IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 12, Issue 6 Ser.2 (Nov. – Dec. 2023), PP 14-22
www.iosrjournals.org

Injury Patterns of Dead Victims in Accident Cases Traffic At the Public Hospital

Theza Elizianno Andrew Pellondo'u[1], Silphia Novelyn[2], Dio Ardhito Indrawan[3]
[1]*Department of Forensic Medical Science and Legal Medicine, Faculty of Medicine, Universitas Kristen Indonesia, Jakarta, Indonesia*
[2]*Department of Anatomy, Faculty of Medicine, Universitas Kristen Indonesia, Jakarta, Indonesia*
[3]*Medical Student, Faculty of Medicine, Universitas Kristen Indonesia, Jakarta, Indonesia*

Abstract:
Background*: A traffic accident is an unexpected accident that occurs on the road, and traffic accidents can happen anywhere and cannot be predicted. Traffic accidents can involve car users, motorbike users, other means of transportation, and pedestrians. In this case, accidents can cause minor, serious injuries or even death. The type of vehicle and type of collision produce certain patterns that can be identified to assess fatalities in victims.*
Materials and Methods*: This study aims to determine the pattern of injuries of victims who died as a result of traffic accidents at the Forensic Installation at the Bhayangkara Tk General Hospital. I R. Said Sukanto East Jakarta. The design of this research is a retrospective descriptive study. The data obtained is secondary data from the post-mortem et repertum report at the Forensic Medicine Installation at the Bhayangkara Tk General Hospital. I R. Said Sukanto East Jakarta*
Results*: Research data obtained from 122 samples in this study from the 2018 – 2019 period showed that the gender distribution was dominated by men (80.3%), with the largest distribution in the early adulthood age range (26 - 35 years). The victim role was found to be more common among car drivers (45.9%), with the most frequent occurrence being 00:01 – 06:00 (46.7%). The most common injury patterns were head injuries (81%), with abrasions occurring most frequently in neck and back injuries (33%), abdominal injuries (59%), and pelvic injuries (25%). Then, the most common injuries to the upper and lower extremities are closed fractures.*
Conclusion:*Overall, the pattern of injuries to victims in traffic accidents is dominated by male car drivers aged 26 - 35 years, with the most frequent time of occurrence being 00:01 - 06:00 in the morning, and the location of the most injuries in head injuries and pattern The most common injuries were abrasions followed by closed fractures of the extremities.*
Key Word*:Pattern of Wound, Trauma, Traffic Accidents, Location of Injuries.*

Date of Submission: 13-11-2023 Date of acceptance: 23-11-2023

I. Introduction

According to the statement by the Indonesian Doctors Association (IDI), death can be defined as the permanent cessation of three systems in the body, namely the central nervous system, cardiacsystem, and respiratory system, and is called clinical death. The human body system has varying cell resistance to conditions of low oxygen; therefore, every human being has a different time of death. In the human body, the three most essential parts are always used as a reference in determining the occurrence of death. Of the three main organs, complete or total damage to the central nervous system is a sign that the human has been declared dead[1,2].Traffic accidents are one of the problems that often occur. Transportation facilities, road sectors, and driver factors are not yet sustainable. This traffic accident resulted in material loss, damage to public facilities, and loss of life. A trafficaccident, according to Article 1 Paragraph 24 of Law No. 22 of 2009 concerning Road Traffic and Transportation, is an unexpected and unintentional accident involving vehicles with or without other road users that results in human casualties and/or property loss[3]. Based on the Minister of Health Decree No. 116/Menkes/SK/VII/2003 concerning Guidelines for Implementing a Health Epidemiological Surveillance System, traffic accidents are one of the priority programs for preventing non-communicable diseases. According to the results of traffic accidents in Indonesia, it is ranked 10th in causing deaths, with 3% of the total deaths that occur[4].

According to data from the Republic of Indonesia Police in 2017, three people died every hour due to traffic accidents. The data explains that the high number of traffic accident cases is caused by various factors, such as 61% of incidents are due to personal ability and character in driving factors, 9% are due to vehicle problems, and 30% are due to unsupportive traffic factors[5]. In motorbike accidents, the victim is usually thrown

onto the road. In contrast, in car accidents, the fatal incident is when they are thrown out of the car, causing bodily injury, especially to the head, which can cause death[6.7]. This causes the injuries to form a varied pattern or picture. in accident trauma, from minor injuries to death. Apart from that, this case also has location characteristics that vary according to the conditions and impact of the environment at the time of the accident. Injuries that are very common in accidents include lacerations, punctures, scratches, bruises, and even broken bones[8].

