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Coffin on Wheels: The Unaddressed Issues of Road Fatality in India

Bhaswati Das[*1] and Ankita Chakrabarti[2]

Abstract: Fatality from road collision has increased substantially in India. Around 17 deaths occurred every hour on roads in 2015 to 2016. The database mainly comprises of National Crime Record Bureau (NCRB) Report (2015) on Accidental Deaths and Suicides which highlights the overall pattern and distribution of road collisions in India and a thorough content analysis from the newspaper reporting from the Times of India and the Indian Express from Delhi edition, between January to December, 2017 to provide an overview for the specific case study of Delhi. It is observed that almost half of who die in road traffic crashes in India are users of motorized two and three wheelers (34%), pedestrians (9%) and cyclists (5%) - collectively termed, 'vulnerable road users'. Roughly 80 percent of the road collision victims do not receive any emergency medical care within the 'golden hour.' Road traffic in India which currently operates within the legal bodywork established in the Motor Vehicles Act, 1988 has been hardly amended in the last three decades, hence, road safety technologies and rationalisation of penalties are often disregarded. It is certain that technology needs to be used for timely information dissemination on crashes, live weather and road condition updates.

Keywords: Road fatality, vehicular collision, SDGs, public health, non-communicable diseases, India.

Introduction

Traffic collision was the 9th leading causes of death among the top 10 global causes of death in 2015. Demographers projected that it would slide up to be the 5th leading cause of deaths in 2030 surpassing cancer, tuberculosis and HIV. This surely calls for an attention even for India, where the country also loses above 4 lakh population and 3 percent of the country's GDP every year due to road collisions with 31 percent of the victims belonging to ages below 30 years. Global Burden of Disease data of 2016 has shown that death from road collisions has made its place within ten important causes of death in India. While, there is a sharp increase on 3.1 percent in road collisions between 2014 and 2015, the increase in deaths is even sharper to 5.1 percent during the same period (http://www.healthdata.org/india). This reveals that fatality of road collisions have increased substantially. India has paved the way for moving towards faster and smarter city life with a transition in rural life. This has impacted the road user's behaviour. Unlike developed countries where the highway collisions and motor vehicle collisions are major cases, in India (also other developing countries) 48 percent of victims are vulnerable road users from young to middle age groups, with low economic and social resources. It was felt that the combined demographic and epidemiological trends in developing world need to shift their focus of policy debate and research on adult health agenda particularly deaths due to non-medical reasons (Murray and Lopez, 1996).

[*] Corresponding Author
[1]Associate Professor, Centre for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University, New Delhi, E. Mail: bhaswati2004@gmail.com
[2]Senior Research Fellow, Centre for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University, New Delhi, E. Mail: chakrabartiankita07@gmail.com

In this context, the widely used definition of health by World Health Organisation is worthwhile to mention. It says that 'health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'. Any policy on health should not only be seen from the medical perspectives but also from well-being perspectives. The previous National Health Policies of India (NHP) of 1983 and 2002 had considered the need of that time and emphasised more on population control, control of epidemics, maternal health and several others. However, India experienced a massive change in economy since 90s mostly followed by globalisation. Information and communication technology along with economic and infrastructure development have changed the ways of life by making it much faster user friendly. The NHP 2017emphasised on preventive and promotive health along with curative care but without actually classifying them. The health policies of India so far have not any specific thrust on road fatality victims.

Asian Development Bank (ADB) report of 2012 observed that 70 percent of road crash victims' families suffer a dip in income. Two-thirds of such families take loans to cover income loss and many are driven into poverty or debt. The public spending for non-communicable health hazards is low in India and the private out of pocket (OOP) expenditure on health is among the highest in the world, thereby resulting in the injured person's household mostly bearing the financial burden of medical care (Kumar et.al., 2011). Since in cases of road collisions the duration of hospitalization is often long, OOP can range from 20 to 30 percent of the total annual expenditure (Kumar et. al., 2012). A case study from urban Hyderabad on traffic collisions revealed that only 22 percent of those injured had some insurance to cover a part of their expenditure (Kumar eta.al 2012). The out of pocket expenditure estimated recently for road fatality treatment in India, is alarmingly high as Rs. 26,132 and the share of this expenditure on economic burden of the households is explicitly greater than other major cause of illness orhospitalisation in the sample population (Goli et. al., 2018).A study, "Cost of Trauma Care" was conducted by Post Graduate Institute of Medical Education and Research (PGMIER), Chandigarh and two other secondary hospitals. They have mentioned that the indirect productivity loss does not only include wage loss due to hospitalisation but also wage loss occurring during recovery time or in instances of being bed ridden for life. The study also found that out-of-pocket expenditure for hospitalisation is higher in the case of poor and nearly 80 percent of such expenditure is on account of medicines and procedures. The research also shows that in more than one-fourth of road collision cases the families end up spending 30 percent or more of their total income for taking care of the patients (Times of India, Delhi, December 21, 2017).India has made impressive progresses in the health sector over last few decades, which many scholars have thought it to be India's ability to make use of 'window of opportunities' for improved health. But, such windows will be short lived as the majority of the young and working population are exposed to road traffic collision. According to Sharma (2008), the direct costs of road crashes are estimated to be 1.5 percent of the share of GDP of the low-middle income countries. Worldwide, the effect of non-fatal injuries on lost productivity is also estimated to outweigh that attributable to fatal injuries (Green et.al, 1993; Peden et.al, 2002).

The society and government has a moral responsibility to act to this issue which has reached an epidemic proportion. After all the huge loss of young lives will only shorten the country's 'window of opportunity'. This study carries special significance while set in the framework of sustainable development goals where in Goal 3, point 6 declares to halve the

number of global deaths and injuries from road traffic collision by 2020. It also set the goal (Goal 11.2) to provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety by 2030 (http://www.undp.org).

Given the background, the paper attempts to highlight the overall pattern and distribution of road collisions in India and focuses on the site, situation and detailed nature of major accidents on road in Delhi NCR and Yamuna expressway. The paper also questions some critical policy issues and comments on the good practice that needs to be incorporated in the policy framework.

The total number of victims as derived from the content analysis of the newspapers is 97, out of which 65 victims (67%) died in the road collisions. Around 49 percent of the victims died on the spot. There are more male victims that female. Roughly 87 percent of the male victims belong to 21 to 25 years of age group and 33 percent of female victims belong to 31 to 40 years of age group. Most of the accidents took place in congested roads followed by highways during the 'office hours'. There can be multiple reasons for collisions, but primarily in India it is associated with careless driving. Around 80 percent of the road collision victims did not receive any emergency medical care within the 'golden hour'. This is the first one hour after the traumatic injury when immediate medical attention is likely to prevent death. It is predicted that at least 60 percent of the deaths could be averted if treatment starts within this time. In around 38 percent of victims did not receive any medical help after the collision and have eventually died. Proper utilisation of technology can make timely intervention and prevention of road crashes. Around 74 percent bystanders are unlikely to assist a victim as most fear legal complications and harassments. The Supreme Court of the country passed 'Good Samaritan Law' in 2016, which gives legal protection to people who voluntarily assist during a road collision. With these landmark guidelines now having legalised no bystander can be harassed in medico-legal cases, if he/she brings a victim of a road crash to the nearest hospital. Such initiatives can help to reduce road fatalities cases drastically. It is very dispiriting, that only a handful of comprehensive works have been done by the scholars in India with an overwhelming inclination towards understanding the health expenditure, ignoring the emerging threat of road fatality on the productive population groups.

