

**STUDY OF COMPENSATORY ACCIDENTS IN
SRI LANKA**

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Dissertation submitted in partial fulfillment of the requirements for the degree of
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DECLARATION

I declare that this is my own work and this dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or Institute of Higher Learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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The above candidate has carried out research for the Masters dissertation under my supervision.

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Date

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ABSTRACT

Study of Compensatory Accidents in Sri Lanka

Although figures of Occupational Accidents are published annually in many countries, reliable data is available only in a limited number of countries (Takala, 1999). Also figures of occupational accidents in most developing countries are not based on proper accident recording and notification systems and under these circumstances, underreporting of occupational accidents is a common problem in many countries (Takala, 1999).

When legal frameworks in countries are considered, it can be seen that some occupations are not covered by the law. Many researches have been done to reveal the extent of underreporting, factors that lead for underreporting and the coverage of occupations by occupational safety legislation in various countries. This study is focused to find the effectiveness of accident reporting system in Sri Lanka, to study the coverage of occupations by the current law and to propose strategies for improving the accident reporting system.

Data for the research were of both primary type and secondary type where secondary data were extracted from the records available at the office of the commissioner for workmen's compensation and primary data were obtained through expert interviews. Accidents reported to the commissioner for workmen's compensation during one year period were compared with the accidents reported to department of labour during the same period for estimating the rate of underreporting. Also, the identification of economic activities that are not covered by the current legislation with regard to occupational safety and health could be identified through the data obtained from the office of the commissioner for workmen's compensation. Proposals for enhancing accident reporting were obtained through interviewing experts in the occupational safety and health field.

Results of the research show that 27% of the compensatory accidents are from economic activities that are not covered by OSH legislation and rate of underreporting is 62.50%. These indicate that the legal framework should be changed to cover all economic activities and strategies should be implemented to enhance accident reporting.

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LIST OF ABBREVIATIONS

BLS	Bureau of Labour Statistics
DFIE	District Factory Inspecting Engineer
EU	European Union
F	Fatal
FO	Factories Ordinance No.45 Of 1942
ILO	International Labour Organization
MER	Medical Examination Report
OHSAS	Occupational Health & Safety Assessment Series
OSH	Occupational Safety & Health
OSHA	Occupational Safety & Health Administration
PPD	Permanent Partial Disability
PTD	Permanent Total Disability
TD	Temporary Disability
WCC	Workmen's Compensation Commissioner
WCF	Workmen's Compensation Fund
WHO	World Health Organization

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CHAPTER 01

INTRODUCTION

1.1. Background

Although the figures of occupational accidents are published annually in many countries, reliable data is available only in a limited number of countries and also the figures in most developing countries are not based on proper accident recording and notification systems (Takala, 1999). Further, presentation of data is not standardized and thus, global figures of occupational accidents are not available (Hamalainen, Takala & Saarela, 2006). However, several attempts have been taken to overcome this situation. For instance, some regions such as European Union have combined accident figures of member states (Hamalainen et al., 2006). Further, International Labour Organization (ILO) publishes estimates of occupational accidents based on the figures gathered from member countries (Hamalainen et al., 2006). According to estimates of ILO, approximately 250 million occupational accidents occur annually and overall fatality rate is around 14.0 per hundred thousand workers (Ergor, Demiral & Piyal, 2003). According to Ergor et al. (2003), both ILO and World Health Organization (WHO) have predicted poor indicators of occupational safety and health in developing countries which comprises of 60% of the global workforce and 80% of this workforce is employed in small scale enterprises and informal sector which involve heavy and dangerous work.

Despite the staggering number of occupational accidents published by ILO, researchers suggest that they are gross underestimates of the true volume of occupational injuries due to accident underreporting (Ergor et al., 2003). Therefore, accurate recording and reporting have been made compulsory by many organizations and government institutions as the prompt and accurate reporting of accidents has a numerous number of benefits for both organizations and nations. According to Probst, Graso, Estrada & Greer (2013), important information is missed when an accident or a near miss is not reported thus lessons learnt from these incidents may

not be captured. As a result opportunities for accident prevention from identifying potential risks through an accident investigation will be missed. Further, Thompson(2007) mentioned that occupational accident underreporting also lead for financial consequences for both worker and the employer as when occupational injuries are not reported to worker's compensation boards, medical costs happen to be paid either by public health care system or private insurance.

Effective recording and notification are crucial in accident prevention and also statistics serve as a tool for measuring level of success in compliance, enforcement and prevention action (Hedlund,2013). At public policy level, accurate statistics on occupational accidents help for setting insurance premiums, comparing trends across occupational groups and jurisdictions, devising suitable accident prevention and as a broad vision determining the need of changes in the legal framework (Shanon& Lowe, 2002). Accurate statistics is essential for employer to implement effective OSH management systems (Azaroff, Levenstein& Wagman,2002) and not understanding the nature of accidents occurring in the organization is a threat for employees (Probst,Brubaker &Barasotti, 2008).

Several researches have shown that underreporting is a common problem in many countries (Takala, 1999). Although the exact magnitude of the phenomenon varies, accident underreporting has been even in empirical literature according to Glzner et al. (1998), Pransky, Synder, Dembe&Himmelstein (1999), Leigh, Marcin&Miller (2004) and Rosenman et al. (2006) as cited by Probst& Estrada (2010). Also, studies have revealed two dimensions of underreporting such as employee failing to report on the job accidents to organizations and the organizations failing to report the accident to relevant authorities (Probst, Brubaker &Barsotti, 2008 and Probst&Granso, 2013). Studies that have utilized non employer based data sources have shown that in United States only one third of occupational accidents are reported to Bureau of LabourStatistics (BLS). Rosenman et al.(2006) and Probst et al.(2008) reveals that companies with poor safety culture fail to report over 80% of accidents to Occupational Safety & Health Administration of U.S where companies with positive safety culture fail to report 47% of accidents.

Although Sri Lanka is affected vastly by accident underreporting, the degree of underreporting has not been properly estimated yet. And also the coverage of Factories Ordinance No. 45 of 1942 which is the legal framework for ensuring OSH in Sri Lanka is limited to some economic activities where economic activities such as agriculture and transportation which are known to have higher accident rates are not covered. This study focuses on estimating the rate of accident underreporting and also on identifying the occupations which are not covered by the present law although they are having higher accident rates. Also the study focuses on identifying mechanisms for enhancing accident reporting.

1.2. Research Problem

Although accident underreporting has been identified as a problem in Sri Lanka, still an estimation of the rate of underreporting has not been done. And also there are many occupations such as agriculture and transportation which are not covered by the Factories Ordinance No. 45 of 1942. Further, drawbacks of existing reporting systems were not identified. Under these circumstances, employees lose the opportunity of getting the benefit of both Factories Ordinance and Workmen's Compensation Ordinance. Hence the questions that are to be answered through this research are;

1. What is the rate of accident underreporting?
2. What are the economic activities that are not covered by the Factories Ordinance No. 45 of 1942 although they have high accident rates?
3. How can the accident reporting system be improved to enhance accident reporting?

1.3. Aim and Objectives

The research aim was revealing measures for minimizing occupational accident underreporting and expanding the coverage of legislation relevant to occupational safety and health. Thus the objectives were;

1. Identifying the economic activities which are not covered by the current law related to occupational safety and health although they have high accident rates.
2. Estimating the rate of underreporting of compensatory occupational accidents.
3. Propose strategies to enhance reporting of occupational accidents.

1.4. Methodology

Accidents reported to Commissioner for Workmen's Compensation can be classified as follows;

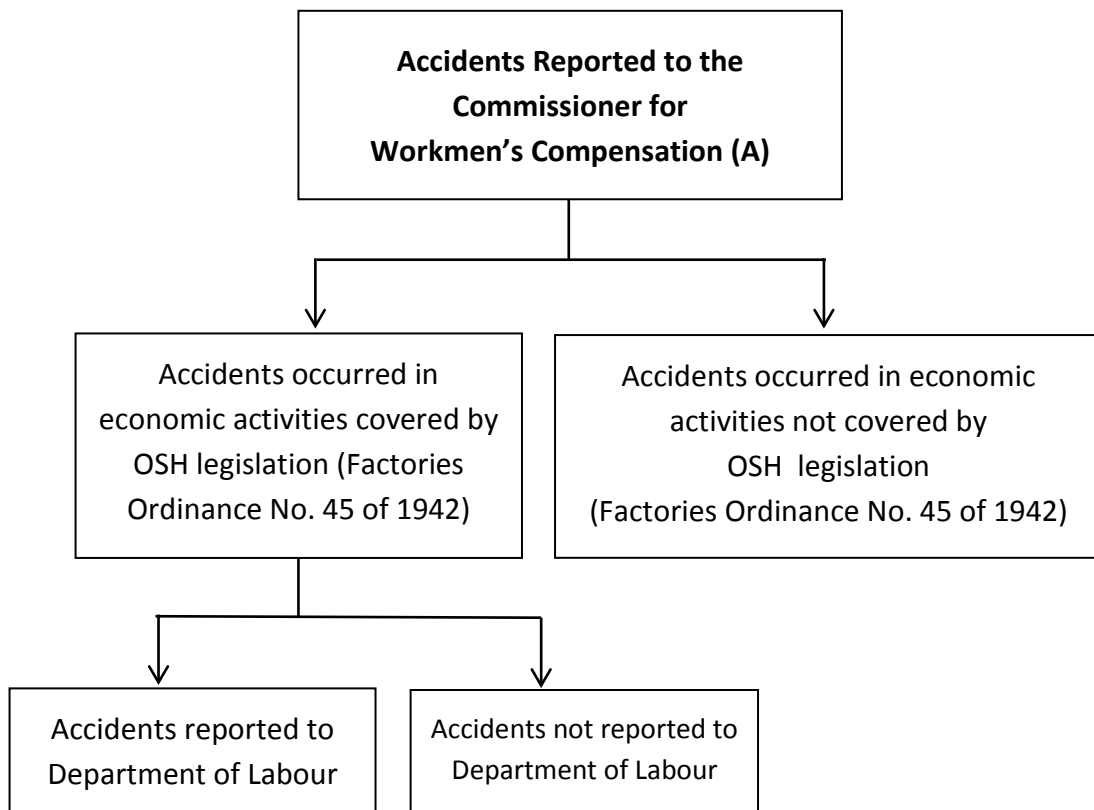


Figure-1.1 Classification of Accidents Reported to Commissioner for Workmen's Compensation

In order to capture the reported accidents, accidents reported to the Commissioner for Workmen's Compensation were obtained from the records at the office of the Commissioner for Workmen's Compensation. After that the accidents related to occupations covered by the Factories Ordinance No. 45 of 1942 and that are not covered by the said ordinance are separated.

Next, the reportable accidents (accidents that have occurred in occupations covered by the Factories Ordinance No. 45 of 1942) were compared with the accidents reported to the department of labour and the numbers of accidents not reported were found. Rate of underreporting was calculated with these data.

Also, occupations which are not covered by the current OSH legislation but in which compensatory accidents occur were found from the data analysis.

Finally, few experts in the field of Occupational Safety and Health were interviewed to get suggestions for enhancing accident reporting system.

1.5.Scope & Limitations

This study focuses on accidents reported to the Commissioner for Workmen's Compensation. The figures available in this office come from three sources. They are;

1. Complaints made by the injured employees or dependents.
2. Accidents notified by the employers and,
3. Accidents notified by Insurance companies.

Hence, all accidents which are entitled for compensation will not be reported to the Commissioner for Workmen's Compensation. Underreporting of accidents is calculated based on the data recorded for compensation. So, it will not give the perfect picture about accident underreporting.

