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Psychometric performance of EQ-5D-5L and VILL-UI, a new condition-specific preference-weighted measure, in patients with age-related macular degeneration: A MACUSTAR Study Report

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Summary: VILL-UI and EQ-5D-5L are both preference weighted measures that generate quality adjusted life years (QALYs). They capture different aspects of health-related and vision-related quality of life. In patients with age-related macular degeneration, VILL-UI has superior performance to EQ-5D-5L for known-group validity, with fewer ceiling effects, but higher missing data.

Aims

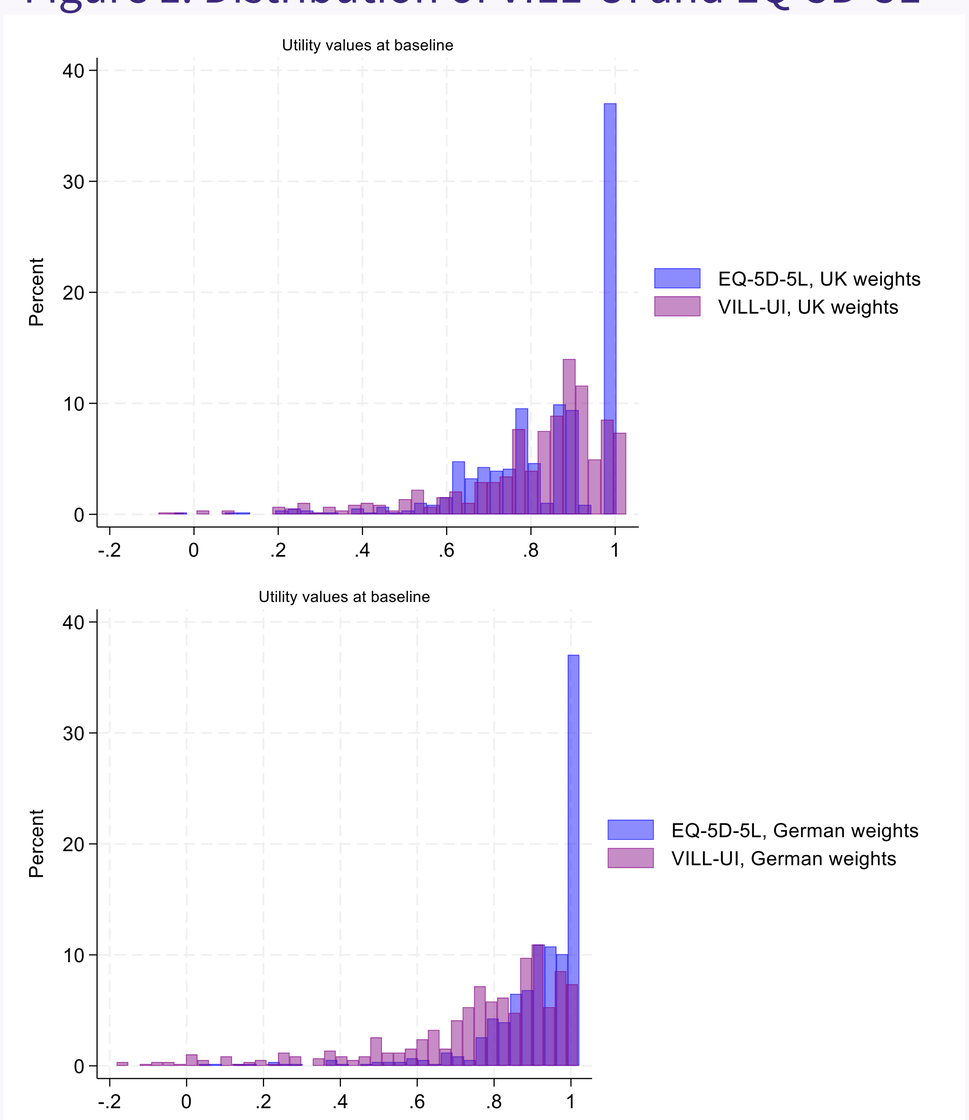
The aim of this study is to assess and compare the psychometric performance of a newly developed preference-weighted measure for patients with age related macular degeneration (AMD), VILL-UI, and EQ-5D-5L in patients with AMD. Understanding the psychometric performance of preference-weighted measures is useful to inform decisions around the selection of measures and understanding and interpretation of their results.

Methods

EQ-5D-5L and VILL-UI utilities were generated using both UK and German value sets using the MACUSTAR cross-sectional and longitudinal data at baseline, 12 months, 24 months and 36 months. Assessments examine feasibility, convergent and divergent validity, and known-group validity.

Results

Figure 1: Distribution of VILL-UI and EQ-5D-5L



- **Sample** (n=586) had mean age 71.9 years (standard deviation 6.9), 65.2% were women, and predominantly had intermediate AMD (87.2%)
- VILL-UI and EQ-5D-5L are **feasible** for completion
- VILL-UI has higher **missing data** (at baseline all 661 participants fully completed EQ-5D-5L whereas 586 have complete VILL-UI)
- EQ-5D-5L has high **ceiling effects**, with around one third of participants reporting the best health state *(Figure 1)*
- **Convergent validity** between EQ-5D-5L and VILL-UI utilities and dimensions/items where a relationship would be expected is low (≤0.4) *(Table 1)*
- **Divergent validity** is demonstrated between EQ-5D-5L and VILL-UI dimensions/items where expected
- VILL-UI detected statistically significant differences in **known-groups** for visual acuity, visual function and AMD stage across most timepoints, with little evidence of known-group validity for EQ-5D-5L *(Table 2)*

Table 1: Convergent validity

Spearman rank correlation	VILL-UI utilities, UK weights	VILL-UI utilities, German weights
EQ-5D-5L utilities, UK weights	0.30	
EQ-5D-5L utilities, German weights		0.34

Table 2: Known group validity by AMD stage

	Early/Intermediate AMD (mean) n=545	Late AMD (mean) n=31	P-value	Effect size (Cohen's D)
VILL-UI, UK weights	0.833	0.420	<0.001	2.600
VILL-UI, German weights	0.790	0.304	<0.001	2.418
EQ-5D-5L, UK weights	0.839	0.790	0.072	0.292
EQ-5D-5L, German weights	0.913	0.865	0.029	0.354

Conclusion

Whilst EQ-5D-5L is feasible and has low rates of missing data, VILL-UI has superior performance for known-group validity and fewer ceiling effects but higher missing data. The measures capture different aspects of health-related quality of life, as evidenced by divergent validity and low convergent validity.

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