



UNIVERSITI PUTRA MALAYSIA

**VALUATION OF FATAL AND NON-FATAL INJURIES DUE TO
MOTORCYCLE ACCIDENTS IN MALAYSIA**

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FK 2006 75

**VALUATION OF FATAL AND NON-FATAL INJURIES DUE TO
MOTORCYCLE ACCIDENTS IN MALAYSIA**

By

MOHD FAUDZI MOHD YUSOFF

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia
in Fulfilment of the Requirement for the Degree of Doctor of Philosophy**

July 2006



DEDICATION

Especially to:

My beloved mother Hajjah Che Amah bt Awang

&

In memorial My father Haji Mohd Yusoff bin Haji Kassim

Special to...

Abang Athif

Fadhli

Afif

Fahmi

Nadiah

Aiman

Husna

Hanis

Last but not least to by beloved wife

Hajjah Rahani bt Mohd Zin

Jazakumullahukhairan for all the support, encouragement, patience and faith.



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment
of the requirement for the degree of Doctor of Philosophy

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MOHD FAUDZI BIN MOHD YUSOFF

July 2006

Chairman: Professor Ir. Radin Umar Radin Sohadi, PhD

Faculty : Engineering

Policy makers often struggle with the question of what is the appropriate monetary value to be associated with reduced fatalities. As a result, a disproportionate number of road safety projects were abandoned in favor of other types of projects as they all compete for a limited amount of public funds. This is the motivation for carrying out this research the main objective of which is to evaluate of the value of statistical life (VOSL) of fatal and non-fatal injuries among motorcyclists in Malaysia in an attempt to overcome the lack of reliable estimates of accident.

The study utilizes extensively two surveys namely the valuation survey amongst motorcyclists covering 6 constituents within the Seremban Municipality in the state of Negeri Sembilan and the epidemiology survey of hospitalized non-fatal injuries amongst injured motorcyclists at Seremban Hospital to develop the Injury Scale Descriptor. Apart from using descriptive statistics, the inferential statistics have been utilised to test the reliability and stability on the estimated values.



Results from the valuation survey passed all the criteria of the construct validity especially the critical scope test. Multiple regression analyses showed statistically significant relationships between WTP and vital variables of income, age, accident experience and riding purpose. A unique variable of race was also found to be significantly related to WTP.

Upon control for the effect of inter-country variation in income, the mean values of statistical life (VOSL) have been found to be approximately RM1.1 million and RM77,000 per non-fatal injury. After considering GDP growth, the suggested estimate to reflect the benefits of road safety in public policy analysis for year 2004 is RM1.3 million and RM92,400 for fatal and non-fatal injury respectively

This study recommends the need for further research on other cost elements to complement the human cost in the effort to establish the comprehensive road accident costs. Other valuation methods should also be conducted in similar valuation studies to fortify the present human cost estimates. Finally, after the successful estimate of intangible benefits (human cost) of road safety, it is strongly recommended that research on other infrastructure investment benefits be undertaken. Only then, can proper Cost Benefit Analysis method become the instrument in evaluating future investments of transport infrastructures.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah

**MENILAI KECEDEeraan MAUT DAN TIDAK MAUT AKIBAT DARIPADA
KEMALANGAN MOTOSIKAL DI MALAYSIA**

Oleh

MOHD FAUDZI BIN MOHD YUSOFF

Julai 2006

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Perdebatan dengan persoalan berapakah nilai wang yang berpatutan boleh dihubungkan dengan pengurangan kemalangan maut tidak pernah berakhir. Akibatnya, sebahagian besar daripada projek keselamatan jalanraya dibatalkan kerana terpaksa memberi jalan kepada projek lain dalam persaingan memperolehi peruntukan dana yang terhad. Fakta inilah yang memotivasikan pelaksanaan kajian ini yang mempunyai objektif utama untuk menganggarkan nilai statistik hayat dan kecederaan di kalangan penunggang motosikal dalam usaha mengatasi ketiadaan anggaran kos kemalangan

Kajian ini telah melaksanakan dua tinjauan soalselidik iaitu soalselidik yang ditadbirkan di kalangan penunggang motorsikal sekitar enam mukim dalam Perbandaran Seremban, Negeri Sembilan dan soalselidik epidemiology mengenai kecederaan (tidak melibatkan maut) di kalangan penunggang motorsikal yang dimasukkan ke Hospital Seremban untuk menghasilkan Skala Penerangan Kecederaan. Selain daripada menggunakan statistik deskriptif, statistik inferensi juga digunakan untuk menguji kepercayaan dan kestabilan nilai yang dianggarkan.

