

**The Status and Performance of Workplace Health and Safety  
Information System in Nairobi Province, Kenya**

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A Thesis Submitted in Partial Fulfillment for the Degree of Master of Science in  
Occupational Health and Safety in the Jomo Kenyatta University of Agriculture and  
Technology.

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## DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

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This thesis has been submitted for examination with our approval as university supervisors

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## **DEDICATION**

I would like to dedicate this project to my wife, Janet and daughter, Michelle. Your patience and understanding were encouraging during this study.

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## **LIST OF ABBREVIATIONS**

<b>BLS</b>	Bureau of Labor Statistics
<b>DHP</b>	Designated Health Practitioner
<b>DOHSS</b>	Directorate of Health and Safety Services
<b>DOL</b>	U.S. Department of Labor
<b>EU</b>	European Union
<b>HSE</b>	Health and Safety Executive – United Kingdom
<b>ILO</b>	International Labor Organization
<b>NOHSAC</b>	National Occupational Health and Safety Advisory Committee
<b>OSH</b>	Occupational Safety and Health
<b>OSHA-K</b>	Occupational Safety and Health Act – Kenya
<b>OSHA-US</b>	Occupational Safety and Health Administration - United States
<b>UK</b>	United Kingdom
<b>USA</b>	United States of America
<b>WIBA</b>	Work Injury and Benefits Act
<b>WHO</b>	World Health Organization

## **ABSTRACT**

Workplace is a significant contributor to disease, injury and fatalities. This study investigated the status and performance of workplace health and safety information system in Nairobi Province, Kenya. The study was motivated by requirement for information on workplace injury and disease data, risk factors, distribution patterns and cost of hazards. Systematic random sampling was used to select 150 workplaces from 845 registered workplaces in Nairobi Province for interviews using a semi-structured questionnaire. Nairobi Province was selected because of its heavy concentration of industries and other enterprises. The method and systems in place for collecting, coding, analyzing and use occupational disease and injury data were appraised to determine the limitations that hamper efforts to quantify the nature and extent of occupational hazards. This study found that 39.3%, 45.3%, 12.0%, 21.3% and 19.3% of workplaces recorded, reported, analyzed, kept records and used injury and disease data respectively. The study also found collection, management and dissemination of injury and diseases data were poor and the regulator scored 4, 1 and 3 respectively in a scale rating of 10. The study concluded that workplace data management system was not adequate and recommends formulation of workplace data policy with an appropriate framework of an elaborate and effective data collection, management and dissemination structures supported by necessary trainings that will provide meaningful statistics to fight against workplace hazards.

## CHAPTER ONE

### 1.0 INTRODUCTION

All workplaces are prone to hazards. The manufacturing, the processing and the use of chemicals, materials, tools, machinery, and equipment in industrial, construction, mining, agricultural and other workplaces are usually accompanied by environmental, health and safety hazards and risks [Ashford and caldart, 1996]. In every workplace, workers are exposed to hazards that may be harmful to them. These hazards cause injuries, disease or exacerbate major disease of the respiratory, cardiovascular, reproductive, and nervous system and cause systemic poisoning and some cause cancer and birth defects.

Occupational diseases and injuries place heavy economic and social burden on workers, employers, citizens and taxpayers. It is therefore imperative that administration of workplaces and regulatory offices takes lead role in the identification and reduction of these risks [Levenstein *et al.*, 2000].

In most countries, the process of industrialization resulted in creation of factory systems, propelling urbanization and generating a working class thus changing people's lives radically. Forced by economic necessity into these newly created factories of the machine age, workers found themselves controlled by bosses whose sole concern was profit [Levy *et al.*, 2006].

The commitment to economic advancement made the workers blind to the toll cost of their safety and health. Workers were engaged to more pressing need of making a living for their families to pay too much attention to widespread occupational safety and health problems. Working in those industries, workers encountered a whole new set of conditions

and became powerless as they were tied to the speed of the machines they operated, and faced ever-present dangers of physical injuries from machines and exposure to chemicals and gases [Levy *et al.*, 2006].

The workplace became a source of injury, disease, disability and death. These injuries and illnesses became so numerous prompting governments, social reformers, professionals and workers to start agitating for elimination of these dangers [Levy *et al.*, 2005]. With the help of social reformers and professionals, people struggled to improve these conditions.

In middle and late 19<sup>th</sup> century, workplace conditions in Britain and Germany were improved through government laws and regulations. There was increase in laws restricting working hours, employment of women and children, promotion of protection against hazardous conditions [Levy *et al.*, 2006].

By 20<sup>th</sup> century workers, unions, and social reformers had achieved political representation in the form of labor, socialist and social democratic parties. This was a major factor in establishing laws to improve working conditions. Britain passed its workmen's Compensation Act for occupational injuries in 1897 while Germany passed a similar law in 1900.

In United States of America (USA), the concern for health and safety of workers increased over the years and the need for a healthy workforce was considered indispensable. In 1960s injury rates rose to 29 percent in USA prompting caution, but it was a mine disaster of 1968 in Farmington, West Virginia (USA) in which 78 miners were

killed that prompted public sympathy and a major step in legislation of workplace safety laws [Levenstein *et al.*, 2000].

In recent years, all the efforts by various governments, labor unions, international organizations, social reformers and workers have been geared towards prevention and reduction of these hazards in the workplaces. The Coal Mine Health and Safety Act of USA was passed in 1969 and was immediately followed by the first comprehensive federal legislation to protect workers, the occupational safety and health act (OSHA – US) that was enacted in 1970 [Levenstein *et al.*, 2000].

Agitation by labor organizations, legislations and inspections by government agents have been some of the methods used to control workplace hazards but have not produced effective results in the elimination of the hazards. The above methods could not quantify the nature and the extent of the hazards and therefore the developed nations and the International Labor Organization (ILO) adopted management of injury and disease data management for it could be used to identify health and safety issues then set and evaluate intervention programs [Malcolm *et al.*, 1998].

Management of workplace injury and disease information involves systematic data collection, coding, analysis and dissemination of information in order to monitor trends in injury and disease events, identify all health and safety issues and determine the cost of injury and disease to the society [Stephens, 2006]. Management of workplace injuries and illness data is also an elaborate system of data collection, creation of database structure management, analysis and dissemination of the information for use in the hazards controlling programs [Malcolm *et al.*, 1998]. The management of workplace injuries and

disease in Nairobi province was evaluated and the result is intended to assist in prevention and control of hazards in the workplaces.

### **1.1 Statement of the Problem**

Many injuries and illnesses in workplaces arise from exposure to hazards. Improving workplace conditions and preventing the resultant injuries and illnesses require deeper interpretation of the hazardous conditions.

New chemicals in products, wastes and workplaces, limits in regulatory enforcements and the demands for an increasingly competitive global economy exacerbate the need to maintain and improve working conditions. The occupational health and safety problems are global in scope. The globalization of productions, trade and consumption [Levy *et al.*, 2006] has made occupational health and safety problems ubiquitous. Workers in developing countries and newly industrialized countries now face a range of workplace hazards.

The International Labor Organization (ILO) has a pyramid representation of relationship and interpretation between fatal accidents and other accidents and incidents in the workplaces. The pyramid represented in Figure 1 shows what one fatality in the workplaces implies according to other injuries and incidents.

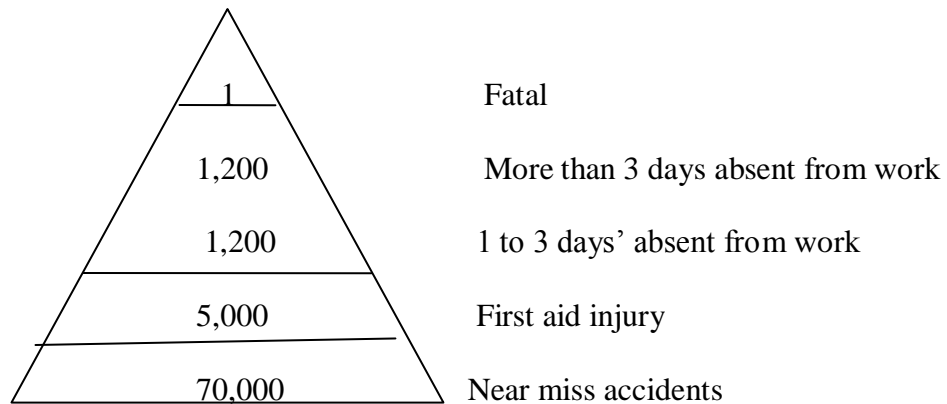


Figure 1: ILO Accident Pyramid [ILO, 2005]

The ILO representative pyramid can be used to interpret situation in the Workplaces according to how many fatalities are reported. The pyramid can also be used to estimate the number of accidents occurring in the Workplace. In Kenya, the regulator, Directorate of Occupational Health and Safety Services (DOHSS) reports on fatalities reported from Workplaces every year. In 2008, 2007, 2006 and 2004, 56, 57, 64 and 95 fatal cases were reported respectively [DOHSS, 2004 - 2008]. The distribution of 2004 cases among the Kenyan 8 provinces were as shown in Table 1. The implication of Table 1 along the ILO accident pyramid shows that many accidents that occur in workplaces go unreported.

Table 1: Excerpt from 2004 DOHSS Annual Report [DOHSS- 2004]

<b>Province</b>	<b>Fatal Accident Cases</b>	<b>Non-Fatal Accidents Cases</b>
Nairobi	19	57
Central	1	84
Eastern	19	30
Rift Valley	8	24
Coast	42	842
Nyanza	2	61
Western	4	94
<b>Total</b>	<b>95</b>	<b>1292</b>



The challenge facing Kenya to day is whether Workplace injury and disease data is effectively collected and management to correctly diagnose and help in prevention and control of Workplace hazards.

This study assessed the collection of data, database management and data use and dissemination systems that were in place to determine weaknesses and gaps experienced in the management of the workplace health and safety data. The aim of this study was to evaluate the magnitude of the problem and look at what other countries facing similar problems have done and then propose possible solutions that may make conditions at the workplace more acceptable.

## **1.2 Conceptual Framework**

The study concept was developed to help understand the main issues affecting management of workplace injury and disease data. These issues were identified as data collection, database management and data use/ dissemination. The variables were data recording, reporting, analysis, records keeping and use. These variables were used to indicate how injury and disease data was handled and used to improve health and safety conditions at the workplaces.

## **1.3 Theoretical Framework**

The situation prevailing in the management of the Workplace injury and disease data in Kenya is as a result of method and systems used to record and collect the health and safety data from the Workplaces. Methods also used for database management, data dissemination and value accorded to injury and disease data plays a very vital role of the

current situation. Understaffing and under-funding usually compromise the quality of workplace health and safety information management. The DOHSS requires systematic data collection, database management and dissemination of the data to provide effective direction in prevention and control of workplace hazards.

## **1.4 Goals and Objectives**

### **1.4.1 Goal**

The aim of this study was to evaluate the management of workplace health and safety information in Nairobi province, Kenya.

### **1.4.2 Objectives**

The objective of the study was: -

- i. To examine the performance of health and safety information management system used in the workplaces.
- ii. To determine the kind of measures in place for collecting, managing and utilizing the workplace health and safety information.

