Cancer screening & early diagnosis: evaluating what works from the health economic perspective

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Overview

The cost-effectiveness analysis (CEA) framework & screening

CEAs of cancer screening in Ireland

The role of the National Screening Advisory Committee (NSAC)

The cost-effectiveness threshold

The CervicalCheck controversy, media & public understanding

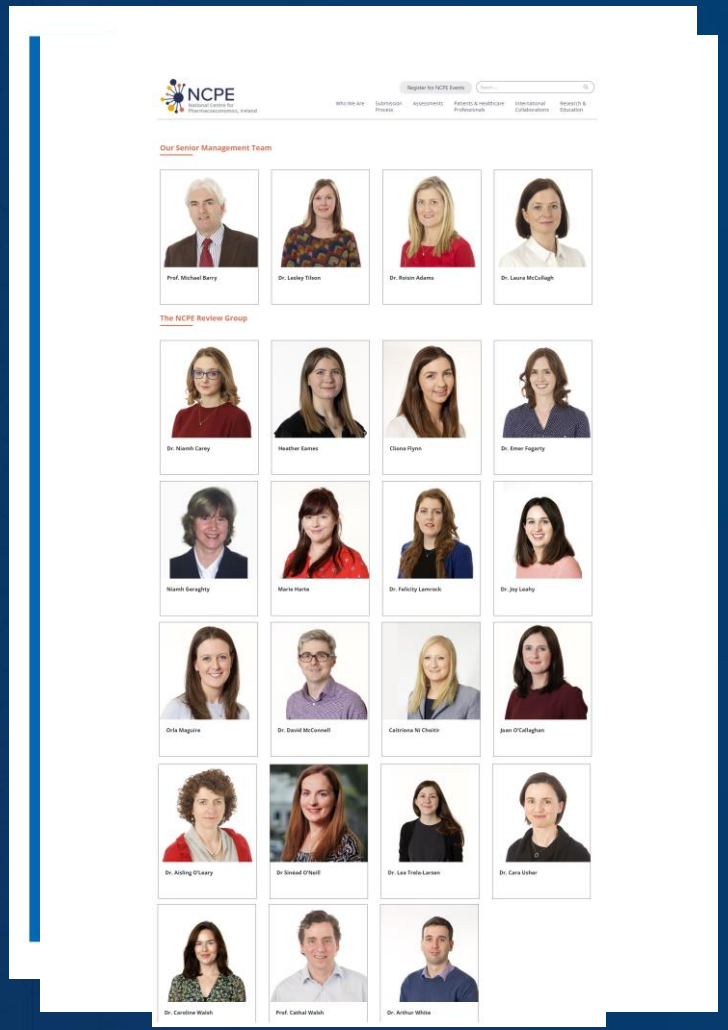
Cost-Effectiveness Analysis (CEA)

CEA methods well established
- including quality-adjusted life years (QALYs) to appraise effects
- Ireland a relatively early adopter internationally

HIQA publish our national guidelines

Principles of CEA recognised in Irish law (2013 Health Act)
- Specific context is provision of drugs
- Could arguably apply more broadly
- Does not oblige HSE to fund cost-effective interventions

CEA most routinely practiced regarding drugs
- By National Centre for Pharmacoeconomics (NCPE)



