MSR133

The Impact of EQ-5D Mapping Algorithm Choice on COVID-19 Utility Values Derived From a Vignette Study

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Background

- COVID-19 is an acute respiratory illness caused by the SARS-CoV-2 virus, which in severe cases requires hospitalisation and respiratory support, and can cause long-term morbidity.
- COVID-19 is still a relatively new and evolving disease and robust estimates of health-related quality of life (HRQoL) in the literature are limited.
- Ideally, HRQoL data should be collected alongside a clinical trial, but this was challenging for COVID-19, given that most trials were conducted in a pandemic situation and that patients in the more severe health states may be unconscious.
- A previously reported[1] vignette study was designed to derive utility values for COVID-19 disease states, using the EQ-5D-5L instrument.
- Due to the lack of a validated UK value set and the preference for EQ-5D-3L utility values, the National Institute of Health and Care Excellence (NICE) recommends the use of a mapping algorithm to the EQ-5D-3L value set.
- In their 2019 position statement on EQ-5D, NICE originally referenced the Van Hout algorithm[2].
- In the 2022 update of the health technology evaluations manual, NICE stated preference for the Hernandez-Alava algorithm[3], on the basis of increased functionality and reliability.

Objective

To investigate the impact of EQ-5D-5L to EQ-5D-3L mapping algorithm choice on utility values for COVID-19 health states.

Methods

- A representative sample of UK adults (n=500), recruited in 2021, completed the EQ-5D-5L questionnaire for 8 vignettes as patient proxies.
- Vignettes described different hospitalisation and disease severity permutations (Table 1), and were informed by a large UK COVID-19 Office for National Statistics infection survey, relevant clinical trials and observational studies, and validated by medical experts and in a pilot study.
- EQ-5D-5L responses were mapped to EQ-5D-3L using the Van Hout cross-walk algorithm[2] and the Hernandez Alava model[3].

Table 1. COVID-19 vignettes

Vignette	Description	Disease severity	Treatment setting	Ventilation status	Underlying health condition	Symptoms	Long-term complications
1	No COVID-19	N/A	N/A	N/A	Present	N/A	N/A
2	COVID-19	Mild	Not in hospital	None	Present	Fever Cough Fatigue Headache Muscle pain Loss of smell Nasal congestion	N/A
3	COVID-19	Moderate	Not in hospital	None	Present	Fever Cough Fatigue Headache Muscle pain Loss of smell Nasal congestion	N/A
4	COVID-19	Severe	General hospital ward	Via nasal canula	Present	Fever Cough Fatigue Confusion Muscle pain	N/A
5	COVID-19 where the patient requires supplemental oxygen through a face mask	Severe	High dependency unit in a hospital	Via face mask	Present	Fever Cough Fatigue Confusion Muscle pain	N/A
6	COVID-19 where the patient cannot breathe on their own and will die if not treated	Critical	Intensive care unit in a hospital	Intubated	Present	N/A	N/A
7	Recovered from COVID-19 with no long-term health issues	N/A	N/A	N/A	Present	N/A	None
8	Recovered from COVID-19 and suffering from long-term health issues as a result	N/A	N/A	N/A	Present	N/A	Fatigue Shortness of breath Muscle and/or joint pain

Results

- Health states associated with acute and chronic symptoms of COVID-19 infection had a substantial impact on the perceived quality of life of people with underlying health conditions (Figure 1), highlighting the value of COVID-19 therapeutics in this population.
- Utility values were similar regardless of the mapping algorithm employed, and error bars representing standard deviation overlapped considerably.
- In most (6/8) health states, the Van Hout cross-walk algorithm generated a higher mean utility than the Hernandez Alava model.
- The mapping algorithm choice had the least impact upon vignette 1, the health state describing baseline HRQoL, without COVID-19 infection (mean utility score difference of 0.002, Table 2).
- The largest impact was seen upon the state representing long COVID, where the Hernandez-Alava algorithm generated a mean utility 0.056 lower than Van Hout (Table 2).
- This is approximately in-line with the minimal clinically important difference for the EQ-5D-5L in respiratory disease, as established in COPD[4] and referenced more recently in COVID-19[5].
- With an estimated mean duration of long COVID of 108.6 weeks[6], this difference could lead to an under- or over-estimation of the benefit of avoiding long COVID by 0.116 QALYs.
- The magnitude of this difference is significant, given the small numbers of incremental discounted QALYs between COVID-19 therapeutics and standard of care as calculated in NICE technology appraisals.[6,7]