1.6. Summary

Researches have shown that reliable occupational accident data is available in a limited number of countries where figures in most developing countries are not based on proper accident recording and notification system. Although accurate recording and reporting of accidents is crucial in accident prevention, several researches have shown that underreporting is a common problem in many countries. Also, the coverage of legislation relevant to OSH in countries where some economic activities are left behind by the legislation.

Hence, identification of the coverage of OSH legislation in Sri Lanka, examining the effectiveness of accident reporting system and recognizing measures for minimizing accident underreporting is the aim of this research.

The research methodology used to achieve the objectives of the study was briefly discussed. It also discusses data collection, scope of the study and limitations.

CHAPTER 02

LITERATURE REVIEW

2.1. Introduction

Although the figures of Occupational Accidents are published annually in many countries reliable data is available only in a limited number of countries (Takala,1999). Also the figures of occupational accidents in most developing countries are not based on proper accident recording and notification systems (Hamalainen, Takala, and Saarela, 2006). Further, the presentation of data is not standardized and thus, global figures of occupational accidents are not available (Hamalainen et al.,2006). However, several attempts have been taken to overcome the situation. For instance, some regions such as European Union have combined accident figures of member states and also International Labour Organization (ILO) publish estimates of occupational accidents based on figures gathered from member countries (Hamalainen et al., 2006).

Many researcheshave revealed that underreporting of occupational accidents is a common problem in many countries. For instance, according to Probst, Brubaker and Barsotti (2008), companies in United States of America with a poor safety climate have failed to report over 80% of the reportable injuries to Occupational Safety and Health Administration (OSHA), and companies with positive safety climate have failed to report 47% of reportable injuries. Although Sri Lanka too suffers from underreporting, no estimates have been done regarding the rate of underreporting. The legal framework in Sri Lanka (i.e. Factories Ordinance No. 45 of 1942) stipulates that occupier of the factory is responsible for reporting the accidents occurring in the factory to the Department of Labour. At present, there is no mechanism to evaluate the effectiveness of the accident reporting system. Also the occupations covered by the "Factories Ordinance No. 45 of 1942 is limited.

Therefore, this study is focused to find the effectiveness of accident reporting systems, to reveal occupations that are not covered by the current law although they cause compensatory accidents and to suggest strategies for improving accident reporting system.

2.2. Definitions of an Occupational Accident

Occupational Health and safety Assessment Series (OHSAS) define an accident in relation to incidents. According to OHSAS 18001-2007, an incident is defined as a work related event in which an injury or ill health or fatality occurred, or could have occurred and an accident is an incident which has given rise to injury, ill health or fatality. An incident where no injury, ill health or fatality occurs may also be referred to as a “near-miss”, “near-hit”, “close call”, or “dangerous occurrence”.

The International Labour Organization defines occupational accident as an occurrence arising out of or in the course of work which results in a fatal occupational injury or a non-fatal occupational injury. Definition of ILO is applied in this research.

2.3. Categorization of Occupational Accidents

Occupational accidents can be classified into two broad categories as fatal accidents and nonfatal accidents. Non-fatal accidents can further be categorized into lost workday accidents and non-lostworkday accidents where lost workday accidents are defined by United States Bureau of Labour Statistics as non-fatal accidents causing lost work or restricted work activity beyond the day of injury (Miller,1995). Workers who are subjected to lost workday accidents are entitled for compensation depending on the legal framework for compensation thus criteria for eligibility varies from country to country (Miller,1995).

OSHA instituted within the Department of Labour U.S under the Occupational Safety and Health Act of 1970 requires businesses having more than 10 persons

employed to maintain annual logs (OSHA Form 300) of occupational accidents and illnesses that are defined as recordable injuries, and recordable injury is defined as any work related injury or illness that results in death, loss of consciousness, days away from work, restricted job duty or transfer or medical treatment beyond first aid and these data are used to compute injury rates by industry, employer size and various other classifications (Probst et al.,2008).

According to the Factories Ordinance No. 42 of 1945 accidents which refrain the injured person from earning full wages for more than three days are considered as reportable accidents and injured person is entitled for compensation under Workmen's Compensation Ordinance No. 19 of 1934.

2.4. Occupational Accident Rates and Trends

The ILO collects and publishes global accident figures based on national accident recording and notification systems in ILO member countries. As the accident recording and reporting systems are not harmonized, reliable data may only be obtained from about one third of 174 ILO member states. Also the member states report both absolute number of accidents and frequency rates where frequency rates are more useful than absolute numbers for preventive purposes and for comparison (Takala, 1999).

According to the estimates of ILO, approximately 250 million occupational accidents occur annually and overall fatality rate is around 14.0 per hundred thousand workers (Ergor, Demiral, and Piyal, 2003). According to Ergor et al. (2003), both ILO and World Health Organization (WHO) have predicted poor indicators of occupational safety & health in developing world which comprises of 60% of the global workforce and 80% of this workforce is employed in small scale enterprises and informal sector which involve heavy and dangerous work.

The argument that poor countries and organizations cannot afford for safety and health is common, but no country or organization in the long run would be benefitted

from a low level of safety & health and on the other hand studies have shown that most competitive countries are also the safest which indicates that performing a low safety, low health and low income survival strategy does not lead for high competitiveness or sustainability (ILO Safety in Numbers, 2003)

According to Takala (1999), reporting of fatal occupational accidents is better than non fatal ones thus number of recorded fatal accidents can be used to estimate the number of non fatal accidents. Studies conducted in countries such as United States, Australia, Zimbabwe, Finland and European Union have shown that ratio between fatal and non fatal occupational accidents is much constant if the reporting system is reliable and a ratio of 1:750 between fatal accidents and non fatal accidents would be a good estimation (Takala, 1999).

2.5. Importance of Accurate Accident Recording & Notification

Accurate accident recording and reporting has been made compulsory by many organizations as well as government institutions as the prompt and accurate reporting of accidents and near misses is an important component of any workplace accident prevention programme. Also when an employee does not comply with the standards of the organization and avoid reporting an accident or a near miss, valuable knowledge is lost as the lack of accident & incident investigations would prevent organizations from identifying risks in the workplace (Probst, Graso, Estrada and Greer, 2013).

According to ILO, accident statistics serve as an important feedback mechanism to monitor performance and the same is instrumental in prevention, as statistics serve as a tool for measuring level of success in compliance, enforcement and preventive action (ILO,1996). The ILO publishes global estimates of occupational accidents by country (Takala, 1999,Hamalainen et al., 2006) which drives for comparison and benchmarking although there are limitations (Hedlund, 2013). According to Hedlund (2013) accidents statistics must be considered as by-products of information systems rather than as precise indicators of performance due to reasons such as variation in

reporting criteria, incident classification and variation across time even within a reporting system. This is further explained by Jacinto and Aspinwall (2004) who examined occupational accident notification systems within EU and observed that lack of uniformity in databases and variations in data collection methods make comparability difficult.

Accident reporting and incident reporting are of equal importance when the preventive culture is considered as the “safety ice burg” assumption states that for every major accident that occurs, a large number of related minor injuries and near misses occur and “identical causation” assumption states that these large number of minor accidents and near misses have the same underline causes as the major accident (Nielson, Carstensen& Rasmussen, 2006).

According to Hedlund (2013), effective recording and notification of occupational accidents are crucial in prevention and also statistics on accidents serve as a tool for measuring level of success in compliance, enforcement and prevention action.

At public policy level, accurate statistics on occupational accidents helps for setting insurance premiums, comparing trends across occupational groups and jurisdictions, devising suitable accident prevention interventions and as a broad vision determining the need of changes in the legal framework (Shanon and Lowe, 2002).

According to Thompson (2007), occupational accident underreporting also lead to financial consequences for both worker and employers as when occupational injuries are not reported to workers’ compensation boards, medical costs happen to be paid by either public health care system or private insurance.

Accurate accident statistics is essential for employers to implement effective OSH management systems (Azaroff, Levenstein and Wegman,2002) and not understanding the nature of accidents occurring in the organization is a threat for employees (Probst et al., 2008)

2.6. Occupational Accident Recording and Reporting Systems

In almost all countries employees have to report work related injuries to their employers and the employers are responsible for recording and reporting accidents to relevant government authorities where recording and reporting systems have differences depending on the legal framework in countries (Tucker, Diekrager, Turner and Kelloway, 2014). A common feature in all countries is the “official notification forms” for reporting accidents. However, differences exist in these forms depending on the country. For example Finland uses a different form to report fatal accidents while Spain has two types of forms depending on the gravity of the consequence (i.e. with or without injury) and Spain since 1989, developed a extremely detailed form for accidents involving machines (Jacinto and Aspinwall, 2004).

In Turkey, employers are responsible for reporting all accidents to Social Insurance Institution within two days of the accident and Labour Inspectors from the Ministry of Labour and Social Security have to conduct an investigation at the accident site for accidents that results in death, loss of organs or long term hospitalization which are classified as serious accidents (Ergor et al., 2003).

Under the U.S. Federal law, firms other than farms employing less than eleven employees are required to count lost workday injuries (injuries causing lost work beyond the day of injury) and U.S. Bureau of Labour Statistics (BLS) collects these data (Miller, 1995). Also, according to OSHA-provided criteria, organizations must record injuries and illnesses in OSHA log of work related injuries and illnesses (Form-300) and these logs must be preserved for a minimum of five years and forward to OSHA and state regulators on request (Probst et al., 2008).

There are noteworthy differences in the type of accidents required to be notified due to the differences in the legal definition of “occupational accident”. For example countries like Belgium, Austria, Portugal and Spain the accidents that occur on the way to and from work are considered as occupational accidents (Jacinto and Aspinwall, 2004)

Reporting criteria for occupational accidents vary from country to country and also over the time in a particular country. As an example, Factories Act of 1941 industries in South Africa required to report accidents resulting in four or more days off work until 1983 and after 1983 only the accidents resulting fourteen or more days off work requires to be reported (Hedlund, 2013). At present, according to Hedlund (2013) legislation in South Africa requires to report incidents that results in fourteen or more days off work, result in death or permanent disablement, spillage of dangerous substance or fracture of machinery. Similar to the legislation in Sri Lanka, South Africa also excludes traffic accidents and accidents occurring in private household.

According to the legal framework related to Occupational Safety and Health in Sri Lanka (Factories Ordinance No. 45 of 1942) occupier of the factory has to record the reportable accidents and illnesses occurring in the workplace in the register called the “General Register”. Reportable accidents are defined as accidents causing loss of life, disables the person for more than three days from earning full wages or making the person unconscious due to electric shock, inhalation of poisonous gases or fumes or due to heat exhaustion. These accidents have to be reported to the Department of Labour on the form stipulated in the law (Form 10). The follow up form (Form CFIE-1) has to be submitted to the Department of Labour for accidents other than fatal accidents once the injured person returns to work. If the injured person is having a permanent disablement the medical examination form specified under the workmen’s compensation ordinance has to be sent to the Department of Labour.

2.7. Underreporting of Occupational Accidents

Although the exact magnitude of the phenomenon varies, accident underreporting has been even in empirical literature according to Glzner et al. (1998), Pransky et al. (1999), Leigh et al. (2004), and Rosenman et al. (2006) as cited by Prost and Estrada (2010).

A number of studies that have utilized non employer based data sources such as hospital discharge data have shown that accident underreporting is significant even in

U.S and according to Rosenman et al. (2006), only one third of occupational accidents are reported to BLS and Probst et al. (2008) suggests that companies with poor safety culture fail to report over 80% of accidents to OSHA where companies with positive safety culture fail to report 47% of accidents. Although these estimates may vary across studies it is evident that underreporting is a significant phenomenon. Also studies have revealed two dimensions of underreporting i.e. employee failing to report on the job accidents to the organization and the organization failing to report the accident to relevant authorities (Probst et al., 2008, 2013).