## **1.5 Research Hypotheses**

The null hypothesis of the study was “Workplace injury and disease data in Kenya is not adequately collected and managed”.

The alternative hypothesis of the study was “Workplace injury and disease data in Kenya is adequately collected and managed”.

## **1.6 Research Questions**

This study was designed and framed to answer the following questions: -

- i. How adequate is workplace health and safety information system in the workplaces?
- ii. To what extent do workplaces and regulating office deviate from set standards according to the regulations?

## **1.7 Rationale and Justification**

Workplace safety and overall employee wellness is an issue of considerable significance for business and communities globally. Occupational disease and injury are important public health issues and are associated with a substantial burden on individuals and societies in terms of mortality, morbidity and costs. There are hazards in all workplaces and it is important to be able to measure and monitor occupational disease and injury effectively in order to identify risk factors, priority areas for preventive actions, and to evaluate preventive actions.

Kenya and Africa in general do not have reliable injury and disease data [Jeyaratnam, 1992] from their workplaces. The country therefore continues to lose unprecedented human and finance capital to workplace hazards. Workers continue to be exposed to hazardous conditions at workplaces and some have even suffered death due to these circumstances.

Right and relevant information serve as backbone in making good decisions and improving safety and performance. Management of workplace health and safety

information is therefore paramount to providing health and safe work environment. This information may be used to guide efforts to improve workplace health and safety, track occupational injuries, illnesses, hazards and exposures and to monitor trends and progress.

Data on injury and disease occasioned by circumstances at the workplaces usually help in decision-making, planning, supporting production units, identifying information needs, taking information acquisition as part of resource building, improving information distribution and performance as was found by Stephens in 2006.

## **1.8 Research Structure**

The study followed the normal research procedure of looking at what has been done before internationally, regionally and locally. It evaluated the method and systems in place for management of the workplace injury and illness data to prevent and control hazards in the workplaces. The study adopted a research methodology that was suitable to provide the best results based on the time scale and resources available. Data was collected from workplaces and government offices by use of questionnaires, face-face interviews and examination of existing records to confirm the interviews.

The study examined the status and performance of health and safety information system in both the workplaces and regulatory levels. Method and systems of data collection, database management and data dissemination in use at both the workplaces and the regulating offices were evaluated. Levels of data recording, reporting, analyzing, record keeping and data usage formed the backbone of this research.

The data collected from the field was analyzed using Statistical Package for Social Scientists (SPSS). The findings were discussed and conclusion drawn to arrive at the required recommendations.

## **CHAPTER TWO**

### **2.0 LITERATURE REVIEW**

#### **2.1 Introduction**

Information management as tool in management of organizations is a new art and mostly found in the developed world. Information management has changed the way the world views existing problems. Management of workplace health and safety information as a tool to controlling workplace hazards has been adopted by the developed countries and is quickly picking ground in the developing countries [Statistics New Zealand, 2003].

Management of workplace health and safety data in USA was initiated through the enactment of the Occupational Safety and Health Act of 1970 [OSHA-US, 1970]. The act directed the secretary of labor to issue regulations that require employers to maintain records on workplace injuries and illnesses. The secretary of labor was also directed to compile accurate statistics on occupational injuries and illnesses and to make periodic reports on such occurrences [OSHA-US, 1970].

The act also created the department of Bureau of Labor Statistics (BLS) and laid upon it the responsibility of collecting and analyzing statistics on occupational injuries and illnesses data. The purposes of act [OSHA-US, 1970] are comprehensive and included the establishment of occupational safety and health standards, carrying out inspections and investigations, ensuring the maintenance of records by employers on occupational injuries and illnesses, requiring reporting by employers of work-related deaths, and conducting research on occupational safety and health.

Nations that have adopted the management of health and safety data have elaborate systems of data collection, sound database management and effective data use and dissemination services [Stephens, 2006].

## **2.2 Importance of Health and Safety Data**

Organizations and businesses revolve around records, reports and information. Many of the organizations keep these records on databases [Robek et al., 2006]. Keeping the records organized ensures institutions are governed effectively and efficiently so that the organization may be accountable to its employees, contractors, visitors and the community it serves [Malcolm et al., 1998].

Stephens in 2006 established that management of health and safety data was vital in tracking of occupational injuries, diseases, exposures and also guiding in improving health and safety conditions at the workplace. He also found out that maintenance of records helps in decision-making, planning, transactions, litigations and ensuring that institutions adhere to legal, professional and ethical responsibilities.

Record management also helps in measuring performance and ensuring that efforts are directed to where they are needed and thus assisting in managing safety and health of workers [King et al., 2005].

## **2.3 Availability of Health and Safety Data**

Availability of data on injuries and illnesses has been a major problem in almost all the countries of the world and especially in the developing countries. Obtaining reasonable

and reliable data on injuries and illnesses is a big challenge in developing countries, as was observed by Jeyaratnam in 1992.

A report published by Takala in 1996 on occupational accidents shows that data on occupational accidents was not available from almost all the countries of the world and the available data was undermined by under-reporting, limited coverage of reporting and non-harmonized systems of reporting.

Many countries faced these challenges; however USA enacted a law to increase efficiency by setting time of reporting and a penalty for reporting out of time and non-compliance [OSHA-US, 2002]. Since the implementation of this act, significant improvement in data collection, database management and data dissemination and use have been noticed by Bureau of Labor Statistics (BLS) [BLS, 2006].

The annual reports of Health and Safety Executive (HSE) [HSE, 2006/7] of United Kingdom, have demonstrated that legislation and formation of bodies that control data collection, database management and data use and dissemination usually minimize the challenges of data availability and improve workplace conditions. The Health and Safety Executive (HSE) identified methods and sources of improving data collection and the 2007 annual report showed 95% confidence intervals [HSE, 2006/7] of reportage and capturing of all incidences that occurred in the workplaces.

A report by ILO in 2005 shows that availability of injury and disease data from its member countries was still a major challenge and has started support systems that enhances recording and reporting of this data.



In 1994, the average estimated fatal occupational accident rate in the world was 14.0 per 100,000 workers, and the total estimated number of fatal occupational accidents was 335,000 [Takala, 1996]. The occupational accident rates are different for different countries and regions.

The estimated global workforce of 2.8 billion persons suffers about 2.2 million deaths annually from occupational injury and illness, 270 million serious non-fatal injuries and 160 million work related diseases [ILO, 2005]. In 2004, the estimated annual cost of workplace related injury and illness was 4% of the world's Gross Domestic Product (GDP), which translated to US\$1250 billion [ILO, 2004].

Fatal accidents are just the tip of the iceberg; International Labor Organization (ILO) and European Union (EU) use accident pyramids to illustrate how one fatality relates to other incidents in the workplace. Figure 2 is an EU incident interpretation pyramid. The figures imply that for one fatal in workplaces, there are 27 accidents that cause either permanent disabilities or 6 months or more absence from work, 920 accidents that cause 4 or more days from work and 1445 non-fatal accidents are reported.

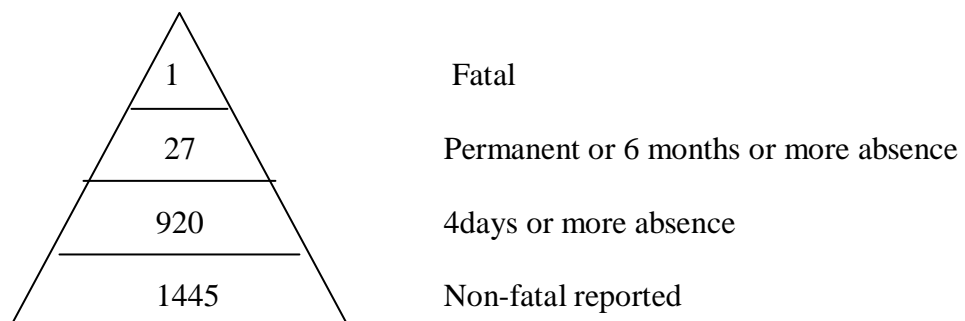


Figure 2: EU Accident pyramid [ILO, 2005]

In Kenya, a review of the data from DOHSS shows that the regulatory authority had not taken the issue of workplace data management seriously. Annual reports of 2002 to 2004 revealed that there was problem in the method and systems used to collect and handle occupational injury and disease. The subsequent years were even worse as the format of working became performance based and injury and disease data missed out on the performance records.

A visit to the Kenya Bureau of Statistics (KBS) and interview with one of the library staff revealed that data on occupational health and safety diseases and injuries was not available. This implied that budgetary allocations for occupational health and safety regulations and monitoring were done without consideration of injuries and illnesses data. The method used for budget allocations ought to be based on data. This study will assist in setting systems that will create data for use in planning, decision-making and budget allocations to guide on intervention programs to minimize hazards in the workplaces.

#### **2.4 Recording and Reporting of Data**

Data collection tools of recording and reporting of workplace injuries and illness data form the basis for management of data. When workplaces do not record and report data, it becomes very difficult to have workplace injuries and illness data management.

Takala (1996) reported that challenges of recording and reporting data affected almost all the countries of the world and the main issues revolved around recording, under-reporting, limited coverage, haphazard systems of coding and reporting.

The International Labor Office (ILO) collects and publishes the global accident figures and rates from member countries based on national recording and reporting systems [ILO, 1996]. Most of the member countries usually do have data and ILO has started programs that support member states to enhance recording and notification systems for occupational accidents and diseases.

The Occupational Safety and Health Act of 2007 [OSHA-K, 2007], laws of Kenya requires accidents that cause death or absence from work for three days or more be notified to the regulatory authority between twenty four hours and seven days of occurrence. The act requires the rest of the accidents and ill health be recorded in the general register of workplaces.

## **2.5 Use of Health and Safety Data**

The occupational health and safety administrator (OSHA) in United States of America in annual reports [BLS, 2006] gives the reasons of collecting and analyzing health and safety data as helping in directing programs, measuring performance, directing efforts to hazards that are hurting workers, discovering health and safety problems and tracking them down and implementation of programs at individual workplaces.

Workplace injury and disease data can be used as a means of monitoring incidences or distribution of events. The data can also be used in identifying trends and emerging health and safety issues including cluster of events and outbreaks. Identification of risk factors and evaluating of impact of intervention programs can be induced from the data to set priorities to prevent and control workplace hazards [Malcolm et al., 1998].

## **CHAPTER THREE**

### **3.0 RESEARCH METHODOLOGY AND DATA COLLECTION TOOLS**

The study evaluated the management of workplace health and safety information in Nairobi province. Data collection, database management and data use/dissemination were evaluated by determining the levels of data recording, reporting, analysis, use and record maintenance in Nairobi province. This section of the report contains the details of the sampling method that was used and how the research tools were designed to achieve the above objectives. It also contains reports on the procedures that were used for data gathering from key information providers.

#### **3.1 Study Area and Population**

The study was carried out in Nairobi city and its environs (province). Nairobi city is the political and commercial capital of Kenya and is one of the largest cities in Africa. It's considered as communication centre and an industrial and economic hub of the East and Central Africa. Nairobi's good road network and its strategic location make it attractive to many foreign investors.

The proximity of the workplaces to one another, transport infrastructure and the time scale of the study were some of the factors considered in choosing Nairobi as the study area. Appendix 1 is a map of Kenya showing all the 8 provinces inclusive of Nairobi while Figure 3 is the map of Nairobi province, the study area.

