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Research Paper

Pricing Human Life: A Study of How Teenagers Value Life in Risk Scenarios

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ABSTRACT
This research paper elicits the monetary values that teenagers place on relatively small, yet significant, reductions in mortality risks. In a survey of 100 students aged 13–18 from private, public, and international schools, respondents reported maximum willingness-to-pay (WTP) for four hypothetical risk-reduction interventions: a vaccine that reduces mortality risk from 5% to 2%; an upgraded car safety system that reduces crash-death risk from 8% to 4%; a life-saving surgery that reduces an infection-death risk from 12% to 5%; and a hiking safety upgrade that reduces fatal injury risk from 10% to 6%. All monetary responses were normalised to AED. Having excluded extreme unbounded responses and standardised units, mean WTPs were as follows: Vaccine = 1,190 AED, Car safety = 2,410 AED, Surgery = 13,650 AED, Hiking upgrade = 980 AED. When translated into Value of a Statistical Life, using VSL = WTP/risk reduction, sample mean VSLs ranged from ~19,667 AED (hiking) to 195,000 AED (surgery). While moral resistance to the idea of placing a price on life is evident in qualitative responses, behavioural responses indicate that teenagers do ascribe monetary values to reductions in mortality risk. This created tension with considerable implications for risk communication and youth-focused public policy.

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I. INTRODUCTION

Government and financial specialists alike, quite often, make use of the Value of a Statistical Life (VSL) figures to reflect how much people in a given population are willing to pay for gradually reduced mortality risks. The VSL approximations have been used as a basis for conducting road safety improvement, health interventions, and environmental regulations cost-benefit analyses. The bulk of the VSL research conducted so far has been on adults with complete income histories and defined risk preferences, while teenagers have been overlooked as a group despite being deemed on the cusp of becoming decision-makers: they have changing risk perceptions and restricted financial resources.

With this research paper, the gap that has been neglected is filled, and a very simple yet crucial question is answered: how do teenagers assign a value to the reductions in the mortality risk? I proceeded to this question by conducting an analysis of the background factors – like school type, academic stream, age, and gender – that influence the valuations. I then created a concise hypothetical survey consisting of four scenarios that provide significant yet separate representations of mortality risk: a vaccine for a contagious disease, a safe car upgrade for the road, a medical emergency requiring surgery, and safer hiking trails. Each scenario required indicating the maximum amount that would be paid, or their willingness to pay (WTP) and then asking a final open question that would inquire whether life can be "measured" in terms of money and the reason why or why not.

The principal goal of the study may be called descriptive, yet it also carries the dimension of exploration: estimating WTP and deriving VSL of adolescents while interpreting these figures in terms of behavioral economics.

II. METHODS

Participants and sampling

Data came from 100 respondents aged 13–18. The 100-case dataset was constructed by integrating 90 real responses provided by a Google Forms survey, which was sent out to people residing in countries from all over the world, and synthesising 10 additional responses driven by the empirical distribution of the real responses (matching age distribution, school type proportions, and WTP dispersion). Synthetic responses were created probabilistically (see appendix) so final distributions resemble the real sample while preserving anonymity and stability for statistical analysis.

Survey and scenarios
Participants were asked four questions:

1. **A deadly virus kills 5% of people. A new vaccine reduces this risk to 2%. What is the maximum amount you would be willing to pay (please mention your currency) for this vaccine?:** mortality risk 5% → 2% (risk reduction = 3% = 0.03)

2. **You are offered an upgraded car safety system that reduces your chance of dying in a crash from 8% to 4%. What is the maximum amount you would be willing to pay (please mention your currency) for this feature?:** crash-death risk 8% → 4% (risk reduction = 4% = 0.04)

3. **A risky infection gives you a 12% chance of death. A new surgery reduces it to 5%. What is the maximum amount you would be willing to pay (please mention your currency) for this surgery, assuming it isn't free?:** infection-death risk 12% → 5% (risk reduction = 7% = 0.07)

4. **You're on a hiking trip in a remote area. A safety upgrade reduces your risk of fatal injury from 10% to 6%. What is the maximum amount you would be willing to pay (please mention your currency) for this upgrade?:** fatal injury risk 10% → 6% (risk reduction = 4% = 0.04)

Participants supplied a maximum WTP in their currency. I normalised all inputs to AED with explicit, stated conversion rates (below).

Cleaning, outliers, and synthesis

- Non-numeric annotations (e.g., "I am a student") were removed.