It is known that up to 80% of patients who enter the emergency department are victims of traffic accidents, and other cases are accidents caused by work accidents, chronic diseases, sports accidents, and victims of violence[9]. This research aims to explain the location of the injury and its shape, as well as the types of injuries resulting from traffic accidents, and see whether there are similarities or differences in the pattern of these injuries. Hopefully, this research will provide knowledge, especially fordoctors, to assess injury patterns and treatment in accident victims. Because of this, the author is interested in researching "Injury Patterns of Death Victims in Traffic Accident Cases at Bhayangkara General Hospital, Tk. I R. Said Sukanto East Jakarta 2018 – 2019 Period".Based on the background description above, the formulation of the problem in this research is the pattern of injuries to fatalities in traffic accident cases at the Bhayangkara Tk General Hospital. I R. Said Sukanto East Jakarta 2018 – 2019 Period.

II. Material And Methods

The research method used in this research is descriptive research with a retrospective content study design. Retrospective is research that attempts to look into the past. Data collection starts from the consequences that occur, and then from these consequences, it is traced back to determine the causes or variables that can influence them. The type of data in this study is secondary data sourced from a collection of post-mortem and repertum reports of patients who died as a result of traffic accidents from January 2018 to December 2019

Study Design: Retrospective content study design

Study Location: BhayangkaraTk.I.R Said Sukanto General Hospital, East Jakarta, using secondary data in the form of post-mortem and repertum reports of patients who died due to traffic accidents. This research will be carried out starting in August 2021

Study Duration: August 2021 to March 2022.

Sample size: 132Accident Victim Data.

Inclusion criteria:

1. Post mortem et repertum report recorded at the BhayangkaraTk.I.R Said Sukanto General Hospital for the period 2018 to 2019
2. The victim died as a result of a traffic accident
3. Victims who died were cars, motorbikes, and pedestrians
4. Based on all ages and genders
5. Based on all accident times
6. Based on all types of injuries resulting from traffic accidents
7. Based on all injury locations resulting from traffic accidents

Exclusion criteria:

1. Based on an incomplete post-mortem report
2. Victims who died were other than cars, motorbikes and pedestrians

Procedure methodology

Data collection

The data used in this research is secondary data. Secondary data is a source of research data obtained and collected by researchers indirectly but with other parties. The data collection method is collecting information regarding the incidence of deaths due to traffic accidents at the BhayangkaraTk.I.R Said Sukanto General Hospital, East Jakarta.

Data Collection Instrument

This study used dataas a post-mortem et repertum report containing a doctor's statement regarding the post-mortem examination with written information at the BhayangkaraTk.I.R Said Sukanto General Hospital, East Jakarta.

Data processing

In processing data in research, several stages are carried out, namely:

a. Editing

   This stage is to check to obtain clean and complete data so that it is suitable for processing.

b. Coding

This activity classifies data in the form of letters into numbers. The aim is to make the analysis process easier.

c. Data Entry

This process involves entering data that has been obtained with a computer program. The program used is Statistical Product and Service Solutions (SPSS) software.

d. Cleaning

The cleaning stage aims to ensure that the data is correct and has been entered so that the data is ready to be processed and entered into the analysis stage.

Data analysis technique

The data analysis technique in this research is univariate analysis. The univariant analysis aims to determine and explain each variable in the research related to the injury patterns of fatalities in traffic accident cases at the Bhayangkara Tk General Hospital. I R. Said Sukanto East Jakarta. The analysis in this research uses the help of SPSS software.

III. Result

In the results of research on the number of victims who died due to traffic accidents at the BhayangkaraTk.I.R Said Sukanto General Hospital from January to December 2018, the results in the table and figure above showed that the number of samples obtained was 61 victims. Based on the highest number of victims, in April, there were 13 victims (21.3%). In July, there were 11 victims (18%). In October, there were seven victims (11.5%), and in May, there were five victims (8.2%). In January, there were four victims (6.6%), and in February, there were four victims (6.6%). In August, there were four victims (6.6%). In September, there were four victims (6.6%). In June, there were three victims (4.9%). In November, there were three victims (4.9%). In December, there were two victims (3.3%), and in March, There was one victim (1.6%).

