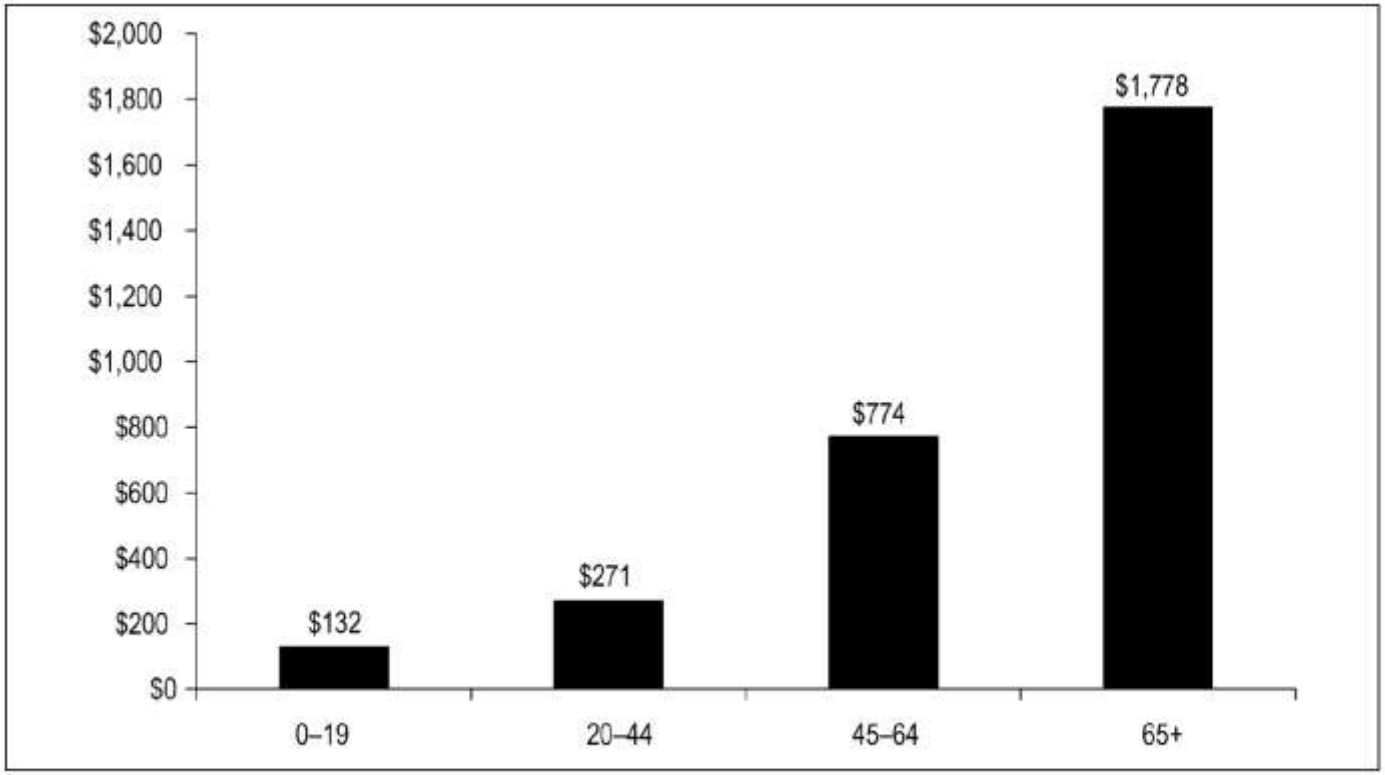
Life Expectancy and Drug Spending

Higher Drug Spending Correlates With Better Life Expectancy



EFPIA, Facts and Figures 2014

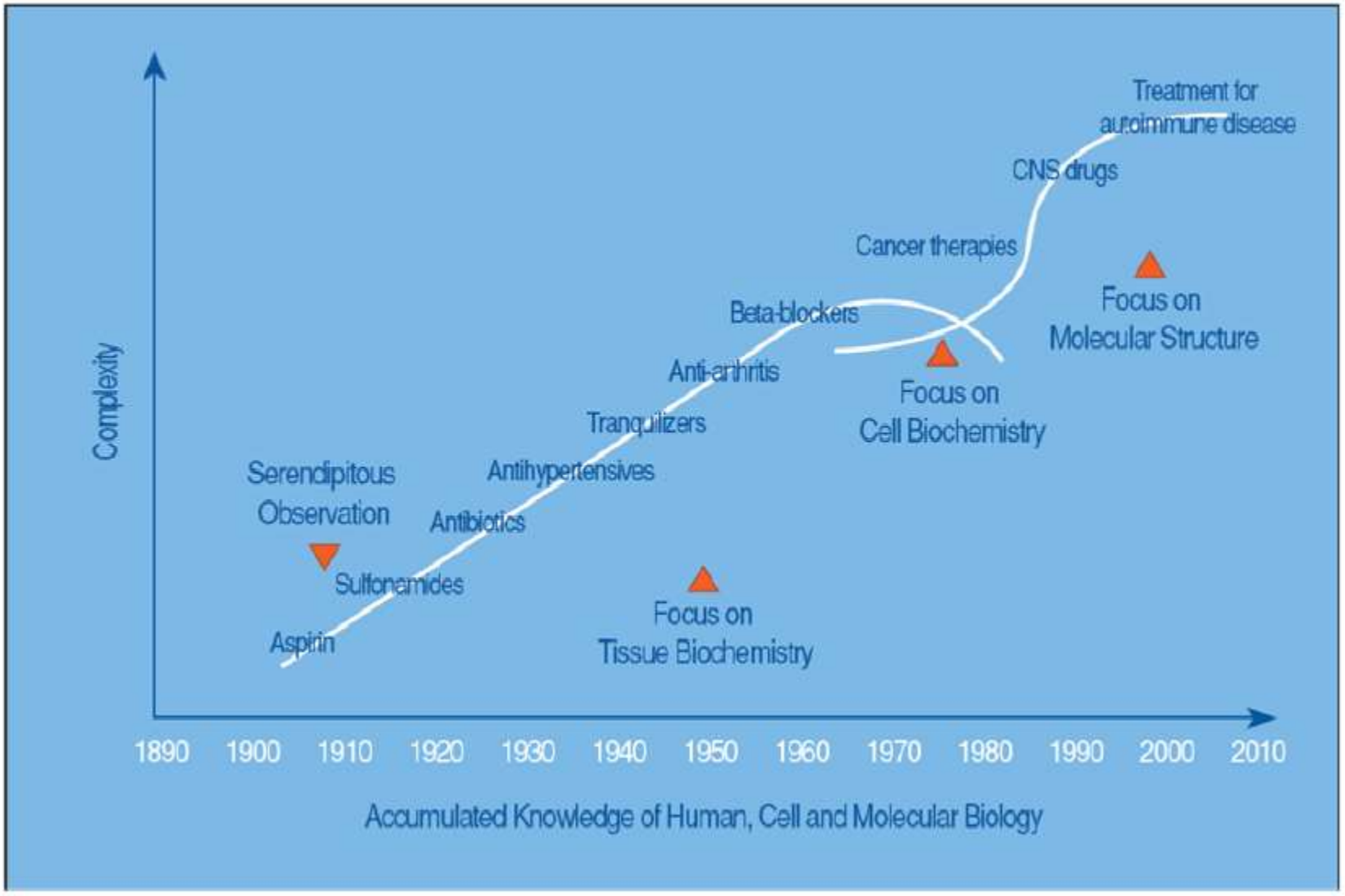
Figure 5: Per Capita Retail Drug Expenditure by Age Group, Canada, 2007



Source

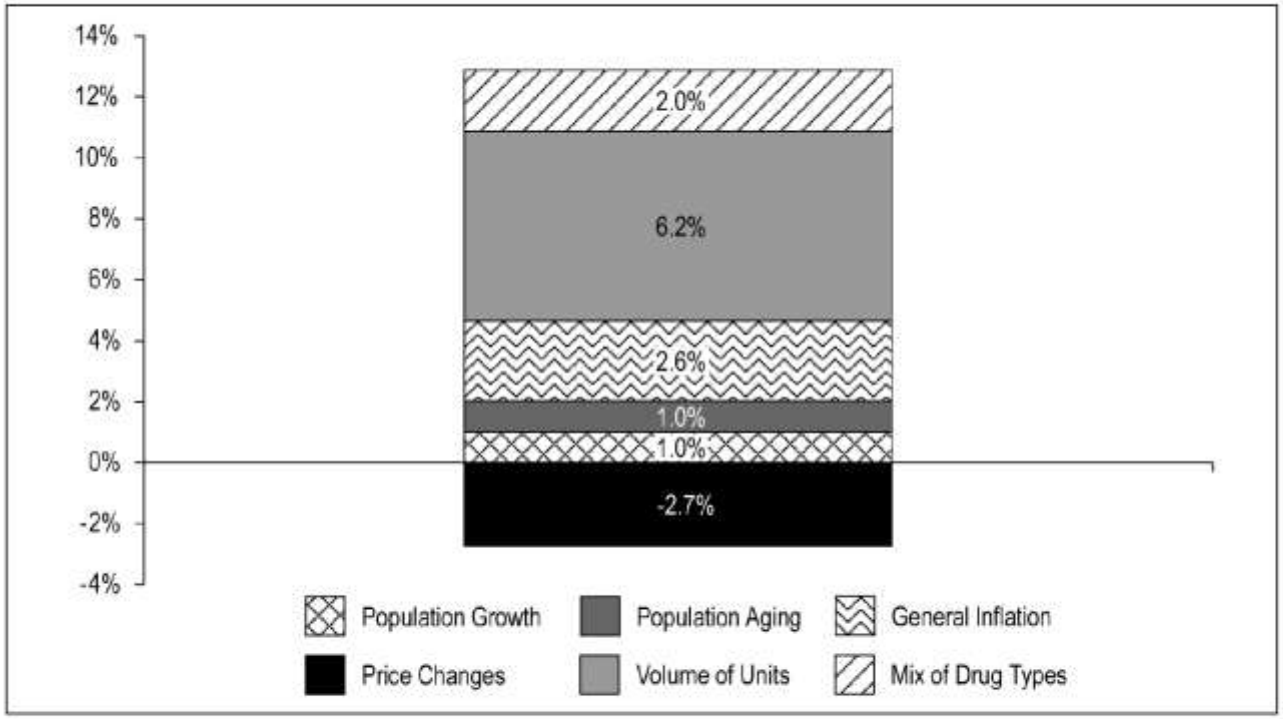
S. Morgan et al., *The Canadian Rx Atlas, 2nd Edition* (Vancouver, B.C.: Centre for Health Services and Policy Research, University of British Columbia, 2008).