According to Daniels and Marlow (2005), as cited by Probst et al. (2008), researches have focused on factors like industry type and size of the organization with regard to accident reporting. For example, accident underreporting appears to be higher than average levels in sectors such as health care, hospitality, agriculture and construction and also many studies have shown that smaller organizations are more likely to underreport than large organizations (Olenick, Gluck and Guire, 1995; Leigh et al., 2004)

2.8. Factors for Underreporting

When an employee meets with an accident related to the employment, he must notify the employer and if this does not occur the employer is unable to record and report the accident to relevant authorities (Probst et al., 2008). Several researches have been done to determine the reasons that employees fail to report on the job injuries to employers and outcomes include demographic characteristics such as age and organizational tenure (Weddle, 1996); perceived lack of management responsiveness (Clarke, 1998); fear of reprisals or loss of workplace perks and pay incentives (Pransky, Synder, Dembe&Himmelstein, 1999); fear of job loss (Probst,2006) and accepting accidents and injuries as a fact of life in certain jobs (Pransky et al., 1999).

According to Probst (2006), as cited by Probst et al. (2010) employees do not report over 50% of all experienced accidents to their supervisors. In U.S accident rates are used during bidding process to select “safe” contractors and the contractors get the

benefit of not recording accidents accurately which in turn leads for underreporting. When no incident investigation or corrective action is taken as a result of reporting, employees feel it is of no use of reporting incidents or accidents and Bridges(2000) suggests that near misses are underreported when employees understand that the management commitment towards safety is low.

Employees who understand that the safety climate in their organization is poor tend to more accident underreporting compared to employees who perceive a more positive safety climate and also employees who observe a low supervisory enforcement of safety policies will engage in greater underreporting than employees who perceive stronger supervisory enforcement (Probst et al., 2010).

Researches also been done to find the relationship between production pressure and experienced number of accidents as well as the relationship between underreporting and production pressure where production pressure has been defined as organizational demands to reach operational goals in order to increase organizational profits. Researches have shown that number of experienced accidents and underreporting increases with production pressure (Probst et al.,2013).

When employees perceive that organizational pressure is excessive on tangible production related results, safety might be perceived to be secondary to production and also reporting accidents might be viewed as cumbersome and time consuming (Probst et al., 2013).

When employees refrain from reporting work related injury in their teenage years, they may continue it in to their adulthood and create negative consequences of underreporting (Tuckeretal., 2014). On contrary,Biddle, Roberts, Rosenman and Welch (1998) suggest that tendency to report accidents increase with age until workers reach their mid fourties.

Severity of injury has a strong relationship to accident reporting where more severe injuries are more likely to be reported according to Shanon and Lowe (2002) and Almgir et al.(2006) as cited by Tucker et al. (2014).

2.9. Coverage of Economic Activities

Although the main legislation relevant to occupational safety and health in Sri Lanka is the Factories Ordinance No. 45 of 1942, it covers only a limited number of economic activities. There are many economic activities which are not covered by this legislation although they cause a considerable number of occupational accidents. One of them is occupational vehicular accidents involving drivers. Occupational vehicular accidents cause a serious threat to both employee safety and public safety and researches have shown that driving is among the most risky occupations when fatal accidents are considered (Cone et al., 1991). Many researches have been done relevant to occupational vehicular accidents and researchers have used data for finding important factors such as relationship between amount of hours of work fatigue (Arnold et al.,1997).

Another occupational area that is not covered by present legislation relevant to OSH in Sri Lanka is agriculture and forestry. Although literature on accidents occurring in this industry sector in Sri Lanka is not available, a high accident rate can be expected when literature in other countries is studied. For example, according to Robert, Elisabeth and Joseph (2015) 3805 accidents had occurred in Austria in the year of 2013 in this industrial sector and out of this 56 had been fatal accidents. Further, in European Region, the number of fatal accidents in agriculture, hunting and forestry is higher than any other sector and only construction industry has similarly high number of accidents but compared to agriculture, fatal accidents in construction industry has a decreasing trend (Robert et al.,2015). As pointed out by Robert et al.(2015), in spite of improving technology, higher educational levels of farmers, coordinated preventive measures and better training, the number of accidents in agriculture and forestry in Austria is still in an increasing trend. Agricultural machinery has been identified as a major hazard and amongst them tractors

are frequently associated with severe injuries and fatalities (Kumar, Mohan and Mahajan 1998). Agriculture has consistently ranked as one of the most hazardous industries in the USA where in 1994, agriculture has had a fatality rate of 26 per 100,000 workers compared with a rate of 4 per 100,000 for all industries combined (Jekayinfa, Ojediran, Adebisi and Adeniran, 2009).

Another area that is rarely considered in occupational safety & health is psychiatric injury which is resulted by workplace stress. According to Cooper et al. (1988) as pointed out by Earnshaw and Cooper (1991), researches conducted in Europe and North America have revealed that workplace stress represents a huge cost to industry through increased sick leave, absenteeism, labour turn over, ill health, less production and lower morale. Although compensation cases related to psychiatric injury is new to United Kingdom, in the USA it has become a common phenomenon (Bale, 1990). When Worker's Compensation Law was introduced in US, "injury" denoted "impact" so that only accidental injuries such as loss of limbs or loss of eye sight were liable for compensation where problems which develop slowly over months or years were excluded (Bale, 1990).

2.10. Accident Costs

Occupational injuries and diseases which cause a significant cost to society can be reduced through prevention activities as suggested by Boucher, Lebeau and Duguay (2014). As an example Australian Industry Commission has estimated that workplace injury and diseases cost for year 1992-93 as \$ 20 billion or approximately 5% of gross domestic product where results for other countries also show costs of a similar relative magnitude (Borooah, Hodges and Mangan, 1998). Boucher et al. (2014) further suggests that it is important to use reliable estimates of accident costs in order to optimize decision making in both prevention and research.

Although many researches have been done on economics of occupational injuries many of them have focused on distribution of costs between direct and indirect costs. According to Borooah et al. (1998) pioneering study in this area has been done

by Heinrich where he had estimated a ratio 4:1 between indirect to direct costs. Subsequent studies carried out by Bird and Loftus (1974), Damray and Schmeer (1978), Simmonds and Grimaldi (1986) and Andrioni (1986) have agreed with Heinrich's findings where studies done by Brody, Letourneau and Poirier (1998) and United Kingdom Health & Safety Executive (1993) do not agree with this ratio as stated by Borooah et al. (1998).

The global cost of occupational injuries and illnesses is substantial specially in developing countries where rate of occupational fatalities are estimated to be at least two to five times higher compared to North America and Western Europe (Concha-Barrientos et al.,2004). Further, medical and disability costs associated with occupational injuries and illnesses are also considerable in developing countries although estimated costs have been well less characterized as there are usually no large centralized record systems that include health conditions having an occupational cause (Phayong and Sathirkorn, 2014). On the other hand costs associated with occupational injuries and illnesses are estimated in developed countries. As an example, total costs in USA in 1992 have been estimated to be 171 billion dollars where direct cost component is 65 billion dollars (Phayong and Sathirkon, 2014).

According to the surveys conducted by Accident Prevention Advisory Unit of the Health and Safety Executive in the United Kingdom, loss for companies from work related accidents is five to ten percent of the profit for all industries, 8.5 percent of the tender price for the construction industry and the ratio of direct cost to the indirect cost is 1:11 (Yoon et al., 2013). Wage loss is also an important factor when occupational accidents are considered where according to Levitt, Parker and Samuelson (1987) workplace accidents add another ten percent to wages bill and Miller, Hoskin and Matthews (1987) suggest a wage loss component of twenty percent.

It is internationally evident that there is a link between health risk factors, productivity and health care costs which drives nations for OSH and specially

maintaining specific working standards (Drakopoulos, Economou and Grimani, 2012). As pointed out by Drakopoulos et al.(2012), European Commission report of 2009 has explicitly stated the objective of reducing occupational accidents and diseases among 27 members of EU where “New European Strategy for Health and Safety at work” has set the objective of reducing the total incidents of occupational accidents in EU countries by 25 percent in 2012.

Some researches which have studied the absence of injured employees have revealed that looking only at the first absence from work leads to misleading conclusions as about one third of those who return to work after an absence leave their job due to the effects of their injuries and are not employed again (Campolieti, 2000). According to Butler Johnson and Baldwin.(1995) returning to work does not often mean a successful end to an absence and they further note that absence from employment can further be classified as: (i) Single absence and successful return to work; (ii) Single absence and unsuccessful return to work; (iii) Multiple absence and successful return to work; and (iv) Multiple absence and unsuccessful return to work. Due to the nature of some occupational accidents specially which lead for back injuries, upper limb or soft tissue injuries which are of a more recurrent nature that may result in further lost time after the initial injury it may be more useful to examine not just the duration of the initial claim but the injured persons subsequent claim history and also re-employment spells after an initial injury (Campolitei, 2000).

2.11. Workmen’s Compensation Systems

In almost all countries employers are legally bound to ensure a safe and healthy working environment for employees. However, systems applied for the payment of compensation for work related injuries and illnesses have many differences across countries (Liao and Chiang, 2015). As pointed out by Liao and Chiang (2015), in countries like Indonesia compensation of employment related injuries and illnesses is considered as the employer’s responsibility and thus compensation is paid by employers where as in countries like Germany and Lebanon employers shall have

contracts with insurance companies to cover the costs of medical treatment and compensation for employment related injuries. They further point out that in countries like Mexico the government provides a system of financial protection including workmen's compensation benefits. In Japan the government acts as the insurer although large companies may use self-insurance or may use commercial carriers for extra protection.

In United Kingdom, any employee who gets injured during employment is entitled for treatment from National Health Service and to claim benefits in certain circumstances where employees are entitled to bring a claim for loss in civil courts. Employers are required by law to obtain compulsory insurance from private insurance companies against their civil liabilities and if an employee's civil action succeeds, the insurance company pays the compensation (Liao and Chiang, 2015).

In Taiwan, law related to compensation is the Labour Insurance Act and according to this act all employers must obtain insurance policies which covers obligation to their employees in the event of an accident arising out and in the course of employment and it is a "no fault liability" scheme where the employer is liable to pay even though the employee might have done acts of fault or negligence which have lead for the accident (Liao and Chiang, 2015).

In Thailand, Workmen's Compensation Fund (WCF) which has been established according to Workmen's Compensation Act replace the liability of the employer when the employees are injured, fall ill or die due to a work related cause where this funding covers all establishments with at least one employee and the employer is solely responsible for contributing an insurance premium to the WCF annually which varies from 0.2% to 1% of employee wages based on the risk rating for the type of establishment classified by Thailand Standard of Industrial Classification (Phayong and Sathirkorn, 2014).

2.12. Strategies for Minimizing Underreporting

According to Einarsson and Brynjarrsson (2008) humans react strongly to high risk environments as well as to each other. Relationships between each other which are a fundamental to workforce morale and for the formation of the basis for company safety culture are often constrained by role pressure within the working environment (Einarsson and Brynjarrsson, 2008). They also suggest that incident and accident reporting has to promote an understanding of work environment as a whole which in turn will improve human factors and safety culture within the organization.

According to De Silva and Nawarathne (2014) eight gaps can be identified in the existing accident reporting procedure in Sri Lanka which also can be identified as barriers for maintaining an effective and centralized reporting system for construction industry. Although the study has focused on construction industry findings can be applied to other industries as well. Based on the identified gaps De Silva and Nawarathne (2014) suggest seven strategies for minimizing underreporting which are; establishment of independent division to maintain centralized occupational accident recording system, employing qualified safety representatives for organizations, introducing prescribed information sheets for accident reporting, conducting awareness programs on accident recording and reporting, decree to implement the SLS OSHAS 18001, continuous monitoring on notification of accidents and encouraging organizations to participate in OSH excellence awards.