Table 1:Number of Death Victims Due to Traffic Accidents in 2018

		Frequency	*Percent*	*Cumulative Percent*
January - December 2018 Period	January	4	6,6%	6,6%
	February	4	6,6%	13,1%
	March	1	1,6%	14,8%
	April	13	21,3%	36,1%
	May	5	8,2%	44,3%
	June	3	4,9%	49,2%
	July	11	18%	67,2%
	August	4	6,6%	73,8%
	September	4	6,6%	80,3%
	October	7	11,5%	91,8%
	November	3	4,9%	96,7%
	December	2	3,3%	100%
	Total	61	100%	

In the results of research on the number of victims who died due to traffic accidents at the BhayangkaraTk.I.R Said Sukanto General Hospital from January to December 2019, the results in the table and image above showed that the number of samples obtained was 61 victims. Based on the highest number of victims, in December, there were eight victims (13.1%). In September, there were seven victims (11.5%). In January, there were six victims (9.8%). In August, there were six victims (9.8%). In February, there were five victims (8.2%). In June, there were five victims (8.2%). In July, there were five victims (8.2%). In November, there were five victims (8.2%). In March, there were four victims (6.6%). In April, there were four victims (6.6%). In October, there were four victims (6.6%), and in May, there were two victims (3.3%), as shown in Table 2 below:

Table 2: Number of Death Victims Due to Traffic Accidents in 2019

		Frequency	*Percent*	*Cumulative Percent*
January - December 2019 Period	January	6	9,8%	9,8%
	February	5	8,2%	18%
	March	4	6,6%	24,6%
	April	4	6,6%	31,1%

	May	2	3,3%	34,4%
	June	5	8,2%	42,6%
	July	5	8,2%	50,8%
	August	6	9,8%	60,7%
	September	7	11,5%	72,1%
	October	4	6,6%	78,7%
	November	5	8,2%	86,9%
	December	8	13,1%	100%
	Total	61	100%	

In the results of research on the gender group of victims who died as a result of traffic accidents at the BhayangkaraTk.I.R Said Sukanto General Hospital from January 2018 to December 2019, the results in the table and figure above showed that the number of samples obtained was 122 victims. Based on the highest number of victims, in the male gender group, there were 98 victims (80.3%), and in the female gender group there were 24 victims (19.7%).

Table 3. Distribution of Categories of Death Victims Based on Gender Groups

		Frequency	***Percent***	***Cumulative Percent***
Gender	Man	98	80,3%	80,3%
	Woman	24	19,7%	100%
	Total	122	100%	

Age groups can be categorized according to the Ministry of Health of the Republic of Indonesia (MOH RI, 2009) as follows: toddlerhood (0-5 years), childhood (5-11 years), early adolescence (12-16 years), adolescence late adulthood (17-25 years), early adulthood (26-35 years), late adulthood (36-45 years), early adulthood (46-55 years), late adulthood (56-65 years), and seniors (>65 years)[36]

Table 4. Distribution of Categories of Death Victims Based on Age Groups

		Frequency	***Percent***	***Cumulative Percent***
Age Group	5-11 years old	1	0,8%	0,8%
	12-16 years old	3	2,5%	18%
	17-25 years old	21	17,2%	20,5%
	26-35 years old	34	27,9%	48,4%
	36-45 years old	21	17,2%	65,6%
	46-55 years old	30	24,6%	90,2%
	56-65 years old	8	6,6%	96,7%
	>65 years old	4	3,3%	100%
	Total	122	100%	

In the results of research on the role group of victims who died as a result of traffic accidents at the BhayangkaraTk.I.R Said Sukanto General Hospital from January 2018 to December 2019, the results in the table and figure above showed that the number of samples obtained was 122 victims. Based on the highest number of victims, in the group of car drivers, there were 56 victims (45.9%), in the group of motorbike riders there were 27 victims (22.1%), in the group of car passengers there were 22 victims (18.0%), in the group of passengers There were 12 motorbike victims (9.8%), and 5 victims (4.1%) were found in pedestrian groups.