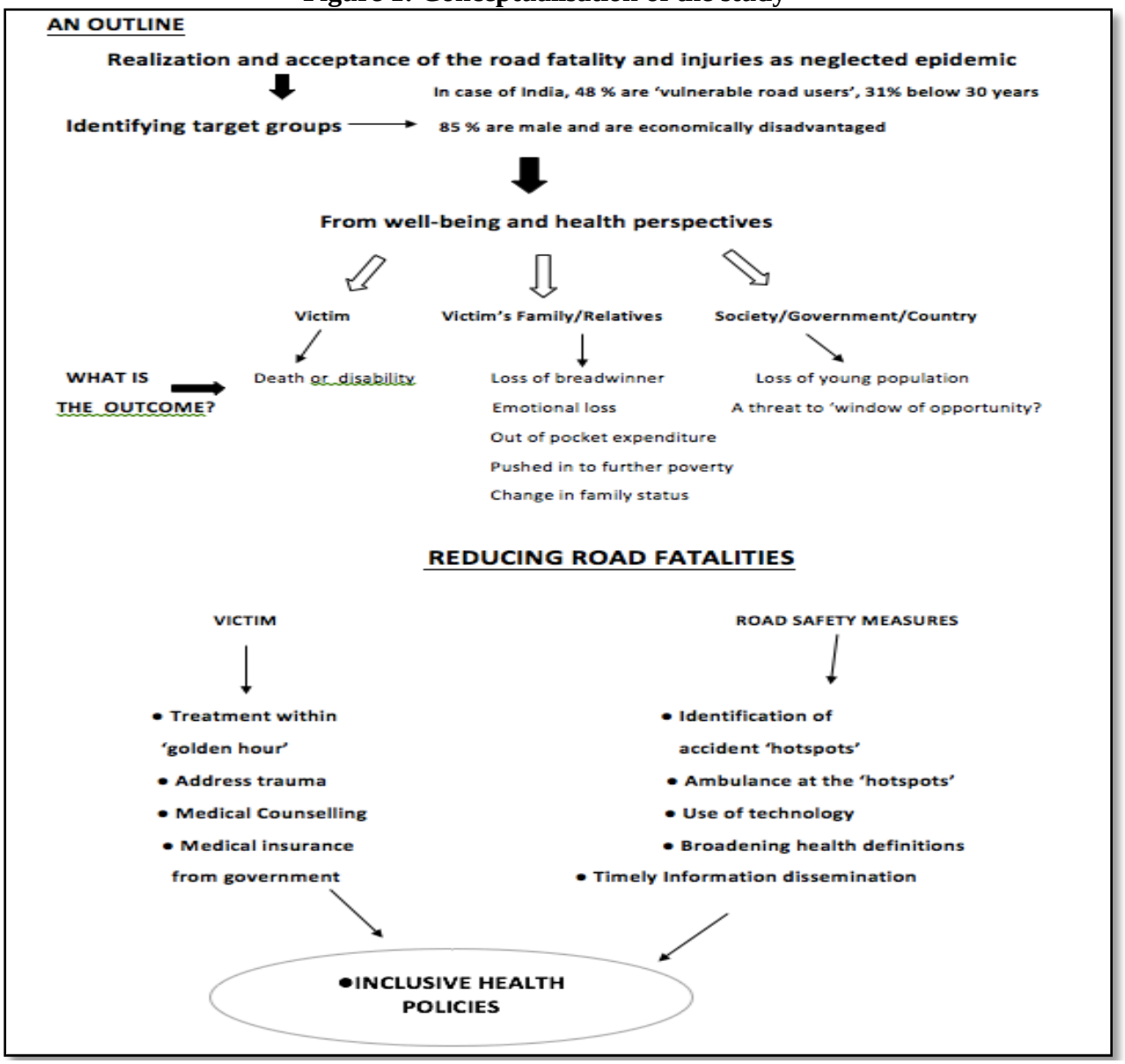
Conceptual Framework

The conceptual framework tried to put the reasons for including road fatality in the health policy considering the vulnerability of the victim and victim's family. The framework also have included the role, state could play to address the vulnerability. The framework is put in the background while addressing the objectives specified in the study.

The outline in Figure 1 comprehends the pathways to tackle road collisions victims by incorporating multi-sectoral approach. Along with health sector, the transport sector needs to consider the incidences with seriousness. The role of road infrastructure in collisions occupies a major position. Thus, it demands their response to tackle the problem. The third NHP of 2017 has specific mention about road collisions. The key step in addressing the issue of high road fatality is primarily to realise that life lost due to road collisions are an immediate public health concern. The next is to identify the target groups for whom the health policies on road collisions

should focus on. This should address the need (both medical and non-medical) of the victim (if he/she survives) and victim's family. It is to be kept in mind that, the most vulnerable groups are the people from poor economic and social settings. Coping up with the loss of near ones are in itself an irrevocable emotional burden. Not only do the costly and elaborative treatments put huge burden on them, but loss (either death or permanently disabled) of a bread-earner in the family might permanently drive their families into acute poverty.

Figure 1: Conceptualisation of the study



Data and Methods

Accurate reporting on deaths and injuries due to road accidents, especially from national sources are very limited. Most of the studies like Dandona *et, al* (2008), Kanchan *et, al*(2012), Kumar *et, al*(2012)and few others have used samples from hospitals and clinics. While this do give a fair estimate, but comparisons on national level becomes difficult. This study follows a unique approach other than the use of descriptive statistics from National Crime Record Bureau (NCRB). Reporting from newspapers are used as an important source of data. This could be an example where the mass media has not only used for creation of a message but also for the construction of a meaning. According to Habermas (1962) the structured setup of modern mass communication imposes a "don't talk back" format on audiences (Schultz, 1999). However, with a help of content analysis, much of the information from the newspaper could be converted to data, providing trends and patterns of a phenomena. Similar attempts are made in case of road collision deaths that were reported by newspaper and which transformed into a larger picture depicts preventable deaths of young lives.

The database of the study comprises National Crime Record Bureau (NCRB) Report (2016) on 'Accidental Deaths and Suicides for Indian' statistics and the newspaper reporting from Delhi edition of Times of India and Indian Express between January to December, 2017 have been analysed to prepare case study of Delhi and Yamuna Expressway. The case study explored the reports about horrific nature of the accidents on Yamuna Expressway in 2017. A thorough content analysis has been done from the newspapers for one years' reporting, covering collision deaths and injuries on the roads of Delhi and NCR. The basic information required for understanding road fatality was extracted. Details like age and sex of victims, reasons for collisions, time and location, availability of medical help, nature of injury and collisions involving multiple victims have been carefully scrutinised and recorded. Descriptive statistics have been generated for data representation to provide an overview.

It is worthwhile to mention that the data from the newspaper only allows rough insights of the collisional deaths and does not provide estimations on severe injuries and permanent disability caused due to the collisions. As the collision victims are hardly being followed afterwards, the information from newspaper are limited to one time reporting only. Many reporting does not have time or location of the collision and thus numbers of information categories vary.

Limitations of Content Analysis from Newspaper

1. The newspapers mostly covered deaths due to road collisions than injuries, even though injuries are far more in case of collisions which in general remain unrecorded as well.
2. Collisions which involve multiple victims or gruesome nature of collisions were mainly reported.
3. Newspapers generally report those collisions where the police complain had been filed. Many collisions are not even registered with police. Those are completely unaccounted for.
4. Most of the reports are inconclusive and do not provide details on aftermath the collision, or whether the victim has received proper medical help. Such 'one-liner' reports are

excluded.

