# Hazards-Risks Nexus: A Survey of Occupational Safety and Health among Municipal Waste Collectors in Harare, Zimbabwe

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## ABSTRACT

This study aims to examine occupational safety and heathy hazards and risks associated with municipal waste collectors in Harare, Zimbabwe. This descriptive cross-sectional survey collected data from waste collectors and managers who have worked in the urban council, using a researcher administered semi-structured questionnaire. The data was analyzed using SPPS version 23. Questionnaires were used to collect data, and that data was used in conjunction with secondary data obtained from various literature. The results indicated that waste collectors in Harare encountered a myriad of safety and health hazards because of their work practices and conditions. Its labor-intensive nature exposes workers to injuries and exposure to disease causing pathogens and hazardous waste. As a result, waste collectors were exposed to various injuries, illnesses and musculoskeletal disorders and other health challenges. Some comprehensive prevention and control measures must be developed and applied prevent or minimize the safety and health risks. This will ensure health and safety in waste management hence reduction of risks among waste management workers at varying stages of the process. The results point to the need for council or municipalities to have a functional occupational safety and health management system that seeks to have a holistic approach towards hazard management mechanisms. The underlying determinants of a successful OSH management system by all stakeholders needs an integrated approach.

**Keywords:** Health, Municipal, Occupational, Safety, Waste

## INTRODUCTION

Traditionally the municipality is the body responsible for solid waste management. Municipal solid waste management (MSWM) encompasses the collection, transportation, treatment, recycling, recovery, and disposal of solid waste in metropolitan settings (Shuvai, 2017). In addition, Waste management is the collection, transportation, recovery and disposal of waste, including the supervision of operations and the after care of disposal sites and including action taken as a dealer or broker (UNSD 1997). Waste management of waste in Zimbabwe is mainly done by councils or local authority. The process of waste management involves related hazards and risks to those directly and indirectly involved. Occupational safety and health contribute significantly to human and economic costs in developing countries as well as developed countries. Therefor waste management by local authorities, especially in urban centers, must ensure that there is proper safety and health practices to avoid consequences. Occupational health concerns exist at every stage, from the collection point at residences to transportation, recycling, or disposal sites (Marahatta et al., 2017). Improper waste disposal at home may be very risky as hazardous objects or substances if unsegregated may pose several risks to the waste collectors which is the case of urban residential areas. High proportions of waste workers reported physical injuries, cuts, injuries, wounds, allergies, musculoskeletal disorders, and other skin problems, consistent with the findings of previous studies (Bogale et al., 2023; Pandey, 2004). The hierarchy of hazard control must be implemented by the management to avoid hazards that result in such risks.

There are serious problems affecting workers in different workplaces and industries; thus, safety and health issues are one big challenge. Municipal waste is composed of various discarded goods, mainly leftover food, garden waste, textiles, glass, papers, metals and other spoiled goods. Waste in urban areas is generated form sources which include residential areas, business centers and industrial areas. Exposure to occupational hazards in terms of waste management is determined by the waste composition, the job tasks (collection, transport, and recycling), and the type and design of equipment used. Occupational health issues for municipal solid trash collectors in poor nations include muscle and ligament sprains, cuts and lacerations, and allergies (Thakur et al., 2018). The risks associated with waste management are caused by hazards such as chemical (including dust), biological, physical (noise, vibration, manual handling, repetitive movements, slips, trips and falls.), sharps, work organization, and psychosocial problems. Handling of waste involves a lot of physical activities like bending, reaching, lifting, physically moving waste amongst others (Takala, 2019). However, risks associated to waste management include injury, musculoskeletal, dermatologic, mucous membrane, respiratory, cardiovascular, gastrointestinal and neurological risks that may lead to death, the scourge of this study is mainly to identify the hazards and risks associated with municipal workers involved in waste management or collection. The objectives of the research are; to identify hazards and risks faced by waste collectors during work sessions, to assess the level of occupational safety and health impact according to the demographic state of Harare urban waste collector, to assess the extent to which Harare waste collectors been involved in the implementation of Occupational Safety and Health management system and to examine the challenges faced by waste managers in implementing safety and health systems

## MATERIAL AND METHODS

The study was conducted in Harare the capital city of Zimbabwe, which acquired its city status under the Urban Act of Zimbabwe. At the time of the research the council the department of waste collection consists of 637 waste collectors, 5 compactor and 10 tractors, 8 working shifts, and daily collection of waste in the city and daily waste is collected. The researcher used questionnaires as data collection instruments in achieving the objectives of this study. This descriptive cross-sectional survey was conducted in Harare. The population boom in the city has resulted in a densely populated area with households occupied by too many people as tenants. As a result, most of waste disposed comes from household sources.

