MINIMAL STANDARDS & QUALITY ASSURANCE IN ONCOLOGY

Focus on treatment of solid tumors

1° INTERNATIONAL CONFERENCE

OCTOBER 13TH/14TH PADOVA 2017

Decision Making to Inform Resource Allocation in Cancer Treatment

Dr Elena Pizzo

Department of Applied Health Research, UCL, London

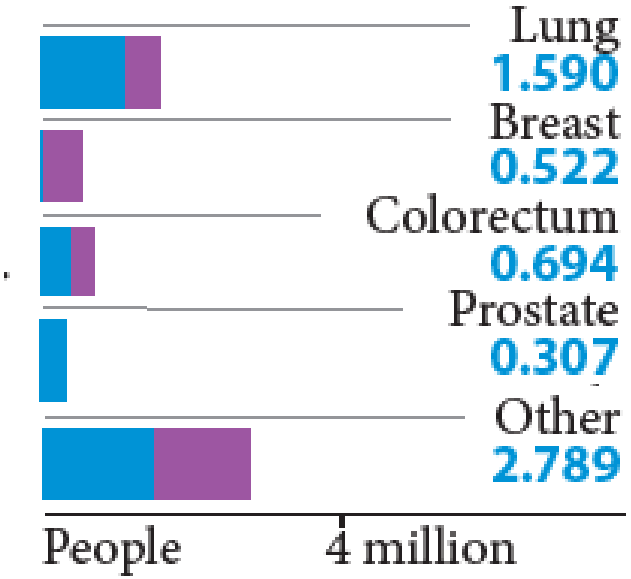
Collaboration for Leadership in Applied Health Research and Care North Thames

UCL DAHR

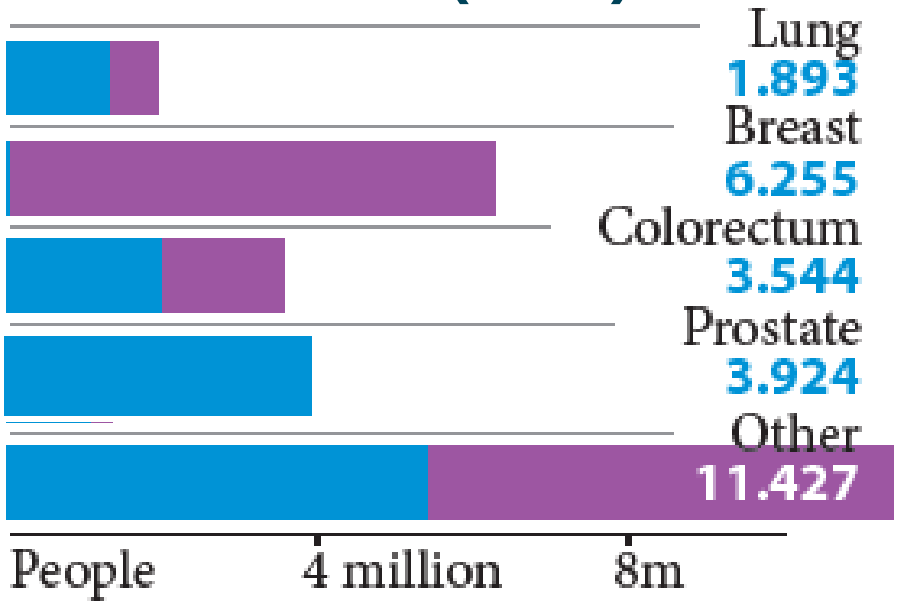
Background – burden of cancer

- The burden of cancer is growing, and it is becoming a major economic expenditure for all countries
  - 14 million new people diagnosed worldwide & estimated to double by 2030 (WHO, 2012)

Mortality (2012)



Prevalence (2012)



Ferlay J, Soerjomataram I, Ervik M, et al. GLOBOCAN 2012 v1.0; IARC, 2013. Cancer Incidence and Mortality Worldwide

Background – cost of cancer

- Why are the total costs for cancer increasing?
  - Increasing number of patients, living longer
  - Increasing expenditure per patient
  - Introduction of new more expensive technologies/drugs
    - A 2015 study by the US National Bureau of Economic Research says the prices of cancer drugs have increased 10% every year between 1995 and 2013

- Is this sustainable?

R, Peppercorn et al. (2011) Delivering affordable cancer care in high-income countries. Lancet Oncology; 12:933-80

Public perception of greatest needs and where the money are best spent

- In recent years, it has been in the media spotlight sparking debate on spiralling costs and overspending.

- In England, the National Institute for Health and Care Excellence (NICE), has come under intense criticism from patient groups for turning down numerous cancer drugs for use on the NHS when they weren't deemed cost effective.

The Telegraph

› News

NHS rationing bodies refuse to fund treatment which stalls breast cancer

How much do we really spend for cancer treatment in England?