Table 5. Distribution of Categories of Death Victims Based on Victim Role

		Frequencyi	***Percent***	***Cumulative Percent***
The Role of Victim	Car Driver	56	45,9%	45,9%
	Car Passenger	22	18,0%	63,9%
	Motorcycle Driver	27	22,1%	86,1%
	Motorcycle Passenger	12	9,8%	95,9%
	Pedestrian	5	4,1%	100%
	Total	122	100%	

In the results of research on the time group where victims died as a result of traffic accidents at the BhayangkaraTk.I.R Said Sukanto General Hospital from January 2018 to December 2019, the results in the

table and figure above showed that the number of samples obtained was 122 victims. Based on the highest number of victims, in the 00:01 – 06:00 time group, there were 57 victims (46.7%). In the 06:01 – 12:00 time group, there were 29 victims

(23.8%). In the 12 time group, 01 – 18:00 found 24 victims (19.7%), and the time group 18:01 – 24:00 found 12 victims (9.8%).

Table 6.Distribution of Categories of Death Victims Based on Time of Event

		Frequncy	***Percent***	***Cumulative Percent***
Time of Event	00:01 - 06:00	57	46,7%	46,7%
	06:01 - 12:00	29	23,8%	70,5%
	12:01 - 18:00	24	19,7%	90,2%
	18:01 - 24:00	12	9,8%	100%
	Total	122	100%	

The location of body injuries can be categorized into seven regions, namely the head (caput), the neck and back (collum and truncus), the chest (thorax), the stomach (abdomen), the pelvis (pelvis), the upper extremities (membrum superius). , and the lower extremities (membrum inferius)[37]. In the results of research on the group of injury locations for victims who died as a result of traffic accidents at the BhayangkaraTk.I.R Said Sukanto General Hospital from January 2018 to December 2019, a sample size of 122 victims was obtained. Based on the largest number of victims, the head injury group was found in 99 victims (81%), the chest injury group was found in 90 victims (74%), the abdominal injury group was found in 72 victims (59%), the upper extremity injury group was found in 53 victims (43%), the lower extremity injury group was found in 43 victims (35%), the neck and back injury group was found in 40 victims (33%), and the pelvic injury group was found in 30 victims (25%).

Table 7. Distribution of Wound Pattern Categories of Deceased Victims Based on Location of Injury

		Frequency	***Percent***	***Percent of Cases***
Location of Injury	Head injury	99	23,2%	81%
	Neck and Back Injuries	40	9,4%	33%
	Chest Injury	90	21,1%	74%
	Abdominal Injuries	72	16,9%	59%
	Pelvic Injuries	30	7,0%	25%
	Upper Extremity Injuries	53	12,4%	43%
	Lower Extremity Injuries	43	10,1%	35%
	Total	427	100%	

The classification of mechanical injuries to parts of the body according to the classification is divided into seven types, namely abrasions, bruises (contusio), lacerations (vulnuslaceratum), incised wounds (vulnusscissum), stab wounds (vulnus punctum), firearm wounds, fractures, and dislocations[28].

In the results of research on the head injury group of victims who died as a result of traffic accidents at the BhayangkaraTk.I.R Said Sukanto General Hospital from January 2018 to December 2019, the sample size was 122 victims. Based on the highest number of victims, in the group, lacerations due to blunt force were found in 99 victims (81%), in the open fracture group of the calvaria bone were found in 94 victims (77%), in the group, head bruises were found in 77 victims (63%), in the fracture group. teeth were found in 70 victims (57%), the nasal bone fracture group was found in 68 victims (56%), the head abrasion group was found in 61 victims (50%), the closed calvarial bone fracture group was found in 61 victims (50%), in the maxillary and mandibular fracture group, 28 victims (23%) were found, and in the laceration group due to sharp violence, 24 victims (20%) were found

Table 8.Distribution of Injury Pattern Categories of Deceased Victims Based on Type of Head Injury

		Frequency	*Percent*	*Percent of Cases*
Head injury	Head Abrasions	61	10,5%	50%
	Head Bruises	77	13,2%	63%
	Torn Wounds Due to Blunt Violence	99	17,0%	81%
	Torn Wounds Due to Sharp Violence	24	4,1%	20%
	Open Fracture of the Calvaria Bone	94	16,2%	77%
	Closed Fracture of the Calvaria Bone	61	10,5%	50%
	Nasal Bone Fracture	68	11,7%	56%
	Fractures of the Maxilla and Mandible	28	4,8%	23%
	Tooth Fracture	70	12,0%	57%
	Total	582	100%	

