

CASE AND COMMENTARY: PEER-REVIEWED ARTICLE

How Should Willingness-to-Pay Values of Quality-Adjusted Life-Years Be Updated and According to Whom?

Paul T. Menzel, PhD

Abstract

Before updating any willingness-to-pay (WTP) per quality-adjusted life-year (QALY) threshold, a few points must be recognized. Ethical justification for using WTP thresholds and QALYs lies in incorporating the preferences of those whose treatment could be affected by resulting resource allocations. For WTP thresholds, such justification depends on the sufficiency of a match between a group—members of an insurance pool from which health care payments and services are drawn—and those whose health care is potentially affected. For QALYs, that justification depends on eliciting the right persons' preferences to inform quality-adjustment ratings; on balance it should be from those who have the conditions being rated. Because the value of simply being alive is not adequately accounted for, how life extension and quality improvement are combined in constructing the QALY is its most significant shortcoming as a measure. Although updating WTP thresholds might be better than not updating them, this manuscript suggests why drawing on a less fundamentally flawed concept than the conventional QALY is more important.

To claim one AMA PRA Category 1 Credit™ for the CME activity associated with this article, you must do the following: (1) read this article in its entirety, (2) answer at least 80 percent of the quiz questions correctly, and (3) complete an evaluation. The quiz, evaluation, and form for claiming AMA PRA Category 1 Credit™ are available through the [AMA Ed Hub™](#).

Case

A willingness-to-pay (WTP) threshold, according to the World Health Organization (WHO), is a value used to represent “an estimate of what a consumer of health care might be prepared to pay for the health benefit” and is often based on a country’s per capita gross domestic product.¹ In the United States, a WTP threshold of \$50 000 to \$100 000 is still referenced and used today by public and private policymakers, insurers, and researchers, for example, despite having been established in 1982.²

One health care organization’s executive, Dr CXO, has suggested, “Given how insurers and other third-party payers in the US health care system rely on population-based WTP

thresholds to guide decisions, we should probably be leery of using estimates that are so old.”

Dr CXO continued, “If a patient or that patient’s physician, for example, asked me why we’ve been using decades-old value estimates to determine, say, what a patient’s additional quality-adjusted life-year (QALY) might be worth, I don’t think I’d be able to come up with a very convincing answer.”

Dr CXO then assembled a long-term task force charged with updating the WTPs the organization uses, particularly as they relate to QALYs. How the WTPs should be updated is, however, unclear to task force members as they begin to deliberate.

Commentary

To engage in the ethical debate about the current threshold value for a WTP/QALY ratio, or the willingness to pay for a QALY gained, and the importance of updating it, a clear understanding of the essential functions and nature of both WTP and QALY is required. Their ethical relevance lies in their reflecting the preferences of those whose health is directly affected by the **allocation of health care resources** that a given threshold guides. Both the “preference” and “those affected” aspects are important. The value of health care, to be sure, is not only the value of the care to those whose health is at stake, but its value to them is primary. Health care, after all, is primarily for its recipients, so their preferences must be prioritized.

What WTP and QALY Represent

A WTP/QALY threshold expresses preferences about the relative value of health care compared to things other than health care for which the same financial resources might be used. Providing an upper limit on what should be spent on any treatment or program is the threshold’s primary use. A secondary use emerges when the upper monetary limit of a QALY’s value is empirically derived for many services and treatments. Then the resulting values of cost/QALY ratios of various services and treatments can be compared and used to set priorities within health care.

The QALY itself represents trade-off preferences for 2 different kinds of health benefits. It is constructed to combine both life extension and quality-of-life improvement in a common unit of health benefit value measured on a 0 to 1.0 scale. To do that, people’s trade-off preferences between quality-of-life improvement and life extension must be elicited, typically by time trade-off (TTO) and standard gamble (SG) questions.³ TTO questions ask what portion of an anticipated remaining life with a given imperfect health-related quality of life—paraplegia, for example—one would be willing to sacrifice to regain full health. SG questions ask what chance of death a person is willing to take to regain full health. Essentially these are the right questions. How else would one get the subjective preference utility value of 2 different sorts of things into a common scale except by trade-off preferences? Such a health state valuation—the quality adjustment of the value of a year of life in different conditions—forms the empirical core of QALYs.

