The European Health Technology Institute for Socio-Economic Research

Together for Health Innovation

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Economics and Medical Innovation: closer to reality or is it out of reach?

Università Commerciale Luigi Bocconi

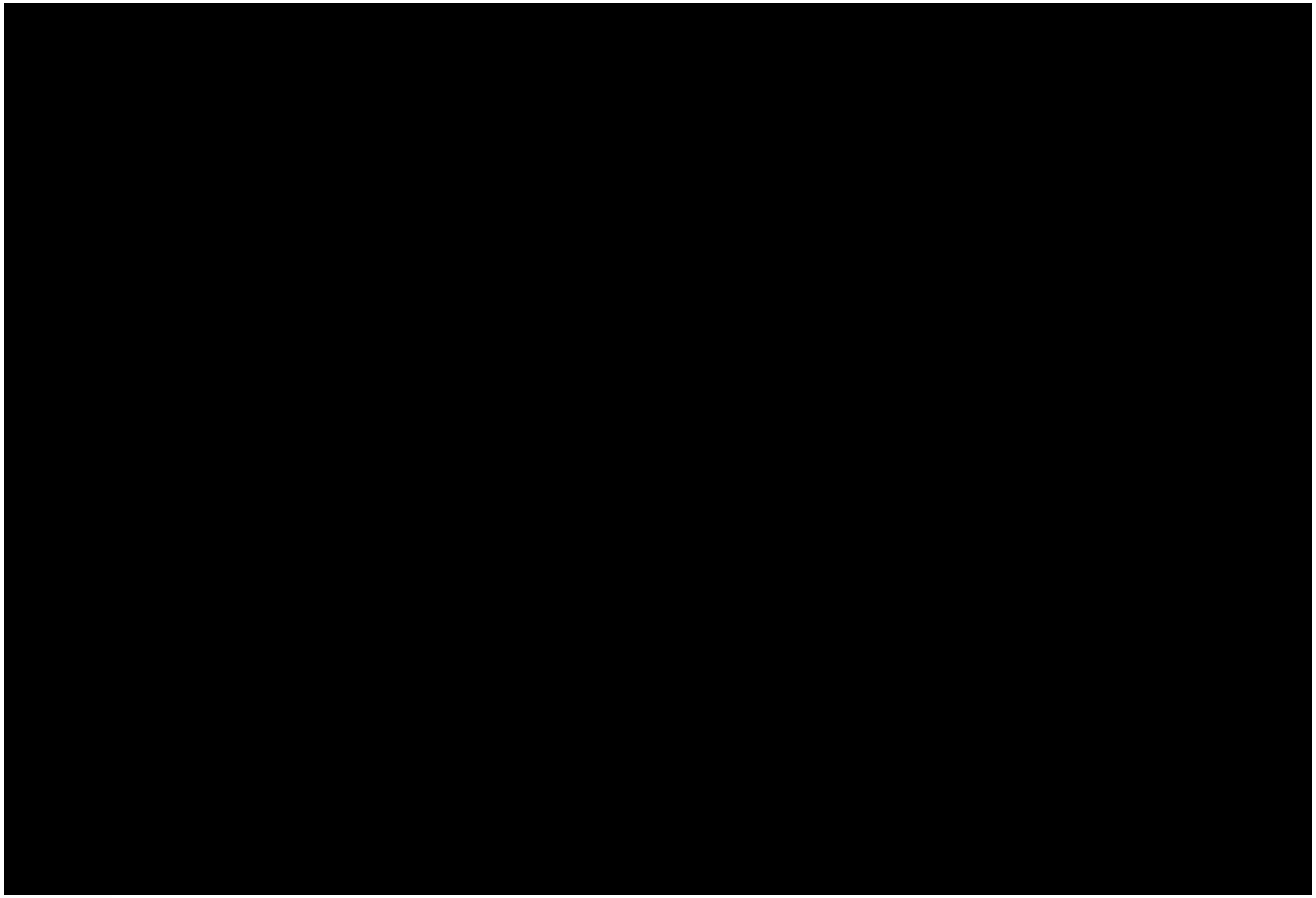
CERGAS
Centro di Ricerche sulla Gestione dell'Assistenza Sanitaria e Sociale

Medical Innovations in Arrhythmias. The Expectations, the Barriers, the Developments

EHRA Summit, 21 and 22 March 2011

Science says 2000s-born babies will live 120 yrs

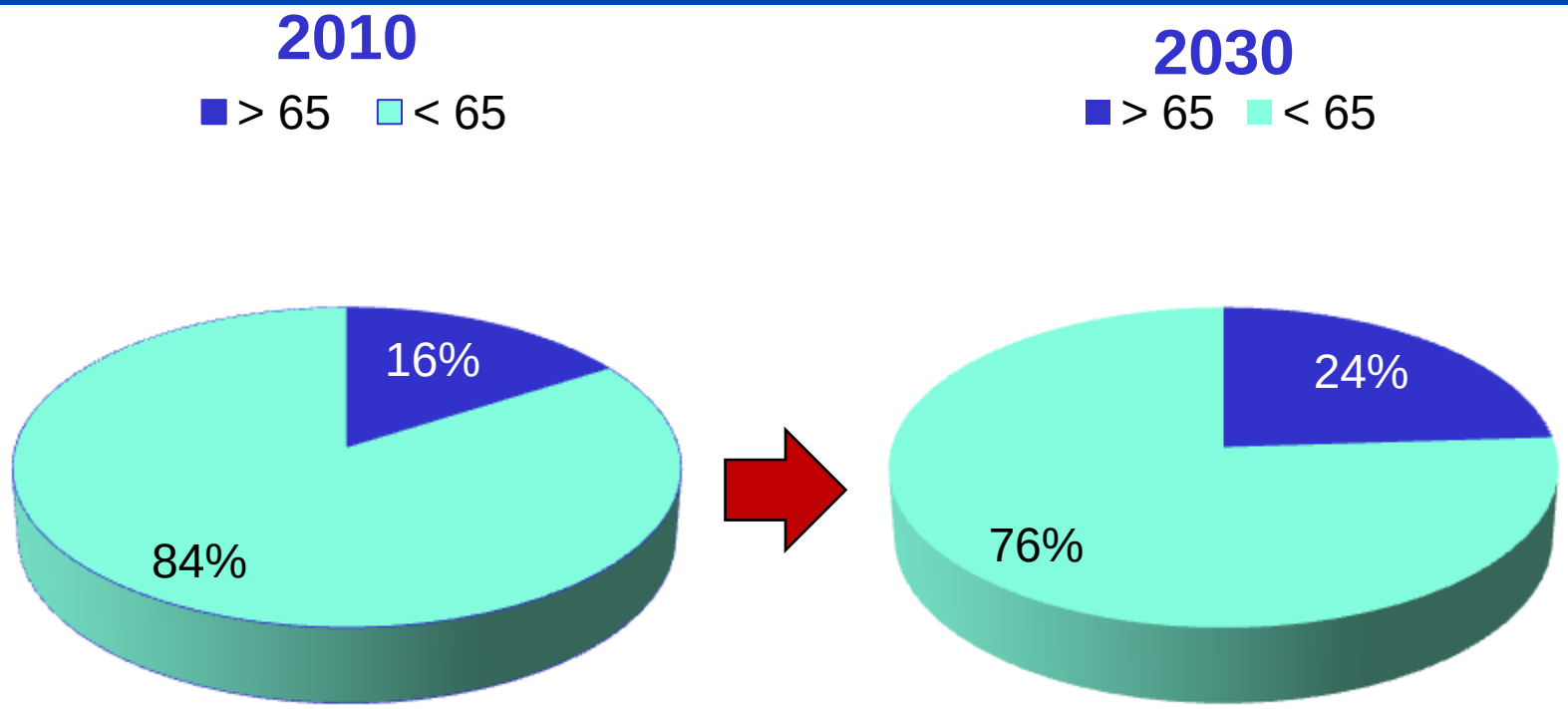
We are all to live longer…but success comes at a price…



