# Codebook for R Tool on COVID-19 QALYS

* Tool by Prof Andrew Briggs developed in Excel information: <https://www.lshtm.ac.uk/research/centres-projects-groups/chil#covid-19>
* Based on v5.0 of Excel tool
* R code written by Nichola Naylor June 2020 – inputs and codebook adapted for v5.0 of the excel tool November 2020

## Inputs

* Excel file (inputs.xslx) with the following information:
  + Life table – probability of dying between ages and
    - Note copied this for age=100 to age=120
  + = Population quality of life norms for different ages
  + Age distribution of deaths from covid19
* User defined inputs through the app interface:
  + Discount rate (r) [where 0.035 represents a discount rate of 3.5%]
  + Standardized mortality ratio (smr) - summarizes how a given comorbidity can increase the risk of dying. For example, an smr=1 shows no adjustment for comorbidities. [[1]](#footnote-1) This must be between 1 and 5.
  + qcm – comorbidity impacts on QALYs [this is in terms of % percentage of population norm QoL associated with SMR]
  + **Note that this version of the tool does not flag when numbers are out of range so please make sure that qcm and discount rates entered are between 0 and 1 for the outputs to be reasonable.**
  + Choice of country, current options are (see data dictionary for sources):
    - Canada
    - Israel
    - Norway
    - UK
    - USA
  + To add your country data – will include an option for this in next version.
  + Please note the current version does not contain error messages, therefore please ensure data are correct before entering new data (e.g. age distribution summation equaling 1).

## Outputs

* Mean life expectancy loss associated with COVID-19 per 100,000 population
* Mean quality-adjusted life expectancy loss associated with COVID-19 per 100,000 population
* Mean discounted quality-adjusted life years lost associated with COVID-19 per 100,000 population

## Functions

* = probability of dying between x and x+1
* = number surviving to age per 100,000 , where
* is estimated for females and males separately, and then averaged to get a “person” estimate using:
  + proportion female =
* , is the upper bound of life-expectancy reported in the life table (e.g. 100 years old for the UK).
* + For example, if a person died at age 2 , for u=2,3…. :
  + + + ….+
* =
* Weighted loss(LE) = , where = proportion of covid19 deaths of age (for the purposes of this tool this is the mean age of the specified groupings).

## To update data for countries currently included:

* The input excel (“input.slxs”) that is used has the following layout: (variable names and first values shown)
  + male\_LT:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Age | UK | US | Canada | Norway | Israel |
| 0 | 0.0042 | 0.006302 | 0.00477 | 0.002 | 0.003336 |

* + female\_LT:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Age | UK | US | Canada | Norway | Israel |
| 0 | 0.003548 | 0.005226 | 0.00427 | 0.002 | 0.002937 |

* + qol\_norm:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Age band | Low | high | UK | US | Canada | Norway | Israel |
| 0-17 | 0 | 17 | 1 | 1 | 1 | 0.89 | 0.985461 |

* + age\_covid:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Age band | low | high | UK | US | Canada | Norway | Israel |
| 0-9 | 0 | 9 | 0.00004 | 0.000222 | 0 | 0 | 0 |

* Data can be updated to match this formatting.
* Previously, for the excel model, downloaded/”copy and pasted” tables from the statistics websites were converted into these. This functionality is present in the excel file “LookupTables\_converter\_v1.1.xlsx”. If data are downloaded or copied into similar tables this may then update the tab “LookUpTables” that can then be copied into “inputs.xlsx”, however coding may have to be changed (such as definitions of columns/rows to sum over). Start by looking at the formulae used within the LookUpTables tab. We have updated from excel tool V4.0 to V5.0 and only updated key tables so there may be a slight mismatch of unused data and used data – please see Excel tool for full workings of the Tables [saved as “Copy of COVID-19 QALYs v5.0.xlsx”]. Note the model does not directly use the lookuptables\_coverter file.
* Once the new data in “inputs.xlsx” have been saved, the app can be rerun.

## To add data for new countries:

* Add in the data dictionary references for data on all inputs needed.
* For every single tab in “inputs.xslx” add a new column with the country name e.g.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Age band | low | high | UK | US | Canada | Norway | Israel | **France** |
| 0-9 | 0 | 9 | 0.00004 | 0.000222 | 0 | 0 | 0 | 0 |

* Within the “app.R” RScript update the following code within the ‘ui’ section:

## nationality

radioButtons(inputId="country", label="Country",

choices=c("UK", "US","Canada","Norway","Israel" **,"France"** ), selected = "UK"),

* Rerun app accordingly.

1. Using life table methods to calculate QALY losses from deaths: with application to COVID-19, Andrew Briggs, LSHTM, May 13, 2020 [↑](#footnote-ref-1)