For this study a semi-structured questionnaire was used to gather data on occupational safety and health practices. The quantitative data collection process involved questionnaires surveys completed by waste collectors responsible for collecting waste in Harare. The questionnaire comprised of questions that provided insight into hazards associated with waste collection. All questions used allowed respondents to express their views on risks associated with waste collection.

Random sampling technique was deployed to sample the 150 waste collectors for questionnaire administration to ensure equality on the probability of each worker being selected as a questionnaire respondent. The target population for this study consisted of waste collectors or managers, irrespective of age and gender, employed by the Harare Municipality. The sample has 75 males and 75 females, 10 of the participants are in the municipality management including Directors, Officers, Environmental health technicians and supervisors. A sample size of 150 waste collectors which represented 23, 5% of the study population since Harare municipality has 637 waste collectors. The sample size of 23.5% of the population is adequate to achieve a high-reliability and validity of the research instrument.

Data from completed surveys was analyzed using the basic statistical analysis. The results were derived using descriptive statistics and provided as a frequency count and percentage for socio-demographic information, work-related factors, and the presence and kind of safety and health hazards and risks waste collectors are exposed to. Particular attention was given to ensuring that the data collection and analysis were explicitly linked to the research objectives, thereby maintaining a coherent and logical narrative.

Ethical consideration has increasingly received great attention in research in response to society's expectation of greater accountability (Zegwaard et al., 2017). Informed consent to respond to questionnaires in the study without any form of coercion was sought from targeted respondents. The aim and significance of the study was fully explained to all the targeted respondents to enable them to make an informed decision on whether to

participate or not. There was also assurance to the respondents on the confidentiality and anonymisation of the data sources thereby allaying fear victimization that possibly could impact negatively on the response rate.

## RESULTS AND DISCUSSIONS

- **Occupational diseases among waste collectors**

As reflected in Figure 1, the prevalence of lacerations and gastrointestines are the most common problem for waste collectors. Lacerations were reported by 92.5% of the respondents and gastrointestines were reported by 72.5 of the respondents. A study conducted by Patil & Kamble, (2017) on workers in Chandrapur City, Central India, confirms that gastrointestines challenges can be a serious problem among waste collectors. In the study, a notable proportion of the workers (52.5) reported experiencing injuries during waste collection. Adeyi and Adeyemi (2019) in a related study, confirm that waste handlers are exposed to hazardous materials present in municipal solid waste stream, leading to various types of injuries associated with occupational exposure. Out of the total workers, nearly two-fifth (42.5%) had respiratory and dermatologic (42.5) related illness. A notable proportion of the workers (37.5%) reported experiencing Musculoskeletal disorders while (27.5) had mucous membrane related illness. The less prevalent problems for waste collectors were cardiovascular and neurological diseases with 10% and while only 5% of the respondents recorded none of the health problems indicated in Figure 1.

