Health State Utility Values in COVID-19: A Vignette Study in Japan

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BACKGROUND & OBJECTIVES

COVID-19 is a respiratory disease caused by the SARS-CoV-2 virus and requires hospitalization and respiratory support in severe cases. Since limited evidence on the health state utility values (HSUV) for COVID-19 patients, we conducted a vignette-based study in Japan, drawing on a previous study in the UK (Goswami H. PharmacoEconomics: 2022).

METHODS

The health status classification for COVID-19 includes eight categories ranging from mild to severe symptoms, such as general ward, intensive care unit, mechanical ventilation, etc. The vignette in this study was set for each of these eight categories. Respondents were asked to answer questions using the EQ-5D-5L questionnaire. The web-based survey was conducted in July 2023 for 500 healthy general public. The existing Japan EQ-5D-5L value set was then applied to generate utility values.

Table1. Overview of health vignettes

Vignette	Description of condition	Disease severity	Treatment setting	Ventilation status	Underlying health condition	Symptoms	Long-term complications
S1	No COVID-19	N/A	N/A	N/A	Present	N/A	N/A
S2	COVID-19	Mild	Not in hospital	None	Present	Fever Cough Fatigue Headache Muscle pain Loss of smell Nasal congestion	N/A
S3	COVID-19	Moderate	Not in hospital	None	Present	Fever Cough Fatigue Headache Muscle pain Loss of smell Nasal congestion	N/A
S4	COVID-19	Severe	General hospital ward	Via nasal canula	Present	Fever Cough Fatigue Confusion Muscle pain	N/A
S5	COVID-19 where the patient requires supplemental oxygen through a face mask	Severe	HDU in a hospital	Via face mask	Present	Fever Cough Fatigue Confusion Muscle pain	N/A
S6	COVID-19 where the patient cannot breathe on their own and will die if not treated	Critical	ICU in a hospital	Intubated	Present	N/A	N/A
S7	Recovered from COVID-19 with no long term health issues	N/A	N/A	N/A	Present	N/A	None
S8	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

Table2. Subjects' characteristic

Characteristic		n (%) or Mean ± SD	%
Age (y)		44.6±14.2	
Sex (m/f)		233/255	
Education	Junior high school	3	0.6
	high school	117	24.0
	College etc.	101	20.7
	University	228	46.7
	Graduate school	31	6.4
Marital status	Married	239	49.0
	Unmarried	225	46.1
	Divorced or bereaved	22	4.5
Family	Single	584	29.2
	Couple	730	36.5
	Two families	582	29.1
	3 or more families	104	5.2
Household income	< JPY 2 mil	42	8.6
	JPY 2 mil <= <4 mil	96	19.7
	JPY 4 mil <= <6 mil	93	19.1
	JPY 6 mil <= <8 mil	62	12.7
	JPY 8 mil <= <10 mil	48	9.8
	JPY 10 mil <=	53	10.8
Diagnosis	Cancer	23	4.7
	Liver disease	2	0.4
	Heart disease	11	2.3
	Diabetes	12	2.5
	Respiratory disease	5	1.0
Vaccination	1 dose	54	11.1
	2 doses	5	1.0
	3 doses	50	10.3
	4 doses	132	27.1
	5 doses	135	27.7
	6 doses	63	12.9
	7 doses	44	9.0
Infections	None	385	78.9
	1 time	91	18.7
	2 times	4	0.8
	3 times	4	0.8
	4 times	1	0.2
	5 times	1	0.2
EQ-5D-5L score		0.909±0.121	
EQ-5D-5L VAS		70.2±21.1	

Data from 488 participants were used in the statistical analysis, excluding participants with missing values. 233 males and 255 females were included, and their mean age was 44.7 years. The mean of the subject's own EQ-5D-5L score was 0.909 ± 0.121. Most participants had received the vaccine (3 or 4 times). EQ values were calculated for each health condition, with scores of 0.387 for Mild/moderate symptoms, 0.248±0.258 for General ward, 0.190±0.187 for Intensive care unit, and 0.115±0.196 for Mechanical ventilation.

