

# Estimating the Direct Disability-Adjusted Life Years Associated With SARS-CoV-2 (COVID-19) in the Republic of Ireland: The First Full Year

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## Introduction

Burden of Disease (BoD) frameworks facilitate estimation of the health impact of diseases to be translated into a single measure, such as the Disability-Adjusted-Life-Year (DALY).

Our study set out to estimate the BoD as a direct result of COVID-19 in the Republic of Ireland for the first full year of the pandemic, which ranged from 01 March 2020; to 28 February 2021 (inclusive).

## Methods

Data relating to COVID-19 in RoI is publicly available through several bodies. Data in this study was sourced from the DATA.GOV.IE website, which collates data from several national organisations.

GBD standard life tables for 2019 were used to calculate remaining life expectancy (RLE) for each sex separately.

Population data was taken from the CSO's (Central Statistics Office) and Migration Estimates which were calculated for April 2020.

**Years of Life Lost:** YLL is the product of the number of deaths (M) and the average remaining life expectancy (RLE) at the time of death:

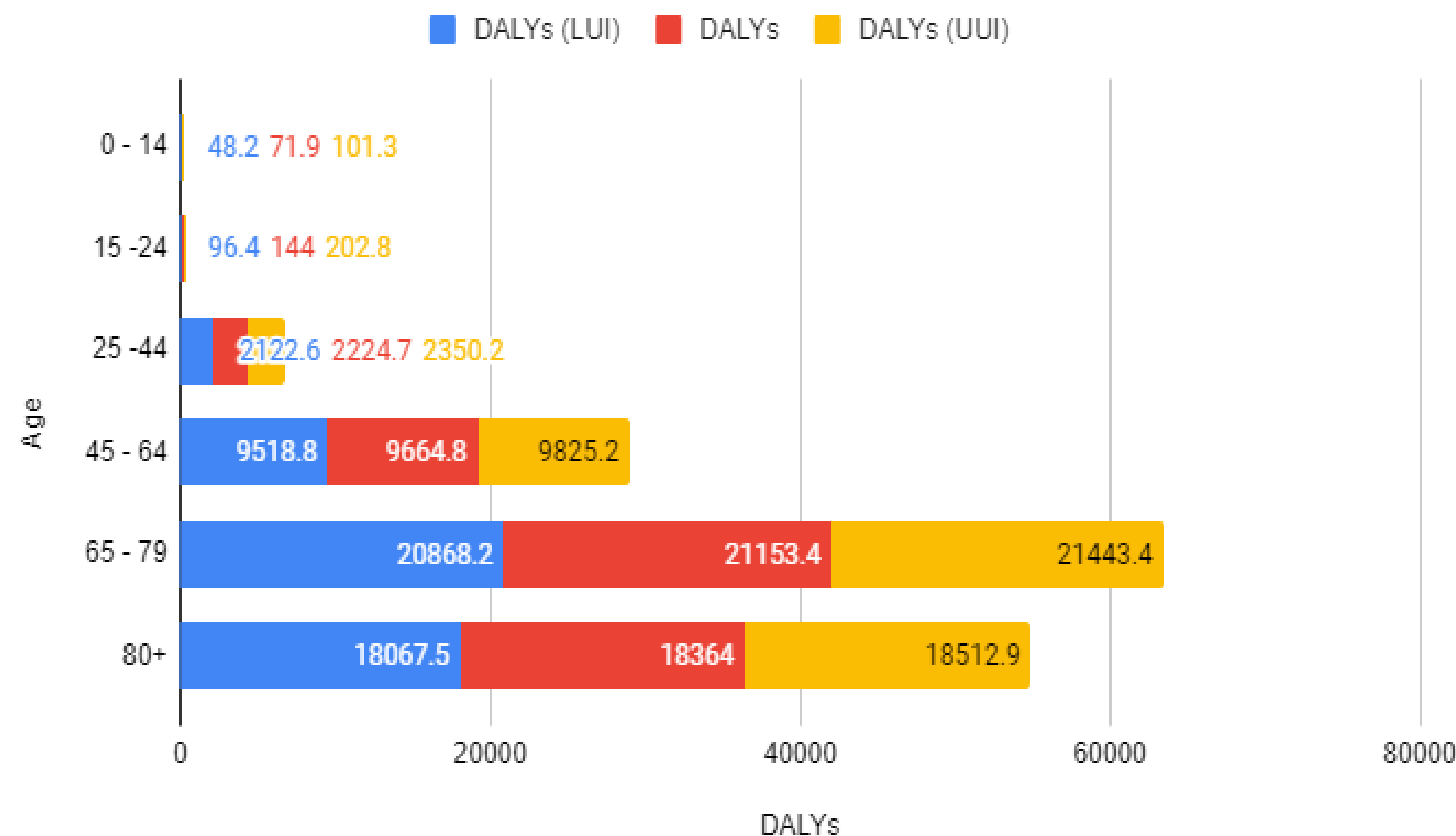
$YLL = M \times RLE$ .

**Years Lived with Disability:** YLD is defined as the product of the number of incident cases (N), the average duration until recovery or death (D), and the disability weight (DW), which is reflective of the reduction in one's health [measured on a scale from 0 (no impact on full health) to 1 (death)]:  $YLD_{inc} = N \times D \times DW$ .

**DALYs:** DALYs are calculated simply by summing the YLLs and YLDs ( $DALY = YLL + YLD$ ).

An **incidence based-** for DALY estimation was adopted

## DALYs (including Uncertainty Intervals) (Pandemic Year 1)



## Results

- There were 220,273 PCR confirmed cases of COVID-19
- A fatality rate of 0.49% was estimated when considering all infected persons (asymptomatic + symptomatic).
- Of symptomatic cases only, we estimated a fatality rate of 2.0% and a hospitalisation rate of 6.5%.
- Of those hospitalised, 10.8% required treatment in an intensive care unit (ICU).
- We estimated that COVID-19 caused 51,622.8 DALYs (50,721.7, 52,435.8) in the full year period.
- Overall, YLL contributed 98.5% towards the DALYs with the remaining 1.5% attributed to YLD.
- We estimated 11.5 (11.3, 11.7) DALYs per death.

## Discussion & Conclusion

- YLL representing 98.5% of the DALYs.
- We estimated 11.3 YLL per death.
- The overall DALYs were marginally higher in males than females
- DALY contribution significantly increased in populations 65 suggesting that the higher age-groups are at a higher risk, particularly of mortality from COVID-19.
- DALY metric is a useful health gap summary measure when attempting to identify the impact of a disease on public health.
- Older adults bore an unequal health burden which ultimately resulted in greater DALYs for this population which were overwhelming informed by YLL.
- Future research must focus on estimating COVID-19 specific DWs, an extensive BoD study relating to the indirect effects of the COVID-19 pandemic, and an extensive study relating to the profile and timeline of "Long-COVID."

## Acknowledgments

This study was completed in association with the European Burden of Disease Network (burden-EU)

