5. Methodology
2.1 Objectives:

1- To assess the burden of unintentional injuries in Pune city.
2- To determine the pattern of unintentional injuries amongst different socio-demographic strata in Pune city.
3- To identify risk factors associated with unintentional injuries in Pune city.

2.1.1 Specific Objectives:

1.1 - To measure the incidence of unintentional injuries in Pune city.
1.2- To determine the burden of unintentional injuries upon private and public medical services in terms of utilization.
1.3- To assess the burden of unintentional injuries on families in terms of absenteeism from school or employment or any productive activity and the direct cost of treatment.

2.1- To measure the distribution of the direct mechanism leading to injuries.
2.2- To measure the magnitude and type specific distribution of unintentional injuries among different demographic and socioeconomic strata.

3.1- To assess the demographic and socioeconomic risk factors for incidence of unintentional injuries.

2.2 Research methods

2.2.1 Study design

The study was population-based, cross sectional with a reference period of one month and one year for unintentional injuries which met the inclusion criteria, and five years for death due to injuries.
2.2.2 Research setting

The city of Pune was selected as the locale of the study because of convenience to the researcher. Pune is located in the state of Maharashtra off the Western coast of India. It is the eighth largest city in India. It is a major industrial center showing rapid growth and is known as the “automobile city,” because it contains several different automobile manufacturers. The population of Pune according to the Census 2001 was 2,538,473 and it was estimated to be 3,006,036 in 2005.

2.2.3 Sample size

The sample size required to calculate incidence rate was derived from the formula:

\[ n = \frac{4(r)(1-r)(f)(1.1)}{(e^2)(n_h)} \]

where

- \( n \) = the required sample size,
- \( 4 \) = a factor to achieve 95% level of confidence (i.e. a reflection of the degree of certainty of obtaining the same results if the survey were to be repeated)
- \( r \) = the anticipated prevalence of the outcome being measured. Incidence rate was selected as 0.05 from the finding of a pilot study done prior to this study.
- \( 1.1 \) = a factor necessary to raise the sample size by 10% to allow for non responses
- \( f \) = the design effect considered as 2
- \( e \) = the margin of error to be tolerated considered as 0.01
- \( n_h \) = the average household size considered as 5

Using this method a sample of 836 households was required to calculate the incidence rate. The study included identification of risk factors and measuring risk of variables involved in occurrence of unintentional injuries. Data from the pilot study showed that the prevalence of injuries was 0.05. Based on this data, the sample size required to measure the risk factors for unintentional injuries (measuring minimum cases required for comparing proportions) the following formula was used:

\[ n \geq (Z_a + Z_b)^2 \times \frac{2 \times p \times (1-p)}{D^2} = (1.96 + 0.84)^2 \times 2 \times 0.075 \times 0.925 / 0.0025 = 435 \text{ cases} \]
Where:

D is the smallest difference of interest considered as 0.05
Za and Zb are centile of the standard normal distribution considering type I error as 0.05% and type II error as 0.20%.
p= average of the two proportion expected if the hypothesis is false

Thus 435 injury cases were required. Pilot study showed that the incidence rate was 0.05, therefore in order to have 435 cases a sample of 8700 individuals was required (according to the following calculation).

\[
\frac{(435 \times 100)}{5} = 8700 \text{ individuals}
\]

2.2.4 Sampling method

In the absence of any accurate lists of households, a modification of compact segment sampling method was selected to obtain a representative sample of Pune city population. \(^{(110)}\) Stages used in the sampling were as follows:

**Stage 1:** Pune Municipal Corporation has divided Pune city into 14 administrative wards and each ward has been further subdivided into a number of electoral wards (each electoral ward represent 15000 to 17000 population) (Appendix A). Intra segmental heterogeneity in socioeconomic and ecological situation of administrative wards represents different socioeconomic structure of Pune residents. Primary sampling units \(^{(111)}\) were identified by selecting one electoral ward from each of the 14 administrative wards (Appendix B).

**Stage 2:** To identify the second-stage units \(^{(111)}\) each electoral ward map (representing 15000-17000 population or approximately 3000 households) was divided into 4 equal segments. Among these 4 segments, the ones located on the north-east of the map were selected as the sampling segment. Boundaries of the segment were defined using a street map of the area (Appendix B).