5. Coverage is low or there is no coverage at all when some other major event of national and international importance that have occurred in parallel.
6. The results from the content analysis may not be strictly comparable with the NCRB 2015 report released in 2016. When this work was underway, 2015 report was the most recent one. Also, the data shown through newspaper was for Delhi, and the mapping from NCRB report is for a national level scenario.

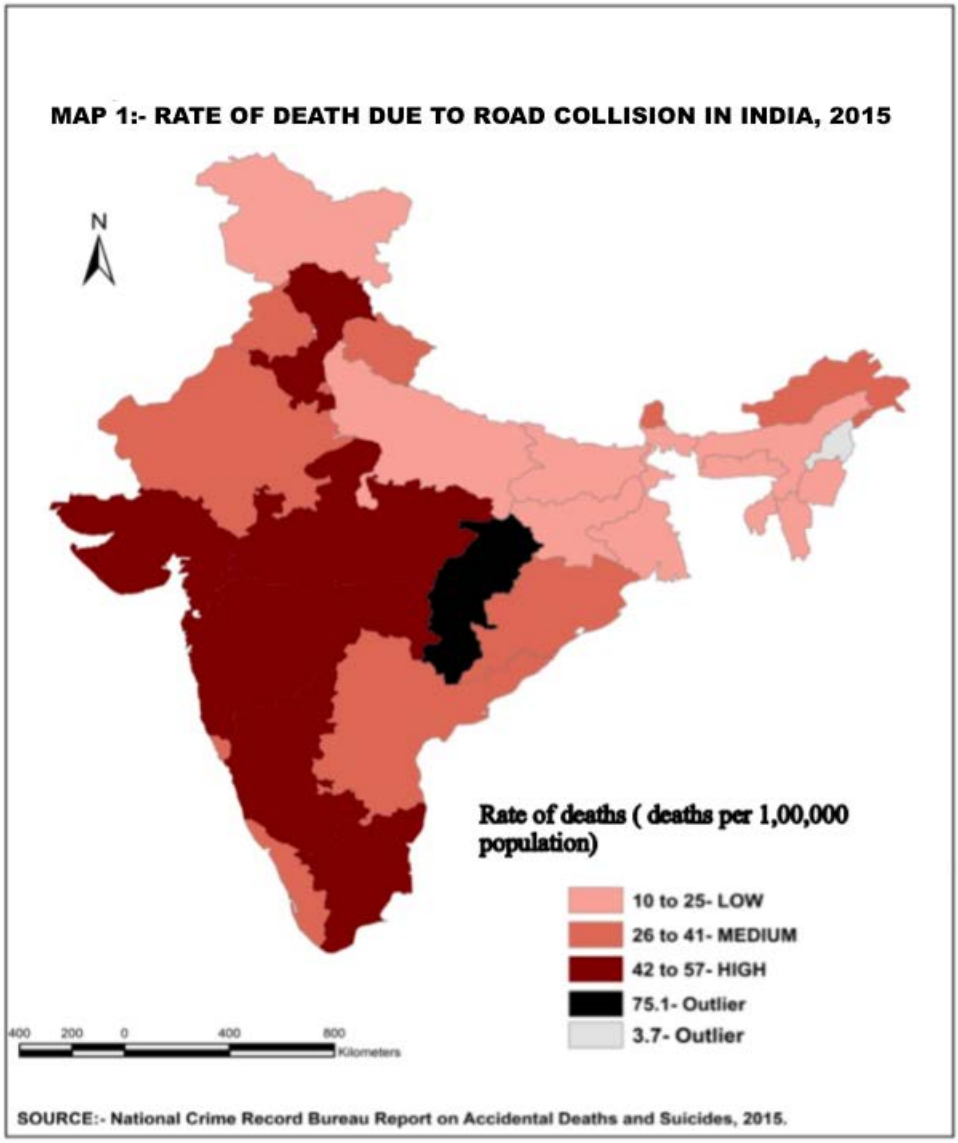
Results and Discussion

An Overview of Road Traffic Collisions in India

India has 1 percent of the world's vehicles but nearly 10 percent of all road crash deaths. Indian Express highlighted that 17 collisional deaths occurred every hour on roads and around 1,50,000 deaths in 2016. Road collisions are the most important cause of disability in India. A survey by WHO for Global Status on Road Safety (2015) showed that on a scale of 1 to 10 on enforcement of road safety rules, India scores 3.8. According to Delhi traffic police, there were 6673 road collisions in the capital in 2017, out of which 1584 (23.7 percent) were fatal collisions. While Chennai recorded the highest number of road collisions, Delhi has overtaken in terms of most number of deaths due to road mishaps. A range of factors from bad road design to lax enforcement of traffic rules led to the Capital claiming the top spot. Not only are the road infrastructure unsafe but also the traffic laws are not robust enough to prevent such collision deaths and injuries. Addressing road safety issues in a comprehensive way demands the coordinated involvement of multiple sectors like health, transport, infrastructure and law.

Cause-specific mortality is one of the most fundamental metrics of population health. The rates and numbers of people who die, where, at what age, and how, is a crucial input into policy and planning interventions (Lozano et.al., 2013). Since the beginning of drafting the health and population policies the objectives were focused on family planning targets and reducing high burdens of communicable diseases, thus ignoring the social impacts of the road collisions as a major health outcome. There is an urgent need to rationalize and address the changing pattern of causes of death in India. Non-communicable diseases (39.1%) and injuries (11.8%) now constitute the major contributor to the country's disease burden. However, National Health Programmes for non-communicable diseases are still very limited in coverage and scope.

Map 1: Rate of death due to road collision in India, 2015



Nature and Dimension of Road Fatalities and Injuries in India

According to NCRB Report (2016), nearly 53 percent of the accidental deaths in India are due to traffic collisions that occurred in 2015. Around 62 percent of victims are in the age group 18 to 45 years, with a higher ratio of male fatality to female fatality (80:20). The population growth from 2005 to 2015 was 14 percent and the increase in the rate of collisional deaths was nearly 23 percent, with 3 percent increase from 2014 to 2015. This suggests that mortality due to collisions is a major and rising concern, while addressing the health issues of population of India. Chhattisgarh has the highest collision death rate with over 75 deaths per 1,00,000 population. Maharashtra and Madhya Pradesh are the only states with incidence rate over 50 deaths per 1,00,000 population. There are 17 states/UTs where the incidence rate is higher than the national average of 33 deaths per 1,00,000 population. The southern and western states along with Punjab and Haryana have very high road fatality incidence rates. This can be due the higher movement of trucks and trailers along the national highways with large number of private vehicles.

Like any other statistical figures based on reporting, the figures on road fatality is also reckoned to be underreported, as in many cases the reports are filed only for medico-legal reasons. Generally, road collisions have caused more injuries than deaths, but the scenario is reverse in Punjab and Uttar Pradesh. A recent newspaper reporting highlighted that 17 deaths occur every hour on Indian roads and around 1,50000 deaths in the year 2016 (The Indian Express, 11 September, 2017) due to road accidents. Among the major cities, Chennai has the highest incidence rate (46 deaths per 1,00,000 population) and Kolkata has the lowest(6 deaths per 1,00,000 population). Tamil Nadu has highest number of road crash in the country, where 1300 persons on an average lose lives every month due to road collisions. The rate is high for both vulnerable road users and heavy motor vehicles. Uttar Pradesh on the other hand has the highest fatality rate due to the road collisions with one collision occurring every 2 hours (Times of India, January 2017). The victims are mostly underage vulnerable road users with disregard of traffic rules.