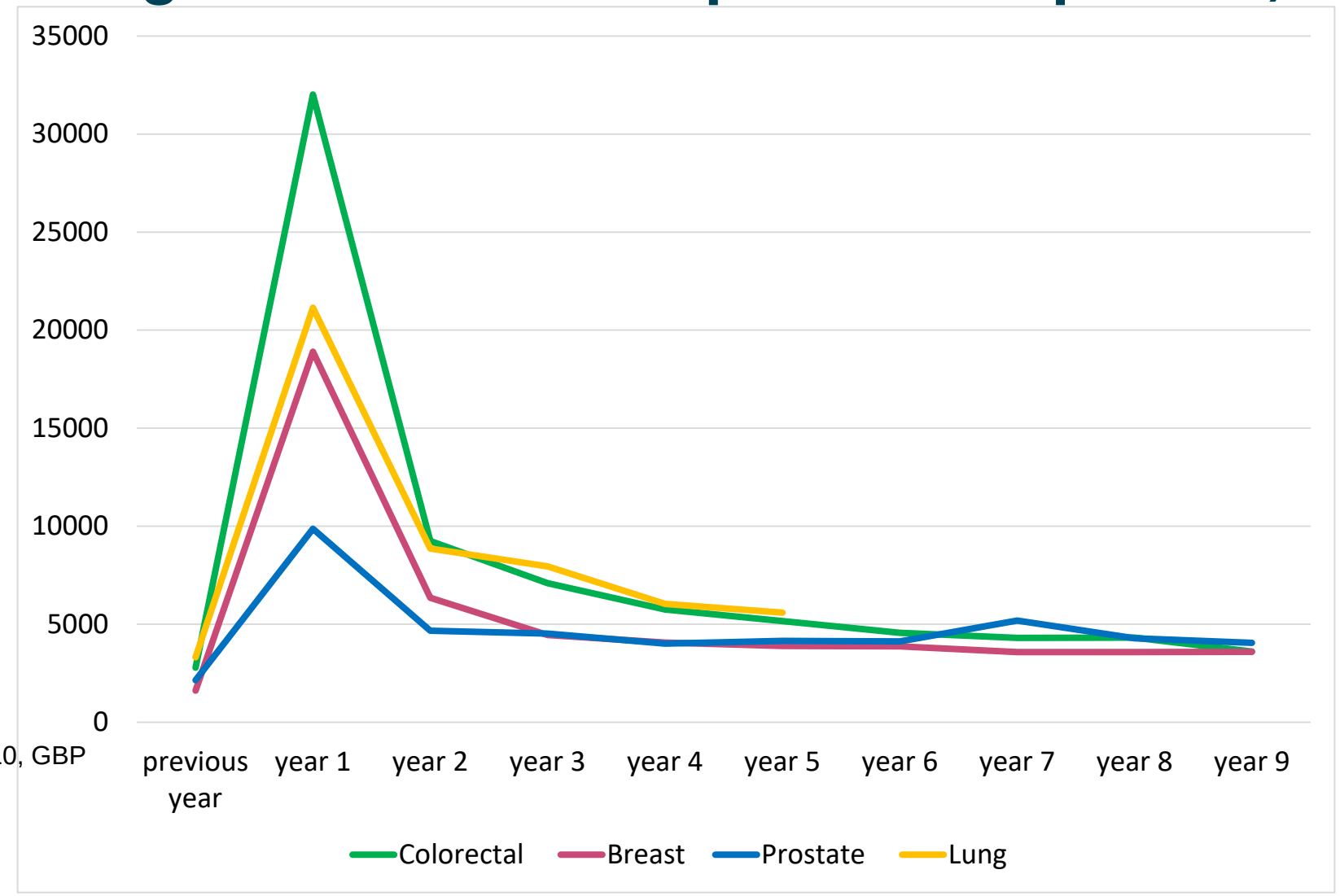
- Evidence on the cost of cancer is essential to support policymakers in achieving the best value for money and realise an efficient allocation of public resources

Laudicella et al, 2016

- However data on cancer prevalence and incidence are not updated and neither are costs analyses.