The “universalistic” principle of EU systems is threatened

- The proportion of over 65 yrs old over general population is increasing

Percentage of people >65 in EU-27



The “universalistic” principle of EU systems is threatened

- The proportion of over 65 yrs old over general population is increasing
- Public resources as from fiscal revenues necessarily decrease:
  - Fewer people would cover a greater number of more costly people
- Incidence of chronic conditions increases

IN 2010, OVER 1/3 OF EU'S POPULATION HAS DEVELOPED AT LEAST ONE CHRONIC DISEASE

Stemming the global tsounami of cardiovascular diseases...Lancet, 2011

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2 billion people are at risk of cardiovascular diseases:

- 1,3 billion smokers
- 600 million hypertensive
- 220 million diabetics

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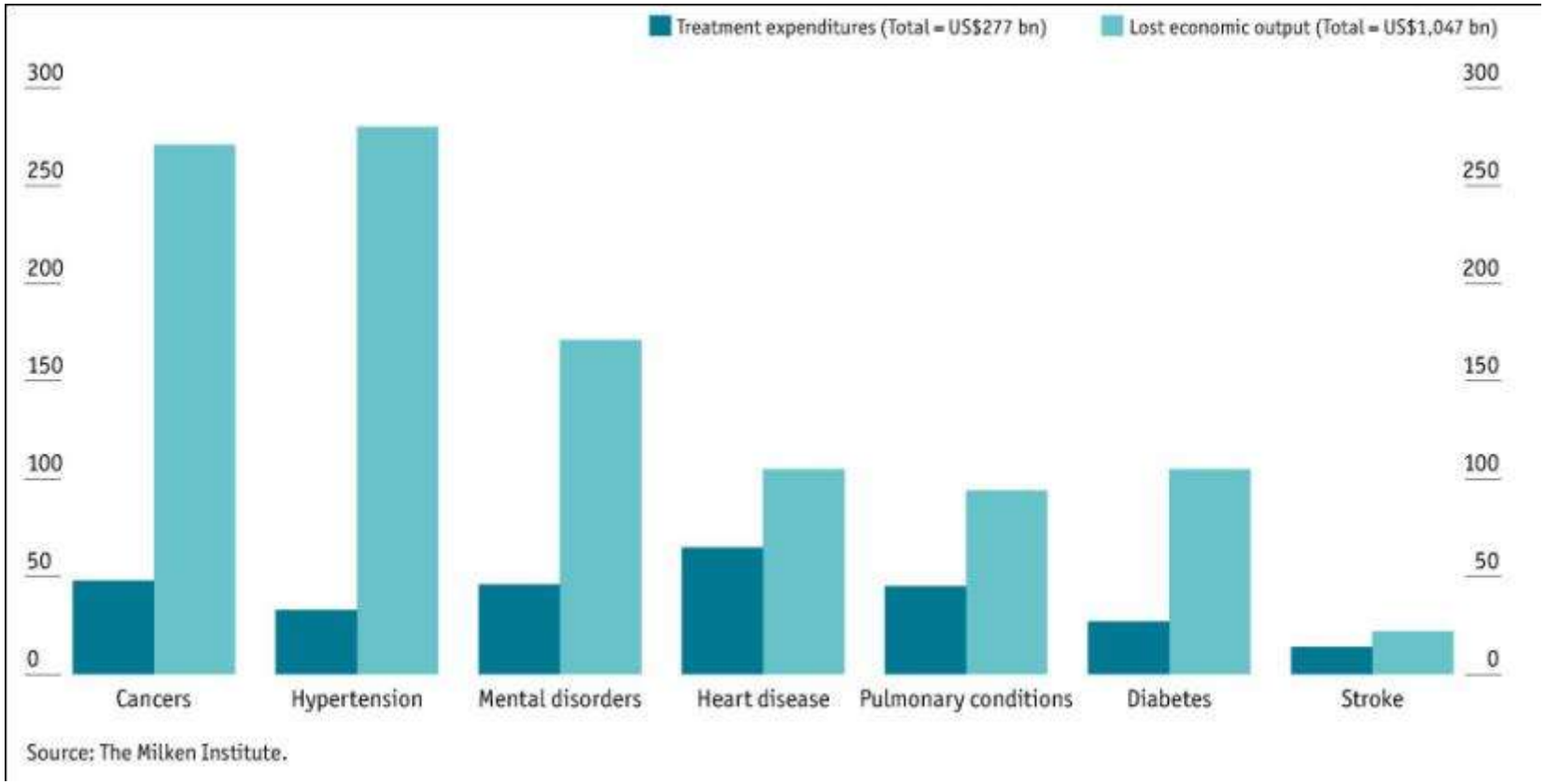
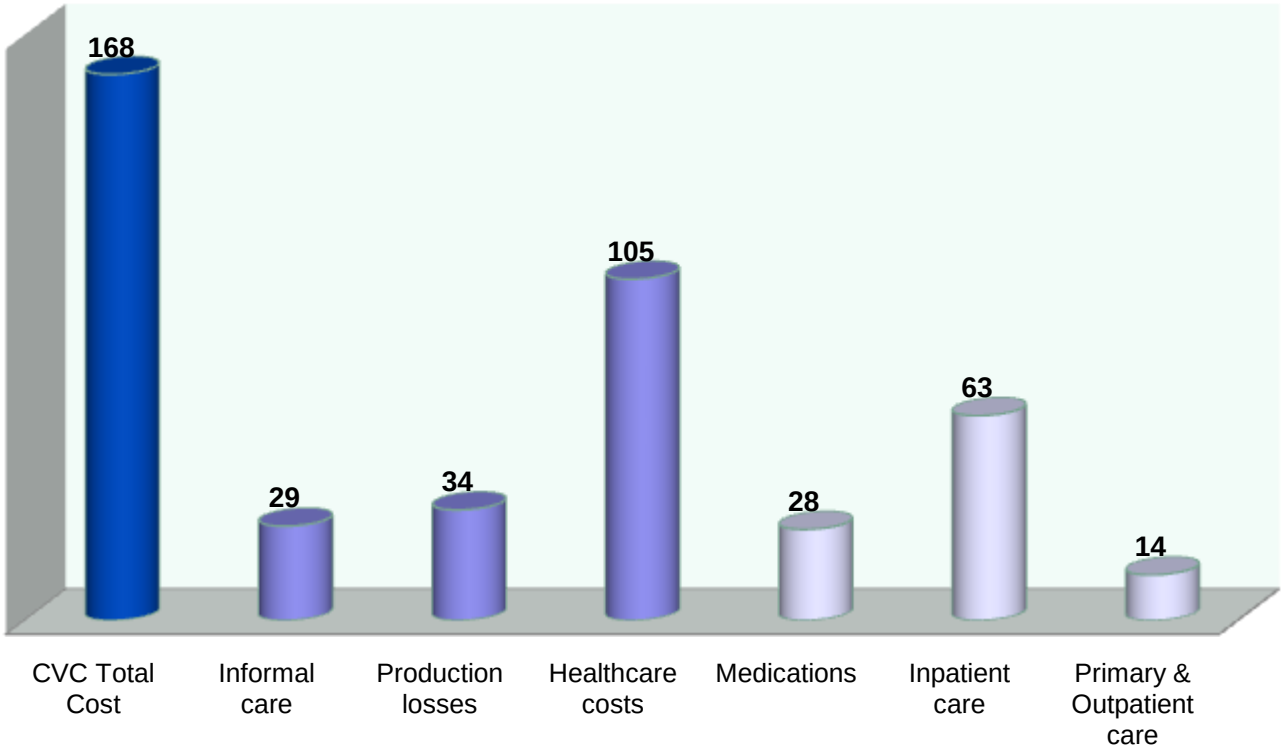
Total economic cost of chronic disease, US, 2003 (USD bn)



