Zorginstituut Nederland

Making Opportunity Costs Visible: The Netherlands' Opportunity Cost Calculator

Joost Enzing, PhD, Zorginstituut Nederland

Symposium 'Using Economic Evaluation in Decision Making: Learning from International Innovations'

| Van goede zorg verzekerd |

13 maart 2025

Opportunity Cost Calculator

Presentatie van de **O**pportuniteitskosten van **I**ntroductie van **N**ieuwe (medische) **T**echnologieën 1.0 (POINT 1.0)

- Why was it developed?
- What is it?
- How do we use it?

Opportunity cost

Opportunity cost = Profit of not chosen option – Profit of chosen option

Profit doesn't have to be money; in Point 1.0 it is health: QALYs.

Quality Adjusted Life Years (generic outcome based on survival and quality of life)

Why was it developed?

Universal Health Coverage in the Netherlands

- Private insurance system within public boundaries

- Participation to the basic package is mandatory

- Basic benefit package defined by the government (= task of Zorginstituut)

Managing the content of the basic benefit package

The four package criteria

1. Effectiveness (knock out criterion)

   Is here evidence that a given treatment works?

2. Necessity

   Is the disease serious enough? Is insurance the right instrument?

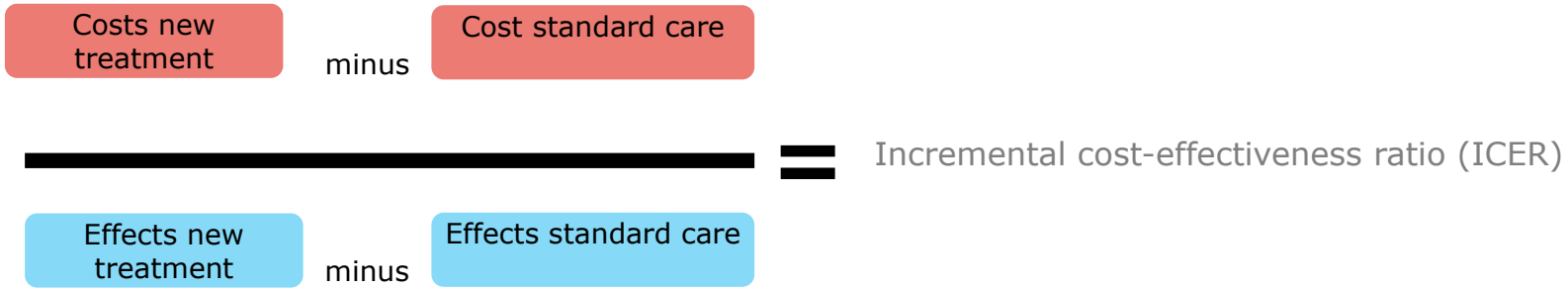
3. Cost-effectiveness

   Is the ratio between the costs of a treatment and its results acceptable?

4. Feasibility

   Is inclusion of a given treatment in the package sustainable and feasible?

Cost-effectiveness (value-for-money, maximizing health)



Cost-effectiveness: Example

	Societal perspective The Netherlands
Costs (€)	
Nusinersen	€2,811,870
Onasemnogene abeparvovec	€4,129,150
Incremental costs	€1,317,280
QALYs	
Nusinersen	4.44
Onasemnogene abeparvovec	9.44
Incremental QALYs	5.00
ICER (€/QALY)	€263,389

Abbreviations: ICER, incremental cost-effectiveness ratio; QALY, quality-adjusted life year

