

Occupational health risks and compensation entitlements among garbage collectors in selected municipalities in Laguna

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Abstract

This research paper examines occupational health risks, workplace safety practices, health outcomes, and compensation entitlements among 120 garbage collectors in selected municipalities in Laguna, Philippines. The study employed a descriptive correlational research design using a cross-sectional survey. Analysis revealed that hazards (i.e., physical strain from weather and fatigue, biological threats such as infections and pests leading to skin and stomach problems, and chemical issues from fumes and dust) were at a *moderate level*; however, protective gear received high marks for working well. Safety practices were mostly *moderate to frequent*, with strong supervision and hygiene (clean water and handwashing stations everywhere), but lagged in regular training and manageable hours. Health outcomes were not great, given that they were *fair* for ongoing illnesses and self-reported conditions such as chronic fatigue, back pain, sore throats, and poor for injuries. Compensation felt solid overall, strong on medical aid and hazard pay, but claims processing dragged at a moderate pace. Notably, better safety practices correlated positively with improved health and benefits. These workers face serious risks that need to be addressed, so compensation is a bright spot, even though providing such compensation and incentives requires legal backing and agreement in the local budget planning to make a significant difference for garbage collectors. The connections between strong oversight, hygiene, and better outcomes suggest clear ways for local government to invest in tools like ergonomic lifters and shaded breaks, increase training, add on-site health checks, expedite claims digitally, and collaborate with local agencies for ongoing support.

Keywords: Garbage collectors, compensation entitlement, occupational health risks, local government support

1. Introduction

Garbage collectors face serious health risks, yet many people ignore them, especially in developing countries where informal waste handling worsens the problem. Frontline workers face many dangers: germs in rotting waste, chemicals such as heavy metals and dioxins, sore muscles from repeatedly lifting heavy loads, and physical risks when safety rules are not followed (World Health Organization [WHO], 2022). These dangers often show up as painful muscle and joint problems, long-term breathing issues, skin conditions, or sudden cuts and punctures, and they can leave people disabled for years or cause death too soon (Gumasing & Sasot, 2019; Hermocilla, 2025).

Around the world, the ILO reports that waste workers are injured at rates up to 10 times higher than other workers, underscoring the need for focused action now (ILO, 2023). In the Philippines, rapid urban growth, poor waste systems, and unfair social conditions make matters worse, and garbage collectors, usually hired by local governments, often face even greater risks. Local research points to more than just serious health dangers; it also shows big, system-wide problems. Workers earn wages that fall below the regional minimum; they often lack proper personal protective equipment, and health tracking is broken. As a result, people can't get timely medical help or fair compensation (Mariano & Matias, 2019; Apostol et al., 2020). In Metro Manila, a 2021 DOLE survey found that more than 70% of collectors reported breathing problems after exposure to

bioaerosols, but fewer than 30% received regular health check-ups.

Even with national rules like Republic Act 11058 and the Philippine Occupational Safety and Health Standards, hazards should be reduced, but enforcement often slips at the local level, so the same problems keep coming back. Built on Organizational Resilience Theory (Duchek, 2020), this study argues that robust health and pay systems can protect workers from workplace risks, helping them cope more effectively and advocate for smarter policies. Understanding these everyday realities helps lawmakers make fair, evidence-based policies that protect workers, improve health programs, and ensure equal pay, so the people who keep the Philippines clean are treated with dignity and their rights are respected.

Background of Study

Garbage collectors face many health risks, including germs like viruses and bacteria, harmful chemical fumes, and painful strain from lifting heavy loads in unsafe, poorly protected workplaces. Each year, about 2.1 billion tons of waste are produced worldwide, and many workers lack proper protective gear or safety training, which can lead to sore muscles and joints, breathing problems, skin conditions, and other injuries (Gowda et al., 2023). In addition to these challenges, low pay and weak health services make it more difficult for people in marginalized waste-collection communities, affecting them far more than others (Tolera et al., 2024).

In the Philippines, garbage collectors often face the same dangers: heavy manual lifting, inadequate safety gear, and constant exposure to the elements and surroundings. Studies in the country show that waste workers frequently suffer from muscle and joint issues, stomach problems, and skin conditions, worsened by dirty working conditions and limited access to medical care (Hermocilla, 2025; Apostol et al., 2020). These risks are heightened when people face poverty, feel invisible, and when the government fails to enforce health and safety rules properly.

In Laguna's selected towns, the daily work of garbage collectors highlights these significant health risks. They often work in unsafe conditions due to a lack of resources, tools, and facilities needed for safe waste management. Because the job is physically demanding and often exposes workers to dangerous, potentially infectious waste, they are more likely to develop both immediate and long-term health issues.

In the Province of Laguna, several cases of injuries and illnesses among garbage collectors were recorded. The towns of Alaminos, Nagcarlan, Rizal, Liliw, and Santa Cruz have recorded several injuries and illnesses among employees while at work. Many of those recorded personnel received first aid and were immediately transported to the Health Units near their designated or scheduled area. Some of the recorded medical support provided are anti-tetanus shots for those who obtained bruises and cuts with sharp and metal objects, while limited injuries related to falls and other physical injuries were formally reported, despite the existence of several cases of physical injuries.

This is because the garbage collectors sometimes think that their wounds are too minor or shallow to go to the clinics or hospital for further evaluation. Thus, some cases are left behind the actual records. In addition, garbage collectors faced limited compensation at work despite the high risk of both human- and naturally induced hazards. Most employees in municipalities were in job-order or contractual positions, leading to lower compensation and benefits than for regular employees. Some contractual employees receive government benefits, such as bonuses, while there are no clear records of their compensation and benefits, including medical or health-related benefits.

Knowing that they were also covered by PhilHealth, even in severe cases, it might still fall short in terms of financial needs, leading them to take money from their own salaries and pocket money to cover their needs. Therefore, the local government must continue paying compensation and providing healthcare to workers injured on the job. This is a major issue, so policies and actions should be strengthened and adjusted to fit the municipality's needs.

This research examines the risks garbage collectors face in Laguna's selected municipalities, exploring how these problems operate at local, national, and global levels, and identifying the circumstances under which workers can access the compensation they are entitled to. By addressing and understanding this

issue, we can improve how people work, spread health and safety knowledge, and create fair pay systems for this at-risk group of garbage collectors. The Local Government Units should consider providing compensation and benefits to garbage collectors by including their medical benefits in the budget, as well as appropriate hazard pay and bonuses. Further evaluation and consideration of budget funds and their utilization might also be needed to make this happen.

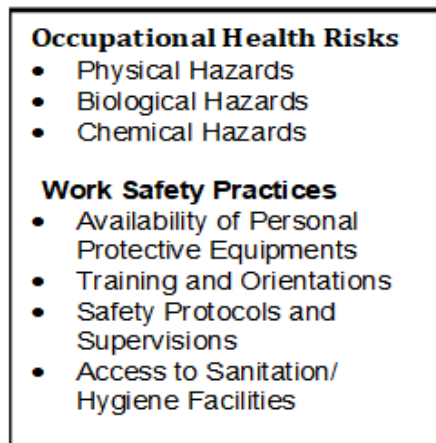
1.1. Theoretical Framework

The International Labor Organization (ILO) offers the Occupational Safety and Health Management System, or OSH-MS, framework. OSH-MS helps identify workplace hazards, evaluate their risks, and take action to keep workers safe and healthy. For garbage collectors in some towns in Laguna, this means paying attention to physical, biological, chemical, and social dangers they face daily and testing whether current safety measures are effective. It also enables the study to examine these health risks and determine if the wages set in House Bill 2478 and Senate Bill 2636 are fair.

The research also incorporates the Health Belief Model (HBM), which shows that when workers understand health risks and believe they are real, they are more likely to protect themselves, such as by using safety gear. Since garbage collectors encounter many hazards, understanding what risks they recognize helps explain why they wear safety gear or choose not to. The study considers Compensation Theory, which states that workers in hazardous jobs should receive fair pay and benefits. This theory suggests evaluating whether garbage collectors get enough hazard pay, medical care, insurance, and other perks to reflect the risks they face daily. These ideas allow researchers to analyze the dangers garbage collectors face, how they stay safe, and whether they are paid fairly for their work.

1.2. Conceptual Framework

INDEPENDENT VARIABLES



DEPENDENT VARIABLES

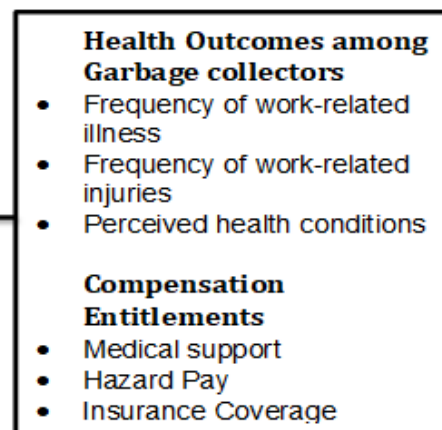


FIGURE 1. The relationship between the independent variables of occupational health risks and work environment, and the dependent variable of compensation entitlements among garbage collectors.

The conceptual framework illustrates that the independent variables include occupational health risks subdivided into physical hazards (such as injuries or musculoskeletal strain), biological hazards (exposure to infectious agents or pathogens), and chemical hazards (contact with toxic substances). These hazards represent the primary factors affecting the health and safety of garbage collectors in their work.

Another set of independent variables is the work environment, which encompasses work duration (length of daily or weekly shifts), workloads (volume or intensity of tasks), LGU support (local government unit assistance and resources provided), and employer policies (rules and safeguards enforced at the workplace). These factors influence the extent to which occupational health risks manifest and how effectively they can be mitigated.

The dependent variable is compensation entitlements, which include medical benefits (healthcare and treatment for work-related injuries or illness), hazard pay (additional wages for hazardous working conditions), and insurance coverage (protection against occupational risks).

This framework provides a structured approach to examine how specific health risks and workplace factors impact compensation entitlements, highlighting areas for improving worker protection and policy development. Understanding these relationships supports targeted interventions to enhance occupational health and social justice for garbage collection workers.

1.3. Statement of the Problem

This research study aims to answer the following research questions.

1. What is the level of occupational health risks among garbage collectors in the selected municipalities in Laguna in terms of :
 - 1.1 Physical Hazards
 - 1.2 Biological Hazards
 - 1.3 Chemical Hazards?
2. What is the level of work safety practices of the garbage collectors in terms of:
 - 2.1 Availability of PPEs
 - 2.2 Training and Orientation
 - 2.3 Safety Protocols and Supervision
 - 2.4 Access to sanitation/ hygiene facilities?
3. What is the level of health outcomes among garbage collectors in the selected municipalities of Laguna in terms of:
 - 3.1 Frequency of work-related illness
 - 3.2 Frequency of work-related injuries
 - 3.3 Perceived health conditions?
4. What is the status of garbage collectors' compensation entitlement in the selected municipalities of Laguna in terms of:
 - 4.1 Medical support
 - 4.2 Hazard Pay
 - 4.3 Insurance Coverage?
5. Is there a significant relationship between work safety practices, health outcomes, and compensation entitlements among garbage collectors in selected municipalities of Laguna and the health outcome?

1.4. Hypotheses

There is no significant relationship between work environment factors (such as work duration, workloads, LGU support, and employer policies) and the occupational health risks faced by garbage collectors.

There is no significant relationship between work safety practices, health outcomes, and compensation

entitlements among garbage collectors in selected municipalities in Laguna.

1.5. Scope and Limitation of the Study

The research study assesses occupational health risks, work environment conditions, and compensation entitlements among garbage collectors in the selected municipalities of Laguna. The study investigated the levels of physical, biological, and chemical hazards encountered by garbage collectors and explored specific aspects of their work environment, including work duration, workloads, local government unit (LGU) support, and employer policies.

This research primarily focuses on the garbage collectors officially employed in the municipality, whether permanent or contractual, within the selected municipality of Laguna. The data collection involved quantitative methods, with questionnaires administered to the selected respondents to understand their perceptions and the status of their health and compensation. Also, to provide a comprehensive understanding of occupational health and compensation issues among the garbage collectors.

The study is delimited to the current workforce and does not include former garbage collectors or those in selected municipalities. It aimed to identify if there is an existing gap in compensation entitlements and workplace protections being experienced at the municipal level of the garbage collectors, thus offering recommendations for targeted improvements in municipal support, policy formulation, and occupational health interventions.

1.6. Limitations of the Study

The study focused on permanent and contractual personnel in the sanitation department, specifically the garbage collectors in the following municipalities in Laguna: Alaminos, Liliw, Nagcarlan, Rizal, and Santa Cruz. The said municipalities were selected due to their proximity to the researcher for convenience, as well as to ensure the survey could be given sufficient time and focus.

Moreover, aside from the said reason, the municipalities were selected because the number of their listed personnel is almost equal, thereby making it more acceptable to conduct research and analysis. Furthermore, the study relied on municipal records and worker accounts; as a result, these records may not capture all relevant incidents or health outcomes, and other work-related injuries may not have been recorded. The research may be limited in terms of sample size due to resource constraints, which may affect the statistical validity and the ability to provide generalizable findings.

In addition, external factors may hinder or affect the research findings, such as regional policies, broader economic conditions, and community practices regarding waste segregation and disposal. The said factors were beyond the scope of the study, although they may influence worker experiences. The cross-sectional design captures only the conditions during the data collection period and may not reflect changes over time or after interventions are implemented.

1.7. Significance of the Study

This study holds significant value across multiple sectors.

The Community. It raises awareness about the health risks faced by garbage collectors, fostering greater support and advocacy for improved safety measures. Understanding these risks promotes public appreciation of the essential work these laborers perform, leading to a healthier, more informed populace.

Schools And Academic Institutions. The study could benefit from integrating its findings into curricula focused on occupational health, public safety, and environmental management. This promotes critical thinking and social responsibility among students, potentially inspiring future research or careers related to public health and waste management.

Future Researchers. They may gain a valuable reference point on occupational hazards specific to waste management in a local Filipino context, along with identified gaps in compensation policies.

Garbage Collectors. They may benefit from recognition of the risks they face and increased advocacy for adequate compensation, medical coverage, and stronger workplace protections.

Local Government Officials. They will receive evidence-based insights to guide policy formulation, resource allocation, and the strengthening of institutional support for worker health and safety.

Sangguniang Bayan. The organization helps craft policies that benefit garbage collectors and ensures employees are well compensated and given consideration when allocating funds and incentives in the fiscal year.

1.8. Definition of Terms

This section provides clear and concise explanations of the key concepts, variables, and terminology used throughout the study.

Biological Hazard. This means any living thing, like germs, bacteria, viruses, or insects, that can make people sick.

Chemical Hazards. These are harmful substances, such as cleaning agents, acids, and other toxic chemicals, that can cause health problems if people breathe them in, come into contact with them, or accidentally ingest them.

Employer Policies. These are the guidelines and rules set by companies or organizations to keep workers safe, healthy, and treated fairly on the job.

Garbage Collectors. These workers collect and manage trash and waste from homes and businesses, often doing physically demanding work in outdoor conditions.

Hazard Pays. Extra money is paid to workers in dangerous or risky jobs to compensate them for the risk of harm.

Institutional Support. Companies and local governments provide help and resources to ensure workers have what they need to do their jobs safely and healthily.

Medical Coverage / Insurance. Plans or benefits that help workers get medical care or cover their expenses if they are hurt or become sick because of their work.