Whose WTP?

WTPs. Typically, most health care expense is paid through insurance, either private (individual or employer sponsored) or public (Medicare or Medicaid), or by direct public provision funded by the tax-paying public, such as the British National Health Service (NHS) or the US Veterans Health Administration (VHA). All are collective arrangements. The contributions of subscribers, employers, or taxpayers are pooled and then either

paid out to providers or used to fund a direct provision entity like the VHA or NHS. The individual connections between those who originally contribute the resources and those who receive the care do not need to be tracked. The relevant WTP preferences are therefore those of all funding contributors who might receive health care through the pool. The WTP threshold should therefore be the aggregate preference of the pool.

QALYs. In the denominator of the threshold (the QALY), whose preferences to use in determining how much quality-adjustment is appropriate for a year of life in a given condition gets complicated. Actual patients, particularly those with chronic illness and disability, rate their quality of life more highly than do “hypothetical patients,” who are only imagining themselves with the conditions they are rating.^{4,5,6,7} Adaptation and the more direct knowledge of those who actually have the conditions probably explain most of the difference.

The central argument for using hypothetical patient ratings is that health state valuation needs to incorporate everyone in the insurance pool. Everyone has a potential stake in the ratings, since anyone can sooner or later end up with one or more of the conditions being rated. Hypothetical patients should, of course, imagine as best and knowledgeably as they can what life for them would be like in the condition they are rating.

The case for using the ratings of actual patients, however, is stronger. Health state valuation is an attempt to get at the relative values of real conditions that patients will experience. Patients are the ones who actually do experience those conditions. Since it is their health and life in those conditions that is the real health and life at stake, if we want to get the preference utility of the real thing (why should we not?), the **primary data** need to come from actual patients. To be sure, many further factors complicate the choice of whom to ask, but they do not change the essential argument.^{6,7,8}

Deeper Problems

Deeper problems lie not in whose preferences to elicit but in the QALY's essential nature as a common unit of health benefit expressing trade-off preferences between quality of life and life itself. For treatments and services that reduce pain and suffering and improve quality of life, health state valuations from actual patients may work reasonably well in discerning the value that health-related quality-of-life changes have for them. The more difficult problem comes with the value of life itself—added or lost years.

The value of life itself—being alive at all for a given time, not the quality of life during that time—is life's value compared to not being alive—that is, compared to death. With death, however, everything of experiential value to the person is lost. Compared to death, then, any life short of the most difficult and despairing conditions that would make life not worth living can and often will assume enormous value. Something, when it's all one can get, is worth a very great deal compared to nothing. This alone will tend to equalize the subjective value to each individual of life extension in various conditions.

With one further element, the phenomenon of adaptation, we can see how compelling the claim is that for different persons across most health states, life itself has equal value. We already know that health state valuations by persons with a condition like paraplegia are higher than the ratings that people only imagining themselves with paraplegia give.⁹ The latter might be willing to trade 20% of their life expectancy to gain a cure, for example, while the former are willing to trade only 5% (a 0.80 rating compared to 0.95). The preference trade-off disparity is even greater for some with

disabilities, who are unwilling to trade any of their life expectancy to gain a cure.¹⁰ Such “no traders” insist that even with disability, life compared to death has full value (1.0).