2.13. Summary

A literature review was carried out in this chapter and areas discussed were definitions of an occupational accident, categorization of occupational accident, accident rates and trends, importance of accurate accident recording and reporting, accident recording and reporting systems, underreporting of occupational accidents, factors for underreporting, coverage of economic activities by legislation accident costs, workmen's compensation systems and strategies for minimizing accident underreporting.

Two broadly applied definitions of an accident namely OHSAS and ILO definitions were discussed in this chapter. Also, accident categorization according to OSHA and ILO were discussed. Literature review reveals that around 250 million occupational accidents occur annually and overall fatality rate is around 14 per hundred thousand workers.

Also, literature shows that accurate accident recording and reporting is important as data can be used for measuring performance, measuring level of success in compliance and for preventive action.

In almost all countries employers are responsible for reporting accidents to relevant authorities and a common feature is the “official notification forms”. Differences in types of accidents that are required to be reported exist due to the differences in legal definition of “reportable accident” in countries.

Studies have revealed that accident underreporting is a common problem in most of the countries and several factors for underreporting have been identified. Strategies for minimizing underreporting are based on the identified factors for underreporting.

In many countries occupations such as commercial driving, forestry and agriculture are left behind by legislation related to OSH. Workmen’s compensation systems also have differences across countries.

RESEARCH METHODOLOGY

3.1.Introduction

Research problem was identified after the literature review and objectives of the research were specified in chapter two. The next step is determining the process or steps followed in the research. This chapter gives a full description of the research process specifically focusing attention on research design, data collection, data analysis, interviewing of experts and presentation of results.

3.2.Research Design

Nested research methodology (Kagioglou et al.,1998) is followed to design the research process in this study as illustrated in Figure 3.1.

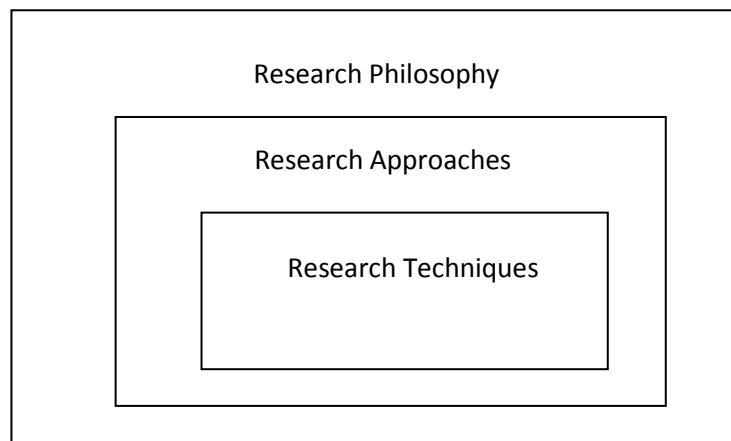


Figure 3.1: Nested Methodology

In this methodology, research philosophy leads for research approaches and research approaches leads for research techniques.

Factories Ordinance No. 45 of 1942 which is the prevailing legal framework for ensuring occupational safety, health and welfare of employees in Sri Lanka is applicable only to workplaces which fall under the definition of the term “Factory” in

the said ordinance. Hence, only the accidents occurring in “Factories” are required to be reported to the industrial safety division of the department of labour as stipulated in section 61 of the said ordinance. But, there are occupations which are not covered by the Factories Ordinance No. 45 of 1942 although they cause occupational accidents and employees in these occupations do not have the opportunity of getting the coverage of the law.

On the other hand, occupational accidents should be reported to the Commissioner for Workmen’s Compensation as stipulated in the Workmen’s Compensation Ordinance No. 19 of 1934. According to the said ordinance if there is an employer-employee relationship, the employer is liable to pay compensation for injuries experienced by the employees. As the Workmen’s Compensation Ordinance solely considers the employer-employee relationship, accidents occurring in any occupation are reportable to the Commissioner for Workmen’s Compensation. Hence, by analyzing the accidents reported to the Commissioner for Workmen’s Compensation during a particular time period it is possible to find the occupations which cause accidents although the occupation is not covered by the factories Ordinance No. 45 of 1942. This result will be very important as it reveals the areas to which the legal framework related to occupational safety and health has to be expanded in order to serve the working population to a better level.

Although the occupational accidents occurring in factories should be reported to the industrial safety division of the Department of Labour by the occupier of the factory according to the law, accident underreporting is a major problem in the field of occupational safety. Estimation of rate of underreporting has not been done in the country and in some instances even fatal accidents are not reported. As non employer based reporting mechanisms are not functioning in the country, affected employees fail to get the benefits that they are entitled for. On the other hand occupational accidents are reported to the Commissioner for Workmen’s Compensation by several sources such as notification by employers, complaints by injured persons or their dependents and by insurance companies when the employers have obtained Workmen’s Compensation insurance coverage.

Hence, by analyzing compensatory accident data and by comparing the same with the accident notification records at the industrial safety division of the Department of Labour, an estimation of the rate of underreporting of the compensatory accidents was done.

Some of the commonly used designs in quantitative studies can be classified by examining them from three different perspectives (Kumar, 2011) as shown in Figure 3.2. They are;

- 1) The number of contacts with the study population,
- 2) The reference period of the study,
- 3) The nature of investigation

The reference period refers to the time-frame in which a study is exploring a phenomenon, situation, event or problem (Kumar, 2011) and studies are categorized from this perspective as;

- 1) Retrospective;
- 2) Prospective and;
- 3) Retrospective-Prospective as shown in Figure- 3.2

This research was of retrospective type as past records at the office of the Commissioner for Workmen's Compensation were studied for obtaining the required data.

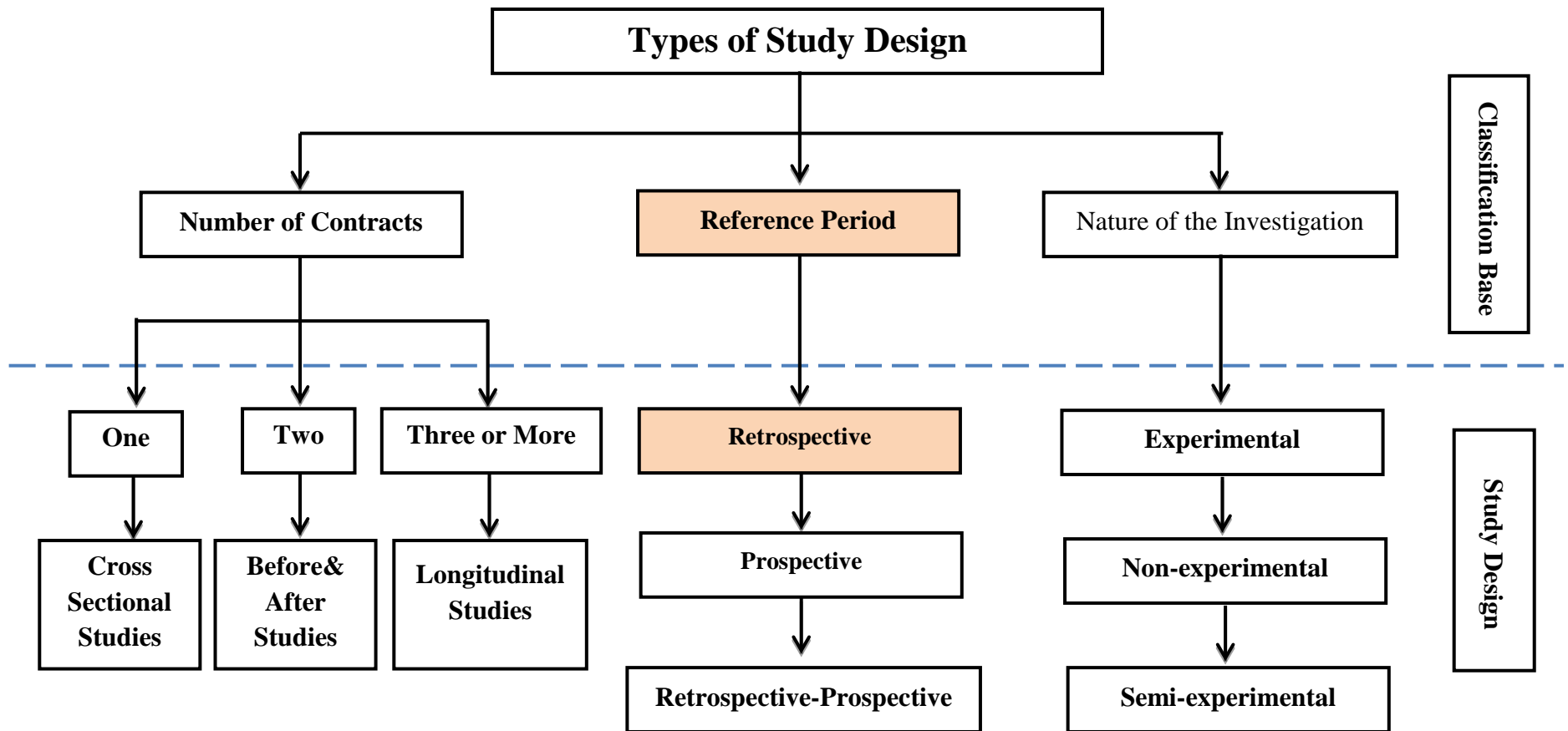


Figure 3.2 Types of Study Design

Source: Kumar, R. (2011) Research Methodology (3rd Edi.), New Delhi, SAGE Publication Ltd.

