

UNIVERSITY OF EDUCATION, WINNEBA

**ASSESSMENT OF OCCUPATIONAL HEALTH AND SAFETY RISKS AMONG
ENVIRONMENTAL HEALTH OFFICERS IN GHANA AMIDST THE COVID-19
GLOBAL PANDEMIC**

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GLOBAL PANDEMIC**

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of the requirements for the award of the degree of
Master of Philosophy
(Environmental and Occupational Health Education)
In the University of Education, Winneba.**

APRIL, 2024

DECLARATION

Student's Declaration

I, Harrison Yengbe, now declare that except for references to the works of other researchers duly cited, this work is the result of my original research and that this dissertation has neither in whole nor in part been presented for another degree elsewhere.

SIGNATURE:.....

DATE:.....

Supervisors' Declaration

We declare that the preparation and presentation of this work were supervised by the guidelines for the supervision of the thesis as laid down by the Akenten Appiah Minkah University of Skills Training and Entrepreneurial Development

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Date:.....

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DEDICATION

This work is dedicated to the Almighty God and my children, Albert Kwadzo Lorlornyo Yengbe, Stephanie Darkowaa Mawuse Yengbe and Harriet Akorfa Yengbe.

TABLE OF CONTENTS

DECLARATION	iii
ACKNOWLEDGMENT.....	iv
DEDICATION	v
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF ABBREVIATIONS.....	xi
ABSTRACT.....	xiii
CHAPTER ONE	1
INTRODUCTION.....	1
1.1 Background.....	1
1.2 Problem Statement.....	2
1.3 Justification.....	3
1.4 Main Objective	4
1.5 Specific Objective.....	4
1.6 Research Questions.....	5
1.7 Limitation/Scope of the Study	5
1.8 Organization of the Study.....	6
CHAPTER TWO	7
LITERATURE REVIEW.....	7
2.1 Novel Coronavirus Disease: A Global Overview.....	7
2.2 COVID-19 in Ghana.....	10
2.3 Interventions to Stem COVID-19 in Ghana	12

2.4	The Role of Environmental Health Officers.....	13
2.5	Occupational Health and Safety Assessment	16
2.6	Occupational Hazards Assessment.....	17
2.7	Support System on COVID-19.....	18
2.8	Impact of Training of Covid- 19.....	19
2.9	Effectiveness of Personal Protective Equipment.....	21
2.10	Occupational Risk Mapping and Risk Scoring.....	22
CHAPTER THREE		26
METHODOLOGY		26
3.1	Description of Study Area	26
3.2	Research Design and Data Collection	30
3.3	Sampling Method	31
3.4	Inclusion and Exclusion Criteria	33
3.5	Data Analysis.....	33
3.6	Risk Score.....	34
3.7	Risk Scoring of Environmental Health Officers.....	34
3.8	Key Informant Interview	36
3.9	Focus Group Discussion.....	37
3.10	Research Philosophy.....	37
3.11	Ethical Consent	38
CHAPTER FOUR.....		39
RESULTS.....		39
CHAPTER FIVE		57

DISCUSSION	57
CHAPTER SIX.....	66
CONCLUSION AND RECOMMENDATIONS.....	66
6.1 Conclusion.....	66
6.2 Recommendations	67
REFERENCES	69
APPENDICES	79
Appendix I: Questionnaire.....	79
Appendix: Introductory Letter	100

LIST OF TABLES

Table 3.1:	Recorded Cases by Regions.....	29
Table 3.2:	Regional Cases Distribution.....	30
Table 3.3:	EHOs in the regions.....	31
Table 3.4	Regional Distribution of Environmental Health Officers.....	33
Table 3.5:	Rating Scale for Hazards Ranked from 1 to	34
Table 3.6:	Rating Scale for Likelihood Rank from1-5 (Probability of incident occurrence).....	35
Table 3.7:	Risk Description (seriousness of hazard).....	35
Table 4.1:	Demographic characteristics of respondents.....	39
Table 4.2:	Status of respondents at the workplace.....	41
Table 4.3:	COVID-19 related activities.....	42
Table 4.4:	Occupational hazards faced by EHOs during the pandemic.....	43
Table 4.5:	What is your rank/position at the work place * Have you had any physical effect during burial process.....	44
Table 4.6:	Gender Have you had any physical effect during burial process.....	44
Table 4.7:	Health and safety training practices.....	45
Table 4.8:	Access and Provision of PPEs during COVID-19 Pandemic.....	47
Table 4.9:	Effect of Rank/Position at Workplace and Access to PPEs.....	52
Table 4.10:	Comparative Analysis of Rank/Position of Participants and the Provision of PPEs.....	53
Table 4.11:	Risk Score for COVID-19 Related Activities.....	56

