

STANDARD MOTORCYCLE HELMET USAGE AND ITS EFFECT ON ROAD TRAFFIC SAFETY IN THE TWO MAJOR CITIES OF VIETNAM

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The number and severity of road accidents in Vietnam is at alarming rate. From 2003, the Government has tried to improve traffic safety, therefore the number of accident and traumatic brain injury (TBI) and the rate of death reduced suddenly. However, from the end of 2008, even though accident number decreasing, a number of TBI and deaths due to road crash are jumping up. This paper aims to analyze the reason of heavy injuries, TBI and deaths happening increased. The specific surveys were taken to motorcyclists, helmet market, traffic safety agencies and hospital in Hanoi and Ho Chi Minh City. Statistic method, integrated comparison, observation, expert interview survey and brainstorming method have been used in this study to analyze the problem. Then road safety situation, helmet usage, regulation and enforcement were analyzed. Base on these, proposal to

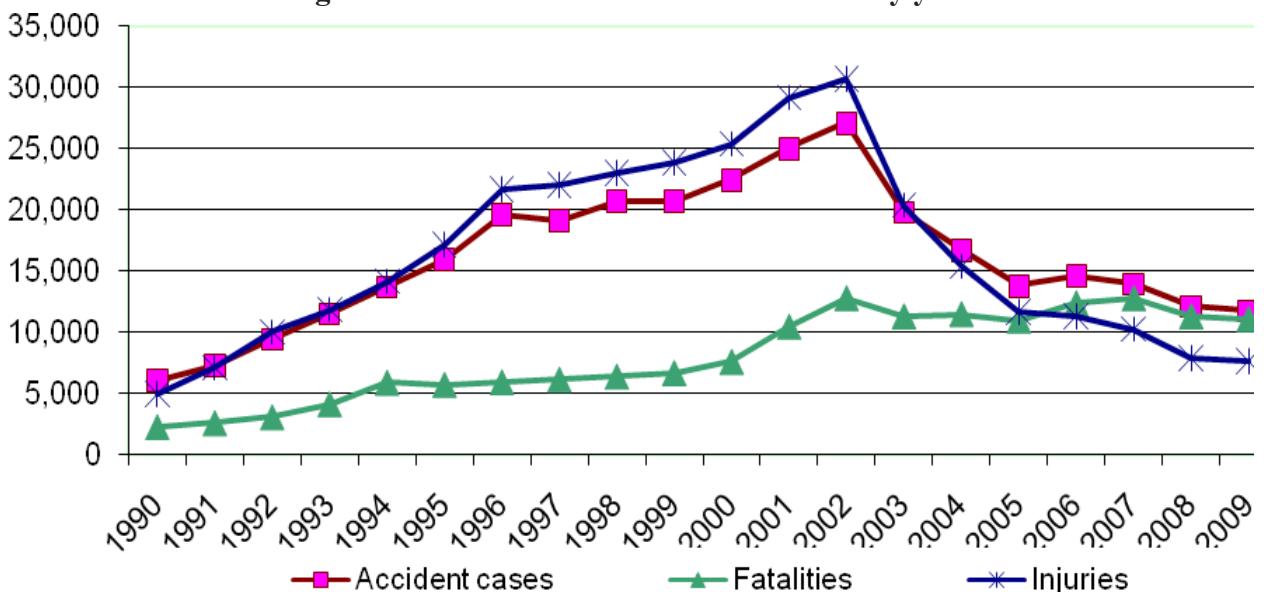
improve road safety in the two major cities in Vietnam is going to be discussed.

Keyword: road safety, traumatic brain injury (TBI), traffic accident, road crash.

I. Fact on Road Traffic Safety in Vietnam

From 1993, road traffic accidents had been increasing and traffic safety was a big problem in Vietnam. The number of road accidents has been increasing at alarming rate up to 2002. From 2003, the Government had tried to keep enforcement then the number was slowing down suddenly. However, traffic safety still is the hot problem in Vietnam. Even though the number of accidents and injuries has been decreasing; the number of fatalities is increasing year by year. Figure 1 show this data.

Figure 1: Road traffic accident of Vietnam by year



Source: National Traffic Safety Committee

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Figure 2 and Figure 3 show the fact of road safety in the two major cities of Vietnam: Hanoi and Ho Chi Minh City. The number of accidents and injuries is reduced

up to 2007, and then slightly increased; however, the number of fatalities is increased by year.