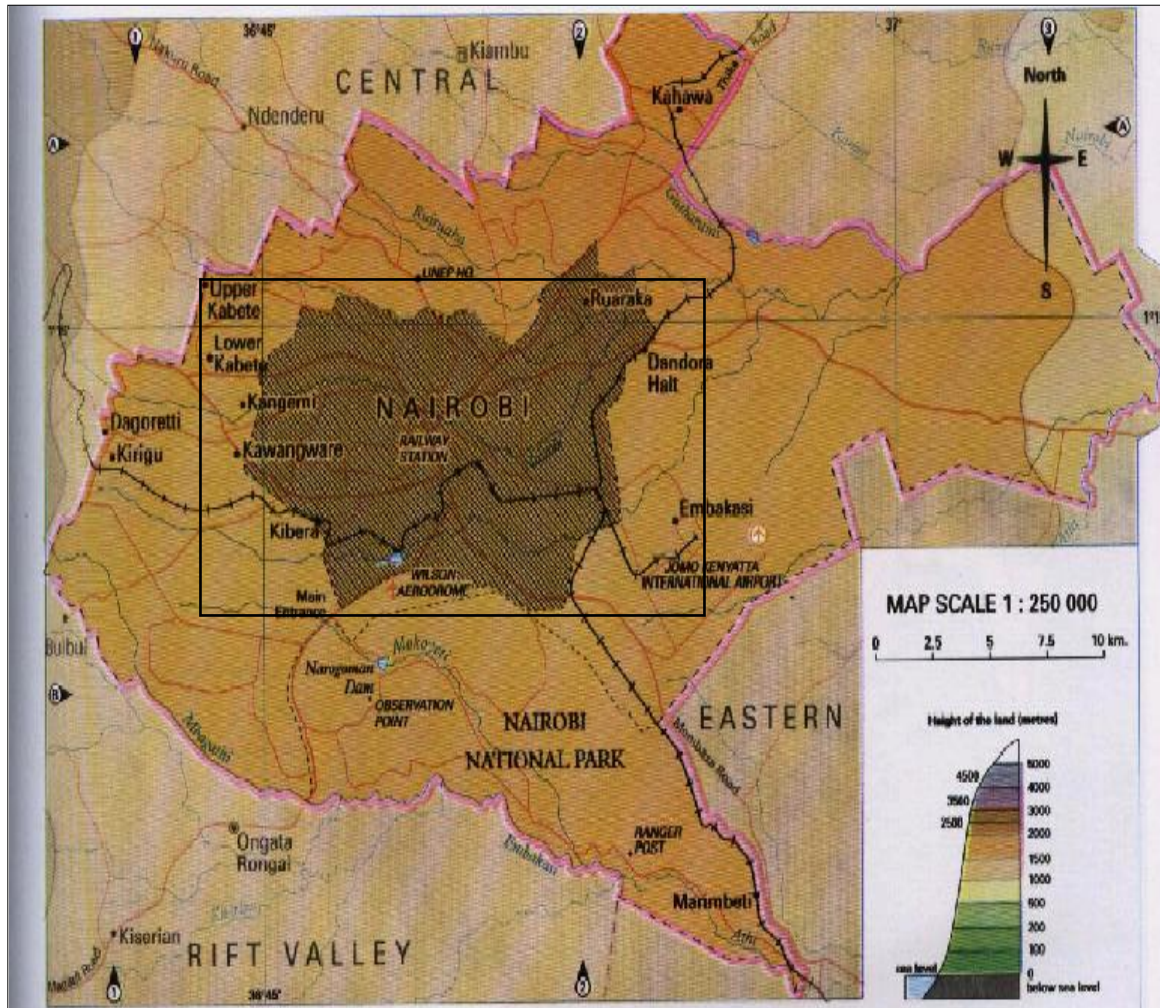


Figure 3: Map showing location of Study Area (Small shaded box)

### 3.2 Sampling Procedure

The Nairobi province had an estimated population of over 40,000 workplaces [DOHSS, 2004]. At the time of the study, only 845 workplaces were registered under the Occupational Safety and Health Act (OSHA) of 2007 [OSHA-K, 2007]. This study used list of the registered Workplaces from DOHSS to identify the workplaces for interviews.

The study resulted to using the list of registered Workplaces after exploring all other means of getting an alternative credible workplace list which proved impossible. The study was confident that the studied workplaces would provide unbiased results as the registration of workplaces was done randomly by the regulating officers. Table 2 shows how each industry was represented in the population of 845 and how sampling was conducted.

Table 2: Sample Size according to Type of Industry

Industry Type	Sampling Techniques		
	Registered Workplaces Per Industry	Interval Applied	Number of Workplaces Sampled
Manufacturing	590	5	102
Quarrying	3	3	1
Agriculture	9	3	3
Building and Construction	20	5	4
Wholesale, Trade and Retail	194	5	32
Electricity, Gas and Water Suppliers	15	4	4
Others	14	3	4
Total	845	-	150

DOHSS grouped 845 registered workplaces according to their industry types and from the list it was easy to categorize the number in each industry [DOHSS- Computer File, 2008]. The list of the 845 workplaces had various industries represented as shown in Table 2. List from each industry was drawn arranged according to which workplace had registered earlier than the other. Systematic random sampling method was applied for each industry in a formula that gave all workplaces chance of being considered to be in the sample. Manufacturing had a population of 590 workplaces so systematic random sampling method with an interval spacing of 5 was applied and 102 workplaces were sampled.

Similarly Agriculture industry had 9 workplaces and a systematic random sampling method of interval 3 was applied and 3 workplaces were identified for the sample. Likewise it was done for all industries and a sample size of 150 workplaces was identified which represented an 18% of the registered workplaces.

### **3.3 Research Design**

A research design is a master plan specifying the methods and procedures for collecting and analyzing the needed information. A research design provides a framework for the collection and analysis of data [Bryman, 2004]. The research design started by analyzing the research questions and focused the design work to address the issues and debate generated by the questions.

In order to address the issues raised by the research questions, it necessitated the researcher to start with identification of the various aspects that play significant role in providing the answers. The initial identification was for various dependent variables and the subjects of measurement. Tools that make for data collection were identified as workplace data recording and reporting. The tools for database management were identified as record maintenance structures and data analysis while the tool for data use/dissemination was identified as data use. Key issues evaluated were levels of data recording, reporting, analysis, records keeping and data usage. The independent variables were identified as type of industry, years in operation by the workplace and number of employees.

Compliance to occupational safety and health regulations, inspections and accident/incident investigations by DOHSS officers were found to be the intervening variables that played significant role in changing of the results.

In order to achieve the intended objectives, research tools were designed (see appendix 2, 3, 4) to cover key information points for data collection. The information points were identified as workplaces offices, provincial and National DOHSS offices.

To address the research questions, this study sought to establish the instruments for evaluating variables of data collection, database management and data use or supply. These were identified as data recording, reporting, analysis, usage and record keeping or maintenance. The development of research tools was based on regulation guidelines given by [OSHA-K, 2007]. The levels of injury and disease data recording, reporting, usage and maintenance were evaluated.

Data recording was evaluated by perusing through the workplace general register. General register is a record book provided by government for purpose of recording accidents and incidents as they happen in the workplaces [OSHA-K, 2007]. Data analysis was evaluated by perusing through the workplace records for indications of data analysis in terms of comparisons, trends, interpretations and cost implications.

The workplaces were also evaluated on whether they used the recorded data. This was evaluated by perusing at what decision or policy change was necessitated by interpretations based on analyzed injury and disease data. A decision or policy change that was not influenced by recorded and analyzed data did not count to the usage of the data.



The other variable to be evaluated was record keeping or maintenance. This was evaluated by enquiring whether the workplaces had a database management structure, and whether it was electronic or paper records and for how long the data was kept.

Workplaces are required by law to report the collected data to the regulating offices; therefore data reporting among the workplaces was also evaluated. The management of the workplace was asked if it followed the set regulations and reported the data to the regulating authority as required.

The final parameter to be evaluated was compliance level. Items that require annual compliance from the OSHA of 2007 [OSHA- K, 2007] were picked from the rest and workplaces measured against them. This variable was very important as it had an influence over the other variables. The DOHSS has quite a number of items or regulations that require annual compliance. Nine of the items were picked and put into the questionnaire and workplaces measured according to how many of the regulations they observed.

A questionnaire was therefore prepared for use in a face-to-face interview with workplace's management for evaluation of the above parameters. All the questionnaires had informed consent and sought to get information for cross checking with authorities responses to ensure accuracy. Face-to-face interview was deemed to be the best option using a semi-structured questionnaire. This type of questionnaire ensured: -

- i. Uniformity in responding to the questions.
- ii. That the interviewer could not alter the sequence of the questions and hence develop a rapport with the interviewee.

Certain disadvantages were anticipated from this method but the advantages outweighed them. These included the interviewer effect that may have led to biased answers, the high cost of traveling and cost of hiring of an assistant for purposes of collecting data from the workplaces. The following were reasons for using face-to-face interview and a semi-structured questionnaire: -

- i. Telephone network in Nairobi was good but could only be used to arrange for interviews and not as method of gathering information since some records were stored in computers and paper files.
- ii. Mail services were not considered as the researcher wanted to examine the available data one-on-one and that mailed data may be inflated or exaggerated.
- iii. Observation methods were not applied due to the amount of time required and also the time frame of the study.

The provincial and national DOHSS offices had different set of questionnaires. The study formulated a questionnaire similar to the workplace questionnaire but different in some issues so as to establish where major challenges were experienced. A face-to-face interview was also set at their offices.

### **3.4 Research Procedure**

Before the interview started, the researcher used an informed consent note to introduce him at workplaces. The workplace managers were interviewed face to face by the researcher or the research assistants.

Many questions about the new labor laws and especially the Worker Injury and Benefits Act of 2007 (WIBA) were asked and the answers required were provided. The shortest time therefore, used to interview one workplace was half an hour. The distance between the workplaces had an impact on how many workplaces that were interviewed in a day. The researcher therefore hired research assistants to help in the collection of data from workplaces. The research assistants had to collect data as guided and on returning to provide contact details of the person talked to so as to call back or revisit for assuring quality of the data.

### **3.5 Research Instruments and Tools**

Research instruments are methods or tools used for purpose of collection of information or data. Face-to-face interview and semi-structured questionnaires were identified as the most viable tools for collecting data for this research work.

### **3.6 Method of Analysis**

All the completed questionnaires were sorted and the data collected was coded and entered in the Statistical Package for Social Scientists (SPSS) for data analysis. Data was interpreted for frequencies, percentage distributions, trends and comparisons on different aspects and then conclusions were drawn.

## **CHAPTER FOUR**

### **4.0 RESULTS AND DISCUSSION**

#### **4.1 Introduction**

The transformation of raw data into a form that will make them easy to understand, interpret and make conclusions involves description of responses, calculation of averages, frequencies and percentage distributions. This system of presentation makes it possible to present the differences in population characteristics, comparisons and associations of data. The selection of the most appropriate statistical test depends on the experimental design and the variables selected by the researcher [Mugenda and Mugenda, 2003].