**Stage 3:** To select 150 households in each sampling segment, a micro-census of all the households in that segment was conducted, whilst simultaneously performing a systematic random selection with the interval of five. \(^{(111)}\)
Diagram: Sampling procedure

Pune city
3006036 populations
14 administrative wards
144 electoral wards

Simple R S

14 Electoral ward from
14 administrative ward
15000-17000
population of each
electoral ward

25% (one forth) of total
geographical area from
North East part of each
electoral ward map was
selected

Systematic R S
Interval 5

750 individuals
150 households

3750 individuals
750 households

In two of the electoral wards, namely, Chatushringi Mandir and Vishrantwadi, the area covered to interview 150 households exceeded one fourth of the total geographic area due to the existence of unpopulated areas. In two other electoral wards, namely, Happy Colony and Shahu College, less than one fourth of the area was covered to interview 150 households due to high density of households.

2.2.5 Household inclusion criteria:

- All households having permanent residence in Pune city including pavement dwellers (i.e. households resident in temporary or no structures within the survey area)

2.2.6 Household exclusion criteria:

- Households/individuals temporarily visiting Pune i.e. with permanent residence elsewhere.
- Institutional households (such as hostels, old age homes, police or military residential quarters, Census 2001).
Methodology

Households residing in Pune but their head or the spouse available as respondent, was not able to communicate with English, Hindi or Marathi languages.

2.2.7 Data collection instruments:

A semi structured general questionnaire (Questionnaire A, appendix C) was used to elicit socioeconomic and demographic information, information related to vehicular risk factors like mode of transport or helmet use and information regarding occurrence of any type of unintentional injuries (as listed below) in the last one month, and in the last one year and any cases of death in last five years due to unintentional injuries. In case of report of any type of injury, seven type-specific questionnaires (Questionnaire B to H, appendix C) were used to elicit information related to general aspects of each injury (like time, date, nature, site, place, activity, type of medical care used, health outcome of injury, duration of treatment, associated factors leading to the injury, expenditure, productive work lost due to injury) in addition to type-specific information for each type of injury. In case of report of death there was a specific questionnaire (Questionnaire X, appendix C) to get a brief history of cause and demographic information of deceased persons.

The unintentional injuries included in the scope of the study were.

- Road traffic injuries
- Poisoning
- Burns
- Fall related injuries
- Suffocation
- Animal related injuries
- Other injuries which were not included in any of the above mechanism (like piercing, mechanical force, electrocution)

Occupational injury, sports related injury and home injury information were subsequently extracted from the above mentioned type of injuries. The information related to these three types of injuries, namely, occupational injuries, home injuries
and sports related injuries were analyzed separately as explained in the section (3.5). The pattern of suffocation was not included in analysis due to less number of cases (two cases).

The question regarding disability, visual impairment, regular alcohol use and drug abuse of any of members of households were not included in the study at the beginning because of sensitivity of these issues, but later on, due to the importance of these risk factors, it was decided that these questions be added to the questionnaire. Therefore, the information regarding these factors is available for 7,350 individuals.

The suffocation cases were excluded from the analyses related to the pattern because of very few numbers of the cases (two cases).

The questionnaires were also designed to elicit information as:

- Socio-economic data
- Demographic data
- Behavioral data
- Data for categorization of injuries
- Outcome
- Cost

### 2.2.8 Data collection

All the questionnaires were translated to Hindi and Marathi and were used according to the language of convenience of the interviewee. Data was collected by trained interviewers by interviewing the head of the household or the spouse of the head of the household. The respondent was asked whether any household member had sustained any injury in the last one month. The respondent was then asked whether any household member had sustained any major injury in the last one year or not. Each injury victim was interviewed individually. If the injured was not at home or was a child (0-14 years old), the head of the household or a household member who knew about the injury was interviewed as a proxy respondent. A brief case report and description of the event resulting in mortality was collected from the respondent.
Methodology

(Appendix D). The researcher was present at all the interviews in order to ensure the maximum accuracy of data.

2.2.9 Non-response
There were a total of 61 households amongst 2100 households, who refused to participate in the interview, giving a non-response rate of 0.03. As the non-response rate was low, the test of homogeneity for non response was not performed.

2.3 Duration of the study and timeline of activities

The total duration of the study was 30 months. The detailed work plan was as follows:

1. Designing the study instruments, pre-pilot study (5 Months)

2. Pilot study, evaluation and modifications (4 months)
   The questionnaire was administered to 200 households randomly selected from 10 electoral wards in Pune city. Appropriate modifications of the study instrument were incorporated.