Η επανάσταση στη φαρμακευτική τεχνολογία



Source: Boston Consulting Group

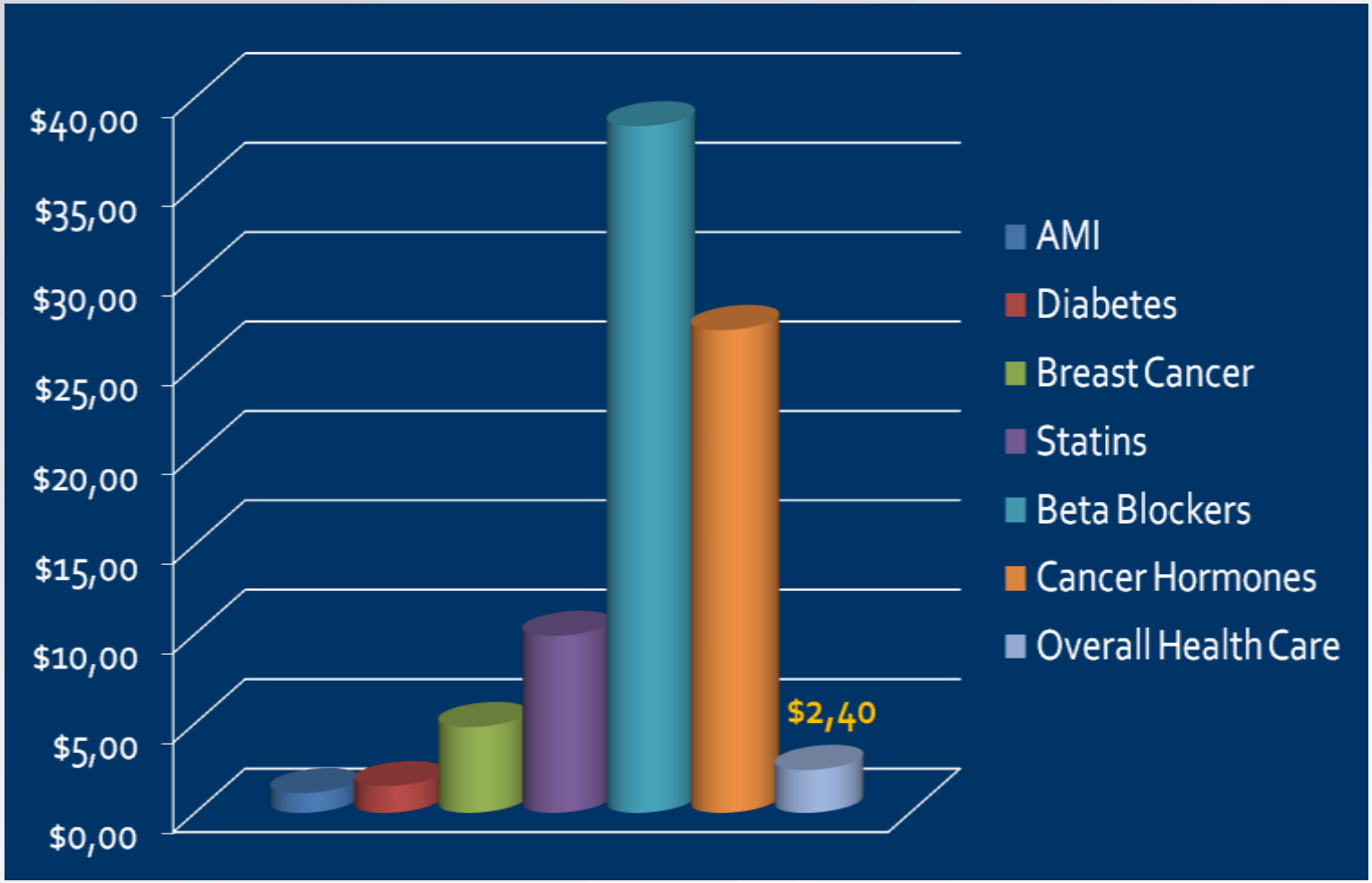
Figure 4: Drivers of the Average Annual Growth in Retail Spending on All Types of Prescription Drugs, Canada, 1998 to 2007



Sources

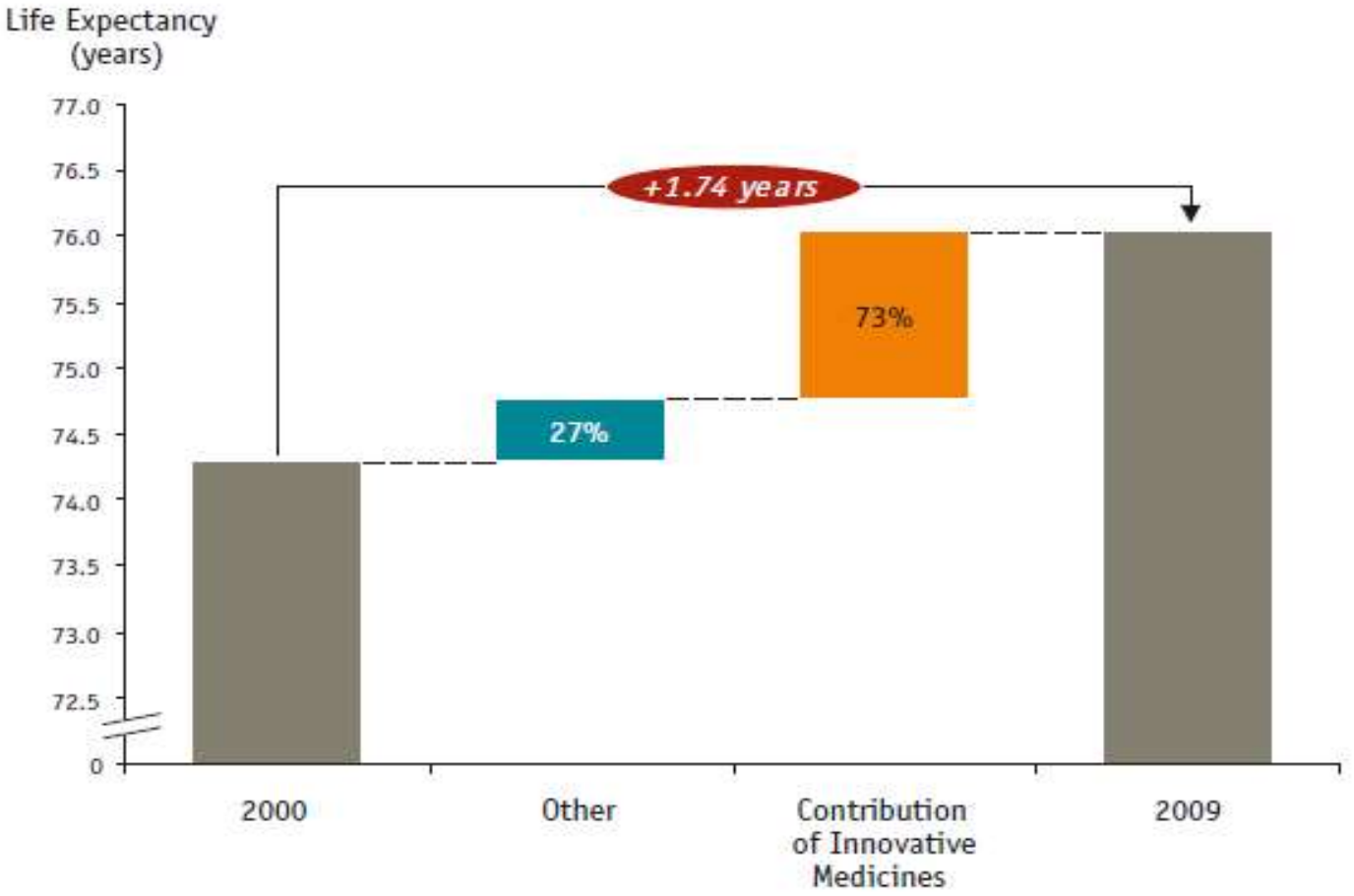
Second Generation Canadian CompuScript Audit and Anonymized Longitudinal Patient Datasets, IMS Brogan; S. Morgan et al., *The Canadian Rx Atlas, 2nd Edition* (Vancouver, B.C.: Centre for Health Services and Policy Research, University of British Columbia, 2008).

The investment is good for economy



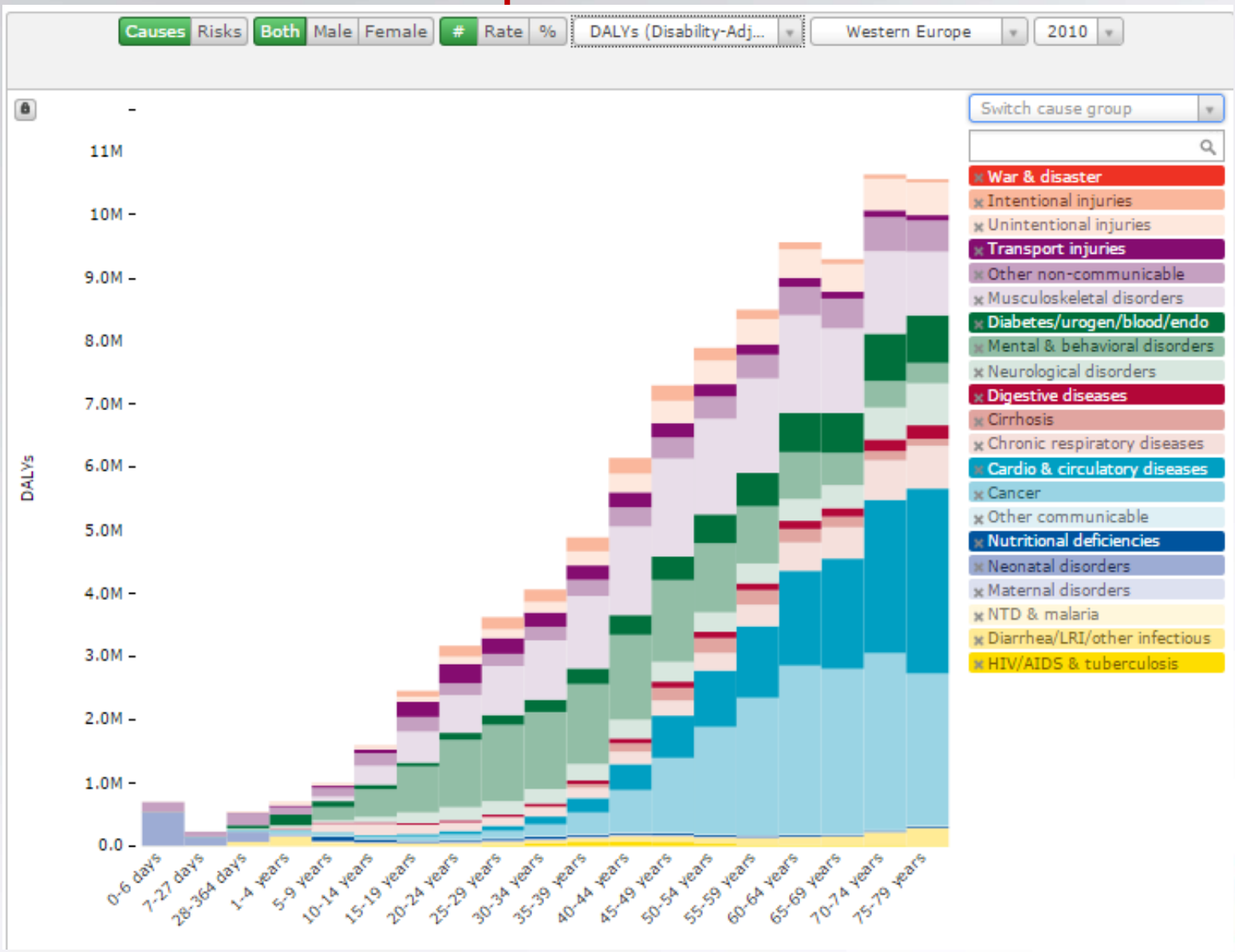
Source: The value of investment in health care, MEDTAP International 2004