In the current design three questionnaires were presented to three different parties, the workplaces, Provincial and National offices (DOHSS). The National and Provincial Offices (DOHSS) results were used for cross checking the workplace results.

#### **4.2 Workplaces**

The sample for this study was made up of 150 of the registered 845 workplaces in Nairobi province. About 36 questions (appendix 1) were presented to the management of the workplaces. All selected workplaces responded to the questions as required in the informed consent form attached to the questionnaires. Some managers however did not respond to all questions making overall response rate to be 90%, which was satisfactory. Frequency tables, percentage bar charts and pie charts have been used to present the findings.

## A) Population Characteristics

### 4.2.1 Type of Industries and their Proportion in Nairobi Province

Before presentation of the result, it was important to understand what type workplaces we were dealing with. The first section of the study defines the characteristics of workplaces in Nairobi Province. The main population characteristics were identified as types of industries, the gender composition, and number of years the workplace has been operating and the level of compliance by the workplaces.

The industries that composed the sample are presented in Table 3. The results show that majority of workplaces (68%) in Nairobi are in the manufacturing sector followed by wholesale/retail/trade sector with 21.3%. The other unmentioned industries are included in the category of others that had a representation of 2.7%.

Table 3: Industries and their Proportion in Nairobi Province

Type of Industry	Number of Workplaces	Percentage	Cumulative Percentage
Agricultural	03	2.0	2.0
Building and construction	04	2.7	4.7
Quarrying	01	0.7	5.4
Manufacturing	102	68.0	73.4
Electricity, gas and water suppliers	4	2.7	76.1
Wholesale, retail and trade	32	21.3	97.3
Others	4	2.7	100.0
Total	150		

#### 4.2.2 Workplace Gender Composition

Table 4 shows the gender composition of the employees in the workplaces. The average numbers of employees per workplace in Nairobi Province was 107 employees. Most industries had male employees with manufacturing, building and construction, quarrying constituting more than 80% male and less than 20% female. Table 4 also shows that female employees in Agriculture and Wholesale/retail/trade industries constituted 47.3% and 41.3% respectively. Most of the employers said the nature of work in many industries is manual and men were more suitable for the tasks.

Table 4: Distribution of Male and Female Workers in the Workplaces

Type of Industry	Average Number of Employees	Percentage of Male Workers	Percentage of Female workers
Manufacturing	118	89.8	10.2
Wholesale, Retail and Trade	86	58.8	41.2
Building and Construction	93	99.4	0.6
Agricultural	129	52.7	47.3
Electricity, Gas and Water Suppliers	32	68.4	31.6
Quarrying	106	100.0	0.0
Others	55	79.8	20.2
Average	107	82.8	17.2

#### 4.2.3 Ratio of Workplaces According to Period in Operation

This study sought to find out if the length of years the workplace had been in operation did help the workplace manage injury and disease data better than the new comers. As Table 5 shows, 2.7% of the respondents came into operation in the last 5 years while majority of

workplaces (85.3%) had been in operation for more than 15 years. The result shows that 85.3% of workplaces are not new to the regulations governing health and safety and should be able to comply with the set regulations without many excuses.

Table 5: Ratio of Workplaces According to Period in Operation

Years	No. of Workplaces	Percentage	Cumulative Percentage
0 - 5	4	2.7	2.7
5 - 10	6	4.0	6.7
10 - 15	12	8.0	14.7
> 15	128	85.3	100.0

#### 4.2.3.1 Ratio of Workplaces According to Period in Operation per Industry

The study investigated how long workplaces have been in existence in each category of industry. Table 6 shows that Manufacturing (2.9%) and Wholesale/Retail/Trade (3.1%) industries had the highest number of new workplaces in the last 5 years. All the other industries did not have new workplaces in the last 5 years. Registration of workplaces is done by regulating office. Regulating officers said most of workplaces only registered because they had been visited by the officers. Most of workplaces in all categories of industries began their operations more than 15 years ago as shown in Table 6.

Table 6: Period in Existence of Study Workplaces According to Industry Type

Industry	Percentage of Workplaces				Total or Cumulative Percentage
	0 – 5 Years	5 – 10 Years	10 -15 Years	>15 Years	
Manufacturing	2.9	3.9	7.8	85.3	100.0
Wholesale, Trade and Retail	3.1	3.1	6.3	87.5	100.0
Agricultural	0.0	0.0	33.3	66.7	100.0
Building and Construction	0.0	0.0	0.0	100.0	100.0
Electricity, Gas and Water Suppliers	0.0	25.0	25.0	50.0	100.0
Quarrying	0.0	0.0	0.0	100.0	100.0
Others	0.0	0.0	0.0	100.0	100.0

#### 4.2.4 Inspection Rate of Workplaces between 2004 -2008

The study evaluated how regularly the regulating officers inspect the workplaces. Regulating offices usually visit workplaces at random to inspect whether the workplaces was adhering to health and safety regulations. Inspections usually increase the level of workplace compliance to regulations. Table 7 shows the levels of inspections from 2004 to 2008. The results indicate a very low inspection rate of workplaces. The sampled were being assessed how often they were inspected every year. The study found out that the inspection rate or the being inspected for the sampled workplaces was (10 – 18%). The regulating office indicated constraints of understaffing and poor facilitations [DOHSS, 2004] as the reasons for low inspection rates. Low inspection rate reflected in low compliance levels, poor data recordings and reporting since most of the workplaces become complacent.



Table 7: Inspection Rate of Workplaces between 2004 -2008

Year	No. of Workplaces Inspected	Percent
2008	21	14.0
2007	17	11.3
2006	27	18.0
2005	15	10.0
2004	18	12.0
Average		13.1

This study also evaluated the trend of inspections per industry among the sampled workplaces by regulating officers. This work found out that regulation officers did more inspections in the manufacturing industry than the other industries as tabulated in Table 8. Inspections were purely random and not in particular order unless an accident had occurred and required to be investigated. The results indicate that although Manufacturing industry had many workplaces inspected on random basis yet the other industries that had fewer visits average better in terms rate of being visited.

Table 8: Trend of DOHSS Inspections of Sampled Workplaces

Industry Type (No. of Sampled Workplaces)	Percentage				
	2008	2007	2006	2005	2004
Manufacturing (102)	14.7	13.7	18.6	10.7	11.8
Wholesale, Trade and Retail (32)	9.4	3.1	15.6	6.2	12.5
Agricultural (03)	0.0	33.3	0.0	33.3	33.3
Building and Construction (04)	25.0	0.0	25.0	0.0	0.0
Electricity, Gas and Water Suppliers (04)	25.0	0.0	25.0	0.0	25.0
Quarrying (01)	0.0	0.0	100.0	0.0	0.0
Others (04)	25.0	25.0	0.0	25.0	0.0
Total	21	17	27	15	18

#### 4.2.5 Level of Compliance to Regulations by Sampled Workplaces

Workplaces were evaluated to ascertain how they complied with the regulations that were in place. Items that required annual compliance were identified from other compliance items and workplaces were evaluated against them. Table 9 shows that majority of workplaces (57.3%) were mostly non compliant. 20% of workplaces complied with only 3 or 4 items of items picked, 18% of the workplaces complied with 5 or 6 items, 4.7% complied with 7 or 8 items and none of the workplaces was fully compliant. Inspection of workplaces by the regulating office was low (Table 7) and this could have contributed to low compliance levels. Workers in workplaces that do not comply with regulations tend to be more exposed to uncontrolled hazards [King et al., 2005]. Most of the workplaces said there were no regular inspections by the authorities and therefore were complacent.

Table 9: Level of Compliance to Regulations by Sampled Workplaces

Compliance Items	Workplaces complying With Annual Requirements	Percent	Cumulative Percent
0 – 2	86	57.3	57.3
3 – 4	30	20.0	77.3
5 – 6	27	18.0	95.3
7 – 8	7	4.7	100.0
9	0	0.0	100.0
Total	150		

## **B) Evaluation of Workplace Research Characteristics**

The second part of the study investigated how workplaces handled injury and disease data. Data collection, database management and data use and dissemination were investigated through evaluation of data collection, reporting, records keeping, data analysis and usage. The levels of workplaces that recorded, reported, kept, analyzed and used injuries and illnesses data was evaluated. Table 10 is a summary of results obtained from the workplaces.

Table 10: Workplace Data Management Characteristics

Variables Evaluated		Results	Comments
1.0 Data Collection	1.0 Recording	39.3% of workplaces recorded injuries and illnesses data	60.7% of workplaces did not record data
	2.0 Reporting	45.3% of workplaces reported injuries and illnesses.	54.7% of workplaces did not report.
2.0 Database Management	3.0 Database management/ Record Maintenance	21.3% of workplaces had databases either in electronic or paper files.	78.7% Workplaces did not have database Management of data.
	4.0 Data Analysis	12.0% of workplaces did data analysis on injuries and illnesses data.	88% of workplaces did not analyze their data.
3.0 Data Dissemination/Use	5.0 Data Use	19.3% of workplaces used the data for improving safety conditions.	Individual incidences were used by workplaces as learning experience.

Table 10 shows how injury and disease data was collected and managed for prevention and control of workplace hazards. The table also indicates that data collection method does not provide effective data for analysis and use in informing policy on workplace hazards. Each of the characteristic in Table 10 is discussed individually to give insight on the exact situation in the workplaces.

#### **4.2.6 Recording of Injury and Disease Data at the Workplaces**

Workplaces are required by law to record all accidents, diseases and near miss accidents in the general register (OSHA-K, 2007). The study evaluated the number of workplaces that recorded injury and disease data and found out that only 39.3% of workplaces recorded injury and disease data while 60.7% of the respondents did not. Most of the workplaces did not know if recording was a requirement nor did they have the government general register.

##### **4.2.6.1 Level of Data Recording Per Industry**

Table 11 shows how various industries recorded data. This work found out that Manufacturing and Wholesale/Retail/Trade industries had 47.1% and 21.9% workplaces respectively among them that recorded data. Quarrying industry had no data and did not kept records of health and safety issues. Data recording in most industries was low and workplaces had problems recording incidences. The respondents said they were only required to report when death occurred but were not informed about recording of other accidents. The incident notification system used for incident reporting was blamed for most workplace not having recorded data.

Table 11: Level of Data Recording Per Industry

Industry Type	Number of workplaces Sampled	No. of Workplaces Recording Data	Percentage of Workplaces Recording
Manufacturing	102	48	47.1
Wholesale, Trade and Retail	32	7	21.9
Agricultural	3	1	33.3
Building and Construction	4	1	25.0
Electricity, Gas and Water Suppliers	4	1	25.0
Quarrying	1	0	0.0
Others	4	1	25.0
Total	150	59	

#### 4.2.6.2 Methods Used for Data Recording in the Workplaces

This study evaluated how many workplaces were using the record book provided by the government to record their data. This study found that 28% of workplaces were using the General Register while 11.3% were using other methods to record their data. The law requires that all injury and disease incidents be recorded in the general register but most people did not know its use.

#### 4.2.6.3 Trends of Data Recording in Workplaces per Industry

Trend of data recording was analyzed for general workplaces and then industries by industry as shown in Figure 4. The results show that the trend in the general workplaces improved from 31.3% in 2004 to 39.3% in 2008. In 2006 and 2007, the number workplaces recording data remained the same. The reason for this could have been due to ineffective enforcement of the act by the regulating officers as shown in Table 7.

