# Are anti-amyloid treatments for Alzheimer's disease ready for practice?

## Long-term effectiveness and cost-effectiveness in Europe

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# Disclosure

**Related to current work**

- None

**Unrelated to current work (past 36 months)**

- Consulting fees from Lilly Nederland (paid to institution)
- Consulting fees from the Institute for Medical Technology Assessment (paid to institution)

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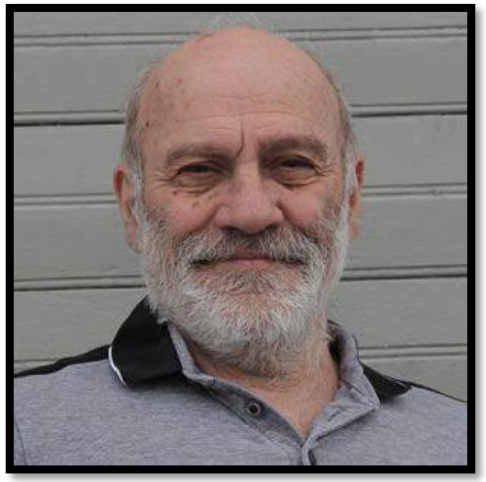

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# Introduction

- **Market access lecanemab**
  - Approved: U.S., Japan, China, South Korea, Hong Kong, Israel, United Arab Emirates
  - Rejected: EMA
  - Under decision: UK
- **Clinical considerations**
  - Clinical meaningfulness of effect size
  - Potential adverse events
- **Health-economic considerations**
  - Cost-effectiveness (ratio between quality-adjusted life years and care costs)
  - Budget impact > competing with alternative dementia care & support

**Aim: Estimate the cost-effectiveness of anti-amyloid treatment for early AD in Europe**

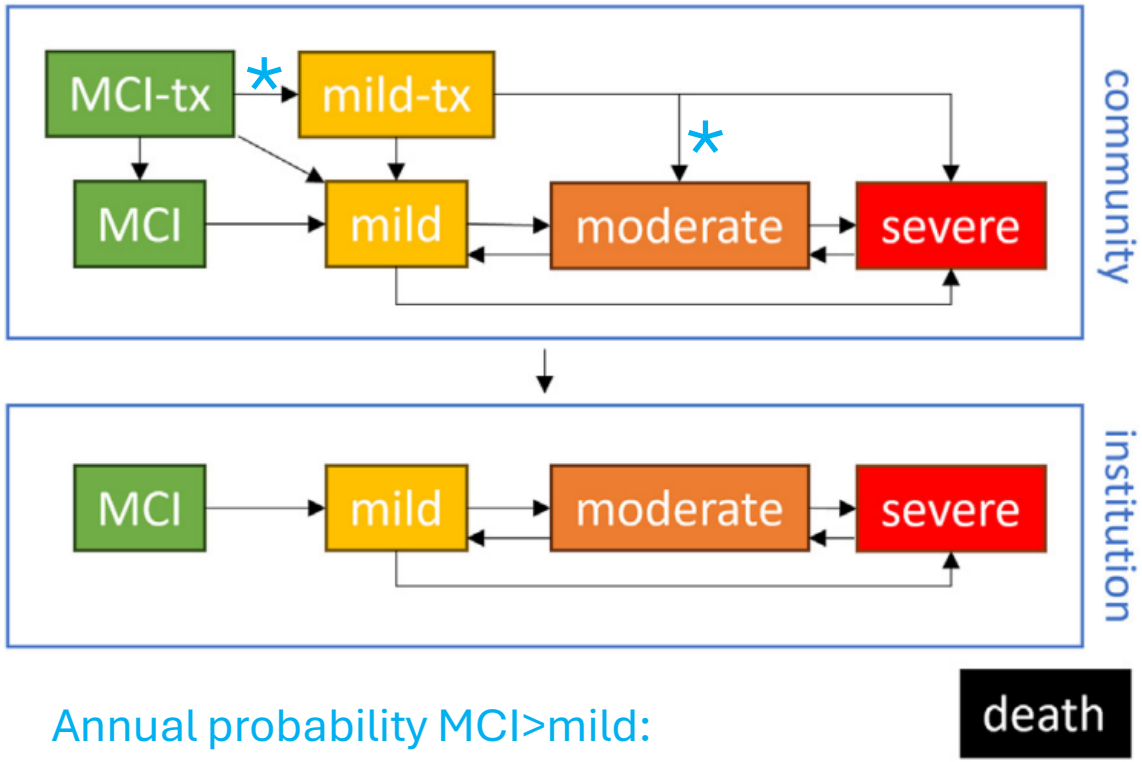
# Methods

Simulate lifetime health-economic effects of lecanemab anti-amyloid treatment in a European setting