However state and national highways have seen around 60 percent of all collisional deaths, while the vehicles like trucks, buses and cars that commonly use these highways account for nearly 30 percent deaths. High incidents rate on highways are seen in Uttar Pradesh, Maharashtra and all the states of southern India. Speed bumps and potholes killed 15 persons a day in 2016. Cause-wise analysis of total fatal road collisions revealed that 41 percent and 32 percent fatalities are due to over speeding and reckless/dangerous driving/overtaking respectively. Risk taking behaviours, temporary distraction and psychological stress among youth are also major contributing factors (Sharma, 2008).

Almost half of who die in road traffic crashes in India are pedestrians (9%), cyclists (5%) and users of motorized two and three wheelers (34%) - collectively known as 'vulnerable road users'. Two-wheelers are the major killers, contributing up to 29% of total road collision deaths in India. Recent coverage by different newspapers in Delhi shows an increased reporting of deaths and severe injuries of 'delivery boys' engaged with e-commerce. Their duties are extremely time bound; they have to rush to deliver orders often risking their health by adopting hasty and careless driving. Doctors from reputed hospitals in Delhi said that there are 3 to 4 registered collision cases per week in the hospitals, with severe leg, spine and head injuries. A study by doctors in Karnataka (Kanchan et. al, 2012) found that 75 percent of the deaths occur due to head injuries.

Collisions on the Roads of Capital City

The data for 2017 shows Delhi recorded only 6,637 collisions despite the national capital having the highest number of vehicles. "The data provided by most states is rubbish. How can one accept that states like Bihar, UP or Delhi have such few collisions? Police simply don't report them. Unless we bring reform and there is proper recording of collisions and their causes, the entire exercise is futile," commented by a former transport commissioner of Kerala. Kerala and Madhya Pradesh are the only states where a police officer is appointed as transport commissioner. A Road safety expert observes that faulty collision data has not helped in coming out with solutions. According to him, "we have to make the data collection system robust with proper investigation of collisions to zero down on the causes to find solutions" (Times of India, Delhi, April 24, 2018).

The total number of victims derived from the content analysis of the newspapers is 97, out which 65 victims (67%) died in the road collisions. Around 49 percent of the victims died on spot. There were 10 collisions that involved death or major injuries of multiple victims, the rest cases are of single victims. It has been seen that 37 percent collisions are by cars and 32 percent by two-wheelers. Around 20 percent of the victims are pedestrians who were hit along the sideways or walkways. This makes 52 percent as vulnerable road users from this study.

Of the total sample, 79.4 percent is male and the rest is female. The age distribution shows that 44.3 percent of the victims belong to the age category 21 to 30 years. This age-sex distribution pattern is fairly consistent with the national figures (by NCRB report). However, around 11 percent of the reports do not have any age of the victim mentioned. Roughly 87 percent of the male victims belong to 21 to 25 years of age group and 33 percent of female victims belong to 31 to 40 years of age group.

Time and Location of the Collisions

The month of July shows that 15.5 victims were involved in any type of collision. But, this figure is higher since one collision took place with 9 victims. Barring July, 14 percent of the victims had collision in the month of March. Least collisions took place in August (4%). Most of the collisions (21 %) took place between 6 am to 9 am followed by 15.5 percent in between 6 pm to 9 pm. Note that both these time slots are busy 'office hours' and hence more traffics on road are expected. The lack of preparedness to tackle the large flow causes more collisions during this time. In around 14 percent news reporting time was not mentioned. Location wise top two spots for road crashes are congested roads (37%) and highways (34%). Roughly 17 percent collisions took place in major road intersections. It is to be noted that unlike developed countries where road collisions are only high on highways and expressways, India has higher percentages of road collisions in both highways and city roads. The Delhi traffic police have identified few collision prone regions across NCR. Major 'T' and 'Y' intersection points and roundabouts cause the most collisions within the city. The outer ring road and national highways are more prone to such collisions. This study observed Connaught Place, Rajiv Chowk area and flyovers near All India Institute of Medical Science (AIIMS) as black spots. The School of Planning and Architecture (SPA) is the first university in the country to include road safety in its curriculum. The course is a part of the master's programme in transport planning. Of the 128 such spots identified by the traffic police, the worst ten were ranked according to the highest criticality by SPA. The figure 2 shows the peak collision hours according to the nature of the road. Here, it is recorded as the type of location where the collisions took place. Most of the collisions along highways occurred around 6 am to 9 am (33%) and 12 am to 3 am (21 %). Many a time further investigations reveal that collisions on the congested roads mainly occur between 3 pm to 6 pm (19.4%) and 9 am to 12 pm (16%).

Reasons for Collision

There can be multiple reasons for collisions, but primarily in India it is associated with careless driving (22%). Reasons such as drunk driving (13.4%), hit and run (18.6%), over-speeding (14.4%) can be brought under the umbrella term of 'careless driving'. Figure 3 highlights the reasons for collision by the time of the day. Hit and run is highest (55.6%) in the hours between 6 am to 9am. This is the time when the roads are most deserted. Collision due to

drunk driving is at peak (46%) between 12 am and 3 am. Notably, over speeding and careless driving remains the major cause throughout all the hours. Most of collisions on highways occur due to drunken driving, over-speeding and careless driving. Around 65 percent of the pedestrians died on the major road intersections.

