

Cost-Effectiveness Analyses versus Back-of-the-Envelope Valuations: An Oncology Pilot Study

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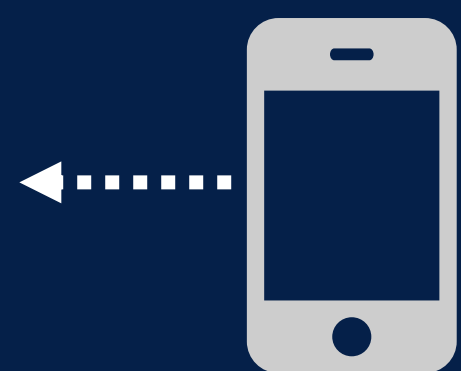
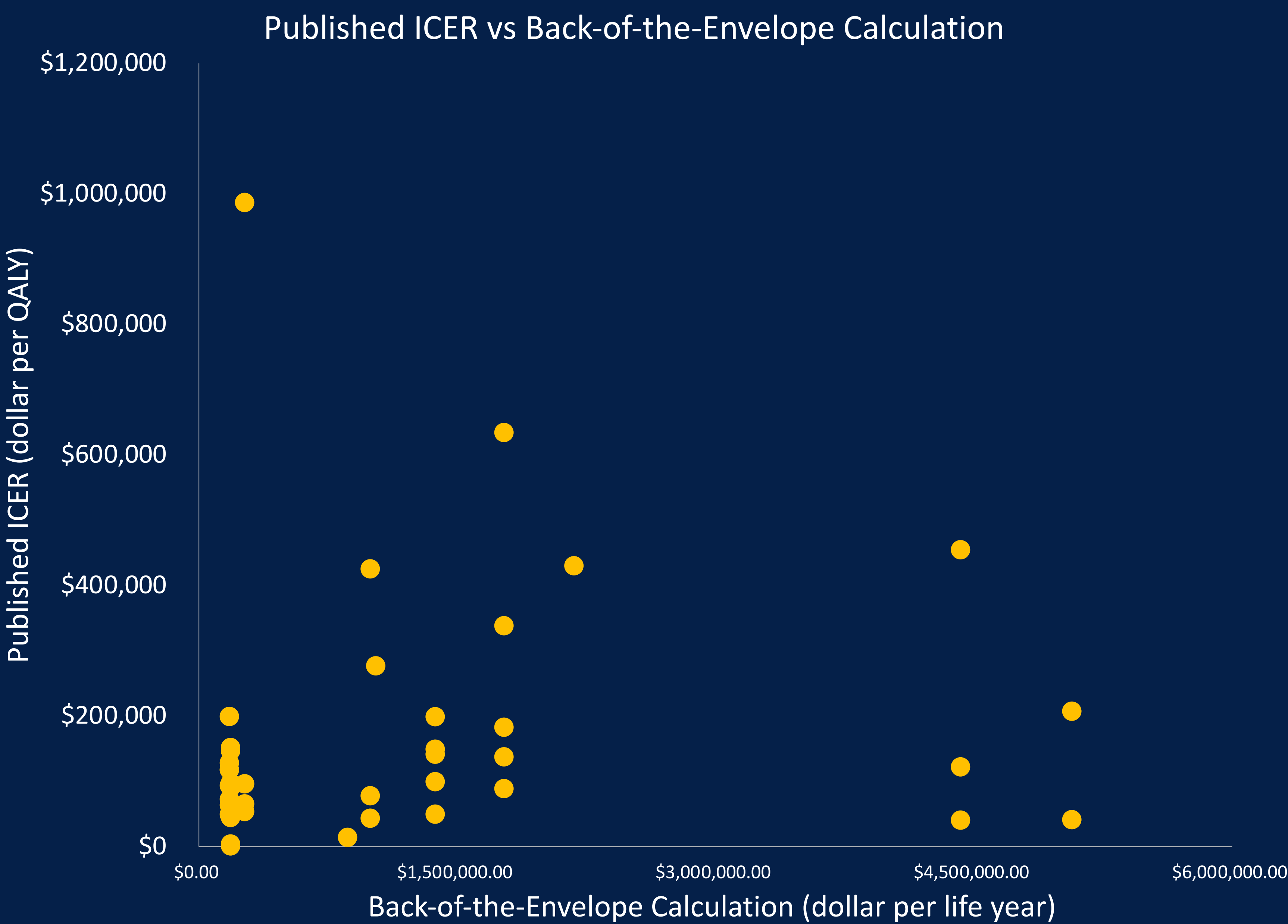
BACKGROUND

- Cost-effectiveness analyses (CEAs) compare the trade-offs between costs and health effects of different interventions
- CEAs are expressed as an incremental cost-effectiveness ratio (ICER)
- CEAs are intended to be unbiased, but this assumption has been challenged
- We assessed whether published ICERs correlated with simple, back-of-the-envelope estimations

METHODS

1. Created dataset of FDA-approved oncology drugs from 2015 through 2022
2. Focused on 2015 drugs (14 total) with overall survival benefit for this pilot study
3. For each drug, conducted a systematic search on Google Scholar for CEA studies
4. Obtained drug costs through Micromedex® RED BOOK Online® average wholesale prices
5. Calculated total cost of the course of treatment based on clinical trial progression free survival
6. Estimated the cost per life year added by dividing the treatment's total cost by the number of years it extends life (back-of-the-envelope calculation, BOTECE)
7. Compared our derived BOTECE to ICERs available in published CEAs

Complex calculations in cancer drug cost-effectiveness analyses did not correlate with simple estimates.



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RESULTS

- 12 out of 14 drugs had an associated cost-effectiveness study
- Only 27% of included analyses were done in the United States (US)
- Notably, ICER calculations did not correlate with published cost-effectiveness analyses ($r^2 = 0.02$, $p = 0.48$)
- No correlation remained even when adjusted for the US CEAs only ($r^2 = 0.04$, $p = 0.69$)

DISCUSSION

- There was no correlation between our calculated ratio and the ICERs from published CEAs
- This lack of correlation could be due to inaccuracies in back-of-the-envelope calculations or inaccuracies in CEAs
- CEAs may not be reliable to determine the values of interventions in the US
- Next steps would involve:
 1. Analyze 2016-2022 cancer drugs
 2. Determine variance of CEAs within a single drug

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