Economic burden of CVC in EU-27, 2003 (Euro bn)

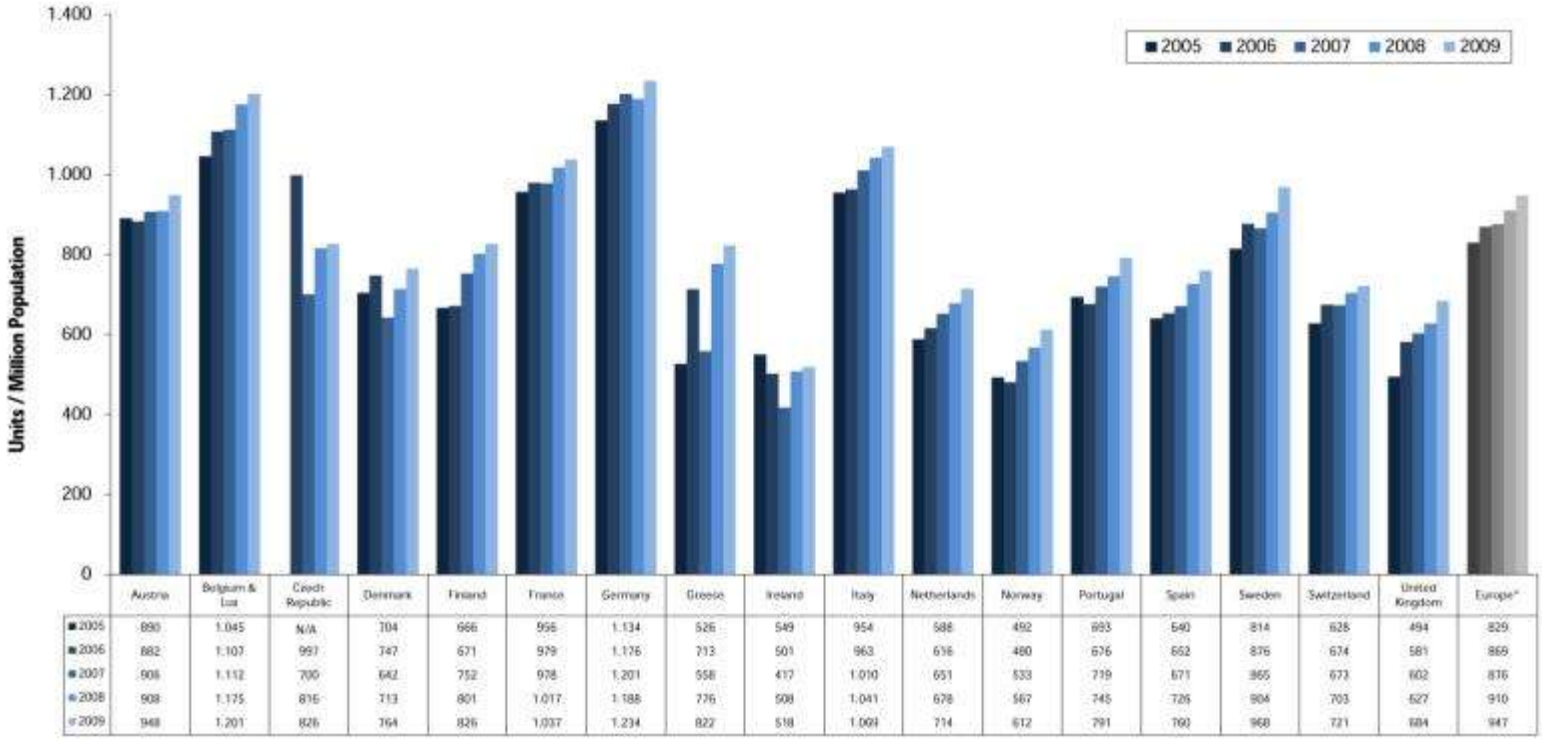


Leal et al., EHJ 2006

The “universalistic” principle of EU systems is threatened

- The proportion of over 65 yrs old over general population is increasing
- Public resources as from fiscal revenues necessarily decrease
- Incidence of chronic conditions increases
- Coverage gets smaller: restrictions to patients’ access

Pacemakers: units per million inhabitants



	Austria	Belgium & Lux	Czech Republic	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Netherlands	Norway	Portugal	Spain	Sweden	Switzerland	United Kingdom	Europe*
2005	890	1.045	N/A	704	666	956	1.134	526	549	954	588	492	693	640	814	628	494	829
2006	882	1.107	997	747	671	979	1.176	713	501	963	636	480	676	662	876	674	581	869
2007	906	1.112	700	642	752	978	1.201	558	417	1.010	651	533	719	671	865	673	602	876
