Introduction:
Orthopaedic trauma is a major public health problem, globally contributing a large burden of disability and suffering. Around the world, almost 16,000 people die from injuries every day. Trauma is among the leading causes of death and disability in the world. WHO data indicates that road traffic accident, violence and self-inflicted injuries are the three leading causes of death among people aged 15 to 44 years in high & low income countries. They affect all populations, regardless of geographic region, sex or income. Pakistan is the seventh most populous country in the world, with a population of 164 million. The national injury survey in Pakistan has shown the yearly overall incidence of trauma to be 41 injuries for every 1000 persons. The survey identified road traffic injuries as one of the major causal factors for injury. Road traffic accidents have a yearly incidence of 15 injuries for every 1000 persons. Another major mechanism of injury in Pakistan is violence particularly after so called war against terrorism.

Karachi is the biggest city of the country. Current estimates of the population range from 12 to 18 million. The city’s population is estimated to be growing at about 5% per year (mainly as a result of internal rural-urban migration), including an estimated 45,000 migrant workers coming to the city every month from different parts of Pakistan. This has made Karachi a multi linguistic & multi ethnic huge city with inhabitants of different interest and political influence. As a result of this rather abrupt change there is an enormous increase in burden of trauma due to road traffic accident, industrial trauma and violence.
R reported 35,607 injuries due to road traffic accidents only, in the calendar year 2007. Though exact trauma burden of the city is not known, it is expected that toll of trauma victims due to violence, RTA, industrial accidents & others would be more than 50000 per year. With this amount of trauma burden, the city has only three tertiary care public sector hospitals. There is no integrated trauma system and specialized trauma centers in the city to cater this burden of trauma. This burden of musculoskeletal trauma reflects to orthopaedic services as well. This study was conducted in Orthopaedic Unit I of Civil Hospital Karachi to find out the burden of trauma & about the adequacy of services. Civil Hospital Karachi is a 1900-bed tertiary care public sector hospital and is arguably the largest teaching hospital of Pakistan, catering not only to all areas of the province of Sindh but also the neighboring province of Baluchistan as well.

Material and Methods:
This prospective descriptive study was conducted in Department of Orthopaedic Unit I Civil Hospital Karachi & Dow University of Health Sciences from January 2009 to January 2010. Civil Hospital Karachi is a 1900-bed tertiary care government hospital situated in south of Karachi. For the purpose of the study, trauma was defined as “Any Physical Injury requiring medical care (Excluding burn trauma)”. Out of 3085 cases of trauma victims seen during the study period, 1165 needed admission for further treatment while 1920 were treated at the spot & did not require admission. Inclusion criteria were injured patients of any age or sex presenting to the Accident, Emergency & Out Patient department. The patients who were brought dead due to trauma or died during resuscitation were excluded; trauma patients sustaining injury to head & neck or thoracoabdominal solely were as well excluded from the study. A pretested trauma registry form was completed for all patients. If the patient was brought unconscious, an attempt was made to collect the information from the patient’s attendant. Basic demographic characteristics, time and date, nature and cause of injury, vital signs and outcome data were recorded. Type of vehicle and mode of collision was recorded in cases of road traffic accident. Thorough clinical examination and necessary investigations were done. The data collected was analyzed using SPSS version 16 to compile the descriptive and analytical statistics. The ethical committee of Dow University of Health Sciences had approved the study protocol.

Results:
Out of 3085 cases of trauma patients seen during the study period, 1165 needed admission for further treatment while 1920 were treated at the spot & did not require admission. Of the 3085 injury patients, 73% were males. Their mean age was 29.2 years, range 0.2–89. Majority of subjects were between 14 to 58 years (67%) as shown in Table 1. Maximum number of cases was road traffic accidents (61.6%) followed by assault (16.5%), fall (13.4%), industrial/machine (5.2%) & others (3.3%) as shown in Table 2. Out of total 1580 admissions in a year in Orthopaedic Unit I, annual incidence of trauma was 73.7% (1165 cases); while 415 patients were admitted for other orthopaedic diseases (26.3%). Average stay time in ward was 21 days. Average waiting time from admission to surgery was 6 days. In road traffic accident victims (1900), most of the injuries were sustained to motor bike riders 1419 (74.7%) followed by public transport passengers 300 (15.8%), pedestrians 120 (6.3) private vehicles drivers 61 (3.2). 69% had only limb injuries while 31% had associated head, pelvis/spine & thoraco-abdominal injuries Table 3. Lower extremity was most commonly involved in motor bike accidents followed by upper extremity. The proportion of injuries in thorax, abdomen was lesser as compared to injuries on head.