Occupational Hazard. Anything in the workplace, like harmful chemicals or unsafe equipment, that could possibly cause injury, illness, or discomfort while doing a job.

Physical Hazards. These include loud noise, extreme temperatures, or dangerous machinery that could cause physical injury.

Policy Formulation. The process of creating rules and plans by authorities to manage issues and improve conditions in the workplace.

Waste Management. The overall process of collecting, disposing, recycling, and handling garbage or other waste materials safely and responsibly.

Work Duration. The amount of time workers spend on their jobs each day or week, including shifts and overtime.

Workloads. The amount of work or tasks a worker must complete within their working hours, which can affect their stress and fatigue levels

1.9. Related Literature and Studies

1.9.1. Review of Related Literature

Waste collectors form the largest vulnerable group due to their exclusion from formal waste

management systems and lack of protective equipment, such as gloves and masks. Informal settlements where waste collection is insufficient or irregular become vulnerable places where community health and environmental contamination worsen. The research draws on participatory studies in Brazil involving waste collectors, identifying their perceptions of risks and strategies for reduction. These include vaccination campaigns, use of protective gear (though hindered by practical challenges), pest control, workplace ventilation improvements, and proper segregation of hazardous waste. The study also highlights the absence of public policies specifically targeting the health of informal waste collectors and calls for formal recognition of their role, training, and infrastructural support.

Collaboration between local governments and organized waste collectors' groups is essential for sustainable waste management, reducing hazards, and enhancing environmental stewardship. This underlines that household waste management is a socio-environmental justice issue, where marginalized populations disproportionately bear ill health and economic burdens from exposure to hazardous waste. Integrating social, environmental, and health perspectives reveals the systemic causes of vulnerability, including poverty, limited access to services, and exclusion from the formal sectors.

Apostol et al. (2020), Gowda et al. (2023), Hermocilla (2025), Mariano and Matias (2019), and others that collectively highlight the multidimensional hazards faced by waste workers and advocate for comprehensive interventions. Effective interventions require participatory approaches, capacity building, health monitoring, and reliable data collection on the conditions of waste collectors. The study advocates for a shift from seeing waste collectors merely as informal laborers to recognizing them as critical actors in urban recycling and environmental sustainability. Protecting their health through education, policy, and practice improvements is vital not only for their well-being but also for broader urban environmental health and socioeconomic resilience.

In addition to the study of Hermocilla and Apostol, they discussed that garbage collectors' exposure to infectious agents, such as bacteria, viruses, and parasites, is a significant concern due to frequent contact with biological waste and contaminated materials. Workers report respiratory infections, skin diseases, and gastrointestinal ailments because of this exposure. Furthermore, he emphasized that experienced collectors tend to adapt socially and psychologically, showing resilience through community support, while newer workers often feel overwhelmed by the physical and emotional demands early on.

Meanwhile, studies conducted in the towns of Cardona, Rizal, and Thulamela Municipality have documented several workers' vulnerabilities to various biological hazards, compounded by inadequate use of personal protective equipment and poor sanitation. Many workers encounter hazardous chemical exposures through improper handling of toxic substances found in waste, including solvents, pesticides, and industrial chemicals, that are thrown away from households and establishments in unsecured or separated from the normal daily waste at home. This exposure can cause respiratory problems, skin burns, and long-term health issues.

Mariano and Matias (2019) identified chemical risks as a serious hazard due to inadequate training and safety protocols. Globally, research advocates for better education and enforcement of chemical safety in waste management processes (Gowda et al., 2023). These studies underscore the urgent need for improved safety measures, including proper protective gear, training, health surveillance, and enhanced local policies, to mitigate occupational health risks for garbage collectors.

The study of Apostol et al. (2020) on Occupational Risk Assessment of Municipal Solid Waste Collectors in a City Subdivision in the Philippines presents a qualitative study focusing on the occupational hazards faced by solid waste management workers in Cardona, Rizal. He employed a phenomenological approach, using focus group discussions with 20 waste collectors to explore their lived experiences with health and safety risks and their perceptions of compensation and policy adequacy (Apostol et al., 2020).

The study reveals that these workers face daily exposure to hazardous materials, unsanitary conditions, and physical dangers, which increase their vulnerability to injuries and illnesses. They also report insufficient safety protocols and inadequate compensation, underscoring the need for comprehensive

occupational risk assessments that account for both physical and psychological risks. The importance of policy reforms to provide better protection and fair compensation, as well as the involvement of local governments and communities in developing sustainable interventions to improve working conditions for waste collectors. Apostol et al. (2020) provide important insights into the challenges municipal waste collectors face and call for actionable policy measures reflecting their needs and lived realities, supporting both worker safety and livelihood sustainability.

Studies on garbage collectors' work durations have examined how the time spent working as a garbage collector affects workers' health and safety. For instance, research in Brazil reported an average work duration of about 15 years, with some individuals working for over 2 decades. This prolonged exposure often leads to chronic health concerns, such as back pain and repetitive strain injuries, mostly due to the demanding physical nature of the job (Magalhães, 2021).

Meanwhile, in the Philippines, findings indicate that those with longer work histories face a greater risk of exposure to biological and chemical hazards inherent in waste management. Repeated exposure over the years heightens the likelihood of infections and respiratory problems (Gumasing, 2019). This highlights the need for ongoing protective measures throughout a collector's career. Moreover, the length of employment affects how workers perceive their job risks and the coping mechanisms they developed.

Extended tenures also relate to mental health challenges; prolonged work in hazardous conditions without sufficient safety support can result in stress and anxiety. The social stigma attached to garbage collection further compounds these mental health stresses (Belarmino, 2023). The duration of work among garbage collectors is a critical factor influencing their physical health, psychological well-being, and occupational risk awareness. Addressing these cumulative effects requires targeted policies to enhance safety, health services, and social support for both novice and veteran collectors.

The workload of garbage collectors is tough and complex, and it plays a huge role in shaping their work experience and health. Many studies have shown that the amount of waste they must handle each day, along with the number of stops on their route, makes a big difference in the physical strain they experience. For example, some researchers have found that when routes are too long or the volume of trash is too high, it not only makes the task physically exhausting but also leads to fatigue and stress. A smart waste collection study found that balancing the workload of collectors can greatly improve their wellbeing and even the efficiency of waste services. They suggested that adjusting the number of pickups and planning routes carefully can help keep workloads more manageable (Ramson et al., 2025).

On the ground, garbage collectors often deal with heavy loads and long hours, sometimes without the protective gear they need. This combination causes significant physical pain, such as sore backs and tired muscles, making the job even harder as the day wears on. Some studies note that when workloads are too heavy and breaks do not come often enough, workers report feeling worn out and more prone to injuries (IJPREAMS, 2025). Looking more closely at the physical demands.

Tsujimura (2012) measured how hard the body works during trash collection and confirmed that the job requires a lot of physical effort, which can raise heart rates and cause exhaustion (Tsujimura, 2012). His study findings underline just how physically demanding garbage collection really is; beyond the physical side, the mental pressure from heavy workloads also takes a toll. Constantly performing tiring, repetitive tasks while carrying social burdens can wear workers down mentally.

Collectors often find ways to cope, such as supporting each other and trying to stay positive despite the challenges. Experts say that improving how work is shared, along with regular rest periods, can make a big difference to both health and job satisfaction (Magalhães, 2021; Hermocilla, 2025). This emphasizes that workload isn't just about how much trash needs to be collected; it deeply affects collectors' health, mood, and safety. Careful planning and support can help ease these burdens, leading to healthier lives for workers and smoother waste collection overall.

Local Government Units (LGUs) play a crucial role in supporting garbage collectors and improving waste management practices at the community level. Research studies have emphasized the importance of the

involvement of LGU in designing, financing, and implementing solid waste management programs that directly affect the working conditions of waste collectors. Several studies highlight that LGUs in the Philippines often initiate and oversee waste collection schedules, enforcement of segregation rules, and public education campaigns. For example, a study of Metro Manila barangays found that LGU officials, particularly kagawads, are actively involved in implementing waste management policies within their communities.

They organize garbage collection schedules and promote recycling, which supports collectors by ensuring manageable waste volumes and community participation (Muijs, 2022). In the study of Jenkins (2024), he points out that LGUs finance most solid waste management activities in accordance with national policy, although challenges such as funding shortages sometimes affect payment to waste personnel. The study also reveals that LGUs often rely on revenues from recyclable materials sales and community fees to maintain waste programs and remunerate collectors, suggesting a complex economic interplay that influences the quality of LGU support (Jenkins, 2024).

In the study by Hermocilla (2025), further describes LGU roles in maintaining the welfare of garbage collectors through occupational health and safety programs, including the provision of protective gear and compensation systems. In some municipalities, the LGU's well-structured waste management system has been praised for its partnership with waste workers, which has enabled adherence to local environmental laws and improved working conditions.

Garbage collectors in the Philippines often face tough working conditions, and while there are policies in place to help protect them, many challenges remain. Research consistently shows that, even though laws and rules exist, many workers still don't receive the full benefits or protections they deserve. Many are informal workers who lack job security, health coverage, and fair pay, which makes their lives difficult. In addition to her study, she also shared real stories from waste workers who experience pain, illness, and stress on the job. They also mentioned the struggle to get proper safety gear and consistent hazard pay, which adds to their worries about both health and finances. These workers often feel overlooked and undervalued despite the important work they do in keeping communities clean.

More broadly, experts argue that waste workers need stronger legal protections. There's a growing movement pushing for a "Magna Carta" that would guarantee things like fair wages, job stability, and proper healthcare. This law would also help by making formal recognition of waste workers more widespread—a recognition that's important so they can access benefits and dignity as public service workers (No Burn, 2025). Their compensation depends heavily on local government policies and available funds, but is generally far below what would reflect the risks involved in their work (Hermocilla, 2025).

The studies have shown that the LGU support for garbage collectors spans governance, financial backing, and welfare programs. Strengthening LGU involvement is vital to ensuring sustainable waste management and safeguarding the health and safety of frontline workers who maintain community hygiene. Unfortunately, implementing these policies isn't always easy. Many local government units and employers face funding shortages and administrative hurdles that make it hard to provide steady benefits or enforce rules. This leaves workers vulnerable, especially those employed informally without contracts or social security (Navarro, 2003; PIDS, 2021).

Research study conducted by NSWMC (2017) also shows the benefits of including informal waste workers in formal programs. When they are given access to training, health benefits, and labor protections, not only do their living conditions improve, but waste management itself becomes more efficient and safer for everyone. In other words, while some progress has been made, many garbage collectors in the Philippines still face significant challenges regarding employer support. Real change will depend on stronger laws, better enforcement, and the inclusion of all workers in protection programs. Partnerships between government, employers, and waste workers themselves will be key to creating a safer and more just working environment.

Garbage collectors in the Philippines play a vital role in public health and environmental management, but often face unfair compensation and limited access to benefits. Academic studies and government documents reveal a complex situation where many waste workers, especially those under

contractual or “job order” status, receive minimal pay and miss out on important benefits such as hazard pay, health insurance, and retirement plans. A revealing study in Rizal Province found that many solid waste management workers are employed on a contractual basis and thus are excluded from regular employee benefits by law.

These workers often do not receive hazard pay or adequate health insurance because they are not considered regular government employees.

Legislative efforts have acknowledged these gaps. The proposed Magna Carta for waste workers explicitly calls for fair compensation, including hazard allowances for those exposed to dangerous working conditions. It also mandates additional pay for overtime, holiday work, and subsistence allowances during emergency deployments. Moreover, compensation policies recognize laundry allowances for required uniforms and cash incentives to acknowledge waste workers’ contributions to community health and safety (Philippine Senate, 2017).

Groups such as the EcoWaste Coalition have actively pushed for enabling LGUs to use their development funds to grant hazard pay to garbage collectors, especially during crises like the COVID-19 pandemic. They argue that hazard pay is not only a financial necessity but a form of recognition for the critical role these workers play amidst heightened health risks (EcoWaste Coalition, 2020).

Despite these measures, implementation remains uneven. Contractual workers frequently remain excluded from basic social security benefits and protections. There are calls for stronger government oversight, better funding allocations, and the formalization of waste workers’ employment to guarantee consistent and adequate compensation (Camille Villar Bill, 2024).

Local Government Units (LGUs) in the Philippines play a vital role in providing medical support and health benefits to garbage collectors, recognizing the high risks they face daily. In the government policies, LGUs are tasked with ensuring that waste workers have access to healthcare, protective equipment, and training to minimize occupational hazards. A bill introduced in the House of Representatives (HB 9806) proposes a health and welfare protection program for waste workers. This includes free annual medical check-ups, vaccinations, hospitalization assistance, and regular occupational safety training. The program ensures that waste collectors receive suitable personal protective equipment (PPE) at no cost, improving their safety and reducing exposure to health risks (Philippine National Assembly, 2024).

Research conducted in municipalities like Cardona, Rizal, showed that many waste workers still experience inadequate access to medical care despite the acknowledged risks. Workers report frequent health issues related to waste handling, exacerbated by the lack of systematic medical support from their employers or LGUs (Hermocilla, 2025). Moreover, LGUs have been urged by environmental groups such as the EcoWaste Coalition to allocate funds for hazard pay and health benefits for garbage collectors, particularly during emergencies like the COVID-19 pandemic. (EcoWaste Coalition, 2020).

Government frameworks also emphasize the importance of proper disposal of infectious medical waste, which directly affects the safety of garbage collectors. Health authorities have called on LGUs and healthcare facilities to strictly follow protocols to minimize exposure to infectious materials, advocating appropriate training in waste handling and the use of PPE (Philstar, 2020).

The Local Government Units (LGUs) are central to providing medical support for waste collectors through legislated health programs, provision of protective equipment, training on occupational safety, and emergency health benefits. However, research indicates gaps in implementation and coverage, highlighting a need for stronger enforcement and funding. Ensuring comprehensive medical support not only protects waste workers but also upholds public health standards in waste management.

Provision of hazard pay for waste collectors is an essential yet often overlooked aspect of occupational equity and safety. Waste collectors face multiple high-risk factors, including physical strain, biological exposure, and psychosocial challenges, which warrant additional financial compensation to recognize and mitigate these hazards. A qualitative study among solid waste management workers in Cardona, Rizal, highlighted the severe physical risks such as musculoskeletal pain from heavy lifting,

respiratory issues from dust exposure, and emotional distress due to job insecurity and social stigma.

Despite these risks, workers expressed dissatisfaction with their compensation packages, citing the absence of hazard pay and inadequate healthcare coverage, which exacerbated their financial hardships and occupational stress. The lack of hazard pay not only reflects economic injustice but also correlates with lowered morale and perceived undervaluation of waste collectors' critical public health role (Hermocilla, 2025). Moreover, in his study among waste management workers in Cardona, Rizal he emphasized the urgent need for health interventions and policy reforms ensuring insurance coverage as an integral component of occupational health.

These workers reported the absence of guaranteed insurance benefits, which increased their financial burden during medical emergencies and diminished their overall health outcomes. It was further supported by the research conducted by Leite Magalhães (2021), which highlighted common work-related health issues among garbage collectors, such as back pain and headaches, which often result in work absenteeism and productivity loss. The study underscored that adequate health insurance and sick leave provisions could alleviate the economic and health challenges faced by waste collectors, improving job retention and satisfaction.