4,129,150 - 2,811,870 = €**1,317,280**

9.44 – 4.44 = **5 QALY**

1,317,280/5 = **€263,389/QALY**

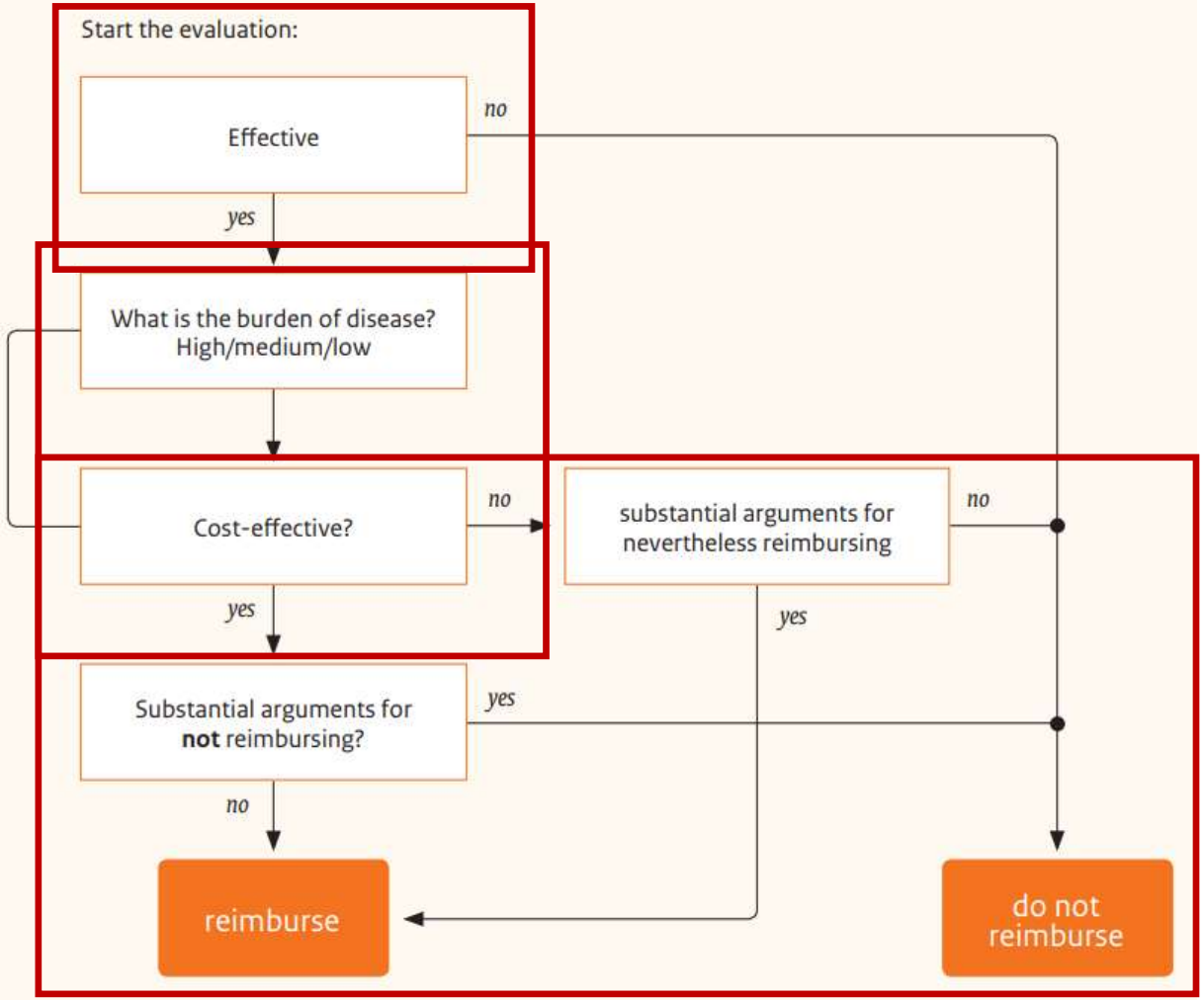
– Is it (too) high?

Dutch willingness to pay (WTP) reference values

Burden of disease	Maximum additional costs (€) per QALY
0.1 to 0.4	Up to €20,000 per QALY
0.41 to 0.7	Up to €50,000 per QALY
0.71 to 1.0	Up to €80,000 per QALY

€263,389/QALY > €80.000/QALY

Appraisal


Start the evaluation:
Effective
no
yes
What is the burden of disease?
High/medium/low
Cost-effective?
no
yes
substantial arguments for
nevertheless reimbursing
no
yes
Substantial arguments for
not reimbursing?
yes
no
reimburse
do not
reimburse

Package Advisory Committee (appraisal committee)

ethical experts,
patients,
long-term care,
political,
health economics,
HTA,
sociology,
psychology.