2008	908	1.175	816	713	801	1.017	1.188	776	508	1.041	678	567	745	726	904	703	627	910
2009	948	1.201	826	764	826	1.037	1.234	822	518	1.069	714	612	791	760	968	721	684	947

Source population data: OECD
Units - Eucomed based on reports from major manufacturers
* Europe represents total of listed countries

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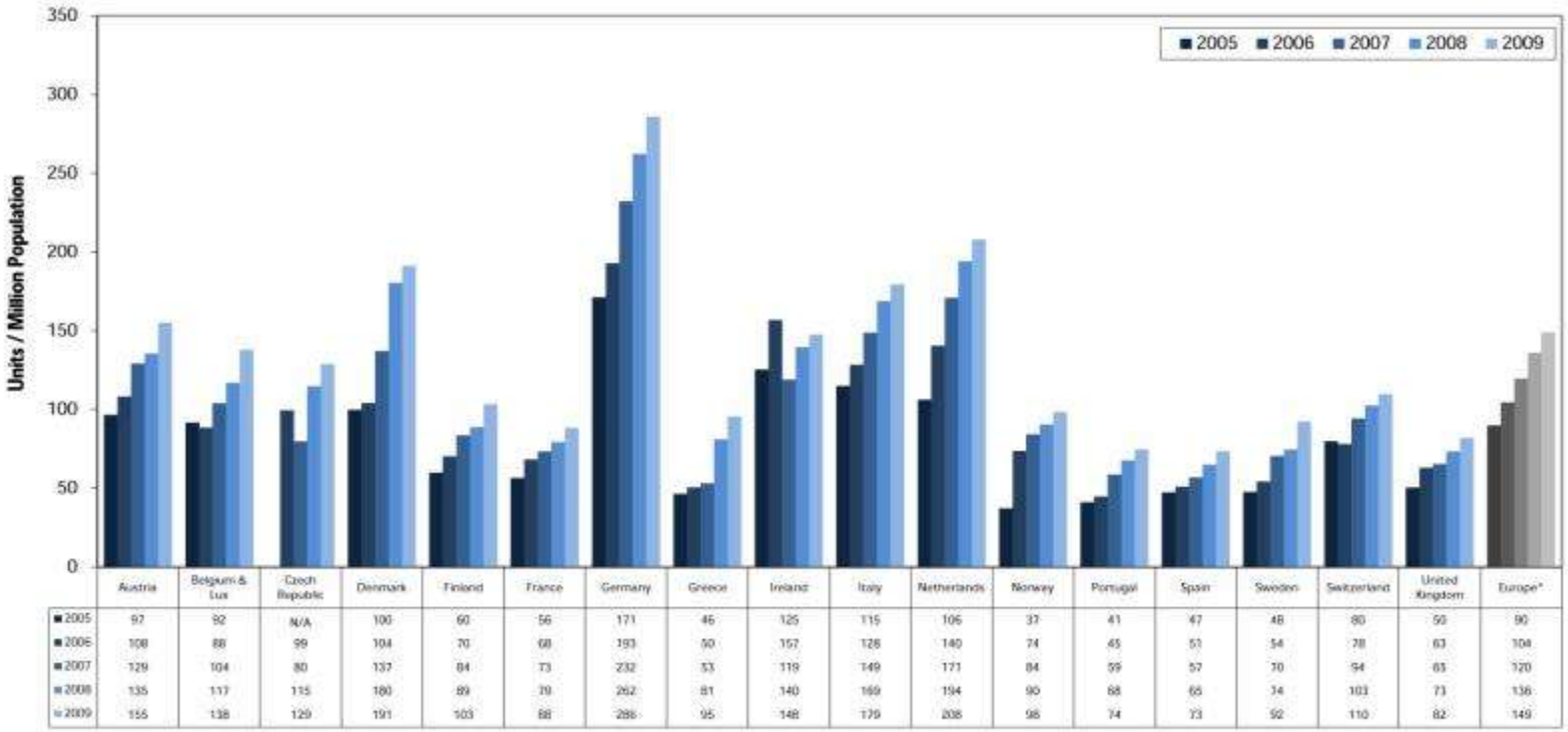
Defibrillators: units per million inhabitants



	Austria	Belgium & Lux	Czech Republic	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Netherlands	Norway	Portugal	Spain	Sweden	Switzerland	United Kingdom	Europe*
2005	97	92	N/A	100	60	56	171	46	125	115	106	37	41	47	48	80	50	90
2006	108	88	99	104	70	68	193	50	157	128	140	74	45	51	54	78	63	104
2007	129	104	80	137	84	73	232	53	119	149	171	84	59	57	70	94	65	120
2008	135	117	115	180	89	79	262	81	140	169	194	90	68	65	74	103	73	136
2009	155	138	129	191	103	88	286	95	148	179	208	98	74	73	92	110	82	149