In the results of research on the neck and back injury group of victims who died as a result of traffic accidents at the BhayangkaraTk.I.R Said Sukanto General Hospital from January 2018 to December 2019, the sample size was 122 victims. Based on the largest number of victims, in the neck and back bruises group, 40 victims (33%) were found, in the neck and back bruises group, there were 10 victims (8%), in the lacerations due to blunt force group, there were 8 victims (7%). The closed neck and back fracture group was found in 7 victims (6%), the laceration wound due to sharp violence was found in 3 victims (2%), and the open neck and back fracture group was found in 3 victims (2%).

Table 9. Distribution of Categories of Wound Patterns for Deceased Victims Based on Types of Neck and Back Injuries

		Frequency	*Percent*	*Percent of Cases*
Neck and Back Injuries	Neck and Back Abrasions	40	56,3%	33%
	Neck and Back Bruises	10	14,1%	8%
	Torn Wounds Due to Blunt Violence	8	11,3%	7%
	Torn Wounds Due to Sharp Violence	3	4,2%	2%
	Open Fractures of the Neck and Back	3	4,2%	2%
	Closed Fractures of the Neck and Back	7	9,9%	6%
	Total	71	100%	

IV. Discussion

Based on data from research results at Bhayangkara Tk General Hospital. I R. Said Sukanto East Jakarta for the 2018-2019 period, the number of cases obtained was 122 victims. In 2018, there were 61 victims; in 2019, there were 61 victims.

In the research results based on gender, there were 98 male victims (80.3%) and 24 female victims (19.7%). The results of this research are in line with a study by the World Health Organization (WHO) in 2021, which showed that men were more dominant with a case presentation of 73% compared to women. 24 This is also similar to Oktaviani's research at Sanglah General Hospital in 2016, it was noted that male victims (75.7%) were higher than female (24.3%). Because of this, it can also be said that bolder driving behavior increases the risk of traffic accidents[34].

The research results based on age groups found that the highest number of traffic accident victims were aged 26-35 years, with 34 victims (27.9%), namely early adulthood. This is also in line with research by Ratu et al. at Bhayangkara Ambon Hospital in 2021 with 19 samples (42%) of traffic victims aged 25-44 years[38]. In Arfan and Wulandari's research in 2018, half of the incidents in traffic accidents were in the 26-45 year age range. , where young adults are of productive age, so they have a hasty and enthusiastic attitude, increasing the risk of traffic accidents[23].

Early adulthood is the stage where a person is active in a career. The many demands of work and activities can cause fatigue, which can reduce a person's ability to drive, especially when making quick

decisions, and decrease the ability to concentrate. The resulting problems can affect a person's balance and visibility when driving a vehicle, and this causes a lack of alertness to incidents on the road[21].

In research based on the role of accident victims in driving, the highest number of car drivers was found to be 56 victims (45.9%). This result is similar to research by Oktaviani in 2016, where traffic accident victims were dominated by car drivers (91.9%)[34]. Research by Kepel et al. (2017) is also consistent, namely that it was found that drivers or car drivers had the highest number of cases, namely 30 victims (78.95%). 31 However, this was different from Angela's research, namely in the case of motorbike drivers, there were 53 cases (66.25%), then by pedestrians (20%), by those riding pillions (12.25%), and the least by car passengers (1.25%)[41]

This can be caused by hitting parts of the head against parts such as the steering wheel, which can result in blunt trauma if the speed is higher, then the kinetic energy produced in the tissue will be more incredible so it can have a more severe impact[33].

Based on the time category of traffic accidents, the time with the highest frequency was in the time group 00:01 – 06:00 am with 57 victims (46.7%). According to research by Widorini (2013), 25% of accidents, especially motorbike accidents, often occur between 6 pm and 6 am. At night, vision will decrease, and it will be difficult for other drivers to see because the lighting is not as good as during the day[25].