Appraisal: the Package Advisory Committee (ACP)

- Societal arguments: rarity, life-threatening disease, children, no alternative treatment options and **DISPLACEMENT**

Need for substantiation of displacement argument

- Is there **evidence of displacement of care** in the Netherlands that can improve the substantiation of our 'negative' advice (based on ICER > € 80.000/QALY) and thus increase public support?

- **What happens to current hospital care** if a new, expensive medicine is included in the basic benefit package and hospitals provide it from their fixed budget?

  - Are certain patient groups '**victims**' of the reimbursement of interventions with an unfavorable ICER?

  - **Can more health be gained** by spending the budget on hospital care instead of on interventions with an unfavorable ICER? → What are the marginal benefits of hospital care spending in the Netherlands? → Needed to calculate opportunity costs

What is it?

Research into displacement within the Dutch healthcare system

- This research consisted of a quantitative and a qualitative part (84 interviews using cases, looking into mode of action).
- Research conducted by a consortium consisting of Maastricht University, Ecorys Netherlands, VU Amsterdam and UMC Utrecht, led by Radboud UMC.
- As part of this research the ‘Opportunity Cost Calculator’ was developed.

How did the researchers estimate marginal benefits?

- Quantitative part
- Elasticity expressed in cost per QALY at the margin
- Per gender, age group and disease group

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RESEARCH ARTICLE

WILEY Health Economics

The marginal benefits of healthcare spending in the Netherlands: Estimating cost-effectiveness thresholds using a translog production function

Niek Stadhouders[1] | Xander Koolman[2] | Christel van Dijk[3] | Patrick Jeurissen[1] | Eddy Adang[4]

[1] Scientific Institute for Quality of Healthcare, Radboud University Medical Center, Nijmegen, Netherlands

[2] Talma Institute, Department of Health Sciences, VU University Amsterdam, Amsterdam, Netherlands

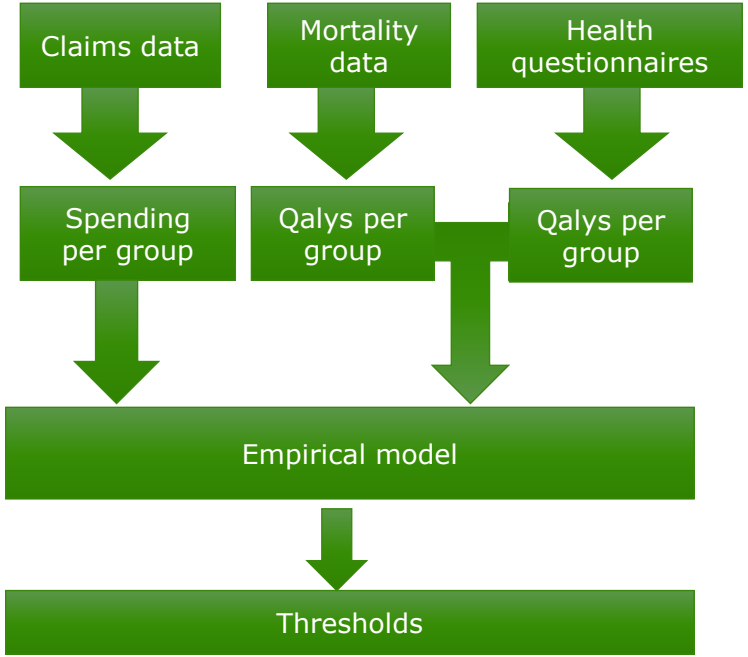
[3] National Health Care Institute, Diemen, Netherlands

[4] Radboud Institute for Health Sciences, Radboud University Medical Center, Nijmegen, Netherlands

Correspondence

Abstract

New technologies may displace existing, higher-value care under a fixed budget. Countries aim to curtail adoption of low-value technologies, for example, by installing cost-effectiveness thresholds. Our objective is to estimate the opportunity cost of hospital care to identify a threshold value for the Netherlands. To this aim, we combine claims data, mortality data and quality of life questionnaires from 2012 to 2014 for 11,000 patient groups to obtain quality-adjusted life-year (QALY) outcomes and spending. Using a fixed effects translog model, we estimate that a 1% increase in hospital spending on average increases QALY outcomes by 0.2%. This implies a threshold of €73,600 per



