A Study on Road Traffic Accident Scenario of Bangladesh

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Abstract

Traffic accidents have been increasing rapidly in Bangladesh during last two decades causing a huge number of social and economic costs in terms of accidents, death, injury and property damages. In 1990, road accident as a cause of death and injuries were by no means insignificant lying in ninth place out of a total of over 100 separately identified cases (WHO) in low and middle-income countries like Bangladesh where highly dense population, with vehicle and urbanization growth. Accident rates and fatality based on the elements directly involved in an accident event are generally expressed as per unit registered motor vehicles, per unit population, per kilometer of roadway length and per unit vehicle kilometer travelled. Although accident and fatality rates based on vehicle kilometers travel but due to data limitation and other constraints accident or fatalities per unit registered motor vehicles are more commonly used worldwide as a tool of global comparison in different countries (4th Annual paper met and 1st Civil Engineering congress, December, 22-24, 2011, Dhaka, Bangladesh). The road accidents statistics and characteristics revealed that Bangladesh has one of the highest fatality rates, about 70 percent of road accident fatalities occurred in rural areas including rural sections of national highways. Almost 89 percent of fatalities are vulnerable road users such as pedestrians, bicyclist and motorcyclist. Pedestrian-vehicle conflicts are clearly the greatest problem with significant involvement of trucks and buses. This study interested to forecast the magnitude of road traffic accidents for the future so that decision makers can make appropriate decision for precaution. This study also provides an assessment of road traffic accidents in Bangladesh and its impacts based on data collected for the period of 1971 to 2017. This study has also tried to pick up the scenarios of road accidents to observe the tremendous situation. The study observed that the general trends of road traffic accident (RTA), deaths and injuries reveal that the number of RTA, deaths and injuries increased gradually. Although the number of RTA and deaths observed decreasing trend in recent years, the ratio of number of deaths to number of accident increased significantly.

Key word: Road Traffic Accident, Casualty, Accidents Severity, Vehicle, Driver, Pedestrian, Awareness, Policy, Agencies, Fatality, Injuries.

INTRODUCTION

The road factors are particularly prevalent in accidents and it is well known that the systematic Road Design and improvements of Road Safety Engineering can prevent many such accidents and save lives quickly and affordably. Bangladesh has one of the highest fatality rates in road accidents over 40 deaths per 10,000 registered motor vehicles (Jacobe et. al. 2000) Road traffic injuries alone cause a loss of about 2% to 3% of GDP. The traffic accident has been increasing rapidly in Bangladesh during last two decades, causing a vast amount of social and economic loss in terms of fatalities and properties damages. Road accident is a Global concern issue, accident rates and fatalities are alarming higher in developing countries like Bangladesh is losing about 1.5 percent of annual GDP due to road traffic accidents, and also many other developing countries. In Bangladesh average 8 persons killed every day 12000 lives and 35000 injuries annually (ARI). Economic cost is 2 to 3% percent of the country's GDP, an enormous loss in health-related cost (WHO, 2015) and is facing a very severe safety problems and the situation has been worsening with increasing number of road accident deaths, due to quick growth in motorization, uncoordinated urbanization, population and inadequate legal investment in road safety. The statistic reveled that Bangladesh has one of the highest fatalities rates internationally in road accidents, over 100 deaths per 10,000 motor vehicles. About 70% percent of road accident fatalities occurred in rural areas including rural section of national highways and the total reported accidents nearly 37 percent occurred on national highways.

Accident type reported hit pedestrian as the dominated accident type both in urban and rural areas, 45 percent involvement in fatal accidents, Other common accident type is: rear end collision- 16.5%, head on collision-13%, overtaking- 9.2%, and overturning- 9.3%. Heavy vehicles such as trucks and buses including minibuses are major contributors to road accidents (bus/minibus 33% & truck 27%) and in fatal accidents their shares are 35percent and 29 percent respectively. The incidents of overall child involvement in road accident fatalities in Bangladesh are found to be also very high, accounting for about 21 percent. Road traffic accidents are the

leading causes of deaths for 10-14 years old children. Up to 61 percent of urban road accident deaths are pedestrians alone. Pedestrians accounted for 49 percent of all reported fatalities in the accident database. Accidents occur more frequently at day time (6 am to 6 pm) and 75 percent in urban areas. Nearly 22 percent of all reported accident in Bangladesh in Dhaka Metropolitan City. About 2.5 percent of all reported accident occurred in bridges and culverts. The principal contributing factors to accidents are adverse roadway and roadside environment, poor design of junctions and sections, excessive speeding, overtaking, dangerous overtaking, reckless driving, careless of road users, failure to obey mandatory traffic regulations, variety of vehicle characteristics, defects in vehicles and conflicting use of roads. The surface road transport system has become a crucial component of modernity. There has been continued increase in the shares of passengers and frights carried by road transport. At present over 75% percent of passengers and nearly 70% percent of freights is carried by road transport (The Asian Age 7 January, 2018).