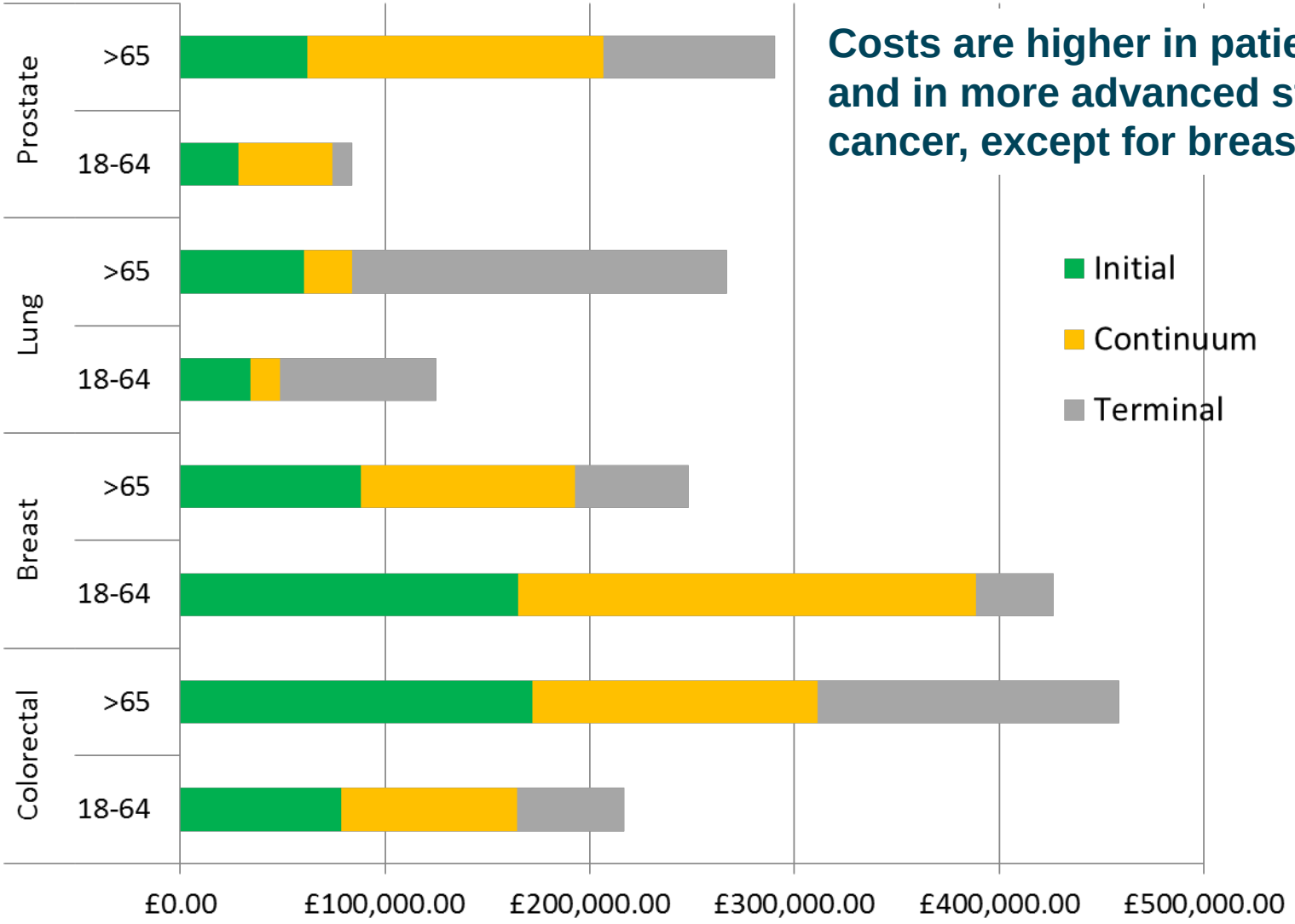
Laudicella M et al. (2016) Cost of care for cancer patients in England: evidence from population-based patient-level data. British Journal of Cancer. 114, 1286–1292

Average incidence cost per cancer patient, 2010



Source: our elaboration of data from Laudicella et al. 2016

Five year prevalence costs in cancer, 2010



Costs are higher in patients >65 and in more advanced stages of cancer, except for breast cancer…

Source: our elaboration of data from Laudicella et al. 2016

Variation in cancer spending and outcomes

- There is geographical variation in health spending and outcomes between areas

- A central issue in health policy concerns the extent to which additional health care expenditure yields patient benefits in the form of improved health outcomes

- But evidence concerning the relationship has been inconclusive, because proving causality is difficult:
  - More spending improves outcomes
  - But spending is higher in areas with poorer outcomes
  - So we may not observe the true effect of spending on health

The role of NICE…

NICE makes decisions on whether drugs and treatments should be available, based on:

- Evidence (RCTs)
- Input from patient organisations, health professionals, experts, and other interested parties such as the manufacturer
- Independent cost-effectiveness analyses

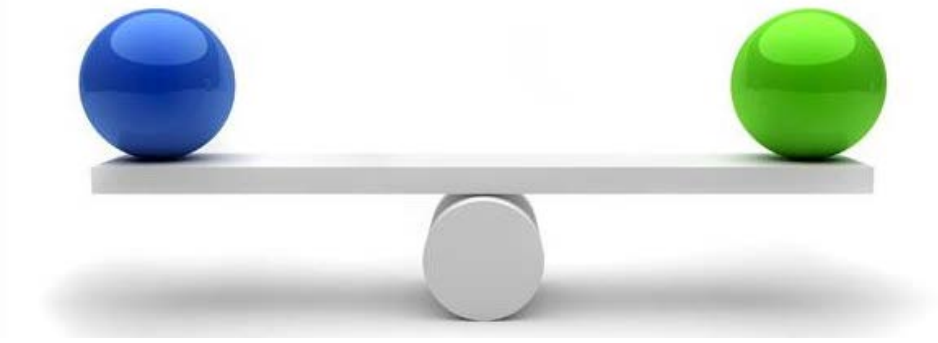
Cost-effectiveness analysis

"*The comparative analysis of alternative courses of action in terms of both their costs and their consequences*"

