Urban/rural differences in preferences for EQ-5D-5L health states: A study of a multi-ethnic region in China

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Objectives

- To compare health preferences for EQ-5D-5L health states between urban and rural populations in China.

Methods

- This study used pooled secondary data from two EQ-VT studies (N=597). Participants were recruited from Guizhou Province, China using quota sampling in terms of age, sex, education and Hukou registration (urban vs rural). Each participant was interviewed face-to-face to value a set of 15 or 16 out of 30 EQ-5D-5L health states using time trade-off (TTO) methods including cTTO and other two variants.
- Regression analysis was used to compare the health state preferences between urban and rural participants:

1) Univariate and multivariable linear regression analyses with adjustment of gender, education and ethnicity were used to examine the differences in mean values for individual health states and in the overall mean values between urban and rural participants.
2) The effects of urban/rural on TTO values were examined using the standard, additive 20-parameter main effects model with 20 interaction terms differentiating urban and rural sub-sample.
3) The modelling results using the data from urban and rural participants separately were compared.

Results

Table 1. Comparison of mean health state values between rural and urban participants.

Health state	Total (N=597)		Urban (N=331)		Rural (N=266)		Unadjusted [a]	Adjusted [b]
	Mean	SD	Mean	SD	Mean	SD	Mean difference	Mean difference
11112	0.935	0.085	0.941	0.073	0.927	0.098	-0.014	-0.015
11211	0.915	0.072	0.921	0.067	0.908	0.076	-0.014	-0.015
12111	0.911	0.089	0.908	0.095	0.914	0.081	0.005	0.008
21111	0.899	0.092	0.908	0.086	0.889	0.098	-0.019	-0.021
11121	0.899	0.092	0.902	0.074	0.896	0.109	-0.006	-0.007
21322	0.710	0.166	0.722	0.156	0.697	0.176	-0.025	-0.022
33112	0.693	0.192	0.724	0.168	0.654	0.215	**-0.069**	**-0.073**
42123	0.533	0.263	0.535	0.275	0.530	0.247	-0.005	-0.012
31433	0.458	0.284	0.502	0.267	0.400	0.295	**-0.102**	**-0.104**
43331	0.430	0.306	0.465	0.308	0.386	0.299	**-0.079**	**-0.087**
22235	0.427	0.364	0.459	0.343	0.385	0.386	-0.074	-0.082
34224	0.396	0.328	0.427	0.323	0.357	0.332	-0.070	**-0.097**
24141	0.377	0.332	0.407	0.321	0.338	0.342	-0.069	**-0.085**
12442	0.339	0.382	0.351	0.379	0.323	0.386	-0.028	-0.026
15134	0.333	0.373	0.378	0.367	0.275	0.374	**-0.103**	**-0.106**
52314	0.277	0.365	0.309	0.361	0.237	0.369	-0.072	-0.085
13525	0.212	0.419	0.210	0.446	0.215	0.387	0.005	0.027
25513	0.209	0.442	0.174	0.464	0.251	0.412	0.078	0.102
14353	0.078	0.455	0.105	0.428	0.045	0.485	-0.060	-0.045
53243	0.062	0.441	0.080	0.455	0.041	0.424	-0.039	-0.048
55421	0.014	0.466	0.053	0.466	-0.037	0.462	-0.090	-0.065
44415	-0.012	0.444	-0.005	0.424	-0.021	0.468	-0.016	-0.020
32551	-0.026	0.470	-0.001	0.476	-0.059	0.462	-0.057	-0.040
23454	-0.069	0.460	-0.022	0.467	-0.129	0.447	**-0.108**	**-0.110**
54532	-0.071	0.496	-0.046	0.480	-0.101	0.514	-0.055	-0.037
45252	-0.130	0.462	-0.114	0.456	-0.149	0.469	-0.036	-0.003
35345	-0.137	0.443	-0.126	0.454	-0.152	0.430	-0.026	-0.037
41544	-0.188	0.457	-0.156	0.471	-0.228	0.435	-0.072	-0.077
51155	-0.250	0.503	-0.239	0.501	-0.262	0.506	-0.023	-0.006
55555	-0.681	0.352	-0.672	0.372	-0.691	0.325	-0.019	-0.013
Total	0.254	0.564	0.272	0.562	0.231	0.566	**-0.041**	**-0.038**

[a] Using univariate linear regression (urban residence as reference group).
[b] Using multivariable linear regression adjusted for gender, education and ethnicity (urban residence as reference group).
Bold values indicate statistically significant at an alpha level of 0.05.

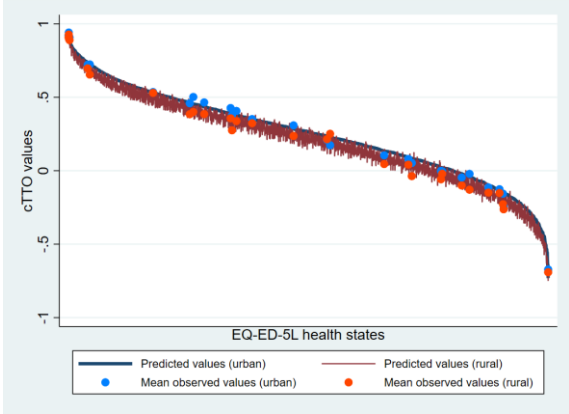
- Both univariate and multivariable linear regression analyses showed that rural participants tended to value health states lower than urban participants regardless of severity of health states (Table 1).
- The unadjusted and adjusted overall mean differences between the two groups were -0.041 (p=0.031) and -0.038 (p=0.049), respectively.