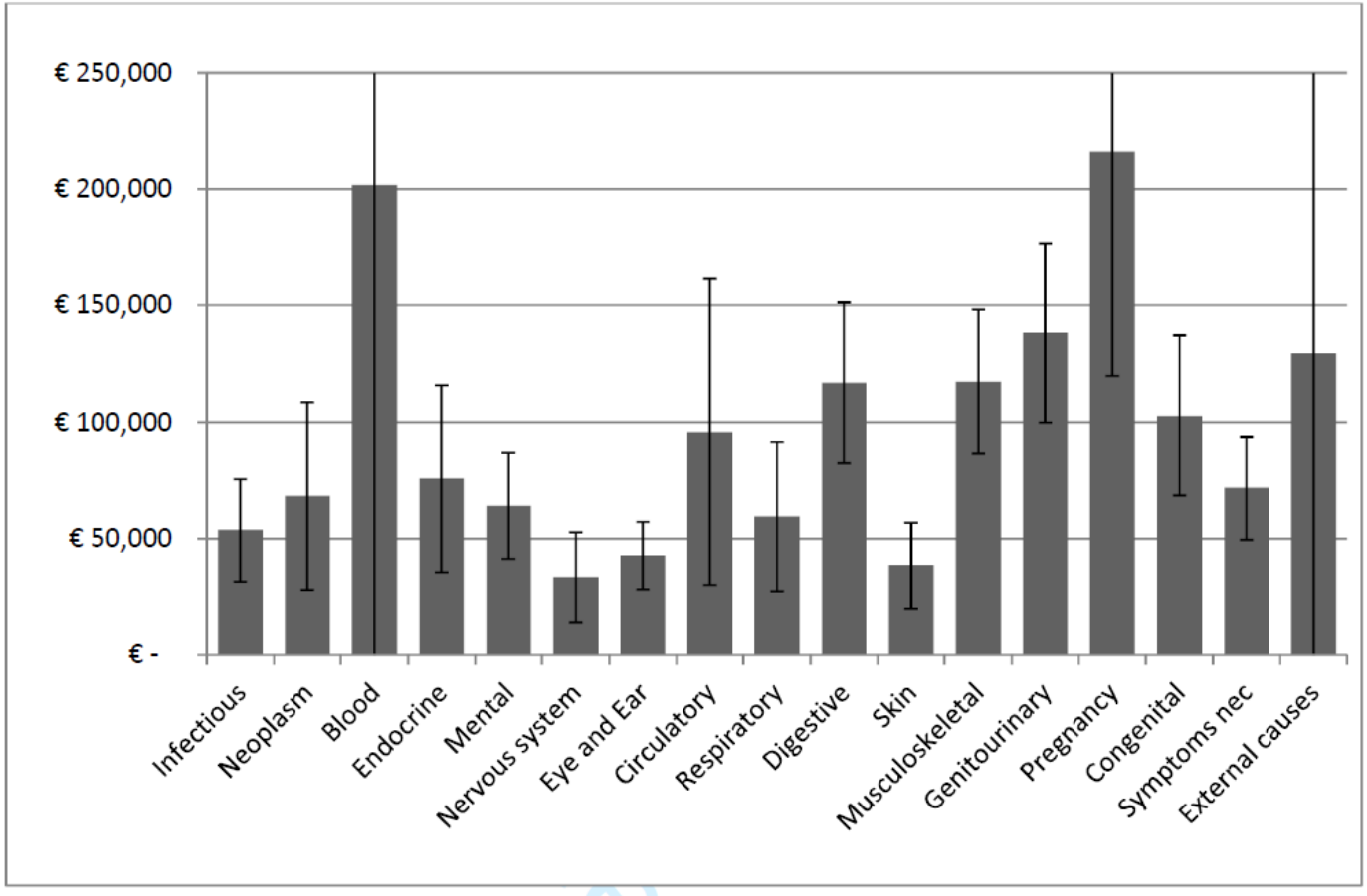


Figure 3. Estimated thresholds in 2014 euro per QALY for patient groups within ICD-10 categories.