Keputusan-keputusan yang diperolehi daripada soalselidik pertama telah melepasi semua kriteria 'construct validity' terutama sekali ujian skop yang kritikal. Analisa regresi pelbagai menunjukkan hubungan yang signifikan antara WTP dengan angkubah penting seperti pendapatan, umur, pengalaman kemalangan dan tujuan menunggang. Satu angkubah unik iaitu bangsa turut didapati mempunyai hubungan yang signifikan dengan WTP.

Setelah mengawal kesan perbezaan pendapatan antara negara, kuantiti nilai min statistik hayat seunit kemalangan maut yang diperolehi ialah sebanyak RM1.1 juta dan manakala kuantiti nilai statistik hayat bagi seunit kecederaan RM77,000. Setelah mengambil kira kenaikan GDP, anggaran yang dicadangkan bagi mencerminkan faedah keselamatan jalanraya untuk tujuan analisa polisi awam pada tahun 2004 ialah RM1.3 juta (satu kemalangan maut) dan RM92,4000 (satu kecederaan).

Kajian ini mencadangkan keperluan melaksanakan penyelidikan seterusnya atas kos-kos elemen yang lain supaya menjadi pelengkap kepada kos manusia dalam usaha penentuan kos kemalangan jalanraya yang komprehensif. Kaedah penilaian yang lain juga perlu dilaksanakan dalam kajian penilaian yang serupa untuk mengukuhkan lagi anggaran kos manusia yang digunapakai dari kajian ini. Akhir sekali, memandangkan faedah (yang tidak nampak) keselamatan jalanraya telah berjaya dianggarkan, adalah dicadangkan dengan sesungguhnya kaedah Analisa Kos dan Faedah menjadi kriteria menilai pelaburan infrastruktur pengangkutan pada masa hadapan.

ACKNOWLEDGEMENTS

Praise be to Allah the most Merciful and Beneficent, without Whose bestowal of strength, dedication and patience on me, this thesis would not have come to its completion.

I am deeply grateful to my supervisor, Professor Ir. Dr. Radin Umar Radin Sohadi for his guidance, encouragement, constructive criticisms and invaluable advices throughout the course of this study. During the course of this study, I have learned much from him especially from his wisdom and professionalism. I would like to express my grateful thanks to my co-supervisors, Associate Professor Dr. Norghani Md Nor and Associate Professor Ahmad Hariza Hashim, for advising, encouraging and for being very understanding during the course of this study.

I am deeply indebted to Mr. Law Teik Hwa (UPM) for his patience and guidance in the customization of MAAP 5. To Dr. Kulanthayan, who without fail addressed me '*Abang.*' His friendship and valuable inputs in discussions have born fruits. I extend my sincere thanks to both of you.

To my mother, Che Amah Bt Awang and late father, Mohd Yusoff Hj Kassim for being very encouraging and persistently asking me '*Bila nak habis mengaji ni.*' Though not around to witness the result of his encouragement I pray to the Almighty that he would be together with the faithfuls in '*Jannah.*'



To Abang Athif, for being my lowest paid RA yet had to do numerous work accompanying me during field works and data input during his short semester breaks from UTM .

To Fadhli, Afif, and Fahmi for being patient, hard work and cooperative with Ummi and Babah through their years of studies although the 'helping hand' is seldom around;

To Kak Yah, Aiman, Nana and young Hanis for entertaining me with your quarrels, homeworks and loves. Truly, all of you have broken the monotony of my long years of struggle;

But most of all I thank my wife, the closest and dearest partner in life, Ummi (Rahani Mohd Zin) who without grouses, understanding, support, patiently put up with my long 'absence' from home during the course of this study.

To all of them, especially Mak and Ummi, I say *terima kasih, jazakumullah*. May Allah bless you all.