3.3. Research Process

Research process followed in this project can be illustrated as in figure 3.3

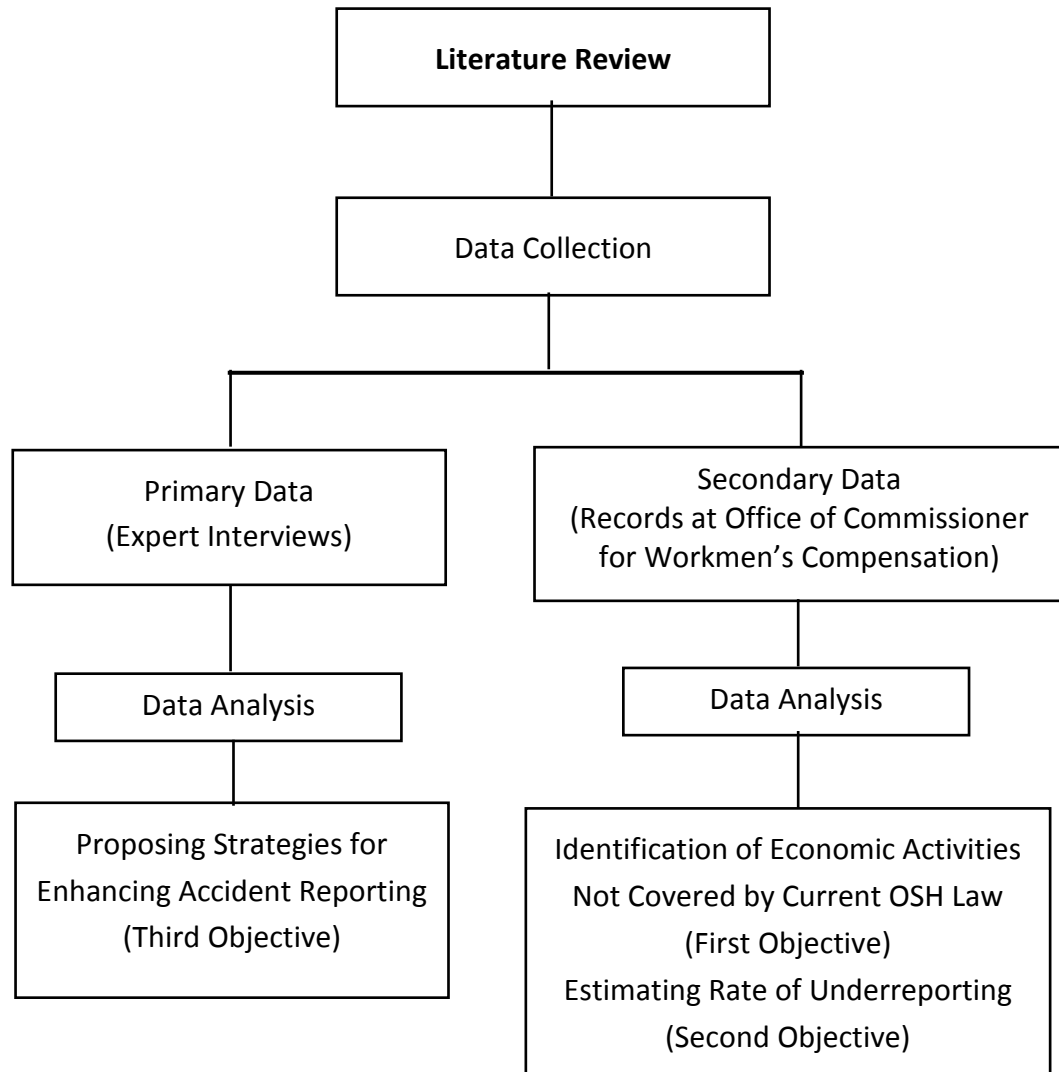


Figure 3.3 Research Process

Identification of the research problem and specifying the research objectives were followed by the literature review. Next, the data collection phase of the research was carried out where both primary and secondary data were collected. Primary data were obtained through expert interviews and secondary data were obtained from the records available at the office of the commissioner for workmen's compensation. The collected data were analyzed to reach the objectives.

3.3.1.Literature Review

A literature review was carried out at the beginning of the research. From the literature review it was evident that accurate reporting of occupational accidents is immensely important in the process of accident prevention. Also it was clear that accident underreporting is a common problem in most of the countries and Sri Lanka is also facing the same problem.

Literature review also revealed that some occupations are left behind by existing legislation related to OSH. Legal framework in a country should cover all the occupations if the country to reach higher standards of safety. Hence, identification of the occupations that are not covered by the current legal framework is important for expanding the coverage of legislation to cover all occupations.

After identifying the research problem, objectives of the research were specified.

3.3.2. Data Collection

According to Kumar (2011) there are two major approaches for gathering information in a research. First is collecting information and the second is extracting information from information which is already available. Based on these broad approaches of information gathering, data can be categorized as;

- 1) Secondary data and,
- 2) Primary data as shown in Figure 3.3

In this project data collection was of survey based and both primary and secondary data were collected.

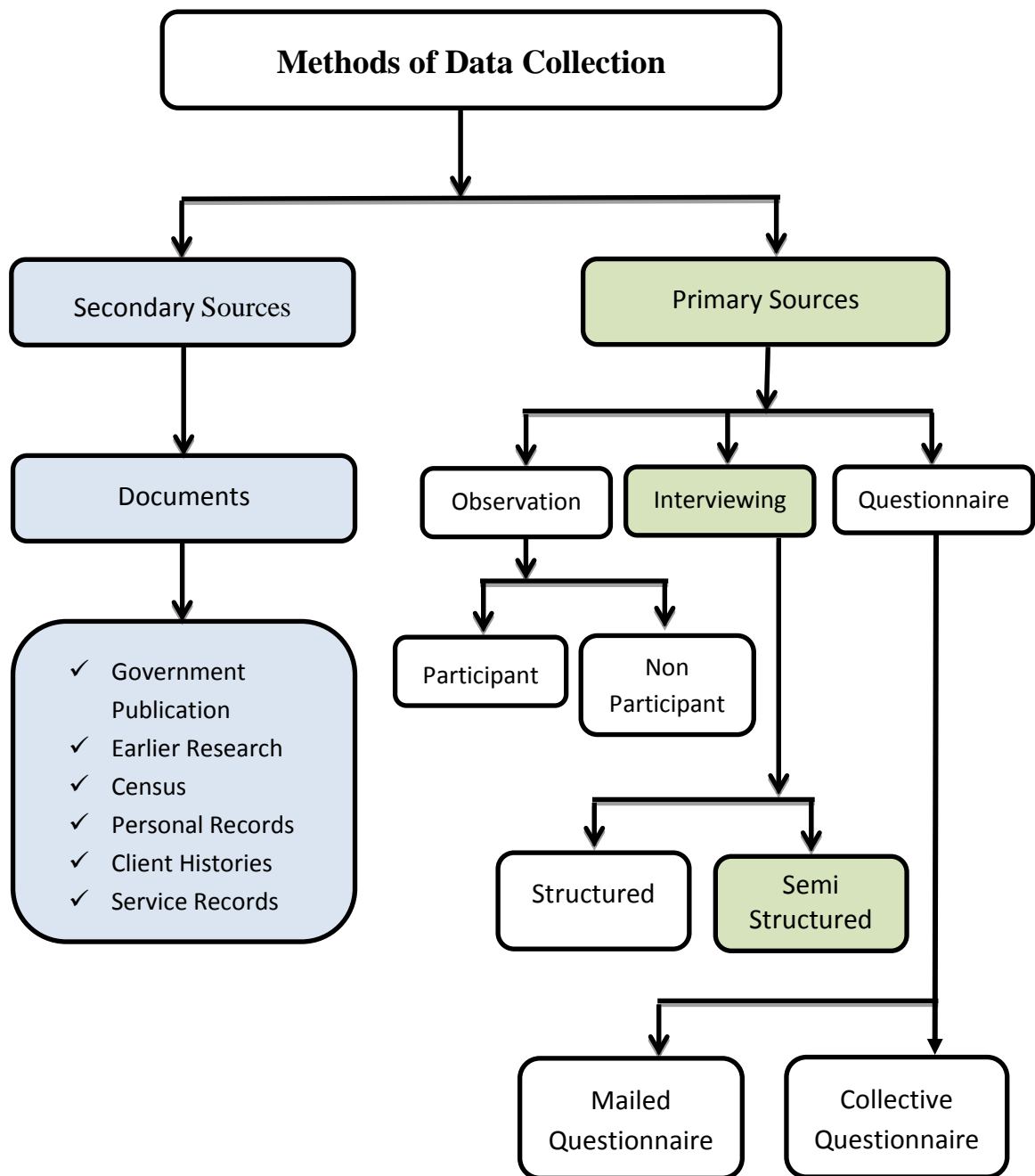


Figure 3.4 Methods of Data Collection

Source :Kumar. R (2011).Research Methodology(3rd Edi.), New Dellhi, SAGE Publication Ltd.

3.3.2.1. Secondary Data Collection

First two objectives of this research were to be achieved by data collection and data analysis. Data for the research were secondary data as they were obtained from records maintained at the office of the Commissioner for workmen's Compensation. Records pertaining to one year (1st January 2014 to 31st December 2014) were studied and required data were obtained.

Occupational injuries are reported to the Commissioner for Workmen's Compensation according to the Workmen's Compensation Ordinance No. 19 of 1934. According to this ordinance the employer is liable to pay compensation to the workman or his dependents (in case of a fatal accident) who meets with an accident which causes injury or death. The accident must have arisen out of his employment and must have occurred in the course of his employment. So, for accidents for which the injured or his dependents are entitled for compensation are reported to the Commissioner for Workmen's Compensation. Another condition that has to be fulfilled for claiming compensation is that the employee must be disabled for more than three days. Similarly according to the Factories Ordinance No. 45 of 1942, accidents which cause a disablement of more than three days must be reported to the Industrial Safety Division of the Department of Labour. So, compensatory accidents are reportable accidents to the Department of Labour if the occupation in which the accident occurred is coming under the preview of the Factories Ordinance.

Injuries are reported to the Commissioner for Workmen's Compensation in four ways. Hence, sources of data available at the office of the Commissioner for Workmen's Compensation are;

1. Complaints made by the injured person (Form A)
2. Complaints made by the dependents of deceased (Form B)
3. Notification by the employer (Form Q), and
4. Notification by the insurance companies (Form G)

In the process of data collection, all above sources were considered for a complete analysis.

Data Source 1– Complaints made by the injured person (Form A)

Complaints are made on Form A (Annexure- 1) and when a complaint is made by an injured person it is recorded as a court case in the office of the Commissioner for Workmen’s Compensation. A case number is given and a separate file is maintained until the end of the case. Hence, each and every case file was studied for obtaining required information. Economic activity of the organization was necessary and in many cases it could be identified by studying the details in Form A. In situations where the economic activity could not be identified from the details in Form A, the name and the address of the organization was forwarded the DFIE in the area and required details were collected. A complaint made on Form A accompanies a MER (Annexure-2) given by the doctor who treated the patient. Nature and the severity of the injury were obtained by studying the MER.

Data Source2 –Complaints made by the dependents of deceased (Form B)

Second source of data is the complaints submitted by the dependents of the dead person in the case of a fatal accident. Complaints are made on Form B (Annexure- 3) by the dependent. When a complaint is made by a dependent it is recorded as a court case in the office of the Commissioner for Workmen’s Compensation. A case number is given and a separate file is maintained until the end of the case. By studying field one of this form and by the details of the organization, the economic activity was identified and when required assistance of the DFIE of the respective area was taken.

Data Source 3 –Notifications made by the employers (Form Q)

Form Q (Annexure – 4) is used by the employers for notifying accidents to the Commissioner for Workmen’s Compensation according to the Workmen’s Compensation Ordinance No. 19 of 1934. A file is opened for each Form Q received by the commissioner and additional documents such as MER are called. Details such as the manner in which the workman was employed at the time of accident, cause of the accident and nature of injuries are given in the Form Q. Hence, by studying these forms required details for the research were obtained.

Data Source 4 – Notifications made by the insurance companies (Form G)

Fourth source of data was the notifications by insurance companies. Although Workmen's Compensation Insurance is not compulsory under the prevailing law some employers insure their employees. When the employer has obtained an insurance coverage for occupational accidents payment of compensation is done by the insurance company. According to Workmen's Compensation Ordinance No. 19 of 1934, in the case of a fatal accident compensation amount has to be deposited at the Commissioner for Workmen's Compensation. In accidents other than fatalities compensation can be directly paid to the injured person and the details of such payment have to be forwarded to the Commissioner for Workmen's Compensation. Hence, the insurance companies obtain details of the accidents from the employer and make the payment to the injured person. Form G (Annexure-5) is perfected and forwarded to the Commissioner for Workmen's Compensation. These details related to the payments are maintained in a separate file at the office of the Commissioner for Workmen's Compensation. All the G Forms relevant to the time period were studied to obtain required information for the research. There were some instances where it was not possible to obtain the required information only by studying Form G. In this situation a simple questionnaire (Annexure-6) was sent to the injured person.

Required details could be obtained from the reply sent back by the injured person. So, by studying these files details can be obtained for the research

3.3.2.2. Primary Data Collection

Primary data were collected for the third objective (i.e. Propose strategies for enhancing accident reporting) from experts in the field of OSH through interviews. Four most senior engineers in the Industrial Safety Division of the Department of Labour and Commissioner for Workmen's Compensation were selected for the interview. The engineers who were selected were The Commissioner of Labour (Industrial Safety), The Deputy Commissioner of Labour (Industrial Safety) and two Specialists Factory Inspecting Engineers. Table 3.1 shows information of experts.

The semi-structured questionnaire in Annexure -7 was used for the interview. A content analysis was carried out and the suggestions of the experts were summarized.