Contribution of Medicines in Survival Increase

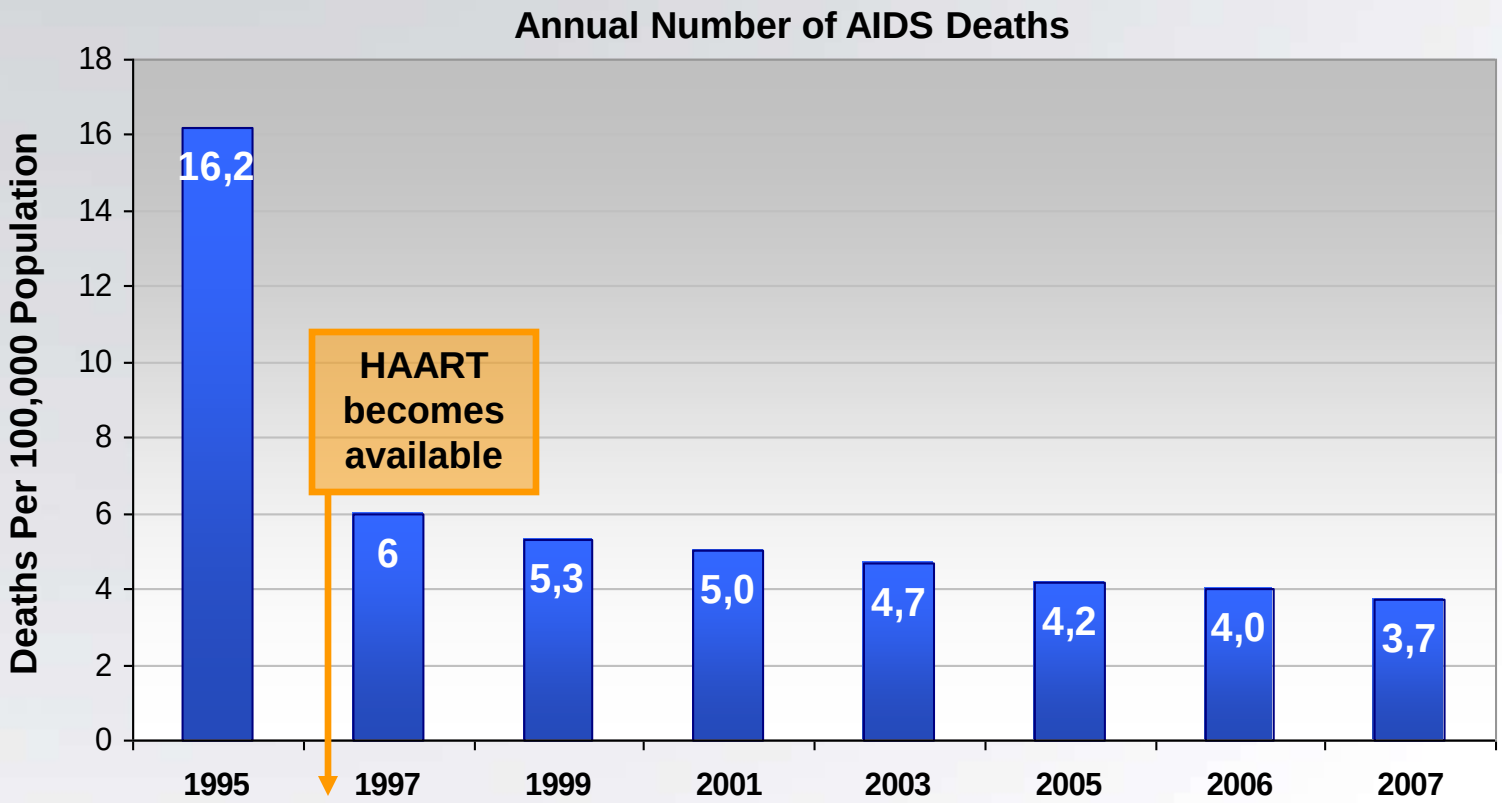


Source: Lichtenberg, F: Pharmaceutical innovation and longevity growth in 30 developing OECD and high-income countries, 2000-2009 (2012)

DALYS in Europe

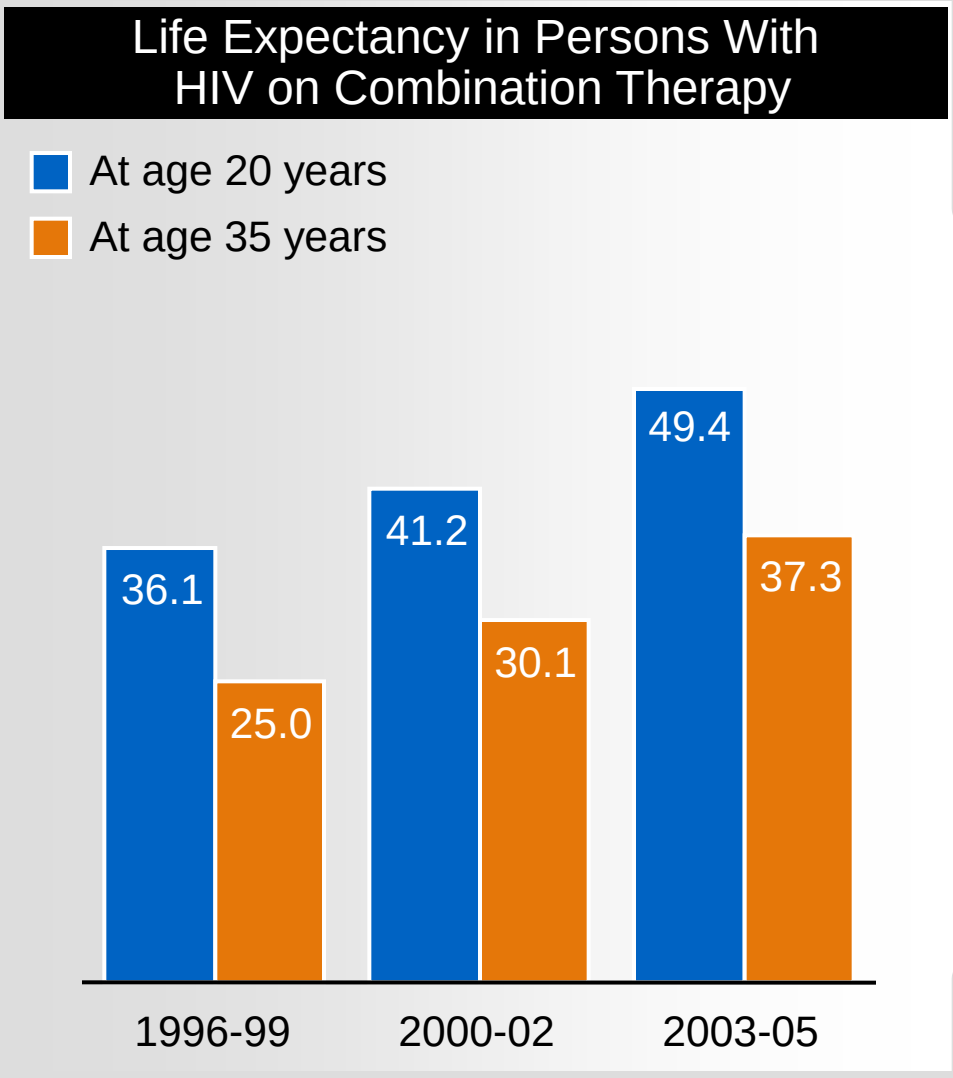


Impact on HIV/AIDS



Source: CDC, National Center for Health Statistics, Health, United States, 2003 With Chartbook on Trends in the Health of Americans (2003); Health, United States, 2009 With Chartbook on Medical Technology (2010); J. Xu, et al. "Deaths: Preliminary Data for 2007," National Vital Statistics Reports, 58, no. 1, p. 5, (19 August 2009) http://www.cdc.gov/nchs/data/nvsr/nvsr58/nvsr58_01.pdf (Accessed 4 December 2009).

Incremental Innovation Has Transformed HIV From a Fatal Disease to a Chronic Disease

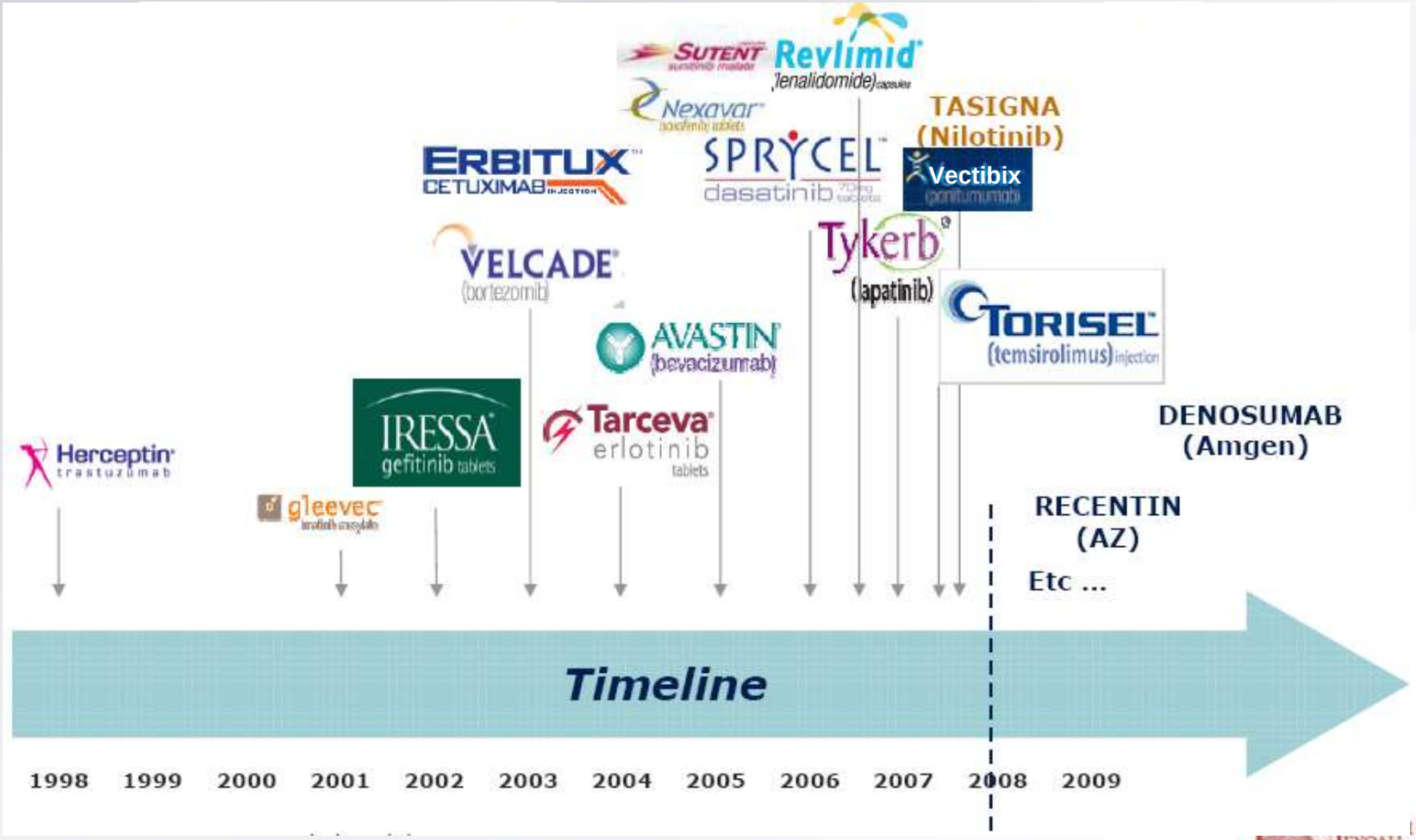


- "Over the past decade, combination therapy regimens have become more effective, better tolerated, and have been simplified in terms of dosing."
- "These advances in treatment have transformed HIV from being a fatal disease… into a long-term chronic condition."
- "The marked increase in life expectancy since 1996 is a testament to the gradual improvement and overall success of such treatment."