Figure 2: Road traffic accident of Hanoi

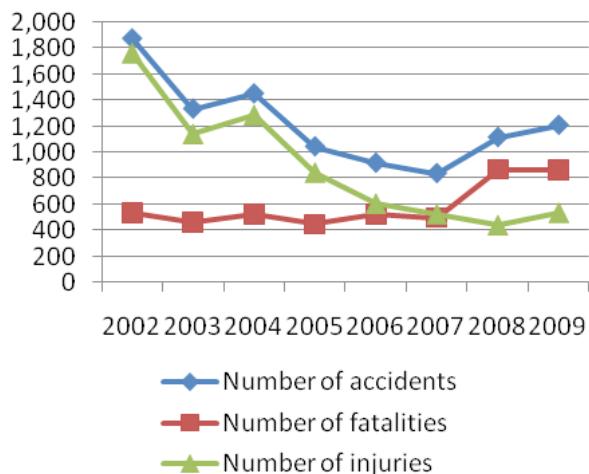
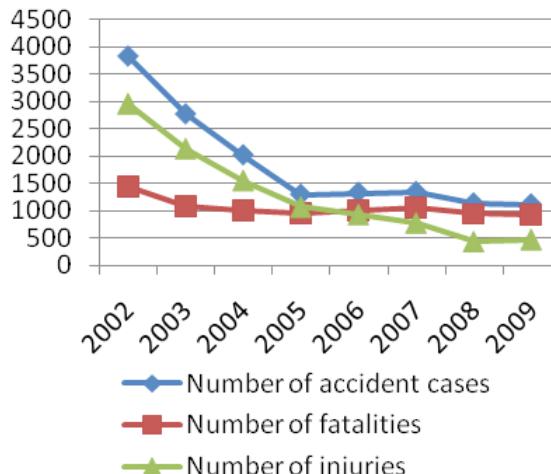


Figure 3: Road traffic accident of HCMC



Most of road accidents were caused by motorcycle (70% among the total). It is revealed that severity of traffic accidents is the problem, especially for motorcycle transport mode, 50% among the traffic accidents were traumatic brain injury (TBI) and the rate of heavy injury and fatal was 25%. From 2007, the Government forced people to wear helmet, then some positive signal appeared as a result, however, a small change could not convince the improvement trend of road traffic.

For the short time, the number of TBI has been reduced 20% - 50% compared to that of before; and the rate of death due to road crash reduced to 15%. However, from the end of year 2008, the number of fatalities was increasing; the number of TBI was jumping up as before.

II. Helmet Usage of Motorcycle Drivers and Passengers

The survey is taken with totally 1038 samples, 517 samples in Hanoi and 521 samples in Ho Chi Minh City. Place of survey allocated at 15 districts, 9 districts in Ho Chi Minh City and 5 districts in Hanoi (detail shown in Appendix 1, Table A).

Feature of the interviewees

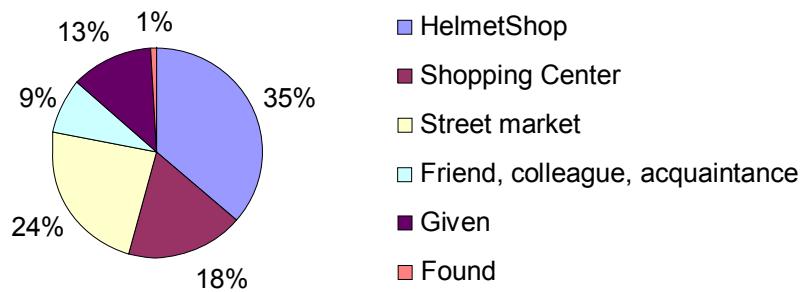
The survey result shows that 56% of interviewees were female; most of interviewees were the youth (65% of the total were under 35 years old) and well educated (60% among the total were educated at the university (Appendix 2, Table B).

Asking about their motorcycle, 89% of interviewees owned their motorcycle; most of those were less than 100cc (76%) compared with 23% of them being larger than 100cc but less than 500cc. 87% of interviewees were drivers and many of them going alone (80%); 75% of interviewees were traveling to/from work (or to schooling) (see Appendix 2, Figure A, B, C, D).

Helmet usage of motorcycle drivers and passengers

Almost all of the interviewees own their helmets (98%) due to the regulation from the Government to force people to wear helmet when driving on the road. 36% of the interviewees bought helmets in the helmet shop, while around 24% bought at street market, 18% bought from shopping centre, shown more detail in figure 4. The number of people who were given helmets or bought them through suggestion of f, c, a is smaller.

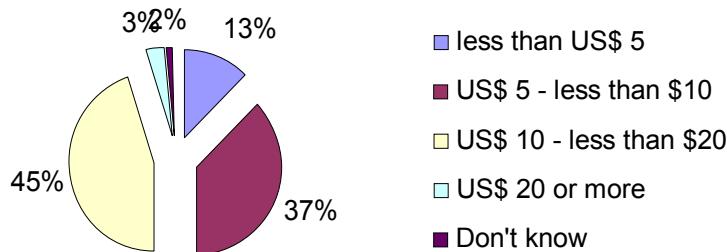
Figure 4. The place to purchase helmet



Asking about the cost of helmets, it is found that most of people bought helmets with the price from 5 to 10 US\$ (37% of the interviewees) and between 11 – 20 US\$

(45% of the interviewee); while very few (3%) bought helmets with the price over 20 US\$. Figure 5 shows the result.