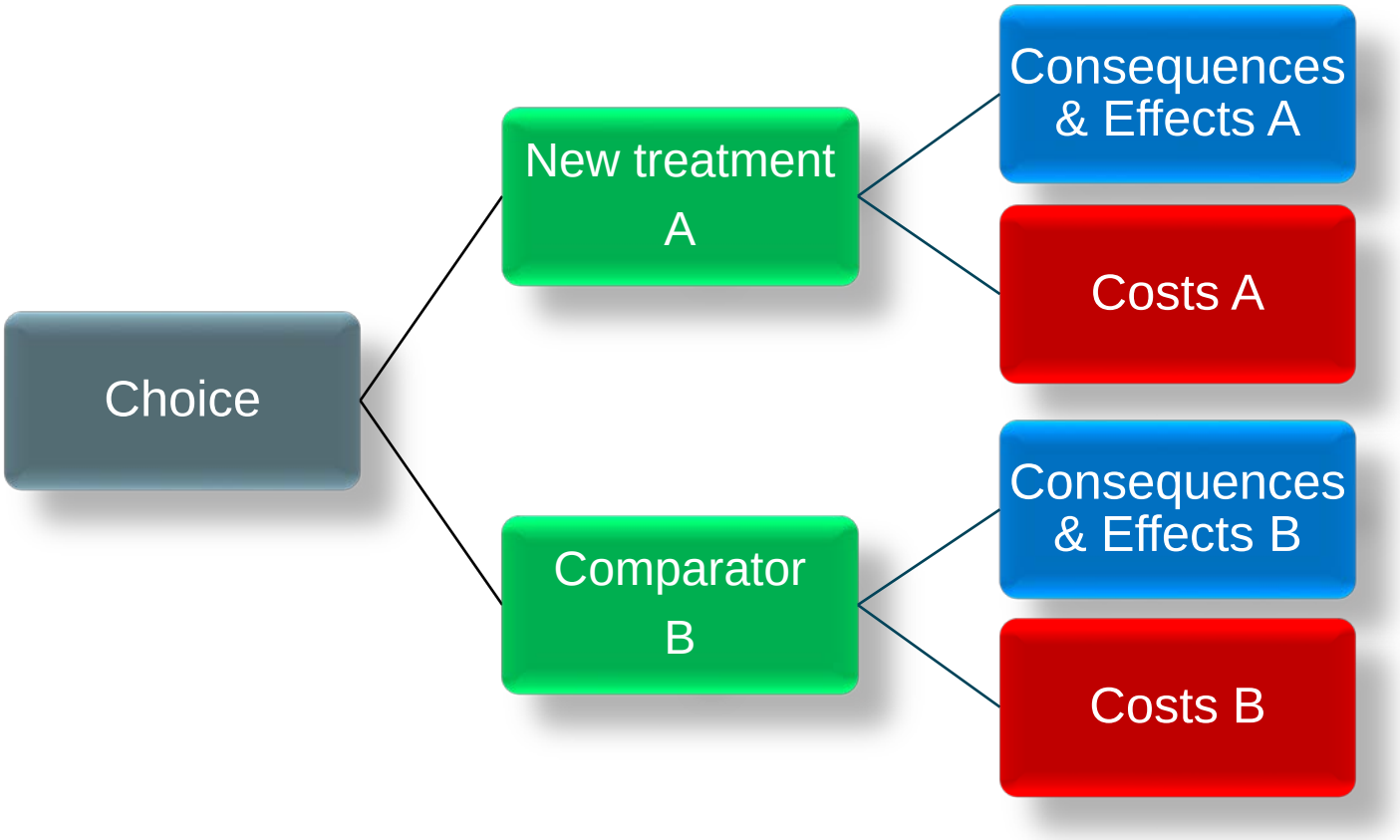
Drummond et al 2005

"Based on the common sense notion that a decision whether to do or not to do something should depend on a weighing up of its advantages (benefits) and disadvantages (costs)"

Morris et al 2007



A comparative analysis…



Costs

- Usually include cost of intervention plus cost savings from improved health (admissions, LOS)
- Perspective e.g. NHS, patients or society
- Resource use
  - Identification of changes in key resource use
  - Measurement of resources in their physical units
- Value of resource use
  - Unit costs usually based on market price

Morris, Devlin & Parkin, 2007. Economic Analysis in Health Care

Consequences

- **Survival…**

- What about **Quality of Life**?

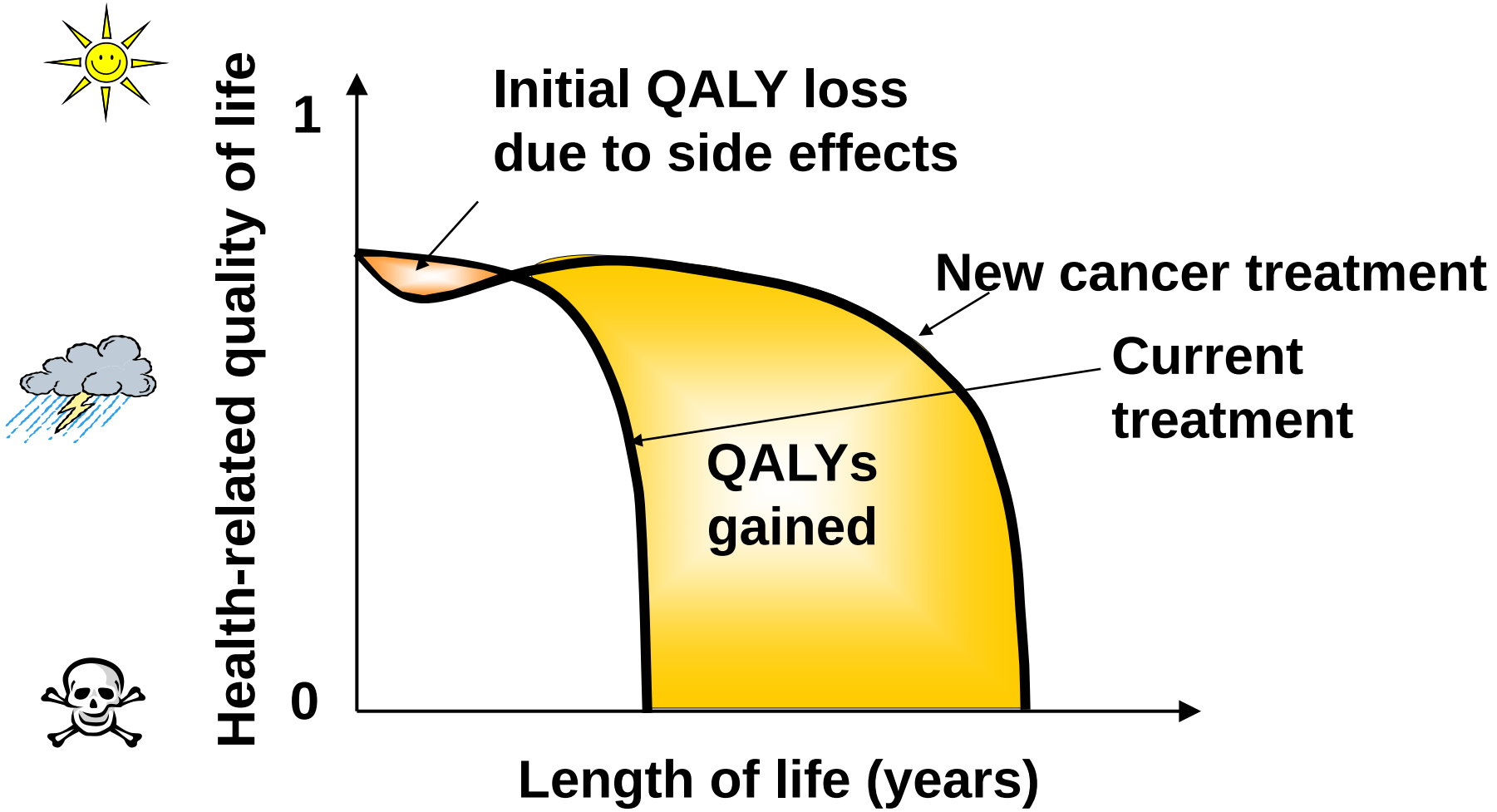
- Quality Adjusted Life Years (QALYs) combine **survival** and **quality of life**