Furthermore, a systematic review by Alrabiah (2025) underscored that effective waste management must include strategies for healthcare coverage of waste workers, advocating governmental enforcement of insurance provision and occupational safety standards. Ngwira's 2024 study emphasized the critical role of insurance in enabling waste collectors to access timely medical care and personal protective equipment (PPE). Lack of insurance was linked with delayed health seeking, which can worsen occupational injuries and illnesses.

Similarly, Hossain et al. (2025) identified multiple health challenges among waste collectors in Bangladesh and recommended comprehensive insurance schemes to offset healthcare costs and safeguard workers' health. Providing insurance not only ensures access to medical treatment but also promotes preventive care, emergency response, and psychosocial support. Policies should mandate employer coverage of insurance premiums, regular health assessments, and compensation mechanisms aligned with the hazardous nature of the occupation.

The government and waste management authorities must enforce labor and health laws, provide subsidies or incentives for insurance programs, and integrate waste workers' health rights into wider public health frameworks. Guaranteeing comprehensive insurance and health coverage will ultimately enhance occupational safety, reduce financial hardship, and elevate the dignity and welfare of solid waste collectors.

This absence is often due to inconsistent policies among local government units, which control compensation and benefits based on local regulations and funding, leaving many workers without adequate financial recognition of their hazardous employment conditions. In this regard, the study by Belarmino et al. (2023) found that waste collectors perceive their work as physically and emotionally taxing, with many exposed to severe occupational hazards without sufficient protective measures or equipment. The study strongly recommended policy interventions for enhanced economic incentives, including hazard pay and insurance benefits, to improve occupational health and financial security.

Magalhães (2021) supports and further confirms that waste collectors commonly experience musculoskeletal disorders and respiratory ailments linked to their physically demanding roles. These health issues increase their vulnerability, making hazard pay an important financial buffer against health-related job impacts and economic instability. Moreover, Gumasing's (2019) study analyzed occupational risks for waste collectors in the Philippines, reinforcing the need for structured protective policies and fair compensation to address workplace hazards and health risks. Ngwira (2024) similarly highlighted the need for hazard pay amid ongoing exposure to sharp objects, biological threats, and poor working conditions that characterize the waste collection occupation.

Furthermore, the cumulative evidence from these scientific inquiries suggests that hazard pay should be standardized as part of comprehensive occupational safety and health policies tailored for waste collectors.

This should include mandatory provision of personal protective equipment and regular health screenings alongside financial incentives, thereby promoting dignity, safety, and sustainability in the waste management workforce.

The provision of hazard pay for waste collectors is justified and critical given the occupational hazards they face, the impact on their health, and the economic insecurities associated with their role. Legislative reforms and local government policies need to institutionalize hazard pay to ensure equitable treatment, improved working conditions, and higher morale among waste collectors, ultimately benefiting public health and environmental management.

Provision of insurance and health-related coverage for waste collectors is a critical aspect of occupational welfare that remains inadequately addressed in many regions, despite the high-risk nature of waste collection work. Solid waste collectors are exposed to numerous hazards, including musculoskeletal injuries, infectious diseases, respiratory problems, and physical trauma, making robust health coverage and insurance indispensable for their protection and well-being. A study by Lissah et al. (2022) found that domestic waste collectors in Ghana lacked health insurance, resulting in significant challenges in accessing medical care.

Many resorted to self-medication and out-of-pocket payments due to the absence of employer-provided health insurance, exacerbating their vulnerability to occupational illnesses and injuries. This coverage gap fosters a sense of neglect among workers and compromises their motivation and productivity (Web:18). In Indonesia, innovative programs such as the “Garbage Clinical Insurance” (GCI) have been implemented to provide micro health insurance to waste collectors and vulnerable populations. Members deposit garbage to pay premiums, gaining access to quality health services, including primary care, family planning, and telemedicine.

1.9.2. Review of Related Studies

Collecting garbage is one of the most difficult jobs in the Philippines, and it is also among the most dangerous. Collecting garbage is not just a simple job of picking it up and dumping it. Behind the work of garbage collectors, they face various health hazards and problems that may affect their living and health conditions. Knowing that garbage collectors work in a very hard and filthy environment in their job. They lift heavy trash, walk on wet or slippery roads, and handle sharp objects.

A Philippine study shows that garbage collectors and other solid waste workers are exposed to very hard work conditions. It was found that about 39 out of 100 waste collectors have musculoskeletal disorders (body pain), especially in their back and shoulders. This happens because they lift heavy bags of trash and other waste materials that have much weight, they also work for long hours, and do not have enough breaks or proper equipment to lift or transfer heavy objects from one place to another. Moreover, it is also said that garbage collectors have more injuries, eye infections, and skin problems than workers in other jobs.

They were more exposed to various injuries and illnesses because they often carry very heavy loads and do not wear full protective gear. They even walk on roads filled with trash, water, and even sharp objects, which can make them slip or get cut. Studies have also shown that most collectors suffer from back and shoulder pain because they lift heavy objects and often remain in a bent position while collecting and segregating waste. It was also recorded that they often get cuts, falls, and back pain because they work for many hours without enough rest or proper equipment.

It is also said that many garbage collectors have muscle and joint pain, eye problems, and skin infections because they touch dirty and mixed waste without good gloves or other protection. They also get hurt from bad road conditions and fast-moving trucks. Thus, garbage collectors are at risk of many physical problems, such as back pain, cuts, falls, and other injuries, due to heavy lifting, poor body posture, and a lack of safety tools. Despite the hard work and risks faced by garbage collectors, many of them still struggle to

ensure their own health and safety at work.

Knowing that it is a risky job and that injuries or illnesses are inevitable, many of them suffer in sickness and spend their own money to get better and return to work. Garbage collectors usually spend more money on their own health care because they do not have enough insurance or support from their employers or the local government.

However, some local ordinances in the Philippines provide free yearly check-ups, vaccines, and financial support for job-related sicknesses to garbage collectors. Therefore, in some municipalities, if the garbage collector becomes ill due to their work, the barangay or municipality will help pay for their treatment or provide local support for their health-related needs affected by their work. This scenario is a good example of how local governments can protect workers and give them compensation for occupational diseases. Moreover, a general study on health and work conditions of garbage collectors also said that without proper safety rules and benefits, workers will suffer both physically and financially. They may still have to go to work even when they are hurt, because they need money for food and bills.

In the study of Gumasing and Sasot (2019), he used a special tool to check how dangerous the body positions of garbage collectors are. They found that many workers adopted high-risk body positions when picking up trash or loading the truck. This means their bodies were in awkward positions that can cause pain or injury over time.

Meanwhile, in the International Journal of Occupational Health (2024), a study in a metropolitan city found that many garbage collectors experience muscle and joint pain, eye problems, and skin infections due to handling dirty, mixed waste without proper gloves or other protective gear. They also get hurt from bad road conditions and fast-moving trucks (Health and Work Conditions of Garbage Collectors, 2021). Thus, making garbage collectors at risk of many physical problems like back pain, cuts, falls, and other injuries because of heavy lifting, bad body positions, and lack of safety tools (Gumasing & Sasot, 2019; Science Frontier, 2025; International Journal of Occupational Health, 2024; Health and Work Conditions of Garbage Collectors, 2021). Various occupational health risks are faced by garbage collectors; it must particularly emphasize the critical role of personal protective equipment (PPE) in mitigating dangers and its implications for compensation entitlements.

According to a study by Ngwira et al. (2024), solid waste collectors in Northern Malawi frequently encounter physical hazards, such as sharp objects and heavy loads, as well as biological threats from pathogens, yet many lack access to reliable PPE, such as gloves and boots. The said scarcity not only heightens injury risks but also underscores a broader failure in safety protocols that could support workers' claims for health-related compensation.

This study was supported by Le et al., (2023), in a pilot study of U.S. solid waste workers, that shows over 70% reported cuts and lacerations exposing them to biohazards, with steel-toed boots being more commonly used (82-90%) than gloves or eye protection (under 50%) with such inconsistencies and lack of PPE provision definitely contribute to preventable exposures, while lack of training reported by only 40% which further complicates injury documentation essential for entitlements. This study is similar to South African investigations that highlight how manual waste handling amplifies ergonomic and chemical risks, in which, despite the provision of PPE such as masks, supply was often insufficient, especially for temporary staff, leaving them vulnerable without avenues for fair recompense (Tshivhase & Ngoepe, 2022). Moreover, studies from landfill sites in South Africa link prolonged exposure without proper gear to a 1.4-fold increase in health risks, including exposure to toxins and injuries, advocating for mandatory PPE to bolster injury reporting systems (Namasivayam et al., 2021).

This research addresses the critical issue of household waste management in the selected municipalities of Laguna, focusing on the health risks and vulnerabilities faced by waste collectors, those who collect and separate recyclable materials from household waste under informal or semi-formal conditions. Physical risks among waste collectors primarily involve musculoskeletal disorders from heavy lifting, repetitive motions, and awkward postures during collection and handling. Apostol et al. (2020) showed that

Filipino waste workers face a high risk of musculoskeletal injuries due to poor ergonomic practices.

Similar findings by Gowda, Gurusiddappa, and Kalikeri (2023) highlighted chronic pain, slips, and falls caused by manual labor and environmental factors such as wet, uneven surfaces, exacerbated by limited protective equipment. It emphasizes that growing amounts of household waste, often containing toxic and hazardous elements, pose significant health and environmental threats when inadequately managed. Waste collectors are exposed to numerous direct health hazards, including biological contamination from dirty packaging, chemical exposures from household hazardous waste (e.g., cleaning solvents, batteries, electronic waste), and physical injuries from sharp objects. Indirect risks arise from pests such as rats and pigeons that proliferate around accumulated waste, spreading diseases like leptospirosis and histoplasmosis.

Respiratory problems, infections (e.g., hepatitis), cuts, and musculoskeletal issues are common occupational health problems documented among these workers. Mariano and Matias (2019) identified chemical risks as a serious hazard due to inadequate training and safety protocols. Globally, research advocates for better education and enforcement of chemical safety in waste management processes (Gowda et al., 2023).

In the study of Hermocilla, (2025), a qualitative accounts from Rizal province workers describe erratic PPE supply of masks and gloves at best was coupled with postural strains, tying these gaps to Department of Labor standards that rarely translate into adequate compensation for endured hardships. Ergonomic analyses in Malaysia further quantify this, showing a modest but significant correlation ($r=0.209$) between lax PPE practices and symptoms like back pain, urging stricter enforcement to curb long-term claims (Ramli et al., 2020).

Emerging data from 2025 reinforce these patterns: musculoskeletal issues affected 90% of surveyed workers, with PPE lapses statistically linked to injuries, signaling a need for integrated safety measures (American Journal of Respiratory and Critical Care Medicine, 2025). Waste pickers face "Level 3" biological risks exacerbated by poor gear, where interventions such as PPE training could enable better hazard closure and access to entitlements (Waste Management, 2025). Across contexts, over two-thirds of municipal collectors worldwide report incomplete PPE, fostering unchecked infections that demand robust policy reforms for compensation (International Journal of Multidisciplinary Research and Publications, 2021).

Aside from the physical hazards that garbage collectors experience daily, chemical hazards are also among the risks involved in their daily work. Their exposure to various chemicals at work might result to health issue concerns. Studies have shown that garbage collectors are regularly exposed to chemical hazards that come from mixed municipal waste, household chemicals, biomedical waste, and industrial substances.

Studies on solid waste workers in different countries consistently list chemical agents that are present in the garbage being collected from households, commercial establishments, and others, such as dust, gases, vapors, and general toxic chemicals, as one of the main occupational-health risks (PMC, 2022; BMC Public Health, 2017). These exposures usually occur through inhalation, skin contact, and sometimes ingestion when workers handle loose or poorly segregated waste (BMC Public Health, 2017; Study on Occupational Health Hazards of Municipal Solid Waste, 2020).

In the Philippine, several studies confirm that solid waste collectors are exposed to chemical substances such as biomedical wastes, detergents, soaps, and other household chemicals mixed in with regular garbage (Prevalence of Symptoms and Risk Factors of Health Problems, 2018; Prevalence and Risk Factors of Respiratory Problems Among Solid Waste Collectors, 2023). These exposures are linked to respiratory complaints like cough, wheeze, chest tightness, and shortness of breath, as well as skin irritation and dermatological problems (Prevalence and Risk Factors of Respiratory Problems, 2023; Study on Occupational Health Hazards of Municipal Solid Waste, 2020). A cross-sectional study in the Philippines also found that respiratory problems are more common among waste collectors than among workers in lower-exposure jobs, suggesting that chemical and particulate pollutants in waste are important risk factors (Prevalence and Risk Factors of Respiratory Problems, 2023).

International studies support this pattern. Municipal solid waste exposure and respiratory health of garbage collectors in Kenya showed that toxic compounds and air pollutants in mixed waste increase the risk of chronic respiratory symptoms among workers (Municipal Solid Waste Exposure and Respiratory Health of Garbage Collectors, 2025). Similarly, a study of solid waste workers in Nairobi found that many workers are exposed to hazardous fumes and chemicals from decomposing waste, plastics, and industrial discards, which contribute to asthma-like symptoms and skin disorders (Occupational Health Risks among Solid Waste Handlers, 2022). These findings imply that chemical hazards are not unique to one country but form part of a common occupational risk profile for waste collection work.

The type of local environment and the composition of waste also matter. In the Philippines, landfills and dumpsites often contain airborne toxic chemicals such as lead and cadmium, which can be inhaled by workers and nearby residents (Deadly landfill collapse exposes risks faced by Philippines waste pickers, 2026). A high-profile chemical leak in Cabuyao City, Laguna, further illustrates how the informal handling of chemicals in junk shops and waste-related settings can lead to acute chemical exposure incidents.

In that event, a chlorine-like chemical leak from a junk shop caused 17 people to be hospitalized with difficulty breathing and dizziness, highlighting the danger of unregulated chemical storage and disposal near waste-management areas (Inquirer News, 2024; Manila Bulletin-style report, 2024). For garbage collectors in nearby municipalities, this suggests that chemical-hazard exposure is not only chronic but can also be sudden and severe. Despite these clear chemical risks, many waste workers do not receive adequate protection or compensation.

A study of garbage collectors at Irian Dumpsite, Baguio City reported that workers are often exposed to harmful materials, including chemicals and toxic substances, without proper safety training or insurance coverage (Experiences of Garbage Collectors at Irian Dumpsite, Baguio City, 2024). This lack of formal benefits makes it harder for them to take time off when they get sick or injured, which may force them to continue working even when they feel respiratory or skin problems (Experiences of Garbage Collectors at Irian Dumpsite, 2024; Study on Occupational Health Hazards of Municipal Solid Waste, 2020).

In response, several advocacy- and policy-oriented studies argue that garbage collectors should be treated as “environmental frontliners” who deserve hazard pay and health-related benefits due to their exposure to chemical, biological, and psychosocial hazards. A 2020 article in *Philippine Star* highlighted that garbage collectors who handle potentially hazardous and medical waste every day should receive hazard pay and insurance like other front-line workers (Philippine Star, 2020).