Fig 1. Boxplots for utility values derived for each vignette

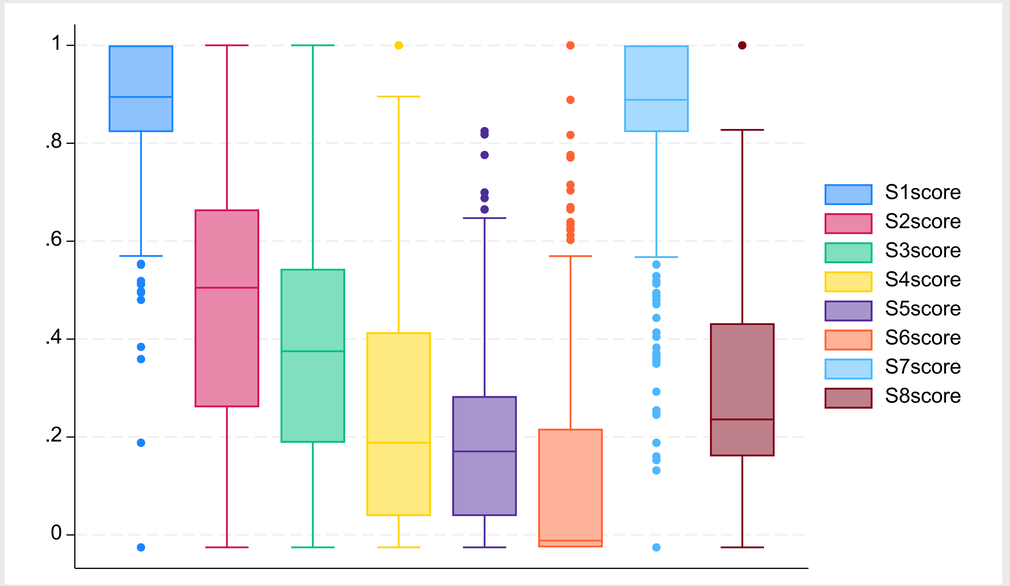

Table3. Comparison of results between Japan, the U.K., and the U.S.

	S1	S2	S3	S4	S5	S6	S7	S8
Japan	0.89	0.48	0.39	**0.25**	**0.19**	**0.12**	0.87	0.28
UK	0.73	0.32	0.35	**-0.19**	**-0.09**	**-0.37**	0.89	0.26
US	0.80	0.51	0.52	**0.16**	**0.23**	**0.00**	0.89	0.46

*S1: Baseline (pre-infection), S2: Mild disease (outpatient), S3: Moderate disease (outpatient), S4: Severe disease (general hospital ward), S5: Severe disease (HDU), S6: Critical disease (ICU), S7: Full recovery with no long-term sequelae, S8: Recovery with long-term sequelae

DISCUSSION & CONCLUSIONS

- For a given vignette, it was found that the general public could respond using the EQ-5D-5L description. However, this was likely influenced by the fact that COVID-19 was a relatively easy disease or condition to imagine.
- In the comparison between Japan and the UK, large differences in S4, S5, and S6 scores were observed, which may be due to differences in the EQ-5D-5L scoring algorithms in the two countries.
- While the study in the UK showed that the EQ values in general wards were lower than those in intensive care units, this inconsistency was resolved in the current study probably due to our minor modifications on the vignettes.
- In the Japanese survey, we tried to provide careful descriptions and explanations in order to correct the inconsistencies in the UK survey. Due in part to this positive influence, no inversion of health status and utility values occurred. This suggests that the vignette-based survey must be carefully described and explained so as not to mislead the participants, or else the correct results will not be obtained.
- The limitation of this study needs cautious discussions for the way of generating the HSUV using EQ-5D-5L answered by the general public for the given vignettes.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Conflicts of Interest: The authors declare no conflicts of interest.

References: Goswami H, Alsumali A, Jiang Y, et al. Cost-Effectiveness Analysis of Molnupiravir Versus Best Supportive Care for the Treatment of Outpatient COVID-19 in Adults in the US. Pharmacoeconomics. 2022;40(7):699-714.