- 1 QALY = one year of healthy life for one person
- Vary between 0 and 1… (negative values?)

- Measured using EuroQoL - EQ5D questionnaires
- To compare treatments within and between patients' groups

Morris, Devlin & Parkin, 2007. Economic Analysis in Health Care

Calculating quality adjusted life years (QALYs)



Morris, Devlin & Parkin, 2007. Economic Analysis in Health Care

Incremental Cost-Effectiveness Ratio

"*What is the difference in costs and the difference in consequences of a New Treatment A compared with the alternative option B?*"

$$ICER = \frac{Costs_A - Costs_B}{Effects_A - Effects_B} = \frac{\Delta C}{\Delta E}$$

How much should we spend extra to gain an extra unit of effect?

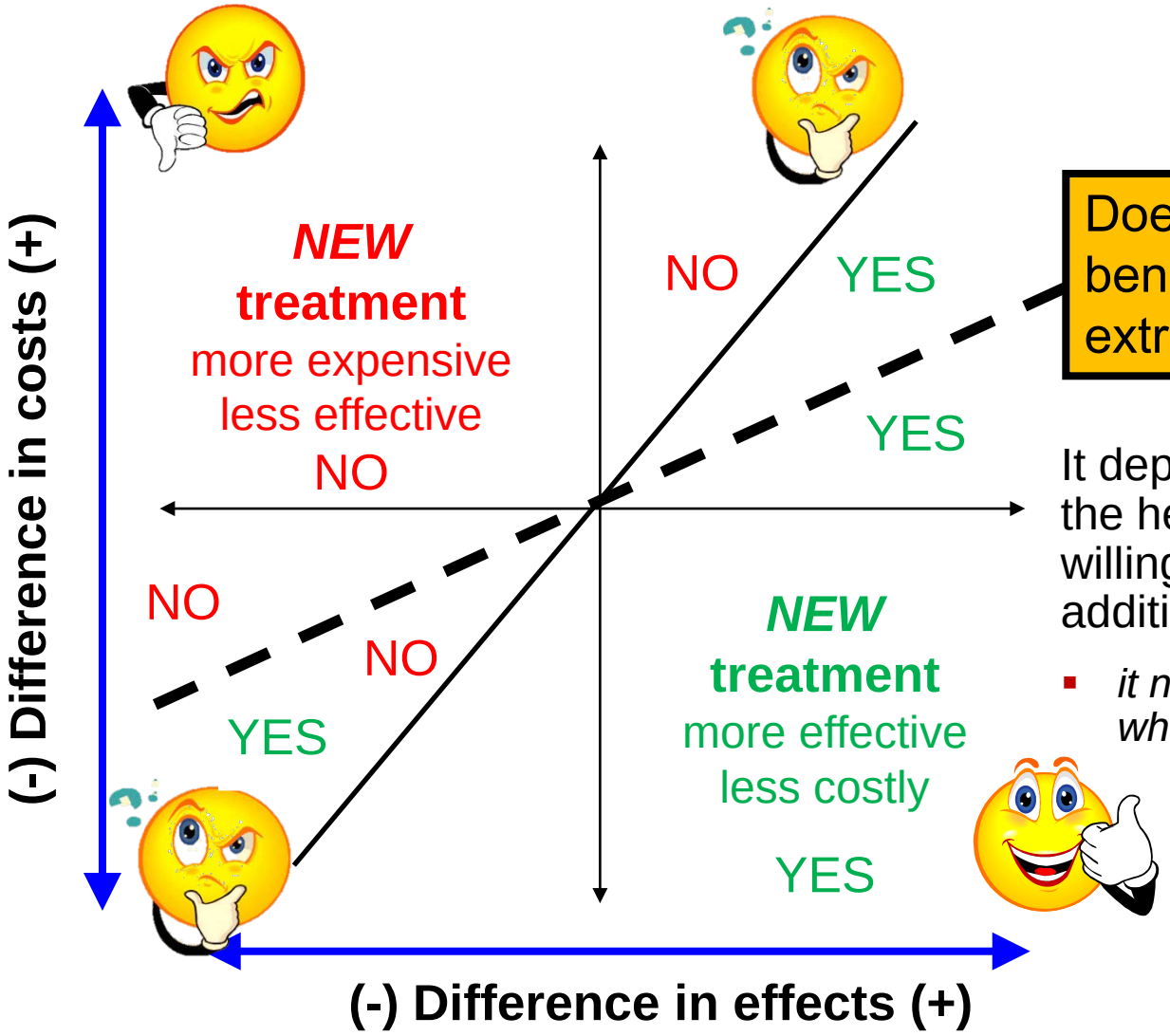
Cost-effectiveness of radiation therapy following conservative surgery for early stage breast cancer