3. Drawing of sample (3 months)
   Sampling method explained above was used to draw a sample of 2100 households.

4. Data collection (12 Months)
   Data collection from general population using the pilot tested questionnaires.

5. Data analysis and report preparation (6 months)

The information from each household in the sample was obtained during one year from the period March 2007 to April 2008. In each month equal proportion of households were interviewed. This method allowed the researcher to address the seasonal variations in injury occurrence.
2.4 Definitions

Summary of classifications and definitions used in this study

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition/classification/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury</td>
<td>A bodily lesion at the organic level, resulting from acute exposure to energy (mechanical, thermal, electrical, chemical or radiant) in amounts that exceed the threshold of physiological tolerance. In some cases (e.g. drowning, strangulation), the injury results from an insufficiency of a vital element&quot; (112)</td>
</tr>
<tr>
<td>Unintentional injury</td>
<td>Injuries in which there is no human purpose in the injury event (112)</td>
</tr>
<tr>
<td>Unintentional injury event</td>
<td>An unforeseen incident, where there was no intent by a person to cause harm, injury or death, but which resulted in injury. (112)</td>
</tr>
<tr>
<td>Operational definition of injury for this study</td>
<td>An injury was included in the study when it was serious enough to meet any of the following conditions: Need for any kind of medical care Need to stay in bed for at least one day Need to stop regular work or activity for at least one day after injury. Injuries were considered as negligible when the person did not require any kind of medical care (including home remedy) or change in the daily activity.</td>
</tr>
<tr>
<td>Severity of injury</td>
<td>Injuries were classified into mild, moderate, moderate to severe and severe according to the required medical services. Mild injuries were those injuries which did not require any medical services but involved disruption of routine activities Moderate injuries were those that required medical services but admission in hospital was not required Moderate to severe injuries were those injuries that required hospital admission but admission to intensive care unit or surgery was not required Severe injuries were those injuries for which the injured was admitted to a hospital and required intensive care or surgery</td>
</tr>
<tr>
<td>Injury control</td>
<td>Efforts to prevent agents from reaching people in amounts or at rates that exceed human tolerance as well as measures to</td>
</tr>
</tbody>
</table>
### Methodology

Prevent or minimize complications or disability resulting from injury. *(112)*

#### Mechanism of unintentional injury

Describes the way in which the injury was sustained, i.e. how the person was hurt. *(112)* Includes road traffic injuries, falls, animal related injuries, poisoning, burns, suffocation and others (i.e., injuries were not classified under any of the above groups as described in the section 3.2).

#### Road traffic injury

All injuries involving at least one moving vehicle of any kind, resulting in collision of one vehicle, or non collision like slipping of the bike or falling from a moving vehicle, but excludes injuries due to falling from a non-moving vehicle.

#### Fall

An event resulting from drop by force of gravity and not attributable to sustaining a violent blow, loss of consciousness, stroke or epileptic seizure. This includes falling on same level, falling from a height, falling on stairs, etc. Falls from animals, burning buildings and transport moving vehicles, and falls into fire, water and machinery are excluded. *(112)*

#### Burn

A thermal injury destroying some or all of the layers of cells forming skin. These can be caused by hot liquids (scalds), hot solids (contact burns), chemicals (chemical burns), or flames (flame burns). It also includes other fire related injury like smoke inhalation, etc. *(94)*

#### Animal related injury

Any type of injury directly induced by an animal including animal bite, falling from an animal, being injured by an attacking animal etc, excluding those injuries for which the animal was indirectly responsible for the injury event like a stray dog in the road, which is indirectly responsible for road traffic injury.

#### Suffocation

A case of unintentional injury due to restriction of breathing, a lack of oxygen and a surplus of carbon dioxide in the body tissues (asphyxia), and being in a place or position resulting in a decreased capacity for breathing (entrapment). This definition also includes drowning and near drowning.

#### Poisoning

A case of unintentional injury due to ingestion, injection, inhalation, absorption or contact with a substance that produces a toxic effect or bodily harm.

#### Mechanical force

A force that concerns machines, i.e. actions performed with or worked by machinery.
Methodology

Concussion A change in mental status caused by trauma (shock). It is accompanied by confusion, loss of memory, and, sometimes, loss of consciousness. (113)

Occupational injury Any incident taking place during the performance of professional and paid activity and resulting in injury. (112)

A work-related injury was an injury that occurred at a work place. (94) An occupational injury was defined as an injury which occurred due to occupational activity.