- Simulation model: IPECAD open-source health-economic model
- Target population: MCI or mild dementia with abnormal amyloid
- Treatment effect:
  - 31% reduction risk of transition to (more severe) dementia (RR=0.69)
  - Assumption: treatment effect sustains after lecanemab trial follow-up period (18m)
- Treatment costs: €24,000 (US list price) per year
- Quality of life and care use: 5 European regions
- Model freely available: https://github.com/ronhandels/ipecad

*Handels et al. https://doi.org/10.1016/j.jval.2024.07.009*
*Jonsson et al. https://doi-org.mu.idm.oclc.org/10.1007/s40273-022-01212-z*

# Simulation model




Annual probability MCI>mild:

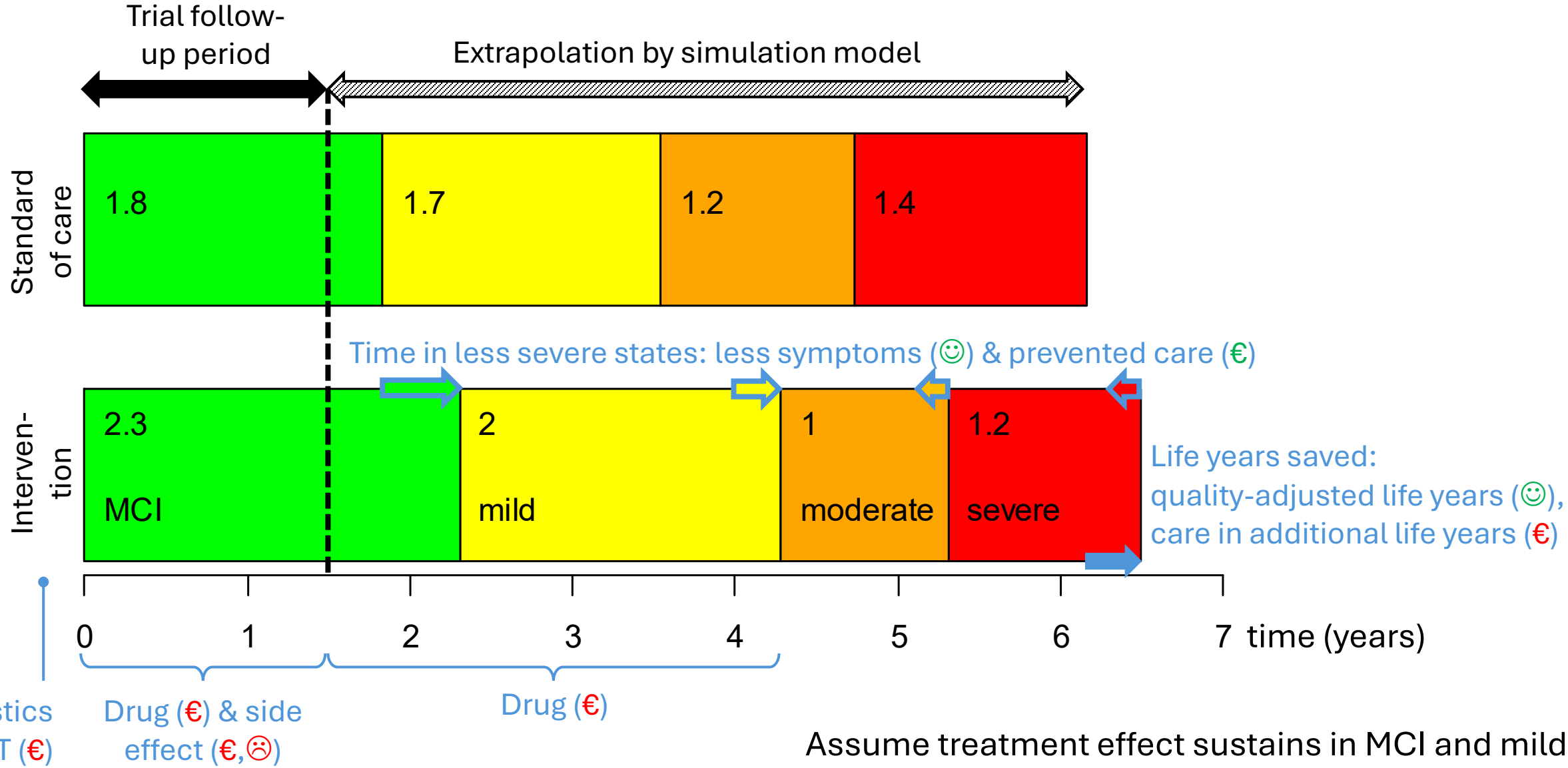
- Care as usual = 0.23
- Anti-amyloid treatment: 0.17 (~0.23 * 0.69)
- Similar for mild>moderate