	Cost (US$)	Effect (QALYs)	ICER (US$/QALY)
Conservative surgery plus radiation therapy	27,200	7.19	
Conservative surgery alone	17,400	6.84	
Difference	9,800	0.35	28,000

"Radiation therapy following conservative surgery is cost-effective compared with other accepted medical interventions."

Source: Hayman J., Hillner B., Harris J., Weeks J. Cost-Effectiveness of Routine Radiation Therapy Following Conservative Surgery for Early-Stage Breast Cancer. J Clin Oncol 1998; 16: 1022-9.

Cost-effectiveness plan



It depends on how much the health-care system is willing and able to pay for additional health benefits

- *it needs a threshold of what is acceptable*

Morris, Devlin & Parkin, 2007. Economic Analysis in Health Care

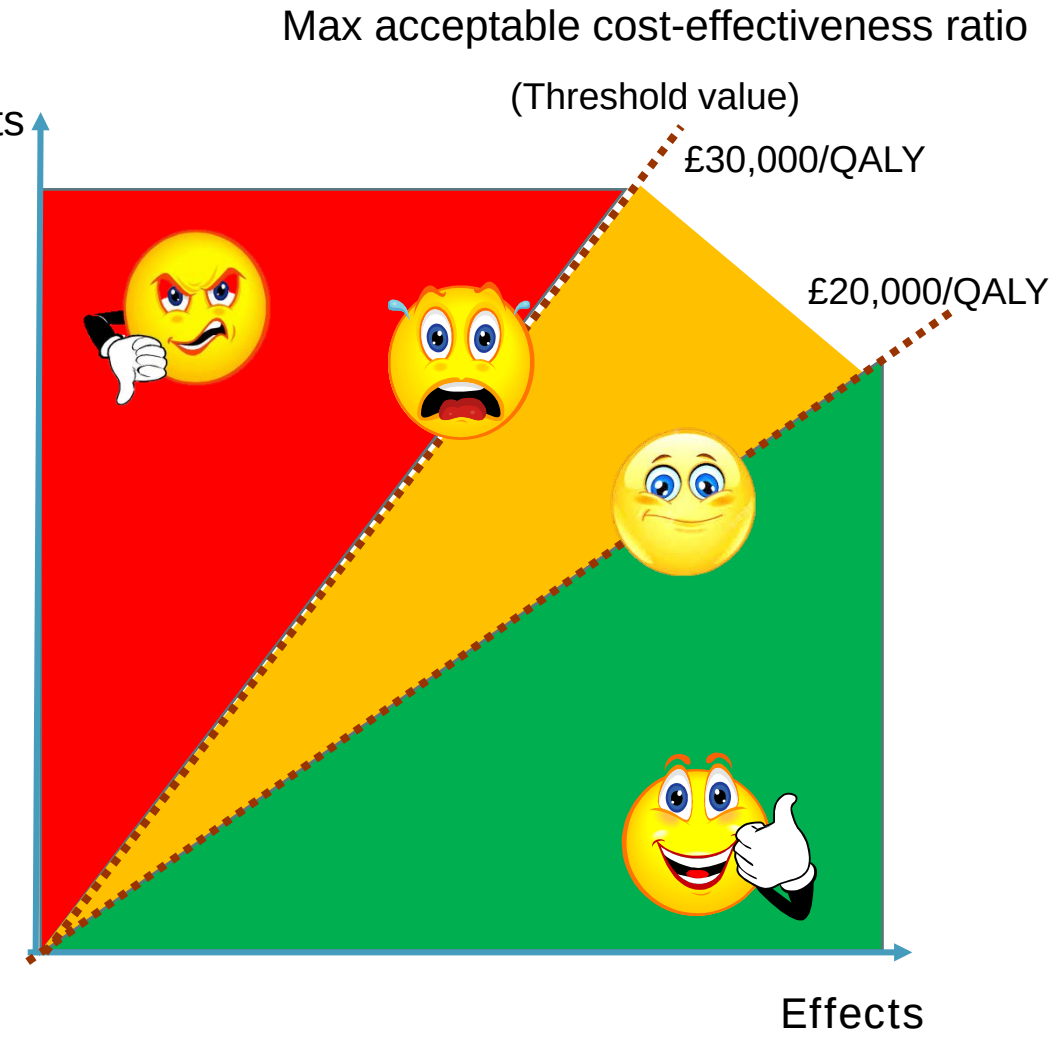
Cost-effectiveness threshold

NICE National Institute for Health and Care Excellence

Cost/QALY<£20,000: likely to be accepted

Cost/QALY £20,000-£30,000: needs additional factors to justify (*)