In research based on groups of injury locations, the location of injury with the highest frequency was a head injury, namely 99 victims (81%). The results of this study are similar to research by Ratu et al. in 2021, where the head was found to be 29 victims (31%) of the total number of cases. 38 Head injuries are always the first place in traffic accident injuries. In other studies, it was found that the most injuries in traffic accidents were the head (88%), One of these factors is the lack of public awareness regarding the use of helmets as personal protective equipment before riding a motorbike. A car driver in an accident will have a collision with the car window where the chest will also hit the steering wheel of the car[39]

In cases of car accidents, the victim often has a head-on collision with the road, and this is because the victim is thrown out of the car window. Impacts to the head usually occur from contact with the car's A-pillar, the side of the vehicle's roof, doors, the car's B-pillar, windows, and surrounding areas. Rapid death during blunt head injury is usually due to subdural hemorrhage[45]. If trauma occurs to the head, it generally has a poor prognosis and often causes 80% of deaths[34].

V. Conclusion

Based on the research results regarding the injury patterns of fatalities in traffic accident cases at the Bhayangkara Tk General Hospital. I R. Said Sukanto East Jakarta 2018 – 2019 period against 122 samples. So it can be concluded that:

1. Based on month groups in 2018, April saw the most victims, namely 13 victims (21.3%), and in 2019, December saw the most victims, namely eight victims (13.1%).
2. Based on gender and age groups, the highest number of victims were male, 98 victims (80.3%), and the most victims were in early adulthood (26-35 years), with 34 victims (27.9%).
3. Based on the victim's role group, the most significant number of car drivers was found to be 56 victims (45.9%).
4. Based on the time group of the incident, the highest number of victims was 00:01-06:00, with 57 victims (46.7%).
5. Based on the group of injury locations, the highest number of head injuries was 99 victims (81%).
6. Based on the type of injury lacerations resulting from blunt force, the most head injuries were 99 victims (81%). Based on the type of injury, the most common abrasions were neck and back injuries, 40 victims (33%).

References

[1]. Senduk, E.A, Mallo, J.F, Tomuka, D.C. Medicolegal Review Estimated Time OfDeath. Sam Ratulangi University Biomedical Journal. 2013;5(1): 37-8.
[2]. Karamoy, G.V. Accidental Death Due ToVictim's Negligence On The Highway. Lex Crimen. 2013;2(4): 131-2.
[3]. Laws Of The Republic Indonesia. No.22 Of 2009 Concerning Road Traffic AndTransportation.
[4]. RI Minister Of Health Decree No. 1116 Of 2003 Concerning Guidelines ForImplementing A Health Epidemiological Surveillance System
[5]. Ministry Of Communication AndInformation. An Average Of Three People Die Every Hour Due To Road Accidents. The Biggest Causes Of Traffic Accidents. Accessed From: Https://Kominfo.Go.Id/Index.Php/Content/Detail/10368/Rata-Rata-Tiga-Orang-Meninggal-Cepatan-Jam-Akibat-Kecelakaan-Jalan/0/Article_Gpr. Accessed June 12, 2021.
[6]. Regional Police Of The Republic Of Indonesia. Accident And Traffic Violation Data. Accessed From: Http://Bappeda.Jogjaprov.Go.Id/Dataku/Data_Dasar/Index/548-Data-Kecelakaan-Dan-Pelanggaran-Lalu-Lintas?Id_Skpd=39. Accessed June 12, 2021.
[7]. Ibrahim M.M, Adi M.S, Suhartono. Description Of TheDistribution Of Traffic Accidents Among Motorcycle Riders. STIKES Kendal Scientific Journal. 2018;8(2): 82-3.

[8]. Republic Of Indonesia Government Regulation No.43 Of 1993 Concerning Road Infrastructure And Traffic Kartika M. Analysis Of Factors Causing Traffic Accidents Among Motorcycle Riders In The Depok Area. UI Faculty OfPublic Health. 2009: 7-31.

[9]. Kartika M. Analysis Of Factors Causing Traffic Accidents Among Motorbike Riders In The Depok Area. UI Faculty OfPublic Health. 2009: 7-31

[10]. Hidayati A.D, Hendrayati L.Y. Traffic Accident Risk Analysis Based OnKnowledge, Lane Use, And Driving Speed. Periodical Journal OfEpidemiology. 2016;4(2): 275-7.

