

Annushiah VASAN THAKUMAR ¹, Xun LI ², Tessa KENNEDY-MARTIN ³, Xin ZHANG ⁴, Bernhard SLAAP ^{5,6}, Michael HERDMAN ⁴, Kristina S. BOYE ⁷, Ling Jie CHENG ^{8,9}

¹ School of Pharmacy, Faculty of Health & Medical Sciences, Taylor's University, Malaysia; ² School of Engineering, Computing, and Mathematics, Oxford Brookes University, Oxford, United Kingdom; ³ Kennedy Martin Health Outcomes, Hove, United Kingdom; ⁴ Saw Swee Hock School of Public Health, National University of Singapore, Singapore; ⁵ EuroQol Group Research Foundation, Rotterdam, The Netherlands; ⁶ Department of Psychiatry, Erasmus Medical Centre, Rotterdam, The Netherlands; ⁷ Global Medical Affairs, Eli Lilly and Company, Indianapolis, Indiana, USA; ⁸ National Perinatal Epidemiology Unit, Nuffield Department of Population Health, University of Oxford, Oxford, United Kingdom; ⁹ Alice Lee Centre for Nursing Studies, Yong Loo Lin School of Medicine, National University of Singapore, Singapore

INTRODUCTION & OBJECTIVE

- EQ-5D instruments are widely used in health technology assessment (HTA) to generate utility values for cost-utility analyses.¹
- The transition from EQ-5D-3L to EQ-5D-5L has introduced methodological innovations in valuation,² yet many health systems still rely on EQ-5D-3L value sets, and systematic comparisons of valuation methods remain limited.
- This review aimed to map and compare methodological approaches used in EQ-5D-3L and EQ-5D-5L valuation studies, and to identify key shifts and their implications for HTA.

METHODS

- Systematic methodological review of national EQ-5D valuation studies
- Data sources:**
 - Five medical databases (inception to August 2025)
 - EuroQol value set repository (2009–2025)
- Inclusion Criteria:** National valuation studies using hypothetical health states with general population samples
- Screening and extraction by two independent reviewers
- Key domains extracted:** sampling and study design, valuation technique and modelling, mode of administration, quality control and protocol adherence

RESULTS

Study Characteristics

- 94 national valuation studies identified across 55 countries (Figure 1)
 - EQ-5D-3L: 49 studies; EQ-5D-5L: 45 studies
- EQ-5D-5L studies had span wider geographic coverage (44 vs 38 countries), reflecting growing global adoption
- Valuation studies for both versions were predominantly conducted in high-income settings (Table 1)

Methodological Shifts (Figure 2)

- Shift from standalone TTO toward hybrid composite TTO (cTTO) + discrete choice experiment (DCE) designs in EQ-5D-5L studies
- Emergence of web-based data collection in EQ-5D-5L, though face-to-face remains dominant

Quality Control and Standardisation

- Near-universal adoption of standardised protocols and quality monitoring in EQ-5D-5L studies
- Reflects maturation of the EQ-VT (EuroQol Valuation Technology) infrastructure and lessons learned from EQ-5D-3L

Utility Value Ranges

- EQ-5D-5L value sets yield more negative pit states (i.e., worst possible health state, 55555) and higher proportions of worse-than-dead values (Table 1)
- These differences have direct implications for cost-effectiveness estimates in HTA