Gun shot was the commonest mode of injury in violence victims.

The pattern of injuries among the study subjects is shown in Table 4. The most common pattern of injury was fracture of shaft of lower limb bones followed by fractures of upper limb. Dislocation and soft tissue injuries were the least common pattern of injury among all the age groups. Open fractures were mostly in tibia and were in motor bike riders.
Table 1: Distribution of age and sex of study subjects according to mode of Injury

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Road Traffic Accident</th>
<th>Violence</th>
<th>Fall</th>
<th>Industrial/Machines</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (in years)</td>
<td>N=1900 n (61.6%)</td>
<td>N=509 n (16.5%)</td>
<td>N=414 n (13.4%)</td>
<td>N=160 n (5.2%)</td>
<td>N=102 n (3.3%)</td>
<td>N=3085 n (%)</td>
</tr>
<tr>
<td>14-58</td>
<td>1332</td>
<td>431</td>
<td>167</td>
<td>98</td>
<td>42</td>
<td>2070 (67%)</td>
</tr>
<tr>
<td>&gt;58</td>
<td>359</td>
<td>73</td>
<td>173</td>
<td>47</td>
<td>47</td>
<td>699 (22.6%)</td>
</tr>
<tr>
<td>&lt;14</td>
<td>209</td>
<td>5</td>
<td>74</td>
<td>15</td>
<td>13</td>
<td>316 (10.4%)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1258</td>
<td>502</td>
<td>270</td>
<td>155</td>
<td>67</td>
<td>2252 (73%)</td>
</tr>
<tr>
<td>Female</td>
<td>642</td>
<td>7</td>
<td>144</td>
<td>5</td>
<td>35</td>
<td>833 (27%)</td>
</tr>
</tbody>
</table>

Table 2: Distribution according to cause of injury (n=350)

<table>
<thead>
<tr>
<th>Cause</th>
<th>No.</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road traffic Accident</td>
<td>1900</td>
<td>61.6</td>
</tr>
<tr>
<td>Violence</td>
<td>509</td>
<td>16.5</td>
</tr>
<tr>
<td>Fall</td>
<td>414</td>
<td>13.4</td>
</tr>
<tr>
<td>Industrial/machine</td>
<td>160</td>
<td>5.2</td>
</tr>
<tr>
<td>Others</td>
<td>102</td>
<td>3.3</td>
</tr>
<tr>
<td>Total</td>
<td>3085</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 3: Body regions injured

<table>
<thead>
<tr>
<th>Body Region</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limbs</td>
<td>2128</td>
<td>69</td>
</tr>
<tr>
<td>Head</td>
<td>617</td>
<td>20</td>
</tr>
<tr>
<td>Pelvis/Spine</td>
<td>216</td>
<td>7</td>
</tr>
<tr>
<td>Thoracoabdominal</td>
<td>124</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>3085</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4: Pattern of limb injury among the study subjects (Trauma victims)

<table>
<thead>
<tr>
<th>Injury</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proximal femur</td>
<td>169</td>
<td>5.5</td>
</tr>
<tr>
<td>Shaft of femur</td>
<td>480</td>
<td>15.5</td>
</tr>
<tr>
<td>Shaft of tibia</td>
<td>704</td>
<td>22.8</td>
</tr>
<tr>
<td>Dislocation hip</td>
<td>25</td>
<td>0.8</td>
</tr>
<tr>
<td>Knee region</td>
<td>246</td>
<td>8.0</td>
</tr>
<tr>
<td>Ankle</td>
<td>216</td>
<td>7.0</td>
</tr>
<tr>
<td>Foot</td>
<td>105</td>
<td>3.4</td>
</tr>
<tr>
<td>Dislocation of shoulder</td>
<td>66</td>
<td>2.1</td>
</tr>
<tr>
<td>Shaft of humerus</td>
<td>134</td>
<td>4.3</td>
</tr>
<tr>
<td>Elbow region</td>
<td>268</td>
<td>8.7</td>
</tr>
<tr>
<td>Radius Ulna</td>
<td>575</td>
<td>18.7</td>
</tr>
<tr>
<td>Hand</td>
<td>97</td>
<td>3.1</td>
</tr>
<tr>
<td>Total</td>
<td>3085</td>
<td>100</td>
</tr>
</tbody>
</table>