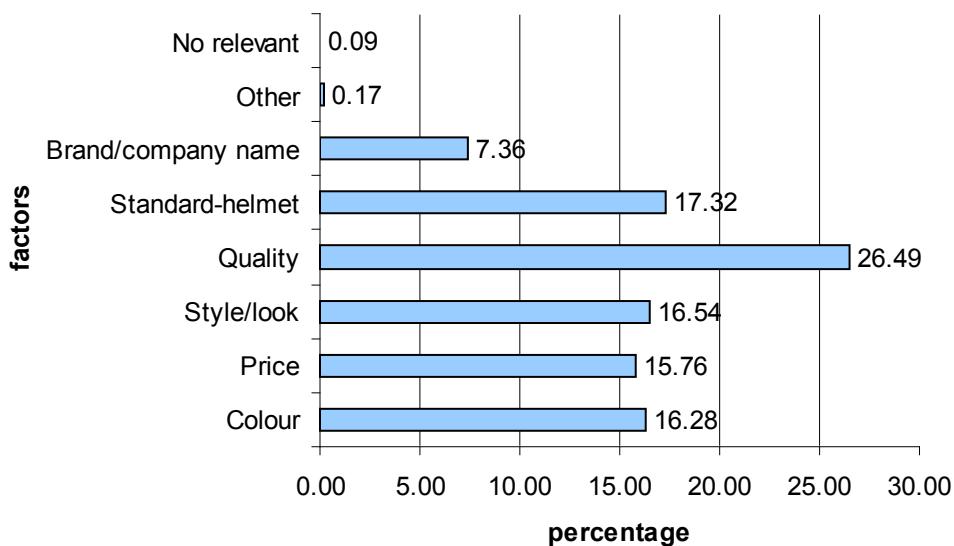
Figure 5. The cost of helmets



Asking the factors that affect to people’s decision to buy helmets, Figure 6 showed that most of people said they bought the helmets due to it was certified as a ”standard” helmet (28%); while very few

(7%) bought due to theirs price, style/look or quality. Noted that 55% of the interviewees said they bought helmets due to all of the reasons above.

Figure 6. Factors affected purchase decision



Standard motorcycle helmet usage

For the interviewer’s observation of a certification marking/sticker in the helmet, it is proved that 89% of the observed helmets had certification marking/stickers and 11%

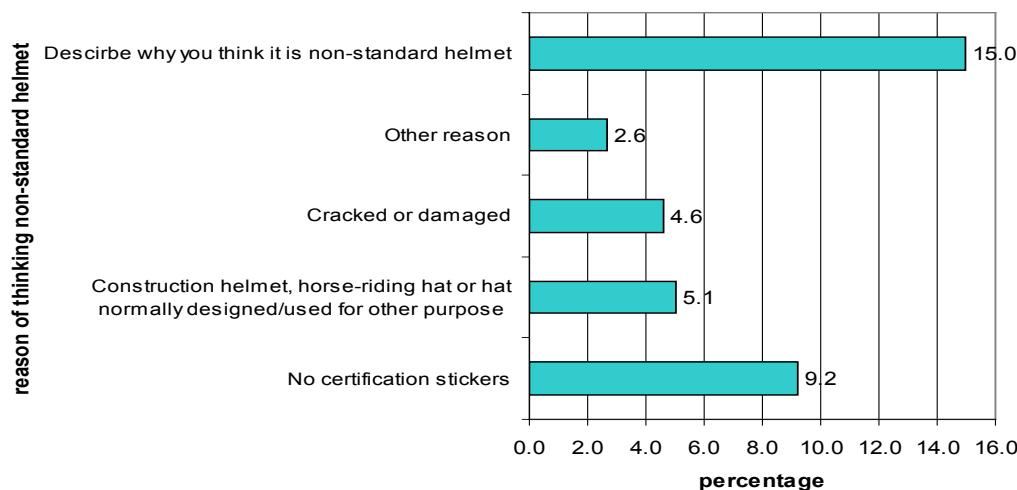
the remains had none. The interviewers noted that 90% of observed certification marking/stickers in the helmet are authentic certification marking/stickers. With “a standard helmet” question of the observed

interviewers, almost agree that the observed helmets are standard (78%) (more details were given in Appendix 3, Table C, D).

For the considered reason of non - standard helmet, while 9% of motorcycle

helmets were without certificate stickers; 5% of motorcycle helmets were construction helmets, horse-riding hats or hats normally designed/used for other purposes or cracked or damaged (Figure 7).