*Figures are adjusted for age differences in the years studied

Source: The Antiretroviral Therapy Cohort Collaboration. Lancet 2008;372:293-9.

Η ογκολογία γνώρισε πολλές νέες θεραπείες τα τελευταία χρόνια



Source: IMS MIDAS, Knowledge Link

30% of the Decline in Cancer Mortality Rates is Attributed to New Drugs

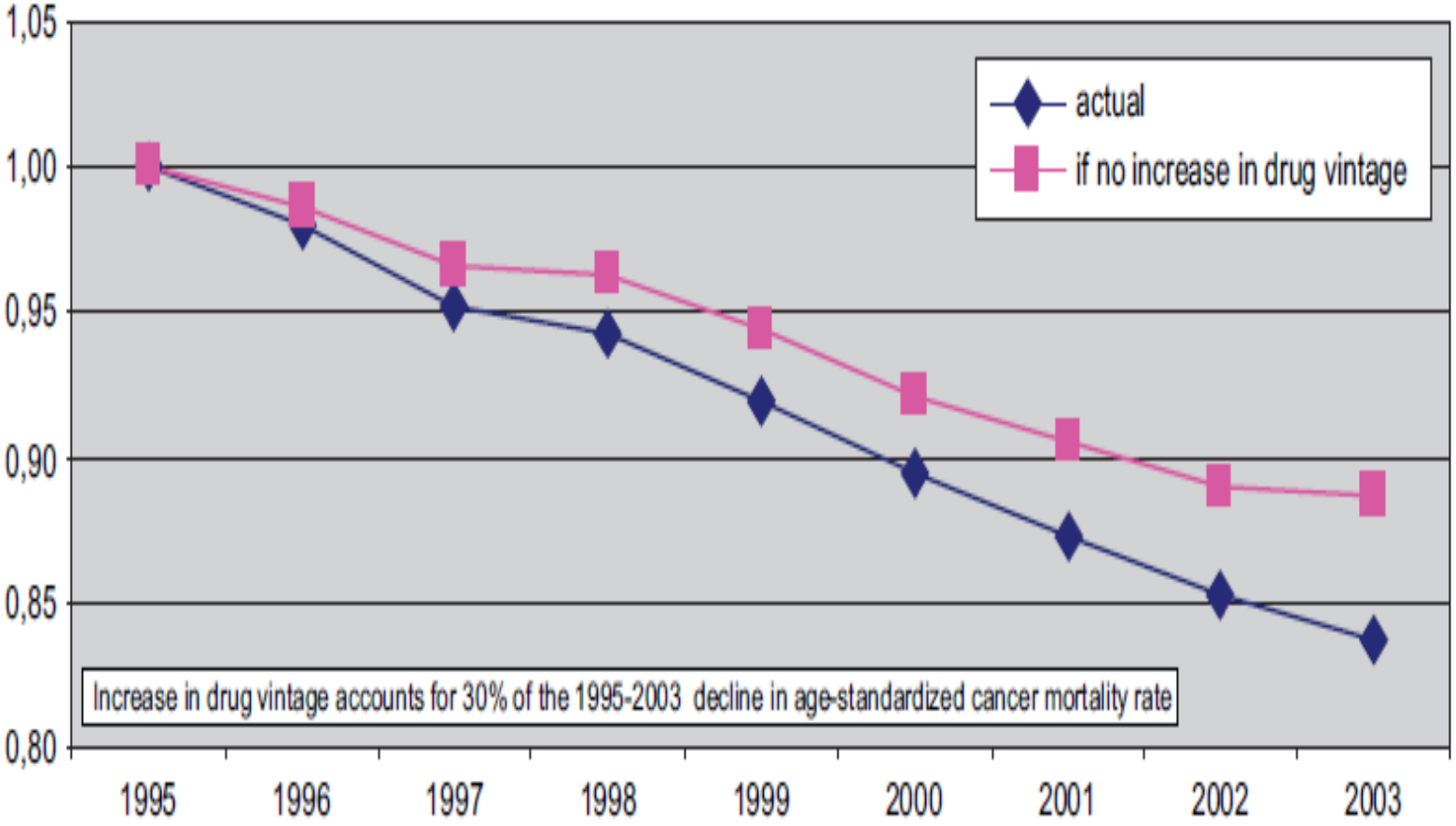
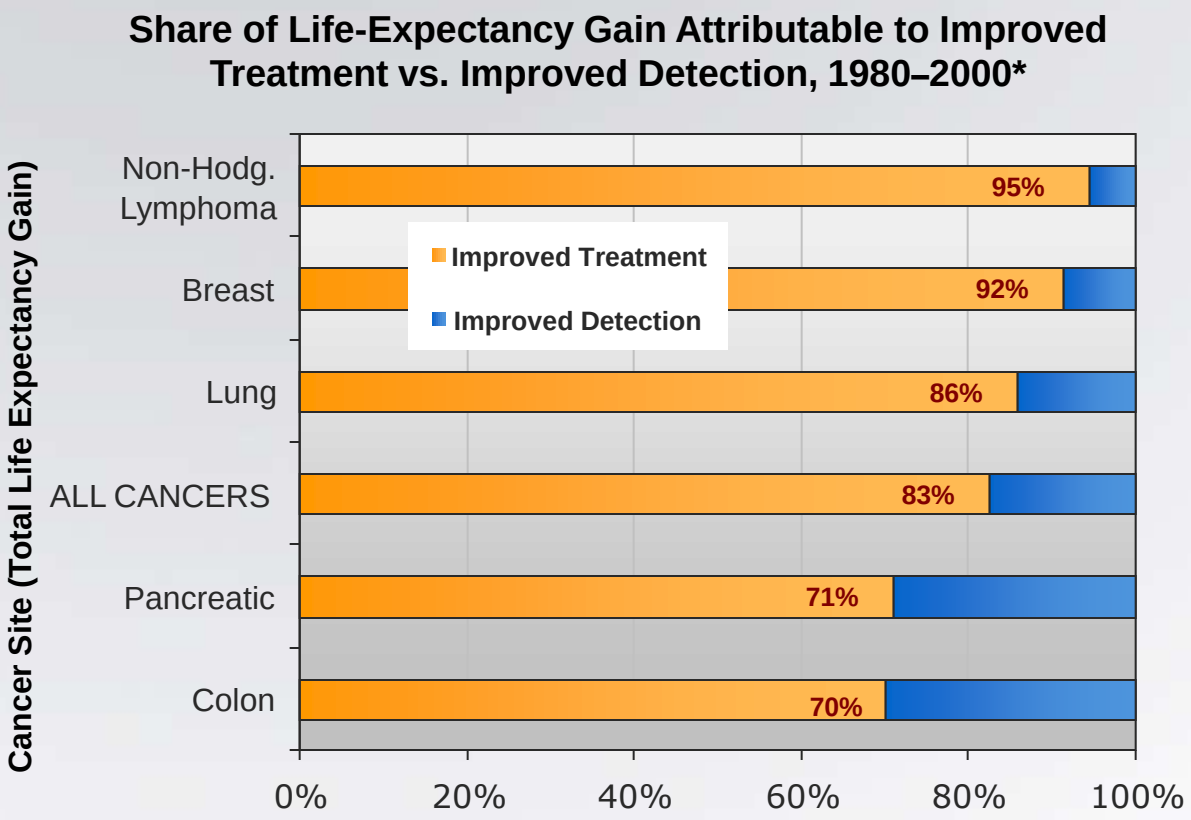


Figure 6. Contribution of the increase in cancer drug vintage to the decline in the age-adjusted cancer mortality rate.

Source: B. Jonsson1 & N. Wilking. Annals of Oncology 18 (Supplement 3): iii1, 2007

Contribution of drug in cancer therapy

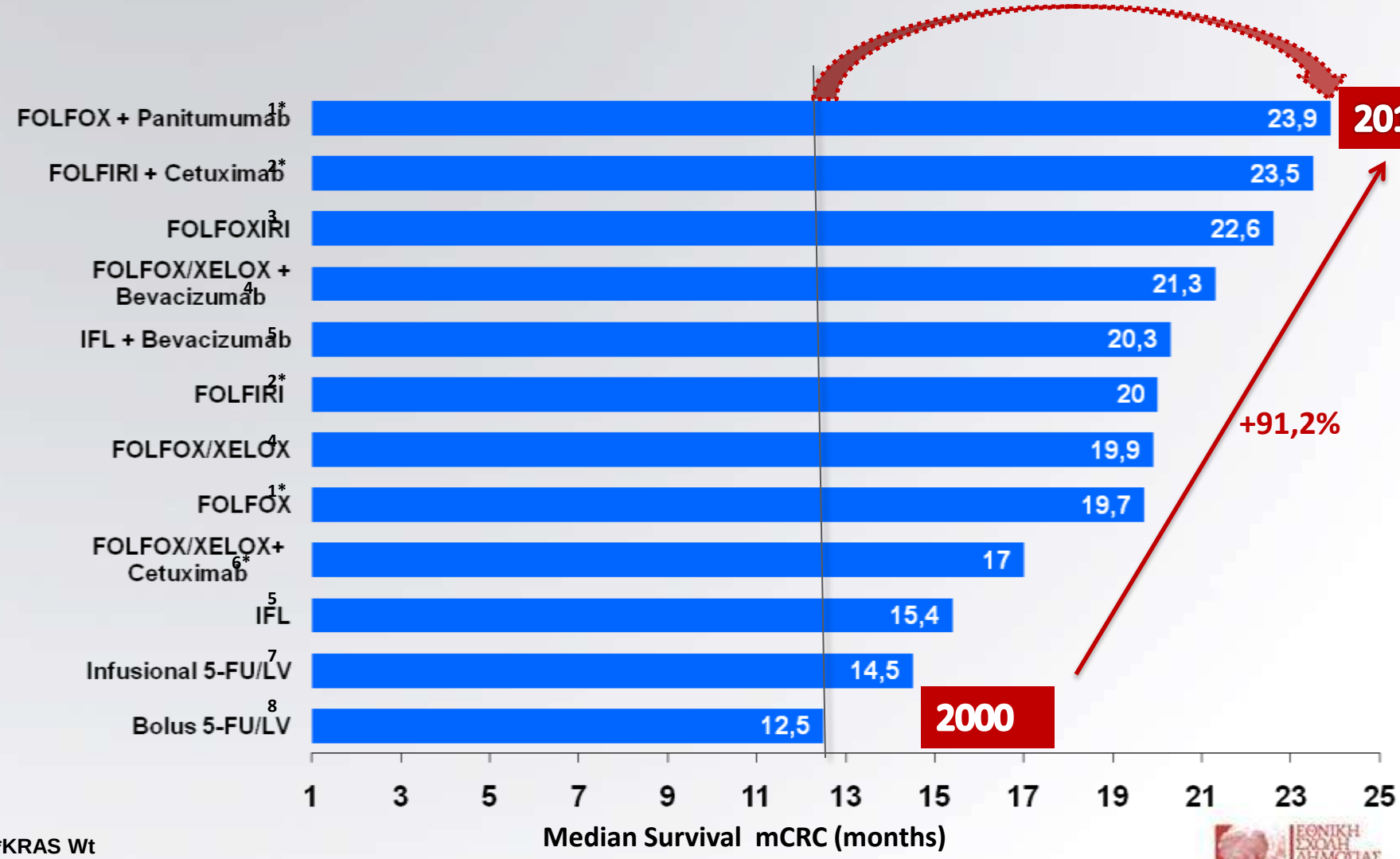


Cancer Type	Life-Expectancy Gain
Non-Hodgkins Lymphoma	3.1-3.6 yrs
Breast	5.9-6.0 yrs
Colon	2.8-3.2 yrs
Pancreatic	0.6 yrs
Lung	0.4-0.5 yrs
ALL CANCERS	2.8-3.2 yrs

Note: Asterisk (*) indicates Life Expectancy gains from 1990-2000 because 1980 data was not available for these conditions.