Figure 2: Road Collision victims by time interval and site in Delhi, 2016

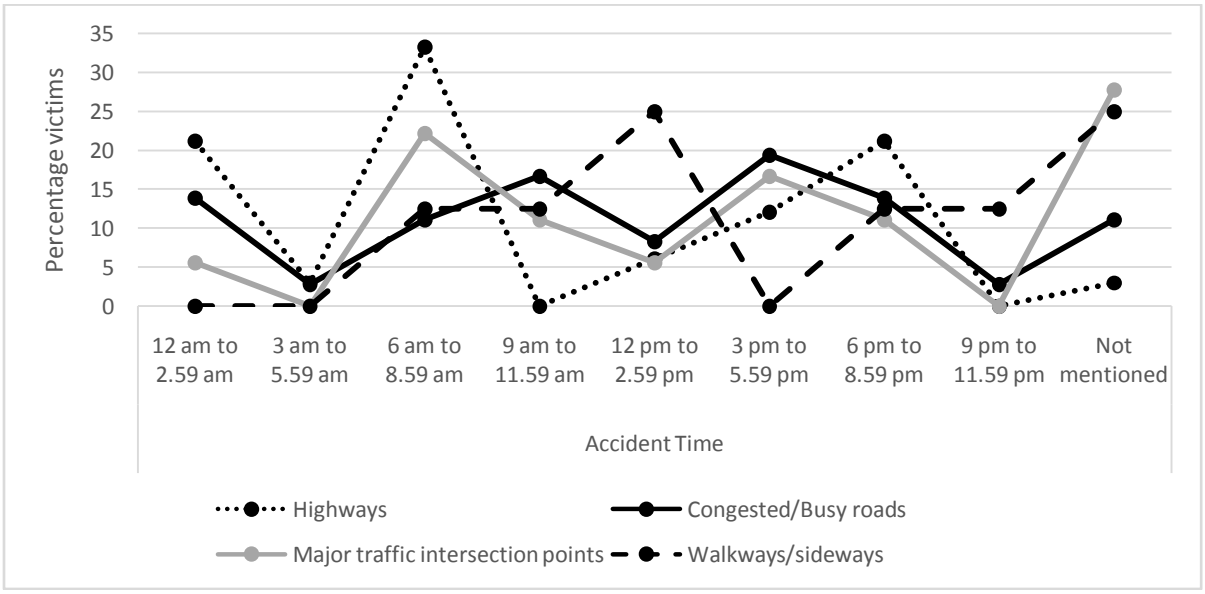


Figure 3: Road collision victims by time interval and reason in Delhi, 2016

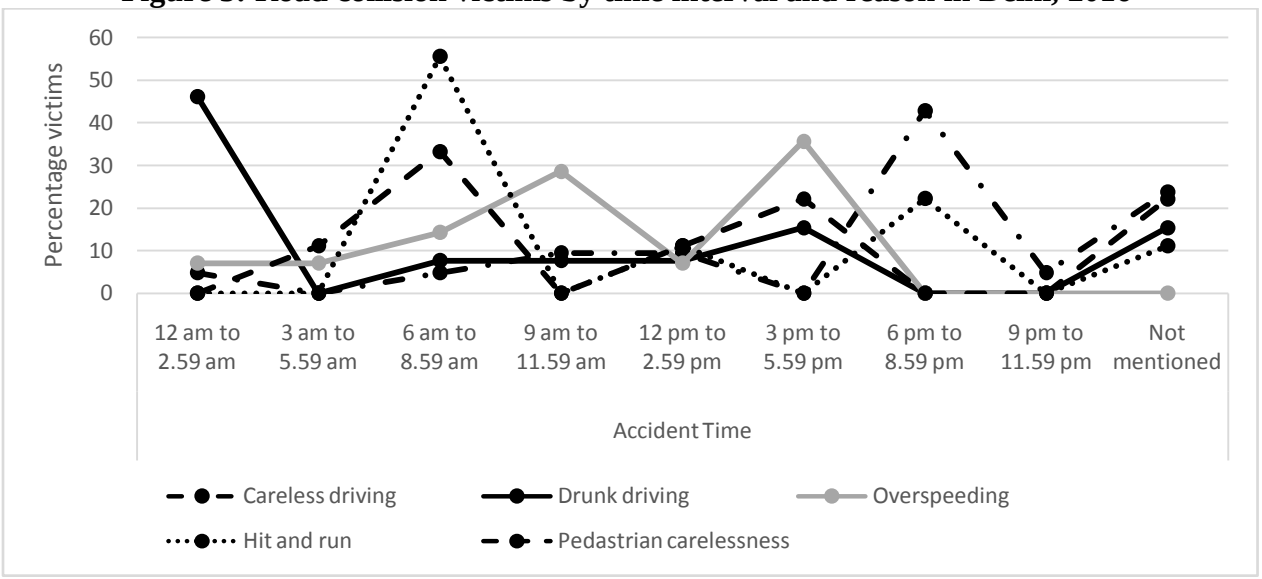


Figure 4: Road collision victims by site and reason in Delhi, 2016

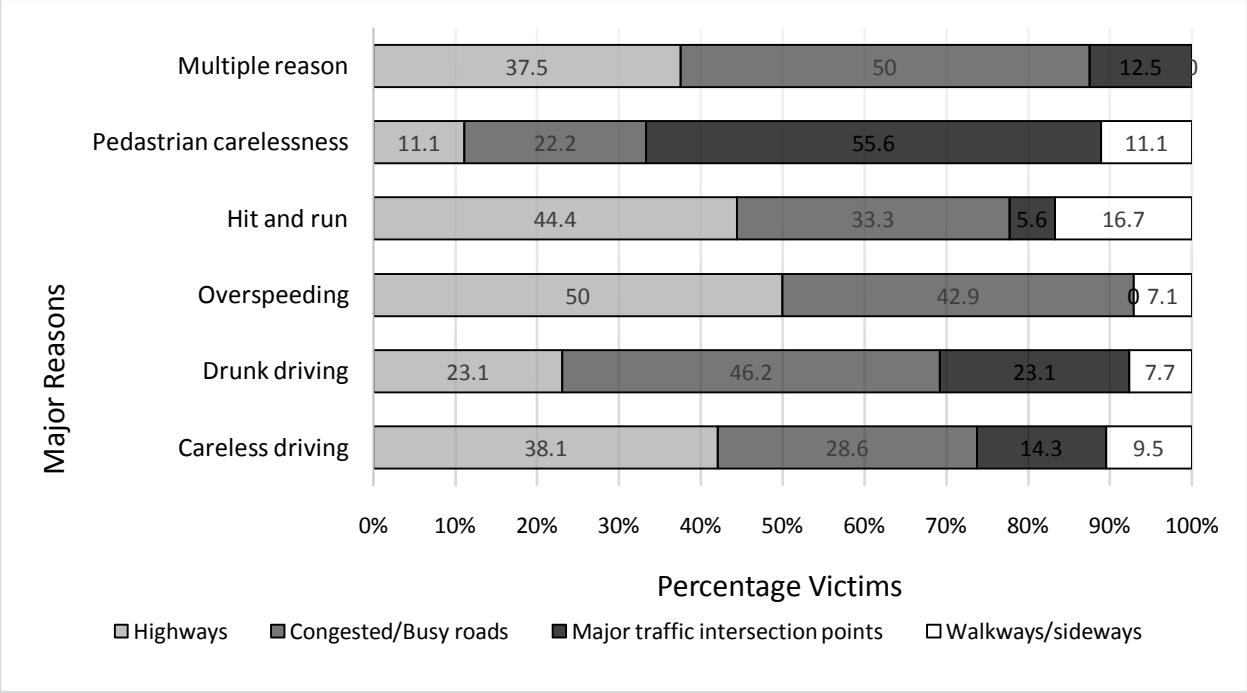
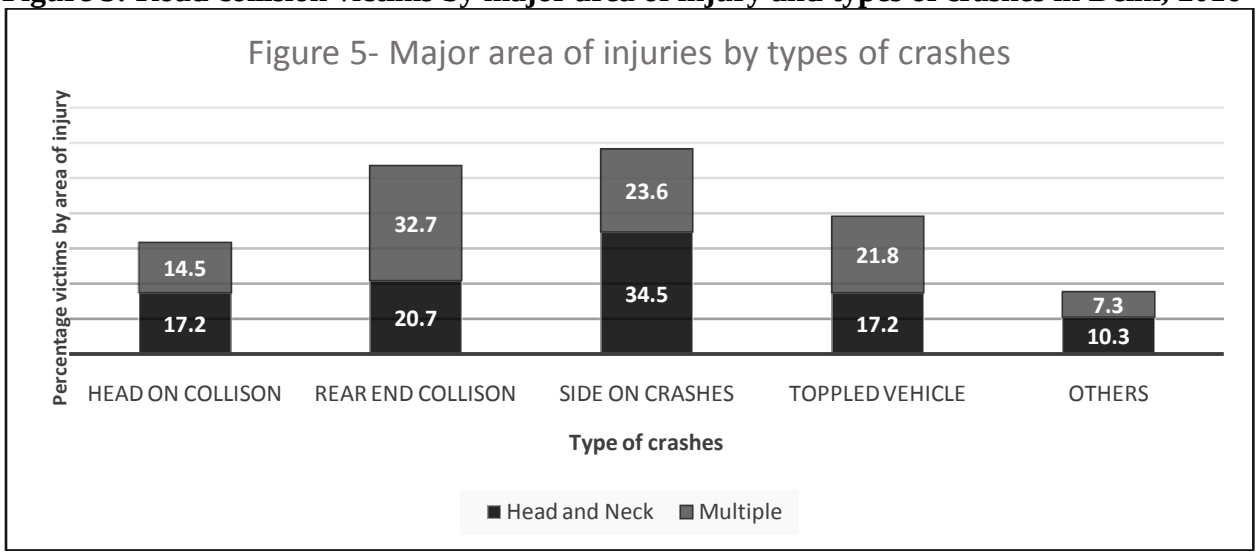