Figure 7. The reason that the interviewer consider helmet were non-standard



Integrated comparative of helmet usage between Hanoi and Ho Chi Minh City

The place to buy helmet between Hanoi and Ho Chi Minh City of respondents is shown more details in Appendix 4, the Hanoi people prefer to buy helmets in street market (17%) while Ho Chi Minh city people like to buy helmets at helmet shop (25%).

The price to buy helmet between Hanoi and Ho Chi Minh City of respondents is different. The Hanoi people prefer to buy helmets with the price between 10 – 20 US\$ (30%) while Ho Chi Minh city people prefer the lower price, between 5 – 10 US\$ (21%) (see Appendix 4, Table F).

The factors that affect people to buy helmets between Hanoi and Ho Chi Minh City are also a little bit different. The Hanoi people prefer to buy them due to their color (23%), which is higher than that in Ho Chi Minh city (see Appendix 4, Table G). Some people who could buy helmets at the price more than 20USD consider much all given reasons (color, style/look, quality, standard) while most of people who could buy helmets at the price from 5 – 20 USD consider the color as the

most important thing, and less significant factor is quality of the helmet.

There was the relationship between the age of respondents and the price of helmets. Even the trend is that people getting older would buy helmets with higher price, however, the difference is not much (Appendix 4, Table H). Data also showed the trend of people getting older would use more standard helmets as a relationship between the age of respondents and their usage of standard helmets (Appendix 4, Table J).

Data also showed the relationship between sex of respondents and their usage of standard helmets: male use standard helmets a little bit more than female (Appendix 4, Table K).

III. Helmet Market

The market survey was conducted in the two biggest cities of Vietnam with totally 25 retail outlets including 58% in Hanoi and 42% in Ho Chi Minh City (Detail showed in Appendix 5). Helmet market in Vietnam is diversified; there were 42% and 25% of helmets sold in the general shop or supermarket and helmet shop only.

There was a big difference from the cost level for standard helmets in each type of helmet and helmet manufacturer, meaning that was a big gap between lowest price and highest price. The most common price of standard helmets was range from 6 USD to 14 USD (47%). The most expensive price of standard helmet is 14 – 25 USD (39%) and over 25 USD (18%). While the most price of non-standard helmets (83%) was under 6 USD.

Table 1 shows data of helmet market. Buying a helmet with price under 6 USD could receive a standard helmet with the

probability of 25%, however, probability to have non-standard one is higher (75%). Buying a helmet with one price range in (6 – 14 USD) could get a standard helmet with high probability (91%), and even small probability of non-standard helmet (9%). For sure the helmet with price over 14 USD is the standard helmet.

The price of non-standard helmets in Hanoi is lower than HCMC while the price of standard helmets in HCMC is lower than that in Hanoi (see Appendix 5, Table M, N, O).

Table 1
Standard helmets and non-standard helmets by prices

	Standard helmets			Non-standards helmet		
	Low price	Normal price	High price	Low price	Normal price	High price
< 6 USD	0.26			0.30	0.26	0.19
6 – 14 USD	0.49	0.40	0.02		0.02	0.07
14 – 19 USD		0.67	0.33			
19 – 25 USD		0.27	0.73			
> 25 USD			1.00			

IV. Survey on Traffic Accidents from Hospital Side

Traffic accidents and helmet usage

Traumatic brain injury (TBI) occurs when an outside force traumatically injures the brain. TBI can be classified based on severity, mechanism (closed or penetrating head injury), or other features (e.g. occurring in a specific location or over a widespread area). TBI is a major cause of death and disability worldwide, especially in children and young adults. Causes include falls, vehicle accidents, and violence. For traffic accidents, prevention measures include use of technology to protect those who are in accidents, such as seat belts and or motorcycle helmets, as well as efforts to reduce the number of accidents, such as safety education programs and enforcement of traffic laws.

The interview survey was taken to doctors at the Choray Hospital (the hospital for physical injuries) and HCMC Traumatic and Reform Hospital to identify the problem of helmet usage and road traffic accidents in the two major cities of Vietnam. According to the survey, the number of traffic accidents in the hospital occupied $\frac{1}{2}$ of total cases there. Among traffic accident cases, a half among the total were physical break injuries and a half were traumatic brain injuries in half which $\frac{1}{2}$ of those were non-helmet using cases and the left $\frac{1}{2}$ were non-standard helmet using or wear on the wrong ways.

Helmet usage, TBI trend to reduce in the short time and increase after that

After forcing people to wear helmet in 2007, for the short time, the number of TBI has been reduced 20% - 50% compared to that of before. In Choray Hospital, the

outstanding hospital on physical injuries, in many cases, the injuries were serious; however, the head was more protected by helmet wearing. However, from the end of year 2008 up to present, traffic accidents with TBI were jumped up as before. 50% among the traffic accidents were TBI. Then serious level also increased, during that time, the heavy disease and fatal rate due to TBI was 25%, reduced to 15% when the Government started to enforce people to wear helmet, and now the rate is increasing at 25%.