Source: Adapted from E. Sun et al., “The Determinants of Recent Gains in Cancer Survival: An Analysis of the Surveillance, Epidemiology, and End Results (SEER) Database,” *Journal of Clinical Oncology,* May 2008.

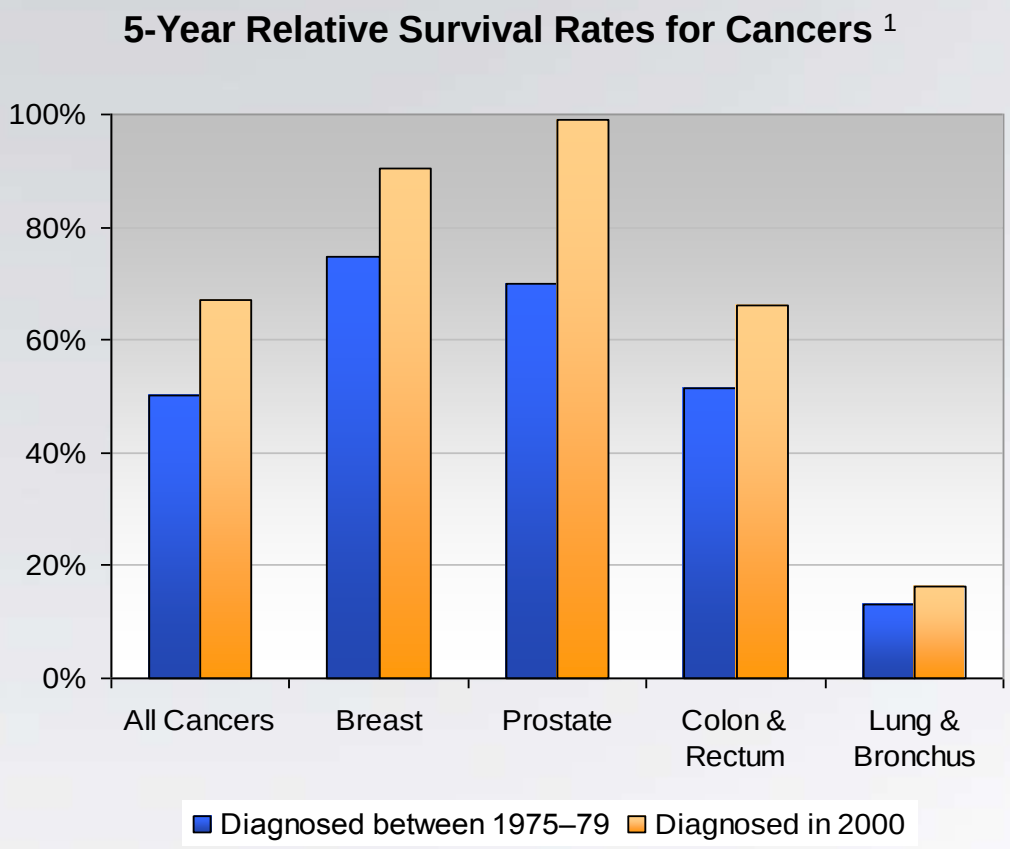
Median Survival Increase in First Line Therapy of Metastatic Colorectal Cancer



*KRAS Wt

1.Siena S, et al. ASCO-GI 2010. 2.Van Cutsem E, et al. ASCO-GI 2010; 3.Falcone A, et al. JCO 2007; 4.Saltz LB, et al. JCO 2008; 5Hurwitz HI, et al. NEJM 2004; 6. Maughan T. et al. ASCO GI 2010 7.De Gramont A, et al. JCO 2000; 8.Saltz LB, et al. NEJM 2000;

Cancer patient survival rates

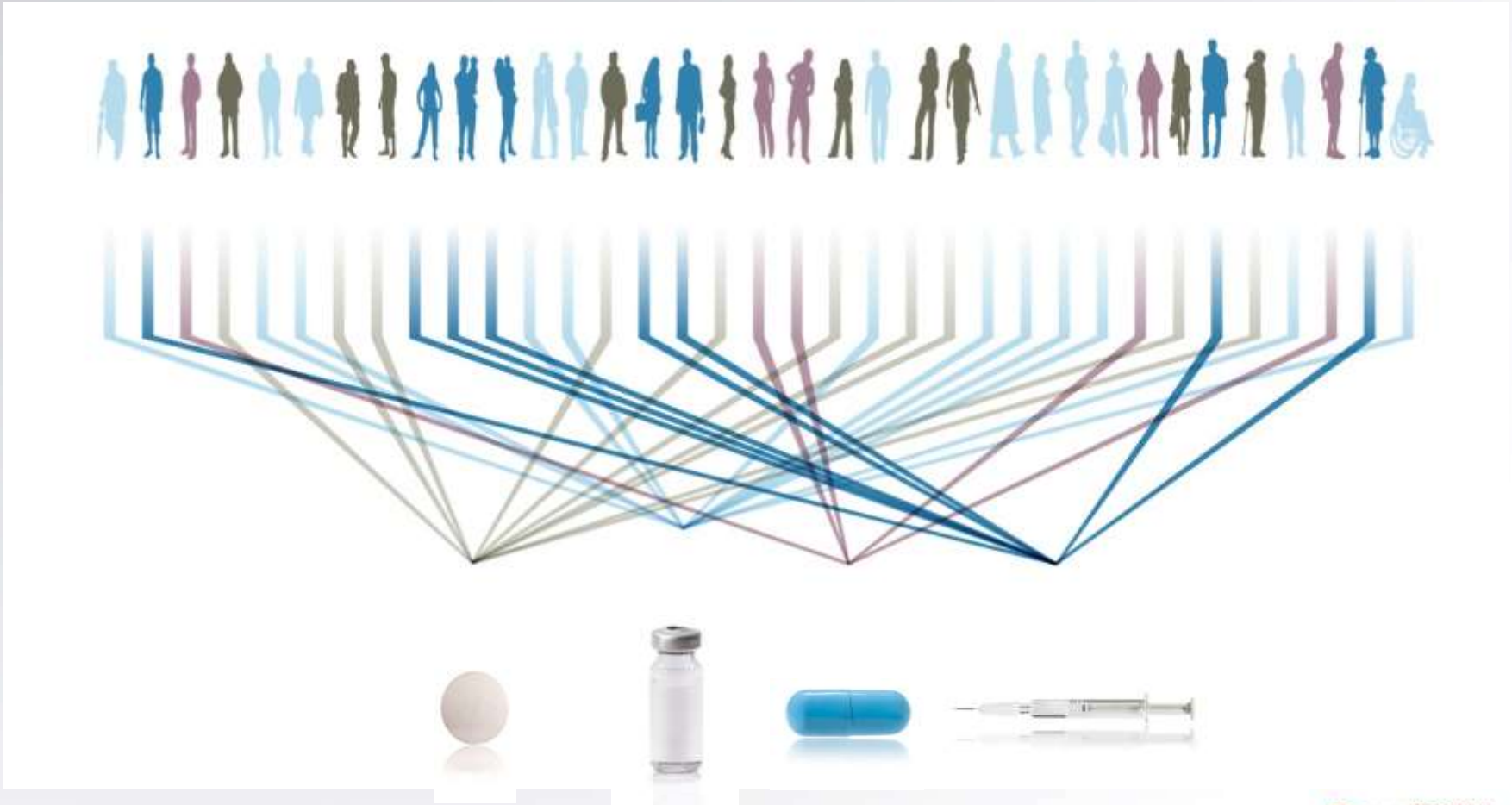


Increases in the number of cancer drugs since 1975 account for 50%–60% of the increase in age-adjusted survival rates.[2]

Note: Survival rates are adjusted for normal life expectancy.

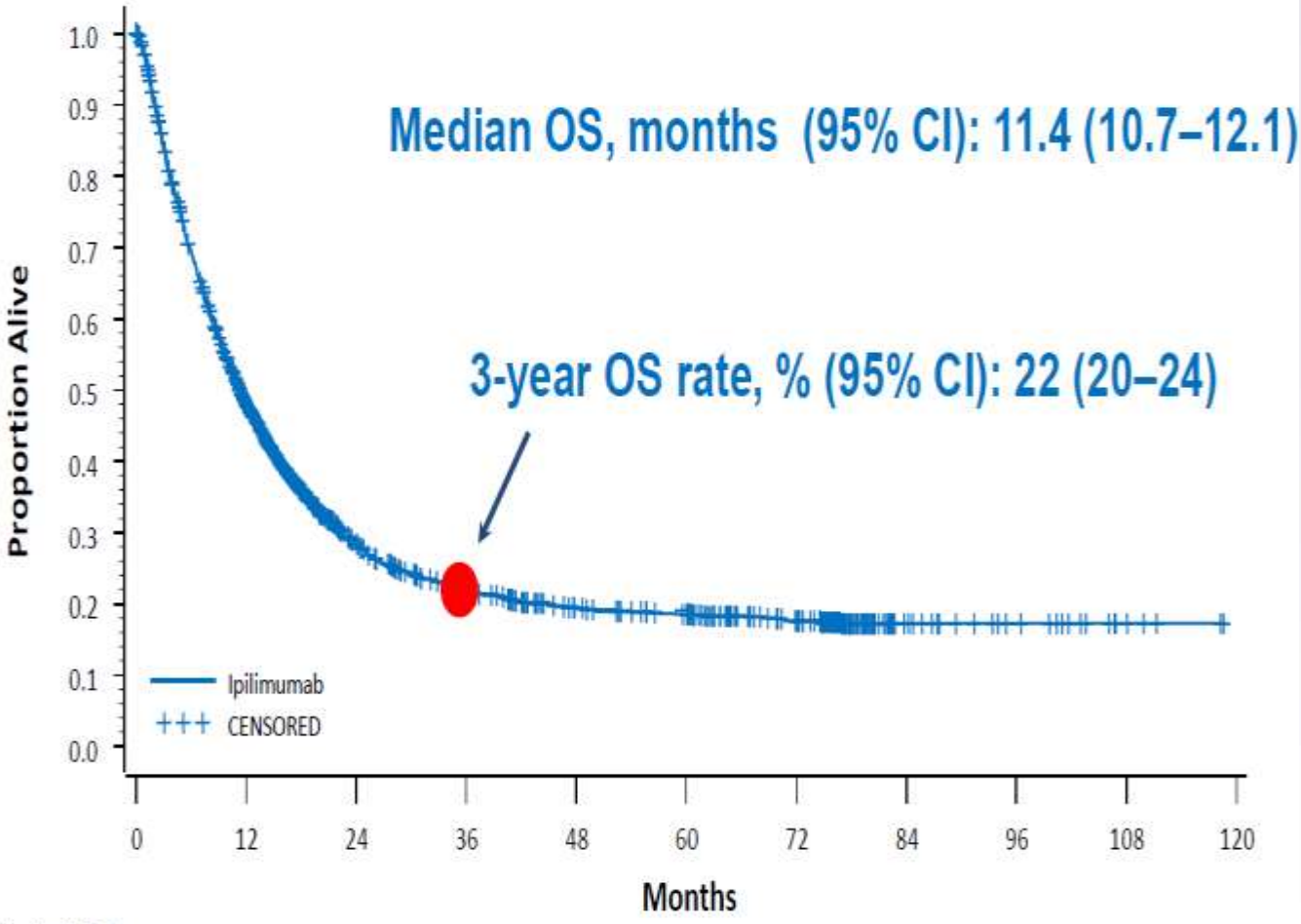
Sources: [1]Ries LAG et al. (eds). "SEER Cancer Statistics Review, 1975-2005," National Cancer Institute, based on November 2007 SEER data submission, posted to the SEER web site, 2008; [2]F. Lichtenberg, "The Expanding Pharmaceutical Arsenal in the War on Cancer," NBER Working Paper 10328, 2004.