Discussion:

Trauma is increasingly recognized as a global public health epidemic. WHO has predicted that trauma will rise from 9th leading burden of disease in 1990 to third leading cause in 2020 worldwide. In present study we found that annual incidence of trauma was 73.7% of total admissions in Ortho Unit I; while 415 patients were admitted for other orthopaedic diseases (26.3%). Most of the injuries were seen in 14-58 year age group. Similar findings were observed in other studies. Most of the trauma victims were male (73%), the male to female ratio being 2.7:1. Male predominance was observed by other authors as well. The obvious reason could be males being the earning members of the family in our society are subjected to more exposure to outside environment as compared to females who usually remain within house most of the time. Most common cause of orthopaedic trauma was road traffic accident (61.6%) followed by assault and fall. Preponderance of RTA as cause of trauma was shown in other studies followed by assault or fall depending upon socioeconomic condition. Type of vehicle involved in accident depends upon mode of transport in a particular community. In our study motor bike was the most common vehicle involved, followed by the public transport. Continuous growth in population, increase in number of motor vehicles with reckless driving & law breaking attitude are the obvious causes of increasing road traffic accidents. As motor bikes being the leading cause of injuries resulting in loss of lives and disabilities in younger age group, measures should be taken to prevent this. The law should be strictly enforced & simulta-
neously separate corridor for motorcyclist could reduce the incidence of injuries.

Gun shot injuries were leading cause among victims of violence in our study, matching with other studies from Pakistan\textsuperscript{[19,20]}. Younger males were in high risk group as shown in other studies\textsuperscript{[21,22]}. The lower limb, and pelvis were the primary areas of body where most of injuries occurred. Our findings differ from other studies where head and chest were affected\textsuperscript{[21,23]} . This could be due to the reason as victims with head injury are most likely to die before getting to the hospital & we excluded trauma victims brought dead or who died during resuscitation. Other reason of gun shot below the waist could be the robber’s purpose to injure the victims rather than to kill.

There were 43 mortalities in one year and all were due to associated injuries which were initially cleared by the concerning specialties or managed and referred earlier to orthopaedic ward. This indicates the need of trauma centers in tertiary care public hospitals where a continued and more vigilant care can be provided as a team.

Present study shows enormous burden of orthopaedic trauma, 73.7\% of total admissions. And the alarming concern is average 6 days waiting time for these injured patients to get definitive surgical treatment. The reason being there is no trauma list available or emergency operating facility in orthopaedics & only ten operative lists per month are not sufficient to deal the workload. This much delay in fracture fixation and open injuries definitely affects the clinical outcome adversely. The other concern is long waiting time (weeks – months) for other non traumatic orthopaedic disease.

The reason is obvious, it is unfortunate to note that for last fifty years there are only two orthopaedic wards while the population has grown from estimated two million to eighteen millions. The similar scenario is present in the other major public sector hospital (Jinnah Post Graduate Medical Centre). Added to this is an increase in wave of violence in the last twenty years.

This burden of orthopaedic trauma will increase as the population, migration continues to this mega city, making the situation grievous.

These alarming facts & the current scenario demands taking urgent steps, to improve the facilities for catering this burden and to deliver effective and quality care management to the unfortunate victims of trauma. The observation of this study can be used as a pilot study that can be applied to the national increase in morbidity, mortality and subsequent disability caused by orthopaedic trauma especially in similar resource constrained settings.

**Conclusion:**
Injuries in city of Karachi are an important public health problem and contribute to major bulk of Orthopaedic facilities. This enormous burden of orthopaedic trauma must be met with a more organized and efficient system to improve the quality of care. Following recommendations are made for this :

1. Two more orthopaedic wards should be added to present facilities.
2. Daily trauma list should be provided in addition to emergency operating facilities.
3. Establishing trauma centre.

**References:**


17. SK Lahiri, P Mandal, P Mandi, SP Mitra & T Chatterjee. A study on cases contracting road traffic accidents in rural area and attending the tarakeswar rural hospital, west bengal. Indian journal of preventive & social medicine, 2005. 36 (3&4), 94-101.