Source population data: OECD
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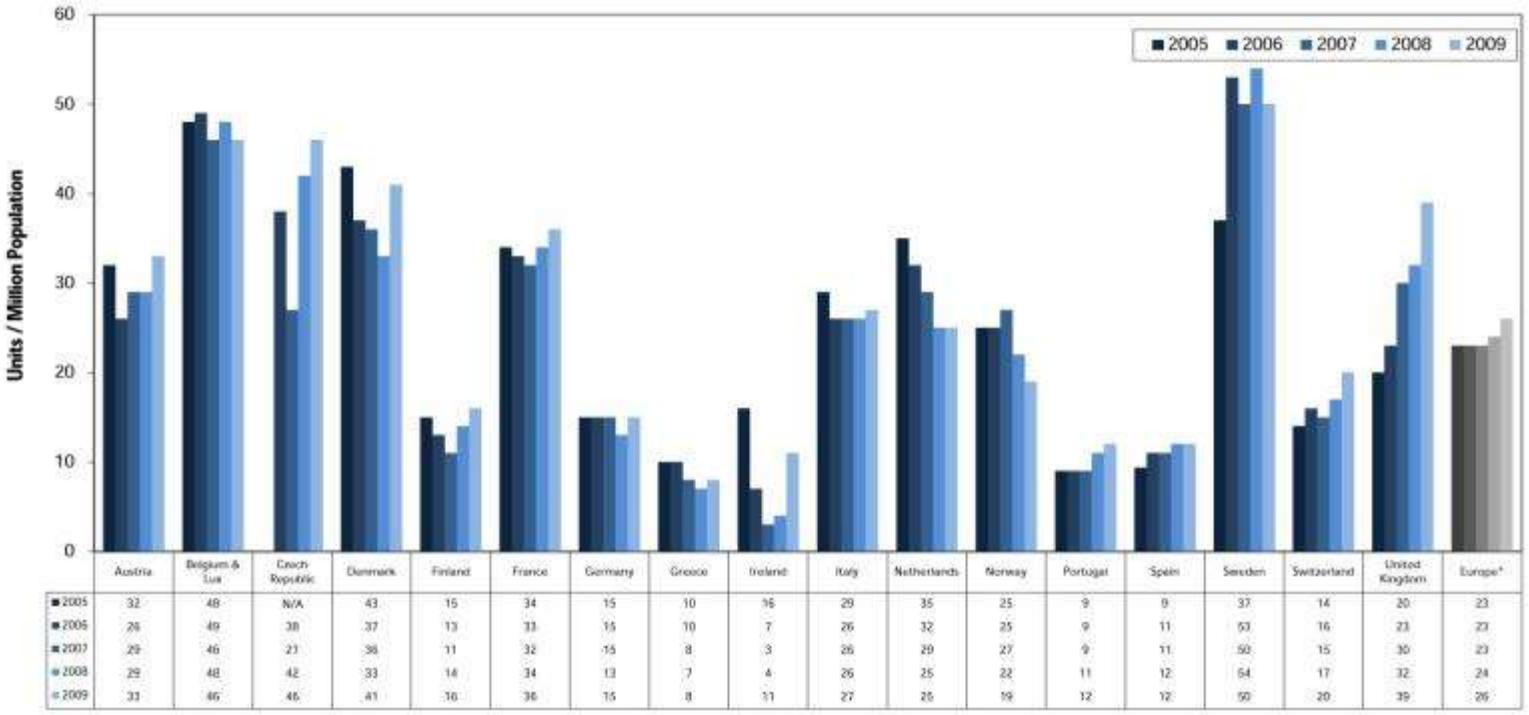
CRT-P per million inhabitants



	Austria	Belgium & Lux	Czech Republic	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Netherlands	Norway	Portugal	Spain	Sweden	Switzerland	United Kingdom	Europe*
2005	32	48	N/A	43	15	34	15	10	16	29	35	25	9	9	37	14	20	23
2006	26	49	38	37	13	33	15	10	7	26	32	25	9	11	53	16	23	23
2007	29	46	21	36	11	32	15	8	3	26	29	27	9	11	50	15	30	23
2008	29	48	42	33	14	34	13	7	4	26	25	22	11	12	54	17	32	24
2009	33	46	46	41	16	36	15	8	11	27	25	19	12	12	50	20	39	26

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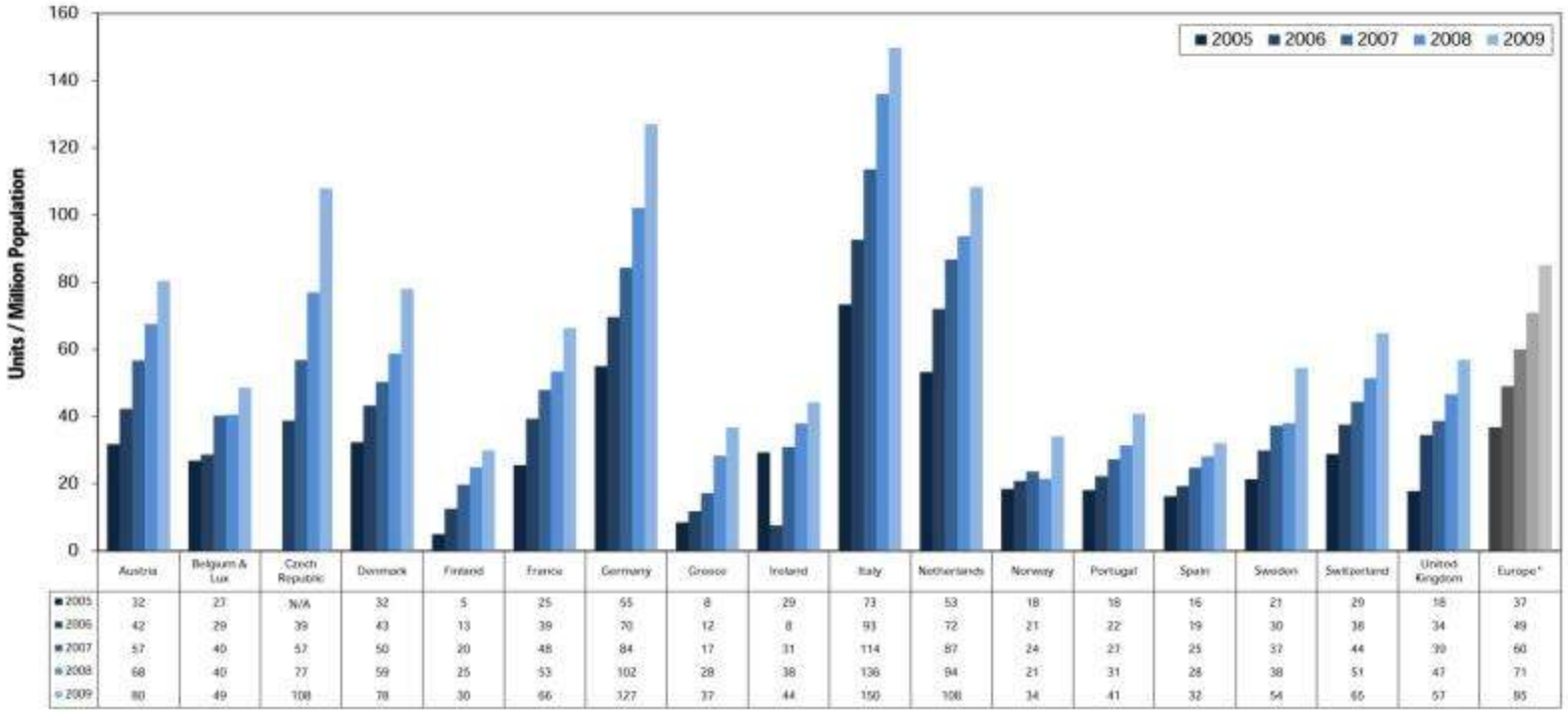
CRT-D per million inhabitants