Sports related injury An unintentional injury event during sports activity

Home injury An injury occurring at home and/or residence related premises such as a flat, a house, a driveway, a garage, an out-house, a garden, yard, and garden walks and ponds (94).

Multiple injury Injuries considered as multiple when more than one site of body was injured in the injury event.

Mode of transport The means by which the injured person was travelling from one place to another. (112)

Pedestrian Any person travelling from one place to another involved in a transport injury event who was not at the time of the event riding in or on a motor vehicle, pedal cycle, railway train, streetcar, animal, animal-drawn or other vehicle, watercraft, or aircraft. (112)

Two-wheeled vehicle A motorized transport device with two wheels, one or two riding saddles and sometimes with a third wheel for the support of a sidecar. (112) Motorized two-wheeled vehicles include motor cycles, scooters and mopeds.

Three-wheeled vehicle A motorized tricycle designed primarily for on-road use. This includes motor-driven tricycle, motorized rickshaw, three-wheeled motor car (112) Auto-rickshaws are the cheap and common mode of transportation in Pune city

Heavy transport vehicle A motor vehicle designed primarily for carrying property, meeting local criteria for classification as a heavy goods vehicle in terms of curbside weight (usually above 3500 kg), and requiring a special driver’s license. (112)

Role of the injured Data element describes how the injured person was involved
Methodology

person in transport

with the specified mode of transport at the time of the injury event. (112)

Traveling

To go from one place to another by any means of transport or as a pedestrian. (112)

Leisure or play activity

Hobby and other activities undertaken mainly for pleasure and relaxation. May be passive (watching TV) or active (dancing at a party), undertaken alone (reading) or with other people (children playing 'hide and seek'), commercial (attending a 'fun park') or not (family picnic at a public park) and formally organized (day-trip) or not (a child 'just playing'). (112)

Unpaid work

Activity for which no money is received but for which a paid worker could be hired. This includes work for payment-in-kind, or other non-monetary form of remuneration and excludes paid work (112)

Paid work

Activity for which a person is paid, or expects to be paid, a salary, commission or other monetary income. (112)

Vital activity

Basic activities necessary for life, for example, sleeping, eating and getting dressed. (112)

Sports and exercise

Physical activity with a described functional purpose for example competition, practicing for competition, improving physical health. This includes practice and training activities, as well as pre-event (eg. taping, dressing), warm-up, competition, cool-down and post-event (eg. showering, dressing). Travel to and from the event or activity is not included. (112)

Place of occurrence

Data element that describes where the injured person was when the injury event started. (112)

Playground

Area equipped with facilities and devices for recreation by children (112)

Sports and athletic place

Location designed primarily for, and being used at the time primarily for, sports and exercise or athletics, including buildings and adjacent grounds (112)

Commercial area

Location being used at the time primarily for business-related activities that are non-industrial, non-recreational, non-cultural and not public, including buildings and adjacent grounds. (112)

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### Methodology

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction area</td>
<td>Location being used at the time primarily for building or demolition, including buildings and adjacent grounds.</td>
</tr>
<tr>
<td>Inside/outside city limits</td>
<td>A place that describes the specific location—whether inside or outside city limits—where the injured person was when the injury event started.</td>
</tr>
<tr>
<td>Hospitalization</td>
<td>Hospitalization was defined as being admitted in a hospital as inpatient for minimum duration of 24 hours.</td>
</tr>
<tr>
<td>Public Hospital</td>
<td>Government hospital where medical cost is minimal or free</td>
</tr>
<tr>
<td>Private Hospital</td>
<td>Hospitals run by the private sector where medical costs have to be paid by patients or insurance</td>
</tr>
<tr>
<td>Private clinics</td>
<td>Clinic run by a medical practitioner</td>
</tr>
<tr>
<td>Occupation</td>
<td>Describes the type of paid work the injured person was engaged in when the injury event took place.</td>
</tr>
<tr>
<td>Education</td>
<td>Activities that form part of a formal course or program of instruction provided by a school, college, university, adult education institution, etc.</td>
</tr>
<tr>
<td></td>
<td>Education was classified as:</td>
</tr>
<tr>
<td></td>
<td>Professional/postgraduate and above: Level of education when the person has academic education after graduate level. It can be professional or non professional</td>
</tr>
<tr>
<td></td>
<td>Graduate: Completion of graduation level which is three or four years after completion of higher secondary degree.</td>
</tr>
<tr>
<td></td>
<td>Higher secondary/ diploma: completion of 12 years of formal education</td>
</tr>
<tr>
<td></td>
<td>Secondary: Completion of 10 years of formal education</td>
</tr>
<tr>
<td></td>
<td>Primary: completion of 5 years of formal education</td>
</tr>
<tr>
<td></td>
<td>Illiterate: No education, the person is not able to read and write</td>
</tr>
<tr>
<td>Household</td>
<td>A household is defined as a group of persons who normally live together and take their meals from a common kitchen unless the exigencies of work prevent any of them from doing so. Persons in a household may be related or unrelated or a mix of both. However, if a group of unrelated persons live in a</td>
</tr>
</tbody>
</table>
Methodology