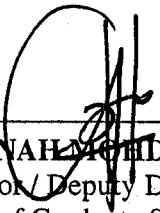
I certify that an Examination Committee has met on 20th July 2006 to conduct the final examination of Mohd Faudzi bin Mohd Yusoff on his Doctor of Philosophy thesis entitled "Valuation of Fatal and Non-Fatal Injuries Due to Motorcycle Accidents in Malaysia " in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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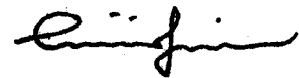


This thesis submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee are as follows:

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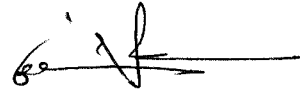


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DECLARATION

I hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.



MOHD FAUDZI MOHD YUSOFF

Date: 15 OKTOBER 2006

TABLE OF CONTENTS

	Page
DEDICATION	ii
ABSTRACT	iii
ABSTRAK	v
ACKNOWLEDGEMENTS	vii
APPROVAL	ix
DECLARATION	xi
LIST OF TABLES	xvi
LIST OF FIGURES	xx
LIST OF ABBREVIATIONS	xxiii
CHAPTER	
I INTRODUCTION	1
Background of the Study	1
Road Accidents	2
Current Trends of Road Accidents between Developed and Developing Countries	3
Road Accidents in Malaysia	4
Valuation of Road Safety	9
Motivation for Valuation of Road Safety	11
The Comprehensive Cost of Road Accidents	13
Valuation of Road Safety in Other Countries	15
The Need to Estimate Road Safety Benefits in Malaysia	16
Objectives	19
Study Hypotheses	19
Road Accident Cost Valuation Framework	21
Scope of the Study	23
Significance of the Study	26
Organization of the Dissertation	29
II LITERATURE REVIEW	31
Introduction	31
The Concept of Safety and Risk	32
Road Accidents in Malaysia	34
Motorcycle Accidents in Malaysia	35
The Possibility of Road Accident Reduction with Increasing Motorization	36
Towards Better Road Safety in Malaysia.	37
Appraisal Methods of Road Safety	41
Cost- Benefit Analysis (CBA)	42
The Importance of Road Safety Costs	46
Road Accident Costs in Developed Countries	47
Road Accident Costs in Malaysia	48
Road Accident Costs in Developing Countries	51
The Need for a Robust and Reliable Accident Costing	54



The Effects of Road Accident Cost in Economic Appraisal	55
Elements of Road Accident Cost	56
Approaches of Accident Costing	60
Ex-post Evaluation- Human Capital	61
Ex-ante Evaluation - Willingness to Pay	67
Theoretical Background of WTP in Safety Valuation	68
Criticism of the WTP Approach	71
Factors in Determining Appropriate Approach	75
Between Human Capital and WTP: WTP the Better Choice	76
The Valuation of Fatal and Non-Fatal Injuries	78
The Concept of Value of Statistical Life (VOSL)	79
The WTP Approach in Estimating VSOL	80
Valuation Methods of WTP	81
Revealed Preference Methodology	81
Stated Preference Methodology	82
Contingent Valuation (CV)	91
Debate about the CV	94
WTP Elicitation Format	105
Testing the Validity and Reliability of CVM	112
Factors influencing WTP in Road Accident Valuation	113
Problems in CV Studies	119
Valuation of Fatal Injuries in Practice	121
The UK Valuation Study	121
The New Zealand Valuation Study	125
Valuation of Non-Fatal Injuries in Practice	125
The UK Non-Fatal Injury Study	125
The Swedish Non-Fatal Injury Study	131
Factors Affecting the Value of Serious Injuries	133
The Value of Non Fatal Injuries in Other Countries	134
Development of Injury State Descriptors and the Estimation of Accident Probability Distribution	136
Injury State Descriptor (ISD)	137
Accident Probability Distribution	137
VOSL and Impact on Public Policy	138
Conclusion of the Review	142
III METHODOLOGY	146
Introduction	146
Research Design	146
Determining the Study Focus	146
The Study Approach	147
Survey Instruments	152
The Fatal and Non-Fatal Questionnaire	152
The Injury Scale Descriptor Forms and Questionnaire	153
Scaling Methods	154
Methods to Ensure Validity and Reliability of Data	156
The Study Area	159
The Sample Size	166