	Austria	Belgium & Lux	Czech Republic	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Netherlands	Norway	Portugal	Spain	Sweden	Switzerland	United Kingdom	Europe*
2005	32	27	N/A	32	5	25	55	8	29	73	53	18	18	16	21	29	18	37
2006	42	29	39	43	13	39	70	12	8	93	72	21	22	19	30	36	34	49
2007	57	40	57	50	20	48	84	17	31	114	87	24	27	25	37	44	39	60
2008	68	40	77	59	25	53	102	28	38	136	94	21	31	28	38	51	47	71
2009	80	49	108	78	30	66	127	37	44	150	108	34	41	32	54	65	57	85

Source population data: OECD
Units - Eucomed based on reports from major manufacturers
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The "universalistic" principle of EU systems is threatened

- The proportion of over 65 yrs old over general population is increasing
- Public resources as from fiscal revenues necessarily decrease
- Incidence of chronic conditions increases
- Coverage gets smaller: restrictions to patients' access
- Informal carers are called to fill the gaps….

More carers for more chronics

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Number of people providing care to a dependent relative

Country	Number of carers	Number of carers combining work and care
Italy	3-3.5m	n/a
Netherlands	2.4m	1.3m
UK	6m	3m

Source: European Commission

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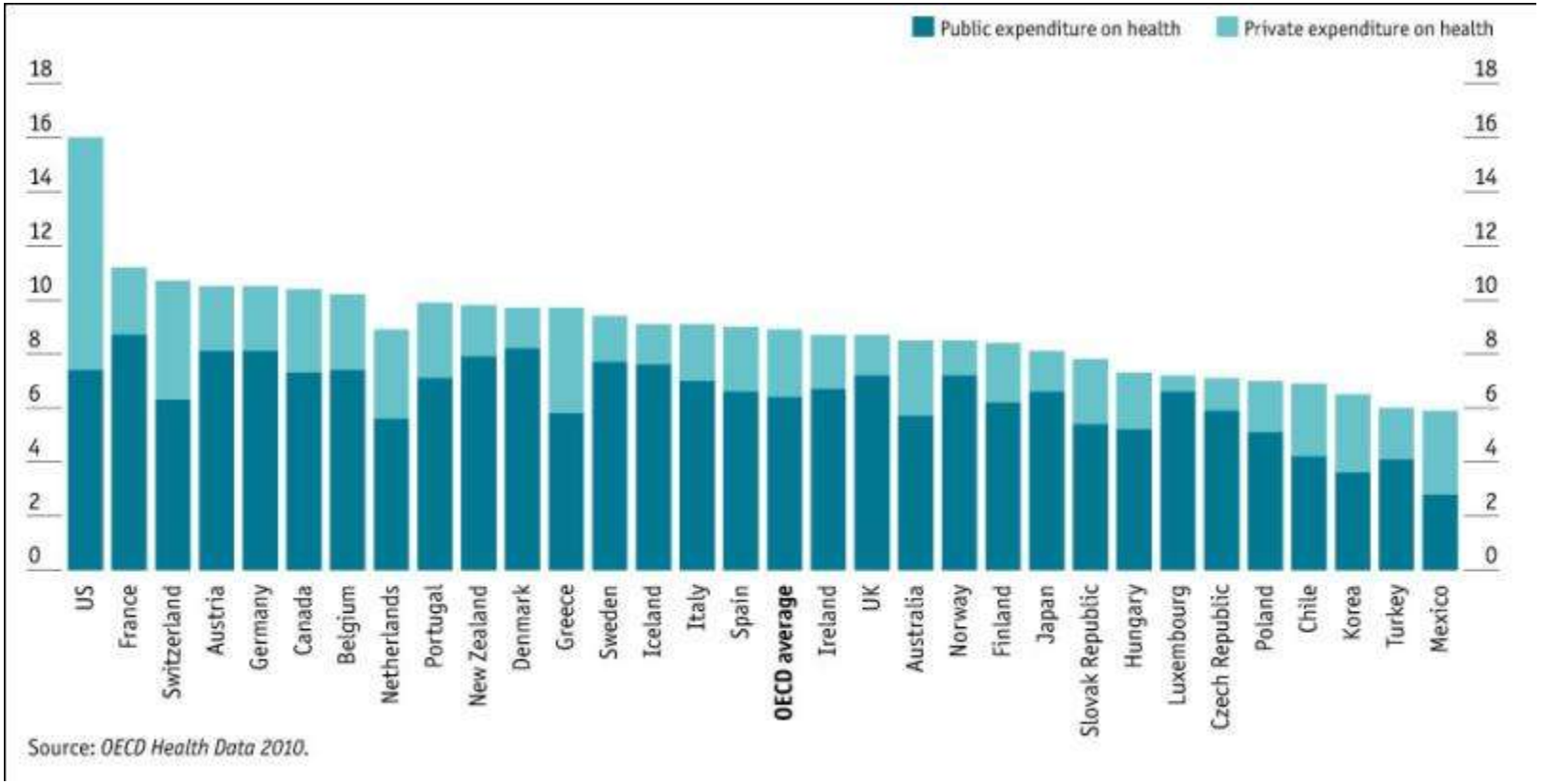
Where is Economics…in principle?