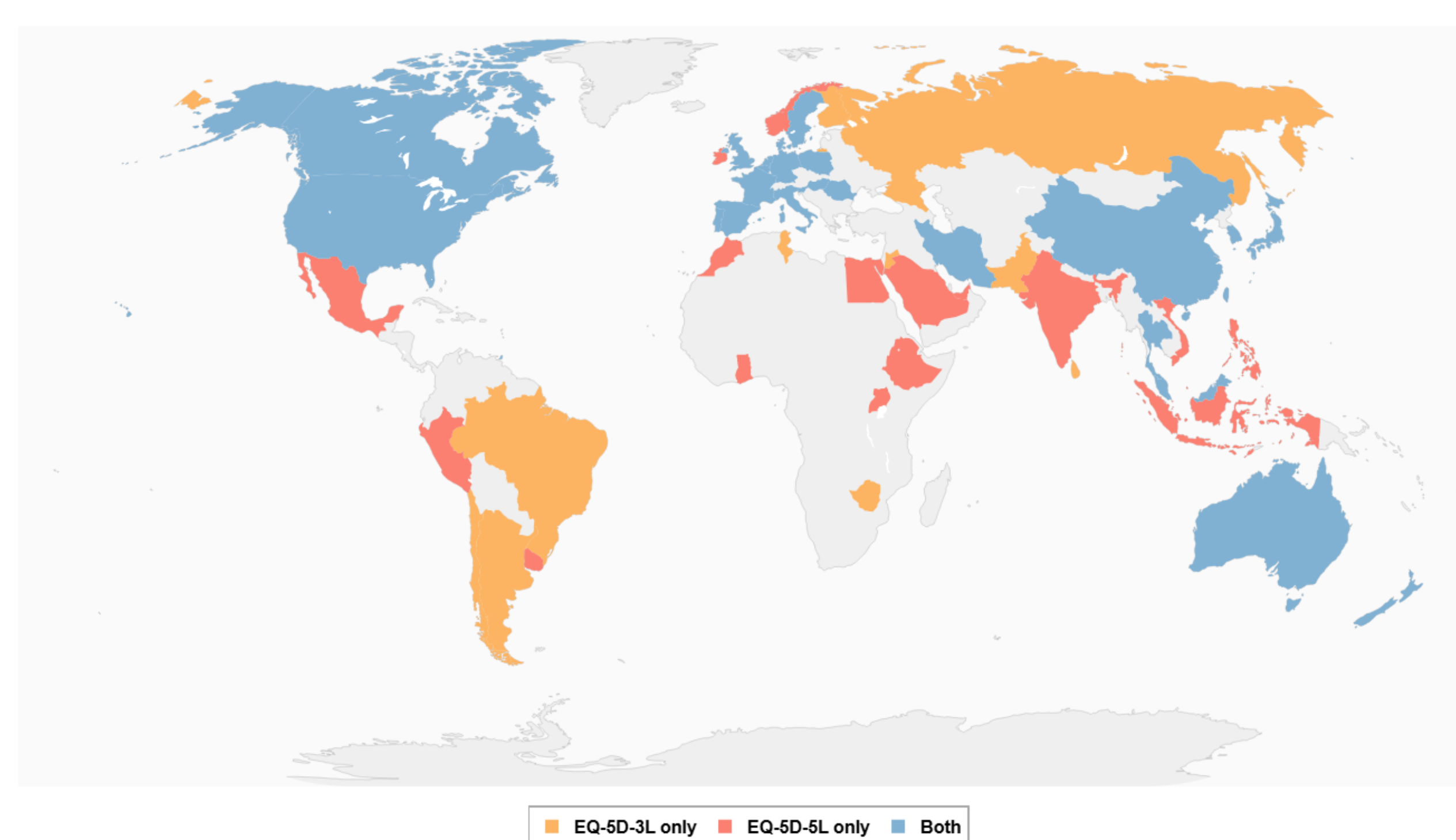


Figure 1. Countries with EQ-5D-3L, EQ-5D-5L, or both instrument value sets

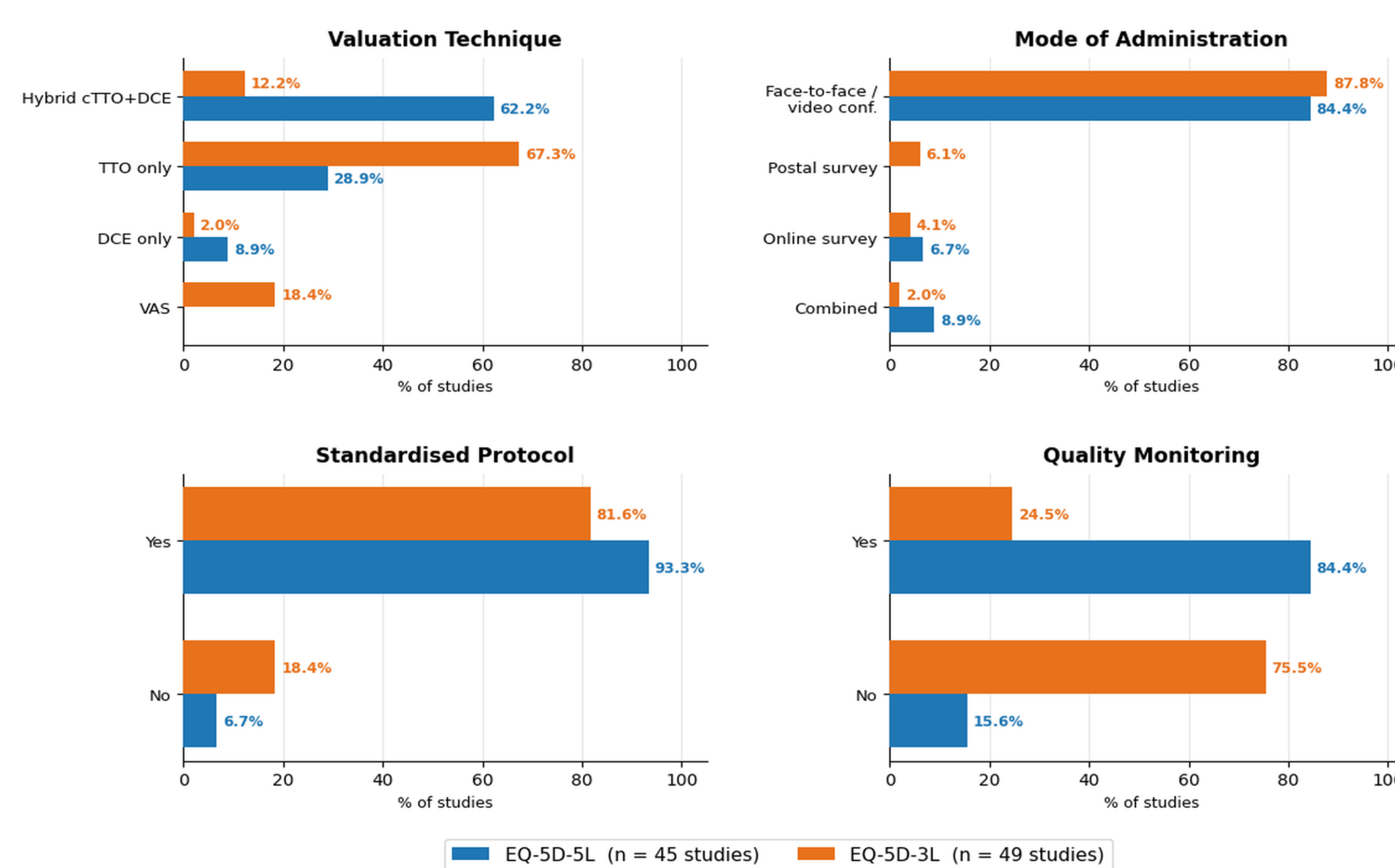


Figure 2. Methodological shifts of EQ-5D-3L and EQ-5D-5L national valuation studies

Table 1. Characteristics of EQ-5D-3L and EQ-5D-5L National Valuation Studies

Characteristic	EQ-5D-5L, n (%)	EQ-5D-3L, n (%)
Year published		
1996-2005	0 (0)	9 (18.4)
2006-2015	0 (0)	24 (49.0)
2016-2025	45 (100)	16 (32.7)
World Bank Region		
Europe & Central Asia	16 (35.6)	17 (34.7)
East Asia & Pacific	13 (28.9)	14 (28.6)
Latin America & the Caribbean	4 (8.9)	7 (14.3)
Middle East & North Africa	5 (11.1)	4 (8.2)
North America	3 (6.7)	4 (8.2)
South Asia	1 (2.2)	2 (4.1)
Sub-Saharan Africa	3 (6.7)	1 (2.0)
World Bank Economic Status		
High	29 (64.4)	30 (61.2)
Upper-Middle	8 (17.8)	14 (28.6)
Low/Lower-Middle	8 (17.8)	5 (10.2)
Sampling method		
Probabilistic	14 (31.1)	27 (55.1)
Non-probabilistic	30 (66.7)	19 (38.8)
Mixed	1 (2.2)	1 (2.0)
Not reported	0 (0)	2 (4.1)
Sample size (completed)		
Median	1,085	745
Range	300 to 8222	153 to 9148
Pit state		
Median	-0.573	-0.329
Range	(-1.491 to -0.025)	(-0.865 to 0.170)
Worse than dead values (%)		
Median	13.31	8.64
Range	(0.032 to 53.50)	(0 to 59.26)

DISCUSSION & CONCLUSIONS

- EQ-5D-5L valuation methods show substantial methodological maturation compared to EQ-5D-3L, driven by the EQ-VT infrastructure^{3,4}
- Near-universal adoption of standardised protocols and quality monitoring in EQ-5D-5L studies has enhanced cross-country comparability
- Despite these advances, methodological heterogeneity persists, particularly in sampling strategies, mode of administration, and modelling approaches