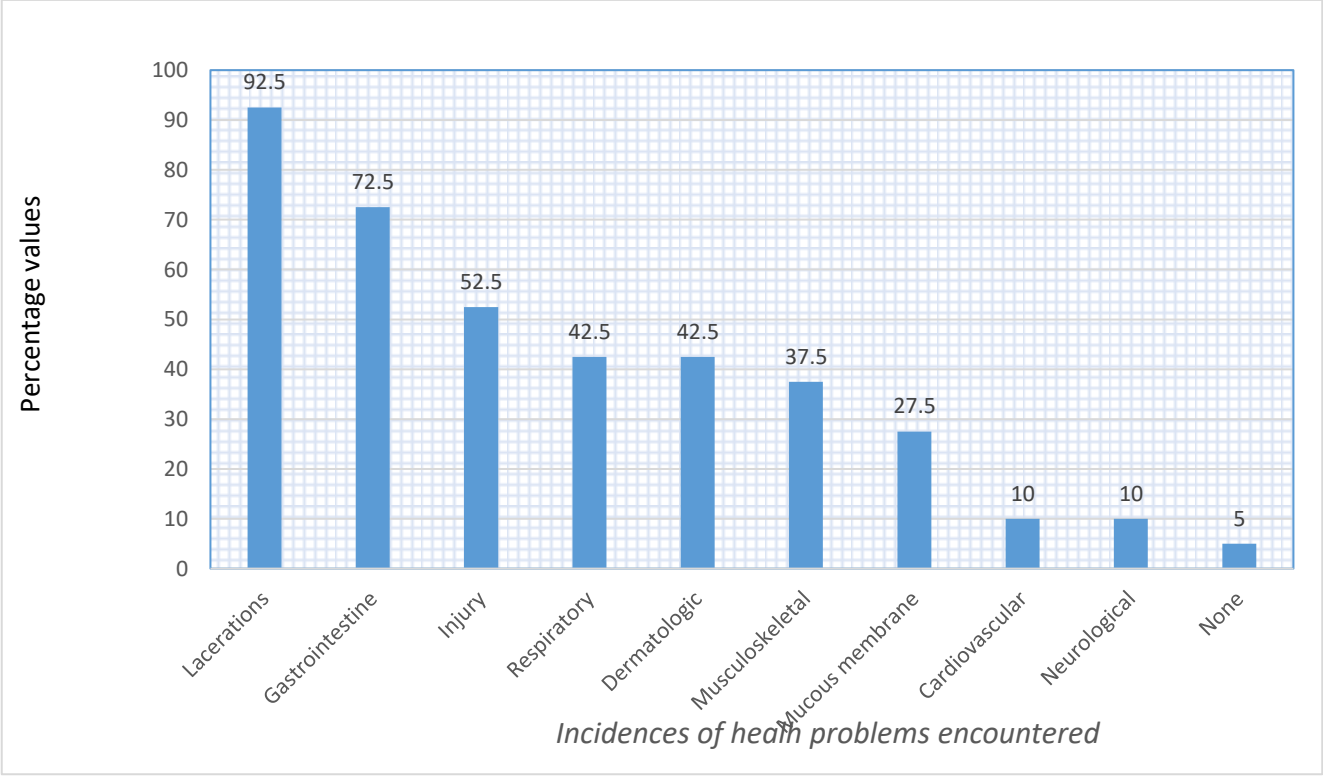


Figure 1: Experience of work-related health challenges in Harare

- **Practice of Occupational Health and Safety**

Practice of Occupational Safety and Health presentation of the result of the practice of Occupational Safety and Health (OSH) as presented in figure 2 showed that 60 % of the respondents had a good level of practices of OHS while 40 % had a poor level of OSH practices.