Proportion in state by year

| Year | MCI | Mild | Moderate | Severe | Death |
|---|---|---|---|---|---|
| 0 | 0.55 | 0.45 | 0 | 0 | 0 |
| 1 | 0.46 | 0.38 | 0.11 | 0.01 | 0.05 |
| 2 | 0.37 | 0.32 | 0.15 | 0.06 | 0.10 |
| 3 | 0.30 | 0.26 | 0.16 | 0.11 | 0.16 |
| 4 | 0.25 | 0.22 | 0.15 | 0.15 | 0.24 |
| 5 | 0.20 | 0.18 | 0.13 | 0.17 | 0.32 |
| 6 | 0.16 | 0.14 | 0.11 | 0.18 | 0.41 |
| 7 | 0.13 | 0.11 | 0.09 | 0.17 | 0.50 |
| 8 | 0.10 | 0.09 | 0.07 | 0.15 | 0.59 |
| 9 | 0.08 | 0.07 | 0.06 | 0.12 | 0.67 |
| 10 | 0.06 | 0.05 | 0.05 | 0.10 | 0.74 |
| Total | 2.66 | 2.27 | 1.08 | 1.22 | 3.78 |

***MCI** = mild cognitive impairment; **tx** = on treatment*

# Results - long-term effect




Assume treatment effect sustains in MCI and mild