Table 3.1: Experts Profile

No.	Expert Name	Experience in OSH Field (years)	Relevant Authority
1	Expert A	23	Industrial Safety Division of Labour Department
2	Expert B	27	Industrial Safety Division of Labour Department
3	Expert C	30	Industrial Safety Division of Labour Department
4	Expert D	25	Industrial Safety Division of Labour Department
5	Expert E	5	Commissioner for Workmen's Compensation

3.3.3. Data Analysis

Occupational accidents reported to the Commissioner for Workmen's Compensation can be categorized for this research as shown in Figure - below.

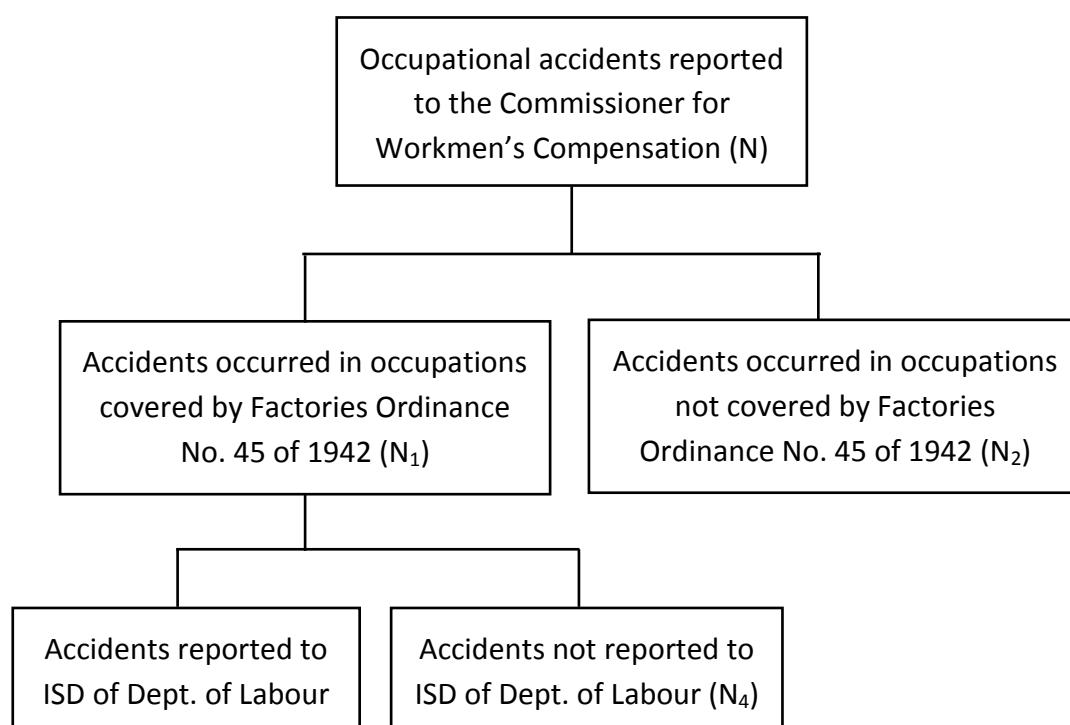


Figure - 3.5: Categorization of occupational accidents reported to the Commissioner for Workmen's Compensation

After the above categorization calculations were done as in earlier researches

1) Rate of underreporting of compensatory accidents = $(N_4/N_1) * 100\%$
.....(3.1)

2) Accidents occurred in occupations not covered by factories ordinance No.45 of 1942 can be further classified in to relevant occupations as

$$N2 = \sum_{i=1}^n N2(i) \quad \dots\dots\dots(3.2)$$

Where $N2(i)$ = Number of accidents in occupation i reported in the relevant period

3.4. Summary

Nested research methodology was followed in the research and study design was of retrospective type. Research process was discussed in detail with literature review, data collection, and data analysis.

Data collected were of both primary type and secondary type where primary data were collected through expert interviews and secondary data were extracted from records at the office of commissioner for workmen’s compensation.

Collected data were analyzed to reach the objectives. Descriptive statistics were used to analyze accident information. Rate of underreporting was obtained through a formula commonly used by other researchers. Further content analysis was used to analyze expert suggestions to derive strategies for enhancing accident reporting.

DATA ANALYSIS & DISCUSSION

4.1. Data Analysis

Data collected from the data sources mentioned section 3.3.2 were used for the first two objectives of the research. All the forms relevant to the period considered for the research were studied and the required fields were summarized as raw data given in Annexure-8.

When raw data were analyzed it could be seen that there are accidents which are not related to the occupation although they had been reported to the Commissioner for Workmen's Compensation. Further, it was observed that these are commuting accidents where the person has met with the accident while coming to work or while going back after work. Hence, raw data were initially categorized as given in Table – 4.1

Table-4.1 Number of Occupational and Non Occupational Accidents

Number of Occupational Accidents	Number of Non Occupational Accidents	Total
402	27	429

Source: Accident Records at WCC Office

Occupational accidents were further categorized to reach the objectives. First, occupational accidents were categorized in to economic activities as given in Appendix-8. After this categorization it was possible to identify the economic activities that are covered by the Factories Ordinance No. 45 of 1942 and the economic activities that are not covered by the said ordinance.

Accidents that have occurred in economic activities that are not covered by the Factories Ordinance No. 45 of 1942 were categorized as given in Table 4.2.

Table – 4.2: Categorization of Accidents Reported to WCC by Economic Activities not covered by Factories Ordinance

Economic Activity	No. of Accidents Reported to WCC
Tea Plantation	28
Transport	28
Quarrying	9
Sales & Field Work	9
Rubber Plantation	7
Toddy Tapping	5
Cleaning Service	4
Security service	4
Hospital Service	3
Equipment Installation	3
Advertising & Propaganda work	3
Coconut Plantation	2
Sugar Cane Plantation	1
Total	106

First objective of the research is to identify the economic activities that are not covered by Factories Ordinance No. 45 of 1942 although compensatory accidents are occurring in them. When figures in Table 4.1 and Table 4.2 are considered out of 402 occupational accidents 106 are from economic activities that are not covered by the current OSH legislation in the country. This indicates that 27% of compensatory accidents are from economic activities that are not covered by the current OSH legislation.

Table-4.3: Categorization of accidents in economic activities not covered by F.O according to Severity of injury

Economic Activity	Total	F		PTD		PPD		TD	
		No.	%	No.	%	No.	%	No.	%
Tea Plantation	28	3	10.71	-	-	11	39.29	14	50
Transport	28	11	39.29	1	3.57	11	39.29	5	17.85
Quarrying	9	4	44.44	-	-	5	55.56	-	-
Sales & Field Work	9	7	77.78	-	-	2	22.22	-	-
Rubber Plantation	7	1	14.29	-	-	2	28.57	4	57.14
Toddy Tapping	5	2	40.00	-	-	3	60.00	-	-
Cleaning Service	4	1	25.00	1	25.00	2	50.00	-	-
Security Service	4	3	75.00	-	-	1	25.00	-	-
Hospital Service	3	1	33.33	-	-	-	-	2	66.67
Equipment Installation	3	2	66.67	-	-	1	33.33	-	-
Advertising & Propaganda	3	-	-	1	33.33	2	66.67	-	-
Coconut Plantation	2	-	-	-	-	1	50.00	1	50.00
Sugar Cane Plantation	1	-	-	-	-	1	100.00	-	-

In the above table accidents that have occurred in economic activities which are not covered by the Factories Ordinance No. 45 of 1942 are further analyzed according to severity of injury. Figures in the table reveal that 53% of accidents are from two economic activities namely tea plantation and transport. Further, when figures in Table 4.3 are considered it can be seen that 11% of accidents that have occurred in tea plantation is fatal accidents and in transport it is about 40%. This is an indication that economic activities such as tea plantation and transport need close attention with regard to OSH.

Occupational accidents were next separated according to DFIE areas and were sent to respective DFIE. They were requested to mark whether the accidents were reported to them or not. According to the feedback of the DFIE^s data were summarized as given in Table-4.4.

Table-4.4: Accidents Reported to WCC & DFIE by Economic Activities Covered by Factories Ordinance No. 45 of 1942

Economic Activity	No. of Accidents Reported to WCC	No. of Accidents Reported to DFIE
Construction	74	15
Printing	18	0
Hotels	17	1
Metal Fabrication	9	5
Power Generation/ Distribution	8	6
Mechanical Workshop	2	0
Mineral Processing	2	2
Vehicle Servicing	2	1
Material Storage	3	2
Manufacturing of:		
Tea	44	28
Wood & Wood Products	27	5
Garments	24	18
Plastic/ Polythene & Rubber Products	13	4
Fiber & Fiber Products	13	3
Food & Beverage	12	8
Rubber	7	7
Briketts	4	2
Others	17	4
Total	296	111

Rate of underreporting can be calculated using equation 3.1 as follows.

$$\begin{aligned} \text{Rate of Under Reporting} &= \frac{\text{No. of accidents not reported to DFIE}}{\text{Total No. of reportable accidents}} \times 100\% \\ &= \frac{185}{296} \times 100\% \\ &= 62.50\% \end{aligned}$$

Second objective of the research was to estimate the rate of underreporting of occupational accidents based on the accidents reported to the Commissioner for Workmen's Compensation. Results of the data analysis indicate that the rate of underreporting is 62.50%. This can be compared with findings of previous researches conducted in other countries. According to Rosenman et al.(2006) rate of underreporting U.S is around 66% and Probst et al.(2008) suggests that companies with poor safety culture fail to report over 80% of accident to OSHA where companies with positive safety culture fail to report 47% of accidents. When average of the findings of Probst et al.(2008) is considered it is almost equal to the rate of underreporting estimated from this research.

Accidents which were not reported to DFIE were further analyzed according to the severity of injury as in Table-4.5.

Table – 4.5: Categorization of accidents which were not reported to DFIE according to severity of injury

Economic Activity	Number of Accidents not reported to DFIE	F		PTD		PPD		TD	
		No.	%	No.	%	No.	%	No.	%
Construction	59	23	38.98	4	6.78	24	40.68	8	13.56
Printing	18	-	-	-	-	1	5.56	17	94.44
Hotels	16	-	-	-	-	1	6.25	15	93.75
Metal Fabrication	4	-	-	-	-	3	75.00	1	25.00
Mechanical Workshops	2	-	-	-	-	1	50.00	1	50.00
Material Storage	1	1	100.00	-	-	-	-	-	-
Vehicle Servicing	1	-	-	-	-	1	100.00	-	-
Manufacturing of									
Wood& Wood Products	22	-	-	2	9.09	16	72.73	4	18.18
Tea	16	1	6.25	-	-	10	62.50	5	31.25
Fiber & Fiber Products	10	1	10.00	-	-	7	70.00	2	20.00
Plastic/Polythene/Rubber Products	9	-	-	1	11.11	7	77.78	1	11.11
Garments	5	-	-	-	-	4	80.00	1	20.00
Food & Beverage	4	1	25.00	-	-	2	50.00	1	25.00
Brickets	2	-	-	-	-	2	100.00	-	-
Others	13	2	15.38	-	-	11	84.62	-	-

When the figures in Table 4.5 are considered highest number of accidents that are not reported is in construction industry and out of these 39% are fatal accidents. Further 40% of that has not been reported from construction industry have caused permanent partial disability to the injured person. This is an indication of the level of OSH in construction industry.