The accident rate has been predicted between the year 2000 and 2020, the number of road traffic death in high income countries will decrease by approximately 30% yet in low and middle income countries the number is expected to increase by over 80% percent (Kopiits, 2003; Peden 2004). Road traffic injuries are likely to become the third leading cause of a global burden of disease and injury (Peden 2004). Although Bangladesh is one of the lowest motorized countries in world, but the highest fatality rates in the world. The estimated number of road traffic accident fatalities per 10,000 on road motor vehicle for Bangladesh is very high by international slandered. Roads of Bangladesh are extremely crowded particularly in cities with bicycles, rickshaws, three-wheeler (CNGs), cars, Jeeps, covered vans, overloaded buses, mini-buses and heavy& mini-trucks all are playing on the road carriageways. Bangladesh has now more than 3 million registered motor vehicles and more than 5 million non-motorized vehicles. It is one of the fasted growing economics in the world, so, the vehicles demand is very high. At the current growth of the vehicles in the country it is expected to be double in the next ten years in terms of vehicle ownership.

OBJECTIVES OF THE STUDY

The objectives of the study are as follows:

1. To assess the road traffic accident scenario of Bangladesh.
2. To find out the accidents severity and type in different areas of Bangladesh.
3. To identify the accidents of pedestrian fatality in Bangladesh.

RESULTS AND DISCUSSION

Accident Characteristics in Bangladesh

According to the official statistic, there were at least 3472 accident, 4284 fatal, 9112 injuries in 2017, but it is estimated that the actual fatalities could be 10000-12000 and sometime beyond 12000 to 20000 (ARI, shotti-bolchi.com) in each year in Bangladesh. An accident incurs a huge loss for a person, a family, a society, a country physically, psychologically and financially. The actual condition of the roads in Bangladesh including National Highways is the worst one. The highways are broken mostly, it becomes dangerous on the rainy season, during heavy rainfall accident may occurs on the roads. The following are the striking problems for accident in Bangladesh as reveled from the accident research studies.

- **Pedestrians:** Pedestrians is the most vulnerable road user group. In Bangladesh around six type of registered motorized vehicle including motorcycle. The role of walk mode is quite significant. Up to 62% percent of urban road accident deaths are pedestrians alone and in Dhaka city they represented nearly 70% percent.
- **Predominant Accident Type:** Accident type analysis showed “hit pedestrian” as the dominant accident type both urban and rural areas, 45% percent involvement in fatal accidents. Other common accident types are rear end collision (16.5%), head on collision (13.2%) and overturning (9.3%). These four types of accident account for 85% percent of the fatal accident.
- **Nature of Accident Occurrence:** The distribution of accident occurrence on road network was characterized as “Clustering” at few sites, demonstrating that accidents are amenable to site specific. Treatments through wide spread implementation of cost-effective countermeasures low-cost road environmental improvements in particular.
- **Accident on National Highways:** Nearly 37% percentof the total reported accident occurred on national highways. Almost 30% percent of total accidents on national highways are occurring only in 4% percent of total kilometrage. Hazards associated with roads and roadsides were particularly predominant.
- **Over Involvement of Trucks and Buses:** Studies of road accident revealed that heavy vehicles such as Trucks and Buses including Minibuses are major contributors to road accidents. These groups of vehicles are particularly over involved in pedestrian, accident accounting for about 79% percent (Trucks 37%, Buses 20% and Minibuses 22%.

- **Involvement of Children in road Accident:** Countrywide road accidents statistics in Bangladesh revealed a serious threat to the children. The incidence of overall child involvement in road accident fatalities in Bangladesh is found to be very high accounting for about 22% percent. This involvement of children less than 15 years of age in road accident fatalities is much higher than those in other developing countries.
- **Accident in Dhaka Metropolitan City:** About 22% percent of all reported accident in Bangladesh occurred in Dhaka City. The large proportion of road accident concentrated on the main street network with main location identifier as "Black Spot" which are amenable to the specific treatments. Closely 52% percent of all accident occurred at only 9% percent (18 intersections) of the total 200 intersections where at least one accident occurred during 2001-2003 (ARI)
- **Scio-economic Burden of accident:** Bonding with social impact in terms of pain, grief and suffering, it is a serious economic burden. Overseas research has shown that countries loss the most economically active years from road accident victims and approximately 70% percent of year of life, lost due to accidents are 'working years', road accident affects the poor disproportionately.
- **Defective and Road Unworthy Motor Vehicles:** Existence of defective and road unworthy motor vehicles on road poses a threat to safety of the road traffic. The most common defects of vehicles in Bangladesh appear to be worn out tires. Loose wheels, overloaded axle, faulty brake and indicators lighting system etc. There is an urgent need to undertake immediate safety initiatives before the situation worsen with increasing motorization and high standard of roads.