Figure 5: Road collision victims by major area of injury and types of crashes in Delhi, 2016



Nature of Injury

The most common types of crashes are considered here given the limited information available from the newspaper. Side on crashes is around 29 percent, followed by rear end collision which is around 25 percent. In case of major area of injury, 57 percent of victims had multiple injuries and 30 percent had head and neck injuries. Common injuries suffered from side on crash type of collision would be trauma to whatever side of the body the vehicle collided with. Common ones are, head injuries from the head striking against the window, neck injuries from the whiplash, fractured arms, pelvis, internal abdominal injuries and fractured legs due to

the side impact of the vehicle. In this case, around 35 per cent of victims suffered head and neck injury due to side crashes. Injuries found in rear end collision would mostly be related to the head and neck region. Depending on, if the victim had used seatbelts, injuries may include head and facial injuries due to the head colliding with the windscreen, neck injuries from the forward-and-back motion of whiplash, chest and abdominal injuries from the steering wheel and finally leg injuries from colliding with the dashboard. A head on collision would also depend on whether the person was restrained in the vehicle, the most common injuries suffered would be head and facial injuries due to the head colliding with objects. In this study around 20 percent had head and facial injuries and 17 percent suffered from neck and head injuries due to head on collision. Injuries suffered from toppled vehicle or rollover could be very severe. If unrestrained, severe trauma to the whole body can be seen, mostly around the head and neck region, which happens in most cases in India. The riders would hardly wear seat belts, even if the law makes it mandatory. Most of the trucks and buses do not even have that provision. There would also be damage on the chest and abdominal area with general trauma, such as fracture, on the lower parts of the body. Multiple fractures and lacerations are common in case on other two severe types of crashes.

Medical Attention after Collision

This section highlights the issues on medical attention received to the victims after the collisions. However, follow up is not done by the reports after the incident takes place. The victim who survived then might have died in some time, or had been permanently disabled or may have recovered. The newspapers in most of the cases mentioned who helped after the incident. In this study 61 percent of the victims were helped by local people, 28 percent by the police in highways and traffic intersections and 8 percent of the victims did not get help from anyone. Around 49 percent of the victims died on spot, before help could be provided. However, in around 38 percent of victims did not receive any medical help after the collision and have eventually died. It is seen 49 victims got help within one hour (golden hour) of the collision, but 28 victims have already died. Save LIFE Foundation (SLF), is a non-profit non-governmental organization founded in 2012, providing emergency medical care for road crash victims and at the same time working on improving methods on road safety. They combine innovative on-ground interventions in crash prevention and post-care response to create a sustainable impact on the ground. They are currently operating in major cities of India like Delhi, Hyderabad, Kanpur, Ludhiana, Mumbai, Indore and Kolkata. It is through their initiatives that the 'Good Samaritan Law' has been passed. More NGOs and public participation are required in addressing the situation. It is observed from the reporting, that 58 victims are already brought dead to the hospital while 26 had been hospitalised for longer term (more than 7 days). Interestingly, out of 49 victims who received medical help within one hour of the accident or the 'golden hour', 28 victims died. The number of deaths also increased with the hours before help had arrived. In 6 cases, the victims received no help at all and died in the area of the collision.

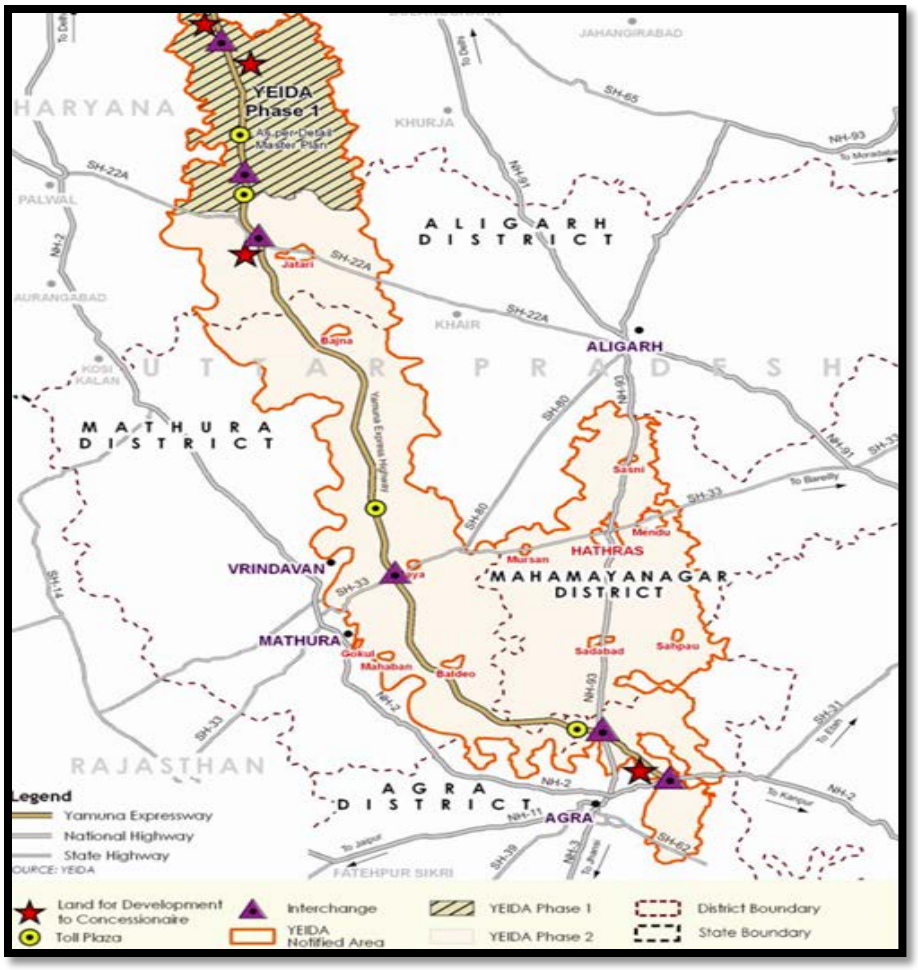
The Supreme Court has issued a host of directions to states to set up a road safety policy as well as dedicated safety funds. The court also expressed distress that there's one death every three minutes in road collisions in India, but legal heirs of only half of the victims receive compensation. Though insurance companies paid Rs 11,480 crore as compensation in 2015-16, half the legal claimants of remuneration did not get their due. Delhi is again a defaulter among states and UTs with regard to setting up of a road safety fund, which has already been established

by Bihar, Chhattisgarh, Himachal Pradesh, Jharkhand, Kerala, Madhya Pradesh, Rajasthan and Uttar Pradesh. The court also criticised states and UTs for their reluctant response to put in place a road safety action plan to reduce the number of collisions and fatality rates. It has directed them to do so latest by March 31, 2018 (Times of India, Delhi, December 3, 2017).