Effect on population health of an additional spending of €1 million

Categorie	Investering bij 1 miljoen extra uitgaven	grenswaarde	Aantal QALYs winst
infectieziekten	€ 58.041	€ 53.500	1,08
nieuwvormingen	€ 266.065	€ 68.300	3,89
bloedziekten	€ 60.882	€ 201.800	0,30
endocriene aandoeningen	€ 68.312	€ 75.700	0,90
psychische aandoeningen	€ 63.985	€ 64.000	1,00
zenuwziekten	€ 58.779	€ 33.500	1,76
oog- en oorziekten	€ 3.124	€ 42.700	0,07
hart- en vaatziekten	€ 26.438	€ 95.700	0,28
longziekten	€ 28.354	€ 59.600	0,48
gastrointestinale ziekten	€ 58.778	€ 116.800	0,50
huidziekten	€ 40.515	€ 38.500	1,05
botspierziekten	€ -	€ 117.200	0

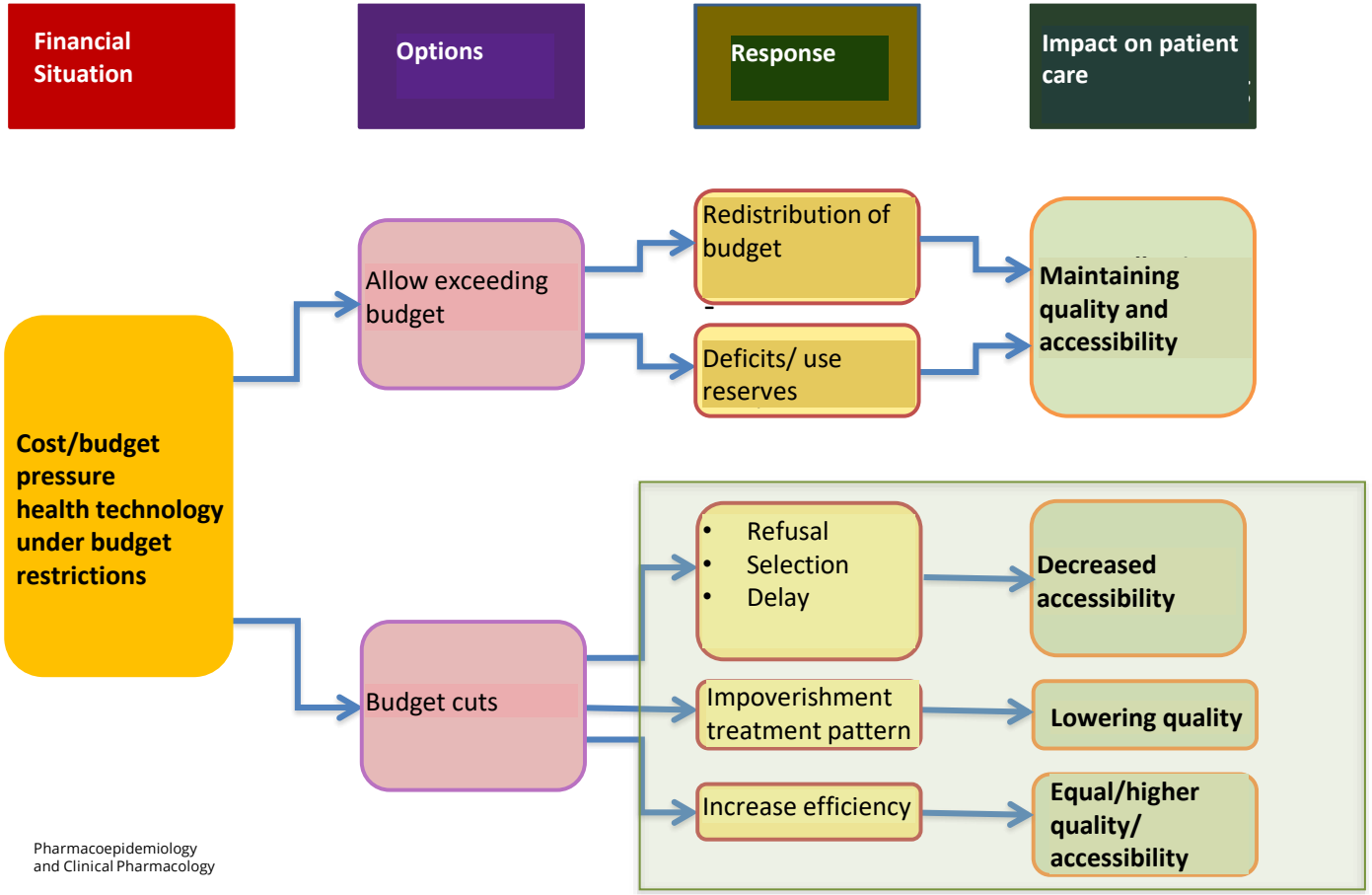
What does the research show?

