Mātauranga Raranga
Long COVID Registry
AOTEAROA NEW ZEALAND

Exploring the inequity of HRQoL in individuals with long COVID symptoms

HPR3

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Background

Long COVID – COVID-19 symptoms or sequelae that persist for longer than three months – is a significant public health problem. Marginalised and deprived groups have been shown to be at greater risk of COVID-19 infection and severe disease, but little is known about the relationship between deprivation and long COVID. There are significant health inequities in Aotearoa New Zealand and these were exacerbated during the pandemic; Māori and Pasifika and those in more deprived areas experienced a greater burden.

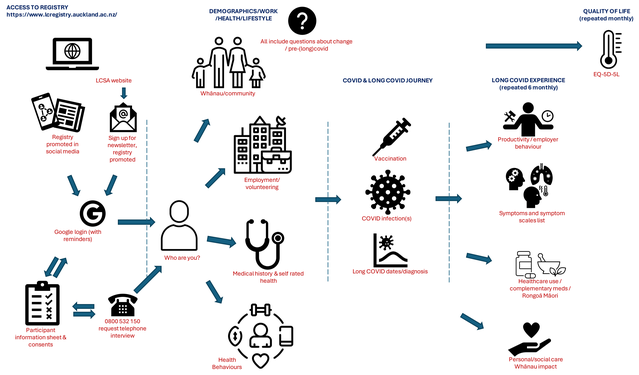
Objective

Greater adoption of the EQ-5D-5L as a measure of population health will be enhanced with evidence of the performance of the instrument against recognised measures of inequality. This analysis seeks to understand the relationship between deprivation and EQ-5D-5L (New Zealand value set) for individuals with long COVID.

Methods

Mātauranga Raranga | Long COVID Registry Aotearoa consists of ten linked survey modules (Figure 1) designed in partnership with people with lived experience of long COVID.

Figure 1: Schematic of the registry and survey modules



The first module collects socio-demographic information and includes an imbedded module that converts a New Zealand street address into a data zone and attaches a deprivation score and domain ranks (NZ Index of Multiple Deprivation 2018, IMD18).

HRQoL is collected using the EQ-5D-5L, with recall for pre-COVID HRQoL and today with long COVID symptoms. Participants can also complete monthly EQ-5D-5L follow-up surveys.

The registry is underpinned by a Tiriti o Waitangi Framework which seeks to avoid deficit framing. Separate analyses of tangata whenua (Māori) and tāngata tiriti (non-Māori) explore the demographic decomposition of the registry by deprivation quintiles and then EQ-5D-5L values and profiles in the top and bottom quintiles.

Linear regression analyses explore if demographics and clinical presentation mediate any relationship between EQ-5D-5L and deprivation.

Results

The registry remains open to enrolment; these results are based on a data extract on the 31st March 2024 – 8 months after the opening of the registry. The sample size is N=1,348, 8.5% Māori; 91.5% non-Māori. The demographics of the sample are presented in Table 1. 73% | 75% of Māori | non-Māori participants are female, and the average age is 45 | 49 years old. 15% | 24% of Māori | non-Māori live in IMD18 quintile 1 (least deprived) and 25% | 12% of Māori | non-Māori live in quintile 5 (most deprived). Vaccination rates are high due to vaccine mandates.

Table 1: Demographics of the sample

	Māori (%)	non-Māori (%)		Māori (%)	non-Māori (%)
Sex			Highest educational attainment		
Female	75.2	73.5	No schooling/Primary school	‡	0.6
Male	24.8	23.3	High school/secondary	23.1	12.0
Non-binary / third gender	‡	2.7	Post-school education	24.1	19.5
Age (mean)	45.69	48.80	Bachelor's degree	34.3	31.1
Current household income			Bachelor Honours degree	9.3	13.8
$0 - $30,000	15.3	12.7	Master's degree	9.3	15.6
$30,001 - $50,000	16.7	7.8	Doctoral degree	‡	5.9
$50,001 - $100,000	25.0	29.0	Essential Worker		
> $100,000	43.1	39.5	Yes	37.9	32.0
IMD Quintile			of which healthcare worker	36.4	40.0
1 - least deprived	15.2	23.8	Num. vaccinations (mean)	3.26	3.44
2	25.0	23.7	Num. of COVID infections (mean)	1.69	1.46
3	15.2	21.2	Number of comorbidities (mean)	3.02	2.64
4	19.6	19.7			
5 - most deprived	25.0	11.6			

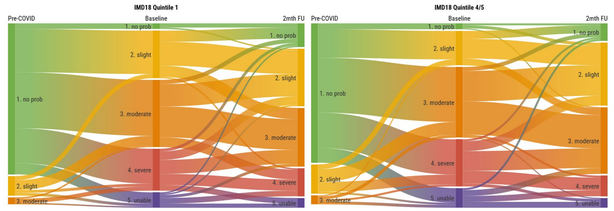
‡ Cells with fewer than 6 people have been suppressed, with rounding to support secondary suppression.