A Summary on Yamuna Expressway Collision Scenario

Yamuna expressway is a six lane highway stretching 205 kilometers from Delhi to Agra in Uttar Pradesh. The expressway serves as the fastest route connecting two famous tourist destinations, shortening both travel time (from 4 hours to less than 2 hours) and distance. The expressway starts from Greater Noida and ends at Kuberpur on NH 2 towards Kanpur and Agra. In addition, a total of 13 service roads of about 168 km have been built for local commuters to access the expressway. In 2017, around 146 people died on Yamuna expressway (Times of India, May 10, 2018).

Map 2: The Yamuna Expressway region demarcated by Yamuna Expressway Industrial Development Authority



However, in recent times this expressway is known as the bloodiest roadway in India, witnessing 30 collisions every week, with numbers increasing in foggy winter months. Right from its inauguration in 2012, the highway claimed many lives. Even though the speed limit for vehicles is clocked at 100 kmph, most of the collisions occur due to over-speeding, careless driving including over taking from the wrong side (the right side being used for overtaking). There are also several reports of vehicles piling up due to low visibility in fog during the winter months. There are also many viral videos over the internet, of cars ramming up against each other on the highway. Every day or the other there are reports on some minor collisions or injuries to major ones. A RTI reply by YEIDA claimed that over speeding was a major contributor of collisions on Yamuna Expressway. Out of 4,956 collisions between August 16, 2012 and March 31, 2018, a total of 1,161 collisions were caused by speeding (Times of India, July 1, 2017).

The data sought by RTI revealed that 1,161 collisions were caused by speeding, 595 by tyre burst, 235 by fog and 2,965 by other factors, including drivers falling asleep and vehicles being hit by others. According to YEIDA, these collisions took the lives of 718 people and injured 7,671. The highest number of casualties was recorded in 2016 with 146 deaths in 763 collisions. According to the data, 3,04,713 speeding vehicles were caught on camera from January 1 to March 31 in 2017 , while 2.33 crore vehicles were caught speeding on the expressway in over five years. According to RTI data, 626 people lost their lives in 4,848 road collisions on the 196-kilometre-long Yamuna Expressway ever since it was thrown open to public in August 2012. Between 2012 to 2017, over 2.3 crore vehicles were detected breaking the speed limit and only 17,883 were issued 'challans' by traffic police in Agra, Aligarh, Mathura and Gautam Budh Nagar (Times of India, May 10, 2018).

Collisions on Yamuna Expressway

All the collision reports are taken from the one-year coverage of Times of India newspaper, circulated in Delhi within the time period of January 2017 to December 2017. Only those reporting are mentioned that have enough coverage including the causes for the collisions and details on victim. On January 21, 2017 a women, 30 years old travelling with her parents died after their speeding car hit the divider and then overturned. She died on spot, while her injured parents were rushed to the hospital after two hours of the collision. Her parents claimed that help came much later, which reduced the chances of their daughter's survival. Police claimed that the car lost control at the high speed and hit the divider. In a long pile up of 35 vehicles due to fog a 57-year-old woman died when the first car overtook suddenly hitting another car from the back, with considerable speed. Roughly 22 people were injured due to this collision. The incident took place on Yamuna expressway on 25th January around 9 am due to dense fog and a visibility less than 15 meters. The victims were rushed to a nearby hospital.

A SUV car overturned on the highway on 28th March, where the driver was killed on spot. He was travelling to Agra for business purposes with his four friends who were critically injured. Police informed that the car was way beyond the speed limit and overturned while overtaking another car. On March 31st at around 11.30 am two cars rammed into one another as the car in the front hit sudden brake. Two students from Delhi University died on spot, while two others were injured. Hours later they were taken to the hospital by the police. Multiple collisions mainly due to over speeding were reported on 3rd July. There were 4 deaths including a 6-year-

old child and 14 others who suffered major injuries. The collisions took place within the span from midnight to early morning. All the victims were in SUV cars.

Around 2 pm on 10th October, 10 university students were travelling in a SUV car towards Noida. The driver was 21 years old, who was driving too fast and lost control, ended in hitting the divider. The collision claimed lives of 4 students, 2 suffered severe injuries, while rest had major to minor injuries admitted to the nearby private hospital. According to the police, the car was at a very high speed and lost control when the front right tyre seemed to have burst. Police also informed that the driver took the car without informing anybody at home.

A school bus carrying 50 students on an educational excursion from Himachal Pradesh lost control and crashed against the divider. The incident took place on 4th November mid-morning, when the tyre of the speeding bus might have burst, hitting the divider. An eyewitness constable said the driver flew out breaking through the windshield and died on the spot. Around 36 school kids were injured out of which 30 were in critical condition. The children were dozed off in the bus when the collision occurred and it happened all of a sudden without them realizing it at all. Most of them suffered lacerations and limb fractures along with bleeding head injuries. Amputation of finger and hand was done to two students respectively after the collision. Both local people and police helped to take the victims to the nearby private hospital.

On 9th November, 13 vehicles rammed into one another due low visibility caused by dense smog. The visibility was less than 10m. Around 6 people were injured and the pile up began when a SUV car hit some construction materials kept on the sideways. A similar incident happened on 11th November as well between 8 to 8.30 am where 5 vehicles rammed into each other. However, there were no causalities. The pile up was again due to low visibility in the heavy smog. After these series of similar episodes both police and transport department decided to announce fog and visibility conditions from different toll plazas and check points. An Australian man driving a motor cycle was hit by a state bus on 22th December on the highway. He was travelling from Delhi to Agra with his friend who was on another bike. The bus was apparently on high speed and could not see the bike due to fog. The victim was rushed to the hospital but was declared as brought dead.

From the above incidents few common observations can be made regarding the nature of collisions that are taking place on the Yamuna e-way. Firstly, most of the collisions are due to over speeding and reckless driving. Second, low visibility in winter months is a challenging issue. More injuries are due to this reason. Third, most of the collisions involved large number of victims either travelling by bus or SUVs. Lastly, there are no mention or no information on medical emergency arrangements in any of the reports. A resident of Agra rescued a Ukrainian woman on the e-way. But there were two other Ukrainian women who were killed because he could manage to help only one, even though he took all three of them in the car. He reported that the rescue team did not reach on time and hence such deaths occurred which could be avoided. According to the current head of operations at Yamuna Expressway, there are supposedly 5 ambulances on three toll plazas and 17 patrolling cars out of which 6 are maintained by local police. (Times of India, May 10, 2018). But, the effectiveness of such arrangements is to be questioned given the huge proportion of deaths that occur almost every day, along the e-way.

A study by Rail India Technical and Economic Service (RITES) in June 2017 found that most of the collisions along the e-way occur between 1 am to 5 am as drivers are inattentive, asleep during the 'graveyard hours' (Times of India, August 8, 2017). Very easily additional measures can be taken during those hours, like keeping working ambulances, and carrying out occasional checks. Yamuna expressway authority claims that at every 25 km stretch, there is one highway patrol and mobile radar to check the speed limit, along with CCTV cameras installed in every 5 km along the expressway for surveillance and ensure safety and collision assistance. Engineers had identified three 'black spots' on the expressway as the most collision-prone, including two in Greater Noida and one in Mathura.