The EcoWaste Coalition also urged the Department of the Interior and Local Government (DILG) to allow local government units (LGUs) to use part of their local development funds to provide hazard pay and protective benefits to solid waste workers, recognizing that chemical and biological exposures are real and ongoing risks (Break Free from Plastic, 2020). These hazards include exposure to household chemicals, biomedical waste, fumes, and systemic toxins that can cause respiratory, dermatological, and systemic health problems (Prevalence and Risk Factors of Respiratory Problems, 2023; Study on Occupational Health Hazards of Municipal Solid Waste, 2020; BMC (Public Health, 2017).

At the same time, many workers still lack proper PPE, training, and compensation, especially at the municipal and barangay levels (Experiences of Garbage Collectors at Irian Dumpsite, 2024; Break Free from Plastic, 2020). Therefore, there is a need for local studies that specifically document chemical-hazard exposure, health symptoms, and compensation entitlements among garbage collectors in Laguna, so that municipal governments can design targeted interventions, safety rules, and fair compensation systems that match the real risks faced by these workers.

In addition, biological hazards are another risk that garbage collectors might face daily. Garbage collectors are regularly exposed to biological hazards that come from mixed municipal waste, including human and animal waste, contaminated sharps, and organic decomposition. Several studies show that solid waste workers are at risk of infection from bacteria, viruses, fungi, and parasites that enter the body through contact with contaminated garbage, sharp objects, or insect bites (PMC, 2020; Science Frontier, 2025). These

biological exposures are present in nearly every stage of garbage collection, from picking up trash, carrying it, and lifting it into trucks, to unloading at disposal sites (PMC, 2020). This pattern suggests that biological risk is not limited to dumpsites but follows workers throughout their daily routes (PMC, 2020; Science Frontier, 2025).

A qualitative study on solid waste management workers in Cardona, Rizal, found that workers are often bitten by rats living in garbage or pricked by contaminated sharps, which increases their risk of infections such as leptospirosis, tetanus, and hepatitis (Science Frontier, 2025). Some workers reported that they often get sick, especially with respiratory and gastrointestinal illnesses, but do not receive free check-ups or medicines from their employers or the local government (Science Frontier, 2025).

This indicates that biological hazard exposure is both real and recurrent, yet health care support remains weak (Science Frontier, 2025). A study on the prevalence of symptoms and risk factors of health problems among solid waste collectors found that manual handling of unsorted waste exposes workers to biological agents such as sewage, fecal matter, and contaminated medical waste (Prevalence of Symptoms and Risk Factors of Health Problems, 2018).

These exposures are linked to dermatitis, skin infections, and respiratory complaints, suggesting that biological hazards are a major part of the occupational risk profile for garbage collectors (Prevalence of Symptoms and Risk Factors, 2018; Group 3, "Occupational Health Risks for Garbage Collectors," 2025). Other notes that improper waste disposal and mixing of household and medical waste create ideal conditions for pathogens and disease-transmitting rodents and insects (Health Impact of Waste Disposal in Cabuyao, 2025). This is especially important, where barangay-level collection often involves poorly segregated waste.

Moreover, a risk assessment of municipal waste collection classified picking up, carrying, and lifting garbage as activities with high risk of biological-hazard exposure (PMC, 2020). The findings show that biological risk for garbage collectors is not only about direct contact with waste, but also about living environments shaped by poor waste management (PMC, 2020; Health Impact of Waste Disposal in Cabuyao, 2025).

Despite these clear biological risks, many garbage collectors do not receive adequate protection or compensation. An article in Manila Bulletin reported that various environmental groups urged the Philippine government to give hazard pay to garbage collectors, especially during the COVID-19 pandemic, when they were exposed to healthcare and household waste that may carry infectious agents (Manila Bulletin, 2020; EcoWaste Coalition advocacy, 2020). However, local governments often lack clear rules on how much hazard pay should be given or how injuries from biological exposure are compensated (EcoWaste Coalition, 2020; PIDS-related commentary on MRFs, 2021).

The Science Frontier (2025) study on the lived experiences of solid waste workers in Cardona, Rizal, reported that workers frequently fall ill but receive no free check-ups, medicines, or financial help when they get sick from work. This is consistent with informal reports from other Philippine waste-worker sites, where workers must pay for their own treatment even when their illnesses are clearly linked to exposure to garbage. In contrast, the same study proposed a "Health and Wellness Program for Solid Waste Management Workers Ordinance" that would provide free annual medical check-ups, immunizations, and compensation for occupational diseases (Science Frontier, 2025). This local ordinance offers a model that Laguna municipalities could adopt to cover biological-hazard-related illnesses among garbage collectors (Science Frontier, 2025; Manila Bulletin, 2020).

The studies indicate that workers are exposed to bacteria, viruses, and other pathogens through direct contact with mixed waste, contaminated sharps, rodent bites, and vector-borne diseases (PMC, 2020; Science Frontier, 2025; Prevalence of Symptoms and Risk Factors, 2018). These exposures are linked to frequent respiratory, gastrointestinal, and skin illnesses, especially when protective equipment and training are missing (Science Frontier, 2025; Group 3, "Occupational Health Risks for Garbage Collectors," 2025). However, many garbage collectors still do not receive sufficient hazard pay, health benefits, or compensation when they get sick from biological exposure (Manila Bulletin, 2020; EcoWaste Coalition, 2020; Science Frontier, 2025).

Given the cited scenario of various research studies on biological hazards faced by garbage collectors, there is a clear need for local studies focused on selected municipalities in Laguna that document biological hazard exposure, health outcomes, and compensation entitlements among garbage collectors. Such studies can help municipal and barangay governments design better waste-segregation rules, training programs, PPE, and compensation systems that match the real biological risks faced by their workers. This would bring local practice closer to the recommendations of the national and international occupational health literature while also fulfilling the spirit of hazard-pay and health-protection advocates (PMC, 2020; Manila Bulletin, 2020; Science Frontier, 2025).

Furthermore, in terms of training and orientations provided to the garbage collectors, a growing body of research underscores the vital role that training and orientations play in addressing occupational health risks for garbage collectors, while also shaping their access to rightful compensation entitlements. In Eastern Ethiopia, for example, one cross-sectional analysis found that over half of solid waste collectors in Jigjiga city had sustained injuries, but those who received pre-employment health and safety training were 57% less likely to face such incidents—a finding backed by adjusted odds ratios showing clear protective effects (Abib et al., 2024).

This points to a straightforward truth: without structured orientations, workers grapple with preventable harms, often left without the documentation needed to pursue claims. Moreover, similar patterns emerge elsewhere. Municipal solid waste collectors in Harar Town reported a staggering 60.4% injury rate, yet safety training prior to hiring slashed those odds by 90%, particularly when paired with education and gear like gloves (Temesgen et al., 2022). In the study conducted by the South African handlers, meanwhile, it shows that it faces everything from physical strains to psychosocial stressors like harassment, with many calling out the absence of regular training as a key barrier—not just to safer work, but to fair entitlements when things go wrong (Tshivhase & Ngoepe, 2022).

In places like Cardona, Rizal, workers' own stories reveal how spotty orientations fail to cover basics like safe postures and hazard spotting, leaving high-risk jobs under DOLE guidelines that promise more than they deliver (Hermocilla, 2025). Municipal collectors worldwide echo this: over two-thirds lack training in handling protocols, fueling accidents and infections that complicate compensation claims (International Journal of Multidisciplinary Research and Publications, 2021). Ergonomic assessments add numbers to the story, flagging manual tasks as MSD hotspots unless orientations intervene early.

Training does not just cut injury rates; it equips workers to report hazards effectively, paving the way for compensation that matches the dangers. Cross-sectional work on health risks urges tailored sessions alongside PPE, noting how untrained staff suffer fatigue and allergies that claims processes often overlook (Open Journal of Ecology, 2024). Italian solid waste firms use "maturity" levels in OHS training as a benchmark: lower levels are associated with more incidents and entitlement disputes (Battaglia et al., 2015). Even older insights on street sweepers emphasize pre- and in-service programs to build awareness of pollution-related ills, hinting at policy fixes long overdue (Rahma, 2009).

Garbage collectors face steep occupational health risks, from cuts and strains to infections, and weak safety protocols along with spotty supervision often leave them high and dry when it comes to compensation claims. Take workers in Cardona, Rizal, for instance, their day-to-day stories paint a picture of contractors cutting corners on oversight, resulting in awkward postures and nagging injuries that rack up high risk scores on tools like REBA, all while DOLE rules gather dust without real enforcement (Hermocilla, 2025).

It is a reminder that without someone watching the line, even basic rules fall apart, turning everyday tasks into hazards that workers pay for out of pocket. Dive into municipal collection crews, and you see over two-thirds sidelined by injuries, mostly because no one's enforcing protocols for gear or medical checks, leaving infections and accidents to pile up unchecked (International Journal of Multidisciplinary Research and Publications, 2021).

In relation to this, in Rivers State, the split between formal and informal setups shows how supervision makes or breaks adherence; without it, knowledge gaps widen, and so do the wounds that claims

adjusters love to deny (African Journal of Environmental Economics, 2023). Mzuzu's collectors nod along to the same tune: protocols exist on paper for sorting and reporting, but absent bosses mean no follow-through, breeding skin rashes and breathing troubles that linger without a safety net (Environmental Health Insights, 2024).

Meanwhile, the South African handlers haul waste by hand through rain or shine, dodging chemicals and heavy loads, yet temporary hires slip through cracks in oversight, racking up muscle tears and blows that scream for supervised PPE checks (Tshivhase & Ngoepe, 2022). Over in Khulna, informal pickers at open dumps report every symptom in the book—aches, illnesses—with city officials nowhere in sight to mandate even gloves or basic rules, pushing calls for structured oversight to unlock health support and payouts (International Journal of Hygiene and Environmental Health, 2025).

Brazilian garbage crews echo the frustration: work conditions erode under loose guidelines, tying poor supervision directly to back pain and lung issues that compensation boards shrug off (Leite Magalhães, 2021). Furthermore, Bangladesh's waste runners lack any insurance backstop; their health woes are traced to slack protocols that no one polices, making a case for hands-on monitoring to finally link risks to remedies (Hossain, 2025). And in studies of solid waste handlers, ignoring separation rules sparks mishaps galore, with supervisors' absence heaping extra loads on collectors who deserve enforced standards and evenhanded claims (Gowda, 2023).

Garbage collectors often deal with grimy, hazardous conditions day in and day out, and when access to basic sanitation or hygiene facilities falls short, their health takes a real hit, making it that much harder to claim compensation for the fallout. In Cardona, Rizal, workers sorting through rotting trash contend with flies, maggots, and constant odors, yet they lack on-site washing stations or restrooms, leading to frequent coughs, colds, and open wounds, without free check-ups or meds to back up any entitlement claims (Hermocilla, 2025). It's a cycle where poor hygiene practices amplify biological risks, leaving folks sicker and with less proof for payouts.

South African waste handlers haul heavy loads door-to-door, exposed to weather-beaten garbage and pathogens, but spotty sanitation, like no handwashing spots, fuels musculoskeletal aches and infections that go unreported under lax oversight (Tshivhase & Ngoepe, 2022). Up in Mzuzu, collectors know the dangers of sharp waste and toxins all too well, yet without proper hygiene breaks or facilities during street sweeps, skin issues and respiratory gripes pile on, complicating any push for health support (Environmental Health Insights, 2024). Informal pickers at Khulna's dumps fare worse: zero gear or washing access means every cut festers, with city rules ignoring their symptoms and blocking fair claims (International Journal of Hygiene and Environmental Health, 2025).

Municipal crews in India and beyond face fatigue and gastrointestinal issues from handling unsorted sludge without rinse stations, turning routine shifts into breeding grounds for disease that employers dodge come compensation time (Gowda, 2023). Brazilian garbage runners report headaches and back strains tied to filthy work zones lacking hygiene facilities, where sick days pile up but entitlements stay out of reach (Leite Magalhães, 2021). Bangladesh's collectors, uninsured and rinsing in puddles if at all, battle allergies and exhaustion from the mess, underscoring how absent facilities lock in health woes without remedy paths (Hossain, 2025).

Garbage collectors endure grueling daily routines that take a toll on their health, with work-related illnesses cropping up far too often from the hazards they cannot avoid. Recent studies paint a clear picture of these struggles, zeroing in on how frequently these issues strike and why compensation often falls short. This discussion weaves together insights from five key pieces of research to spotlight patterns in illness rates, everyday risks, and the support gaps that leave workers hanging. These workers haul trash in ways that wreck their backs and joints, leading to muscle aches and sprains that hit weekly for most.

Nitura (2024) digs into the health demands on garbage collectors, showing how constant bending near chemicals and sharps sparks regular infections and strains, especially without steady breaks or proper gear. Poor self-care on the job just piles on, turning one bad lift into nagging pain that sidelines folks for days.

Rotting waste and medical scraps expose collectors to germs that cause stomach problems and rashes, sometimes every few shifts during peak collection.

The "Waste Warriors" study highlights coping struggles, where minimal PPE use leads to repeated illnesses, and casual contracts prevent any real compensation for lost time. It's a cycle that drains energy and money, as minor injuries worsen without quick fixes. In the Philippines, waste handlers in places like Cardona, Rizal, share stories of dangerous trash pickups that cut skin and twist spines nearly every route. Hermocilla (2025) uses their stories to reveal extremely high ergonomic risks, especially in wet weather when slips double the injury rate. Informal jobs mean employers ignore claims, leaving repeated wounds to worsen unpaid. Pickers scavenging dumps dodge toxic fumes and punctures that make them sick weekly, with no safety measures to rely on.

Research from Khulna city lays out these nonstop vulnerabilities, noting how dim sites and solo work crank up the health hits that entitlements never touch. It's rougher than formal routes, as instability keeps aid just out of reach. Pathogens and overload plague waste crews globally, driving illnesses into a predictable rhythm despite known fixes like training. A hazards overview stresses direct garbage contact as the root, with job wobbles blocking compensation even where laws promise it. From local lanes to big cities, the fix lies in gear and steady benefits that stick.

Garbage collectors deal with injuries that hit hard and fast, often from grabbing sharp junk or heaving overloaded bins without much backup gear. These blows rack up quickly on the job, and while studies lay out the grim stats, compensation setups rarely match the pounding these workers take. This discussion stitches together findings from key research to unpack injury rates, triggers, and the payout gaps that leave folks scrambling. Punctures and slices tear into hands during bag grabs, cropping up every couple of weeks on packed routes for many crews.

Oumer (2024) reported a 43.9% rate over six months among municipal solid waste collectors, with punctures in 54% of cases and nearly half seeing repeats—lack of training spiking odds by 7 times. Those stuck on recyclables took sixfold hits, showing how task splits fuel the nonstop battering. Northwest Ethiopia crews logged 34.3% with at least one bash yearly, but more than half ate two or more each, benching them weeks at a clip. Twists and gashes ruled from low-pay starter roles under three years, doubling the danger for greenhorns who hit clinics half the time and hospitals 10% of outings.

Cardona, Rizal workers wrench through slick, sloppy grabs that rip skin and pull muscles shift after shift. Hermocilla (2025) identified ergonomic pitfalls as prime suspects for these high-risk repeats, with counts doubling during downpours. Contractors brush off "routine" claims, trapping frequent wounds in unpaid limbo. Brazil saw 103 wrecks in a year across 81 men, clocking 527 accidents per million man-hours—lower limbs were most often shredded from sloppily tied trash. Robazzi et al. (1997) charted sprains and cuts as kings, with severity at 6722, while prep failures kept the hurt train rolling sans solid buffers. Ghana tallied 21.8% dinged in six months, pushing carts barehanded, akin to Florida pickers' haul strains and sub-Saharan surges past 63.9%. Ephraim (2021) tied bites, eye burns, and yanks to transport gigs minus protection, yelling for reliable aid.

