
Point of view/Point de vue

The incremental effect of age-weighting on YLLs, YLDs, and DALYs: a response

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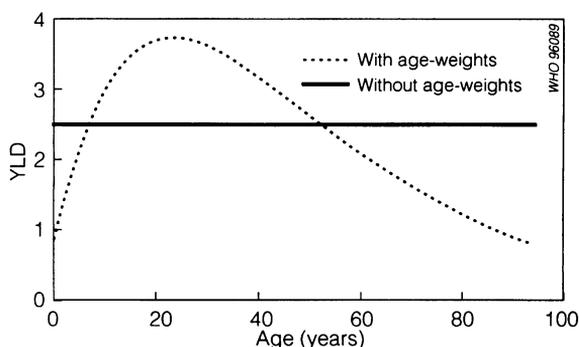
When disability-adjusted life years (DALYs) were first formulated, the effect of age-weighting on years of life lost due to death at each age as well as the different effect on short- and medium-term disability were taken into consideration. While there is considerable scope for discussion on the actual values that are incorporated into DALYs, the present article argues that once the values have been chosen we should accept the consequences of the choice.

In the previous article, Barendregt et al. (1) analyse the incremental effect of including age-weights in the estimation of the number of “years of life lost” (YLL) due to deaths at different ages — by definition, DALYs are the sum of years of life lost (YLL) and “years lived with a disability” (YLD). We concur with their observation that the incremental effect of adding age-weights but without discounting enhances the importance attached to deaths between the ages of 0 and 27 years. This effect is brought about because of the long period over which the age-weighting function is integrated in order to calculate the number of years of life lost due to a premature death. Barendregt et al. also find that when discounting is included, the incremental impact of age-weighting is to enhance the importance of deaths between 0 and 38 years. The largest incremental change, however, is closer to age 10 years. Their findings confirm the basic observation about YLL that the interaction of duration of life lost, age-weighting, and discounting leads to a maximum YLL for a death during adolescence.

Barendregt et al. go on, without supporting examples, to conclude that their observation for YLL

also applies to YLD, the other component of DALYs. They claim that “It appears that the same will happen for disability when the disability weights are applied to the years lived: disability between 0 and 27 years will be emphasized, and outside that range played down.” This conclusion, however, must be qualified; the incremental effect of age-weighting will depend on the duration of disability. According to the results of the Global Burden of Disease Study, the average duration of a disability is much shorter, substantially less than 5 years. Fig. 1 shows the YLD lost due to a disability with a duration of 5 years and a disability weight of 0.5 calculated with and

Fig. 1. Years lived with a disability (YLD) of duration 5 years and severity weighting of 0.5, as a function of age at onset, calculated with a discount rate of 0 and with and without age-weighting.



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Reprint No. 5723

without age-weighting but no discounting — for short duration conditions discounting has virtually no effect. The curves show clearly that the incremental effect is to enhance the importance of disability between 7 and 52 years (with or without discounting) and that the maximum enhancement is at age 23 years.

We draw three conclusions from the article by Barendregt et al. and our analysis presented here.

- The incremental effect of age-weighting with a 3% discount rate is to enhance the importance of the number of YLL for deaths between 0 and 38 years with a peak effect in adolescence.
- The incremental effect of age-weighting for life-long disability will be similar to that for death; however, the incremental effect of age-weighting for short-to-medium term disability (less than 10 years) will be to enhance the importance of YLD approximately between the ages 7–52 years.
- The conditions most affected by age-weighting are neuropsychiatric disorders, such as unipolar major depression, which have short-to-medium durations and are concentrated in adult age groups.

At the time of formulating DALYs, we were aware of the effect of age-weighting on years of life lost due to deaths at each age as well as the different effect on short- and medium-term disability. Since we believed that the age-weighting function represented a credible approach to capturing the dependence of the young and older generations on adults, we were satisfied with the

consequences of this viewpoint. While there is considerable scope for debate on the actual values incorporated into DALYs, we would argue strongly that once each of the values has been chosen, we should be willing to accept the consequences of the combination of these values in calculations.

Résumé

Effet incrémentiel de la pondération en fonction de l'âge sur les années de vie perdues (YLL), années de vie avec incapacité (YLD) et années de vie corrigées de l'incapacité (DALY)

Lorsque le concept d'années de vie corrigées de l'incapacité (DALY) a été formulé pour la première fois, il a été tenu compte de l'effet de la pondération en fonction de l'âge sur le nombre d'années de vie perdues du fait de la mortalité à chaque âge et de son effet différent sur le calcul de l'incapacité à court et moyen terme. Bien que les valeurs réelles à incorporer dans les DALY fassent encore l'objet de vastes controverses, cet article soutient qu'une fois les valeurs choisies, il faut accepter les conséquences de ce choix.

Reference

1. Barendregt, JJ et al. DALYs and age-weights scrutinized. *Bulletin of the World Health Organization*, 1996, **74**: 439–443.