The quantitative research:

- The study shows that at population level the marginal cost-effectiveness of regular hospital care is around **€74,000 per QALY**. This means, under a set of stringent assumptions, that new reimbursed care with a higher incremental cost-effectiveness ratio (ICER) will lead to **displacement** of regular supply.

The qualitative research:

- At the level of the individual practitioner and the hospital, it is clear that budgetary pressure, partly caused by reimbursement of expensive new hospital drugs, leads to **reduced accessibility (waiting list) and impoverishment of care** (earlier dismissal). However, it also leads to greater efficiency in healthcare provision.
- It is clear that doctors select patients based on medical urgency in times of scarcity. **Acute and oncological patients are then given priority** over plannable and non-oncological care.
- Displacement probably does not occur at the level of interventions.


Financial Situation
Options
Response
Impact on patient care
Cost/budget pressure health technology under budget restrictions
Allow exceeding budget
Budget cuts
Redistribution of budget
Deficits/ use reserves
Maintaining quality and accessibility
Refusal
Selection
Delay
Decreased accessibility
Impoverishment treatment pattern
Lowering quality
Increase efficiency
Equal/higher quality/ accessibility

POINT 1.0: Input

P.O.I.N.T.	Presentatie van de Opportuniteitskosten van Introductie van Nieuwe (medische) Technologieën
Versie 1.0	

☑ toelichting

Budgetimpact nieuwe technologie	84,4	Miljoen euro
Kosteneffectiviteit nieuwe technologie	403.000	Euro per QALY

☑ meer opties

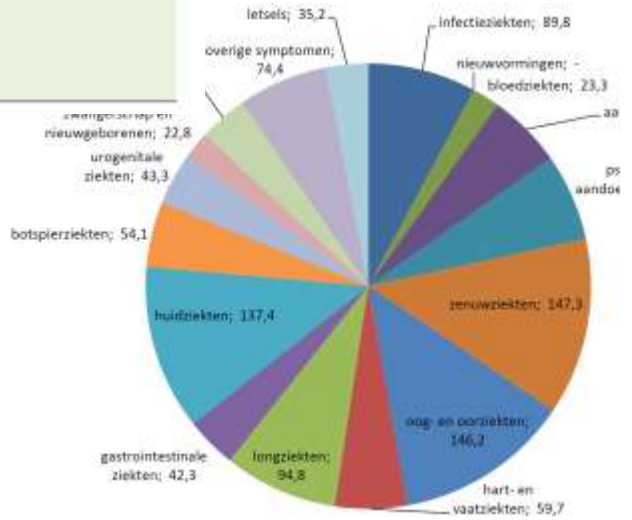
Parameters	
1. Open of gesloten budget	gesloten
2. Toestaan non-lineairiteit	ja
3. Engelse verdringingswaarden	nee
4a. Extra verdringing binnen ziektecategorie	0%
4b. ICD-hoofdstuk nieuwe technologie	alle hoofdstukken
5. Berekening uitgaven-elasticiteit	historisch
6. Eigen referentiewaarde	per QALY