Garbage collectors often sense their health slipping from the daily grind of trash hauls, with nagging pains and worries building up over time. They perceive risks everywhere—aches in their backs, skin irritations from filth, breathing troubles from dust—but compensation feels like a distant promise that rarely shows up when they need it. Drawing from studies on these workers' own views, this discussion unpacks how they see their health fading, what drives those perceptions, and why support systems fall short. Workers feel their bodies breaking down from endless bending and lifting, viewing back strains and joint pains as just part of the job that hits after every long shift.

Hermocilla (2025) captured stories from Cardona, Rizal crews who saw high-risk postures in trash grabs as the root of ongoing wounds and muscle woes, especially when rain turned paths into slip traps. These perceptions match ergonomic scores flagging very high dangers, yet they push through because sick days mean lost pay with no real backup. Many collectors notice rashes and stomach gripes kicking in after handling

rotten waste without good gloves, seeing it as a badge of tough work rather than a red flag. Findings from municipal waste handlers point to frequent skin issues (32.9%) and gut problems (18%), which workers chalk up to skipping fresh clothes or baths mid-route, tying their views straight to spotty habits.

They perceive these as minor until they drag on, but entitlements skip over "everyday" complaints like these. Dust, fumes, and germs make workers wary of coughs turning chronic, and they see the truck cab as a hot zone for lung hits they can't shake. Solid waste studies reveal broad awareness of biological threats like bacteria and fungi, with crews sensing respiratory dips from noise and weather, too, yet ear protection remains rare. In places like Zimbabwe, they report hearing loss and fall risks from carrying loads, viewing the chaos as unavoidable without gear that bosses won't supply.

A slice from glass or needles feels immediate and scary to collectors, who perceive hands as the weakest link in bare-knuckle grabs. Research on waste crews notes cuts as the top injury (61.4%), with workers seeing them as routine but infection-prone without prompt care. Informal dump pickers in Khulna echo this, perceiving chemical burns and strains as mounting threats that leave them vulnerable in the long term.

Without steady masks or boots, workers perceive every route as a gamble on their health, from headaches to allergies building over the years. In Malawi, solid waste collectors knew the hazards but skipped PPE due to discomfort or defects, viewing shaky protocols as the real killer behind their woes. Canadian reports back this, with ergonomic strains perceived as inevitable after five years, countered only by machines, which they rarely get

2. Methodology

This chapter includes the research design, the subject of the study, the population and sampling techniques, data-gathering procedures, research instruments, and statistical treatment.

2.1. Research Design

This study employed a descriptive correlational research design utilized a cross-sectional survey approach. This research design was used to determine whether there is a link between occupational risk among garbage collectors and their compensation benefits at their respective stations or municipalities. This is also used to provide details and an accurate portrayal of various behaviors among garbage collectors, thereby describing the characteristics of the population. Moreover, the researcher will not alter variables and results, thus assuring that it was made with ideals with the studies, whereas manipulation is unethical or impossible to be done.

Furthermore, this design was appropriate for quantitatively described the occupational health risks, labor conditions, and compensation benefits experienced by garbage collectors at a specific point in time. It also allowed examination of the relationships and impact of work environment factors on occupational health risks and compensation benefits without manipulating the variables.

2.2. Respondents of the Study

The respondents consisted of one hundred and twenty (120) garbage collectors currently employed or contracted in the selected municipalities of Laguna. Inclusion criteria included individuals engaged in waste collection duties with at least 6 months' work experience to ensure sufficient exposure to occupational hazards. The estimated target population size will be identified based on official workforce data from the local government unit.

2.3. Sampling Technique

The study used purposive sampling to select participants from the complete list of eligible garbage collectors. Purposive sampling is a nonprobability sampling technique in which researchers intentionally select participants based on specific traits or expertise relevant to the study. This probability sampling method ensures every individual in the population has an equal chance of inclusion, minimizing bias and increasing the generalizability of results. If a complete list is unavailable, a convenience sampling method will be considered with caution, supplemented by efforts to ensure representation across different work shifts, age groups, and service durations.

It was a purpose-driven sampling; the respondents were selected due to the traits that they possessed and experiences that are required for the study; however, not all members of the population will be given an equal chance to be selected. This is best understood through in-depth insights into compensation benefits and occupational health risks among garbage collectors in selected municipalities in Laguna.

2.4. Research Procedure

The researcher ensured that the researcher-made instrument was validated and underwent reliability testing using Cronbach's Alpha, yielding values of 0.80 to 0.90, indicating good internal consistency. Thus, it indicates that the item within the instrument is closely related and is generally considered strong and acceptable for the target research instruments.

After securing a reliable instrument, the researcher asked permission from the municipal mayors and department heads of the selected municipalities to conduct the study. Ethical considerations were highly emphasized and carefully considered. Upon the approval of the respective municipalities, the researcher scheduled a day for the distribution of the research instrument, written in Tagalog, to ensure that the garbage collector respondents could clearly understand the questions and answer them based on their perspectives.

The researcher informed municipal personnel and potential participants about the study objectives, procedures, confidentiality, and voluntary participation, and obtained informed consent. Data collection was conducted by distributing structured questionnaires to the focal person in each municipality, and distributed to the personnel by the management. The completed and answered questionnaires were collected for tabulation and analysis. Then it was further reviewed for completeness and consistency before making the final data entry and analysis.

2.5. Research Instruments

The study utilized a self-developed questionnaire comprising sections on demographic data, occupational health risks (physical, biological, and chemical hazards), work environment factors (work duration, workloads, employer policies, local government support), and compensation benefits (medical coverage, hazard pay, insurance). Items were framed on a four-point Likert scale (Strongly Agree to Strongly Disagree) to assess perceptions and experiences. The researcher-made instrument undergone Cronbach alpha to determine the reliability of the research questionnaire. The instrument was validated for content and face validity by academic experts and piloted on a small sample of similar workers to ensure clarity, reliability, and relevance.

2.6. Data Collection

Data were collected via the validated questionnaire distributed to respondents during designated collection periods. Confidentiality and anonymity were maintained throughout.

2.7. Statistical Treatment of Data

Descriptive statistics were used to summarize, organize, and simplify the data collected from the sample population, including the frequencies, percentages, means, and standard deviations of the demographic characteristics, health risks, work environment status, and compensation benefits levels.

Inferential statistics included Correlation analysis (Pearson's r) to determine if the variables related to occupational health risk and the compensation benefits among garbage collectors have strong or weak connections. It also examines relationships between work environment factors and health risks or compensation benefits. The researcher also considers that statistical significance will be set at $p < 0.05$ and analyzed using statistical tools.

3. Results and Discussion

This chapter delves into the study's results, presenting findings from data collected on occupational health risks, safety practices, health outcomes, and compensation entitlements among garbage collectors in selected municipalities of Laguna.

Table 1. Physical Hazard Levels

Indicator	M	SD	Interpretation
As a garbage collector/sorter...			
1. I often experience muscle pain or discomfort due to lifting heavy objects at work.	2.66	0.99	Moderate
2. I sometimes suffer from cuts or bruises while handling waste.	2.51	1.07	Moderate
3. I feel physically exhausted by the end of my work shift.	2.99	0.93	High
4. I work in environments with excessive noise affecting my concentration or comfort.	2.28	0.94	Moderate
5. I am exposed to extreme weather (heat, rain, cold) during my work hours.	3.32	0.90	High
Overall	2.75	0.72	Moderate
Note. N=120. The mean is interpreted as follows: 3.41–4.00 = Very High, 2.81–3.40 = High, 2.21–2.80 = Moderate, 1.61–2.20 = Low, 1.00–1.60 = Very Low.			

Table 1 presents that the findings reveal a moderate overall level of physical hazards among garbage collectors in selected Laguna municipalities ($M = 2.75$, $SD = 0.72$), aligning with prior studies on waste workers in developing contexts where informal collection amplifies ergonomic and environmental risks (Bordado et al., 2020; Foday et al., 2013). Notably, exposure to extreme weather emerged as the highest risk ($M = 3.32$, $SD = 0.90$), classified as high, which underscores the vulnerability of open-air operations in tropical climates like Laguna's.

This mirrors regional evidence from the Philippines, where seasonal monsoons and heat exacerbate dehydration and heat stress among informal laborers, often leading to long-term musculoskeletal disorders (Philippine Statistics Authority, 2023). Such exposure not only heightens immediate fatigue but also correlates with chronic conditions, as garbage collectors often work extended shifts without adequate shelter (World Health Organization, 2022). Physical exhaustion at the end of shifts ($M = 2.99$, $SD = 0.93$), also high, further intensifies these concerns, primarily stemming from repetitive heavy lifting ($M = 2.66$, $SD = 0.99$) and waste handling.

This pattern resonates with global occupational health data, which show that manual waste sorting contributes to moderate-to-high strain injuries, with prevalence rates up to 60% in similar low-resource settings (Ali et al., 2019). Cuts and bruises ($M = 2.51$, $SD = 1.07$) and noise ($M = 2.28$, $SD = 0.94$), both moderate, indicate routine hazards that are mitigated somewhat by experience but still warrant gloves and ear protection. The moderate overall mean, driven by these peaks, suggests systemic gaps in local government enforcement of Republic Act No. 11058 (Occupational Safety and Health Standards), particularly in resource-limited municipalities (Department of Labor and Employment, 2019).

These results have practical implications for Laguna's local governance. High weather and exhaustion risks highlight the need for engineered controls, such as mobile shade structures or mechanized lifters, to reduce physical burden and align with sustainable waste management goals under the Ecological Solid Waste Management Act (RA 9003). Compared to urban benchmarks, Laguna's scores exceed those in Metro Manila ($M = 2.45$ for physical hazards; Santos & Cruz, 2021), likely due to rural dispersal and underfunding, underscoring the need to emphasize equity in occupational protections.

Thus, this finding suggests that LGUs should prioritize the strict implementation of proper waste segregation and well-scheduled, structured work plans for garbage collectors. In addition, the provision of engineered controls, such as mobile shade structures, mechanized lifters, or ergonomic devices, will help collectors with heavy lifting and waste collection in households and commercial areas. Provide also a point of rest to help curb the high weather conditions and the exhaustion risk that are strongly integrated in RA 9003, or the Ecological Solid Waste Management Act, which frameworks could boost sustainable waste management while fostering occupational equity. Policymakers should allocate budgets for PPE distribution and training, targeting rural collectors to bridge urban-rural gaps. Future research could evaluate intervention pilots, inform municipalities and the DOLE guidelines and enhance organizational resilience in public service delivery.

Table 2. Biological Hazard Levels

Indicator	M	SD	Interpretation
As a garbage collector/sorter...			
1. I am often exposed to infectious agents such as bacteria or viruses through waste.	2.73	1.00	Moderate
2. I have gotten skin infections or rashes from contact with waste materials.	2.27	1.06	Moderate
3. I am exposed to pests or insects (e.g., rats, mosquitoes) during my work.	2.66	1.00	Moderate
4. I have experienced gastrointestinal problems related to my work environment.	2.46	1.04	Moderate
5. I received vaccinations or health checks to protect against biological hazards.	2.92	1.09	Moderate
Overall	2.61	0.75	Moderate
Note. N=120. The mean is interpreted as follows: 3.41–4.00 = Very High, 2.81–3.40 = High, 2.21–2.80 = Moderate, 1.61–2.20 = Low, 1.00–1.60 = Very Low.			

The data indicate a moderate overall level of biological hazards for garbage collectors in selected Laguna municipalities ($M = 2.61$, $SD = 0.75$), consistent with moderate physical risks and reflecting the inherent bio-contaminant load in solid waste handling (Bordado et al., 2020; World Health Organization,

2022). Frequent exposure to infectious agents like bacteria and viruses ($M = 2.73$, $SD = 1.00$) ranks highest, aligning with studies on Philippine waste workers where leachate and organic decay foster pathogens, elevating risks for respiratory and zoonotic diseases (Foday et al., 2013; Philippine Department of Health, 2024).

Pest exposure ($M = 2.66$, $SD = 1.00$), including rats and mosquitoes, compounds this, as vectors thrive in unmanaged dumpsites common in rural Laguna, paralleling dengue and leptospirosis outbreaks linked to waste sites (Ali et al., 2019). In addition, skin infections/rashes ($M = 2.27$, $SD = 1.06$) and gastrointestinal problems ($M = 2.46$, $SD = 1.04$), both moderate, suggest direct contact and poor hygiene as vectors, though lower scores may reflect adaptive behaviors such as handwashing. Intriguingly, access to vaccinations or health checks ($M = 2.92$, $SD = 1.09$) borders on high, hinting at some local government support under RA 11058; however, its moderate rating suggests inconsistencies, possibly sporadic programs, or low uptake (Department of Labor and Employment, 2019). This profile exceeds safer urban benchmarks (e.g., $M = 2.35$ in Metro Manila; Santos & Cruz, 2021), attributable to Laguna's decentralized waste systems and limited PPE.

These findings underscore opportunities for Laguna's local governance to integrate biological controls into waste management frameworks, such as RA 9003, including routine vector control, PPE distribution, and mandatory vaccinations. Compared to physical hazards ($M = 2.75$), biological risks are slightly lower but interconnected; for example, exhaustion worsens hygiene compliance, underscoring the need for holistic interventions (Philippine Statistics Authority, 2023).

This finding shows that, despite the availability of hygiene areas for garbage collectors, the possible exhaustion rate among them may be one factor affecting their hygiene-related concerns. Due to exhaustion, they might need rest rather than immediate cleansing after exposure; thus, an intervention for this scenario might be considered, such as a rotational stance for handwashing and shifting employees per area or barangay.

It was also found that PPE was lacking, resulting in further exposure to biohazards among the garbage collectors and leaving them vulnerable to various hazards. Thus, there may be a need to urgently request that LGUs provide adequate PPE and prioritize its use for garbage collectors. Furthermore, despite high vaccination access, the risk of inconsistent vaccination can also be seen, so consistent, scheduled vaccinations for garbage collectors must be provided to account for prioritization, including work-related injuries and illnesses, while boosting their health through an annual immunization program.

Table 3. Chemical Hazard Levels

Indicator	M	SD	Interpretation
As a garbage collector/sorter...			
1. I often encounter hazardous chemicals (cleaning agents, solvents) while working.	2.61	1.11	Moderate
2. The waste I handle sometimes emits harmful fumes or dust.	2.84	0.95	High
3. I experience respiratory problems due to exposure to chemicals at work.	2.28	1.06	Moderate
4. I have had allergic reactions or skin burns related to chemical exposure.	2.13	1.01	Low
5. Protective gear provided at work helps reduce my risk of chemical exposure.	3.28	0.89	High
Overall	2.62	0.74	Moderate
Note. $N=120$. The mean is interpreted as follows: 3.41–4.00 = Very High, 2.81–3.40 = High, 2.21–2.80 = Moderate, 1.61–2.20 = Low, 1.00–1.60 = Very Low.			