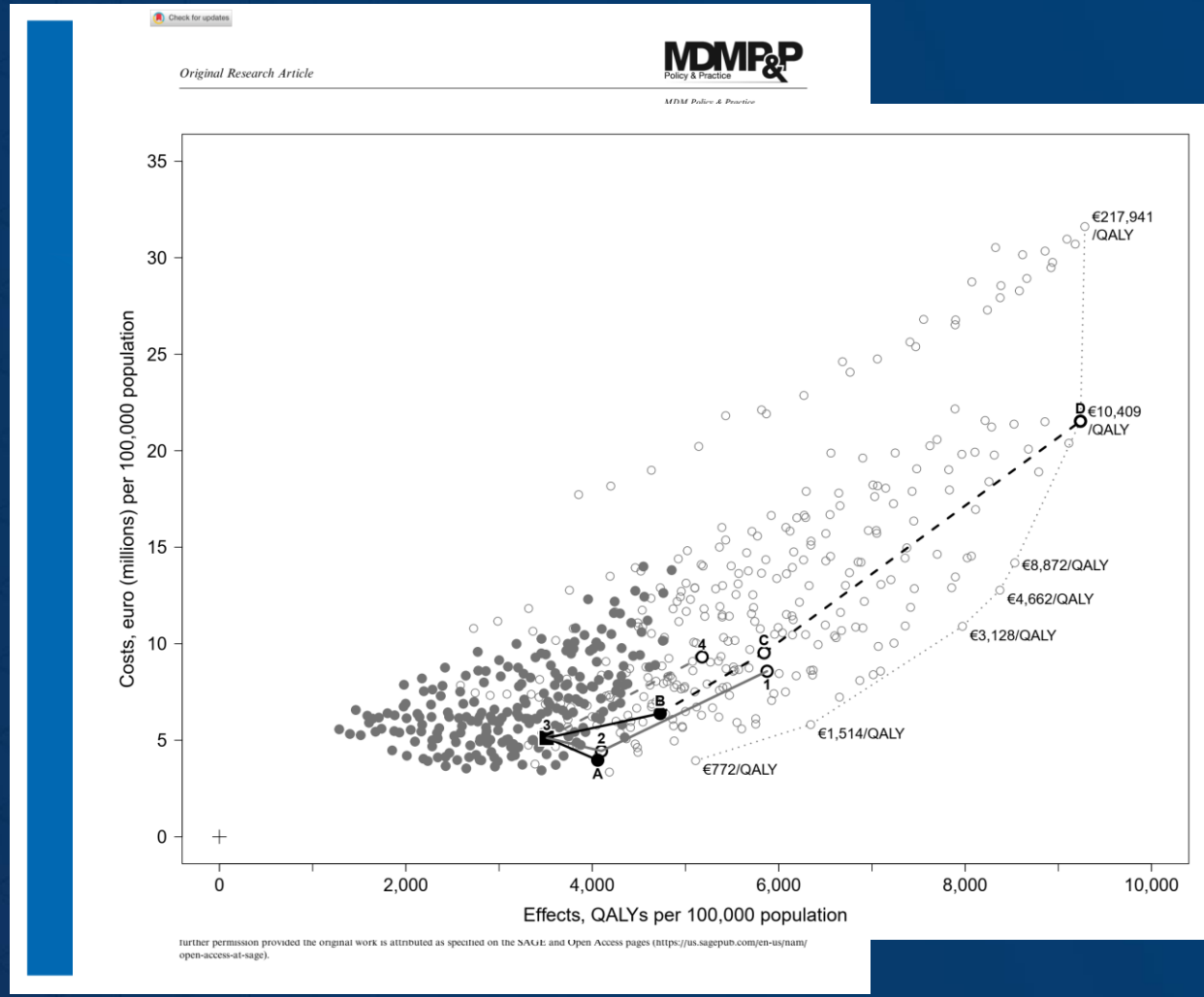
CEAs of Screening in Ireland

Typically assessed using simulation models:

- Simulate the natural history of disease (a difficult task)
- Impose estimates of screen test performance: estimate true positives & false negatives
- Estimate costs and effects for a range of strategies and pick the most cost-effective

CEAs of Screening by HIQA

2009 HTA for Colorectal Cancer Screening
- Important for establishing BowelScreen
- Constrained by capacity & few strategies considered
- We are far under optimal screening intensity



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VALUE IN HEALTH ▮ (2015) ▮▮▮–▮▮▮

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HIQA's CEA of Breast Screening: Pragmatic Policy Recommendations are Welcome, but ACERs Reported as ICERs are Not

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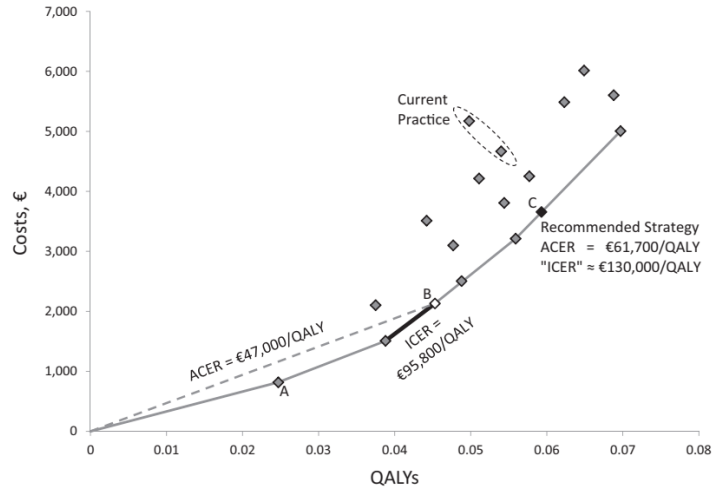

Fig. 1 – A cost-effectiveness plane from HIQA's analysis for the BRCA 2 subgroup showing the differences between ACERs and ICERs. ACER, average cost-effectiveness ratio; HIQA, Health Information and Quality Authority; ICER, incremental cost-effectiveness ratio; QALY, quality-adjusted life-year.