- EQ-5D-5L value sets yield systematically more negative utility values, which may alter cost-effectiveness conclusions in HTA compared to EQ-5D-3L-based analyses

- Limitations of the search include the exclusion of grey literature and non-English studies, and the absence of formal quality appraisal of included valuation studies
- Future research priorities:
 - Head-to-head comparisons of EQ-5D-3L and EQ-5D-5L value sets within the same country to quantify impact on HTA outcomes
 - Strengthening valuation methods in low- and middle-income settings where standardised protocols remain underused

REFERENCES

- Kennedy-Martin M, Slaap B, Herdman M, et al. Which multi-attribute utility instruments are recommended for use in cost-utility analysis? A review of national health technology assessment (HTA) guidelines. *Eur J Health Econ.* 2020; 21: 1245-57.
- Devlin NJ, Brooks R. EQ-5D and the EuroQol Group: Past, Present and Future. *Appl Health Econ Health Policy.* 2017;15(2):127-37.
- Stolk E, Ludwig K, Rand K, van Hout B, Ramos-Goñi JM. Overview, Update, and Lessons Learned From the International EQ-5D-5L Valuation Work: Version 2 of the EQ-5D-5L Valuation Protocol. *Value Health.* 2019;22(1):23-30.
- Ramos-Goñi JM, Oppe M, Slaap B, Busschbach JJV, Stolk E. Quality control process for EQ-5D-5L valuation studies. *Value Health.* 2017;20(3):466-73.

FUNDING

EuroQol Research Foundation, the Netherlands (2078-RA). The views expressed are those of the authors and do not necessarily reflect the views of the funding organization.

CONTACT

X: @JeremyChengLJ

Email Address: jeremy.cheng@npeu.ox.ac.uk
cheng.lingjie@nus.edu.sg