Personalized treatment



Targeted therapy

Primary Analysis of Pooled OS Data (N=1861 Patients)

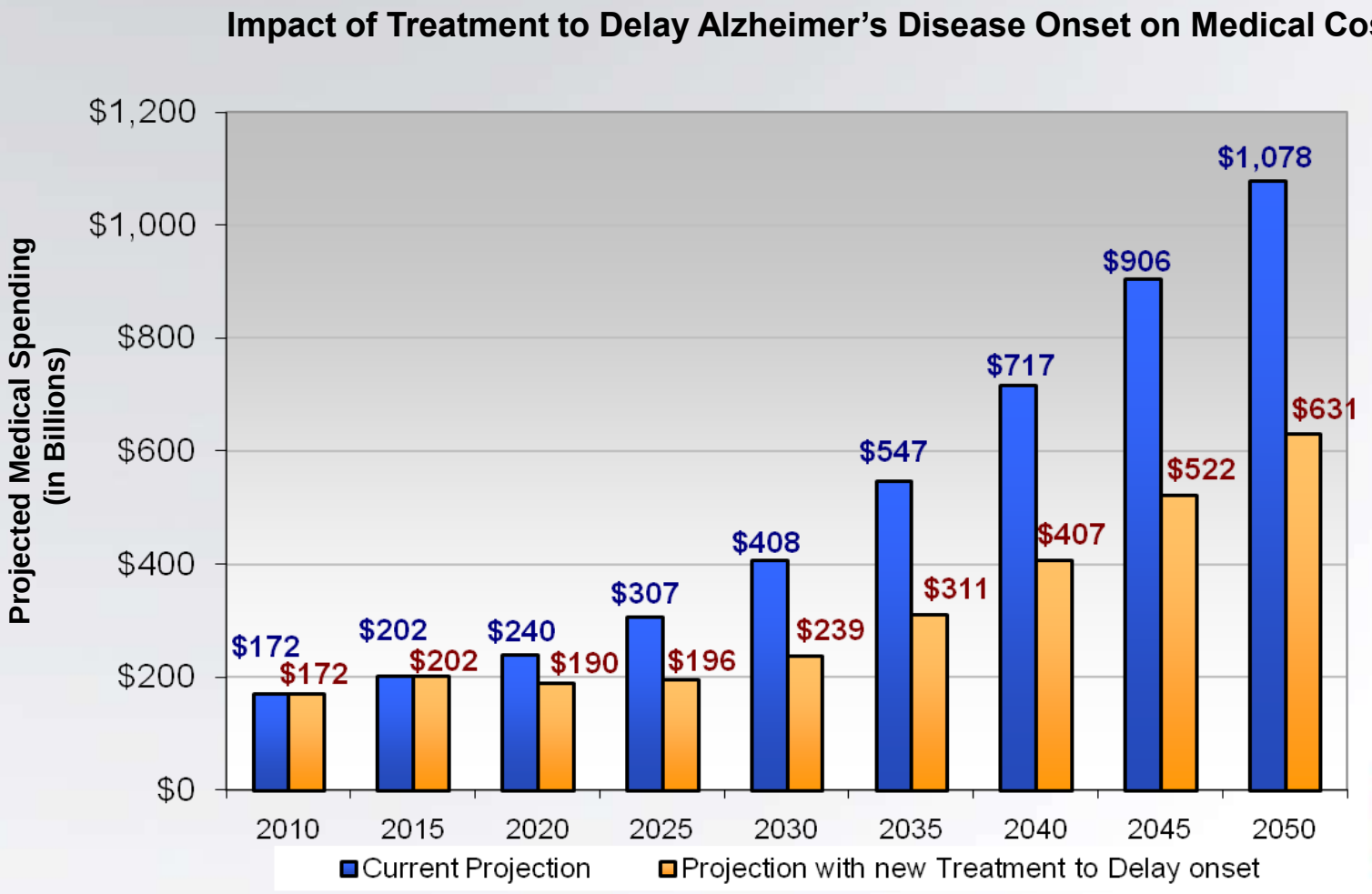


Patients at Risk

Ipilimumab	1861	839	370	254	192	170	120	26	15	5	0

1. Schadendorf D, et al. Pooled analysis of long-term survival data from phase II and phase III trials of ipilimumab in metastatic or locally advanced, unresectable melanoma. Presented at: European Cancer Congress 2013 (ECCO-ESMO-ESTRO); 27- Sep–1 Oct, 2013; Amsterdam, The Netherlands. Abstract 24.

Impact of drugs on burden of disease



Source: Alzheimer's Association, "Changing the Trajectory of Alzheimer's Disease: A National Imperative," 2010.

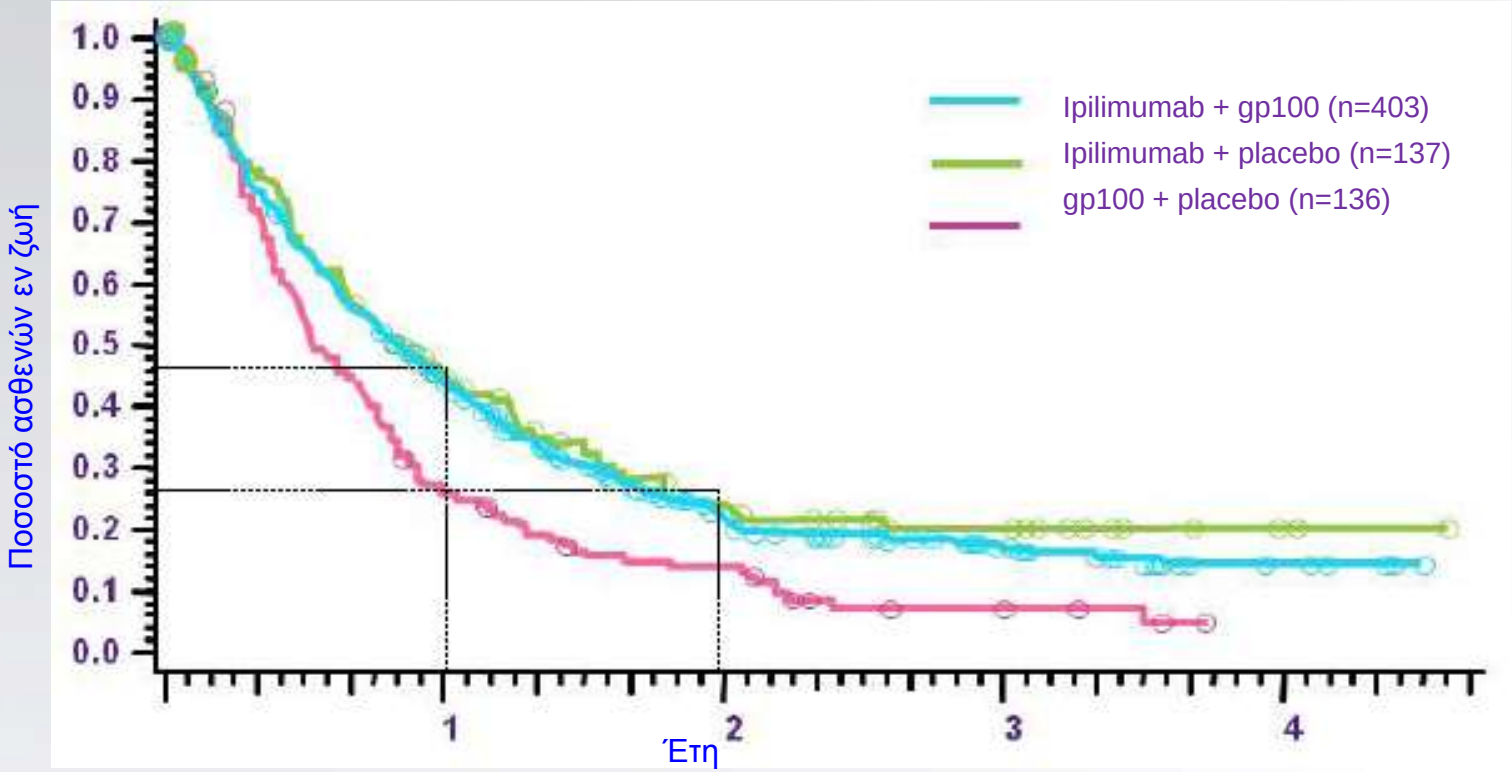
Humira	Spiriva	Enbrel	Remicade	Cosentyx
Solvadi	Harvoni	Madthera	Avastin	Inbvance
Crestor	Neulasta	Abilify	Herceptin	Cyramza
Revlimid	Gilenya	Spiriva	Neulasta	Kadcyla
Lucentis	Cardasil	Eylea	Xarelto	Olysion
Pradaxa	Xtandi	Tecfidera	Velcade	Keytruda
LCZ	Rituxan	Repatha	Opdivo	Brexpiprazole
Nexium	Orkambi	Seretide	Januvia	Evolocumab
Prevenar	Tenofovir	Plavix	Imbruvica	Alirocumab
Soliris	Titicay	Lantus	Prolia	Darzalex
Victoza	Vidosa	Jumalog	Keytruda	
Novorapid	Seretide	Eliquis	Stelara	
Perjeta	Vyvanse	Simpony	Spiriva	

Study	Control arm	Herceptin arm†	Reduction in relative risk of recurrence‡	Disease-free survival [DFS]	Overall survival [OS] rate	Hazard ratio
Joint Analysis§	AC→T (n=1880)‖	AC→TH (n=1872)‖	52%	At 3.5 years 86.7%		0.48‖ (95% CI: 0.39-0.59) *P* < 0.0001
	(n=2032)¶	(n=2031)¶			At 8.3 years 86.9%	0.64¶ (95% CI: 0.55-0.74) *P* < 0.0001
HERA#**	Observation only (n=1693)	Herceptin (n=1693)	46%	At 2 years 85.8%		0.54 (95% CI: 0.44-0.67) *P* < 0.0001
BCIRG†† 006	AC→T (n=1073)	TCH (n=1075)	33%	At 3 years 86.3%		0.67 (95% CI: 0.54-0.84) *P*=0.0006
		AC→TH (n=1074)	40%	At 3 years 88.0%		0.60 (95% CI: 0.48-0.76) *P* < 0.0001