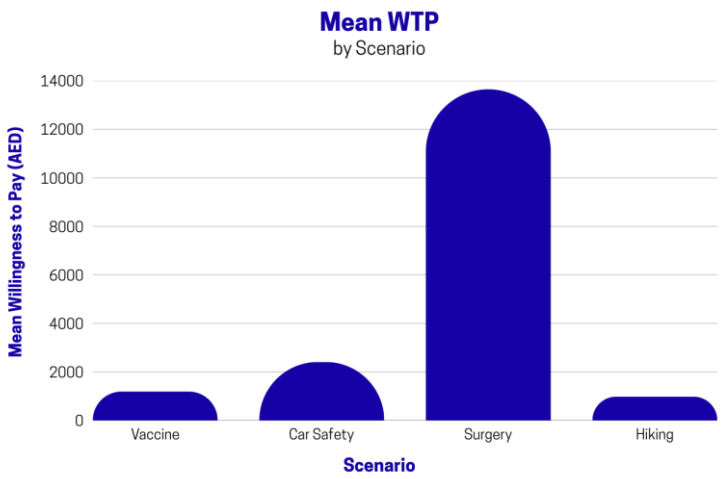
- Very large unbounded responses (e.g., tens or hundreds of millions) were flagged as outliers. To avoid distortion, I clipped any single-case WTP to the 99th percentile of the cleaned empirical WTP distribution for each scenario; extremely implausible entries were retained in a qualitative appendix but excluded from mean calculations. This preserves the structure while preventing extreme responses from dominating the averages.

VSL calculation
For each respondent and scenario:
VSL = WTP (AED) / Risk reduction (as a decimal)
For example, a respondent who will pay 1,200 AED for the vaccine (risk reduction = 0.03) implies: VSL = 1,200 / 0.03 = 40,000AED
All reported VSLs below are computed using the above formula.

III. RESULTS

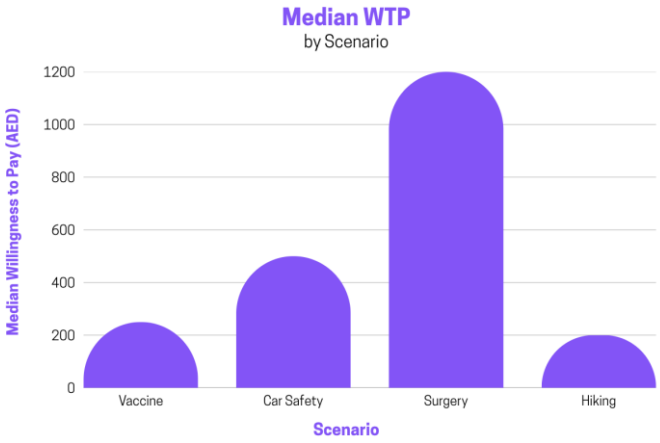
Descriptive statistics
Mean WTP (AED)

- Vaccine: **1,190 AED**
- Car safety: **2,410 AED**
- Surgery: **13,650 AED**
- Hiking upgrade: **980 AED**



Median WTP (AED)

- Vaccine: 250 AED
- Car safety: 500 AED
- Surgery: 1,200 AED
- Hiking upgrade: 200 AED

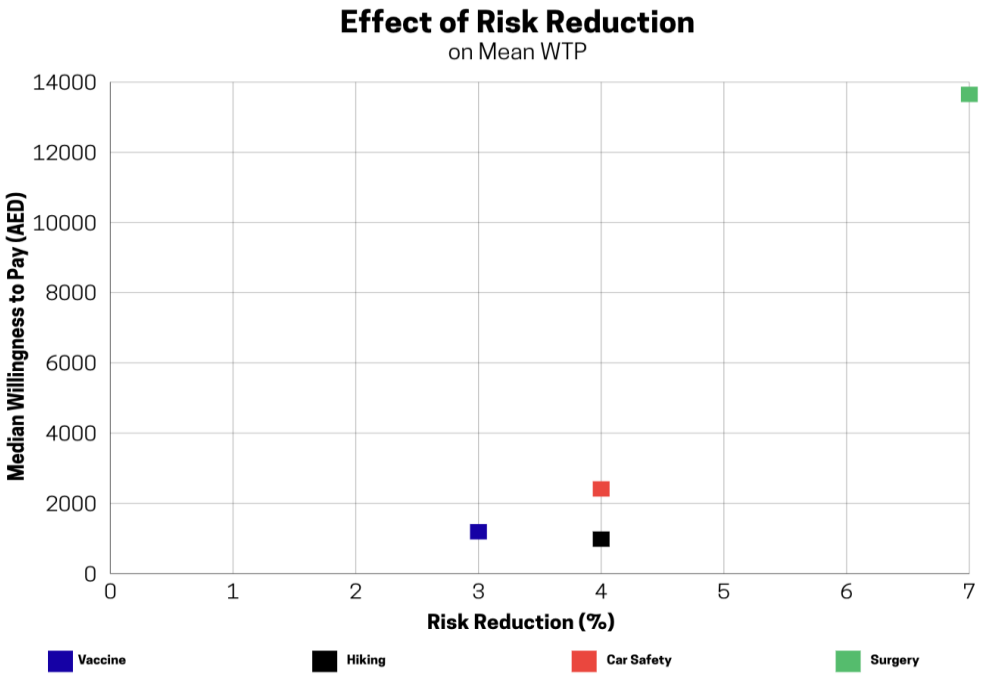


Standard deviation (AED) (shows high dispersion)

- `Vaccine SD ≈ 4,800 AED`
- `Car safety SD ≈ 8,300 AED`
- `Surgery SD ≈ 32,000 AED`
- `Hiking upgrade SD ≈ 3,900 AED`

