# VALUATION OF SERIOUS INJURY COSTS

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# Main valuation methods

- Human capital models
  - What is the loss of productivity – for the victim, for others (e.g. Service providers, family)
  - Can add "pain and suffering" estimates
- Willingness to pay
  - What are people prepared to pay to reduce risks?
  - Can be applied to risk of both death and injury
  - Stated preference vs revealed preference variants

# How do they differ?

- Implicitly, WTP is a broader measure:
  - It includes "everything people value"
  - By contrast, the human capital approach is narrowly "economic" (unless PGS is added).
- Consequently, WTP estimates are systematically higher than human capital base equivalents

# What is current practice?

## According to IRAP:

(nb: PGS = pain, grief, suffering)

| Country | Official VSL | Per capita GDP | VSL/per capita GDP | Year | Currency | Method |
|---|---|---|---|---|---|---|
| Australia | 1,832,310 | 40,654 | 45 | 2003 | Aus $ | HC |
| Austria | 2,676,374 | 31,028 | 86 | 2006 | € | WTP |
| Canada | 1,760,000 | 36,806 | 48 | 2002 | C$ | HC |
| France | 1,156,925 | 27,232 | 42 | 2005 | € | HC |
| Germany | 1,161,885 | 26,753 | 43 | 2004 | € | HC |
| Iceland | 284,000,000 | 3,840,943 | 74 | 2006 | ISK | HC+PGS |
| Netherlands | 1,806,000 | 28,807 | 63 | 2002 | € | HC + PGS |
| New Zealand | 3,050,000 | 37,536 | 81 | 2005 | NZ$ | WTP |
| Sweden | 18,383,000 | 295,436 | 62 | 2005 | SK | WTP |
| United Kingdom | 1,384,463 | 19,663 | 70 | 2004 | £ | WTP |
| United States | 3,000,000 | 36,311 | 83 | 2002 | $ | WTP |

# What is current practice (2)?

- The previous slide shows both methods are widely used
- However, the International Roads Assessment Program states:
- *"...despite the difficulties associated with accurate estimation of individual Willingness-to-pay it is generally accepted as the most valid method for assessment of the value of prevention of road risk....* ***Both COST 313 and the ECMT Round Table concluded that Willingness-to-pay is the preferred methodology as the human capital approach is not conceptually sound.***"

# Consistency across policy areas

- An effective policy analysis process will use consistent approaches across the board;
- In Victoria (and nationally) the WTP method is used in all RIS analysis to calculate VSL (VCEC & OBPR guidance)
- Thus, any RIS or BIA on a road safety program must use this approach
- Implies that this approach should be used by road safety authorities

# VSL vs VoSI

- Currently, RIS practice is inconsistent:
  - VSL is calculated using WTP
  - But no clear guidance on VoSI
  - Different approaches are used in practice
- This can easily be addressed:
  - VoSI data can be derived directly; but
  - Much research has gone into developing usable "ratio" guidance
  - That is, allowing us to say "VoSI = X% of VSL"
  - Range of figures of 10% (NZ) to 25% (IRAP) approx.

# Policy implications

- If we use human capital approaches for both VSL and VoSI, we will:
  - Under-estimate the value of road safety measures;
  - In some cases value SI more highly than fatalities;
- If we use WTP for VSL, but human capital for VoSI we will:
  - Under-estimate the value of road safety measures (by lesser amount); and
  - Tend to unduly favour fatality reduction measures over injury reduction measures (i.e. Distort choices);
  - Adopt a conceptually inconsistent approach.

# IRAP Recommendations:

## "Default & sensitivity analysis values for the economic appraisal of road safety measures"

Table 10: iRAP economic appraisal model values

| | Lower | Central | Upper |
|---|---|---|---|
| Value of Fatality | 60*GDP/Capita | 70*GDP/Capita | 80*GDP/Capita |
| Value of Serious Injury | 12*GDP/Capita (20%VSL) | 17*GDP/Capita (25%VSL) | 24*GDP/Capita (30%VSL) |
| Number of Serious Injuries to number of Fatalities | 8 | 10 | 12 |

# Conclusions

- Estimates of VoSI must be comprehensive;
- Use of  Human Capital approaches – which has been common in Australia to date – will lead us to take too little policy action to reduce risk
- It will also be increasingly inconsistent to our approaches to VSL
- **Thank you for your attention**

# References


- McMahan, K. & Dahdah, S. (2008). ***The True Cost of Road Crashes, Valuing Life and the Cost of a Serious Injury.*** International Road Assessment Program
- Australian Transport Safety Bureau (2002). ***Rail Accident Costs in Australia.*** [For a methodological discussion – see pp 18 - 22].
- ***Leung, J. (2009). Understanding Transport Costs and Charges DECEMBER 2009 Phase 2 – Value of statistical life: a meta analysis Is the current value of safety for New Zealand too low?*** *Ministry of Transport, New Zealand.*
- COST 313 (1994). ***Socio-Economic Cost of Road Accidents.*** See: http://cordis.europa.eu/cost-transport/src/pub-313.htm
- Soby, BA., Ball, DJ. & Ives, DP. (1993). ***Safety Investment and the Value of Life and Injury.*** Risk Analysis, Vol. 13, No. 3, 1993
- Henry Le, H., van Geldermalsen, T., Lim, WL. & Murphy, P. (2011). ***Deriving Accident Costs using Willingness-to-Pay Approaches - A Case Study for Singapore.*** [Discusses stated preference and contingent valuation methods]. http://www.patrec.org/atrf.aspx