Accident Severity Picture in Bangladesh

Bangladesh Police are the main source of accident data as they formally collect and records all the accidents within the country in the form of First Information Record (FIR). Accident and fatality data are collected from Police HQ, Dhaka for the year 1993 to 2017 and data for the year 1970 to 1992 are collected from Statistical Yearbooks of Bangladesh published by Bangladesh Bureau of Statistics (BBS). To calculate accident and fatality rates on the basis of registered motor vehicles and motor vehicles plying on road, relevant data have been collected from BRTA and Statistical Yearbooks of Bangladesh published by BBS. To calculate accident and fatality rates per unit population data have been collected from Statistical Yearbooks of Bangladesh. To calculate vehicle kilometers traveled, data have been collected from RHD vehicle operation survey 1999, 2000, 2002 and 2004 where annual kilometers driven by each mode of vehicles per vehicle are shown.

Table- 1: Accidents Severity Trends in Bangladesh from 1970-2017 (by Police Report)

Year	No. of accidents	No. of fatality	No of injuries Grievous + Simple Injury	Total no, of casualties
1970	2,066	265	551	816
1971	759	75	170	245
1972	1140	187	421	608
1973	1394	268	490	758
1974	1490	432	631	1063
1975	1404	356	769	1125
1976	1513	428	1006	1434
1977	2004	551	939	1490
1978	2683	665	1478	2143
1979	3022	744	1389	2133
1980	2856	791	1483	2274
1981	3222	928	1897	2825
1982	2782	1009	2172	3181
1983	3195	1116	3515	4631
1984	3787	1242	2587	3829
1985	3923	1463	2741	4204
1986	1568	1169	1651	2820
1987	1521	1156	1988	3144
1988	1890	1367	2083	3450
1989	2967	1867	3016	4883
1990	3276	1844	3687	4531
1991	3224	1982	2929	4911
1992	4012	2317	4509	6826
1993	3134	1487	2434	3921
1994	3013	1597	2686	4283
1995	3346	1653	2864	4517

1996	3730	2041	3300	5341
1997	5448	3162	5076	8238
1998	4769	3085	3997	7082
1999	4916	3314	3453	6767
2000	4357	3430	1911	5341
2001	4091	3109	3127	6236
2002	4918	3398	3772	7170
2003	4749	3289	3818	7107
2004	3917	2968	2752	5720
2005	3955	3187	2755	5942
2006	3794	3193	2409	5602
2007	4869	3749	3273	7022
2008	4427	3186	1002	4188
2009	3381	2482	706	3188
2010	2827	2203	512	2715
2011	2667	2084	511	2595
2012	2637	2062	473	2535
2013	2029	1957	1396	3353
2014	2027	2067	1535	3602
2015	2394	2376	1958	4334
2016	2992	3412	8572	11984
2017	3472	4284	9112	13396

Number of accidents and fatalities that are occurring each year gives idea about the safety situation. The above table and figure will demonstrate the road safety scenario in the history of the country. Police reported Trend of Road Accidents & Fatalities (1970-1981) from the above table shows that number of accidents and number of fatalities have been changing but within 3 three digits over that years. Again, we observed that from 1982 the accidents and number of fatalities have been increasing to 4 four digits up to 2017. Finally, we examined that in 2016 and 2017 the number of accidents not increasing accidents remarkably but the casualty the grievous and simple injuries increasing remarkable, it occurred due to speed of vehicles and changed of road surface, width, lane of the road has increased. Although in certain years the numbers are less than those of previous ones, the general trend indicates the increment in the number of accidents and fatalities. Number of accidents has increased from 1,140 in 1972 to 5448 in 1997, nearly 4.77 times in the history of the country. The highest number of accidents reported is 5,448 in the year 1997. Number of fatalities has increased from 187 in 1972 to 4284 in 2017, more than 22.90 times in the history of the country. The highest number of fatalities reported is 4284 and grievous and simple injuries 9112 in the year 2017. Significant fluctuations in the numbers reflect the problems of reporting inconsistencies. Calculating the increase rates of the number of accidents and fatalities corresponding to every previous year it is found that in some years, especially in last five years increase rates of fatalities are higher than accidents increase rates of corresponding years. Increase rates of accidents and fatalities are as high as 57.99% (1989) and 149.33% (1972). But after 1997 such high rates are not observed and they are well below 22.77%.