Figure 1. Utility values produced via the Van Hout and Hernandez Alava mapping algorithms

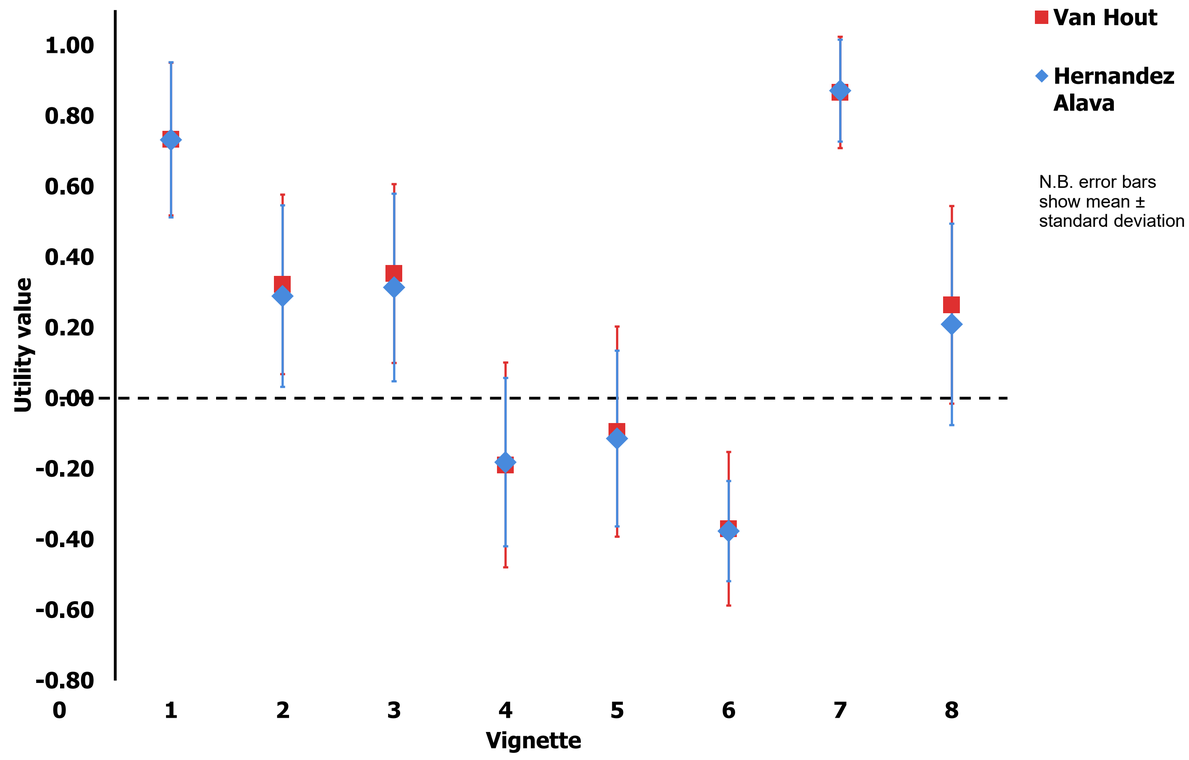

Table 2. Differences between utility values produced with the Van Hout and Hernandez Alava mapping algorithms

Vignette	1	2	3	4	5	6	7	8
Difference	0.0019	0.0333	0.0394	0.0078	0.0197	0.0067	0.0048	0.0557

Conclusions

- In this COVID-19 vignettes utility study, choice of EQ-5D-5L to EQ-5D-3L mapping algorithm had a limited impact upon the resulting EQ-5D utility values in most health states.
- In the long COVID disease state, the difference was approximately in-line with the minimal clinically important difference as validated in respiratory disease.[5]
- A difference of this magnitude has the potential to impact the conclusions of NICE committees, in an area such as COVID-19 where incremental QALYs associated with therapeutics are relatively small.[6,7]
- **There is a clear need for a validated UK value set for EQ-5D-5L[8], to resolve the reliance on mapping algorithms and create a standard approach in the future.**

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Disclosures

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