Durable Long-term Survival

Μακροχρόνια επίδραση του Ipilimumab σε κλινική μελέτη Φάσης II

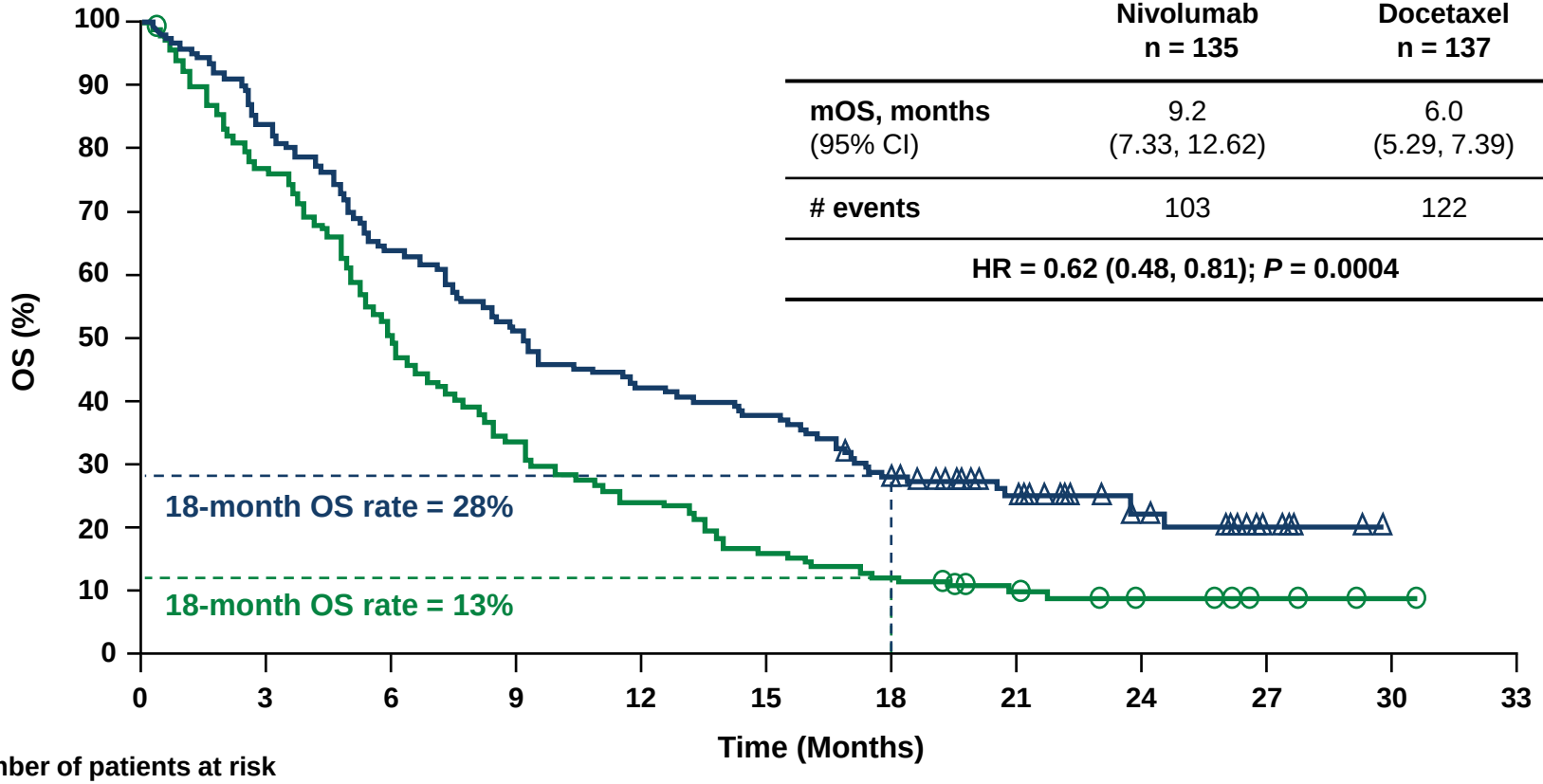
Μέγιστη διάρκεια παρακολούθησης με ipilimumab: 55 μήνες



1. Hodi FS, et al. Improved Survival with Ipilimumab in Patients with Metastatic Melanoma. New EnglJ Med 2010;363(8):711-723

Nivolumab in advanced squamous NSCLC

Overall survival



	Nivolumab n = 135	Docetaxel n = 137
mOS, months (95% CI)	9.2 (7.33, 12.62)	6.0 (5.29, 7.39)
# events	103	122
HR = 0.62 (0.48, 0.81); *P* = 0.0004		

Number of patients at risk

Nivolumab	135	113	86	69	57	51	37	25	14	6	0	0
Docetaxel	137	104	69	46	33	22	17	11	7	4	1	0

Symbols refer to censored observations; based on August 2015 DBL.

Reckamp K, *et al*. WCLC; September 6–9, 2015; Denver, CO; Abstract 736.

Table 1 : ACR Responses in Placebo-Controlled Trials (Percent of Patients)

	Study II Monotherapy (26 weeks)			Study III Methotrexate Combination (24 and 52 weeks)	
Response	Placebo N=110	HUMIRA 40 mg every other week N=113	HUMIRA 40 mg weekly N=103	Placebo/MTX N=200	HUMIRA/MTX 40 mg every other week N=207
ACR20					
Month 6	19%	46%*	53%*	30%	63%*
Month 12	NA	NA	NA	24%	59%*
ACR50					
Month 6	8%	22%*	35%*	10%	39%*
Month 12	NA	NA	NA	10%	42%*
ACR70					
Month 6	2%	12%*	18%*	3%	21%*
Month 12	NA	NA	NA	5%	23%*

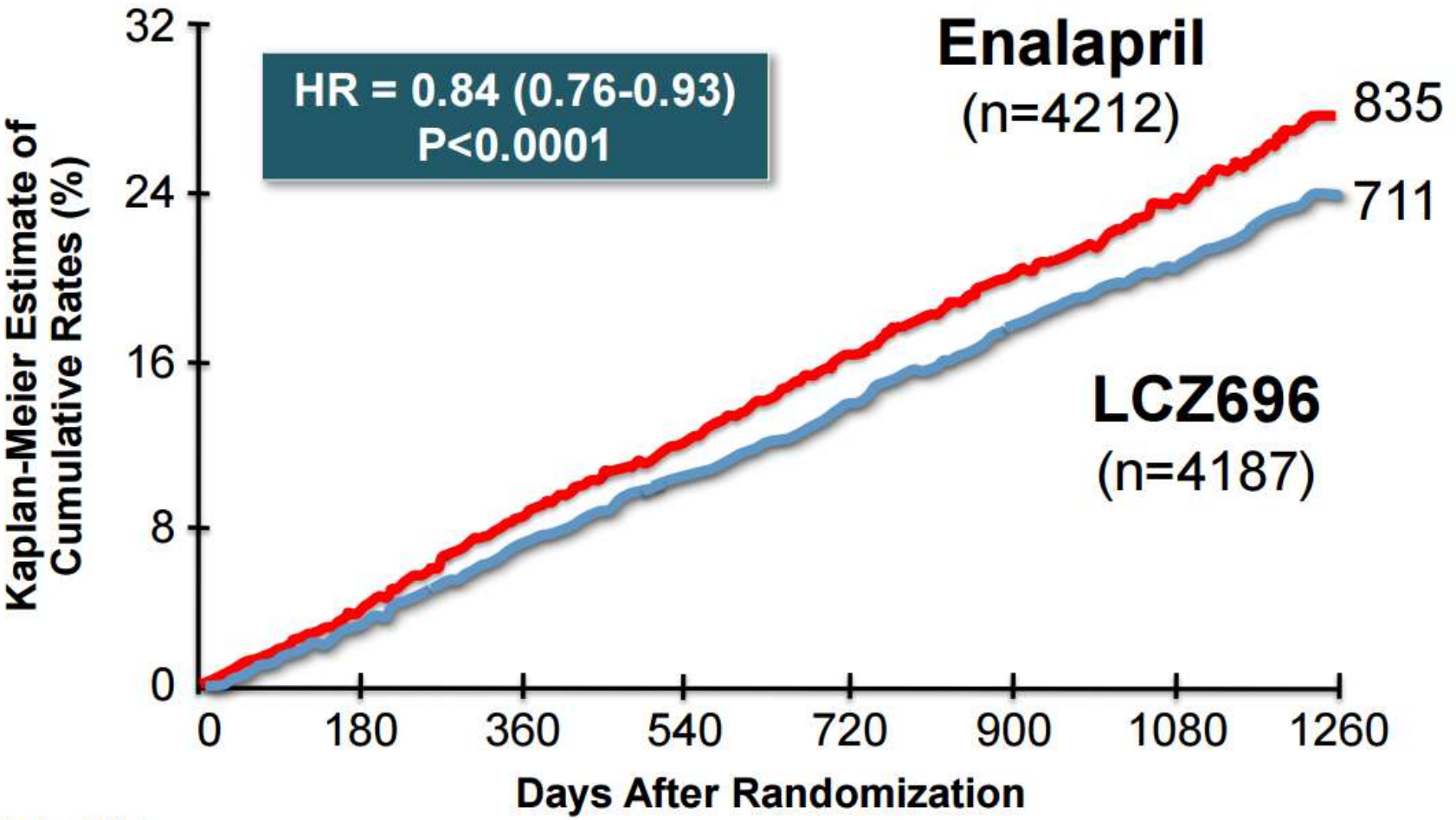
* $p<0.01$, HUMIRA vs. placebo

SOVALDI (sofosbuvir) Tablets
Product Monograph

Table 10. Virologic Outcome in Study NEUTRINO

	SOVALDI + Peg-IFN alfa + RBV 12 weeks
	N=327
Overall SVR	90% (295/327)
<LLOQ[a] at treatment week 12	100% (327/327)
Outcome for subjects without SVR	
On-treatment virologic failure	0/327
Relapse[b]	9% (28/326)
Other[c]	1% (4/327)
Death[d]	0/327
Discontinued study treatment due to adverse event (AE)	2% (5/327)
Discontinued study treatment for other reasons	<1% (2/327)

PARADIGM-HF: All-Cause Mortality



Patients at Risk

LCZ696	4187	4056	3891	3282	2478	1716	1005	280
Enalapril	4212	4051	3860	3231	2410	1726	994	279

Efficacy of LDL-C Reduction With PCSK9 mAb in FH and non-FH Patients Receiving Statin Therapy

Alirocumab 150 mg Q2W

non- FH	-67.3%
FH	-57.3%

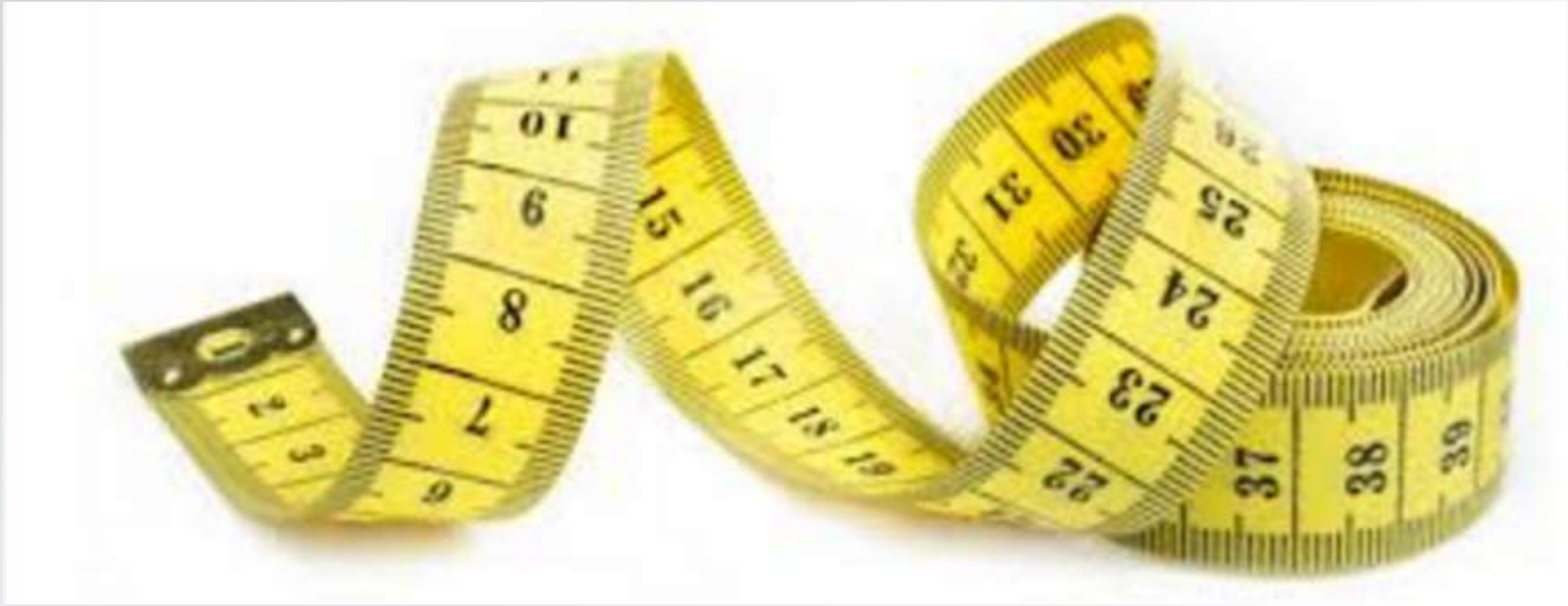
Evolocumab 420 mg Q4W

non-FH	-50.3%
FH	-56.4%

McKenney et al. JACC 2012; 59: 2344-53
Stein et al. Lancet 2012; 380: 29-36
Giugliano et al. Lancet 2012; 380: 2007-17
Raal et al. Circulation 2012; 126: 2408-2417