4.2. Suggestions of experts for enhancing accident reporting

For the last objective (i.e. Propose strategies for enhancing occupational accident reporting) experts in the field of occupational safety and health were interviewed. From the Department of Labour, Commissioner of Labour (Industrial Safety), Deputy Commissioner of Labour (Industrial Safety) and two Specialist Factory Inspecting Engineers were interviewed. Also Commissioner for Workmen's Compensation was interviewed. Expert suggestions for enhancing accident reporting are summarized as follows:-

Suggestion 1: Legal action

Stringent legal action to be taken against employers who fail to report accidents. Expert A has mentioned "*Resources in Industrial Safety Division of the Department of Labour need to be increased to handle the legal action as the relevant enforcing entity*". Expert B of the same department explained "*Non employer based accident reporting systems such as obtaining accident details from hospitals, police and insurance companies and complaints from public should be strengthened to identify employers who do not report accidents*". Further, all the experts stated that increasing fines for not reporting accidents can also lead to reduce underreporting.

Suggestion 2: Awareness among public

Improve awareness among public was suggested by all the experts where expert B suggested "*Advertisements in television and newspapers can be used to encourage public to report accidents by which non employer based accident reporting can be increased*". Expert C mentioned "*Awareness programmes conducted at organizational level will help employers/managers to improve knowledge on legal*

provisions related to accident reporting". Currently the Industrial Safety Division of the labour department conducts many awareness programmes island wide specially to mark World Safety Day and the National Safety Week. Apart from these DFIE offices conduct awareness programmes at organizational level on the request of the organizations.

Suggestion 3: Coordination between authorities

Coordinating authorities such as department of labour, hospitals and devising a mechanism to exchange data was also suggested by all the experts. According to expert D "*Under section 61 of the Factories Ordinance No. 45 of 1942, department of labour can take legal action for not reporting accidents. So, coordination between authorities will make legal action effective*". Although the formation of an independent authority for collecting accident data is another idea, experts were not certain that it will function effectively due to various reasons. Reasons expressed by expert C and D were "*Will this independent authority have enough power to obtain data from other organization such as department of labour and hospitals and will the organizations give their data to this independent authority without any objection*". Another doubtful area is the purposes for which data will be used. Expert A says "*Uses of data should be clearly defined to prevent using them for personal interests*".

Suggestion 4: Increasing amount of compensation

Expert E mentioned "*Amount of compensation paid to victims should be increased. Simultaneously resources at the office of the Commissioner for Workmen's Compensation should be increased and the officers should be give opportunity upgrade knowledge in the relevant field. Awareness among public should also be increased to encourage claiming compensation*".

Suggestion 5: Safety award system/rating system

Introducing an award or rating system for industries to motivate them for following OSH rules and regulations was another suggestion. Expert A states "*The award or*

rating system will be more effective if it gives financial benefit to the organization. Financial benefit may be such as income tax reduction or customs duty reduction”.

Suggestion 6: Employing qualified safety officers in organizations

Expert D stated “*In Sri Lanka qualifications of safety officers are not defined. This has given opportunity to organizations for employing any person as a safety officer and the person may not be well aware of the legal provisions*”. Hence employing qualified persons as safety officers will help organizations to improve safety and it will also lead for reducing underreporting.

Suggestion 7: Obtaining confirmation from Department of Labour before payment by insurance companies

According to Factories (Amendment) Act No. 33 of 2000 particulars relevant to occupational accidents are furnished to department of labour by insurance companies after payment of compensation where process of insurance payment sometimes takes few months from the date of accident. Expert A and Expert C mentioned “*The department of labour gets the information after few months of the accident and by this time the workplaces such as construction sites in which accidents occurred may not be present*”. Hence, the system should be changed in such a way that the insurance companies have to get the confirmation from the department of labour that accident has been reported prior to the payment of compensation.

4.3. Summary

It is evident from the data analysis that 27% of economic activities are left behind by the legislation relevant to OSH. This is a serious issue when OSH standard in the country is considered as a whole as the persons employed in these economic activities are not getting attention with regard to OSH. Also it is obvious that accident underreporting which is a burning issue can be solved through the implementation of strategies suggested by the experts. Seven strategies can be implemented at organizational level and national level to overcome this situation

CONCLUSION & RECOMMENDATIONS

5.1. Conclusion

First objective of the research was to identify the economic activities that are not covered by Factories Ordinance No. 45 of 1942 although compensatory accidents are occurring in them. Data analysis reveals that 27% of compensatory accidents are from economic activities that are not covered by the current OSH legislation. This is an indication that about one fourth of economic activities are left behind by the legislation. Under this situation the employees in these economic activities are not getting attention with regard to OSH in their employment.

When accidents that have occurred in economic activities that are not covered by law are further analyzed, it is observed that 53% of them are from two economic activities namely tea plantation and transport. Further, when figures in Table 3 are considered it can be seen that 11% of accidents that have occurred in tea plantation are fatal accidents and in transport it is about 40%. This is an indication of the severity of accidents occurring in these economic activities. Hence, immediate attention is required for expanding the legal framework in the country to cover all economic activities.

Second objective of the research was to estimate the rate of underreporting of occupational accidents based on the accidents reported to the Commissioner for Workmen's Compensation. Results of the data analysis indicate that the rate of underreporting is 62.50%. This indicates that underreporting is a burning issue in the country. Further, when the figures in Table 5 are considered highest number of accidents that are not reported is in construction industry and out of these 39% are fatal accidents. Further 40% of that has not been reported from construction industry have caused permanent partial disability to the injured person. Hence, implementing the proposals of experts for enhancing accident reporting is an immediate requirement as far as safety of the working population is considered.

Third objective of the research is proposing strategies for enhancing accident reporting. Experts in the field of OSH who were interviewed for this objective have proposed the following seven strategies.

1. Taking stringent legal action against employers who fail to report accidents to the department of labour. This will be more effective if the amount of fines is also increased.
2. Improving awareness among public through mass media and conducting awareness programmes at organizational level to make employers/managers aware of the legal provisions related to accident reporting.
3. Improving coordination between authorities such as department of labour, hospitals and police and devising a mechanism for exchanging data among authorities.
4. Increasing amount of compensation. This has to be coupled with increasing the resources at the office of Commissioner for Workmen's Compensation and encouraging public to claim compensation.
5. Introducing a safety award or rating system for organizations where award or rating will carry a financial benefit for the organization.
6. Employing qualified safety officers in organizations and defining qualifications of safety officers.
7. Amending the legal framework to require insurance companies to get confirmation from department of labour that the accident has been reported to the same before payment of compensation.

Implementation of above strategies will lead for enhancing accident reporting to a considerable level.

Findings of the research are of immense importance when OSH management in economic activities is considered. If the outcome of the research is considered in amending the legislation and in framing national level policies the entire working population in the country will be benefitted.

5.2. Recommendations

Through the analysis of data it is evident that about one fourth of accidents for which compensation is claimed are from economic activities that are not covered by the Factories Ordinance No. 45 of 1942. Under this situation employees in these economic activities are not getting attention with regard to OSH. Hence, this is a serious problem when OSH is considered as a whole in the country.

The only solution to overcome this problem is to amend the legal framework in such a way that it will cover all the economic activities. Hence, the relevant authorities should take immediate attention to amend the law.

Further, it is obvious from the analysis of data that accident underreporting is a burning issue in the country. Also it is evident that the issue is very much prominent in construction industry where 39% of the accidents that have not been reported to the department of labour are fatal accidents. Hence, the proposals of the experts in the field of OSH should be implemented immediately and special attention should be paid to OSH in construction industry.

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Annexure -1

FORM "A" (Under Regulation 11)

WORKMEN'S COMPENSATION ORDINANCE, No. 19 OF 1934 APPLICATION FOR COMPENSATION BY WORKMAN



To : THE COMMISSIONER FOR WORKMEN'S COMPENSATION, COLO-100.

Applicant's { Name :
 { Address :

versus

Respondent's { Name :
 { Address :

It is hereby submitted that—

(1) The applicant, a workman employed by (a contractor with) the respondent on the _____ day of _____, 19____, received personal injury by accident arising out of and in the course of his employment. The cause of the injury was (here insert briefly in ordinary language the cause of the injury)

(2) The applicant sustained the following injuries, namely :—

(3) The monthly wages of the applicant amount to Rs. _____

the applicant is $\frac{\text{over}}{\text{under}}$ the age of 15 years.

*(4) (a) Notice of the accident was served on the _____ day of _____, 19____
(b) Notice was served as soon as practicable.
(c) Notice of the accident was not served (in due time) by reason of _____

*(5) The applicant is accordingly entitled to receive—

(a) Half-monthly payments of Rs. _____ from the _____ day of _____, 19____, to _____

(b) A lump sum payment of Rs. _____

(6) The applicant has taken the following steps to secure a settlement by agreement namely,

but it has proved impossible to settle the questions in dispute because

*You are therefore requested to determine the following questions in dispute, namely—

- (a) Whether the applicant is a workman within the meaning of the Ordinance ;
- (b) Whether the accident arose out of or in the course of the applicant's employment ;
- (c) Whether the amount of compensation claimed is due, or any part of that amount ;
- (d) Whether the respondent is liable to pay such compensation as is due ;

I certify that the facts which I have stated above are to the best of my knowledge and belief, true and correct.

Annexure -2 MEDICAL EXAMINATION REPORT

1. (a) Name of Workman :
- (b) Postal Address :
- (c) Age :
- (d) Sex :
- (e) Employment in which injured workman was engaged at the time of accident :
- (f) Date of Accident :
- (g) History of accident as stated by injured workman :
2. (a) Name and extent of injuries :
- (b) Is the incapacity to work solely due to the accident ? :
- (c) Is the disablement temporary or permanent ? :
- (d) If TEMPORARY, state the probable duration of disablement, giving the date of commencement :
- (e) If PERMANENT, state the percentage of loss of earning capacity :
- (Please state percentage in words and figures)
- (f) Is a review necessary, If do when :
3. If the injured workman is suffering from occupational disease mentioned in Schedule III, state :
- (a) The description of occupational disease the workman is suffering from :
- (b) Is the disablement temporary or permanent ? :
- (c) If TEMPORARY, state the probable duration of disablement, giving the date of commencement :
- (d) If PERMANENT, state the percentage of loss of earning capacity :
- (Please state percentage in words and figures)
4. Is the injured workman's injury consistent with his present condition :
5. Dates of Examination:
6. Any other remarks :
- (X-ray examination, light duty recommended etc.)

Signature of the Registered
Medical Practitioner

Name :

Qualifications :

Designation if in Govt. Service :

Date :

Annexure -3



No.

Stamp not
to be
cancelled

RORM B

(Under Regulation 11)

WORKMEN'S COMPENSATION ORDINANCE, No. 19 OF 1934

APPLICATION FOR ORDER TO DEPOSIT COMPENSATION FOR DEPENDANTS

To: The COMMISSIONER FOR WORKMEN'S COMPENSATION, COLOMBO

Applicant's { Name :
Address :

versus

Respondent's { Name :
Address :

It is hereby submitted that

(1) _____ a workman
employed by (a contractor with) the respondent on the _____ day
of _____, 20, _____ received personal injury by accident arising out of
and in the course of his/her employment resulting in his/her death on the
day of _____, 20, _____. The cause of the injury was (*here insert
briefly in ordinary language the cause of the injury*)

(2) The applicant(s) is a/are dependant(s) of the deceased workman being his/her

(3) The monthly wages of the deceased amount to Rs. _____
The deceased was over/under the age of 15 years at the time of his/her death.

* (4) (a) Notice of the accident was served on the _____
20,

(b) Notice was served as soon as practicable.

(c) Notice of the accident was not served (in due time) by reason of

(5) The deceased before his/her death received as compensation the total sum of
Rs. _____

(6) The applicant(s) is/are accordingly entitled to receive a lump sum payment of
Rs. _____

You are therefore requested to award to the applicant the said compensation or any other compensation to which he/she may be entitled.

I certify that the facts which I have stated above are to the best of my Knowledge and belief true and correct.

Dated :

20

Signature or make of Applicant.

*Strike out the clauses which are not applicable.