1. Global decision-making level:
   - apportionment of % GDP to healthcare (allocative efficiency)

Budgets tighten: health expenditure over GDP, 2008



Where is Economics…in principle?

1. Global decision-making level:
   - apportionment of % GDP to healthcare (allocative efficiency)

2. Healthcare decision-making level:
   - Health Technology Assessment (technical efficiency)

Health Technology Assessment

- HTA is a multi-disciplinary process studying the medical, economic, social and ethical implications of diffusion and use of health technology aimed at informing policy-decisions to efficiently allocate scarce resources
- A large number of organisations undertake or commission HTAs across the world and many of them increasingly link HTA to a particular decision about reimbursement, coverage, access and use of technologies (e.g. NICE, IQWiG, PBAC, CADTH)
- Economic Efficiency and Clinical Effectiveness dominate HTA activities and Cost-Effectiveness (Cost-Utility) Analysis, normally make the most of HTAs

CEA decision rule: Incremental Cost-Effectiveness Ratio (ICER)

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$$ICER = \frac{C_B - C_A}{E_B - E_A}$$

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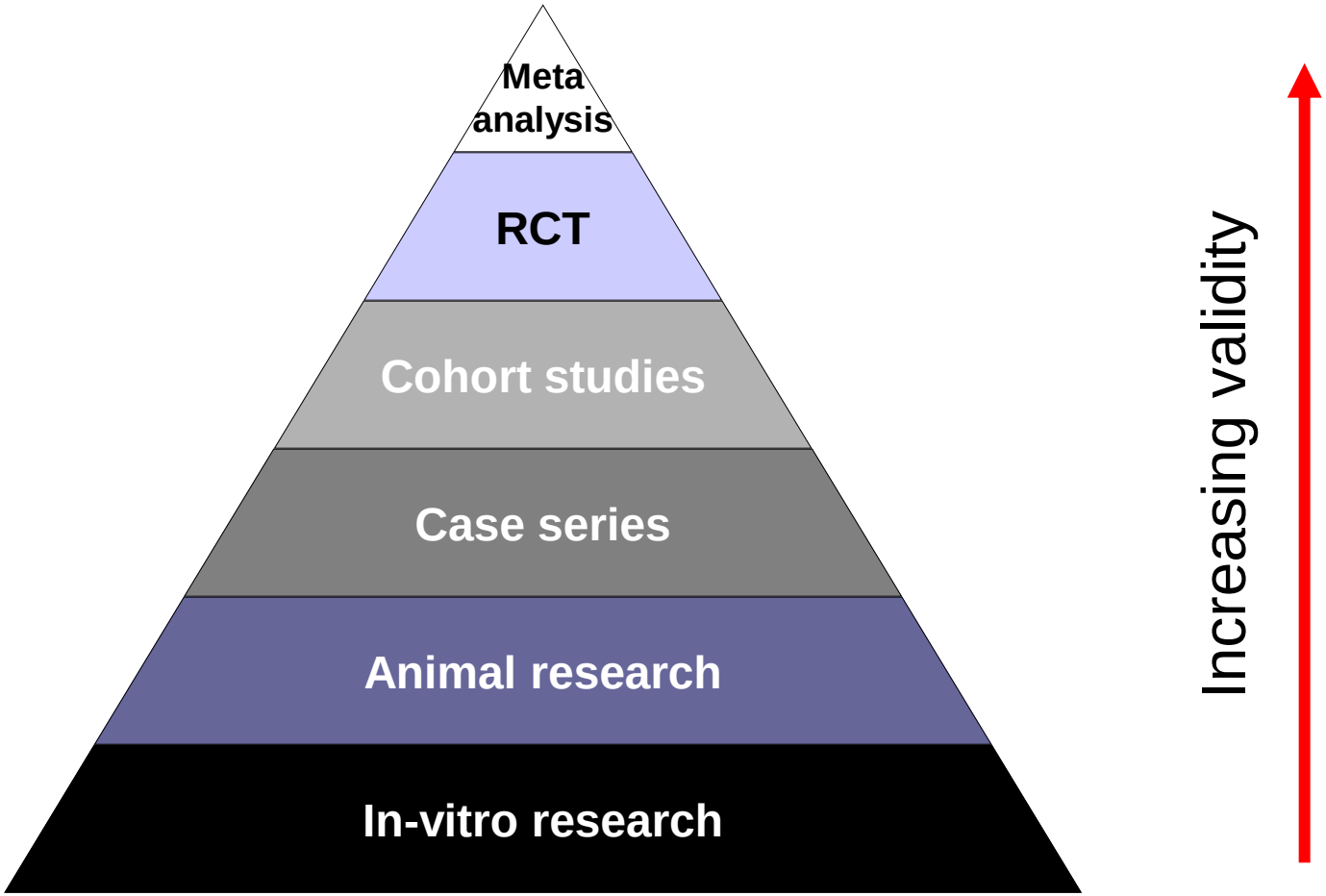
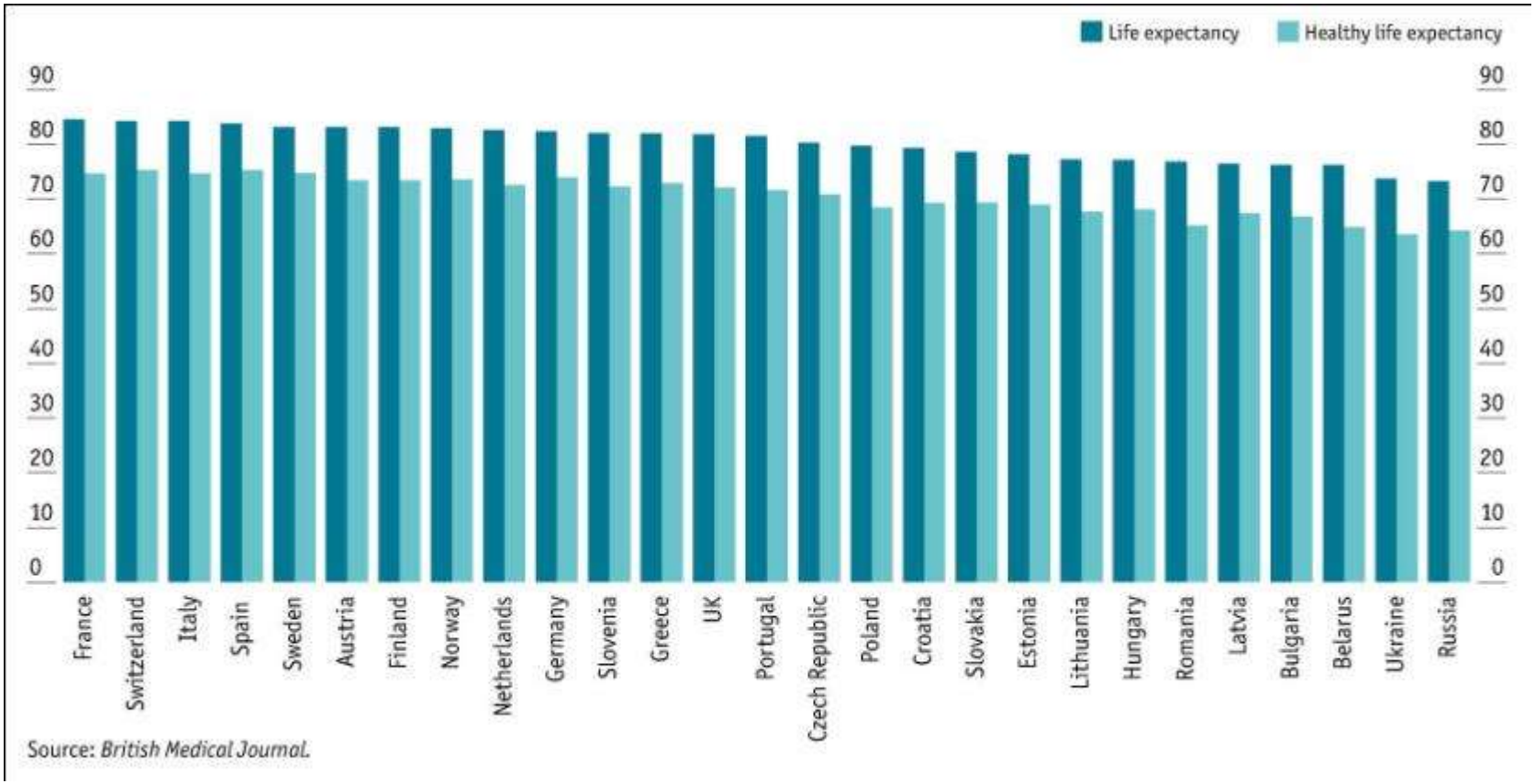
Clinical Effectiveness of the new program (E_B): sources of evidence