Sampling Method	167	
Survey Construction	168	
Procedures in the Valuation of Fatal Injuries	169	
Procedures in the Valuation of Non-Fatal Injuries	171	
Demographic, Vehicle Ownership and Ridership Data	173	
Procedures in the Development of Localized ISD	174	
The Conduct of Surveys	177	
Pilot Survey	177	
The Main Survey	179	
Follow-up Survey	180	
The Injury Epidemiology Surveys	181	
Data Management	183	
Analysis of Data	185	
IV	CHARACTERISTICS OF RESPONDENTS	190
Introduction	190	
Descriptive Analysis of the Fatal and Non-Fatal Injury Survey	191	
Descriptive Analysis of the Injury Epidemiology Survey	202	
The Retrospective Study	202	
The Outpatient Study	206	
Summary	210	
V	RESULTS ON THE DEVELOPMENT OF INJURY STATE DESCRIPTOR	212
Introduction	212	
Retrospective Survey	212	
Outpatient Survey	218	
Discussion on the Injury Epidemiology Studies	224	
The Retrospective Study	224	
The Outpatient Study	227	
Development of the Localized ISD	228	
VI	RESULTS OF THE FATAL INJURY SURVEY	234
Introduction	234	
Examination of Probability Concept, Consistency and Extreme Responses	234	
The Estimates of WTP and WTA for Risk Reductions	237	
Assessment of Normality of Data	237	
WTP and WTA for Different Levels of Risk Reductions	238	
Estimates between Private and Public Risk	242	
Estimates between WTP and WTA	243	
Internal Scope Test	245	
Estimation of the Marginal Rates of Substitution for Risk of Death	246	
Relationship between Age and MRS	249	
Multivariate Analysis of Influences on MRS	250	
Follow-up Survey	260	
The Determination of VOSL of Fatal Injury	262	



VII	RESULTS OF THE NON-FATAL INJURY SURVEY	265
	Introduction	265
	Examination of Ranking of Injuries and Consistencies of Valuation	265
	The Ratio of Non-Fatal Injuries	267
	Multivariate Analysis of Influences on Risk Ratios	268
	Follow-Up Survey	275
	The Determination of the VOSL of Non-Fatal Injury	276
VIII	DISCUSSION AND CONCLUSION	278
	Introduction	278
	The Use of CV Method in Estimating VOSL	278
	The Comprehensive Cost of Road Accidents	281
	The Underestimation of Road Accident Costs in Malaysia	284
	The Test of Validity and Reliability of the Estimated VOSL	286
	Falling Percentage of WTP Respondents with Increase in Risk	288
	Higher Willingness to Pay for Higher Risk	289
	Concave Function of WTP	290
	WTP between Public and Private Transport	292
	Higher WTA Values than WTPs	293
	Influencing Factors of WTP/WTA	294
	Stability of Estimates	399
	International Comparison	300
	The Test of Validity and Reliability of the Estimated VOSL of Non-Fatal Injuries	303
	Ranking of Injuries and Internal Consistency Checks	304
	Influencing Factors of Risk Ratios	304
	Assessment of Construct Validity on VOSL of Non-Fatal Injuries	306
	International Comparison	307
	The Malaysian VOSL: Implication on Public Policy	309
	Conclusion	311
	Recommendations	314
	REFERENCES	317
	APPENDICES	337
	BIODATA OF THE AUTHOR	386



LIST OF TABLES

Table		Page
1.1	Road Accident Statistics in Selected Developed Countries in 2002	4
1.2	International Practices in Valuing Human Costs	15
2.1	Cost of a Traffic Fatality in 20 Developed Countries in 1991 (US Dollars 1998)	48
2.2	Road Accident Costs in Malaysia for 1985 (millions)	49
2.3	The Average Cost by Types of Road Accident in Malaysia for 1996	50
2.4	The Average Cost by Severity and Cost Elements of Road Accident for 1992	50
2.5	Average Cost of Road Accident Casualties in Selected Developing Countries (US Dollars 2000)	52
2.6	Some Merits and Limitations of WTP Elicitation Formats	111
2.7	Costs for Seriously Injured Person (ECU 1990)	135
2.8	Costs for a Slightly Injured Person, (ECU 1990)	135
2.9	Injury State Descriptor and Probability Distribution	139
3.1	Fatality Rates between Negeri Sembilan and Malaysia I 1996	162
3.2	Percentage of Motorcycles and Motorcycle Accident Fatalities Other Vehicles and Road Users Fatalities	162
3.3	Breakdown of Population, Residences and Respondents by Constituencies within the Seremban Municipality	168
4.1	Response Rates of Main Survey	191
4.2	Categories of License and Number of Years Held	198
4.3	Number of Motor Vehicle Accident Cases Recorded at A & E Department and Reasons for Omitting Cases	202
4.4	Response Rates of Main Survey	206



