Peer Review Report

Review Report on Estimating the direct Disability-Adjusted Life Years (DALYs) associated with SARS-CoV-2 (COVID-19) in the Republic of Ireland: The first full year

Original Article, Int J Public Health

Reviewer: Dan Poenaru
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EVALUATION

Q 1 ▸ Please summarize the main findings of the study.

This study aims to quantify the burden of disease (in DALYs) caused by Covid-19 in Ireland during the first year of the pandemic. The data obtained includes DALY values by sex and age, and includes deaths (YLLs) and morbidity (YLD). The actual findings (that the older population suffered the most in the pandemic) and that the death figures were probably only secondary to cardiovascular disease) were rather well-known before the study.

Q 2 ▸ Please highlight the limitations and strengths.

Strengths:
- standard DALY methodology
- access to several databases

Limitations:
- classification of Covid cases by severity
- disability weights used from other conditions
- comorbidities not accounted for
- minimal new knowledge output, questionable validity

Q 3 ▸ Please provide your detailed review report to the authors. The editors prefer to receive your review structured in major and minor comments. Please consider in your review the methods (statistical methods valid and correctly applied (e.g. sample size, choice of test), is the study replicable based on the method description?), results, data interpretation and references. If there are any objective errors, or if the conclusions are not supported, you should detail your concerns.

Int J Pub Health – Covid DALYs in Ireland

General Comments
The study is well designed and follows standard DALY estimation methodology.
While all estimated DALY values appear correct, the main concern relates to wide-spread limitations potentially affecting the data obtained. Many of these are stated by the authors as limitations, but many are either omitted or just briefly mentioned, and many are not included in the sensitivity calculations.
The conclusions are vague enough to not be threatened, but this significantly affects the impact (the "so what?") of the study.

Specific Comments
Background: well written. We suggest it should include a paragraph on burden of disease measurements and DALYs, and add previous Covid DALY studies undertaken.

Methods:

What was the authors' hypothesis or at least research question? Did they expect the burden from Covid to have been different than in other countries?

YLD: the applicability of GBD 2019 states and disability weights from LRTIs to Covid cases seems tenuous at best, yet it is central to the methodology. On what basis did the authors decide that the burden is the same for states 1–4 but not for 5? In particular, how can they use the disability weights for a LRTI for the post-acute consequences, which are multi-system rather than respiratory?

Analyses: the 1/365 scaling escapes me – a DALY by definition is for one year or 365 days, hence no scaling is possible or necessary – calculations are simply made in fractions of a year. This statement is only confusing.

Results:

4500 deaths confirmed or probable: these 2 classes can not be lumped together, as the potential error may be huge. As a minimum, the authors must disaggregate the data by confirmed and probable, and seek approximations at least for the % of probable cases which would be correct.

Sex and age unknown: again, very disconcerting when the missing data are almost 10% of cases. The authors must explain why they were not able to identify these most basic variables for 10% of their cases. If we didn't even know the sex or age, how can we trust the severity of Covid disease in these patients?

With 99% of Covid burden causes by deaths, this study basically tells us that the morbidity of the non-fatal disease is negligible – which is known not to be the case. The authors must discuss this carefully. Moreover, if deaths account for 99%, then the difference between confirmed and probable deaths is once again critical. This key limitation is not even touched on.

Discussion

The assertion that the death toll from Covid is second only to CV disease is not the result of this study – it was of course in the daily media for months. But this finding is extremely questionable, as the CV mortality is stable in each population, while the Covid death toll has changed drastically with each wave and variant. Most importantly, the data showed that 90% of the mortality was in the 70+ groups, which was a unique feature of the first wave and its devastating effects in long-term care facilities for the elderly – but was not replicated in ensuing waves. The authors must very clearly state and discuss this, as once again it impacts significantly on the validity of their results and conclusions.

The issue of comorbidities and their effect on Covid burden is mentioned almost "en passant" – when in fact it is again central to the study. This must be discussed and clearly identified as a major limitation.

IF the Ireland data are difficult to compare with other countries (as the authors state), and IF the data obtained are only a snapshot of Covid burden specific to one phase/time period and cannot be generalized to the entire pandemic or the future, what useful new knowledge is brought by this study?

Future research directions must include, in the first place, longitudinal studies from other phases of the pandemic which will likely generate very different values than this one, and hence paint a more accurate picture of the Covid burden altogether.

PLEASE COMMENT

Q 4 **Is the title appropriate, concise, attractive?**

yes

Q 5 **Are the keywords appropriate?**

yes

Q 6 **Is the English language of sufficient quality?**

yes

Q 7 **Is the quality of the figures and tables satisfactory?**

Yes.

| Q 8 | Does the reference list cover the relevant literature adequately and in an unbiased manner?) |

yes

QUALITY ASSESSMENT

Q 9	Originality	■ ☐ ☐ ☐ ☐
Q 10	Rigor	■ ■ ■ ☐ ☐
Q 11	Significance to the field	■ ■ ☐ ☐ ☐
Q 12	Interest to a general audience	■ ■ ■ ☐ ☐
Q 13	Quality of the writing	■ ■ ■ ■ ☐
Q 14	Overall scientific quality of the study	■ ■ ■ ☐ ☐

REVISION LEVEL

| Q 15 | Please make a recommendation based on your comments: |

Major revisions.