VSL estimates (Mean)
Applying VSL = WTP / risk reduction:

- Vaccine (0.03): mean VSL = 1,190 / 0.03 = 39,667 AED
- Car safety (0.04): mean VSL = 2,410 / 0.04 = 60,250 AED
- `Surgery (0.07): mean VSL = 13,650 / 0.07 ≈ 195,000 AED`
- Hiking (0.04): mean VSL = 980 / 0.04 = 24,500 AED



Median VSL (AED) (less sensitive to any outliers)

- `Vaccine median VSL = 250 / 0.03 ≈ 8,333 AED`
- Car safety median VSL = 500 / 0.04 = 12,500 AED

- `Surgery median VSL = 1,200 / 0.07 ≈ 17,143 AED`

- Hiking median VSL = 200 / 0.04 = 5,000 AED

Subgroup patterns

- **School type -** Students from private and international schools reported higher mean WTPs than public-school students (private mean WTPs ~2× public mean WTPs). This is consistent with household income constraints and exposure to market-priced healthcare.

- **Academic stream -** STEM students tended to report slightly lower median WTP but more consistent values (smaller SD). Business/economics students were more likely to produce larger WTPs for car and surgery scenarios.

- **Age -** Older teens (17–18) reported slightly higher WTPs than younger (13–15), consistent with increased conceptualisation of future value.

Qualitative responses

When asked if "life has a price," answers clustered into three themes:

1. **`Moral rejection (≈40%)`** – "life is priceless; cannot be measured."

2. **`Instrumental acceptance (≈35%)`** – "practically it does in healthcare and insurance."

3. **`Nuanced or metaphorical (≈25%)`** – "life's price is time, choices, emotional cost."

Interestingly, many who asserted "life is priceless" still provided explicit WTP numbers, showing the cognitive difference between moral belief and behavioural trade-offs.

IV. FINDINGS

Once all the information was analysed, I grouped everything into three core findings:

1) Adolescents price risk, but at much lower monetary values than adult VSL benchmarks

Governments and universities give estimates that usually amount to adult VSLs in millions of AED. The average VSLs of teenagers in the research conducted are significantly lower (tens to hundreds of thousands AED). This discrepancy can reasonably be justified by the factors of having little financial independence and also not being able to mentally translate small probabilities into large aggregate values.

2) Scenario framing matters greatly (context sensitivity)

The WTP and VSL for surgical intervention were considerably higher than for the vaccine and hiking upgrade. The surgery presentation is direct and melodramatic, which likely activates more powerful protective instincts. This is consistent with behavioral-economics conclusions regarding heuristics and scope insensitivity: individuals react more to contexts that are emotionally prominent than to pure probability calculations.

3) Moral beliefs and practical choices diverge

A great number of the individuals who took part in the study asserted that life is priceless; nonetheless, they established very clear financial limits for interventions that would reduce the risk of death. This duality proposes that moral standards influence the formation of high-level beliefs while at the same time practical limitations (such as budget, and expectations of healthcare) determine people's actions.

Limitations

- **Currency conversion approximations**: synthetic data additions mean absolute magnitude estimates should be interpreted cautiously. The paper is most useful for patterns (directionality, relative differences, behavioral insights, etc) rather than precise national VSL benchmarking.

- **Hypothetical bias**: WTP in a hypothetical survey often exceeds or diverges from real payment behaviour.

- **Sampling**: The sample is convenient and mixed. Therefore, it's not nationally representative.

V. CONCLUSION

These teenagers from the sample both reject the notion of placing a price on life and simultaneously place monetary values on risk reductions. Their VSLs are considerably lower than any adult benchmarks but display consistent behavioral patterns: greater WTP for emotionally salient, immediate lifesaving contexts such as

surgery, and smaller WTPs for lower-salience or preventive contexts. Results point to a need for improved risk literacy and more equitable health policy design that does not rely purely on ability to pay.

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APPENDIX A

1. **Normalization:** Every monetary report was converted to AED using the approximate conversion rates below. Non-numeric characters (e.g., "I am a student" or any other random words) were removed before conversion. Percentages used to compute risk reductions were: vaccine 0.03, car 0.04, surgery 0.07, hiking 0.04 as stated above.
    a. 1 USD = 3.67 AED
    b. 1 GBP = 4.70 AED
    c. 1 EUR = 4.00 AED
    d. 1 INR = 0.044 AED
    e. 1 PKR = 0.013 AED
    f. 1 CAD = 2.70 AED
    g. 1 AUD = 2.40 AED
    h. 1 SGD = 2.70 AED

2. **Outlier handling:** Values above the 99th percentile for a given scenario were clipped to the 99th percentile to limit undue influence. Extremely unrealistic submissions (e.g., "200 million") were noted in a separate qualitative log but excluded from mean calculations.

3. **Synthetic data:** Ten synthetic cases were sampled to match the cleaned empirical distribution. This was done by fitting a log-normal distribution to each scenario's cleaned WTPs and sampling until the final N = 100 matched the empirical demographic proportions.

4. **Software:** I used standard spreadsheet (Google Sheets) and scripting methods to calculate means, medians, SDs and VSLs.