Annexure -4

W. G. 11
(P. 2. 3. & 4.) 02/75

24.4.— හදිසි දූතයුරු සිදුවූ දින සිට දින 14ක කාල පරාසයේ දූතයුරු වෛෂයන්ගේ සේවා පිළිබඳව පත්‍ර යුගය.
N. N.—This Report should be furnished to the Commissioner within a period of 14 days reckoned from the date on which the accident occurred

“සීටී” ආකෘති පත්‍රය FORM Q

(1956 සැප්තැම්බර් 14 වැනි දින සහ අංක 11,025 දරන සැසටු කිරීමේදහසේ මෙහිත් සංස්කරණය කරන ලද පිටුවේ පෙරලුණු සහ 1956 අංක 19 දරන කම්කරු මන්දි ආඥාවන් 37 (1) වැනි විධානමය යටතේ සකස් කරන ලදී.)

(Under section 37(1) of the Workmen's Compensation Ordinance, No. 19 of 1956, and Regulation 61 as amended by Notification in Gazette No. 11,673 of December 14, 1956)

කම්කරු මන්දි ආකෘතිකරණ අධිකාරිය, කොළඹ.
To: The Commissioner for Workmen's Compensation, Colombo.

විෂය විස්තරයයි/SIR,

මාගේ විෂයයේ සේවකයෙකු සිදුවූ හදිසි දූතයුරු ප්‍රතිඵලයක් වශයෙන් සහයෝගී දැක්වීමකින් තොරව ප්‍රකාශයෙහි සඳහන් තැනිත්/ නමැතිවත් හදුන්වනු ලබන කම්කරුවන්/කම්කරුවන්ට දූතයුරු සිදුවූ සිට සිටින දිනක කිසිවක් කැලැන්පතකි.

I HAVE the honor to report that the workman/workmen whose name/s appear in the statement of particulars set out hereunder has/have been injured as a result of an accident occurring on my business premises.

මිය ගියේ/වියා.

එම හදිසි දූතයුරු සිදුවූ දින සිට අනුකූල පිළිවෙලින් දින තුනක් ඇතුළත එම කම්කරුවන්/කම්කරුවන්ට
දින 03 තොරතුරු සීමාව/ සංචාලිතය.

The workman/workmen died within a period of three consecutive days next succeeding that in which the accident occurred.

විස්තර ප්‍රකාශය Statement of Particulars

- (අ) නම, වයස, ලිංගික ස්වභාවය, වයස අදියර (අන්තර් සිට පිටත) }
(a) Name, sex, age and marital status.
- (ආ) හදිසි දූතයුරු සිදුවූ දිනය }
(b) Date of accident
- (ඇ) හදිසි දූතයුරු සිදුවූ ස්ථානය }
(c) Place where the accident occurred
- (ඈ) එම හදිසි දූතයුරු සිදුවූ අවස්ථාවෙහිදී එම කම්කරුවන්/කම්කරුවන්ට සේවයෙහි යොදවා සිටි අන්දම }
(d) Manner in which the workman was employed at the time
- (ඉ) එම හදිසි දූතයුරු සිදුවීමට හේතුව }
(e) Cause of accident
- (ඊ) කුඩාලුණු ස්වභාවය }
(f) Nature of injuries
- (උ) එම කම්කරුවන්/කම්කරුවන්ට සේවයෙහි නියම කළ, දැන්වූ හෝ එම කම්කරුවන්ට සේවයෙහි යොදවා තිබූ සේවකයන්ගේ නම සහ-මවුන් හා එම කම්කරුවන්/කම්කරුවන්ගේ අන්තර් සබඳතාව }
(d) If the workman is dead, the names of the dependents and their relationship to the workman/workmen if known
- (ඌ) වෙර අදාළ වන වෙනත් සරුකුණු }
(h) Any other relevant particulars

ඔබගේ විෂයයේ සේවකයා,
I Am, Sir
Your obedient Servant,

දිනය/Date:

.....
සේවකයන්ගේ සේවකයාගේ අත්සන/
Signature of Employer,
.....
නම සහ ලිපිනය/Name and Address
.....

*කම්කරු මන්දි ආකෘතිකරණ අධිකාරිය, කොළඹ.

Annexure -5

FORM "G"

(Under Regulation 38)

Workmen's Compensation Ordinance, No. 19 of 1934

MEMORANDUM OR AGREEMENT

W.A. 7
(P 2 Eng.) 7/33

Affix an
Uncancelled
Stamp for
Rs. 10

It is hereby submitted that on the _____ day of _____, 19____,
personal injury was caused to
residing at _____

by accident arising out of and in the course of his employment at _____

The said injury has resulted in permanent disablement to the said workman of the following
nature, namely :—

The said workman's average monthly wage is estimated at Rs. _____

The said workman has, prior to the date of this agreement, received the following
payments, namely :—

Rs. _____	on _____	Rs. _____	on _____
Rs. _____	on _____	Rs. _____	on _____
Rs. _____	on _____	Rs. _____	on _____

It is further submitted that
the employer of the said workman has agreed to pay, and the said workman has agreed to
accept the sum of Rupees _____
(State amount in words)

in full settlement of all and every claim under the Workman's Compensation Ordinance,
No. 19 of 1934, in respect of the disablement stated above and all disablement now manifest.
It is therefore requested that this memorandum be duly recorded.

Dated : _____, 19____, _____

Signature of { Employer : _____
Witness : _____ Name and Address of Employer.

Signature or mark of Workman : _____

Signature of Witness : _____

NOTE.—An application to register an agreement can be presented under the signature of one party, provided that the other party has
agreed to the terms. But both signatures should be appended, whenever possible.

Receipt

(To be filled in when the money has actually been paid)

In accordance with the above agreement, I have this day received the sum of
Rupees _____
(State amount in words)

Signature or mark of Workman.*

Dated : _____, 19____, _____

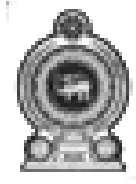
The money has been paid and this receipt signed in my presence.

(On Rs. _____ Stamp)
Signature of Witness.

NOTE.—This form may be varied to suit special cases, e.g. injury by occupational disease, agreement when workman is under legal
disability, &c.,

Appendix 6- Questionnaire for obtaining details from injured persons

luzlrefomdrA;fuzka;=j
 DEPARTMENT OF LABOUR
 oqrl:kh
 njhiyNgm 081-2225087
 Telephone Your No.
 *elaiaawxlh-ngf;]; ,yFax No: 081-2225087



uf.awxlh
 My No.
 @f@w@xlh



osia;%slalrAudka;Yd,dmrSlaIlbxcfskareldrAhd,h" luzlref,aluzldrAhd,h" "hákqjr]ù†h",uykqjr
 khtl;lnjhoppw;rhiygupNrhjidnghwpáashsHmYtyfk;"njhopy; \$izf;fsk;"abDtu æ\$"fz;b
 Office of the District Factory Inspecting Engineer, Department of Labour, LabourSecretariat,YatinuwaraVeediya, Kandy

2015.05.

.....

මහත්මයාණෙනි/මහත්මියනි.

රැකියාව ආශීර්ෂිත හදිසි අනතුරු පිළිබඳ විමර්ශනය.

ඉහත කරුණු ඔබට අදාළ වීමේ මකාර්යාලය මඟින් කරනු ලබන විමර්ශනයක් සඳහා
 දින ම බට සිදු වූ හදිසි අනතුරු පිළිබඳව තොරතුරු අවශ්‍ය ව ඇත.

02. එබැවින් පහත ආකෘතිය සම්පූර්ණ කර මෙම ලිපියේ දින සිට සති දෙකක් ඇතුළත මෙම කාර්යාලයට ලැබීමට සලස්වන ලෙස ඉල්ලා සිටිමි.

මිට වියවා සි.

.....

දිස්ත්‍රික් කර්මාන්ත ශාලා පරීක්ෂක ඉංජිනේරු
 - මහනුවර

අවශ්‍ය තොරතුරු

1. අනතුර සිදු වන අවස්ථාවේ සේවය කළ ආයතනයේ
 - i. නම :-
 - ii. ලිපිනය :-

2. එම ආයතනයේ සිදු කරන නිෂ්පාදනය/ කාර්යය (උදා - ඇඟළු නිෂ්පාදනය, ගොඩනැගිලි ඉදිකිරීම) :-

3. බලගේ රැකියාව :-

4. අනතුර සිදු වූ ආකාරය (කෙටියෙන් විස්තර කරන්න) :-

Annexure 7 – Questionnaire for expert interviews

- (1) Accident under reporting is a major problem when OSH management is considered. Do you agree with this statement?
- (2) Some employees are reluctant to report accidents to the management. Can this lead for underreporting?
- (3) In your opinion what can be the reasons for personal level under reporting?
- (4) What do you propose to minimize under reporting at personnel level?
- (5) Some organizations do not report accident to relevant authorities such as Labour department &, commissioner for W C. what can be the reasons for not reporting accidents by organizations?
- (6) What are your suggestions to minimize underreporting at organizational level?
- (7) Do you think that lack of national level policies and strategies relevant to accident recording and reporting lead for under reporting?
- (8) What are the additions or changes in national level policies you propose for minimizing underreporting?
- (9) Do you think coordination between authorities such as hospitals, department of Labour and Workmen's Compensation Commissioner's office will enhance accident reporting?
- (10) If a central authority/Independent authority is established for collecting and maintaining accident data will it lead for enhancing accident reporting?
- (11) In your opinion, what are the organizations that have to be coordinated with the authority mentioned in (9)?

Annexure 8 –Summarized raw data

*- Details in these columns were deleted to prevent identifying persons & organizations

Se. No.	Name of Injured *	Date of Accident:	Organization *	Nature of the Accident	Severity of Injury	Type of Industry	covered by F.O
1		2012/9/26		Fallen while working in factory	ppd-75%	Tea Manufacturing	y
2		2013/7/8		Hand Caught in the roller machine	td	Tea Manufacturing	y
3		2013/3/12		Hit by machinery	ppd-5%	Tea Manufacturing	y
4		2013/7/17		vehicle accident while on an official travel	td	Electricity distribution	y
5		2014/3/21		Hand Caught in the roller machine	td	Tea Manufacturing	y
6		2013/2/16		Snake bite in the field	td	Rubber plantation	n
7		2013/7/30		Stuck by falling object	td	Tea Manufacturing	y

Annexure 9- Accident data categorized in to economic activities

Se. No.	*Name of Injured	Date of Accident:	* Organization	Nature of the Accident	Severity of Injury	Economic Activity	covered by F.O	Notified to DFIE
26		2013/11/15		Fall from the scaffolding when working as a mason	td	Construction	y	n
29		2013/7/26		Fallen in to an excavation	td	Construction	y	n
33		2013/12/14		Stuck by a falling scaffolding from upper floor	ptd-100%	Construction	y	n
38		2014/9/29		Fallen from upper floor of a building	F	Construction	y	n
51		2012/2/20		Fallen from a scaffolding	td	Construction	y	n
55		2013/11/21		Bursting of a grinding stone	td	Construction	y	n
68		2014/3/4		Stuck by a falling object	td	Construction	y	n
72		2014/3/6		Buried under soil	f	Construction	y	n
74		2013/1/22		Fall from height	ppd-20%	Construction	y	n
86		2014/5/12		hit by a piece of bursting grinding wheel	ppd-10%	Construction	y	n
90		2014/8/21		Fallen in to an excavation	f	Construction	y	y
100		2014/7/5		run over by road roller	ppd-75%	Construction	y	y
113		2013/8/8		Injured while unloading a roller from a lorry	td	Construction	y	y
117		2012/4/8		Crushes inside a concrete mixing machine	ptd-100%	Construction	y	n
123		2014/8/25		stuck by an object	ppd-50%	Construction	y	n

*- Details in these columns were deleted to prevent identifying persons & organizations