Non-standard helmet usage or by a wrong way

Data from the interview survey show that, in many cases, motorcycle drivers wear non-standard helmet and or in wrong ways, then the accident would be heavy and the victim would be TBI. In case of using standard helmet, even the helmet was broken or failed, the victims avoid from TBI. The doctor said about the important of standard type of helmets, and the right way of usage.

Data from the National Traffic Safety Committee shows almost 99% of motorcyclists in the inner cities has used helmets. However, in the suburban areas, people wear helmets to deal with traffic police, then most of them wear helmets in the wrong ways.

In many cases, people who used fashion helmets or plastic brim helmets could have serious injured in head, eyes, scruff and neck when crash happening. For non-standard helmets, the sponge could not absorb and the cover could not dispose the press of crashing then heavy injury could be happened.

Many fashion helmets which are under standard are selling in the market. Those helmets could not protect people when crashing, even causes serious injury for them. According to the data from Technical Measurement Standard Center

and Traffic Police Office, there are 17 TBI cases due to non-standard usage in only half of March 2009.

The form, style and size of helmets also have problems. The half-head helmets that are using by many motorcyclist are appropriate to travel around the inner city with a slow speech (around 30 km/h). If crash occurred, they would not suffer heavy injury. Most of victims of TBI due to road crash are wearing half-head helmets when driving high speed in highway. The full face helmet should be the best choice for people driving motorcycle on the highway for their safety. The young people like fashion styles which look more beautiful and colorful, however, those are under standard and could not help people avoid TBI from crashing. Many non-standard ones with un-clear information about the name, origin, manufacture, date... are distributed widely in the market. Those helmets could bring many potential dangers for people using them.

Motorcyclists wearing helmets in a wrong ways such as non fasten, loose fasten, helmet size bigger than the head... could be heavily injured from road crash.

Helmets for the kids

Road accidents of the kids are increased during the time. Not wearing helmets when the kids going with their parents is prevailing. Moreover, in some cases the kids wearing non-standard helmets and or in the wrong ways could have the same problem as analyzed earlier.

Survey that was taken in Kid Hospital 2 revealed that 60% of the kids coming to the hospital were related to TBI due to road crashes. From August 2008 to July 2009, there were 43 kids under 15 years old with TBI and 63% of them due to road crashes.

V. Regulation and Enforcement

There is the legislation in Vietnam about the standard of motorcycle helmets. By that regulation, the manufacture, the import, the sale and the use of non-standard

helmets are not allowed. However, financial punishment is still lacking. Data of offences or convictions for the manufacture and the use of non-standard helmets are not available while there are some records for the import and the sale of non-standard helmets in Hanoi.

Therefore, in order to improve road safety, the Government to have enforcement with punishment solution and to strictly deal with the manufacture, the import, the distribution and the use of non-standard helmets. The Market Management Unit is required to enhance inspection and control to discover non-standard helmets. Mass media have to do campaign and propagation for people to use standard helmets and impacts of using non-standard helmets.

Appendix 6 showed the specific documents relating to regulation and enforcement of using standard helmet in Vietnam

VI. Conclusion

In this paper, five specific surveys were taken to reveal the problem. The first survey was taken to 1038 motorcycle users to identify the use of helmets including type, price, place to buy, people's features and reason of using standard or non-standard helmets including five factors price, type, color and form, brand, quality. Therefore it was revealed that most of people use non-standard helmets even those have certification stamp. The second survey was taken at the helmet market and then revealed that many helmets sold in the market were non-standard. The third survey toward 5 hospitals in the two cities and revealed that the number of traffic accident into the hospital occupied $\frac{1}{2}$ of total cases there. Among traffic accident cases, a half among the total were physical break injuries and a half were traumatic brain injuries in which $\frac{1}{2}$ of those were non-helmet using cases and the left $\frac{1}{2}$ were non-standard helmets using or wearing on the wrong ways. Data show

in many cases, motorcycle drivers wear non-standard helmet and or in wrong ways, then the accidents would be heavy and the victims would suffer TBI. The fourth survey was taken to analyze the problem of helmet for kids. The fifth survey 9 traffic safety agencies.

Based on the road traffic safety in the major two cities of Vietnam, enforcement and education are very important to improve the situation. To improve road traffic safety in Vietnam, changing people's attitude and awareness is very important and needs to be dealt firstly.