5.1	Time of Admission into the A&E	213
5.2	Length of Stay in Hospital	214
5.3	Injuries by Body Regions	215
5.4	Injuries between Body Regions and Anatomic Structures	217
5.5	Injuries between Types of Lesion and Anatomic Structures	217
5.6	Result of Non-Parametric Two-Sampled Test	218
5.7	Distribution of Time when Accident Occurred	219
5.8	Distribution of Injuries by Body Regions	219
5.9	Distribution of Injuries between Body Regions and Specific Anatomic Structures	220
5.10	Frequency Distribution of Injuries between Anatomic Structure and Type of Lesions	221
5.11	Length of Stay in Hospital	221
5.12	Number of Rest Days Awarded after Discharged	223
5.13	Injuries by ISD Codes between Studies	230
5.14	Injuries by ISD Codes and Percentage of Injuries	232
5.15	Percentage Distribution and Descriptions of Injury Categories	233
6.1	Respondents WTP for a Reduction in the Risk of Fatal Injury (Type 1 Question)	239
6.2	Respondents WTP for a Reduction in the Risk of Fatal Injury (Type 2 Question)	240
6.3	Paired Sample t Test between Risk Levels on Type 1 and Type 2 Questions	241
6.4	Paired Sample t Test on Private and Public Risks	242
6.5	Respondents WTA for Increase in the Risk of Fatal Injury (Type 2 Question)	243
6.6	Paired Sample t Test between WTP (Type 1 and Type 2) and WTA	244
6.7	Paired Sample t Test on WTP and WTA Difference in	245



	Risk Reduction	
6.8	Estimates of Marginal Rates of Substitution from Type 1 Question	247
6.9	Estimates of Marginal Rates of Substitution from Type 2 Question	248
6.10	Descriptive Statistics of Variables in Multiple Regression	253
6.11	Correlations between Independent Variables Included in the Analysis (Pearson's r)	254
6.12	Description of Independent Variables	256
6.13	Regression Results for the WTP and WTA Values using Semi-Logarithm Specification	258
6.14	Correlation of Responses between the First and Second Interview	261
6.15	Estimated Difference in Responses between the First and Second Interview	261
6.16	Estimates of Combined Marginal Rates of Substitution	263
7.1	Standard Gamble Results According to Categories of Injuries	267
7.2	Correlations between Dependent and Independent Variables Included in the Analysis (Pearson's r)	270
7.3	Description of Selected Independent Variables	271
7.4	Regression results for the Injury Models using Semi-Logarithm Specification	274
7.5	Correlation between First and Follow-up Interviews	275
7.6	Estimated Difference in the Means between First and Follow-up Interviews	275
8.1	Average Cost per Casualty by Cost Elements and Severity in Great Britain 2004 (£)	283
8.2	The Assumed Cost per Casualty by Cost Elements and Severity in Malaysia 2004 (RM)	283
8.3	The Cost of Road Accidents by Types of Injury (2000)	284
8.4	Empirical Estimated VOSL in Road Safety, by Studies	301

(in 1997 USD x 1'000)

8.5	Empirical Estimated VOSL in Road Safety, by Countries and GDP in Malaysian Ringgit (1999)	302
8.6	Costs for Seriously Injured Person (USD 1990)	308



LIST OF FIGURES

Figure		Page
1.1	Overall Road Accident and Motorcycle Accident Deaths and Casualties in Malaysia (1994-2004)	6
1.2	Trend of Fatality Rates since 1984 to 2004	8
1.3	A Systematic Approach for Road Safety	12
1.4	Road Accident Cost Assessment Framework	24
2.1	Comparison between Road and Motorcycle Accident Deaths and Casualties (1974-2004)	35
2.2	Target for Reducing 30% of Road Accident Fatalities	38
2.3	Fatality Model and Safety Target in Malaysia	49
3.1	Flow Chart of the Study Approach	149
3.2	Population Distribution by Constituencies (Mukim) in Seremban Municipality	160
3.3	Road Accident Fatalities in Malaysia, Negeri Sembilan and Seremban by Age Groups in 1998	164
3.4	Road Accident Serious Injuries in Malaysia, Negeri Sembilan and Seremban by Age Groups in 1998	164
3.5	Road Accident Slight Injuries in Malaysia, Negeri Sembilan and Seremban by Age Groups in 1998	164
3.6	Categories of Injuries by Gender in Malaysia, Negeri Sembilan and Seremban by Age Groups in 1998	165
4.1	Distribution of Respondents by Age	193
4.2	Distribution of Respondents by Gender	194
4.3	Distribution of Respondents by Race	194
4.4	Distribution of Respondents by Marital Status	195
4.5	Distribution of Respondents by Sectors of Employment	195
4.6	Distribution of Respondents by Monthly Income Earned	196