Not all products are the same

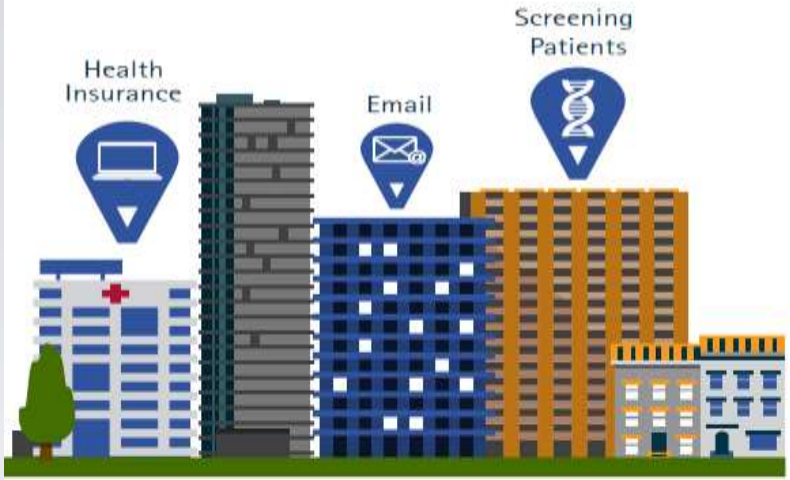
Measure true impact



1. The Internet of Me: Your healthcare, personalized

Welcome to the era of personalized healthcare defined by meaningful and convenient individual health experiences.

Today



People are shopping for health insurance online

Doctors are emailing patients

Clinics are screening patients to see how they react to certain medications based on their DNA

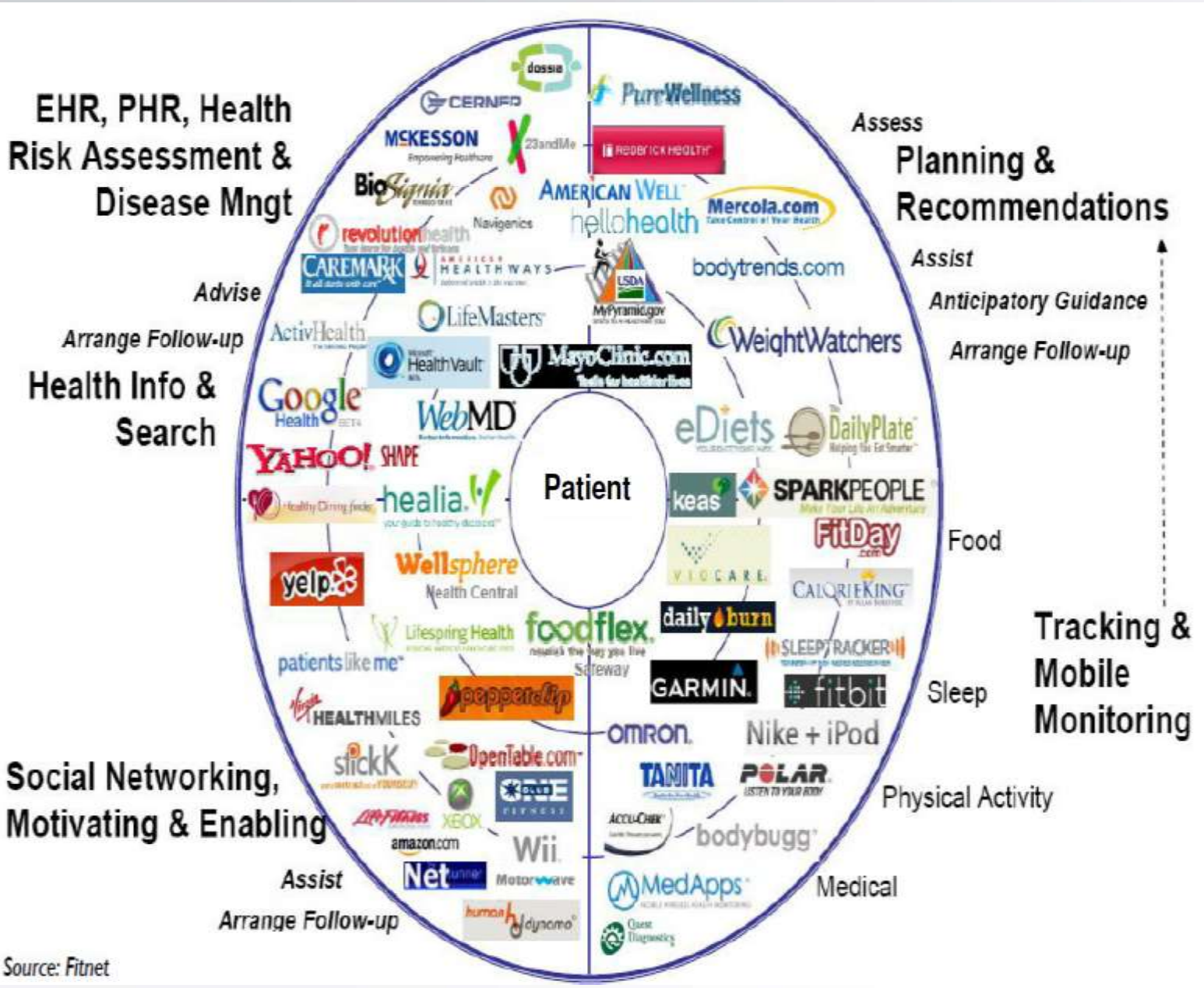
Tomorrow

Request meds from your smartwatch

Receive one simple bill for care

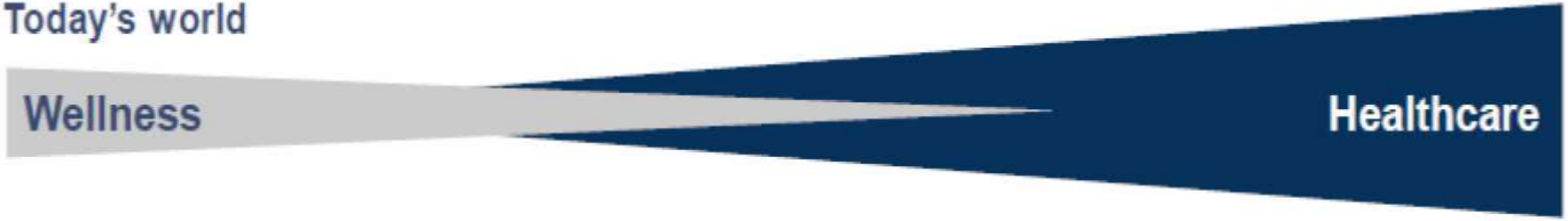
Get a real-time text alert that your blood pressure is too high

Access personalized plan options from your insurer

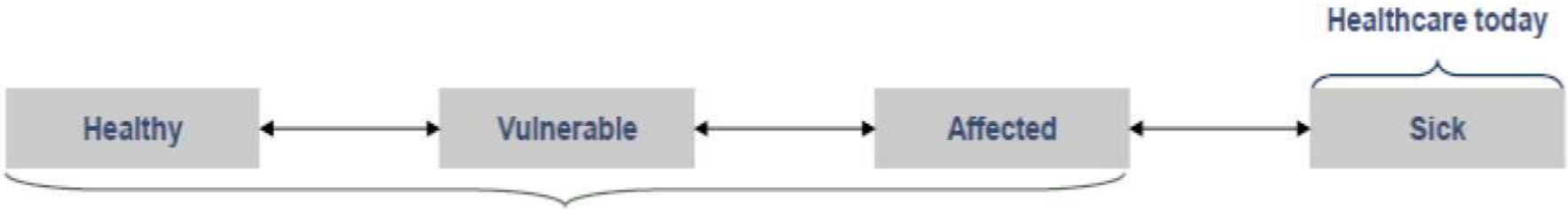


Source: Fitnet

Today's world



Personal Coaching | Communication/ Information Services | Preventive Services | Education | Physical Exams | Disease Management | Clinical Diagnostics & Therapeutics



Future system

Consumer Products | Medical Health Spas | Complementary and Alternative Medicines | Integrated Health Solutions

Outcomes define service reimbursement

Stockholms läns landsting

Stockholm developed an outcome-based payment model for spine surgery

In 2013, Stockholm launched outcome-based payment model for spine surgery

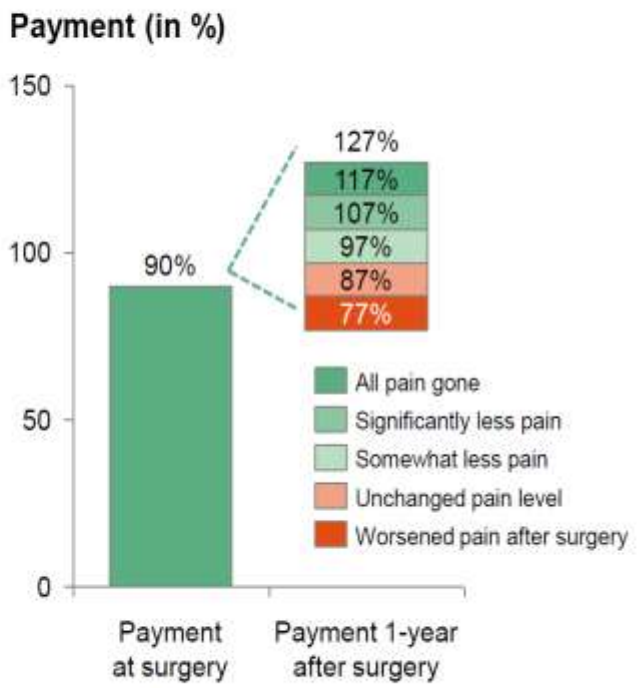
Bundled payment covers entire care chain
- Incl. pre-operative visit, surgery, post-operative care and all follow-ups

Payment level based on patient groups but individually adjusted for each patient
- Adjusted for age, gender, co-morbidity, etc.

Performance payment is 10% of total
- Adjusted up (max +37%) or down (max -24%) based on the achieved outcomes

Provider responsible for all complications related to the treatment for up to 2 years after surgery

Based on patient reported pain level after year: example for spinal stenosis



Source: Förfrågningsunderlag enligt LOV, Vårdval Ryggkirurgi, BCG

ΕΘΝΙΚΗ ΣΧΟΛΗ ΔΗΜΟΣΙΑΣ ΥΓΕΙΑΣ

Many thanks for your attention