house but do not take their meals from the common kitchen, then they are not constituent of a common household. (114)

Institutional household

A group of unrelated persons who live in an institution and take their meals from a common kitchen, for example, boarding houses, messes, hostels, hotels, rescue homes, jails, ashrams, orphanages, etc. (114)

Slum

Areas where buildings are in any respect unfit for human habitation, are by reason of dilapidation, overcrowding, faulty arrangement and design of such buildings, narrowness or faulty arrangement of streets, lacking ventilation, light, sanitation facilities or any combination of these factors which are detrimental to safety, health and morals. (114)

Temporary house

Temporary houses are houses in which both walls and roof are made of materials, which have to be replaced frequently. Walls may be made from any one of the following temporary materials, namely, grass, thatch, bamboo, plastic, polythene, mud, un-burnt bricks or wood. Roof may be made from anyone of the following temporary materials, namely, grass, thatch, bamboo, wood, mud, plastic or polythene (114)

Housewife

All ever married women who do not have any occupation other than work at home

Disability

Restriction or lack of ability (resulting from an impairment or health condition) to perform an activity in the manner or within the range considered normal. Disability is also commonly used to refer only to long-standing limitations in carrying out activities of daily living (115)

Socioeconomic status

Household socio-economic status was classified according to modified version of socioeconomic scale introduced by Kuppuswamy (116)

In this scale, three criteria for socioeconomic classification were used: head of the household education, occupation and income. (appendix E)

Age classification

As per Global Burden of Disease 2000 study with modification for the Indian situation i.e. 0 to 5, 5 to 15, 15 to 30, 30 to 45, 45 to 60 and 60 years above.

Type of family

Type of family was classified as:

Nuclear: when the family member are husband and wife with or without children

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Extended: when nuclear family live with their parent/s or grandparent/s (any vertical relation)
Joint family: when individuals/ nuclear families live with their horizontal relative or horizontal and vertical relative
Separated family when due to any reason like divorce, death or others, both parents are not living together with their children (one of parents and children)

Marital status
The marital status of a person was classified under the following heads:-
Never married
Married
Widowed, Separated or Divorced.

2.5 Calculations

2.5.1 Annual incident rate

The incident rate of unintentional injuries for a 30 days recall was calculated using the formula:
\[ i_{30} = \frac{i}{n} \times 1000 \]
\[ i_{30} = \frac{129}{9014} \times 1000 = 14.3 \]

Where:
\[ i_{30} = \text{incidence rate of injury for 30 days recall period per 1000 individuals} \]
\[ i = \text{total number of injuries reported over the 30 days period} \]
\[ n = \text{total number of individuals in the sample} \]

The annual incidence rate of injuries was calculated using the following formula:
\[ i_a = \frac{i_{30} \times 365}{30} \]
\[ i_a = \frac{14.3 \times 365}{30} = 174 \]

Where:
\[ i_a = \text{annual incidence rate of injuries per 1000 individuals} \]
365 = number of days in a year
30 = recall period of one month

In this study the objective was to monitor the incidence of injury. If an individual was injured more than once during the study period, all injuries were registered, and each incidence was considered separately. A “case” was an injury event which was serious
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enough to meet inclusion criteria of the study, irrespective of whether the injured had single or multiple injuries.

2.5.2 Case fatality and mortality rate

The injury case fatality rate and mortality rate were calculated with the assumption that injury and mortality rate was constant during the last five years. Therefore to estimate the number of mortality per year, number of reported mortality during five years was divided by five.