4.7	Distribution of Respondents by Academic Qualifications	197
4.8	Distribution of Respondents by Types of Licence Held	197
4.9	Number of Years Riding Motorcycle	198
4.10	Experience in Seeing Motorcycle Accident	199
4.11	Experience in Motorcycle Accident	199
4.12	Number of Times Involved in Motorcycle Accidents	200
4.13	Percentage between Injured and Non-injured Motorcycle Accidents	200
4.14	Number of Times Involved in Slight Injuries	201
4.15	Number of Times Involved in Serious Injuries	201
4.16	Distribution of Warded Motorcyclists by Age Group	204
4.17	Distribution of Warded Motorcyclists by Gender	205
4.18	Distribution of Warded Motorcyclists by Race	205
4.19	Distribution of Outpatient Respondents by Age Group	207
4.20	Distribution of Outpatient Respondents by Gender	207
4.21	Distribution of Outpatient Respondents by Race	208
4.22	Distribution of Outpatient Respondents by Marital Status	208
4.23	Distribution of Outpatient Respondents by Academic Qualification	209
4.24	Distribution of Outpatient Respondents by Sector of Employment	209
4.25	Distribution of Outpatient Respondents by Monthly Income Earned	210
5.1	Relationship between Length of Stay and Nature of Injuries in June 1999	216
5.2	Relationship between Length of Stay and Nature of Injuries in December 1999	216

5.3	Relationship between Body Regions Involved and Length of Stay in Hospital	222
5.4	Relationship between Body Region Involved and the Number of Rest Days Awarded	223
5.5	Number of Loss Days between Retrospective and Outpatient Studies	229
6.1	The Proportion of Respondents Ability to Answer the First Probability Question	235
6.2	The Proportion of Respondents Ability to Answer the Second Probability Question	236
6.3	WTP for Safety Feature fitted to the Motorbike, 50% and 20% Reduction of Risk of Death (In Between Values)	239
6.4	WTP for Taking an Excursion Bus, between 50% and 20% Reduction of Risk of Death. (In Between Values)	241
6.5	WTA for Taking an Excursion Bus, between 20% and 50% Increase of Risk of Death	244
6.6	Comparison between 50% and 20% MRS in the Reduction of Death	248
6.7	MRS between 50% and 20% Risk Reduction by Age Group	250

LIST OF ABBREVIATIONS

BTCE	Bureau of Transport and Communication Economics (Australia)
BTE	Bureau of Transport Economics (Australia) (formerly BTCE)
CV	Contingent Valuation
CA	Conjoint Analysis
DC	Dichotomous Choice
DETR	Department of the Environment, Transport and the Regions
DOT	Department of Transport
ECU	European Currency Unit
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
HC	Human Capital
HSE	Health Safety Executive (UK)
IB	Interactive Bidding
ISD	Injury Scale Descriptor
Mi/Mu Ratio	The ratio of MRS of Injury/MRS of Death
MRS	Marginal Rate of Substitution
NRAs	Swedish National Road Administration's
NOAA	National Oceanic and Atmospheric Administration (US)
OECD	Organization of Economic Co-operation and Development
OE	Open Ended
OMD	Office of Management and Budget (US)
OSHA	Occupational Safety and Health Administration



QALY	Quality Adjusted Life Years
RULA	Relative Utility Loss Approach
RTO	Risk Trade-Off
SG	Standard Gamble
Sig. at 5% level	Significant at 5% level
TO	Trade-Off
TRL	Transport Research Laboratory
TTO	Time Trade-Off
WTP	Willingness to Pay
WTA	Willingness to Accept
UK	United Kingdom
VOSL	Value of Statistical Life