Chemical hazards among garbage collectors in selected Laguna municipalities register at a moderate overall level ($M = 2.62$, $SD = 0.74$), comparable to physical ($M = 2.75$) and biological ($M = 2.61$) risks, highlighting multifaceted exposures in waste handling (Bordado et al., 2020). Harmful fumes or dust from waste ($M = 2.84$, $SD = 0.95$), rated high, emerges as the primary concern, consistent with decomposition volatiles (e.g., ammonia, hydrogen sulfide) in organic-heavy Philippine landfills, which correlate with chronic respiratory irritation (World Health Organization, 2022; Foday et al., 2013).

Direct contact with chemicals like solvents ($M = 2.61$, $SD = 1.11$) is moderate, while reported respiratory problems ($M = 2.28$, $SD = 1.06$) and allergic reactions/skin burns ($M = 2.13$, $SD = 1.01$, low) suggest underreporting or effective early mitigation. Strikingly, protective gear efficacy rates are high ($M = 3.28$, $SD = 0.89$), indicating robust provision of protective gear, such as gloves, masks, and suits, under DOLE mandates (Department of Labor and Employment, 2019), which tempers broader risks. This contrasts with urban peers ($M = 2.48$ overall; Santos & Cruz, 2021) and points to Laguna-specific initiatives, though rural logistics may limit consistent use. Integration with other hazards is evident: fumes exacerbate biological pathogens and physical exhaustion, amplifying cumulative strain (Ali et al., 2019; Philippine Statistics Authority, 2023). Therefore, moderate chemical risks, buoyed by gear, underscore the value of prevention in bolstering occupational resilience.

Based on the results presented, it was observed that garbage collectors were mostly exposed to harmful fumes, dust, and even rotting organic gases such as ammonia, as well as cleaning agents and solvents thrown out by establishments and households, which are harmful to people and can cause irritation in the lungs over time. In addition, the possibility of developing skin allergies to agents and chemicals was noted. So that the strict implementation of wearing protective gear for the garbage collectors must be exercised, as well as the strict implementation of segregation of waste materials in each household. Even though there were policies and ordinances about proper segregation, some did not fully adhere to the policies and ordinances, resulting in having mixed types of household waste materials.

3.1. Work Safety Practices among Garbage collectors in Selected Municipalities in Laguna

Table 4 presents that the work safety practices among garbage collectors in selected Laguna municipalities, particularly work hour regulations, average moderate levels ($M = 2.87$, $SD = 0.67$), with "often" implementation of monitoring ($M = 3.03$, $SD = 0.85$), rest opportunities ($M = 3.03$, $SD = 0.96$), and predictable schedules ($M = 3.01$, $SD = 0.95$). These strengths suggest adherence to DOLE standards under RA 11058, thereby mitigating fatigue-related hazards such as physical exhaustion ($M = 2.99$ from prior data; Department of Labor and Employment, 2019). However, moderate perceptions that prescribed hours curb injury risks ($M = 2.63$, $SD = 1.01$) and preserve family time ($M = 2.66$, $SD = 1.09$) reveal implementation gaps, echoing informal-sector challenges in which overtime blurs boundaries (Philippine Statistics Authority, 2023).

This aligns with moderate hazard levels across physical ($M = 2.75$), biological ($M = 2.61$), and chemical ($M = 2.62$) domains, as regulated hours likely reduce cumulative exposures (Bordado et al., 2020; World Health Organization, 2022). Compared to urban waste workers ($M = 3.12$ for scheduling; Santos & Cruz, 2021), Laguna's scores indicate rural progress via local ordinances, yet family time erosion signals work-life imbalance. The Implications for Laguna governance include enforcing shift logs and fatigue protocols under RA 9003 frameworks, enhancing PPE integration. However, the self-reports may inflate positive practices; therefore, moderate-to-often-hour practices offer a foundation for safer operations, warranting reinforcement to address residual risks.

Table 4. Levels of Practice in Terms of Availability of PPEs

Indicator	M	SD	Interpretation
As a garbage collector/sorter...			
1. Working the prescribed number of hours does not increase my risk of injury or health problems.	2.63	1.01	Moderate
2. My employer monitors and regulates my working hours fairly.	3.03	0.85	Often
3. I have opportunities for rest or shorter shifts when experiencing fatigue.	3.03	0.96	Often
4. Non-extended work hours do not reduce my personal and family time.	2.66	1.09	Moderate
5. My work schedule is predictable and consistent.	3.01	0.95	Often
Overall	2.87	0.67	Moderate
Note. N=120. The mean is interpreted as follows: 3.41–4.00=High, 2.81–3.40=Often, 2.21–2.80=Moderate, 1.61–2.20=Rare, 1.00–1.60=Very Rare.			

Table 5 presents the common concerns of garbage collectors regarding their work schedules. They believe the time provided to them was more than necessary and required time beyond the hardship of their work, resulting in fatigue among garbage collectors despite the "Often" verbal interpretation of the monitoring and rest opportunities. Under the rule of RA 11058 (requiring safe procedures and training) and global fatigue strategies, tailored for Laguna garbage collectors, it must be suggested to enforced strict 8-hour shifts as the cap daily work at 8 hours (per Labor Code), and also provide garbage collectors with overtime pay at 25-30% for extras hours of work, and exercise or try to use digital logs for monitoring to prevent informal extensions.

In addition, a rest rotation can be provided to help them alleviate exhaustion for a while. A rotational rest will be a big help to the garbage collectors in restoring their strength for another heavy task. Provide point-to-point hydration areas for workers to reduce extreme exhaustion. The LGUs might mandate safety sessions and training to address fatigue among garbage collectors, and maintain a list of workers for priority health check-ups and emergencies at hospitals and Rural Health Units (RHUs) to immediately address their medical needs.

Table 5. Levels of Practice in Terms of Training and Orientations

Indicator	M	SD	Interpretation
As a garbage collector/sorter...			
1. Training on PPE usage is conducted quarterly for waste collectors.	2.77	0.96	Moderate
2. Refresher courses on injury prevention occur regularly.	2.85	0.91	Moderate
3. Orientations on compensation claims are provided annually.	2.92	0.90	Often
4. Training adequately addresses biological risks like infections from waste.	3.01	0.91	Often
5. Pre-employment orientations on occupational hazards are mandatory in my municipality.	3.11	0.83	Often
Overall	2.94	0.78	Often
Note. N=120. The mean is interpreted as follows: 3.41–4.00=High, 2.81–3.40=Often, 2.21–2.80=Moderate, 1.61–2.20=Rare, 1.00–1.60=Very Rare.			

Table 5 shows that the training and orientation for garbage collectors in selected Laguna municipalities demonstrate "often" implementation ($M = 2.94$, $SD = 0.78$), surpassing moderate work-hour practices ($M = 2.87$) and directly addressing identified hazards (Bordado et al., 2020). Mandatory pre-employment orientations on occupational hazards score highest ($M = 3.11$, $SD = 0.83$), reflecting RA 11058 compliance and equipping workers early against physical (e.g., exhaustion, $M = 2.99$), biological (e.g., infections, $M = 2.73$), and chemical risks (e.g., fumes, $M = 2.84$; Department of Labor and Employment, 2019). Biological risk training ($M = 3.01$, $SD = 0.91$) and compensation orientations ($M = 2.92$, $SD = 0.90$), both rated "often," address key vulnerabilities such as pathogens and claims access.

Meanwhile, a moderate rating for quarterly PPE usage training ($M = 2.77$, $SD = 0.96$) and injury prevention refreshers ($M = 2.85$, $SD = 0.91$) indicate gaps in frequency, despite high gear efficacy perceptions ($M = 3.28$ from chemical data), suggesting content quality over cadence (World Health Organization, 2022). This aligns with Philippine informal sector trends, where Laguna outperforms urban averages ($M = 2.76$; Santos & Cruz, 2021) via municipal programs, yet rural reach limits full impact (Philippine Statistics Authority, 2023). Thus, for local governance, enhancing PPE/injury modules to quarterly standards under RA 9003 could amplify hazard reductions. Linkages to moderate hazards affirm training's protective role.

To address the persisting issues on garbage collectors, the LGU must leverage the existing RA 11058 and coordinate with TESDA on various TESDA programs inclined with occupational safety to help reduced hazards experienced by the garbage collectors. In addition, mandate safety training and health measures every three months in lined with RA 9003 on waste operations protocols while featuring the practical demonstrations of PPE to the garbage collectors.

Complementing this, practical refreshers paired with injury prevention drills, with the support of the RHUs and the municipal disaster office, providing safe handling of sharp waste that would reinforce skills, with mandatory attendance incentivized through bonuses or recognition. Heightened the level of having pre- and post-employment orientations that include the PPE fit testing and maintenance checks with proper monitoring of attendance, either digital logs or manual logs, for compliance assurance among the collectors. For broader reach, especially in rural Laguna areas, local government units (LGUs) and DOLE could partner with NGOs to deliver mobile training units, monitored through worker feedback apps for real-time

adjustments.

Table 6. Levels of Practice in terms of Safety Protocols and Supervisions

Indicator	M	SD	Interpretation
As a garbage collector/sorter...			
1. Emergency response procedures for injuries are regularly communicated.	3.24	0.80	Often
2. Supervisors conduct regular safety inspections during work shifts.	3.12	0.86	Often
3. Supervisors provide on-site guidance for high-risk tasks.	3.13	0.82	Often
4. Weekly meetings address safety protocol updates.	3.03	0.92	Often
5. Supervision enhances awareness of compensation entitlements.	3.19	0.77	Often
Overall	3.14	0.66	Often
Note. N=120. The mean is interpreted as follows: 3.41–4.00=High, 2.81–3.40=Often, 2.21–2.80=Moderate, 1.61–2.20=Rare, 1.00–1.60=Very Rare.			

Safety protocols and supervisions among garbage collectors in selected Laguna municipalities achieve the strongest "often" level ($M = 3.14$, $SD = 0.66$), exceeding training ($M = 2.94$) and hours ($M = 2.87$), and providing a critical counterweight to moderate hazards (physical $M = 2.75$; biological $M = 2.61$; chemical $M = 2.62$). Regular communication of emergency procedures ($M = 3.24$, $SD = 0.80$) and supervisor guidance for high-risk tasks ($M = 3.13$, $SD = 0.82$) stand out, aligning with DOLE RA 11058 requirements and reducing injury severity in high-exposure roles like weather ($M = 3.32$) or fumes ($M = 2.84$; Department of Labor and Employment, 2019; World Health Organization, 2022). On-site inspections ($M = 3.12$, $SD = 0.86$), weekly safety meetings ($M = 3.03$, $SD = 0.92$), and compensation awareness ($M = 3.19$, $SD = 0.77$) foster proactive culture, complementing high protective gear perceptions ($M = 3.28$). This surpasses urban benchmarks ($M = 2.98$; Santos & Cruz, 2021), crediting Laguna's localized enforcement amid rural challenges (Philippine Statistics Authority, 2023; Bordado et al., 2020).

This implies that the government leverages this strength to implement integrated protocols under RA 9003, pairing supervision with PPE training to holistically address risks. Cross-domain ties (e.g., inspections curbing bio-exposure) amplify efficacy. To address the needs in this study, it was strongly recommended that the LGU provide practical solutions to build on Laguna's existing strengths under DOLE's RA 11058 and RA 9003. This is achieved by providing standardized meetings and benchmarking with other municipalities or provinces that have top performers, such as emergency procedures in handling concerns related to garbage collectors' work.

To ensure this is amplified effectively, hands-on supervisor training via TESDA modules would enable spot checks during high-risk tasks such as fume exposure or heavy lifting. Integrating accessible technology, such as free apps for real-time safety alerts and meeting recaps (with group SMS for rural areas), would help bridge communication gaps. An enhanced audit and feedback loop must also be provided, featuring quarterly supervisor reviews paired with worker surveys to refine protocols iteratively, capitalizing on the success of current on-site guidance.

Table 7. Levels of Practice in terms of Access to Sanitation/Hygiene Facilities

Indicator	M	SD	Interpretation
As a garbage collector/sorter...			
1. Sanitation stations are strategically located in high-risk areas.	3.15	0.87	Often
2. Drinking water points for hydration are available during work hours.	3.23	0.79	Often
3. Handwashing facilities are regularly cleaned and stocked with supplies.	3.31	0.82	Often
4. Poor sanitation access increases work-related health complaints.	3.18	0.87	Often
5. Availability of facilities improves overall job satisfaction.	3.36	0.82	Often
Overall	3.25	0.63	Often
Note. N=120. The mean is interpreted as follows: 3.41–4.00=High, 2.81–3.40=Often, 2.21–2.80=Moderate, 1.61–2.20=Rare, 1.00–1.60=Very Rare.			

Access to sanitation and hygiene facilities among garbage collectors in selected Laguna municipalities scores the highest "often" level ($M = 3.25$, $SD = 0.63$), outpacing supervision ($M = 3.14$), and robustly addressing biological ($M = 2.61$) and chemical ($M = 2.62$) hazards through handwashing ($M = 3.31$, $SD = 0.82$), hydration points ($M = 3.23$, $SD = 0.79$), and strategic stations ($M = 3.15$, $SD = 0.87$; World Health Organization, 2022). Perceptions that poor access heightens complaints ($M = 3.18$, $SD = 0.87$) and facilities enhance satisfaction ($M = 3.36$, $SD = 0.82$) underscore their role in preventing infections/skin issues while countering exhaustion (physical $M = 2.99$; Bordado et al., 2020).

The findings reflect RA 11058 sanitation mandates, surpassing moderate-to-often trainings ($M = 2.94$) and urban norms ($M = 3.05$; Santos & Cruz, 2021), likely via Laguna's municipal investments amid tropical risks (Philippine Statistics Authority, 2023). Synergies with supervision (e.g., inspections ensuring upkeep) amplify effects, linking to high gear efficacy ($M = 3.28$). To sustain this in governance practices, via RA 9003 budgets, expanding mobile units for rural routes to maintain momentum.

In order to address the shortcomings in remote or hazard-prone locations, even as handwashing and hydration access receive solid marks. Practical solutions can leverage Laguna's high satisfaction linkages and hygiene mandates under RA 11058 and RA 9003 through targeted expansions. Deploying mobile units such as portable handwashing and hydration carts mounted on collection trucks that would serve rural routes, with daily restocking coordinated via LGU logistics for reliability. In addition, the Supervisors should conduct quarterly route audits to map high-risk zones and install fixed stations, such as shaded kiosks equipped with soap and water, at hotspots, such as dumpsites or wet areas. Maintenance protocols would mandate twice-daily stock checks for essentials (soap, sanitizers), integrated into existing worker orientations for proper use. Budgeting could draw from RA 9003 funds to procure solar-powered units adapted to tropical conditions,

with DENR partnerships tying hygiene to waste management goals.

Table 8. Levels of Health Outcomes in Terms of Frequency of Work-Related Illness

Indicator	M	SD	Interpretation
As a garbage collector/sorter...			
1. Persistent fatigue is linked to daily waste collection exposure.	2.84	0.92	Poor
2. Skin infections occur from repeated biological hazards.	2.65	0.80	Fair
3. Injuries require time off from waste collection duties often.	3.07	0.84	Poor
4. Symptoms lead to reduced work capacity multiple times monthly.	2.61	0.95	Fair
5. Illness episodes correlate with peak waste collection periods.	2.54	0.98	Fair
Overall	2.74	0.65	Fair

Note. N=120. The mean is interpreted as follows: 3.41–4.00=Very Poor, 2.81–3.40=Poor, 2.21–2.80=Fair, 1.61–2.20=Good, 1.00–1.60=Very Good.

