

EQ-5D-5L Canadian scoring algorithm - R syntax

This program computes the Canadian preference-weighted index score using self-reported EQ-5D data.

It is presumed that the data set includes the following five variables.

Dimension	Variable Name	Range

* Mobility	MO	1-5
* Self-care	SC	1-5
* Usual activities	UA	1-5
* Pain/discomfort	PD	1-5
* Anxiety/depression	AD	1-5

where 1 indicates no problems, 2 indicates slight problems, 3 indicates moderate problems, 4 indicates severe problems, and 5 indicates unable to perform. The variables containing responses for the five dimensions must be named as above (in capital letters).

Missing values should be left blank (i.e., a '.' should not be substituted for a missing value).

The index score will not be generated when responses are missing for 1 or more of the five dimensions

Note re R code:

The following R code creates a function named `eq5d_utility_score` that accepts "state" as an input, where state is a vector of length five as indicated by the numerical responses per dimension in the following order `c(Mobility, Self-Care, Usual Activities, Pain/Discomfort, Anxiety/Depression)`.

For example, executing the command `eq5d_utility_score(c(1,2,3,4,5))` returns 0.3204. In this case, health state 12345 is an example response where the respondent has indicated the following: I have no problems in walking (Mobility, MO, dimension); I have slight problems washing or dressing myself (Self-Care, SC, dimension); I have moderate problems doing my usual activities (Usual Activities, UA, dimension); I have severe pain or discomfort (Pain/Discomfort, PD, dimension); I am extremely anxious or depressed (Anxiety Depression, AD, dimension).

According to the Canadian scoring algorithm, the health state 12345 has an

index score of 0.320, which is between the anchors of 0, dead, and 1, perfect or full health.

R codes begins

```
eq5d5l_utility_score = function(state) #state is a vector = c(MO, SC, UA, PD,
AD)
{
  if(any(is.na(state)))
  {
    c("NA")
  }
  else
  {
    vector.state = c(rep(0, (5*5)))
    vector.score = c(0, 0.0389, 0.0389, 0.0899, 0.0389, 0, 0.0458, 0.0458,
0.1042, 0.0458, 0, 0.0195, 0.0195, 0.1298, 0.0195, 0, 0.0444, 0.0444, 0.1853,
0.0444, 0, 0.0376, 0.0376, 0.1653, 0.0376)
    score = 0

    for(i in 1:length(state))
    {
      vector.state[(i-1)*5+state[i]] = 1
      score = score + sum(vector.score[(1+(i-1)*5):(state[i]+(i-1)*5)])
    }

    num4or5 = sum(vector.state[c(4,5,9,10,14,15,19,20,24,25)])
    num4or5.term = num4or5
    if(num4or5.term >0)
    {
      num4or5.term = num4or5.term-1
    }

    eq5d5l_index = 1-(score+0.0511+(num4or5.term^2*(-0.0085)))

    c(eq5d5l_index) #EQ-5D-5L Index Score
  }
}
```

Reference: Xie F, Pullenayegum E, Gaebel K, Bansback N, Bryan S, Ohinmaa A, Poissant L, Johnson JA; Canadian EQ-5D-5L Valuation Study Group. A Time Trade-off-derived Value Set of the EQ-5D-5L for Canada. Med Care. 2016 Jan;54(1):98-105.