Table 2. The modelling results using linear random-effect models (N=597).

	Model 1			Model 2		
	Coef	SE	p-value	Coef	SE	p-value
Intercept	0.027	0.025	0.294	0.040	0.027	0.133
MO2	**0.053**	0.009	<0.001	**0.053**	0.013	<0.001
MO3	**0.117**	0.011	<0.001	**0.114**	0.015	<0.001
MO4	**0.260**	0.010	<0.001	**0.257**	0.013	<0.001
MO5	**0.357**	0.010	<0.001	**0.347**	0.013	<0.001
SC2	**0.030**	0.009	<0.001	**0.030**	0.013	0.015
SC3	**0.077**	0.010	<0.001	**0.072**	0.013	<0.001
SC4	**0.187**	0.010	<0.001	**0.180**	0.014	<0.001
SC5	**0.261**	0.010	<0.001	**0.267**	0.013	<0.001
UA2	0.019	0.010	0.055	0.022	0.013	0.099
UA3	**0.082**	0.010	<0.001	**0.082**	0.013	<0.001
UA4	**0.208**	0.010	<0.001	**0.201**	0.013	<0.001
UA5	**0.300**	0.010	<0.001	**0.312**	0.013	<0.001
PD2	**0.049**	0.009	<0.001	**0.040**	0.013	0.002
PD3	**0.116**	0.010	<0.001	**0.091**	0.014	<0.001
PD4	**0.338**	0.010	<0.001	**0.326**	0.013	<0.001
PD5	**0.482**	0.010	<0.001	**0.463**	0.013	<0.001
AD2	**0.031**	0.010	0.002	**0.029**	0.013	0.027
AD3	**0.076**	0.011	<0.001	**0.080**	0.015	<0.001
AD4	**0.203**	0.010	<0.001	**0.194**	0.014	<0.001
AD5	**0.275**	0.010	<0.001	**0.282**	0.013	<0.001
Residence (ref: Urban)						
Rural	**0.038**	0.019	0.049	0.008	0.027	0.764
Gender (ref: Female)						
Male	-0.009	0.019	0.639	-0.009	0.019	0.631
Education (ref: Primary)			[0.278]			[0.271]
Junior high	0.018	0.024	0.448	0.018	0.024	0.446
Senior high	0.011	0.028	0.699	0.011	0.028	0.701
University & above	0.058	0.030	0.057	0.058	0.030	0.055
Ethnicity (ref: Han)						
Minority	0.024	0.020	0.231	0.024	0.020	0.237
Interactions						[0.446]
Rural x MO2				0.003	0.019	0.893
Rural x MO3				0.009	0.022	0.696
Rural x MO4				0.007	0.020	0.741
Rural x MO5				0.020	0.020	0.295
Rural x SC2				0.000	0.019	0.998
Rural x SC3				0.011	0.020	0.569
Rural x SC4				0.015	0.020	0.469
Rural x SC5				-0.013	0.020	0.521
Rural x UA2				-0.007	0.020	0.738
Rural x UA3				-0.001	0.020	0.976
Rural x UA4				0.015	0.020	0.456
Rural x UA5				-0.027	0.020	0.174
Rural x PD2				0.022	0.019	0.251
Rural x PD3				**0.055**	0.021	0.007
Rural x PD4				0.026	0.020	0.192
Rural x PD5				**0.044**	0.020	0.025
Rural x AD2				0.003	0.020	0.886
Rural x AD3				-0.010	0.022	0.646
Rural x AD4				0.021	0.021	0.321
Rural x AD5				-0.016	0.020	0.422

Bold values indicate statistically significant at an alpha level of 0.05.
The p-value for joint tests of the interaction terms is given in brackets.

Fig. 1 Observed mean values for 30 health states and predicted values for all 3125 health states by 20-parameter linear random-effect models.



- The Model 1 suggests that urban/rural was significantly associated with health state values (β=0.038, p=0.049) (Table 2).
- The Model 2 indicated that rural participants put more weight on the pain/discomfort dimension than urban participants (Table 2).
- Predictions for the 3125 health states based on rural participants' health preferences tended to be lower than those based on urban participants' health preferences (Fig. 1).

Conclusion

- There were small, yet significant, differences in EQ-5D-5L health states preferences between urban and rural populations in a multi-ethnic region in China.
- This finding is consistent with previous study showing a urban-rural gap in preferences for EQ-5D-3L health states [1].
- It is necessary to use a representative population sample to generate a national value set.
- When we switch to online data collection using panel company, we should be mindful about the sample representativeness given that online sample always leaves out certain population groups.

[1] Liu, G. G., Guan, H., Jin, X., Zhang, H., Vortherms, S. A., & Wu, H. (2022). Rural population's preferences matter: a value set for the EQ-5D-3L health states for China's rural population. *Health and quality of life outcomes*, *20*(1), 1-12.