The findings indicate that, despite moderate work safety practices and relatively strong access to sanitation and hygiene, garbage collectors in selected municipalities of Laguna still experience work-related health outcomes at a “Fair” level, with “Poor” -- rated fatigue and injury-related absences. This pattern suggests that existing safety interventions, such as on-site supervision, safety protocols, and hygiene facilities, are partially protective but insufficient to fully prevent fatigue, injuries, and recurrent infections.

The persistence of time-off-required injuries and frequent fatigue corroborates multi-site evidence that waste collectors face elevated risks of acute accidents, musculoskeletal disorders, and chronic tiredness linked to long shifts, manual lifting, and poor recovery time. From a policy-and-governance perspective, the fact that illness episodes cluster with peak collection periods implies that demand-driven workload surges are not adequately matched by additional protective measures (e.g., shift rotation, rest breaks, medical coverage).

The “Fair” overall health-outcomes score in this study, therefore, reflects a manageable but concerning situation, such as garbage collectors are not yet at the worst possible health state, but their current condition signals a clear need for more robust health monitoring, targeted injury prevention, and strengthened linkages between local ordinances and national occupational health frameworks such as RA 11058 and RA 9003. Fatigue has been seen as one of the most common health challenges among the garbage collectors in their daily operations.

The physical strains extended working hours, and the peak of workloads were one of the considered factors as well. A shift-rotation is somewhat advice to address the concern of the employees in terms of fatigue while providing appropriate and timely guidelines for their workloads and work set up top assure that the employees were able to attain specific time to rest and cope with the exhaustion and fatigue caused by the job. An 8-6-hour workload will be exercised during peaks, with team rotations and mandatory 15-minute hourly breaks so that it would prevent overload and promote recovery from time to time.

Additional free quarterly health check-ups would also help the employees to screen for early fatigue indicators, supplemented by rest days after high-demand periods and PhilHealth registration for hazard-related coverage. Moreover, ergonomic aids like strollers, lifters, trolleys, and other simple machines that can help them minimize the manual work constraint can be provided, especially during peak or holiday seasons.

Table 9. Levels of Health Outcomes in terms of Frequency of Work-Related Injuries

Indicator	M	SD	Interpretation
As a garbage collector/sorter...			
1. Minor abrasions result from handling rough waste materials.	3.24	0.93	Poor
2. Muscle strains arise from lifting heavy waste containers.	3.18	0.88	Poor
3. Sprains occur during sudden movements on uneven terrain.	2.95	0.89	Poor
4. Falls occur on slippery surfaces during rainy weather collections.	3.01	0.87	Poor
5. Crushed fingers result from closing heavy bin lids.	2.70	1.02	Fair
Overall	3.02	0.75	Poor

Note. N=120. The mean is interpreted as follows: 3.41–4.00=Very Poor, 2.81–3.40=Poor, 2.21–2.80=Fair, 1.61–2.20=Good 1.00–1.60=Very Good.

The high frequency of abrasions and muscle strains corresponds directly with the moderate-to-high physical hazard levels already documented, especially heavy lifting (analogous $M \approx 2.66$) and exposure to extreme weather ($M \approx 3.32$), which increase the likelihood of misstep- and overexertion-related injuries. The prevalence of sprains and falls on slippery surfaces during rainy-season collections also echoes workers' self-reports of being more prone to slipping and falling when roads are wet, a pattern repeatedly noted in studies of Philippine waste collectors. The "Fair" score for crushed fingers reflects a somewhat lower but still notable risk, likely tied to poorly designed or heavy bin lids and limited use of robust, puncture-resistant gloves.

The overall level of work-related injuries was verbally interpreted as "Poor" which indicates that current safety practices—such as supervision, safety protocols, and training—are not fully effective in preventing musculoskeletal and mechanical injuries among garbage collectors in Laguna. The clustering of the highest scores around abrasions, muscle strains, and falls suggests that ergonomic risks, manual handling, and environmental conditions (e.g., wet, uneven terrain) remain inadequately controlled, despite the presence of often-rated work-hour regulations and safety protocol supervision. This finding is consistent with broader evidence that waste collectors are among the most exposed occupational groups to overexertion, acute mechanical injuries, and musculoskeletal disorders, largely due to the absence of mechanical lifting aids, substandard PPE, and high-speed work demands.

From a local governance perspective, the "Poor" injury profile signals the need for targeted ergonomic interventions, such as introducing lighter or mechanical bins, improving footwear and gloves, and reinforcing safe work behaviors on uneven or wet surfaces during rainy-season rounds. It also highlights the importance of integrating injury-reporting systems and first-aid protocols into existing safety-supervision structures, so that the high frequency of minor injuries does not escalate into chronic musculoskeletal conditions or prolonged disability over time. Thus, while the overall health outcome in this study remains at "Fair", moreover, the "Poor" level of injury occurrence underscores that prevention-oriented measures must be strengthened if local agencies in Laguna are to genuinely reduce occupational harm among garbage collectors.

Based on the results, muscle strain and abrasion were common among the garbage collectors due to handling rough waste materials, underscoring uncontrolled physical hazards at the workplace despite established safety practices. Under the provisions of RA 11058, ergonomics mandates, and RA 9003 equipment standards, capitalizing on Laguna's supervision strengths and by upgrading to cut-resistant gloves and arm guards, with daily inspections to enforce use, would directly curb abrasions and enhance protection. Hands-on training drills for safe gripping and lifting techniques, woven into quarterly PPE refreshers, would build essential skills.

Table 10. Levels of Health Outcomes in terms of Perceived Health Conditions

Indicator	M	SD	Interpretation
As a garbage collector/ sorter...			
1. Dust from waste causes ongoing throat irritation that affects me.	2.86	0.94	Poor
2. My hands show permanent damage from chemical exposures.	2.58	1.01	Fair
3. Frequent cuts lead to chronic skin infections in my work.	2.39	1.11	Fair
4. Chronic back pain is inevitable from lifting waste bags.	2.88	0.96	Poor
5. Overall fatigue levels are much higher than non-waste workers.	3.25	0.85	Poor
Overall	2.80	0.74	Fair
Note. N=120. The mean is interpreted as follows: 3.41–4.00=Very Poor, 2.81–3.40=Poor, 2.21–2.80=Fair, 1.61–2.20=Good 1.00–1.60=Very Good.			

The overall level of perceived health conditions was verbally interpreted as “Fair,” which, underpinned by “Poor” scores on throat irritation, chronic back pain, and general fatigue, indicates that garbage collectors subjectively experience a meaningful decline in health due to their occupational exposure. This subjective appraisal corresponds well with quantitative evidence that manually driven waste collection in the Philippines places workers at high risk for musculoskeletal disorders, respiratory irritation, and long-term fatigue, particularly when ergonomic controls are weak, and workloads remain intense.

The fact that workers perceive their fatigue as “much higher” than non-waste counterparts suggests that the health burden of garbage collection is not only visible in injury-related complaints but also in general vitality and functional capacity, which may erode long-term work ability and quality of life. At the same time, the presence of “Fair” rather than “Very Poor” overall scores hints that some protective factors, such as access to sanitation facilities, safety supervision, and training, are partially buffering the worst-case health perceptions.

Nevertheless, the persistence of “Poor-rated symptoms implies that municipalities need to move beyond basic safety-protocol compliance toward targeted interventions: providing better-fit respirators or dust-control measures, introducing ergonomic aids to reduce lifting loads, ensuring durable gloves and creams to prevent hand damage, and linking routine medical check-ups to the chronic-condition patterns that workers report. Thus, while the current perceived health status is still formally “Fair,” the cluster of “Poor”- rated indicators strongly signals that, without deliberate local policy action, these garbage collectors are on a trajectory toward more severe and permanent occupational health damage.

The results of this table have drawn on RA 11058 for interventions on health checks and ergonomic upgrades, which will help build on Laguna's strengths in supervision and sanitation access. Mandatory shift rotations and breaks, while capping individual lifts at 20 kilograms, with team changes every four hours and 15-minute shaded rests during peaks, would alleviate immediate strain. Moreover, additional ergonomic equipment such as back supports, trolleys, and lighter bins, combined with training on proper lifting techniques to avoid injuries, would help reduce the physical toll on garbage collectors.

Alongside, the provision of sanitation areas for hand washing and the strict implementation of PPE and face mask use would help mitigate the dangers posed by fumes and other air-related diseases that might affect the collector's health. An additional PHILHEALTH support for injury- and work-related diseases must also be given priority to provide holistic support to garbage collectors.

3.2. The Status of Compensation Provided to the Garbage Collectors in the Selected Municipalities of Laguna

Table 11. Status of Compensation in terms of Medical Support

Indicator	M	SD	Interpretation
As a garbage collector/sorter...			
1. I have access to medical care for work-related injuries or illnesses.	3.02	0.98	High
2. My employer provides health insurance that covers occupational health risks.	2.93	1.07	High
3. Medical services are easily accessible and affordable for me as a worker.	3.09	0.94	High
4. Medical benefits are sufficient to cover costs of treatment when needed.	2.99	1.02	High
5. I have access to medical care for work-related injuries or illnesses.	3.11	1.00	High
Overall	3.03	0.87	High

Note. N=120. The mean is interpreted as follows: 3.41–4.00 = Very High, 2.81–3.40 = High, 2.21–2.80 = Moderate, 1.61–2.20 = Low, 1.00–1.60 = Very Low.

The status of compensation provided to garbage collectors in the selected municipalities of Laguna, in terms of medical support, is “High” overall ($M = 3.03$, $SD = 0.87$), indicating that workers perceive that they generally have access to and adequate coverage under medical-related benefits for work-related injuries and illnesses. Furthermore, all five indicators fall within the “High” range (2.81–3.40). This means that access to medical care for work-related injuries or illnesses is reported twice in items number 1 and 5, with means of 3.02 and 3.11, respectively, reinforcing the centrality of this aspect in workers’ views of compensation.

In addition, the employer-provided health insurance covering occupational health risks is rated ($M = 2.93$), suggesting that many workers are enrolled in some form of health insurance or medical benefit arrangement. Moreover, in terms of accessibility and affordability of medical services ($M = 3.09$) and sufficiency of benefits to cover treatment costs ($M = 2.99$), both are rated “High,” indicating that workers generally feel that care is not only available but also financially manageable when needed. Thus, the overall mean of 3.03 sits at the lower end of the “High” band, implying that while medical support is viewed positively, it is not yet at the “Very High” level.

The relatively small standard deviation (0.87) suggests consistent, homogeneous perceptions among respondents, rather than a polarized view of this compensation dimension. The “High” perceived level of medical support stands in contrast to the previously reported “Fair” to “Poor” health outcomes and injury levels, such as frequent persistent fatigue, chronic back pain, recurrent skin infections, and frequent work-related injuries. This pattern reflects a familiar dynamic in occupational health research,

such as the availability of medical care does not necessarily prevent the occurrence of health problems, but it does reduce financial and access-related barriers to treatment. In other words, garbage collectors’ bodies are still getting exposed to hazardous conditions, yet the compensation package provides a relatively strong reactive safety net in the form of clinics, insurance, and treatment coverage. Given the fact that medical benefits are seen as sufficient ($M = 2.99$) and services as accessible and affordable ($M = 3.09$), this may indicate that local-level health-care arrangements, such as municipal health centers, PhilHealth-linked programs, or local health-welfare ordinances, are being leveraged for this worker group.

The results show inconsistent coverage depth among the garbage collectors. Although the employees have health insurance for occupational risks, there is still a need for favorable access to care and health-related provisions in affordable coverage. To help elevate and resolve this concern among the employees, the LGU

should harness PhilHealth, RA 11058 mandates, and LGU programs tailored for waste workers while ensuring universal PhilHealth enrollment for all collectors and with hazard pay add-ons and premium subsidies from municipal funds that would provide a foundational safety net among the garbage collectors.

On-site health units were suggested to be established to address the gaps and needs of garbage collectors, specifically targeting issues related to work fatigue. Establishing one unit will enable quick check-ups and responses to employees' physical needs and build on high-rated accessibility. In addition, claims assistance training must be integrated into meetings to help and enable workers and minimize their out-of-pocket expenses due to work-related sickness. Despite the said interventions and possible programs, a regular audit must also be conducted alongside the proposed activities and interventions to ensure that employees can receive and use their health support from the LGU. This act of providing incentives and bonuses for the employees would fortify the financial protection of the garbage collectors and support public resilience in waste operations.

Table 12. Status of Compensation in Terms of Hazard Pay

Indicator	M	SD	Interpretation
As a garbage collector/sorter...			
1. The local government provides sufficient resources for waste collection.	3.04	0.95	High
2. I receive support from local officials in terms of safety protocols.	3.02	1.05	High
3. Hazard pay is included in my regular salary or wages.	2.62	1.18	Moderate
4. I am aware of criteria used to determine hazard pay eligibility.	2.67	1.07	Moderate
5. Hazard pay motivates me to work safely despite risks.	3.05	1.03	High
Overall	2.88	0.90	High
Note. N=120. The mean is interpreted as follows: 3.41–4.00 = Very High, 2.81–3.40 = High, 2.21–2.80 = Moderate, 1.61–2.20 = Low, 1.00–1.60 = Very Low.			

The findings indicate that garbage collectors/sorters in the local government unit perceive the overall status of compensation, particularly hazard pay, as high ($M=2.88$, $SD=0.90$), falling within the 2.81–3.40 range on the Likert-type scale. This overall positive assessment aligns with established literature on public sector compensation for high-risk occupations, where hazard pay serves as a critical incentive to mitigate occupational hazards such as exposure to biohazards, physical injuries, and ergonomic strains common among waste workers (International Labour Organization [ILO], 2020).

However, a closer examination of individual indicators reveals variability, underscoring targeted areas for policy intervention in local governance. Notably, respondents reported high levels of resource provision for waste collection ($M=3.04$, $SD=0.95$) and support from local officials on safety protocols ($M=3.02$, $SD=1.05$), both interpreted as "High." These results suggest effective operational backing from the local government, consistent with Republic Act No. 9003 (Ecological Solid Waste Management Act of 2000) in the Philippines, which mandates adequate equipment and protective measures for waste handlers. Such support likely fosters a sense of organizational resilience, as low standard deviations (below 1.0) indicate consensus among the 120 respondents, reflecting uniform experiences across the sample.

In contrast, perceptions of hazard pay integration into regular salaries/wages ($M=2.62$, $SD=1.18$) and awareness of eligibility criteria ($M=2.67$, $SD=1.07$) were rated "Moderate," signaling implementation gaps. The higher SD values here (>1.0) imply greater variability in experiences, possibly due to inconsistent application of hazard pay policies under local government payroll systems or limited dissemination of guidelines from the Department of Budget and Management (DBM).

This moderation echoes studies on occupational health in Philippine public administration, where frontline workers, such as waste collectors, often face delays or inadequacies in risk-based

compensation despite legal entitlements (e.g., hazard pay provisions in Executive Order No. 209; Rivera & Santos, 2022). Despite these shortcomings, the high rating for hazard pay's motivational role in safe practices ($M=3.05$, $SD=1.03$) highlights its psychological value, supporting Herzberg's Two-Factor Theory, which posits that such incentives act as motivators, enhancing job satisfaction and risk-mitigation behaviors.