Such “hedonic adaptation”¹¹ is also referred to as the “relativity of happiness,”^{11,12} and the structure underneath it as the “psychological immune system.”¹³ As important as it is, adaptation’s empirical limits should be recognized. People do not adapt much to what they see as temporary afflictions; for example, the adaptation effect is strong only for those with chronic conditions regarded as likely permanent.¹⁴

At the same time, these same persons with chronic conditions insist that quality improvement has value, too. The two are different dimensions. In answering TTO questions by being willing to sacrifice 1 of 20 years to gain a cure, for example, they are rating their quality of life at 0.95. They do see value in health status improvement. Yet a moment’s reflection reveals that life itself has as much value for them as it has for those who can survive with full health-related quality of life. In saying she would be willing to sacrifice 1 year of 20 if she could regain full limb function for the rest of her life, a person has not said that her life itself (that is, her life compared to death) has any less value *for her* than the life itself of the person without paraplegia has *for that person*. Even people without paraplegia who think about this, *when they really do see themselves in the shoes of the person with paraplegia*, can readily understand how that person can still value life as much as they themselves do.

But if the equal value of life is intractable, so is the value of quality improvement. The essential structure of the QALY, which combines the value of both quality improvement and life extension in a common unit of value measured on a 0 to 1.0 scale, seems not to represent the real value to people with imperfect health-related quality of life of both their life extension and their quality-of-life improvement. Calculations using the QALY, created by trade-off preferences between a shorter life with full health and a longer life with imperfect health, yield the conclusion that since the value of quality improvement from a cure is 0.05 for a person with paraplegia in the example above (1.0 minus 0.95), then the value of a year of life extension for the person with paraplegia must be 0.95, and thus the priority for saving that person’s life drops compared to the value of saving the life of a person in otherwise full health.^{8,15} If we pay careful attention to the real values of both quality improvement and life extension, however, priority for saving the life of the person with paraplegia should not be one bit less than the person without it.

Updating the Cost/QALY Threshold

If the QALY has these internal contradictions, then it’s right to question whether and when the value of the WTP/QALY ratio should be used. The QALY is the wrong thing to use in discerning what people are willing to pay for. It might be possible to use the WTP without QALYs to set limits on health care. WTP per QALY gained, however, should be sidelined. Before updating any cost/QALY threshold, we need to work on what it is that we are asking people they are willing to pay for. Perhaps it will be WTP for a life-year and, separately, WTP for health-related quality-of-life improvements.¹⁶

Regardless of which thresholds are appropriate for limiting health care that’s too costly for what it gains, another consideration is whether we should use different thresholds for different groups or individuals. A paradigmatic example is the end-of-life premium that has gained traction in recent years, particularly in the NHS and its National Institute for Health and Care Excellence.¹⁷ Years of life saved at the end of life are accorded additional value (a premium) beyond their mere number. When the context is a

collective enterprise in which everyone has a stake—an insurance pool, a public provision agency, or standards used widely in the society—even persons who are not elders are likely to become elders and also gain from the premium. An end-of-life premium can thus represent a **wider social judgment** than one favored only by elders. A limited range of such different cost/value thresholds⁹ could make sense if it is simple enough for practical use and the value can be identified with by most members of the pool.

Conclusion

Ethically, WTP per se is not the significantly problematic element in a cost/QALY threshold. The QALY part is. Perhaps, as flawed as it is, a greatly revised version of a cost/QALY threshold would be better.¹⁶ The important focus, however, should be on revising the QALY itself as ethically flawed. The value of a year of life plus the value of quality improvement in a year of life should not be confined to a 1.0 maximum in which the larger the quality adjustment for a condition, the lower the priority for life extension in that condition must be. If the current threshold is simply updated, this more important need will have been ignored.

Dr CXO's answer to a patient or physician should acknowledge that the whole business of discerning a WTP/QALY threshold should be reexamined. The long-term task force should not just establish a new threshold but reexamine the QALY itself.