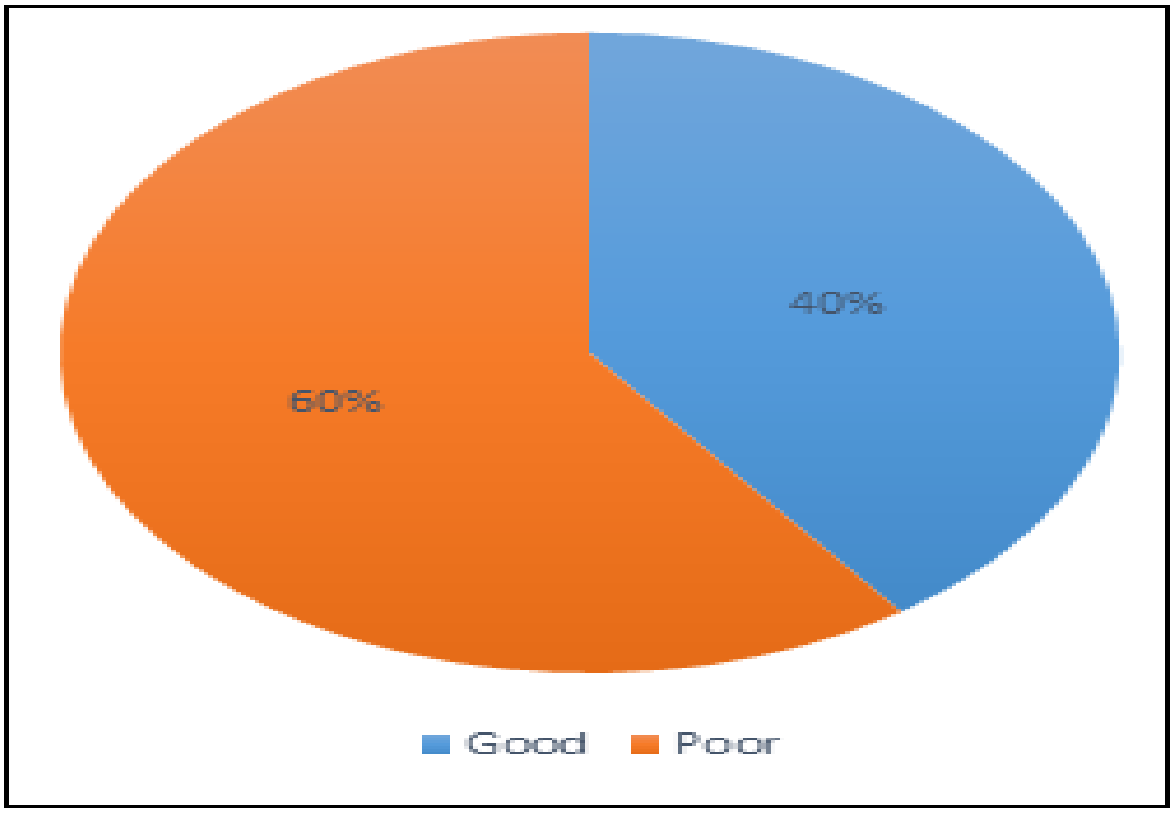


Figure 2: Responses from the managers and supervisors on Occupational Health and Safety practices

As depicted in Figure 2, there is generally significant adherence to the use of occupational safety and health.

The high employee involvement and participation vindicates long held observation of the centrality of employees in the success of occupational safety and health management system. A study by Shabani et al. (2023) identified employee involvement as paramount in boosting the level of safety and health awareness about the importance of occupational safety and health among workers which is critical in developing an organizational preventive safety culture. Research has proved employee involvement to be having a strong link to employee commitment and improved occupational safety and health results (Walters et al., (2020). Lack of employee involvement and participation can be negatively influenced by lack of leadership and commitment of top management in addressing safety and health concerns raised by employees. As depicted in Figure 2, Harare municipality basically has meaningful adherence to a good safety culture among its waste collectors.

- **Challenges faced to implement proper OSH system**

As depicted in Figure 3, the provision of adequate occupational safety and health personal protective equipment proved to be a major challenge as indicated by 80% of the respondents during the survey. A related study by Abdi and Hareru (2024) highlighted that, unavailability of personal protective equipment, is a serious challenge in the implementation of OSH management system. Similarly lack of management in terms of supervision and provision of safe and healthy environment to avoid unsafe acts has (80 %) share which is one of the greatest challenges for OSHE implementation system. Absence of competent and qualified OSHE personnel is also major challenge in implementing a functional OSHE management system which was indicated by 73 respondents. OSH implementation challenges, such as poor safety awareness among leaders, inadequate worker training and ineffective safety regulation implementation were also echoed by other scholars such as by Kheni and Afatsawu (2022), and Kunodzia et al. (2024). Workers behavior especially unsafe acts got was indicated by 60% of the respondents. Inadequate OSHE training is also a challenge that leading to challenges of implementing OSHE management systems having 40% of the respondents indicating it, Lack of Policies and policy implementation strategies got the least response of 20% that hinder implementation of the OSHE management system.