VII. References

- Data from Protect Helmet Enterprise, Traffic Police Team of Hadong, Hanoi City, National Traffic Safety Committee, Directorate for Standards and Quality, Ministry of Science and Technology, Traffic Police Office of Ho Chi Minh City, Market Management Unit of Ho Chi Minh City, Ho Chi Minh City Custom Department, Department of Science and Technology, Ho Chi Minh City.
- The "National technical regulation on protective helmets for motorcycle and moped users" (QCVN 2: 2008/BKHCN).
- Using Helmet: Road Traffic Safety Manual for Planning and Implementation. WHO. 2006
- Helmet use saves lives. WHO. 2009
- Prevalence of Helmet use Among Motorcycle Riders in Vietnam. D V Hung, M R Stevenson, R Q Ivers. 2006

VIII. Appendix

Appendix 1

Table A: Place of survey

Place	Frequency	Valid Percent
Petrol station in Tran Hung Dao road, Dist. 1, HCMC	25	4.65
Petrol station in Cach Mang Thang Tam road, Dist. 3, HCMC	25	4.65
Petrol station in Ben Van Don street, Dist. 4, HCMC	51	9.48
Petrol station in Nguyen Trai road, Dist. 5, HCMC	50	9.29
Petrol station in Le Van Viet road, Dist.9, HCMC	44	8.18
Petrol station in Vo Van Ngan road, Dist.Thuduc, HCMC	6	1.12
Petrol station in Hoang Van Thu road, Dist.Tanbinh, HCMC	47	8.74
Petrol station in An Suong Bus Station, Dist.Hocmon, HCMC	16	2.97
Petrol station in Tan Ky Tan Quy road, Dist. Tanphu, HCMC	6	1.12
Petrol station in Hoang Quoc Viet road, Dist. Tayho, HN	50	9.29
Petrol station in Tay Son road (Nam Dong station), Dist. Dongda, HN	50	9.29
Petrol station in Bach Mai road, Dist. Haibatrung, HN	53	9.85
Petrol station in Nguyen Trai road, Dist. Thanhxuan, HN	50	9.29
Petrol station in Hadong Bus Station, Dist. Hadong, HN	50	9.29
Petrol station in Tran Hung Dao road, Dist. Hoankiem, HN	15	2.79
Total	538	100.00

Appendix 2

Table B. Percentage of people who own motorcycles.

Own motorcycle	Frequency	Valid Percent
Yes	474	88.60
No	61	11.40
Total	535	100.00