Voor uitgebreide toelichting, zie document: Handleiding bij POINT 1.0
De uitkomsten worden berekend op basis van het rapport Verdringingseffecten binnen het Nederlandse zorgstelsel: op weg naar transparantie (te verschijnen) -->
<-- Vul hier de budgetimpact in miljoenen euro's in
<-- Vul hier de kosteneffectiviteitsratio (ICER) in van het nieuwe geneesmiddel
1. Bij een open budget (standaard) gaat het nieuwe geneesmiddel ten koste van andere investeringen, bij een gesloten budget gaat het nieuwe geneesmiddel ten koste van bestaande zorg.
2. Bij non-lineairiteit heeft een hogere budgetimpact effect op de drempelwaarde. Als non-lineairiteit niet wordt toegestaan is sprake van een lineaire relatie tussen uitgaven en uitkomsten, en heeft de budgetimpact geen invloed.
3. Standaard worden de empirische waarden uit het Nederlandse onderzoek naar verdringing gebruikt. In de VK wordt een andere metodologie gebruikt, die lagere drempelwaarden oplevert.
4a. Standaard nemen we aan dat de kosten van een nieuwe technologie over de hele ziekenhuiszorg wordt verdeeld. Het percentage van de kosten die binnen een afdeling extra wordt verdrongen kan worden verhoogd.
4b. Kies het betreffende ICD-hoofdstuk van de nieuwe technologie
5. Standaard wordt budgetdruk verdeeld op basis van historische verandering in uitgaven tussen 2012 en 2014. Alternatief is om budgetdruk proportioneel aan totale uitgaven over categorieën te verdelen.
6. Hier valt een eigen referentiewaarde in te vullen, bijvoorbeeld 80.000 euro per QALY.

POINT 1.0 Output

Uitkomsten	
Aantal gewonnen QALYs	209
Aantal verloren QALYs	1145
Drempelwaarde	€ 73.711
Is de toelating kosteneffectief?	nee
Vereiste prijsdaling	82%

Netto gezondheidseffect	
-936	QALYs



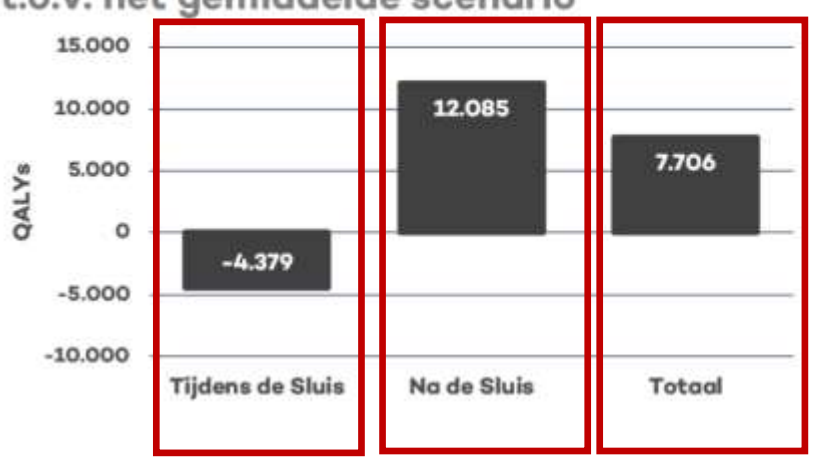
How is it used?

Expensive inpatient pharmacy: waiting lock

More health thanks to the lock (2015-2021)

– Expensive inpatient pharmacy: waiting lock

Figuur 12: Totale gezondheidseffecten (QALYs) en budgeteffecten van de sluis t.o.v. het gemiddelde scenario



Advice of the ACP

"In order to be able to make a statement about this, the committee uses so-called reference values for cost-effectiveness. These reference values should be understood as maximum amounts that we as a society want to invest in a treatment per year of life gained. If we go above that, then there is a question of displacement. This means that for **the same amount more health gain can be obtained by spending it on other treatments**. There must therefore be very good reasons to accept a cost-effectiveness equal to the reference value or even more than the reference value." (ACP, 2021) (tucatinib + trastuzumab + capecitabine)

"However, from a social perspective, it is not justifiable to spend so much money on one drug. A member points to a point that was also on the agenda today: the problems in elderly care. **For 1-3 million euros, which you gain one year of life in good health (QALY) with the treatment of Pompe disease, you could hire approximately 20-60 nurses annually to care for the elderly.**" (ACP, 2024) (avalglucosidase alfa)

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The impact of different types of NHS expenditure on health: Marginal cost per QALY estimates for England for 2016/17