Published by Elsevier Inc.
http://dx.doi.org/10.1016/j.jval.2015.08.009

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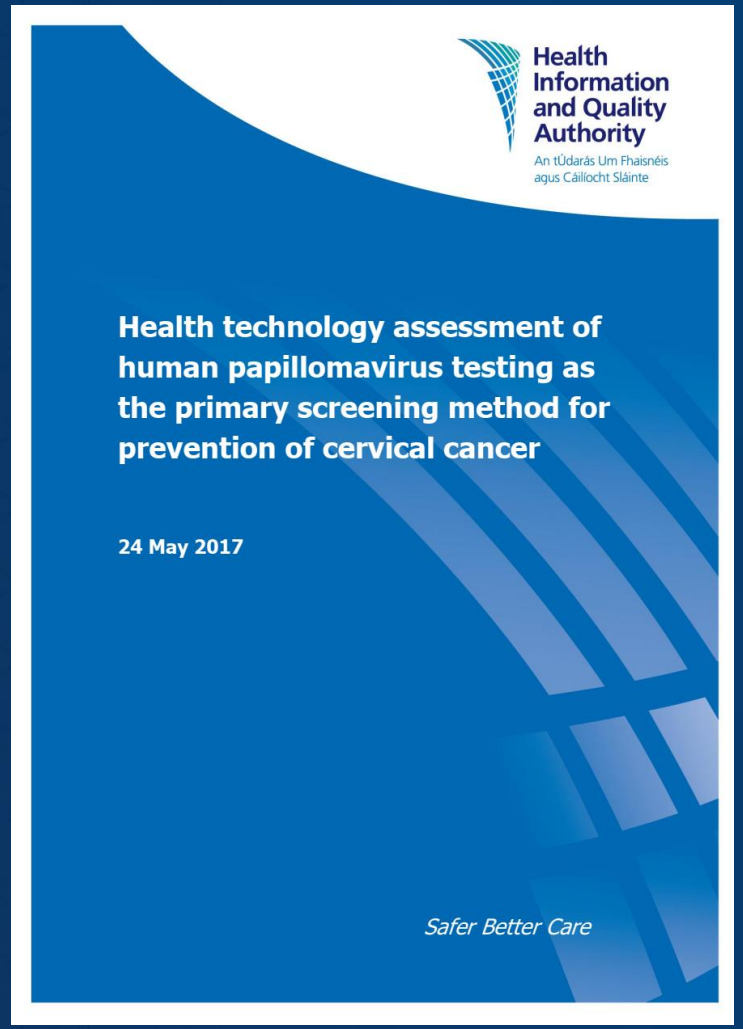
2017 HTA of HPV testing for cervical cancer screening
- Showed moving to HPV-based screening is cost-effective
- Did not consider significant reduction in screening intensity
- Current frequency & age range too intensive to be cost-effective