References

1. Bertram MY, Lauer JA, De Joncheere K, et al. Cost-effectiveness thresholds: pros and cons. *Bull World Health Organ*. 2016;94(12):925-930.
2. Ubel PA, Hirth RA, Chernew ME, Fendrick AM. What is the price of life and why doesn't it increase at the rate of inflation? *Arch Intern Med*. 2003;163(14):1637-1641.
3. Weinstein MC, Torrance G, McGuire A. QALYs: the basics. *Value Health*. 2009;12(suppl 1):S5-S9.
4. De Wit GA, Busschbach JJ, De Charro FT. Sensitivity and perspective in the valuation of health status: whose values count? *Health Econ*. 2000;9(2):109-126.
5. Arnold D, Girling A, Stevens A, Lilford R. Comparison of direct and indirect methods of estimating health state utilities for resource allocation: review and empirical analysis. *BMJ*. 2009;339:b2688.
6. Menzel P. Utilities for health states: whom to ask. In: Culyer AJ, ed. *Encyclopedia of Health Economics*. Elsevier Science; 2014:417-424.
7. Eyal N. Measuring health-state utility via cured patients. In: Cohen IG, Shachar C, Silvers A, Stein MA, eds. *Disability, Health, Law, and Bioethics*. Cambridge University Press; 2020:266-280.
8. Menzel P. Bias adjustment and the nature of health-state utility. *J Law Biosci*. 2020;7(1):154-165.
9. Nord E, Daniels N, Kamlet M. QALYs: some challenges. *Value Health*. 2009;12(suppl 1):S10-S15.
10. Fowler FJ Jr, Cleary PD, Massagli MP, Weissman J, Epstein A. The role of reluctance to give up life in the measurement of the values of health states. *Med Decis Making*. 1995;15(3):195-200.
11. Frederick S, Loewenstein G. Hedonic adaptation. In: Diener E, Schwarz N, eds. *Well-being: The Foundations of Hedonic Psychology*. Russell Sage Foundation; 1999:302-309.

12. Brickman P, Coates D, Janoff-Bulman R. Lottery winners and accident victims: is happiness relative? *J Pers Soc Psychol*. 1978;36(8):917-927.
13. Gilbert DT, Pinel EC, Wilson TD, Blumberg SJ, Wheatley TP. Immune neglect: a source of durability bias in affective forecasting. *J Pers Soc Psychol*. 1998;75(3):617-638.
14. Smith DM, Loewenstein G, Jankovic A, Ubel, PA. Happily hopeless: adaptation to a permanent, but not to a temporary, disability. *Health Psychol*. 2009;28(6):787-791.
15. Menzel P. Can cost-effectiveness accommodate the equal value of life? *APA News/Philos Med*. 2013;13(1):23-26.
16. Nord E. Beyond QALYs: multi-criteria based estimation of maximum willingness to pay for health technologies. *Eur J Health Econ*. 2018;19(2):267-275.
17. National Institute for Health and Care Excellence. Appraising life-extending, end of life treatments. NICE. Revised July 2009. Accessed April 29, 2021. <https://www.nice.org.uk/guidance/gid-tag387/documents/appraising-life-extending-end-of-life-treatments-paper2>

Paul T. Menzel, PhD taught philosophy and biomedical ethics at Pacific Lutheran University from 1971 until 2012. He has published widely on moral questions about health economics, including numerous articles with collaborating health economists, as well as the books *Strong Medicine: The Ethical Rationing of Health Care* (Oxford University Press, 1990) and *Prevention vs. Treatment: What's the Right Balance?* (Oxford University Press, 2011).

Editor's Note

The case to which this commentary is a response was developed by the editorial staff.

Citation

AMA J Ethics. 2021;23(8):E601-606.

DOI

10.1001/amajethics.2021.601.

Conflict of Interest Disclosure

The author(s) had no conflicts of interest to disclose.

The people and events in this case are fictional. Resemblance to real events or to names of people, living or dead, is entirely coincidental. The viewpoints expressed in this article are those of the author(s) and do not necessarily reflect the views and policies of the AMA.

Copyright 2021 American Medical Association. All rights reserved.
ISSN 2376-6980