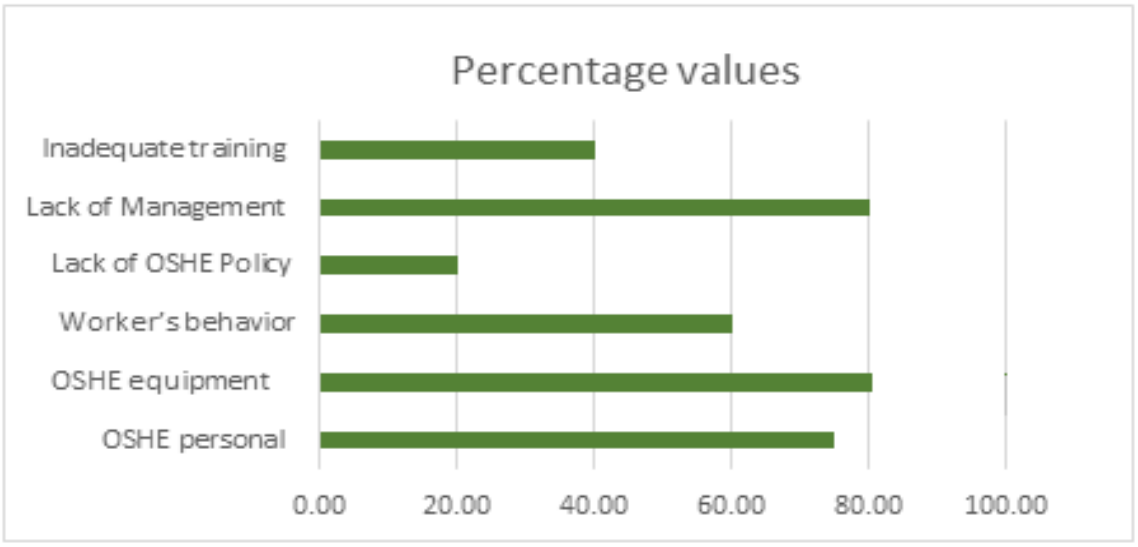


Figure 3: Response to the Challenges faced to implement proper OSHE system

## RECOMMENDATIONS

- There is need for mandatory high-quality personal protective equipment. Harare municipal authorities must provide and enforce the use of personal protective equipment such as puncture-resistant gloves, masks (respirators for dust/fumes), safety boots, and high-visibility uniforms to prevent cuts, infections, and traffic-related accidents.

- The Municipality of Harare should initiate the adoption of an OSH Policy and as well, engage a SHE Officer who will ensure that all the safety and health measures are observed in the organization and as well, facilitate the establishment of a safety committee, to create a platform for communication between workers and the employers to promote a consultative approach in executing OSH issues.

- The National Social Security Authority should conduct safety and health awareness campaigns and as well, offer safety education courses, starting with top management personnel, and extending down to every supervisory level and to field personnel. Training in top management will enhance their commitment to OSH issues.

- There is need for Health and Safety Education. Harare municipal authorities and other essential stakeholders must educate waste collectors on the risks associated with biological, chemical, and physical hazards. Waste collectors must also be taught basic precautionary measures on waste handling.

- The top management at Harare Municipality should allocate an adequate budget to support occupational safety and health for the entire organization, which include casual and part-time workers. The Municipality should increase the frequency of waste collection once a week, in order to effectively manage waste as well as to reduce the workload for solid waste workers. Municipalities should provide sanitary facilities where workers can wash after work to ensure that effective personal hygiene is maintained.

- There is need for routine and regular health checks. Harare municipal authorities and other essential stakeholders must carry out regular medical surveillance for waste collectors to detect occupational health problems as early as possible.

## CONCLUSION

It can be concluded that, waste collectors at Harare municipality encountered a myriad of safety and health hazards because of their work practices and conditions. The waste collection method in Harare was undertaken through a labor-intensive system which involved lifting heavy waste loads containing biodegradable wastes,

infested with disease causing pathogens and hazardous wastes. As a result, waste handlers are exposed to various injuries, illnesses and musculoskeletal disorders and other related health challenges. Municipal waste (MSW) is an important economic and environmental issue worldwide (Yukalanget al., 2018). Occupational safety and health practices encompass all measures to ensure a safe and healthy workplace, protecting employees from accidents, injuries, and illnesses. This includes identifying and controlling hazards, implementing safety protocols, providing employee training, and promoting a positive safety culture. Furthermore, some clinical effects, such as cancer and other degenerative illnesses, appear months or even years after the initial exposure (Domingo et al., 2020). Some of the risks encountered are not immediately they can be experienced later in life after exposure to some hazards, thus later risks must be avoided through good practices by employees and employers at all costs.

The major municipality safety intervention was the provision of PPE which is the last line of defense. The most critical findings of the study that contributed to OSH problems at the Harare Municipality were, lack of an OSH policy which can be related to the lack of management commitment to OSH issues that was observed. OSH policy is critical in providing guidelines for implementing the Hierarchy of controls process in which the critical steps are Hazard identification, Elimination, Engineering controls, administrative controls and Provision of PPE. Workers in the waste management sector are exposed to a very wide range of hazards. Correspondingly complex and comprehensive prevention and control measures must be developed and applied. This will ensure health and safety in waste management hence reduction of illness and death among waste management workers at varying stages of the process.

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