Screening Not Yet Subject to Irish CEA

Breast screening

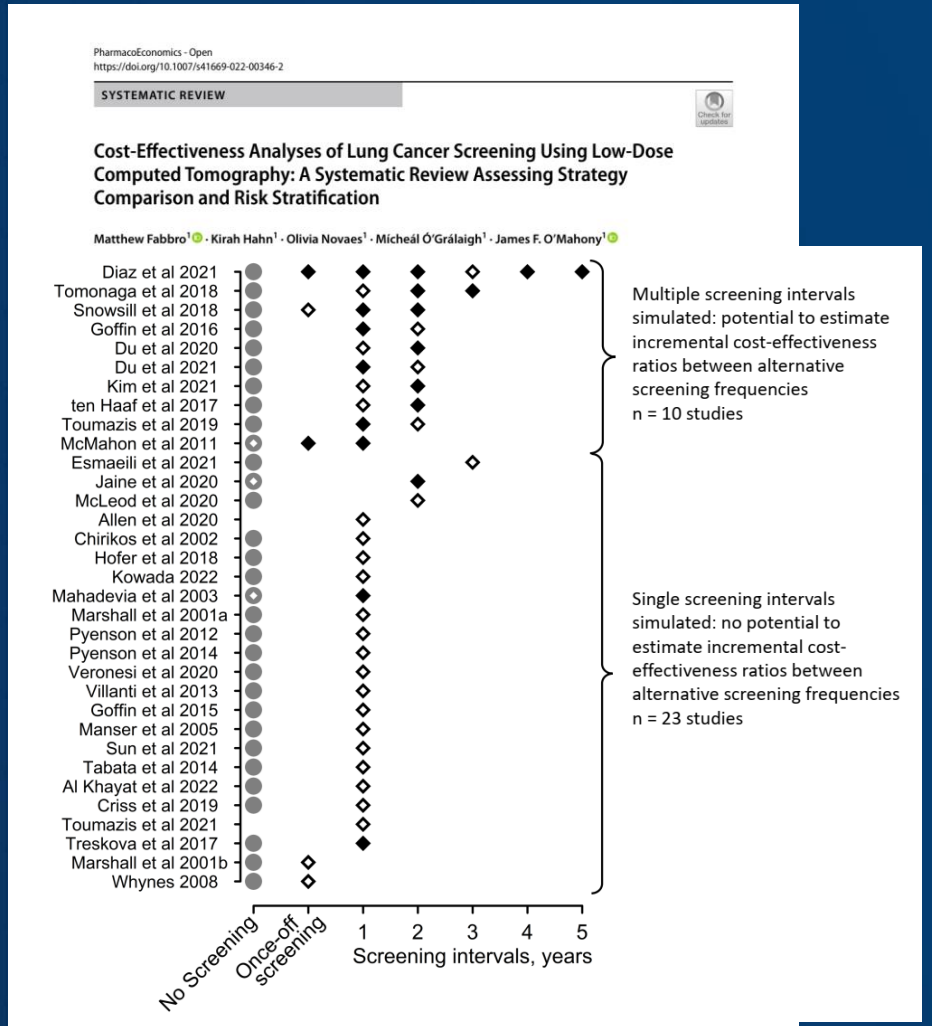
- Effectiveness hotly debated
- Moran and Cullinan (2022) find no disease-specific mortality benefit from phased implementation of BreastCheck
- CEAs generally dated and of mixed quality
- No CEA of 2015 BreastCheck age extension to 70 years

Lung screening

- Randomised trial evidence demonstrates effectiveness
- CEAs indicate it is cost-effective
- Optimal intensity and risk selection remain unclear
- Policy significance of large mortality burden and social gradient

Prostate screening and triage

- Not provided by the National Screening Service yet widely practiced
- HSE pays for subsequent triage
- CEA evidence unclear, even if primary screening costless
- Equity questions clear



The National Screening Advisory Committee

Established in response to the CervicalCheck controversy on Dr Gabriel Scally's recommendation

Group of 19 members that meet quarterly to review proposals to advise the Minister for Health on population screening, including cancer screening

Supported by HIQA's new screening unit

Time to review evidence is limited

Opinion: if you want cost-effective interventions you need vocal health economists on the committee

The Cost-Effectiveness Threshold

Explicitly stated previously for drugs

- €45,000/QALY
- Current status is unclear
- Never explicitly applied to screening
- Threshold not based on evidence
- Probably too high

This is problematic

- Screening not on a par with drugs, in principle
- Cannot give evidenced-based recommendations on cost-effectiveness

CervicalCheck Controversy

Irish media left many with gravely mistaken impressions:

- Women were knowingly left with cancer
- Test performance was substandard
- Outsourced tests were inferior to domestic tests

Serious ethical questions regarding responsible reporting

Political response arguably of panic and grandstanding

- Expensive legal legacy
- Political will to efficiently revise CervicalCheck likely gone
- Significant uncertainty regarding viability of lung screening

Conclusions

CEA of screening is technically demanding

Ireland has many key aspects of CEA appraisal infrastructure

Policy influence of CEA evidence likely very modest

- Though capacity and budget planning likely useful

Ethics of allowing CEA to languish extremely questionable

Thank You

Machine Learning and GDPR

Art. 22 GDPR:

"The data subject shall have the right not to be subject to a decision based solely on automated processing, including profiling, which produces legal effects concerning him or her or similarly significantly affects him or her.“

I see machine learning as another tool

Presents a (good) challenge of an analytic moving target for CEA and service implementation