Cost/QALY>£30,000: these factors have to be increasingly strong



* In Europe:
•Cost/QALY €30,000-€50,000

Morris, Devlin & Parkin, 2007. Economic Analysis in Health Care

NICE decisions between 2000-2017

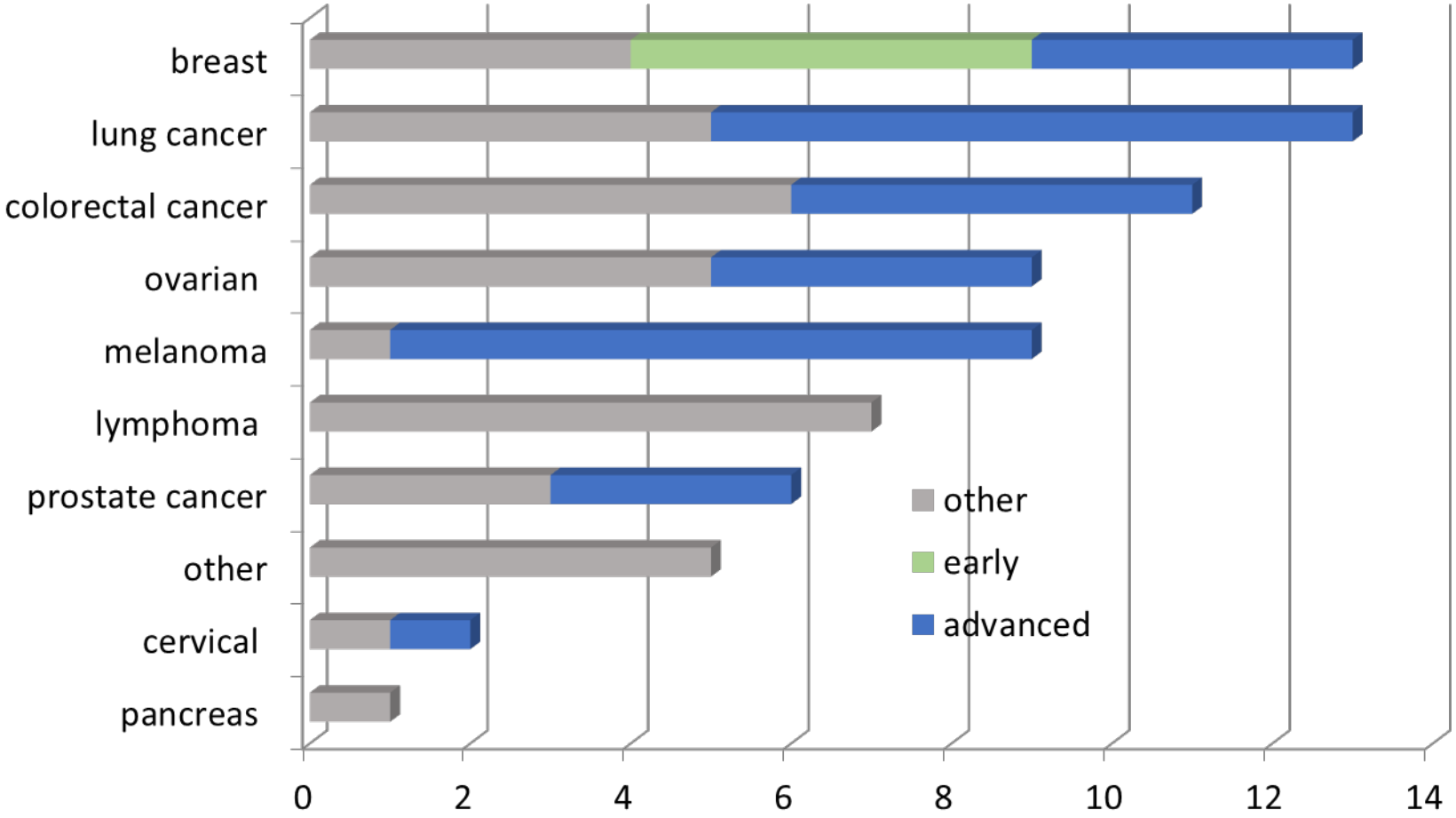
Breakdown of decisions in published technology appraisals for anti-cancer agents.

Recommendations for cancer appraisals	1 March 2000 to 31 May 2017		
	STA	MTA	Total
Yes	63 (53%)	61 (63%)	124 (58%)
Optimised	16 (13%)	3 (3%)	19 (9%)
CDF	1 (1%)		1
Only in research	2 (2%)	6 (6%)	8 (4%)
No	36 (31%)	27 (28%)	63 (29%)
Total	118 (100%)	97 (100%)	215 (100%)