Healthy life expectancy vs. overall life expectancy



Did she invent QALYs?

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"It's not the years in your life, but the life in your years, that counts."

Mae West

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CEA decision rule: Incremental Cost-Effectiveness Ratio (ICER)

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$$ICER = \frac{C_B - C_A}{E_B - E_A}$$

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ICER: Threshold Value Approach

- Programs are judged in terms of absolute value of the ICER and are cost-effective if below what is deemed an acceptable “price” for producing health improvement:

  Threshold Value:

  - Australia
  - Canada
  - UK (20,000-30,000 UKP/QALY)

Are (current) CEAs & ICERs good proxies for cardiac devices values?

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- Since the 90s there has been significant innovations in the cardiology sector (e.g. ballon angioplasty, coronary stents, ICDs, TAVI, mitra-clip,..)
- Nevertheless a systematic review* on economic evaluation studies of cardiac devices (i.e. ICDs, pace-makers, stents) over the period early 1990-2009 shows poor results:
  - 5% examined long-term benefits
  - 15% used QALYs
  - Cost of device at uptake primary cost driver :
    - No consideration for learning curves
    - No organisational impact

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*Sorenson et al. Applying Health Economics for Policy Decision Making: Do Devices differ from Drugs? Europace, in press.

Are (current) CEAs & ICERs good proxies of cardiac devices values? NO

- Adapting CEAs for pharmaceuticals to devices gives a partial picture of the true costs and benefits
- This might mislead decision-makers who under those premises happen to conclude that:

"based on our analysis, there are NO observable increasing benefits from health technology innovation in the last 10 years…" (CADTH, 2011)

- Even the most advanced HTA Agencies would restrict access to promising innovative devices unless we change approach

What next?

- Drugs differ from devices:
  - evidence is growing (Drummond et al, 2009; Sorenson et al, 2010; Tarricone & Drummond, 2011) but needs support by clinicians to contribute to the debate (e.g. 2nd Join-Action by EC)
- RCTs do not work sufficiently for MDs:
  - registers need to become more reliable and credible
- Benefits should encompass a wider perspective:
  - Productivity gains by patients & carers
  - Returns on the economy (R&D, competitiveness, qualified employees, ..) through the multiplier effect of MedTech

What might happen then?

- We'd measure the true "opportunity cost" of allocating scarce resources in programmes other than healthcare
- Evaluations would address several recipients beyond MoH
- Higher level debate might be engaged onto how and where to allocate global public budgets, providing that benefits healthcare programmes accrue to non-healthcare sectors also

That is?

1. Global decision-making level:
   - apportionment of % GDP to healthcare (allocative efficiency)

2. Healthcare decision-making level:
   - Health Technology Assessment (technical efficiency)

Is it out of reach?

- John Dalli, "*Better Health, Better Economy*", at Finnish Government (February, 2011)
- German Ministry of Economic Affairs, "*We must not only regard health care spending as a cost factor, but need the full economic perspective*":
  - direct medical costs have increased by €101 billion in 2003-2008 vs. 2002. This is however counterbalanced by an avoided loss of gross national product by €123 billion in the same period, as a result of avoided loss of productive life years
  - Medical progress has thus a positive net impact on the economy, as a result of lowered indirect costs such as productivity losses.

What if it doesn't happen?

That we have secured economics out of the game but we all will be ruled by accountants …