

Singh Sonia (Orcid ID: 0000-0003-2430-0262)
Cheek John (Orcid ID: 0000-0002-3615-3821)
Babl Franz (Orcid ID: 0000-0002-1107-2187)

July 10, 2019

Title: Response to “Choosing the Discount Route in an Economic Analysis”

by Drs Lim

1. Sonia Singh^{1,2,3,4}
2. John A. Cheek^{1,2,3,5}
3. Franz E. Babl^{1,2,3,5}
4. Jeffrey S. Hoch^{6,7}

Affiliations:

¹Emergency Research, Murdoch Children’s Research Institute, Parkville, Victoria, Australia

²Department of Paediatrics, University of Melbourne, Melbourne, Australia

³Paediatric Research in Emergency Departments International Collaborative (PREDICT)

⁴Department of Emergency Medicine, University of California Davis Medical Center, Sacramento, California, USA

⁵Emergency Department, Royal Children’s Hospital Melbourne, Parkville, Victoria, Australia

⁶Center for Healthcare Policy and Research, University of California at Davis, Sacramento, California, USA

⁷Division of Health Policy and Management, Department of Public Health Sciences, University of California at Davis, Davis, California, USA

Corresponding author:

Sonia Singh singhsd@student.unimelb.edu.au

This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: [10.1111/1742-6723.13369](https://doi.org/10.1111/1742-6723.13369)

Dear Editor,

We thank Drs. Lim for their response to our paper: A primer for clinical researchers in the emergency department: Part X. Designing Economic Evaluation alongside Emergency Medicine Research.¹ The authors highlight the importance of discounting costs and future health gains accurately, since this can influence the conclusion of an economic evaluation alongside a clinical study.

Often, the choice of the discount rate for economic evaluation is dictated by the existing guidelines in individual countries. In Australia, as Drs. Lim state, both the Pharmaceutical Benefits Advisory Committee and the Medicare Services Advisory Committee use a 5% discount rate on healthcare projects.² The UK Treasury and NICE adopted the discount rate of 3.5% in 2004, derived from the Ramsey formula. It is the sum of the catastrophic risk premium (1%), pure welfare time preference (0.5%), and the combined effect (2%) of the expectation of growth in per capital consumption and the elasticity of marginal utility of consumption.³⁻⁵ While the proper way to discount in cost-effectiveness analysis has been the subject of recent debate, health economists have demonstrated that the theoretically correct rate depends on key judgments of fact and value.⁴ Nevertheless, it is important to use the relevant discount rate when comparing cost-effectiveness of interventions across countries.

Our paper was designed to introduce the basic concepts of discounting for the emergency medicine researcher.¹ There are clearly more technical aspects of discount rates in the context of health care. The principle of discounting reflects the societal value of future costs and health relative to the present.

$$\text{Present Value} = \frac{X}{(1+r)^t}$$

X - cost or health benefit
 r - discount rate
 t - time period ($t=0,1,2\dots T$)

From a cost perspective, the discount rate reflects the opportunity cost of utilising the funds for either consumption of other goods (social time preference rate of foregone consumption) or for investment with the long run rate of return of safe government bonds (social opportunity cost of capital). In a competitive, undistorted market, these rates are thought to be the same.⁴

From a health perspective, the discount rate reflects society's value of present vs. future health. If the objective is to maximise health, the discount rate reflects the willingness to pay threshold (the value of a QALY), and the social opportunity cost of capital. If the objective is to maximise the consumptive value of health, then the discount rate reflects the gain in welfare from health relative to consumption of other goods and services.^{4,5}

For simplicity, researchers use the same rate to discount costs and health. If the discount rate is 0%, this indicates that future costs and health are equally valuable as the present. If future costs and health gains are discounted at the same rate, this indicates present cost and health are equally more valuable than those in the future.

Sometimes, the cost of the healthcare interventions is incurred in the present ($t=0$), and the health benefits occur 20-30 years later. Therefore, if both costs and health gain are discounted at the same rate, the discounted present value of health is much lower relative to the discounted costs. Therefore, the discount rate could have an impact on the economic appraisal of the intervention. To evaluate the impact of discount rates on the cost-effectiveness analysis, PBAC recommends sensitivity analysis with discount rates of 0% and 3.5%, and depending on the situation differential rates or time-varying rates.²

Finally, although technically correct, both weighted average cost of capital (WACC) and company discount rates are not really relevant to our paper. They are used for financial analysis at the company/organizational level and are not often found in a health economic analysis conducted alongside emergency medicine research in a peer-reviewed context.

References

1. Singh S, Cheek JA, Babl FE, Hoch JS. Review article: A primer for clinical researchers in the emergency department: Part X. Understanding economic evaluation alongside emergency medicine research. *Emerg Med Australas*. 2019.
2. Australian Government Department of Health. Guidelines for preparing a submission to the Pharmaceutical Benefits Advisory Committee. (Version 5.0) September 2016. Canberra, ACT: Department of Health and Ageing; 2016.
3. Drummond MF, Sculpher MJ, Claxton K, Stoddart GL, Torrance GW. *Methods for the Economic Evaluation of Health Care Programmes*. 4th edition ed. Oxford, UK: Oxford University Press; 2015.
4. Claxton K, Paulden M, Gravelle H, Brouwer W, Culyer AJ. Discounting and decision making in the economic evaluation of health-care technologies. *Health Econ*. 2011;20(1):2-15.
5. Paulden M, Claxton K. Budget allocation and the revealed social rate of time preference for health. *Health Econ*. 2012;21(5):612-618.

Word count: 595

Author Manuscript