Pre-COVID EQ-5D-5L had a mean value of 0.856 | 0.887 for Māori | non-Māori; at enrolment with long COVID symptoms the mean value was 0.488 | 0.529. The difference in EQ-5D-5L is statistically significant across those two time points. Analysis of the monthly follow-up data shows the disutility associated with long COVID symptoms persists (see poster EE422).

The relationship between deprivation and HRQoL is as expected; those residing in least deprived areas have higher EQ-5D-5L scores pre-COVID (0.889 | 0.896) and at baseline (0.591 | 0.544) than those in the most deprived areas (IMD18 Quintiles 4 & 5 combined) (0.852 | 0.886 & 0.484 | 0.526). Analyses of the difference in EQ-5D-5L pre-COVID and baseline finds that while all participants on average experience a decline in EQ-5D-5L score, non-Māori participants in the most deprived areas experienced a marginally significant reduction in HRQoL relative to those in the least deprived areas.

Exploring the relationship at the dimension level finds that selfcare and usual activities are most impacted by long COVID symptoms. Figure 3 provides an example of how participants are self-reporting their usual activities pre-COVID, on entry into the registry and at 2 months follow-up.

Figure 3: Sankey diagram of usual activities pre-COVID, baseline and 2mth follow-up for non-Māori IMD18 Quintile 1 and Quintiles 4&5



The longitudinal follow-up allows for the QALY shortfall to be estimated. Pre-COVID EQ-5D-5L and time in study are used to calculate potential QALYs in the absence of long COVID. The area under the curve method is employed to estimate the QALYs of experiencing long COVID. The QALYs lost due to long COVID range from 0.721 to -0.097 | 0.705 to -0.143, mean QALYs lost is 0.142 | 0.133 for Māori | non-Māori. Note that the average time in the study is 166 | 167 days with a range of 28 to 249 | 25 to 263 days for Māori | non-Māori.

Regression analyses of the QALYs lost (controlling for time in study) find that in univariate analyses sex, age, pre-existing conditions, hospitalisation with COVID, and duration of long COVID symptoms are significant determinants of the QALY shortfall. There is no evidence of a deprivation impact on the QALY shortfall in univariate analyses.

Table 2 presents multivariate regressions for Māori and non-Māori controlling for pre-COVID EQ-5D-5L. Many of the univariate associations persist, additionally for Māori | non-Māori participants the analysis finds that residing in the most deprived areas substantially | marginally increases the QALY shortfall.

Table 2: Multivariate regression – dependent variable QALYs lost

	Māori (%)		non-Māori (%)	
	coeff	t-stat	Coeff	t-stat
Pre-COVID EQ-5D-5L	0.715	2.77***	0.568	6.02***
Age	-0.002	-0.40	-0.002	-2.62***
Male	-0.095	-0.86	0.027	1.29
Non-binary	-0.098	-0.54	0.072	1.16
IMD18 Quintile 2	0.211	1.64	-0.008	-0.33
IMD18 Quintile 3	0.152	1.03	0.040	1.52
IMD18 Quintile 4/5	0.338	2.63**	0.052	2.21**
Hospitalised with COVID	0.458	2.26**	0.027	0.88
Duration of symptoms (3-6mths)	0.697	3.19***	-0.007	-0.20
Duration of symptoms (6-12mths)	0.460	3.50***	0.022	0.77
Duration of symptoms (1-2yrs)	0.423	3.36***	0.025	0.87
Duration of symptoms (>2yrs)	0.193	0.75	0.093	2.03**
Pre-existing conditions	-0.022	-1.13	0.007	1.40

* p-value <0.10; ** p-value <0.05; *** p-value<0.01

Discussion

A recent systematic review to assess the prevalence and symptomology of long COVID found few studies that considered ethnicity and no studies which considered indices of deprivation. This study addresses that evidence gap and additionally explores the relationship between EQ-5D-5L and deprivation. The results suggest a complex relationship between HRQoL and deprivation which is variable for Māori and non-Māori. The study is currently limited in terms of the representativeness of the sample, particularly with respect to Māori; recruitment is ongoing.

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