STA: single technology appraisal; MTA: multiple technology appraisal

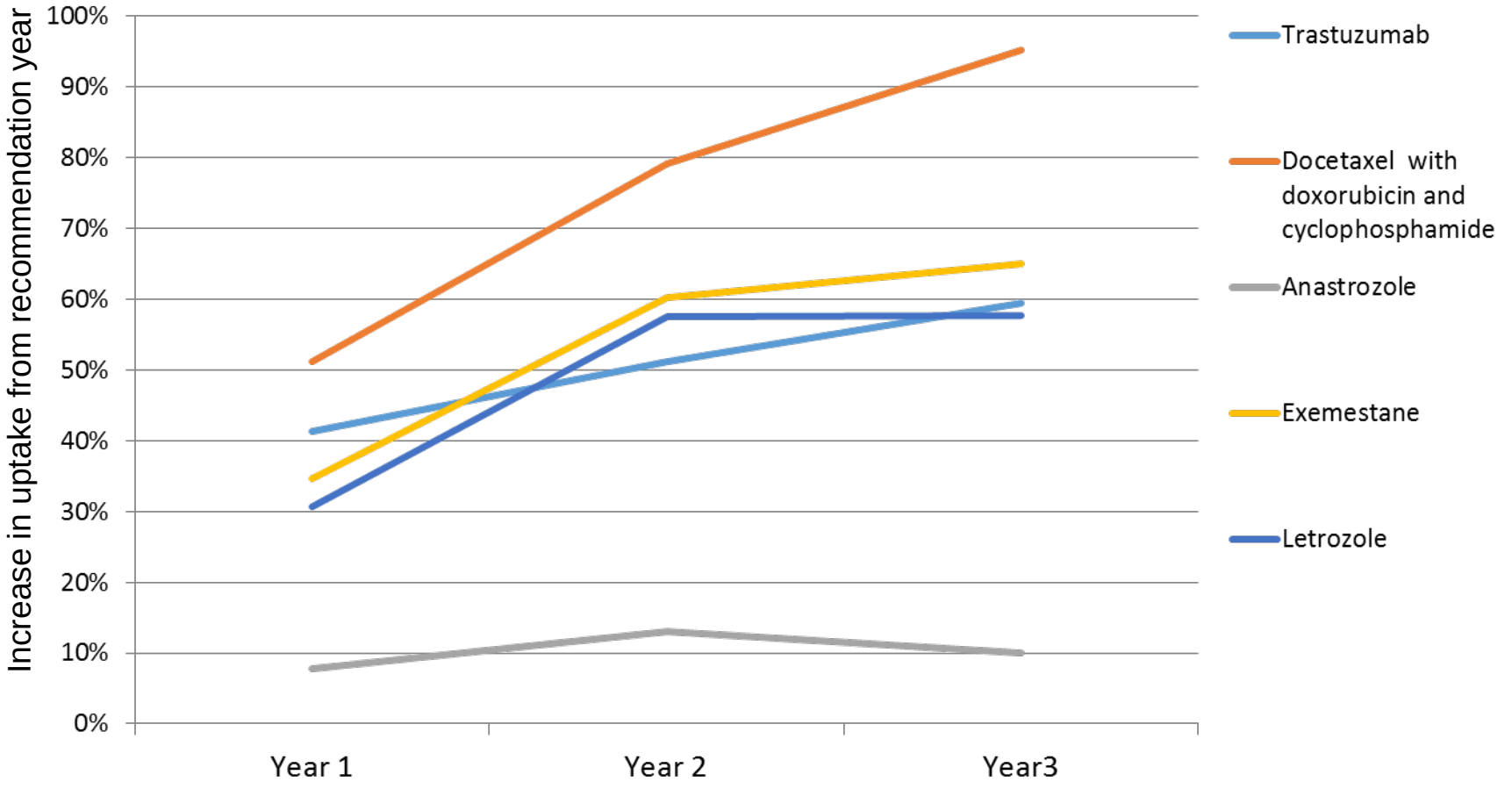
Source NICE data 2017

NICE recommendations for cancer drugs 2000-2017



Source: our elaboration of NICE data 2017

Change in uptake of breast cancer drugs following NICE recommendation



Acknowledgments: Dr Estela Capelas Barbosa, UCL

Source: Hospital Prescribe England 2006 & NICE data

Some challenges…

- What about uptake?
  - e.g. a drug might be cost-effective, but if the extra cost is high and the population size is also high, the budget impact might be massive and not be implementable

- What about patients' and caregivers' needs?
  - Patients and caregivers costs are excluded from the analysis, but travel time and cost influence uptake
  - Are QALYs a good measure?

NICE threshold: is it updated?

What about inflation, increase in R&D costs and drugs' prices?

NICE 'sets price too high for NHS medicines'

By Smitha Mundasad
Health reporter

19 February 2015 | Health

The price the NHS in England agrees to pay for new medicines is too high causing more harm than good overall, an analysis suggests.

How much is a year of life worth?

Chris Cook
Policy editor, BBC Newsnight

29 August 2014 | Health

Drugs for cancer patients are often very expensive

Thinking about the cost-benefit decisions on the affordability of drugs made by the National Institute for Health and Care Excellence (NICE) involves a grim question: how much is a year of life worth? How much should you, the taxpayer, be willing to pay to keep someone alive?

Some potential contributions of health economics in cancer care

- Impact of cancer spending on health outcomes: causality?
- Measuring health outcomes to account for quality of life, survival and patients' needs
- Measuring the costs of services
- Cost-effectiveness of treatments
- Priority setting at the policy level: cancer vs other services
- Optimal configuration of services (screening, diagnosis, treatment, palliative care)

Conclusion

- Some form of rationing is essential, but economic evaluation has its own limits
- There is an infrastructure, but it is not perfect
- Data are not always complete or up to date

A final plea, please…

- More interaction between cancer professionals, researchers, policy makers, industry, health economists and patients

Thank you

Dr Elena Pizzo
e.pizzo@ucl.ac.uk

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