Stephen Martin [a], Karl Claxton [b], James Lomas [a,*], Francesco Longo [b]

[a] Department of Economics, University of York, York YO10 5DD UK
[b] Centre for Health Economics, University of York, York YO10 5DD, UK

ARTICLE INFO

Keywords:
Healthcare productivity
Healthcare expenditure
Mortality
Two-stage least squares estimation
Cost per quality-adjusted life year

ABSTRACT

English data from 2003 to 2012 suggests that it costs the NHS £10,000 to generate an additional quality-adjusted life year (QALY). This estimate relates to all NHS expenditure and no attempt was made to explore possible heterogeneity within this total. Different types of expenditure – such as secondary care, primary care and specialized commissioning – may have different productivities and estimates of these may help policymakers decide where additional investment is most beneficial. We use the two-stage least squares estimator and data for 2016 to explore the mortality response to three types of healthcare expenditure. Three specifications are estimated for each type of expenditure: backward selection and regularized regression are used to identify parsimonious specifications, and a full specification with all covariates is also estimated. The regression results are combined with information about survival and morbidity disease burden to calculate the marginal cost per QALY for each type of expenditure: the most conservative results suggest that this is about £8,000 for locally (CCG) commissioned services, while estimates for specialized commissioning and primary care are more uncertain. When this heterogeneity is taken into account, the estimated marginal cost per QALY for all NHS expenditure increases slightly, from about £6,000 to £7,000. Our results suggest that additional investment is likely to be most productive in primary care and in locally commissioned services.

Interpretation During 2000–20, NHS coverage of new drugs displaced more population health than it generated. Our results highlight the inherent trade-offs between individuals who directly benefit from new drugs and those who forgo health due to the reallocation of resources towards new drugs.

Population-health impact of new drugs recommended by the National Institute for Health and Care Excellence in England during 2000–20: a retrospective analysis

Huseyin Naci, Peter Murphy, Beth Woods, James Lomas, Jinru Wei, Irene Papanicolas

Summary

Background Health systems experience difficult trade-offs when paying for new drugs. In England, funding recommendations by the National Institute for Health and Care Excellence (NICE) for new drugs might generate health gains, but inevitably result in forgone health as the funds cannot be used for alternative treatments and services. We aimed to evaluate the population-health impact of NICE recommendations for new drugs during 2000–20.

Methods For this retrospective analysis, we identified technology appraisals for new drugs in England published in NICE's publicly available database of appraisals between 2000 and 2020. We excluded products with terminated appraisals, not recommended, or subsequently withdrawn from the market and excluded appraisals in programmes focusing on medical devices, diagnostics, or interventional procedures. We included drugs that underwent NICE appraisal within 5 years of initial regulatory approval. We collected data on drug name, appraised indication, and specific features of both the drug and its appraisal. We noted the value for money offered by new drugs, expressed as the incremental cost-effectiveness ratio (ICER), and data on health benefits, expressed as quality-adjusted life-years (QALYs). We estimated the number of patients receiving new drugs recommended by NICE using proprietary data on the total volumes of new drugs sold in England between Jan 1, 2000, and Dec 31, 2020. We calculated the net health effect of each appraisal using the difference between the incremental QALY gains from implementing the new drug within the National Health Service (NHS) and the estimated QALYs that could hypothetically be obtained by reallocating the same funds to other NHS services or treatments. We obtained forgone QALYs by dividing the incremental cost of the new drug by the health-opportunity cost of NHS expenditure.

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Department of Health Policy, London School of Economics and Political Science, London, UK (H Naci PhD); **Centre for Health Economics** (P Murphy PhD, B Woods PhD) **and Department of Economics and Related Studies** (J Lomas PhD), **University of York, York, UK; Centre for Health System Sustainability, School of Public Health, Brown University, Providence, RI, USA** (J Wei MSc, I Papanicolas PhD)

Correspondence to:

Thanks for your attention & enjoy the coffee!

https://www.iqhealthcare.nl/nl/kennisbank/tools/point-10-verdringingseffecten-zichtbaar-maken/

Zorginstituut Nederland

Joost Enzing, PhD

jenzing@zinl.nl