Trend of data recording for each represented industry was also analyzed as shown in Table 14. Industry like Quarrying remained constant at zero for the industry did not record data and therefore there was no change. Agriculture and industries classified as others had constant trends of 33.3% and 25.0% respectively showing that there was no increase in the number of workplaces that recorded data in their industries. Wholesale/ Retail/Trade, Electricity/Gas/Waters Suppliers and Manufacturing industries had trends that were improving. Manufacturing industry trend improved from 41.1% in 2004 to 47.0% in 2008. Wholesale/ Retail/Trade improved from 9.4% in 2004 to 21.9% in 2008. These improvements could be explained as increase of number of workplaces that were beginning to record their data due to increase of interaction with the government agents brought about by new labour laws and accompanying legal notices [OSHA- K, 2007].

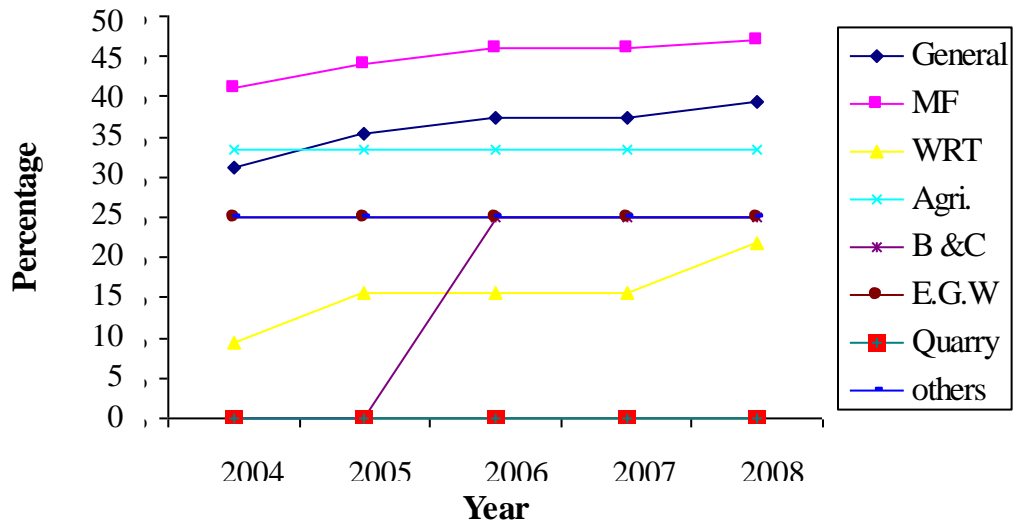


Figure 4: Data Recording in Workplaces per Industry (Codes are as follows:- General - All Sampled Workplaces, MF- Manufacturing, WRT- Wholesale/Retail/ Trade, Agri.- Agriculture, B & C – Building and Construction, E.G.W – Electricity/Gas/Water Suppliers, Quarry – Quarrying, Others – Others)

#### **4.2.7 Reporting of Injury and Disease Data to DOHSS**

Workplaces are required by law to report injury incidents that cause 3 days or more absence from work to the regulating office [OSHA-K, 2007]. This work found out that 45.3% of workplaces reported injury and disease data to the regulating offices. The rest or 54.7% of the workplaces did not report. Most of respondents said they fear reporting incidents and data for being found to be guilty. Most of workplaces interviewed said reported those incidents that are either serious or fatal.

##### **4.2.7.1 Trend of Reporting Injury and Disease Data per Industry**

This study sought to establish if reporting of injury and disease data was a trend that the workplaces always practiced. This work found that data reporting improved from 28.0% in 2004 to 45.3 % in 2008 as shown in Appendix 6 and Figure 5. Data reporting number remained the same the years 2005 and 2006. The mandatory health and safety trainings and audits by government-registered agents as provided in the legal notice No. 31 of 2004 increased awareness and could be responsible for the positive trend [OSHA-K, 2007].

Trend of reporting injury and disease data for each industry was also analyzed as shown in Figure 5. Industry like Quarrying remained constant at zero for the quarry industry did not report data. Electricity/Gas/Waters Suppliers industry also had a constant trend for the 5 years at 25%. Agriculture, Manufacturing, Building Construction, Wholesale/ Retail/Trade and industry classified as others had data reporting trends improving but they were very poor. This could be explained as poor interaction between the regulating officers and the workplaces.



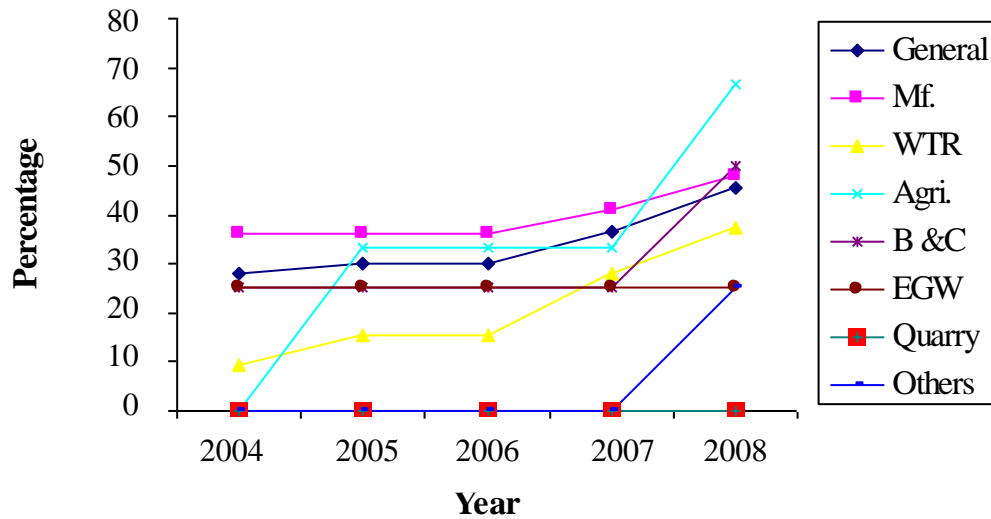


Figure 5: Data Reporting Trends per Industry (Codes are as follows:- General - All Sampled Workplaces, MF- Manufacturing, WRT- Wholesale/Retail/ Trade, Agri.- Agriculture, B & C - Building and Construction, E.G.W - Electricity/Gas/Water Suppliers, Quarry - Quarrying, Others - Others)

#### 4.2.8 Database Management of Injury and Disease Data at the Workplaces

Records management helps keep databanks, make comparisons, draw trends, analyze and make interpretations [Stephens, 2006]. Workplaces were evaluated on whether they had databases or databanks on injury and disease data. The study found that 21.3% of workplaces kept data but not necessarily on a databanks while 78.7% did not. The reason for this could be that workplaces were unaware of the importance of this data and government had not asked them to maintain databanks.

#### 4.2.8.1 Percentage Trends of Data Recordkeeping by Workplaces per Industry

Many of the hazards happening in workplaces cannot be quantified without recordkeeping. Workers will continue to suffer the consequences unless this culture is changed. Table 12 shows how workplaces that recorded and kept data were distributed in various industries. Agriculture with 33.3% had the highest proportion of workplaces that kept and maintained data followed by the manufacturing industry at 26.5%. The building construction industry did not keep data while quarrying did not even have the data. Inspections by regulating officers, guidance and awareness are the key factors that control data keeping.

Table 12 Percentage Trends of Data Recordkeeping by Workplaces per Industry

Industry Type	No. of workplaces Considered	% of Workplaces Keeping Records					
		2008	2007	2006	2005	2004	Aver. %
General or Sampled Workplaces	150	21.3	19.3	18.0	16.7	12.7	17.6
Manufacturing	102	26.5	24.5	23.5	21.6	17.7	22.7
Wholesale, Trade and Retail	32	9.4	9.4	6.3	3.1	0.0	5.6
Agricultural	3	33.3	33.3	33.3	33.3	0.0	26.7
Building and Construction	4	0.0	0.0	0.0	0.0	0.0	0.0
Electricity, Gas and Water Suppliers	4	25.0	25.0	25.0	25.0	25.0	25.0
Quarrying	1	0.0	0.0	0.0	0.0	0.0	0.0
Others	4	0.0	0.0	0.0	0.0	0.0	0.0

#### 4.2.8.2 Percentage of Workplaces by Method of Keeping Data

The workplaces were also evaluated on what methods they used to keep their data. Table 13 show that 7.3% of workplaces used computer while 14.0% of workplaces used paper records for keeping their data. The reason for this observation could be due to lack of government guidance during inspection as shown in Table 7. Databases are very important for keeping data as they provide convenience in coding, data analysis and dissemination of data. Workplaces that do not use data find it hard to characterize the workplace hazards [Malcolm *et al.*, 1998].

Table 13: Percentage of Workplaces by Method of Keeping Data

Method	Workplaces/Frequency	Percent
Paper File System	21	14.0
Computer Database System	11	7.3
No Data/Database	118	78.7
Total	150	100

#### 4.2.8.3 Percentage of Workplaces using Computer Based Data per Industry

Workplaces that had computer-based databases were evaluated in various industries. Table 14 shows that 33.3% of workplaces in agricultural industry, 25.0% in electricity/gas/water suppliers and 8.8% in manufacturing maintained electronic data and used computer to keep their records. The rest of industries had not adopted the use of computers to maintain their data. The reason for the observation could be because management of many workplaces has

not appreciated the use of computers and especially for use of managing injury and disease data.

Table 14: Percentage of Workplaces using Computer Based Data per Industry

Industry Type	Workplaces Sampled	Workplaces/ Used Computers	Percent
Manufacturing	102	9	8.8
Wholesale, Trade and Retail	32	0	0.0
Agricultural	3	1	33.3
Building and Construction	4	0	0.0
Electricity, Gas and Water Suppliers	4	1	25.0
Quarrying	1	0	0.0
Others	4	0	0.0
Total	150	11	
Average or Mean Percentage			12.5

#### 4.2.8.4 Trends of Data Recordkeeping by Workplaces per Industry

Trend in recordkeeping for all workplaces increased from 12.7% in 2004 to 21.3% in 2008 as shown in Figure 6. Trends of recordkeeping were also analyzed in each industry. This study found that Quarrying, Building Construction and industry classified as others had trends that remained constant at zero. The reason for this was because the industries did not record or keep data. Electricity/Gas/ Water Suppliers industry also had trend remaining constant at 25.0%. The result also shows Manufacturing, Agriculture and Wholesale/ Retail/Trade industries with improving trends as shown in Figure 6. The trends were very poor although they increased indicating a problem in the way data was handled.

Understaffing and lack of facilitation of government officers were given as some of the problems.