Table 2: The road Casualty accidents severity of the Division and metropolitan city wise in Bangladesh (Fatal Accidents, 4284 in 2017)

Division/ city	**Number of accidents 3472, fatal 4284 Grievous and Simple Injury 9112 in 2017**				**Population (000,000)**	**Accident rates**	
	Severity					**(No. per 10,000 populations)**	
	Fatal	**Grievous**	**Simple injury**	**Total Casualties**		**Fatal accident**	**Fatal + injury accidents**
Divisions, excluding Cities of Bangladesh							
Barisal	155	28	302	485	96.500	0.160	0.502
Chittagong	607	113	1177	1897	240.168	0.252	0.789
Dhaka	964	282	1876	3122	260.670	0.369	1.193
Khulna	265	44	430	739	128.797	0.205	0.573
Mymensingh	265	73	489	827	118.523	0.223	0.697
Rajshahi	574	116	1104	1794	148.561	0.386	1.207
Rangpur	258	68	481	807	172.153	0.149	0.468
Sylhet	311	68	593	972	128.212	0.242	0.758
Total	3399	792	6452	10643	1294.584	0.262	0.822
Cities, excluding Divisions of Bangladesh							
Chittagong	172	22	418	612	92.354	0.186	0.662
Dhaka	618	163	1083	1864	160.456	0.385	1.161
Khulna	46	12	68	126	44.100	0.104	0.285
Rajshahi	49	17	85	151	55.200	0.088	0.273
Total	885	214	1654	2753	352.108	0.251	0.781
Grand Total	4284	1006	8106	13396	1646.692	0.260	0.815

The accidents data & populations data collected from Bangladesh Police head quarter Dhaka, and statistical year book of Bangladesh 2012 and up date information's, of Populations (Property Damage are not included)

Table-3: The road Casualty accidents severity of the Division and Districts wise in Bangladesh (Fatal Accidents, 4284 in 2017)

Division/city	**Number of accidents 3472, fatal 4284, Grievous and Simple Injury 9112 in 2017**				**Population (000,000)**	**Accident rates**	
	Severity					**(No. per 10,000 populations)**	
	Fatal	**Grievous**	**Simple injury**	**Total casualties**		**Fatal accident**	**fatal+ grievous+ injury accidents**
Barisal Division							
Barguna	31	5	60	96	10.151	0.305	0.945
Barisal	34	9	67	110	26.688	0.127	0.412
Bhola	27	3	51	81	20.35	0.132	0.339
Jhalakati	19	1	39	59	7.734	0.245	0.762
Patuakhali	21	8	38	67	17.576	0.119	0.381
Pirozpur	23	2	47	72	14.029	0.163	0.513
Total	155	28	302	485	96.528	0.16	3.352
Chittagong Division							
Bandarban	13	5	26	44	4.4	0.295	1
Brahmanbaria	59	9	112	180	32.72	0.18	0.55
Chandpur	49	9	100	158	27.832	0.176	0.12
Chittagong District	161	34	317	512	87.915	0.183	0.582
Chittagong city	172	22	418	612	92.354	0.186	0.662
Comilla	109	15	213	337	66.694	0.158	0.917
Coxes-Bazar	19	2	38	59	26.464	0.071	1.273
Feni	59	10	109	178	16.62	0.354	1.07
Khagrachari	20	9	40	69	7.099	0.281	0.971
Lakshmipur	47	8	96	151	19.976	0.236	0.755
Noakhali	52	9	94	155	35.908	0.144	0.431
Rangamati	16	6	32	54	6.888	0.232	0.783
Total	779	135	1595	2509	332.522	0.234	0.754
Dhaka Division							
Dhaka District	169	49	346	564	139.078	0.121	0.405
Dhaka city	618	163	1083	1864	160.456	0.385	1.161
Faridpur	126	21	258	405	22.098	0.57	1.832
Gaziour	166	21	340	527	39.449	0.42	1.335
Gopalgong	34	10	70	114	13.563	0.25	0.84
Kishorganj	37	15	114	166	33.652	0.109	0.494
Madaripur	12	2	24	38	13.465	0.089	0.282
Manikgonj	41	10	82	133	16.076	0.255	0.827
Munshigonj	30	8	59	97	16.698	0.179	0.58
Narayangonj	114	16	221	351	34.152	0.333	1.027