[11]. Republic Of Indonesia State Intelligence Agency. 2014. Traffic Accidents Are TheThird Biggest Killer. Accessed From: Http://Www.Bin.Go.Id/ Awas/Detil/197/4/21/03/2013/Kecelakaan-Lalu- Lintas-Jadi-Pemkiller-Terbesar-Ketiga. Accessed July 14, 2021.

[12]. Dki Jakarta Provincial Central Statistics Agency. Number Of Traffic Accident Victims According ToAge Groups In DKI Jakarta Province, 2016. Accessed From: Https://Jakarta.Bps.Go.Id/Dynamictable/2020/03/06/466/4-4-9-Nomor-Korban- Traffic-Accidents-By-Age-Group-In-Dki-Jakarta-Province-2016.Html. Accessed July 14, 2021.

[13]. World Health Organization. Pedestrian Safety: A Road Safety Manual For Decision-Makers And Practitioners.; 2013.

[14]. Insurance Institute For Highway Safety: Highway Loss Data Institute. Fatality Facts 2019 Males AndFemales. Retrieved From: Https://Www.Iihs.Org/Topics/Fatality-Statistics/Detail/Males-And-Females. Accessed July 15, 2021.

[15]. DKI Jakarta Provincial Government. Department Of Communication, Information AndStatistics. Accessed From: Https://Data.Jakarta.Go.Id/Dataset/Data-Nomor-Korban-Kecelakaan-Lalu-Lintas-Menrut-Profesi/Resource/9968fb00-5119-441d-97e7-4007663b508c. Accessed July 14, 2021.

[16]. Saputra A.D. Study OfRoad Traffic Accident Rates In Indonesia Based On KNKT (National Transportation Safety Committee) Data From 2007-2016. National Transportation Safety Committee (KNKT). 2017;29(2): 180-6.

[17]. Central Java Statistics Agency. (2013). Number Of Traffic Accidents, Victims, And Value OfLosses In The Central Java Regional Police Area. Central Java. Accessed From Https://Jateng.Bps.Go.Id/Index.Php/Linkt Ab Elstatis/899 Accessed On 18 July 2021.

[18]. Central Java Statistics Agency. (2017). Population Data 1993-2016. Central Java. Accessed From Https://Www.Jateng.Bps.Go.Id Accessed On 20 July 2021.

[19]. Directorate General OfLand Transportation. 2013. Land Transportation InFigures 2013. Accessed From: Http://Hubdat.Dephub.Go.Id/Data-A-Information/ Pdda/1483-Tahun-2013. Accessed July 20, 2021].

[20]. Mutharuddin. Characteristics Of Transportation Accidents On The Jakarta-Cikampek Toll Road. Transportation Research AndDevelopment Agency. 2010;22(12): 1335-8.

[21]. Kutsiyah N. The Influence OfMotorcycle Driver Behavior And The Environment On Traffic Accidents In Sidoarjo Regency In 2010. Surabaya: Airlangga University. 2011: 88-97

[22]. Hobbs F.D. Traffic Planning AndEngineering, Second Edition, Indonesian Edition, Translated By Suprapto T.M. And Waldijono, Traffic Planning AndEngineering, Second Edition, Gadjah Mada University Press, Yogyakarta. 1995;2(1)

[23]. Arfan I, Wulandari. Epidemiological Study OfTraffic Accidents In Pontianak City. Health Vocational Journal. 2018: 91-5.

[24]. World Health Organization. Road Traffic Injuries. Accessed From: Https://Www.Who.Int/News-Room/Fact-Sheets/Detail/Road-Traffic-Injuries. Accessed On 8 July 2021.

[25]. Widorini T. Safety AndPrevention Of Traffic Accidents At Teuku Umar High School Semarang. Semarang University Faculty OfEngineering. 2013: 4-18.

[26]. Zilma S.N, Nahoya S, Ayunugrawati S, Mutaher A.A. Traumatology. Forensic And Medicolegal Medicine, Halu Oleo University. 2020: 3-31.

[27]. Parinduri AG. Blunt Trauma. Research And Community Service Unit, Faculty OfMedicine, Muhammadiyah University, North Sumatra. 2017;1(2): 29-35.

[28]. Biswas, G. Review OfForensic Medicine And Toxicology. (3rd Ed.). Bangladesh: Jaypee Brothers Medical (P) Ltd; 2015: 188-200

[29]. Burke M.P. Forensic Medical Investigation OfMotor Vehicle Incidents. United States OfAmerica: CRC Press;2007.