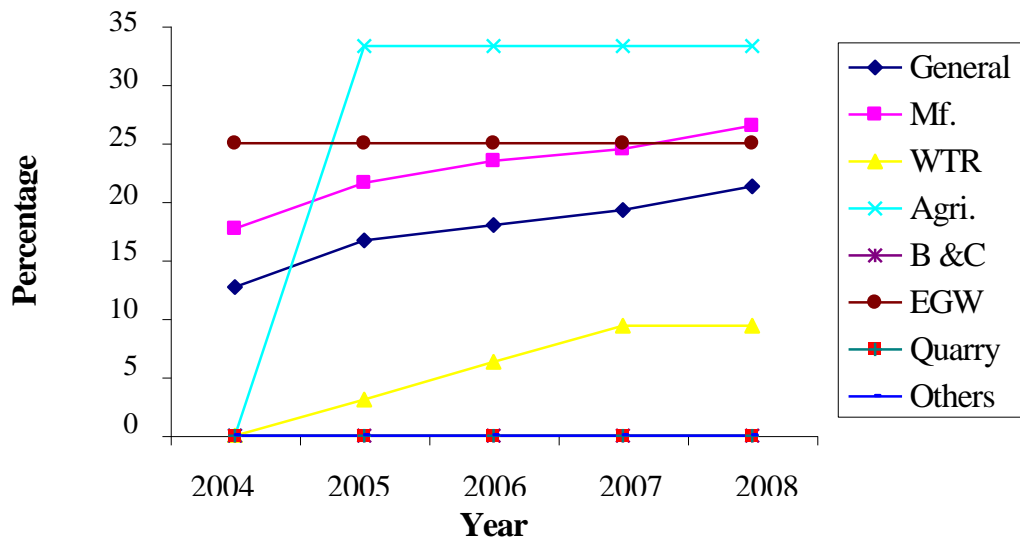


Figure 6: Recordkeeping by Workplaces per Industry (Codes are as follows:- General - All Sampled Workplaces, MF- Manufacturing, WRT- Wholesale/Retail/ Trade, Agri.- Agriculture, B & C - Building and Construction, E.G.W - Electricity/Gas/Water Suppliers, Quarry - Quarrying, Others - Others)

#### 4.2.9 Injury and Disease Data Analysis by Sampled Workplaces

Data analysis is very vital in providing statistical indicators that help to control and eliminate hazards in workplaces. Workplaces were evaluated to see how many analyzed their injury and disease data. This work found out that 12% of workplaces were analyzing their data while 88% did not. This observation could be due to lack guidance by the government agents.

#### **4.2.9.1 Trends of Workplaces Analyzing Data per Industry**

Trend of data analysis was evaluated to establish how workplaces were handling their data. The injury and disease data could analyzed for frequency of occurrence, incidence rates, prevalence rates, cost of the hazards and pattern of occurrence. The trend of data analyzing in the sampled workplaces improved from 6.7% in 2004 to 12.0% in 2008 as shown in Figure 7. The increases in trend were minimal and situation of analyzing data in industries still remain poor. Trend of data analysis was also evaluated in each industry. Quarrying, Building Construction and industry classified as others had trends that remained constant at zero. The reason for this was because the industries did not record or keep data. Electricity/Gas/ Water Suppliers industry also had trend remaining constant at 25.0%. The result also shows Manufacturing, Agriculture and Wholesale/Retail/Trade industries with improving trends as shown in Figure 6. Although the workplaces were not required by the law to analyze, some workplaces had taken the initiative that was positive. Those workplaces in all industries who did not analyze their data said they lacked knowledge and skills of analyzing the data.

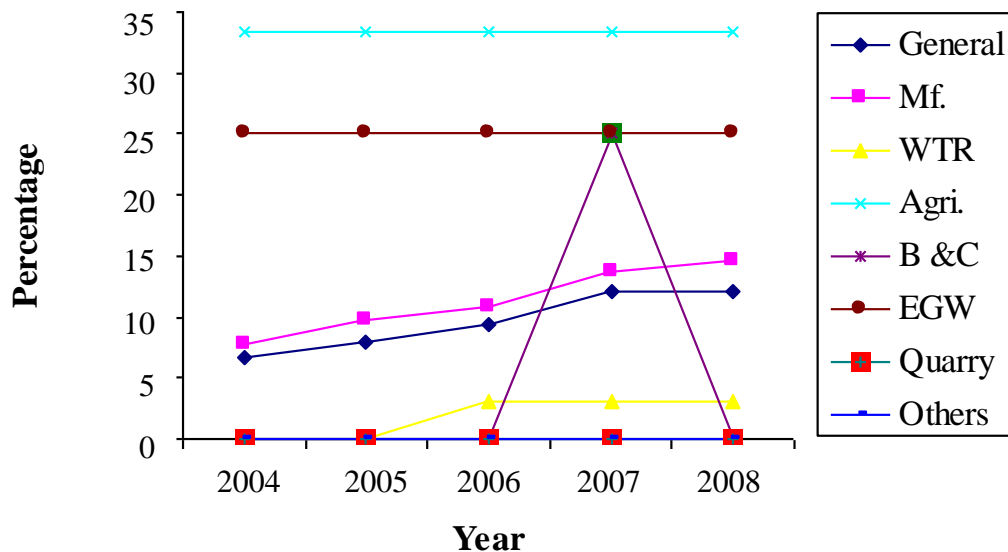


Figure 7: Data Analyzing between 2004- 2008 in Different Industries (Codes are as follows:- General - All Sampled Workplaces, MF– Manufacturing, WRT– Wholesale/Retail/ Trade, Agri.– Agriculture, B & C - Building and Construction, E.G.W – Electricity/Gas/Water Suppliers, Quarry – Quarrying, Others – Others)

#### 4.2.10 Use of Injury and Disease Data by Sampled Workplaces

Injury and disease data is used to identify risk factors, priority areas for preventive actions and evaluation of preventive actions (King et al., 2005). This work evaluated workplaces to find the level of use of injury and disease data to prevent and control hazards in the workplaces. This work found out that 19.3% of workplaces used injury and disease data for improvement of work safety conditions while 80.7% did not. Most of interviewed staff mentioned awareness and knowledge as the main reasons for not using the data.

Implications for not using the data would be lack of identification of all risk factors and good quality decisions to set preventive priorities.

#### 4.2.10.1 Injury and Disease Data Utilization by Workplaces per Industry

Injury and disease data can be used to direct efforts in improvement of health and safety conditions at the workplace. As Table 15 shows, 33.3% of workplaces in agriculture, 22.5% in manufacturing, 25.0% in Electricity/Gas/Water Suppliers and 9.3% Wholesale/Trade/Retail used data on injury and disease. The rest of industries did not use data to prevent and control hazards in workplaces. Most of the respondents said they were not guided and lacked knowledge on how to use.

Table 15: Injury and Disease Data Utilization by Workplaces per Industry

Industry Type	Number of Workplaces Sampled	No. of Workplaces Using Data	Percent
Manufacturing	102	23	22.5
Wholesale, Trade and Retail	32	3	9.4
Agricultural	3	1	33.3
Building and Construction	4	0	0.0
Electricity, Gas and Water Suppliers	4	1	25.0
Quarrying	1	0	0.0
Others	4	0	0.0
Total	150		
Average or Mean Percentage			21.6



#### **4.2.10.2 Trends of Workplaces using Data per Industry**

The study evaluated workplaces to establish the level of Usage of injury and disease data. The use of data as appearing in Figure 8 show that 14.7% of respondents in 2004 as compared with 19.3% of respondents in 2008 were found to be using injuries and illness data to control occupational hazards in workplaces. Although positive trend was established, the levels were very low to have any impact in changing the conditions at the workplaces. Workplaces should be guided on how data is used to increase the levels.

Investigations were also made on the trend of data use among industries. The trends expose a situation of poor data management in the industries and generally in all workplaces. Figure 8 shows that Agricultural industry had an average trend 33.3% followed Electricity/Gas/Water Suppliers (25%) and then the manufacturing with 21.4%. The rest of the industries had very poor trends, which was explained as lack of awareness and few inspections by the regulating officers as shown in Table 7.

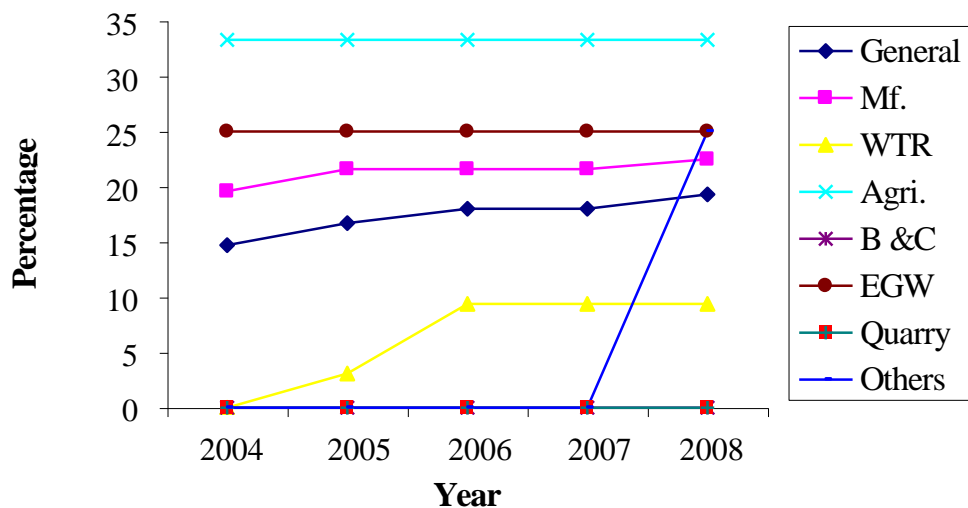


Figure 8 Workplaces using Data per Industry (Codes are as follows:- General - All Sampled Workplaces, MF- Manufacturing, WTR- Wholesale/Retail/ Trade, Agri.- Agriculture, B & C - Building and Construction, E.G.W – Electricity/Gas/Water Suppliers, Quarry – Quarrying, Others – Others)

#### 4.3 Management of Injury and Disease Data at Nairobi Provincial DOHSS Office

The Nairobi provincial office (DOHSS) was requested to respond to questionnaire presented to them concerning issues of health and safety data. The Nairobi province covers an area of 682 square kilometers and had 10 field occupational health and safety officers. Compliance level by workplaces is measured on extend to which a workplaces complied with the Act [OSHA- K, 2007]. The official compliance level by workplaces to safety regulations was 9%. Data collection, database management and data use and dissemination methods and systems were appraised.

Table 16 gives a summary of results obtained from the Provincial office (DOHSS).

Table 16 Management of Injury and Disease Data at Nairobi Province Office (DOHSS)

Variables Evaluated		Results	Comments	Rating out of 10
1.0 Data Collection	1.0 Recording	Employers report serious cases to DOHSS within 7 days for investigations.	First aid cases are not reported to DOHSS. Not all serious cases were reported.	3
	2.0 Reporting			
2.0 Database Management	3.0 Database Management/ Record Management	Reported data is recorded in record book.	Data available was raw and not coded	2
	4.0 Data Analysis	Incidence rates, Prevalence rates, trends and distribution patterns were not analyzed	Data was not analyzed due to lack of coding and established parameters.	1
3.0 Data Dissemination / Use	5.0 Data Use	Reported cases were investigated individually to establish the cause.	Aggregated data was not used to prevent and control workplace hazards	3

**a) Data Collection by Regulating Officers**

The law requires employers to notify DOHSS about workers who suffer serious harm as a result of their work [OSHA-K, 2007]. Not all serious cases are reported to DOHSS. First aid cases recorded in the workplace general registers [OSHA-K, 2007] were not collected from the workplaces. Method and system used by DOHSS left too much data uncollected. There was no policy on how to deal with first aid cases data. Data collection by regulating

officers had a rating of 3. This study felt that there was a large room for improvement on data collection.