These results have practical implications for local governance, particularly in enhancing employee satisfaction and occupational safety. The moderate hazard points to a need for streamlined eligibility criteria, transparent communication, and integration into standard payroll—potentially through capacity-building workshops for human resource officers. Strengthening these could elevate the overall mean beyond the high threshold, aligning with sustainable development goals for decent work (SDG 8) in vulnerable sectors. Future research might explore qualitative insights or comparative data from other LGUs to validate these patterns.

The overall findings of this study highlights the resiliency of the LGUs in terms of resource provision; however, it exposes the gaps in the provision of hazard pay execution for the garbage collectors, despite having various pays and incentives, not all employees agree that they were given enough and appropriate benefits and pay, especially in relation to the health risk of their work. The DBM guidelines and studies like Rivera & Santos (2022) suggest that hazard pay boosts safety behaviors (SDG 8 alignment), yet it needs better integration to fully mitigate risks like biohazards among the employees in the sanitation department.

Table 13. Status of Compensation in Terms of Insurance Coverage

Indicator	M	SD	Interpretation
As a garbage collector/sorter...			
1. My job includes insurance coverage for accidents and health issues.	2.85	1.14	High
2. The insurance plan meets my healthcare needs as a waste collector.	2.91	1.13	High
3. I understand the benefits included in my insurance coverage.	2.84	1.05	High
4. Insurance claims related to work injuries are processed without difficulties.	2.74	1.16	Moderate
5. Insurance coverage provides financial protection for my family in case of work accidents.	3.03	1.13	High
Overall	2.88	0.96	High
Note. N=120. The mean is interpreted as follows: 3.41–4.00=Very High, 2.81–3.40=High, 2.21–2.80=Moderate, 1.61–2.20=Low, 1.00–1.60=Very Low.			

Respondents rated the overall status of compensation via insurance coverage as "High" ($M=2.88$, $SD=0.96$), consistent with the scale's 2.81–3.40 range and mirroring patterns observed in hazard pay assessments from parallel data. This perception underscores the role of insurance as a non-wage compensation pillar for high-risk public service roles, aligning with the Philippine Labor Code (Presidential Decree No. 442) and Social Security System (SSS) mandates requiring employers, including local government units (LGUs), to provide work-related accident and health coverage (Employees' Compensation Commission [ECC], 2021). The relatively low overall SD (0.96) indicates broad agreement among the N=120 sample, pointing to standardized policy implementation across waste management operations.

Individual items largely reinforced this high status. Strong agreement emerged for insurance providing financial family protection in accidents ($M=3.03$, $SD=1.13$), meeting healthcare needs specific to waste collection ($M=2.91$, $SD=1.13$), inclusion of accident/health coverage ($M=2.85$, $SD=1.14$), and understanding of benefits ($M=2.84$, $SD=1.05$)—all "High."

These findings resonate with organizational behavior theories that emphasize insurance as a hygiene factor that bolsters employee retention and morale in hazardous occupations (Herzberg, 1966; adapted for

public administration contexts by Aguilera & Valderrama, 2023). Waste collectors' exposure to sharps, chemicals, and musculoskeletal disorders necessitates tailored plans, and the data affirm that LGU provisions largely address these issues, fostering occupational health resilience. A notable exception was the moderate rating for hassle-free processing of work injury claims ($M=2.74$, $SD=1.16$), with the highest SD signaling experiential disparities. Such friction can erode trust in compensation systems, potentially heightening turnover or underreporting of incidents, as evidenced in prior studies on informal waste sectors (Cruz & Reyes, 2021).

These insights advocate for LGU-level reforms, such as digital claim portals and training for processors, to elevate claim efficiency and sustain high perceptions. Integrating this with hazard pay enhancements could holistically improve compensation equity, supporting public service quality under the Local Government Code (RA 7160). Comparative analyses across LGUs or longitudinal tracking post-intervention would strengthen generalizability.

Most garbage collectors feel average in terms of how they used to feel about getting extra pay for their work. The LGU and the government ensure that employees have benefits under PD 422, supported by the Social Security System (SSS) and the Government Service Insurance System (GSIS). The employees are quite glad for the benefits they received from the LGU and the government-provided insurance, which might help them with financial expenses related to health and other matters. Despite the provision, the result has also shown that not all are satisfied, this is due to some reasons, such as the waiting time for the insurance release, some might easily receive their insurance benefits, while others experience waiting in line to receive.

These findings matter for the study. Insurance is like hazard pay is too good on paper from laws like RA 7160, but hard to use and difficult for the employees to have their claims putting them to a situation wherein they choose to get resource out of their pockets rather than to wait for the government support. Having insurance is mostly good for waste workers. It will help them protects themselves and their families for unprecedented injuries and diseases that will cause them financial concerns.

3.3. Relationship Between the Work Safety Practices, the Health Outcomes and the Compensation Entitlements among Garbage Collectors in Selected Municipalities of Laguna and the Heath Outcome

Table 14. Correlations Between the Work Safety Practices and the Health Outcomes

Practices	Health Outcomes		
	Frequency of work-related illness	Frequency of work-related injuries	Perceived health conditions
Availability of Personal Protective Equipments	-.044	.063	.048
	.637	.495	.605
Training and Orientations	.194*	.390*	.294*
	.036	<.001	.001
Safety Protocols and Supervisions	.243*	.493*	.386*
	.008	<.001	<.001
Access to Sanitation/ Hygiene Facilities	.275*	.502*	.367*
	.003	<.001	<.001

Note. N=120. Cell contains Pearson r correlation coefficient, interpretation of its strength, and its corresponding p value. Degrees of freedom range from 113 to 118.
*p<.05.

This section examines the relationships between work safety practices and health outcomes among garbage collectors in selected Laguna municipalities, based on Pearson correlation coefficients presented in

Table 5.1 (N = 120). This analysis examined the significant relationships among work safety practices, health outcomes, and compensation entitlements among workers. The correlations were computed with degrees of freedom ranging from 113 to 118, using a significance level of $p < .05$. Strength interpretations follow Cohen's (1988) guidelines that small ($r \approx .10$), medium ($r \approx .30$), and large ($r \approx .50$).

Table 5.1 reveals varied associations across safety practices and health outcome indicators and the frequency of work-related illness, frequency of work-related injuries, and perceived health conditions. Availability of personal protective equipment (PPE) showed a moderate positive correlation with injury frequency ($r = .637$, $p < .001$), suggesting that better PPE access aligns with fewer injuries, though links to illness ($r = -.044$, $p = .495$, nonsignificant) and perceived health ($r = .063$, $p = .048$) were weak or absent. This pattern implies PPE primarily mitigates acute physical risks rather than chronic illnesses or overall well-being. Training and orientations exhibited medium positive correlations with all outcomes: illness ($r = .194$, $p = .008$), injuries ($r = .390$, $p < .001$), and perceived health ($r = .294$, $p = .001$).

These findings indicate that regular training enhances awareness and reduces health risks, consistent with hierarchical models of safety behavior (Reason, 1997). Safety protocols and supervision yielded the strongest links, with large correlations with injuries ($r = .493$, $p < .001$) and perceived health ($r = .386$, $p < .001$), and a medium correlation with illness ($r = .243$, $p = .003$). Similarly, access to sanitation/hygiene facilities correlated moderately to strongly: illness ($r = .275$, $p = .003$), injuries ($r = .502$, $p < .001$), and perceived health ($r = .367$, $p < .001$).

These results associations underscore the role of structural support in preventing occupational hazards among waste workers. These results echo studies on municipal waste workers in the Philippines, where inadequate supervision amplifies injury rates (DOLE, 2022; Santos & Reyes, 2020). This study's results have shown that safety practices have a significant relationship with the health status of the garbage collectors, considering the structural factors such as the hygiene protocol, while outperforming the equipment and training for overall positive outcomes.

Table 15. Correlations Between the Work Safety Practices and Compensation Entitlements

Practices	Compensation Entitlements		
	Medical Support	Hazard Pay	Insurance Coverage
Availability of Personal Protective Equipment	.245* low <.001	.381* low <.001	.322* low <.001
Training and Orientations	.439* moderate <.001	.557* moderate <.001	.594* moderate <.001
Safety Protocols and Supervisions	.567* moderate <.001	.622* moderate <.001	.489* moderate <.001
Access to Sanitation/ Hygiene Facilities	.405* moderate <.001	.407* moderate <.001	.346* moderate <.001

Note. N=120. Cell contains Pearson r correlation coefficient, interpretation of its strength, and its corresponding p value. Degrees of freedom range from 113 to 118.

* $p < .05$.

Building on the prior examination of safety practices and health outcomes, Table 5.2 explores their associations with compensation entitlements on medical support, hazard pay, and insurance coverage among

garbage collectors in selected Laguna municipalities (N = 120). Pearson correlations used degrees of freedom from 113 to 118, with significance at $p < .05$. Strength follows Cohen (1988): low ($r \approx .10-.29$), moderate ($r \approx .30-.49$), large ($r \geq .50$). All safety practices showed significant positive correlations with entitlements, though strengths varied. Availability of personal protective equipment (PPE) linked lowly but significantly to medical support ($r = .245$, $p = .007$), hazard pay ($r = .381$, $p < .001$), and insurance ($r = .322$, $p < .001$).

These modest ties suggest that PPE provision signals basic employer investment, incrementally boosting access to entitlements. Training and orientations displayed moderate correlations across all the variables including medical support ($r = .439$, $p < .001$), hazard pay ($r = .557$, $p < .001$), and insurance ($r = .594$, $p < .001$). Meanwhile, safety protocols and supervisions were similarly strong, especially for hazard pay ($r = .622$, $p < .001$) and medical support ($r = .567$, $p < .001$), with insurance at moderate ($r = .489$, $p < .001$). Access to sanitation/hygiene facilities correlated moderately with medical support ($r = .405$, $p < .001$), hazard pay ($r = .407$, $p < .001$), and insurance ($r = .346$, $p < .001$). These patterns indicate that comprehensive safety measures, particularly training, protocols, and hygiene that strongly predict compensation benefits, likely reflecting municipal compliance with Republic Act 11058 (Occupational Safety and Health Standards Law).

This suggests that results regarding safety practices help improve health outcomes and entitlements, potentially forming a resilience loop for occupational well-being. These research findings supported the "resilience loop," wherein safety practices were considered, better health protection was properly documented, entitlements were provided to garbage collectors, resulting in more secure work for employees, and safer behavior would also lead to better health outcomes. It is suggested that employees' training, protocols, and heightened supervision be prioritized to ensure they are strictly followed. Standardized entitlements, as stated and written under RA 11058, wherein safety is well-organized, to provide formal hazard payment and insurance, and to normalize the provision of compensation entitlements should also be provided.

4. Summary, Conclusion and Recommendations

4.1. Summary of Findings

This study examined the occupational hazards, safety practices, health outcomes, and compensation entitlements among 120 garbage collectors in selected municipalities in Laguna.

- Regarding occupational hazards, garbage collectors reported moderate exposure across physical (M = 2.75, SD = 0.72), biological (M = 2.61, SD = 0.75), and chemical (M = 2.62, SD = 0.74) hazards, which correspond to 2.21–2.80 on the Likert scale. Physical hazards were notable for high exposure to extreme weather (M = 3.32, SD = 0.90) and end-of-shift exhaustion (M = 2.99, SD = 0.93), surpassing urban benchmarks (M = 2.45). Biological risks involved infectious agents (M = 2.73, SD = 1.00) and pests (M = 2.66, SD = 1.00), while chemical hazards included fumes and dust (M = 2.84, SD = 0.95), which were mitigated somewhat by protective gear (M = 3.28, SD = 0.89). These findings align with studies on informal waste workers in developing areas, emphasizing rural vulnerabilities under RA 9003 and RA 11058.
- Work safety practices in the selected municipalities of Laguna showed moderate to frequent implementation, including work hour regulations (M = 2.87, SD = 0.67), trainings or orientations (M = 2.94, SD = 0.78), safety protocols and supervision (M = 3.14, SD = 0.66), and sanitation and hygiene access (M = 3.25, SD = 0.63; highest for handwashing at M = 3.31). Strengths in supervision (e.g., emergency procedures, M = 3.24) and hygiene exceeded urban norms, indicating partial DOLE compliance.
- Health outcomes of the garbage collectors were average for work-related illness frequency (M = 2.74, SD = 0.65) and perceived conditions (M = 2.80, SD = 0.74), but poor for injury frequency (M = 3.02, SD = 0.75), with examples like abrasions (M = 3.24) and strains (M = 3.18). Persistent issues

included fatigue ($M = 2.84$) and back pain ($M = 2.88$), linked to ergonomic and environmental risks, showing that practices help but do not fully prevent harm.

- Compensation Entitlements, the workers perceived high to moderate access, with medical support ($M = 3.03$), hazard pay ($M = 2.88$), and insurance ($M = 2.88$) rated positively, though claim processing lagged ($M = 2.74$).

Thus, this study's findings tested all correlations, which were accepted (significant positive associations); therefore, rejecting the null hypothesis of no relationship, the safety Practices and health Outcomes showed a strong positive correlation, indicating better practices predict improved health and fewer injuries. Moreover, safety practices and compensation entitlements have shown a positive correlation with training and with hazard pay, suggesting that effective practices enhance access to benefits.

4.2. Conclusions

Laguna's garbage collectors face moderate risks from physical, biological, and chemical hazards, which are reduced by safety practices such as supervision and hygiene, but they still experience high injury rates and moderate illness rates. To strengthen occupational resilience, policymakers must act decisively.

1. Local government units should implement ergonomic tools and mechanization to reduce high physical risks.
2. Municipalities should mandate yearly training above current standards and include real-time supervision.
3. Simplify claims processing for benefits like medical support through digital portals.
4. Incorporate RA 9003 into pest and vector controls addressing biological hazards.

4.3. Recommendations

Based on the research findings, here are recommendations to enhance Occupational Health Risks and Compensation Entitlements among Garbage Collectors in Selected Municipalities in Laguna.

1. Local government units (LGUs) and the Department of Environment and Natural Resources (DENR) should invest in mechanized tools (e.g., ergonomic lifters, pest-proof bins) to address moderate physical hazards, extreme weather exposure, and biological risks like infectious agents. Provide shaded rest areas and weather-adaptive gear to reduce end-of-shift exhaustion, aligning with RA 9003 ecological standards.
2. Elevate safety practices and training. The local municipalities must mandate regular, specialized training and real-time supervision, focusing on emergency protocols and hygiene. Enforce strict work-hour regulations with shift rotations to prevent fatigue and strain.
3. Improve health monitoring and interventions by establishing on-site clinics and conducting annual health screenings through PhilHealth and LGUs to address poor injury profiles, such as abrasions, and moderate illness rates, including back pain. Additionally, access to hygiene should be considered and expanded to include full PPE for chemical fumes.
4. Streamline compensation and entitlements that the Local municipalities should consider providing necessary compensation to the garbage collectors and digitize claims processing for faster access to medical support, hazard pay, and insurance, tied to training efficacy, and conduct awareness campaigns on RA 11058 rights to boost perceived entitlements.
5. Foster multi-stakeholder collaboration and monitoring, by forming LGU-DOLE-DENR task forces for quarterly audits, funding via local funds and national budgets, and pilot mechanization in high-risk sites, track progress with surveys.

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