Narsingdi	68	30	131	229	25.72	0.264	0.89
Rajbari	37	22	69	128	12.121	0.305	1.056
Shariatpur	12	3	22	37	13.354	0.089	0.277
Tangail	99	16	195	310	41.722	0.237	0.743
Total	1582	445	2959	4986	421.126	0.754	1.478
Khulna Division							
Bagerhat	16	8	27	51	16.233	0.098	0.385
Chuadanga	40	6	35	81	12.476	0.32	0.649
Jessore	28	8	51	87	30.464	0.091	0.285
Jhenaidah	64	10	123	197	19.509	0.328	1.009
Khulna	32	3	59	94	25.486	0.125	0.368
Khulna City	46	12	68	126	44.1	0.104	0.285
Kushtia	16	3	27	46	21.476	0.074	0.214
Magura	23	2	41	66	10.143	0.226	0.65
Meherpur	12	2	19	33	7.243	0.165	0.455
Narail	6	3	7	16	7.793	0.076	0.285
Satkhria	27	5	49	81	21.919	0.123	0.369
Total	265	56	490	865	172.897	0.309	0.858
Mymensingh Division							
Jamalpur	96	10	147	238	24.664	0.389	0.964
Mymensingh	173	36	263	442	55.017	0.314	0.803
Netrokona	34	13	57	99	24.02	0.141	0.414
Sherpur	12	14	22	48	14.821	0.08	0.323
Total	265	73	489	827	118.523	0.223	0.697
Rajshahi Division							
Bogra	125	22	243	390	37.441	0.333	0.649
Chapinawabganj	47	6	90	143	10.099	0.465	1.415
Joypurhat	22	7	41	70	28.619	0.076	0.244
Naogaon	62	9	121	192	18.842	0.329	1.019
Nature	63	15	123	201	18.298	0.344	1.098
Pabna	48	7	91	146	27.242	0.176	0.535
Raj Shahi District	62	14	120	196	28.586	0.216	0.685
Raj Shahi city	49	17	85	151	55.2	0.088	0.273
Sirajganj	142	36	275	453	34.13	0.416	0.805
Total	623	133	1189	1945	203.761	0.474	1.48
Rangpur Division							
Dinajpur	28	6	48	87	32.608	0.085	0.266
Gaibandha	43	7	75	134	25.697	0.167	0.521
Kurigram	12	6	22	37	22.375	0.053	0.165
Lalmonirhat	32	5	81	100	13.876	0.23	0.72
Nilphamari	19	7	35	61	19.92	0.095	0.306

Panchagarh	19	9	32	63	10.899	0.174	0.578
Rangpur	68	23	123	219	31.441	0.216	0.696
Thakurgaon	35	5	65	106	15.332	0.228	0.691
Total	258	68	481	807	172.153	0.149	0.468
Sylhet Division							
Hobiganj	98	9	186	293	22.375	0.437	0.831
Moulvibazar	53	12	101	166	20.881	0.253	0.794
Sunamganj	58	16	110	184	26.642	0.217	0.69
Sylhet	102	31	196	329	58.312	0.174	0.564
Total	311	68	593	972	128.212	0.242	0.758
Grand Total	4284	1006	8106	13396	1646.69	0.26	0.813

Table-4: Casualty Accident by Type of Collision (Fatal Accidents, 4284 in 2017)

Collision Type	**Number of Fatal Accidents**								
	Road Environment			**Road Class**					
	Urban Road	**Rural Road**	**Total**	**National Highway**	**Regional Highway**	**District Road**	**Rural Road**	**City Road**	**Total**
Head on	146	397	543	284	86	108	40	38	555
Rear end	181	213	394	185	48	57	17	96	403
Right end	3	6	9	3	3	2	2	2	12
Side Swipe	63	131	194	89	37	53	10	10	199
Overturn Vehicle	81	208	289	135	39	85	32	14	304
Hit object in road	15	29	44	22	5	6	5	7	45
Hit object off road	16	42	58	30	10	10	3	5	58
Hit parked vehicle	14	31	45	33	3	8	2	6	52
Hit pedestrian	921	1493	2414	1066	336	433	221	405	2461
Hit animal	2	6	8	5	3	2	2	2	14
Others	58	106	164	67	20	37	22	20	166
Unknown	40	82	122	3	3	3	3	3	15
Total	1537	2747	4284	1922	593	804	359	606	4284
% total	35.87	64.12	100	44.86	13.84	18.76	8.38	14.14	100

The Table 4 we find that (type of collision) 'hit pedestrian' is the highest number of accidents occurs and the percentage is 57.44%. 'Head on collision' is 555, the second highest accident occurs which is 13% of total. 'Rear end collision' is 403 (9.40%) and 'Over turn' vehicles is 304 (7.09%) all are the failure of drivers due to un-skills, less experienced or un-trained drivers. Pedestrian hit may sometime occur due to un-concious and wrong activity of the road users.