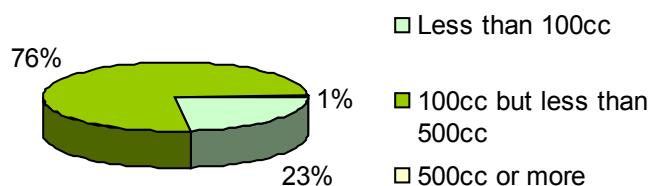


Figure A. Motorcycle size of the respondents

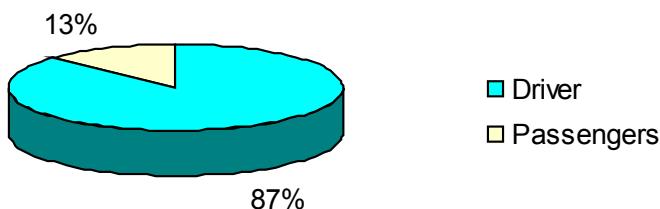


Figure B. Status of motorcyclist

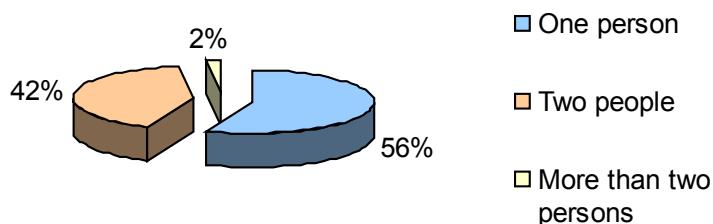


Figure C. Number of person of the motorcycle

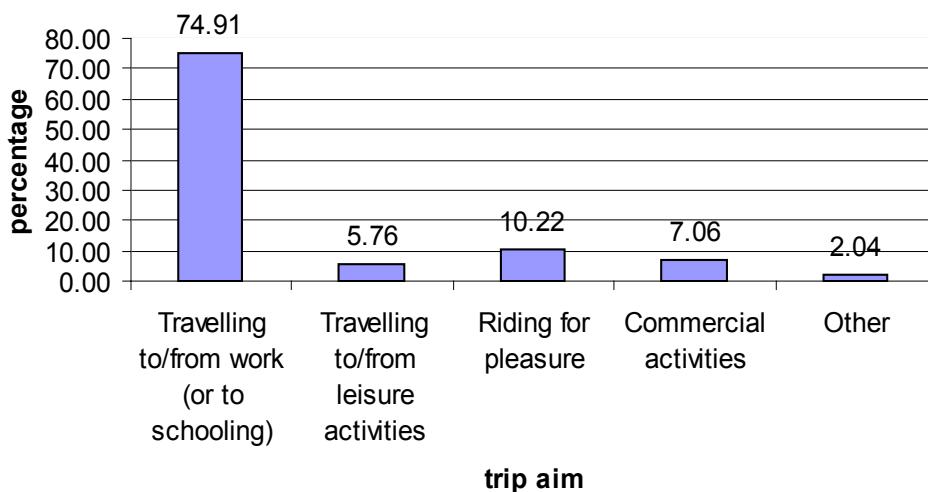


Figure D. The purpose of the trip

Appendix 3

Table C. Observation of helmet sticker

Observation of helmet sticker	Frequency	Valid Percent
Yes	475	88.29
No	62	11.52
Missing	1	0.19
Total	538	100.00

Table D. Observation of real sticker

Observation of real sticker	Frequency	Valid Percent
Yes	435	90.44
No	46	9.56
Total	481	100.00

Appendix 4**Table E. Place to buy helmet (analyzing by survey area)**

The survey area	The place to buy Helmet (%)						Total
	Helmet Shop	Shopping Center	Street market	Friend, colleague, acquaintance	Bought from Other	Given	
Hanoi	11.45	11.07	16.41	7.25	4.77	0.19	51.15
HCMC	24.81	6.49	7.63	1.34	7.82	0.76	48.85
Total	36.26	17.56	24.05	8.59	12.60	0.95	100.00

Table F. Price to buy helmet (analyzing by survey area)

City	Price of helmet (%)					Total
	less than US\$ 5	US\$ 5 - less than \$10	US\$ 10 - less than \$20	US\$ 20 or more	Don't know	
Hanoi	5.25	16.63	29.98	1.53	0.00	53.39
HCMC	7.44	20.57	15.54	1.31	1.75	46.61
Total	12.69	37.20	45.51	2.84	1.75	100.00

Table G. Factors that affect people to buy helmet (analyzing by survey area)

City	Factors affect people's decision to buy helmet (%)								Total
	Color	Price	Style/look	Quality	Standard-helmet	Brand/company name	Other	No relevant	
Hanoi	22.39	8.26	6.96	10.22	5.22	0.00	0.00	0.00	53.04
TpHCM	18.48	8.48	1.96	11.96	5.22	0.43	0.22	0.22	46.96
Total	40.87	16.74	8.91	22.17	10.43	0.43	0.22	0.22	100.00

Table H. The relationship between the age of respondent and the price of helmet

Age	Price of helmet (%)					Total
	less than US\$ 5	US\$ 5 - less than \$10	US\$ 10 - less than \$20	US\$ 20 or more	Don't know	
18-23year-old	15.12	34.88	43.02	4.65	2.33	100.00
24-35year-old	10.75	41.59	43.93	2.34	1.40	100.00
Over 36year-old	14.19	32.90	48.39	2.58	1.94	100.00

Table I: Relationship between the price of helmet and factor affected people to purchase helmet

Price of helmet	Factor (%)								Total
	Color	Price	Style/look	Quality	Standard-helmet	Brand/company name	Other	No relevant	
less than US\$ 5	5.04	4.39	1.32	1.54	0.44	0.00	0.00	0.00	12.72
US\$ 5 - less than \$10	15.57	6.14	3.29	8.11	3.95	0.22	0.00	0.00	37.28
US\$10 - less than \$20	19.08	6.36	3.95	10.75	5.48	0.00	0.00	0.00	45.61
US\$ 20 or more	1.10	0.00	0.44	0.66	0.66	0.00	0.00	0.00	2.85
Don't know	0.44	0.00	0.00	0.66	0.00	0.00	0.22	0.22	1.54
Total	41.23	16.89	8.99	21.71	10.53	0.22	0.22	0.22	100.00

Table J. The relationship between the age of respondent and the usage of standard helmet

Age	Standard Helmet (number)		Total
	Yes	No	
18-23year-old	78	31	109
24-35year-old	192	48	240
Over 36year-old	141	40	181
Total	411	119	530

Table K. The relationship between sex of respondent and their usage of standard helmet

Sex	Standard Helmet (number)		Total
	Yes	No	
Male	232	63	295
Female	172	54	226
Don't know	10	3	13
Total	414	120	534