Summary and Conclusion

This study is unique in its way of showcasing the deaths due to the road collision in India along with its distribution and pattern. More specifically, it also shows the nature, site and details on victims in case of Delhi, the capital city which records one of the highest deaths in the country due to road accidents. Attempts were made to highlight the cases of accidents along the Yamuna expressway designated as the bloodiest road, as wellwhich is impossible to capture from national level factsheets. Only few severe accidents on Yamuna e-way were discussed with variations in time, reason and types of vehicles. In a nutshell, the paper wants to draw attention to both health policy makers and the traffic rule makers to address the issue with grave urgency by employing real time data, hotspots mapping, providing immediate care services and effective punitive measures for the accused, so that the preventable deaths could be avoided.

Around 17 deaths occurred every hour on roads in 2015 to 2016. Both the studies on Delhi and Yamuna expressway revealed that most of the collisions occur because of the careless driving and pedestrians' negligence. The total number of victims derived from the content analysis of the newspapers is 97, out which 65 victims (67%) died in the road collisions. Around 49 percent of the victims died on spot. Most of the accidents took place in congested roads followed by highways during the 'office hours'. There can be multiple reasons for collisions, but primarily in India it is associated with careless driving. Reasons such as drunk driving (13.4%), hit and run (18.6 %), over-speeding (14.4%) can be brought under the umbrella term of 'careless driving'. The highest number of casualties was recorded in the year 2016on the Yamuna e-way, with 146 deaths in 763 collisions. According to this study, over-speeding followed by low visibility due to fog or smog claimed most lives. However, the magnitude of injuries and even death could be prevented if working medical unit reaches the spot in time. There are no dedicated trauma care units to handle collisions cases. It is also certain that in this era of technology, timely information dissemination, be it on incidence of crashes or live weather and road condition updates can save many lives. Around 38 percent of victims did not receive any medical help after the collision and have eventually died. Road traffic in India currently operates within the legal framework established in the Motor Vehicles Act in 1988 which has only been moderately amended in the last three decades with almost complete disregard to road safety and rationalisation of penalties. A number of key contributing factors to road crashes have not been addressed as the purview of the act is limited to "motor vehicles" instead of road users in general. It has been seen that 37 percent collisions are by cars and 32 percent by two-wheelers. Around 20 percent of the victims are pedestrians who were hit along the sideways or walkways. This makes 52 percent as vulnerable road users from this study that is not protected under the

ambit of this Act. Surprisingly, India has no policies with road fatality reduction targets or rehabilitative care for the road collision victims.

A coordinated response and strategy is required to make the policies and laws more effective and binding. Quality checks and minimum safety standards should be made compulsory in all cars- as in India, low budget cars are manufactured nowadays to target the lower middle and middle income population which have no basic protection gears like airbags and anti-breaking system (ABS). Strict and regularised intervention from the central agency for road safety can prevent such random manufacturing of cars which literally is nothing other than 'coffin on wheels'. Asking state and UT governments to strictly implement lane-driving rules, the SC asked the governments to set up at least one trauma care centre in every district "since it is on record that treatment soon after a road collision is crucial for saving the life of a victim" (Times of India, Delhi, December 3, 2017).

The Sustainable Development Goals also include a target of 50 percent reduction in road traffic deaths and injuries by 2020, and India being a participant; also have to achieve the goal. They offered effective and sustainable responses to reduce death by promoting cycling which not only have health benefits, but also promotes pollution free environment and congestion free road, reducing traffic collisions. But, in the recent Health Policy of 2015, any such initiatives are simply absent.

Road collisions are the most important cause of disability in India (also in world). Yet, India's health policies negate the importance of rehabilitative care in case of road collision victims. It is important to identify collision 'hotspots' and make provision for working ambulances at these 'hotspots' so that emergency can be attended in time. The road environment and infrastructure must be adopted to the limitations of the road users (Mohan, 2008). Segregated lanes for two- wheelers and disable friendly pedestrian path can reduce the risks of vulnerable road users to some extent. Government should have provisions of covering both medical and non-medical costs of collision victims, especially for the disadvantaged population. Public awareness and at the same time compulsory value education courses in schools and colleges might also help in imparting some road safety awareness among the young generations. Health researches should also focus on studying such cases, in order to help policy making. India needs a comprehensive policy that should address such loss of lives, which can be avoided with targeted and transformative public health and road safety policies (both in rural and urban areas). However, mere formulation of policies will not help to solve the problem, the most challenging work lies in implementing and enforcing such policies with iron hand. After all, the enjoyment of the 'highest attainable standard of health is one of the fundamental rights of every human being'.

References

Dandona, R., Kumar, G. A., Ameer, M. A., Reddy, G. B., and Dandona, L., 2008, Under-reporting of road traffic injuries to the police: results from two data sources in urban India. *Injury Prevention*, 14(6): 360-365.

Goli, S., Zahid, S. et. al., 2018, Road Traffic Collisions and Injuries in India: High Spending on Hospitalised Treatment. *Economic and Political Weekly*, 53(14): 52-60.

Green, M. M., McFarlane, A. C., Hunter, C. E., and Griggs, W. M., 1993, Undiagnosed post-

traumatic stress disorder following motor vehicle collisions. *Medical journal of Australia*, 159(8): 529-534.

Habermas, J.,1962, English Translation 1989), The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society, Thomas Burger. Cambridge Massachusetts: The MIT Press Hauser, G (1998),*Vernacular Dialogue and the Rhetoricality of Public Opinion, Communication Monographs,* 65(2): 83-107.

http://www.healthdata.org/india downloaded on 10 September 2018

http://www.undp.org downloaded on 4 September 2018

Kanchan, T., Kulkarni, V., Bakkannavar, S. M., Kumar, N., and Unnikrishnan, B., 2012, "Analysis of fatal road traffic collisions in a coastal township of South India". *Journal of Forensic and Legal Medicine*, 19(8): 448-451.

Kumar, A. S., Chen, L. C., Choudhury, M., Ganju, S., Mahajan, V., Sinha, A., and Sen, A., 2011,Financing health care for all: challenges and opportunities. *The Lancet*, 377(9766): 668-679.

Kumar, G.A., Dilip, T.R., Dandona, L. and Dandona, R., 2012,Burden of out-of-pocket expenditure forroad traffic injuries in urban India.*BMC Health Services Research*, 12(1): 285.

Lozano, R., Naghavi, M., Foreman, K., Lim, S., Shibuya, K., Aboyans, V. and AlMazroa, M. A., 2013, Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *The Lancet*, 380(9859): 2095-2128.

Mohan, D., 2008, Road traffic injuries: a stocktaking. *Best Practice & Research: Clinical Rheumatology*, 22(4): 725-739.

Murray, C. J., and Lopez, A. D., 1997, Alternative projections of mortality and disability by cause 1990–2020: Global Burden of Disease Study. *The Lancet*, 349(9064): 1498-1504.

National Crime Records Bureau, 2016, *Collisional Deaths and Suicides in India. 2015*. New Delhi: Ministry of Home Affairs, Government of India.

Peden, M. M., McGee, K., and Krug, E. (Eds.), 2002, *Injury: a leading cause of the global burden of disease*, 2000. World Health Organization.

Schultz, T., 1999, Interactive options in online journalism: A content analysis of 100 US newspapers. *Journal of Computer-Mediated Communication*, 5(1): JCMC513.

Sharma, B. R., 2008, Road traffic injuries: a major global public health crisis. *Public health*, 122(12): 1399-1406.

World Health Organization, 2015, *Global status report on road safety 2015*. World Health Organization.