The case fatality rate of injury was calculated using the following formula:

\[
fr = \frac{m}{i} \Rightarrow fr = \frac{26}{5}/430 = 0.01
\]

Where:
- \(fr\) = case fatality rate
- \(m\) = total number of reported mortality per year

The mortality rate of injury was calculated using the following formula:

\[
m_r = \frac{m}{n} \times 100,000 \Rightarrow m_r = \left[\frac{26}{5}/430\right] \times 100,000 = 57.7
\]

Where:
- \(m_r\) = mortality rate per 100,000 individuals
- \(m\) = total number of reported mortality per year
- \(n\) = total number of individuals in the sample

2.5.3 Age adjusted incidence rate

The age adjusted incidence rate was calculated using the formula presented by Pennsylvania Department of Health. For calculating the age adjusted incidence rate, the population of Pune city enumerated in Census 2001, India, was considered as standard population.

2.6 Measurement of risk factors

If an individual was injured more than once during the study period, all injuries were registered, and each incidence was considered separately. Sixteen individuals
reported two cases of injuries in one year. For calculation of risk factors, the characteristics of these individuals were considered twice. Thus, the total number of individuals was considered as sum of total individuals in the sample and the number of individuals with report of two injuries (9014+16=9030).

As the ratio of injury occurrence amongst males was twice than females, the risk factors were calculated separately for males and females to avoid masking the effect of the male gender.

Road traffic and fall related injuries constituted the major share of injuries. Therefore the risk factors were calculated not only for all unintentional injuries but also for road traffic and fall related injuries separately. Fatal injuries were excluded for the purpose of identifying risk factors because the sample size was not large enough.

In this study, some well known safety devices in developed countries like smoke detector, helmet use for bicycle and children who are pillion riders of two-wheeled vehicles, were not questioned as these issues are unheard of and not commonly practiced in India. Seat belt use also was deleted from the questionnaire after the pilot study due to rare reporting of use of seat belt and receiving inaccurate responses during the pilot study.

2.7 Pilot study

A pilot study was conducted to examine the feasibility and accuracy of methodology, and the questionnaire and to obtain an approximate incidence of injury. The pilot study was conducted by interviewing 200 households from 10 electoral wards of Pune city.

2.8 Short description of data analysis

Data were entered in Excel Microsoft office 2007, and transferred to SPSS software version 13. The procedure of data cleaning was done by cross check of all data and double check for 10% of questionnaires.
Data related to burden and pattern of unintentional injuries were analyzed using simple descriptive analysis like frequency, cross tabulation, average and other methods of descriptive studies. For measuring risk factors, Chi Square test was used for uni-variate analysis and for multivariate analysis multiple logistic regressions was used. Fisher exact test was performed in cases of small proportion of individuals in the variable category, like disability, visual impairment, etc. In case of individuals and households who were injured more than once during the study period, the number of injuries were considered as the unit of the study and the characteristics of individuals were repeated as many times in data entry as the number of injury cases occurring to that individual. As the number of missing data for injured individuals was minimal, the missing data were not analyzed in Chi Square and Logistic Regression tests.

**2.9 Ethical considerations**

All interviews were conducted after informed consent of the interviewee. All questionnaires were stored and maintained with complete confidentiality. A numerical identifier, rather than name was used in the research.

**2.10 Challenges faced during study**

Research is a process of facing challenges and solving problems. One of the biggest challenges of this study was to approach the large building societies in highly secured areas. To address this issue a special letter to the chairperson or secretary of these housing societies were made by the supervisor of the research and the aim and importance of the research were explained to them. They were requested to cooperate with interviewers. These letters were handed over personally by the researcher to the management authority of these large building societies and frequent visits were made (in some cases more than 8 times) till finally (except for one case), the permission to interview was obtained from these kind of residences.
Another challenge was getting accurate information regarding income of the households. To solve this problem, it was decided that instead of income, income category be used in the questionnaire.

2.11 Limitations

There are some shortcomings of the study that need to be highlighted:
First, the understanding of 'accidental events or unintentional injury' and reporting these events could differ between individuals with different economic and education levels which may result in reporting bias.
Second, the consequences of injury on health or health outcome were very difficult to assess accurately on a self-reported basis. For those cases of injuries where the injured did not recover completely at the time of interview, obtaining the exact outcome and duration of recovery was by phone calls and follow up.
Third, the financial cost of injuries was based on the report of respondent and was not verified.
Forth, the severity of injury was classified according to the type of medical care used, because any clinical classification was not appropriate for a population based study.
In injury severity classification, based on type of medical care utilization, other factors like accessibility, affordability, etc which influence the medical care seeking behavior, were not taken into account, which may be a source of bias in the classification of severity of injuries.