Appendix 5

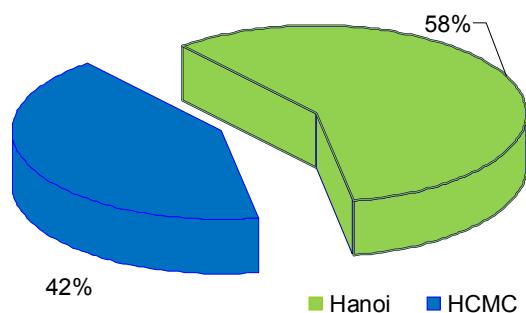


Figure E. The surveyed cities

Table L. Location of retail outlet

Location of retail outlet	Percentage
Chua Boc, Dong Da, HN	8.3
CMT8, Dis10, HCMC	25.0
Ha Dong,HN	33.3
Nguyen Trai, Ha Dong, HN	8.3
PhamHongThai, Dis1, HCMC	16.7
Truong Chinh, Dong Da, HN	8.3
Total	100.0

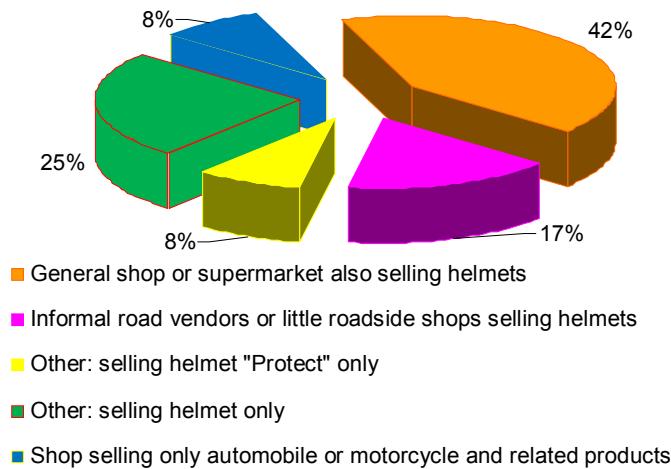


Figure F. Type of retail outlet

Table M. The cheapest cost for standard helmet

Price (USD)	City		Total
	HCMC	Hanoi	
Standard Helmet			
6	14.3%	28.6%	42.9%
7	0%	28.6%	28.6%
12	0%	14.3%	14.3%
26	14.3%	0%	14.3%
Total	28.6%	71.4%	100.0%
Non-standard			
2	0%	20.0%	20.0%
3	0%	20.0%	20.0%
5	60.0%	0%	60.0%
Total	60.0%	40.0%	100.0%

Table N. The most expensive cost for standard helmet

Price (USD)	Frequency	Percent (%)
5 – 10	2	17
11 – 20	3	25
21-40	5	42
> 40	2	17
Total	12	100.0

Table O. The most common cost for standard and non-standard helmet

Price (USD)	City		Total
	HCMC	Hanoi	
Standard Helmet			
7	10.0%	0.0%	10.0%
8	10.0%	10.0%	20.0%
9	20.0%	10.0%	30.0%
11	0.0%	20.0%	20.0%
13	0.0%	10.0%	10.0%
14	0.0%	10.0%	10.0%
Total	40.0%	60.0%	100.0%
Non-standard Helmet			
5		100.0%	100.0%
Total		100.0%	100.0%

Appendix 6

- Data from Protect Helmet Enterprise, Traffic Police Team of Hadong, Hanoi City, National Traffic Safety Committee, Directorate for Standards and Quality, Ministry of Science and Technology, Traffic Police Office of Hochiminh City, Market Management Unit of Hochiminh City, Hochiminh City Custom Department, Department of Science and Technology, Hochiminh City.
- Regulation No.04/2008/QĐ-BKHCHN dated 28 April 2008 of the Ministry of Science and Technology.
- The “National Technical Regulation on Protective Helmets for Motorcycle and Moped users” (QCVN 2: 2008/BKHCHN).
- Product and Goods Quality Law No. 05/2007/QH12 dated 21 November 2007
- Criterion and Technical Standard Law No.68/2006/QH11 dated 29 June 2006
- Decree No.126/2005/ND-CP dated 10 October 2005: Regulation on Administrative Punishment of Products and Goods Quality and Assessment
- Decree No.06/2008/ND-CP dated 16 January 2008: Administrative Punishment of the Sale of Non-standard Products and Goods
- Decree No.95/2007/ND-CP dated 4 June 2007: Amendment and Supplementation for the No.126.
- Decree No.179/2004/ND-CP dated 21 October 2004: Regulation of Quality Management of Products and Goods.
- Decree No.50/2006/QĐ – TTg dated 07 March 2006: List of Products and Goods to Quality Testing
- Decree No.32/2007/NQ-CP dated 29 June 2007 by the Prime Minister: Emergency Solutions to Deal with Traffic Accident and Congestion
- Decree No.146/2007/NQ-CP dated 14 September 2007 by the Prime Minister: Administrative Punishment in Road Transportation.
- TCVN 6979: 2001 Standard of Motorcycle Helmets for Children.
- Traffic Law dated 29 June 2001.