Table-5: Casualty Accident by Type of Junction (Fatal Accident, 4284 in 2017)

Collision Type	**Number of Accidents**								
	Road Environment			**Road Class**					
	Urban Road	**Rural Road**	**Total**	**National Highway**	**Regional Highway**	**District Road**	**Rural Road**	**City Road**	**Total**
Not at Junction	901	1653	2554	1249	300	483	155	399	2586
Cross Junction	93	72	165	70	15	24	16	50	175
Tee Junction	125	149	274	124	28	34	27	71	284
Off-set Tee Junction	25	32	57	22	18	10	3	5	58
Roundabout	8	5	13	8	2	2	2	2	16
Railway Crossing	2	3	5	2	2	2	2	2	10
Other	328	620	948	375	201	205	118	72	971
Unknown	126	142	268	121	15	11	9	28	184
Total	1608	2676	4284	1971	581	771	332	629	4284
% total	37.53	62.46	1005	46.00	13.56	18.00	0.08	14.68	100

Table-6: Road Accidents of Pedestrian Fatality by Age & Sex

Age(years)	**Number of Pedestrian Fatalities**		
	Male	**Female**	**Total**
0-5	74	44	118
6-10	150	76	226
11-15	105	20	125
16-20	83	20	103
21-25	100	29	129
26-30	153	18	171
31-35	107	28	135
36-40	145	20	165
41-45	96	28	124
46-50	79	37	116
51-55	66	18	84
56-60	92	37	129
61-65	66	18	84
66-70	53	11	64
71-75	18	12	30
> 75	25	8	33
Unknown	566	90	660
Total	1980	512	2492
%total	79.45%	20.5%	100%

Table 7: Number of Vehicles by type involved in Casualty Accidents by Road Environment and Road Class (Fatal Accidents 2017)

Vehicle Type	Vehicle per accident	**Total Number of Vehicles in Accident 2017**								
		Road Environment			**Road Class**					
		Urban Road	Rural Road	Total	National Highway	Regional Highway	District Highway	Rural Road	City Road	Total
Bicycle	**ONE**	2	12	14	6	0	6	0	2	14
Rickshaw		0	3	3	2	0	0	2	0	4
Push Car		0	3	3	0	3	0	0	0	3
Motor cycle		24	108	132	27	25	41	34	6	133
Baby taxi		28	21	49	16	3	13	3	18	53
Tempo		36	67	103	16	12	39	19	21	107
Microbus		28	71	99	55	16	16	7	10	104
Minibus		76	164	240	95	59	49	22	22	247
Bus		357	567	924	493	108	160	37	144	942
Sedan Car		30	25	55	28	3	6	2	16	55
Jeep		10	49	59	10	3	15	30	4	62
Pick-up		16	73	89	44	19	15	10	4	92
Truck		25	55	80	34	13	15	16	4	82
Heavy truck		241	312	553	251	81	101	25	104	562
Artic truck		6	2	8	3	0	0	0	5	8
Oil Tanker		0	9	9	4	3	2	0	0	9
Tractor		7	37	44	3	7	15	19	0	44
Animal draw		0	0	0	0	0	0	0.	0	0
Other		73	185	258	90	36	62	43	28	259
Unknown		191	237	428	208	67	44	30	21	370
Toal		1150	2000	3150	1382	458	599	299	409	3150
Bicycle	**TWO OR MORE**	43	90	133	41	25	47	5	16	134
Rickshaw		93	70	163	70	27	22	3	47	169
Push Car		5	16	21	10	2	6	0	3	21
Motor cycle		50	118	169	68	40	34	19	12	173
Baby taxi		16	61	77	34	6	18	10	10	78
Tempo		31	70	101	41	21	24	7	9	102
Microbus		25	46	71	39	12	9	7	10	77
Minibus		37	117	154	64	31	37	15	7	154
Bus		167	301	468	285	61	71	15	50	482
Sedan Car		22	18	40	22	4	3	0	13	42
Jeep		6	10	16	9	2	4	0	2	17
Pick-up		18	22	40	25	3	10	0	4	42
Truck		18	53	71	40	7	15	9	2	73
Heavy truck		151	258	409	245	65	59	10	40	419
Artic truck		0	6	6	4	2	0	0	0	6

Oil Tanker		3	9	12	7	0	3	0	2	12
Tractor		10	22	33	12	7	9	3	2	33
Animal draw		0	0	0	0	0	0	0	0	0
Other		39	113	152	67	28	39	12	7	154
Unknown		87	61	148	49	24	7	6	9	95
Other		821	1461	2283	1130	367	417	121	245	2283

Table-8: Total Number of Vehicles by type involved in Casualty Accidents By severity