[30]. Dix J. Upper Color OfForensic Pathology. CRC Press. 2000: 118-61.

[31]. Kepel F.R, Mallo J.F, Tomuka D. Injury Patterns InTraffic Accident Cases In The Forensic And Medicolegal Sciences Section Of Prof Dr R D Kandou Manado Hospital, 2017 Period. E-Biomedik Journal. 2019;11(1): 23-7.

[32]. Juwita, Et Al. Characteristics OfInjuries And Types Of Violence In Traffic Accidents At Sartika Asih Hospital For The 2012-2016 Period. Bandung Islamic University. 2017;3(2): 715-19.

[33]. Indriani D, Yulianti K. Injury Patterns OfTraffic Accident Victims In Pedestrians And Motorcycle Riders. Udayana Medika Journal.2015;4(8)

[34]. Oktaviani P.H. Prevalence AndDescription Of Wound Patterns Of Motorcycle Accident Victims At The Sanglah Hospital Denpasar Forensic Installation In 2013. Digest Of Medical Science. 2016;7(1): 33-9.

[35]. Raimonda V, Et Al. Retrospective Epidemiological Study OfPediatric Femoral Fractures. Swiss Medical Weekly. 2020;10(14):

[36]. Ministry Of Health Of The Republic Of Indonesia. Indonesian Health System. Accessed From: Http://Www.Depkes.Go.Id. Accessed 27 January 2022.

[37]. Paulsen F.R, Waschke J. Sobotta Atlas Of Human Anatomy General Anatomy And Musculoskeletal System . (15th Ed.). Germany: Elsevier; 2011.

[38]. Ratu R.N, Pamuttu A, Bension J.B. Characteristics AndInjury Patterns Of Traffic Accident Victims At Bhayangkara Ambon Hospital For The 2014-2017 Period. Molucca Medica. 2021;14(1): 6

[39]. Rukmana P.H, Afandi P, Burhanuddin L. Types OfViolence And Injury Patterns In Traffic Accident Death Victims At Arifin Achmad Regional Hospital For The 2007-2011 Period. Riau University Repository. 2013: 45-61.

[40]. Riyadina W, Suhardi, Permana. Patterns And Sociodemographic Determinants OfInjuries Due To Traffic Accidents In Indonesia. Indonesian Medical Magazine. 2009;59(10): 464-72.

[41]. Angela Z A, Tomuka D C, Siwu J. Injury Patterns InTraffic Accident Cases At BLU RSU Prof. DR. R. D. Kandou Manado 2010-2011 Period. E-Biomedic Journal. 2013: 676-685.

[42]. Riandini I.L, Susanti R, Yanis A. Description OfWounds Of Traffic Accident Victims Who Were Examined At Dr M Djamil General Hospital Padang. Andalas Health Journal. 2015;4(2): 502-7.

[43]. Rao N.G. Textbook OfForensic Medicine &Toxicology. (2nd Ed.). New Delhi: Jaypee Brothers Medical Publishers; 2010.

[44]. Thompson J.C. Netter's Concise Orthopedic Anatomy. (2nd Ed.). Philadelphia: Saunders Elsevier; 2010.

[45]. Richter M, Et Al. Fractures Of The Foot Region Of Car Drivers And Passengers. Occurrence, Causes, And Long Term Results. Unfallchirurg. 1999; 102:429–433.

[46]. Howard A, Et Al. Children In Side-Impact Motor Vehicle Crashes: Seating Positions And Injury Mechanisms. The Journal OfTrauma 2004; 56:1276–1285.

[47]. Mcgwin G Jr, Et Al. The Effect Of State Motorcycle Licensing Laws On Motorcycle Drive Mortality Rates. The Journal OfTrauma 2004; 56:415–419.
[48]. Handoyo, C.N, Supriyanto, E. Profile OfThoracic Trauma In The Surgical Inpatient Room At Gambiran Regional Hospital For The Period March 2017 – March 2018. Wijaya Kusuma Medical Scientific Journal. 2018;7(2): 178-188.
[49]. Afandi, D. VisumEt Repertum(Manufacturing Procedures AndTechniques). (2nd Ed.). Riau: Riau University Faculty OfMedicine; 2017