

Health Years in Total (HYT)

What is HYT?

- Health Years in Total (HYT) is a metric used in cost-effectiveness analysis for measuring the value of a healthcare intervention in a summary score (i.e., cost/HYT), developed by researchers at the University of Washington.
- HYT was created as an alternative to the quality-adjusted life year (QALY), which is widely recognized as discriminatory towards individuals with underlying health conditions or disabilities.

How is HYT different?

- HYT attempts to fix the discriminatory feature of traditional value assessments, like the QALY, which assumes a lower quality of life for people with disabilities and chronic conditions.
- The HYT uses an additive framework to combine life expectancy and quality of life changes instead of multiplying them as in the QALY. While the QALY is the product of changes in life expectancy and quality of life, HYT is the sum of changes in life expectancy and a modified QALY.
- The modified QALY is the product of changes in quality-of-life (for each respective treatment) and changes in life expectancy (based on which comparator results in more years of survival). This means that the modified QALY is essentially the QALY measured over a time frame corresponding to the maximum survival of any given alternative treatments. Thus, it considers any QALY gains a patient would have if they didn't die.
 - For example, when comparing Treatments A and B, if patient life expectancy is 2 years for a patient on Treatment A and 2.5 years for Treatment B, the Modified QALYs for Treatment A would be calculated over 2.5 years.
- The willingness to pay thresholds for HYT are approximately 70% of the willingness to pay threshold for traditional cost/QALY. For example, the threshold of \$74K/HYT corresponds to the traditional cost/QALY threshold of \$100K/QALY. These cutoffs were generated based on the rationale of keeping the same number of technologies under the threshold, as opposed to being set based on keeping expenditures the same.

How Does HYT Measure Up?

- The HYT does not fully address all discriminatory aspects of the QALY. It can give a lower value to health interventions in certain patient populations—particularly those with lower potential life expectancy or quality of life gains, such as those with disabilities, chronic conditions, the elderly, and communities of color.
- HYT places more value on medicines that extend life than those that impact quality of life (e.g., a treatment which decreases symptoms of irritable bowel syndrome).

- Furthermore, when a novel medicine does not increase life expectancy incremental HYT is equivalent to the incremental QALY.
- Like the QALY, HYT can rely on general population estimates of quality of life. This means that the value placed on life does not account for symptoms or other factors specific to a given disease.
- HYT relies on averages, ignoring that patients often respond differently to a treatment due to a number of factors including comorbidities, disease severity, genetics, and age.
- HYT does not inherently address disparities in health that are often a function of systemic inequities related to social factors, severity of disease, and access to care, which can exacerbate health risks and affect value.
- HYT calculations are compared against benchmarks or thresholds to classify a treatment as high or low value, but these thresholds are criticized as subjective and are not validated. For example, the cost/HYT thresholds were developed based on data representing treatments primarily in the cardiovascular disease area only and shouldn't be relevant to other disease areas.
- HYT requires estimating quality of life for comparator population in years they do not survive, making math less intuitive, requiring additional assumptions not tested easily.

Who is using HYT?

- Most of the references to HYT are theoretical, as HYT has yet to be used widely in cost effectiveness applications.
- In the 2023 Inflation Reduction Act revised guidance, HYT was listed as a measure to be evaluated to determine if it violates the law's patient protections and whether HYT can be used by the government to evaluate the value of certain pharmaceutical products.

What is the broader community saying?

- Researchers Mike Paulden, et al. critique HYT stating: *"We find that the HYT and evLYG approaches can result in logical inconsistencies We recommend that policy makers exercise caution and avoid adopting any approaches [such as HYT] that violate fundamental principles of rational decision making or that rely upon assumptions that lack credibility."*
- The National Disability Council referenced HYT in its 2022 policy brief on alternatives to the QALY stating: *"HYT has limitations. It does not directly address distributional issues regarding whether populations with higher QALY shortfalls or other equity factors should receive more resources.... One critique called the HYT framework a "poor substitution" for the QALY, acknowledging the metric reduces distributional inequity "but does not altogether fix it." ... Though there are positive attributes to HYT, one shortcoming among all the utility-based metrics is that they have often relied on utility values generated based on the general population's preferences..."*