Total number of vehicles	**Types of vehicles**	**Percentage**	**Severity of accidents**
1424	Bus	41.01%	1st High
981	Heavy truck	25%	2nd high
401	Minibus	11.55%	3rd high
306	Motor cycles	8.81%	4th
209	Tempo	6.01%	5th
181	Microbus	5.21%	6th
173	Rickshaw	4.98%	7th
155	Truck	4.46%	8th
148	Bicycle	4.26%	9th
134	Pick-up	3.85%	10th
131	Baby taxi	3.77%	11th
97	Sedan car	2.79%	12th
79	Jeep	2.27%	13th
77	Tractor	2.21%	14th
24	Push car	.0.69%	15th
21	Oil tanker	0.60%	16th
14	Artic truck	0.40%	17th
0	Animal draw	0.0%	----
413	Others	11.89%	----
576	Unknown	16.58%	----
5433	Total number of vehicles		

Road Traffic Accident Cost in Bangladesh

The Cost of Road Traffic Accidents in Bangladesh is high and the over burden & bad effect of national economy of the country. It appears that in most countries the overall cost of road accidents exceeds 1% of the GDP. The estimated cost of crashes ranges from 0.3% of the GDP in Vietnam to almost 5% in the US. Accident cost in the world about 517.8 billion dollars in a year and in Bangladesh it is about 0.0063 billion dollars (BDT 517.64 Crore). The Organization for Economic Co-operation and Development (OECD) later estimated the cost of road crashes for its member countries to be of 450 billion dollars, the equivalent of 2% of its GDP. As far as developing countries are concerned, the cost is estimated to be of 65 billion dollars, which would account for more than the total aid received from bilateral and multilateral sources. This is also preliminary aim to estimate road traffic accident costs and classify the costs with the accident severity and safety measures, into different items according to origin by using Human Capital or Gross Output Method preferred for developing countries by Transport Research Laboratory (TRL) of the United Kingdom. Costing includes costs incurred by the victim, the society, and the government in general. Measuring emotional damages translated to social costs puts values to non-monetary economy terms such as the pain, grief and suffering of the victim and the affected relatives. These are things not bought nor sold, otherwise known as non-market values. To provide some scopes for application of these data or the cost in policy making and decision-making process.

The importance of crash costing

At a country level, it is essential to estimate the cost of crashes for the overall economy. Such a study highlights the socio-economic burden of road crashes. In many countries, particularly in the developing world, road safety doesn't receive due consideration. Failing to assess the cost of traffic crashes prevents governments and civil society from realizing the importance of the economic drain that crashes provoke. Road crashes are considered to cost annually between 1% and 3% of the national GDP in developing countries. In terms of public policy, governments need to have a clear estimate of the cost of road safety in order to both justify the investment of tax-payer's money and to assess the efficiency of their policy. As far as the latter is concerned, thanks to an accurate estimate of the costs, governments can do cost-benefit analysis, which allows comparison of the profitability of such policy with any other government program; or cost-efficiency analysis, which allows comparison of different road safety programs.

Summary of Total Accident Cost Estimation Based on Reported Data

The results of all of the computations for accident cost components is collected and summarized in Table 9. It is noteworthy that a single accident may produce multiple casualties of different injury severities and multiple vehicle damages. Again, reminds the readers to take note that these are costs per accident and not per casualty basis.

Table-9: Distribution of cost components based on severity level

Cost Component	Accidents Type			
	Fatal RTA	**Grievous RTA**	**Simple RTA**	**PDO**
Medical cost	196270	192729	3600	--
Vehicle Damaged cost	296325	204104	119578	22827
Lost output cost	3729080	2124775	13528	11381
Pain, Grief & Sufferings	2219241	1254016	3922	--
Administration Cost	16850	13498	11944	12256
Funeral cost	9440	189	--	--
Total cost (BDT):	6467206	3789611	152572	46464

Problem of Accident Reporting:

Accident reporting is important for policy planning, development of traffic safety measures and interventions, monitoring and evaluation measure and feasibility of targets and to inform policy makers and society about this negative aspect of traffic and acceptance of measure to calculate social costs for benchmarking to make the right cost benefit calculation of measures and to give right properties to measures.

Table-10: Estimated UN reported RTA on the basis of reporting.

Type of accidents	Data Reported	% of Reporting	Estimation of 100% Accidents in 2017
Fatal RTA	2668	49	4284
Grievous RTA	610	19	1006
Simple RTA	127	7	8106
PDORTA	144	--	--
Total	**3549**	--	**13396**

Table-11: Annual National RTA Cost for year 2017

Type of accidents	Number of Accidents	Average cost per Accident (TK)	Total cost (BDT)
Fatal RTA	4284	6467206	35213936670
Grievous RTA	1006	3789611	12168440921
Simple RTA	8106	152572	276918180
PDO RTA	73297	46464	3405671808
Total RTA Cost for the year 2017			51764.967,579