#### **b) Database Management by Nairobi Provincial Office**

Oxford learner's dictionary (1995) defines database as a collection of information that is organized so that it can easily be accessed, managed, analyzed and updated. Database management is very important for it gives direction to where more effort is required [King et al., 2005]. Reported data was kept in record books and annual reports. There was no database management of injury and disease data neither was coding or analysis of data for prevalence rates, incidence rates, trends, hazard pattern distribution, lost hours, cost and comparisons done. Coding and analysis of the data are important as they help to know the impact of hazards and guides on how to react against them with measured precision.

#### **c) Data Use and Dissemination by Nairobi Provincial Office**

Injury and disease data can be used to guide efforts to improve worker safety and health, and to monitor trends and progress over time. Data collected becomes important if it can be used for improvement of safety conditions. This study found that the provincial office (DOHSS) uses the reported cases through investigation of prioritized serious cases and acting upon them. Advice is then given to employer according to what measures should be to ensure the incident does not reoccur. Cases were investigated according to seriousness, priority and availability of regulating officers. DOHSS did not communicate to

the public on the number of accidents that occurred annually. The reason for this could have been due to lack of data and the system used to manage data.

#### **4.4 Management of Injury and Disease Data at National Office (DOHSS)**

The National Office (DOHSS) was in charge of workplace occupational safety and health issues in Kenya. The department is under the Ministry of Labor and Manpower Development and headed by a Director. Table 17 is a performance summary report of 2008 by DOHSS [DOHSS, 2008]. It shows the number of inspections done, number of investigated injury and disease incidences, number of prosecutions performed and generally other particular registrations and trainings the department of the government has been able to do or facilitate.

Table 17: DOHSS Performance Report for 2008

<b>Activity</b>	<b>Performance</b>	<b>Remarks</b>
Workplace inspections	2732	For enforcement to ensure compliance
Prosecutions	61	Prosecutions in court of law
OSH audits	564	Carried out by OSH advisers
Number of OSH approved advisers	43	Persons qualified in occupational safety and health to carry out OSH audits privately
Number of fire auditors	8	Recently approved and still in process of approval
Number of workers medically examined	6321	Examinations are carried out on workers exposed to hazardous work environments
Number of DHPs	36	These are medical practitioners approved to undertake medical examinations in workplaces.
Hygiene Surveys	31	To monitor workplace hazards with the resent acquired equipment
Number of training institutions	59	These are institutions with qualified persons who train on occupational health and safety.
Number of trained workers	3692	These are mainly members of health and safety committee who have undergone the mandatory training course.
Number of plants examined	3189	These are boilers, air receivers, lifts and lifting appliances among others, examined by approved persons to ensure safety
Number of plant examiners	32	Persons with engineering background approved purposely for examining plants.
Accidents with action taken	264	Accidents thoroughly investigated
Capacity building on WIBA	60	The number of officers trained for effective implementation on the new WIBA act

The annual reports [DOHSS, 2004 – 2008] cited inadequate operational funds, communication facilities, and lack of working tools and equipments, inadequate transport facilities, shortage of staff and lack of training opportunities as the major constraints experienced by regulatory officers. The National Office (DOHSS) was requested to respond to questionnaire presented to them concerning issues of health and safety data. Data collection, database management and data use and dissemination methods and systems at the National Offices were appraised. Table 18 gives a summary of management of injury and disease data obtained from the National office (DOHSS).

Table 18: Management of Injury and Disease Data at National Office (DOHSS)

Variables Evaluated		Results	Comments	Rating out of 10
1.0 Data Collection	1.0 Recording	Provinces reported data to head office (DOHSS). Some cases were also received from accident compensation claims	A lot of uncollected and unreported data from workplaces by provincial offices made the reported data unreliable.	4
	2.0 Reporting			
2.0 Database Management	3.0 Database management/ Recordkeeping	Reported cases not coded but kept in electronic form and annual reports.	Database Management and coding was not practiced by the DOHSS	3
	4.0 Data Analysis	No data analysis by DOHSS	No established parameters that must be reported annually.	1
3.0 Data Dissemination/ Use	5.0 Data Use	Reported cases were filtered and acted upon individually to provide corrective actions.	Aggregated data was not emphasized for providing corrective actions.	3

**a) Injury and Disease Data Collection by National Office**

Data collected by the provinces was forwarded to the head office by the provinces. The returns were then used by National office for compiling its annual reports. The



unreported and uncollected data at the provinces affected the quality of data at the national level. The data received from provinces is kept in record books and annual reports.

#### **b) Database management of Injury and disease at the National Office**

This study found that data reported to head office (DOHSS) was not coded nor kept in a structured databank or a database after being forwarded from the provinces. It was not possible to know which industry or occupation had most of the cases. The forwarded data was not analyzed for prevalence rates, incidence rates, trends, lost hours, cost, distribution patterns and comparisons. The forwarded data was however used in writing annual reports. The annual reports changed format every year and had no consistency in particular statistical indicators. Prevalence rates, incidence rates, trends, comparisons and distribution of hazards were not analyzed in the annual reports. The regulatory officers interviewed mentioned lack of training and data policy as the major shortcomings that affected the handling of the data.

#### **c) Data Use and Dissemination at the National Office**

DOHSS is supposed to use injury and disease data to set national policy on occupational health and safety in the workplaces. The data is supposed to be used to advice the provinces on what urgent measures are required to address a certain situation. This study found that most of data forwarded to the national office was lacking in quality to be used in setting of a national policy on occupational health and safety in the country. Data

reported was not communicated to the public and other stakeholders for scrutiny and criticism. System used to collect data did not lend well to the aggregation of data.

## **CHAPTER 5**

### **5.0 CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Conclusion**

##### **5.1.1 Workplaces**

Workplaces were required by regulations to report injury and disease data to the regulating office. As Table 10 shows majority of workplaces were found not reporting the data to the authorities. As table 10 also shows majority of the workplaces did not record, analyze and use injury and disease data. The study concluded that the system used to manage and guide workplaces on collection and handling of data was not effective in managing the injury and disease data in the workplaces. Data collection, database management and data dissemination structures had not been established as a guide to manage the workplace injury and disease data.

##### **5.1.2. Directorate of Occupational Health and Safety Services (DOHSS)**

Recording, recordkeeping, coding, analysis, use and communication of data are not adequately done at regulatory offices as shown by Tables 16 and 18. The system used to collect and manage data is not quantification-oriented system and therefore availability of data at DOHSS is a problem. The system in place of notifying serious harms to the DOHSS could not provide a coherent set of statistics and statistical indicators for guidance in management of the workplace safety. The system was riddled with under-reporting, inability to provide aggregated data and low state of ready data.

## **5.2 Recommendations**

It is important to be able to measure and monitor occupational disease and injury effectively in order to identify risk factors, priority areas for preventive action, and to evaluate preventive actions. There is need for information to monitor trends in workplace injury and disease events, identify health and safety issues and determine the cost of injury and disease to the society. It is therefore crucial to have injury and disease data to help in prevention by identifying patterns across time spans, industries and occupations that cannot be discerned through casual observation. This is important because “apparently unrelated events assume different character when looked at collectively” [Law commission, 2000].

This study found that the system in place for managing health and safety information was not effective in providing meaningful data that could be used to fight against workplace hazards as shown in Tables 10, 16 and 18.

In order to improve on data collection, database management and data use/dissemination at both workplace and regulatory level, there is need for regulatory authority to formulate workplace injury and disease data policy and set: -

- i. A system that is designed specifically and exclusively to collect an elaborate injury and disease data from the workplaces.
- ii. A framework that would provide for a coherent set of statistics and statistical indicators for guidance and research purposes.
- iii. Statistical indicators that meet the requirement of informing on workplace injury and disease.

- iv. Appropriate approach to manage and communicate on workplace injury and disease situation.
- v. An Authority (Bureau of Labour Statistics) with qualified and trained staff to preside over collection and management of workplace injury and disease data.
- vi. Application of both incidence notification and aggregate data systems for collecting and managing workplace injury and disease data.

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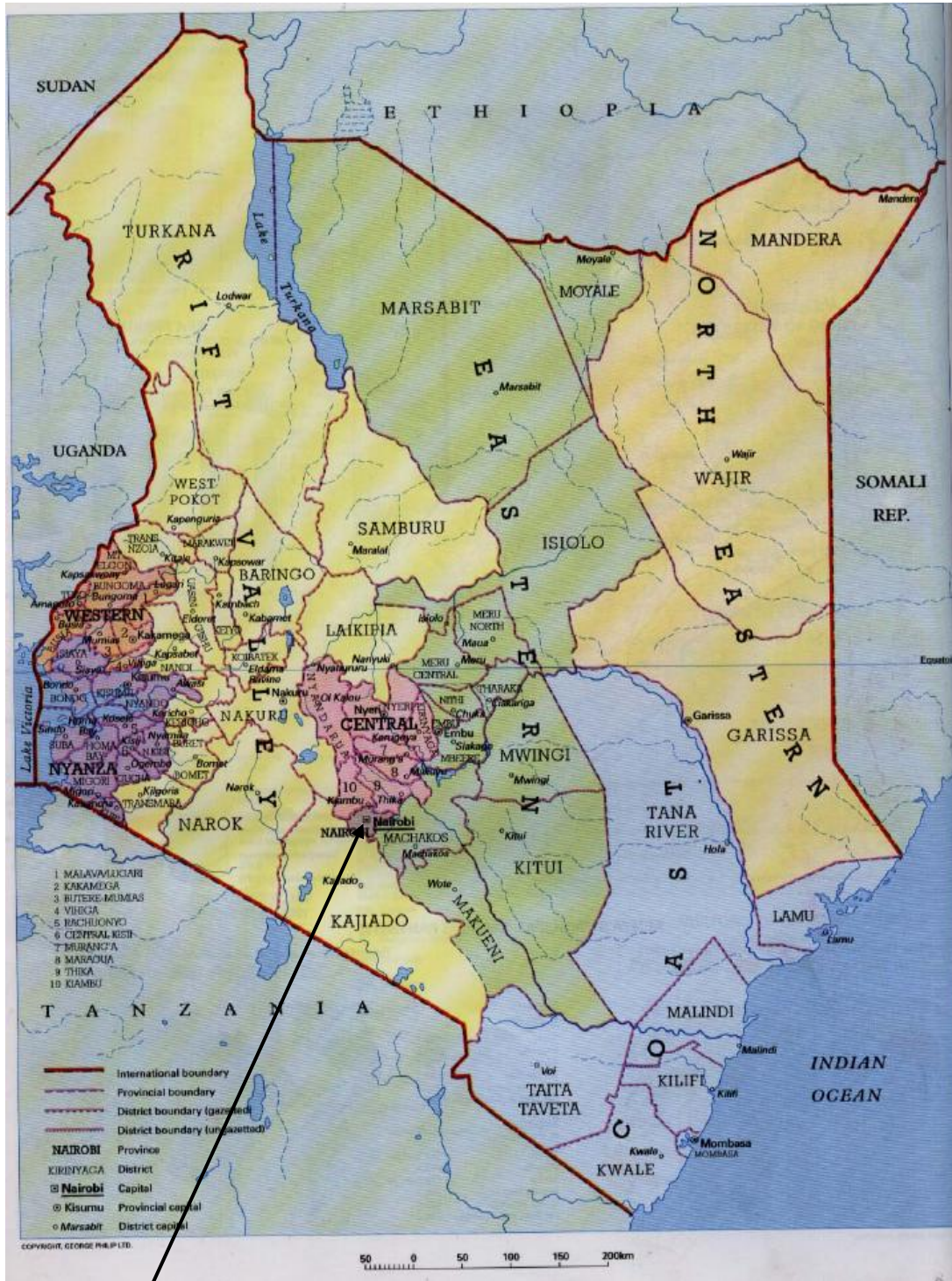


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## APPENDICES

Appendix 1: Map of Kenya Showing the Study Area and other Provinces



Location of the study area, Nairobi Province

## **Appendix 2: Workplace Questionnaire**

Informed Consent

Hello,

My name is Justin J. Wambua Kyongo, a student at the Jomo Kenyatta University of Agriculture and Technology, Kenya and a Health and Safety Adviser under the Legal Notice no. 31 of 2004 (Health and Safety Committee Rules under the Occupational Safety and Health Act (OSHA, 2007)). I am conducting a health and safety survey in fulfillment of a Master's degree in Occupational Health and Safety.