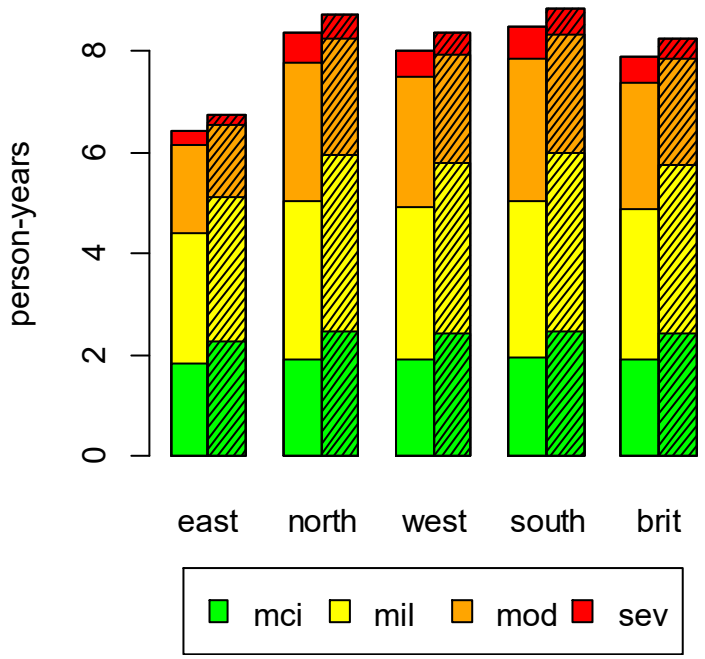
# Results

*Outcome = mean per person, over lifetime period, per European region*

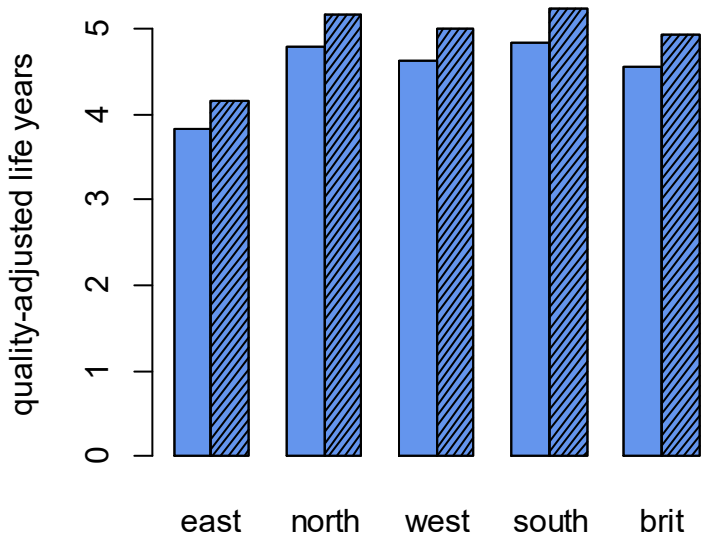
*New treatment*

*Care as usual*

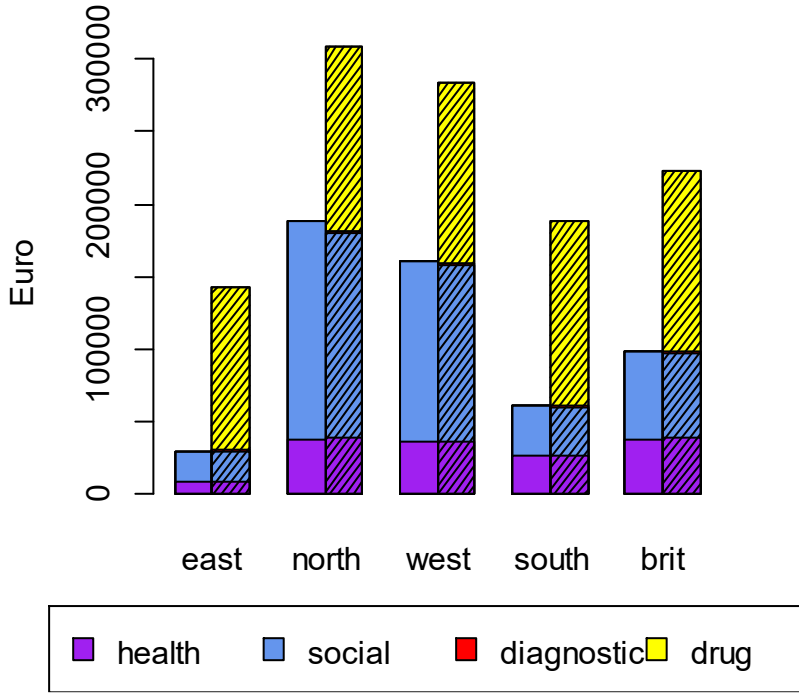
**time in state**




**quality-adjusted life years**




**costs accross care sectors**




QALY benefit = 0.33-0.39

Care costs savings:
€-100 to 7,700

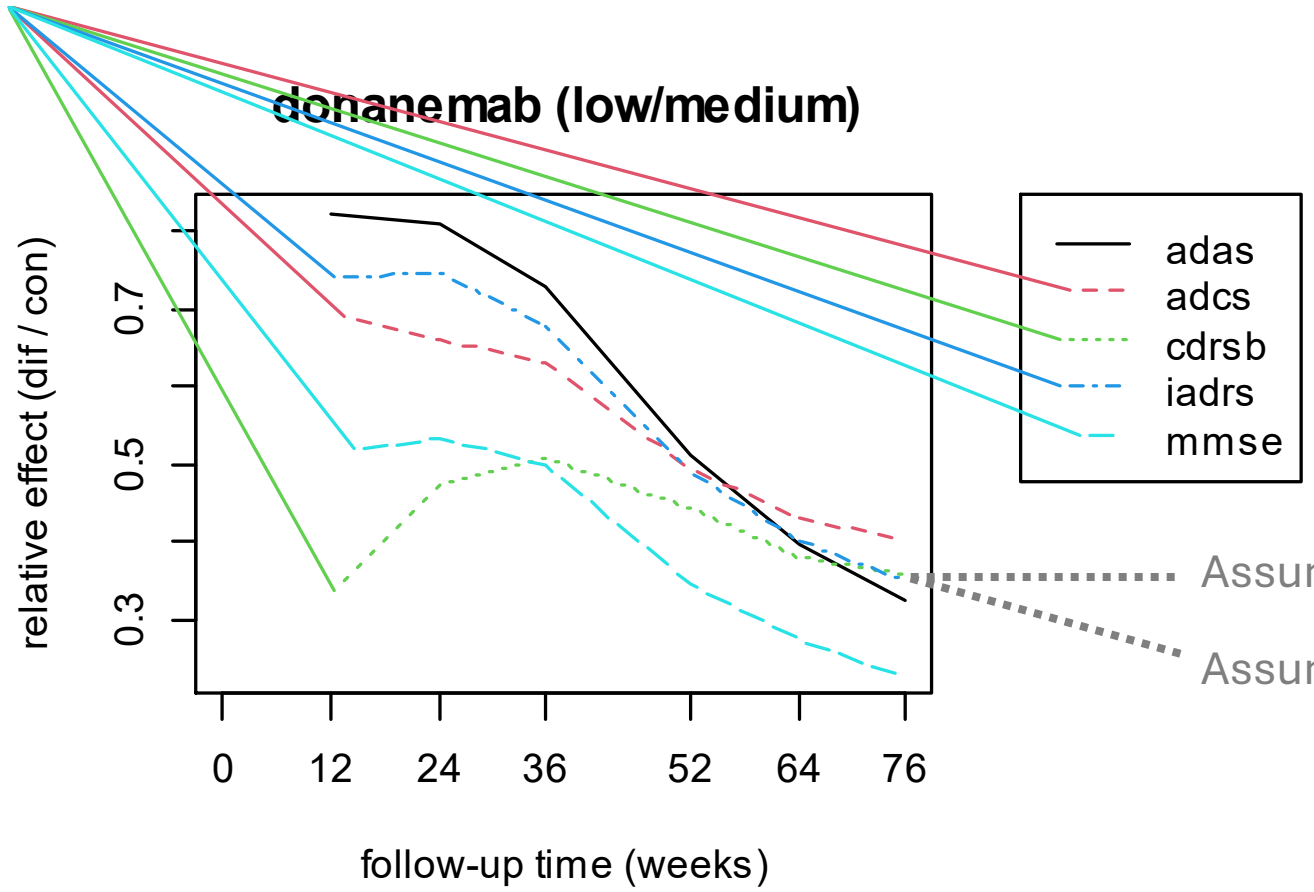
Additional diagnostic & drug costs:
€113,000 to 128,000

| Europe region | ICER (€/QALY) |
|---|---|
| East | 346,000 |
| North | 315,000 |
| West | 328,000 |
| South | 309,000 |
| British Isles | 319,000 |

ICER higher than common willingness-to-pay thresholds in Europe.

Cost-effective around drug price €6,700 to 8,900 per year.

# Uncertainty – sensitivity analysis




| Scenario | ICER (€/QALY) Range region |
|---|---|
| Base case | 308,000 - 346,000 |
| Stop at 18 months without sustained treatment effect | 290,000 - 325,000 |
| Stop at 18 months with sustained treatment effect | 78,000 - 124,000 |
| 10% treatment effect waning | 406,000-433,000 |

Assume sustained effect

Assume treatment effect waning

# Take home messages

- IPECAD open-source model (QR-code)
- Anti-amyloid treatment lecanemab for early AD at the current US price exceeds common willingness-to-pay thresholds in Europe.
- We suggest:
  - Further research to identify cost-effective AD subtypes
  - Performance-based payment
  - Lower price