CONCLUSIONS

This study has a great practical impacts and it reflects the road accident situations. It also reflects whether there are any seasonal variations of the road accident and forecasts the road traffic accidents for the future. The study discussed the trend of road accident and its causalities, accident rate, vehicle rate show a clear picture of

different infected district by road accident. We also elaborated the age of the affected people, type of accidents and different clash. The general trends of road traffic accident (RTA), deaths and injuries reveal that the number of RTA, deaths and injuries increased gradually with little fluctuations from 1971 to 2007 and after 2007 there is a slow decreasing trend. Although the number of RTA and deaths observed decreasing trend in recent years, the ratio of number of deaths to number of accident increased significantly. The rate of register vehicles per 10,000 people increased moderately throughout the period but a sharp increment is exhibited from 2009. It is discovered that the maximum number of injuries occurred between ages 21 and 30 while the maximum number of deaths occurred between ages 11 and 30. Most of the RTA and deaths due to RTA are caused by run over by vehicles and head to head collision. The severity of occurring road accident is higher during the month of May, June and September since the major religious festivals ("Eid-Ul-Fitre" and "Eid-Ul-Azha" are Muslims' main festivals and "Durgapuza" is the biggest festival of Hidu community) usually occurred in these months because of increasing movement.

It is not at all expected that road accidents will be totally removed from the country. The way to control road accident is in our hand as it is not a natural disaster. Ensuring about proper remedy must be considered by the policy makers before many more lives are taken away by this threat of road accidents. Road accident is such as case which does not occur by itself but operated by the careless drivers while driving aggressively. More strict and competent legislations should be introduced to bring the situation under control. An attempt has been made by the paper to highlight the cases of road accidents of Bangladesh. Influence on the number and severity of road accidents have been made by many varied factors and issues. Driving speeds along with human issues like driver's attitude, driving skill, use of roads by pedestrians are the main contributors in the road accidents. Some environmental factors like road condition, road side activities, weather condition etc have added distress in this research. Speed restriction can play significant role to reduce road crashes. The target to lower the rates of road accidents cannot be sustained without collective approach of all stakeholders working in road management. The Government along with common people shall also be concern about the traffic laws to make joint commitment on road safety.

RECOMMENDATIONS

The recommendations of the study are as follows: n the summary of the findings enumerated above on the number of road accidents, the number of cases will be reduced to the beeriest minimum by the government if the following recommendations are considered.

1. The government will have to increase efforts to promote awareness among stakeholders about the road safety issues and their social economic implications.

2. Many government organizations as well as various private agencies, share the responsibility of the various safety information data base. Detailed analysis of road accidents is essential if the causes of the accident are to be fully understood.

3. The government should modernize data recording system of road traffic accidents in detailed and accessibility of all data.

4. Vehicle's fitness, driver's license should be verify regularly. Traffic rules should be implemented strictly.

5. Existing roads should be widened and one-way movement should be introduced. Pavements and roads must be kept occupation free.

6. To conduct necessary and immediate survey in all over the country on the condition of national highways and adopt suitable measure to repair. More sincere function is necessary from the local authority and vehicle body inspector to block unworthy vehicles on road which are the major contributor of the road accidents.

7. To ensure signs, road marking and effective signal system for pedestrian safety together with pedestrian segregation, improved footpath facilities, improved road crossing facilities, speed controlling devices must be ensured by adequate and proper engineering mechanism.

8. To fix the speed limit on basis of design and pattern of the roads as speed is one of the major contributing factors of road crashes. So speed breakers and cautionary signs should be developed and ensured at location where concentration of pedestrians is necessary.
9. True and effective maintenance of both public and private vehicle should be ensured and inspired by the government. Having and maintaining good materials for vehicles should be monitored by strict government rules to confirm desired standard of vehicle.

10. To construct both national highways and intra-district road in a sustainable ways as this is beneficial for vehicles and road safety. Every vehicle of 10 years and more should be banned from driving on roads.

11. There shall be strong process of fitness certification method that shall cover suspension and tie-rod checks.

12. Stations and check posts should be formed on all national highways to control over loading of trucks and pick-ups. Along with this locally made vehicles should be re-examined for the purpose of safety. Better equipments must be provided to the highway police department and they must not act as a means of harassment and extortion.

13. Process of providing driving license must be computerized and free of corruption. Proper education and training system must be introduced to train up the drivers about ins and outs of all vehicles maintenance.

14. Time to time updating list of black spots and priority action plan must be adopted properly.

15. To evict all the pity shops, huts and tea-stalls from road side which are established unlawfully. Many of the areas and footpaths near road which are under the illegal possession must be recovered.

16. Time to time health testing system must be made compulsory for the drivers to refrain them from addition to drug. Before granting and renewing of license drivers must go through some pathological test to assure that they do not take narcotic substances.

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