Your workplace has been chosen among those that will give true representative picture in this survey and I would very much appreciate your participation. I would like you to provide answers to some health and safety issues on management of health and safety information. This information is for academic purposes but is expected to assist in understanding the health and safety issues affecting workplaces in Kenya and in particular the status of workplace health and safety information management.

Whatever information you provide will be treated in strict confidence and will not be shown to other individuals or companies. Participation in this survey is voluntary and you can choose not to answer any individual question or all the questions. However I hope that you will participate in this survey since your company's views are very important. At this time, if you have any question regarding the survey please feel free to ask me.

May I begin the interview please?

Respondent Does Not Agree to be Interviewed.....

Return questionnaire to the interviewer.

End of interview

Signature of the interviewer.....Date.....

Respondent Agrees to be interviewed.....

Answer the questions

**A. Questionnaire 1**

Please answer the following questions as precisely as possible

**Workplace Information**

1. Name of the Workplace .....
2. Type of Industry.....
3. Contact person/ Title. ....
4. Number of employees .....Male.....Female .....
5. How many years have you been in operation.....
6. When were you last visited by an Occupational Health and Safety Officer? .....
7. Do you record your injuries and illnesses data? Yes/No .....
- If yes, when did your start recording? .....
- Where do you record?       Government General Register.....
- Other Record Book .....
8. Do you report injuries and illness data to the D.O.H.S.S? Yes/ No
- If yes, when did you start reporting? .....
- If no, why do you not report?.....



How often are the plants under statutory management examined?.....

Do you have any comment or suggestion concerning occupational health and safety data?.....

Thank you for your participation and co-operation. Your contribution will go along way to add knowledge and understanding of management of the workplace health and safety information in Kenya and also assist in the formulation of a suitable workplace health and safety information systems and help Kenya to make informed decisions on health and safety issues.

### **Appendix 3: National DOHSS Office Questionnaire**

Informed Consent

Hello,

My name is Justin J. Wambua Kyongo, a student at the Jomo Kenyatta University of Agriculture and Technology in Kenya and a Health and Safety Adviser under the Legal Notice no. 31 of 2004 (Health and Safety Committee Rules under the Occupational Safety and Health Act (2007) Laws of Kenya (OSHA, 2007)). I am conducting a health and safety survey in fulfillment of a Master's degree in Occupational Health and Safety in the Nairobi area and would very much appreciate your office's participation in this survey. I would like you to provide answers to some health and safety policy issues on workplace health and safety information management. This information is for academic purposes but is expected to assist in understanding the health and safety issues affecting workplaces in Kenya and in particular the status of health and safety information management in the workplaces as well as in the Directorate of Occupational Health and Safety Services (DOHSS).

Whatever information you provide will be treated in decorum and in confidence it deserves. Participation in this survey is voluntary and you can choose not to answer any individual question or all the questions. However I hope that you will participate in this survey since your office's views are very important. At this time, if you have any question regarding the survey please feel free to ask me.

May I begin the interview now?

Respondent Does Not agrees to be interviewed.....

Return questionnaire to the interviewer.      End of interview

Signature of the interviewer.....Date.....

Respondent Agrees to be interviewed .....

Answer the questions

## **B      Questionnaire 2**

Please answer the following questions as precisely as possible

1.      Contact person /Job Title .....
2.      What is the estimated number of workplaces in Kenya?.....
3.      How many workplaces are registered in Kenya under the occupational health and safety act? .....
4.      How many employees in the Kenyan workplaces?.....
5.      How many officers are working under you.....
6.      What is the current officer/ workplace ratio?.....
7.      What would be the ideal officer/ workplace ratio?.....
8.      What is the average annual inspections or visitations?.....

What would be your ideal number of annual inspections? .....

What parameters do you think would help you improve the number of annual inspections? .....

9. What is the level of compliance under Occupational health and safety act?.....

**Information Management**

10. What is your current method of collecting injuries and illness statistics from workplaces?.....

11. Do you maintain a database for your injuries and illness data?

Yes / No .....

If yes, when did you start maintenance .....

In what format do you maintain? Paper files.....

Computer files.....

12. Do you analyze the injuries and illness data reported by the workplaces?

.....

13. Do you use the injuries and illness data for any purpose? Yes/No...

If yes, what purpose? .....

14. Do you keep and preserve your injuries and illness data reported from the workplaces? .....

15. Are you satisfied with the way your injuries and illness data is collected, managed and used? Yes /No.....



What changes would you like to see put in place?.....

Thank you for your participation and co-operation. Your contribution will go along way to add knowledge and understanding of management of the workplace health and safety information in Kenya and also assist in the formulation of a suitable workplace health and safety information systems and help Kenya to make informed decisions on health and safety issues.

#### **Appendix 4: Provincial DOHSS Office Questionnaire**

Informed Consent

Hello,

My name is Justin J. Wambua Kyongo, a student at the Jomo Kenyatta University of Agriculture and Technology in Kenya and a Health and Safety Adviser under the Legal Notice no. 31 of 2004 (Health and Safety Committee Rules under the Occupational Safety and Health Act (2007) Laws of Kenya (OSHA-K, 2007). I am conducting a health and safety survey in fulfillment of a Master's degree in Occupational Health and Safety in the Nairobi area and would very much appreciate your office's participation in this survey. I would like you to provide answers to some health and safety issues on workplace health and safety information management. This information is for academic purposes but is expected to assist in understanding the health and safety issues affecting workplaces in Kenya and in particular the status of health and safety information management in the workplaces as well as in the Directorate of Occupational Health and Safety Services (DOHSS).

Whatever information you provide will be treated in decorum and confidence it deserves. Participation in this survey is voluntary and you can choose not to answer any individual question or all the questions. However I hope that you will participate in this survey since your office's views are very important. At this time, if you have any question regarding the survey please feel free to ask me.

May I begin the interview now?

Respondent does not agree to be interviewed.....

Return questionnaire to the interviewer .End of interview

Signature of the interviewer.....Date.....

Respondent agrees to be interviewed.....

Answer the questions

**B. Questionnaire 3 Provincial DOHSS Office**

Please answer the following questions as precisely as possible

Please answer the following questions as precisely as possible

1. Contact person /Job Title .....
2. What is the estimated number of workplaces in Nairobi province?.....
3. How many workplaces are registered in Nairobi province under the occupational health and safety act? .....
4. How many employees are there in the Nairobi workplaces?.....
5. How many officers are working under you.....
6. What is the current officer/ workplace ratio?.....
7. What would be the ideal officer/ workplace ratio?.....



15. Are you satisfied with the way your injuries and illness data is collected, managed and used? Yes /No.....
16. What changes would you like to see put in place?.....

Thank you for your participation and co-operation. Your contribution will go along way to add knowledge and understanding of management of the workplace health and safety information in Kenya and also assist in the formulation of a suitable workplace health and safety information systems and help Kenya to make informed decisions on health and safety issues.

## **Appendix 5: Journal Paper 1**

### **Evaluating the Management of Workplace Health and Safety Information in Nairobi Province, Kenya**

Justin J. Wambua Kyongo, J. W. Njenga and E. G. Gatebe

**Institute of Environment and Energy Technology, Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya**

**Abstract:** Workplace is a significant contributor to diseases, injuries and fatalities. This study investigated the status and performance of workplace health and safety information system in Nairobi Province, Kenya. It was motivated in response to need for information on trends in injury and disease events, identification of health and safety issues and the determination of the cost of injury and disease to the society. Systematic random sampling was used to select 150 workplaces from 845 registered workplaces in Nairobi Province for interviews using a semi-structured questionnaire. Nairobi province was selected because of its heavy concentration of industries and other enterprises. The method and systems in place for collecting, coding, analyzing and use occupational disease and injury data were appraised to determine the limitations that hamper efforts to quantify the nature and extent of occupational hazards. This study found that 39.3%, 45.3%, 12.0%, 21.3% and 19.3% of Workplaces recorded, reported, analyzed, kept records and used injury and disease data respectively. The study also found collection, management and dissemination were poor and the regulator scored 4, 1 and 3 respectively in a scale rating of 10. The study concluded that data collection and management was poor and recommends training on data handling, formulation of workplace data policy with an appropriate

framework of elaborate and effective data collection, management and dissemination structures that will provide meaningful statistics to fight against workplace hazards.

**Key Words:** Workplaces, method and systems, injury, disease, data collection, database management, data dissemination/use.

## **Appendix 6: Journal Paper 2**

### **Evaluating the Management of Workplace Health and Safety Information at Regulation Offices, Kenya**

Justin J. Wambua Kyongo, J. W. Njenga and E. G. Gatebe

#### **Institute of Environment and Energy Technology, Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya**

**Abstract:** Workplace is a significant contributor to diseases, injuries and fatalities in Kenya. This study investigated the status and performance of workplace health and safety information system in Nairobi Province, Kenya. It was motivated in response to need for information on trends in injury and disease events, identification of health and safety issues and the determination of the cost of injury and disease to the society. The Directorate of Occupational Health and Safety Services were evaluated on how they manage workplace injury and disease data using a semi-structured questionnaire. The method and systems in place for collecting, coding, analyzing and use occupational disease and injury data were appraised to determine the limitations that hamper efforts to quantify the nature and extent of occupational hazards. This study found that 39.3%, 45.3%, 12.0%, 21.3% and 19.3% of Workplaces recorded, reported, analyzed, kept records and used injury and disease data respectively. The study also found collection, management and dissemination were poor and the regulator scored 4, 1 and 3 respectively in a scale rating of 10. The study concluded that data collection and management was poor and recommends training on data handling, formulation of workplace data policy with an appropriate framework of elaborate and

effective data collection, management and dissemination structures that will provide meaningful statistics to fight against workplace hazards.

**Key Words:** Workplaces, method and systems, injury, disease, data collection, database management, data dissemination/use, Directorate of Occupational Health and Safety Services (DOHSS).