Scenario-Specific Values of a Statistical Life in Japan: Evidence from Willingness-to-Pay Elicitation for Health, Disaster, and Safety Risks

HPR2

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INTRODUCTION

-The value of a statistical life (VSL) is widely used when assessing policies that reduce mortality risks.
-However, whether a single VSL estimate is appropriate across heterogeneous policy contexts remains uncertain.

OBJECTIVE

To estimate scenario-specific VSL in Japan using multiple mortality-risk contexts and elicitation methods.

METHOD

-We conducted an online survey in Japan in November 2025.
-Participants were assigned to either a free-text willingness-to-pay (WTP) group or a double-bounded dichotomous choice (DBDC) group.
-WTP was elicited for small reductions in mortality risk across four scenarios: traffic accident, cancer, new infectious disease, and great earthquake.
-VSL was calculated by dividing WTP by the corresponding absolute risk reduction. Scenario-specific VSL estimates were compared across elicitation methods.

RESULTS

Table 1. Participants' backgrounds

	Free-text group (n = 3,477)	DBDC group (n = 3,413)
Age group		
18 −29 years	480 (13.8%)	463 (13.6%)
30 −39 years	436 (12.5%)	417 (12.2%)
40 −49 years	527 (15.2%)	518 (15.2%)
50 −59 years	615 (17.7%)	599 (17.6%)
60 −69 years	951 (27.4%)	967 (28.3%)
≥70 years	468 (13.5%)	449 (13.2%)
Female	1,802 (51.8%)	1,757 (51.5%)
Income		
<5 million JPY	1,330 (38.3%)	1,320 (38.7%)
5−10 mil JPY	715 (20.6%)	662 (19.4%)
>10 mil JPY	228 (6.6%)	220 (6.4%)
Unknown	1,204 (34.6%)	1,211 (35.5%)
Living with child	941 (27.1%)	894 (26.2%)
Living alone	835 (24.0%)	771 (22.6%)

Table 2. Willingness to pay and value of a statistical life in each scenario

WTP for 50% reduction in risk of death (JPY)	Free-text group	DBDC group
Traffic accident		
Mean (SD) [95%CI]	89,109 (2,420,207)	6,442 [6,101−6,761]
Median (IQR) [95%CI]	3,000 [500−10,000]	2,045 [1,892−2,212]
Cancer		
Mean (SD) [95%CI]	145,674 (3,952,995)	8,311 [7,825−8,733]
Median (IQR) [95%CI]	5,000 [1,000−10,000]	2,873 [2,662−3,106]
New infectious disease		
Mean (SD) [95%CI]	68,223 (1,753,494)	7,297 [6,912−7,653]
Median (IQR) [95%CI]	3,000 [500−10,000]	2,525 [2,345−2,718]
Great earthquake		
Mean (SD)	35,214 (922,583)	2,893 [2,734−3,042]
Median (IQR)	1,667 [333−3,333]	990 [917−1,067]

Abbreviations: DBDC, double-bound dichotomous choice; JPY, Japanese yen. IQR, interquartile range; SD, standard deviation; VSL, value of a statistical life; WTP, willingness to pay.

DISCUSSIONS

-The WTP results across the four scenarios indicate that the magnitude of the reduction in mortality risk did not substantially affect WTP.
-WTP elicited using free-text answers was consistently higher than that obtained using the DBDC method across all four scenarios.

Limitations

-Unable to assess participants' level of understanding of the survey questions, which has been shown to influence WTP estimates.

CONCLUSIONS

-WTP was relatively stable across the four scenarios, despite substantial differences in the proposed absolute reductions in mortality risk. VSL varied markedly by scenario, indicating the importance of applying context-specific VSL estimates when informing policy decision-making.

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