LIST OF FIGURES

Figure 2.1:	Distribution of Covid-19 Cases.....	10
Figure 2.2:	Regional Distribution of Covid-19 Cases in Ghana.....	11
Figure 3.1:	Regional Sources of Recorded cases (local/imported).....	29
Figure 3.2:	Map of Ghana.....	30
Figure 4.1:	Position at work place and work experience.....	41
Figure 4.4:	Support system on COVID-19.....	46
Figure 4.5:	Comparative analysis of Rank/Position and the use of personal money to buy PPEs.....	48
Figure 4.6:	Comparative Analysis of mode of involvement in COVID-19 related activities and the use of personal money to buy PPEs for the work.....	48
Figure 4.7:	Possession and Use of PPEs.....	49
Figure 4.8:	PPEs needed by Participants and those available.	50
Figure 4.9:	Work Perception of EHOs	51
Figure 4.10:	Rank and Providers of PPEs.....	54

LIST OF ABBREVIATIONS

COVID-19:	Corona Virus – 2019
ECOWAS:	Economic Community of West African States
EHA:	Environmental Health Assistant
EHOs:	Environmental Health Officers
EHT:	Environmental Health Technology
EHA _n :	Environmental Health Analyst
EHSU:	Environmental Health and Sanitation Unit
GHS:	Ghana Health Service
ILO:	International Labour Organization
IOS:	International Organization for Standardization
IPC:	Infection Prevention and Control
MMDAs:	Regions, Metropolitans, Municipal and District Assemblies
NGOs:	Non-Governmental Organizations
NHIS:	National Health Insurance Scheme
OHS:	Occupational health and safety
PDCA:	Plan-Do-Check-Act
PHEC:	Public health emergency committee
PPE:	Personal Protective Equipment
RMMDEHOs:	Regional, Metropolitan, Municipal and District Environmental Health Officers
SARS:	Severe Acute Respiratory Syndrome

SPSS: Statistical Package for Social Sciences

UK: United Kingdom

WHO: World Health Organization

ABSTRACT

Occupational health and safety risk assessment entails the evaluation of workplace hazards and the degree of injury or effect such hazards pose to the health of the workers. This study assesses occupational health and safety risks among Environmental Health Officers in Ghana amidst the COVID-19 global pandemic. By way of methodology used 215 EHOs sampled for data collection and analysis. This research used a mixed-method approach. Qualitative and quantitative data collection approach were employed to gather information on respondents through the administration of questionnaires, augmented with key informant interviews, and focus group discussions. Findings showed that Environmental Health Officers were involved in the fight against COVID-19 in the following ways; contact tracing 13%, health education 40%, fumigation and disinfection 14%, and as well as burial 33%. However, personal protective equipment was not available to about 34% of the officers for their work at the time of data collection. This could possibly lead to exposure of the officers to occupational risks such as contraction of the COVID-19 virus (1.4%), injuries (80%), and effects of chemicals meant for fumigation 33%, on their bodies. This could also result in a lot of emotional and psychological hazards on these officers. Furthermore, 42% of the officers were not trained on COVID-19 management at the time of involvement in this study while there were virtually no support systems and motivational incentives available to the officers. It is recommended that the government and Environmental Health Sanitation Unit should provide the officers with adequate and appropriate protective equipment, training and support systems. This could be supported by health and safety polices to protect the officers in their work.

CHAPTER ONE

INTRODUCTION

1.1 Background

The emergence of the novel Corona virus 2019 (COVID-19) has affected every part of the world. The disease which was first reported by the World Health Organization's office in Wuhan Province, China on the 31st of December, 2019 had affected almost every sector in every country by the middle of the year 2020. A total of 29,739,453 infections were recorded globally as at 17th October, 2020 resulting in close to 1,000,000 fatalities (WHO, 2020). Fast forward to 2021, every sector of life and the economy have experienced the rippling effects of the global pandemic. Ghana has not been left out of the devastating effects of the pandemic. After recording its first two cases on 12th March, 2020, the country went on to record 42,993 cases and 248 deaths by 16th August in the same year (Ayisi-Boateng et al., 2020).

The government of Ghana has instituted several measures and protocols that aimed at preventing the spread of the virus in the country. These protocols range from effective hand washing under running water with soap, use of alcohol-based hand sanitizers, wearing of nose masks and social distancing (Asante & Mills, 2020). Those who succumb to the disease are buried under the strictest of hygienic practices to ensure infection prevention and control. At the helm of burial of fatalities resulting from the virus are the Environmental Health Officers (EHOs). These are personnel with the

requisite knowledge, techniques and skills to ensure people who die from COVID-19 are buried in a manner that do not pose further fatal implications to other people.

However, in doing their work, EHOs are exposed to huge risks and little is done to protect them from the deadly virus on daily basis which poses varying degrees of risk to their physical and mental health. Hence, this study is aimed at assessing the occupational health and safety risks among EHOs in Ghana during the global pandemic.

1.2 Problem Statement

Health Workers and Environmental Health Officers across the world are faced with occupational health and safety issues, during the outbreak of Covid-19. This have made it even more challenging with work-related occupational injuries. About 860 000 lives were lost due to accidents at workplaces (Takala et al., 2014). Several continents have also recorded unprecedented infections and death tolls which has tested the health systems in place (World Health Organization, 2020). The COVID-19 virus has affected all sectors of the world causing lockdowns in most countries, including areas such as academic institutions, religious activities, trans-border trades, air travels, hospitality industries, restrictions on human movement amongst others (Laurencin & McClinton, 2020). All these restrictions have had dire consequences on the world's economy, standards of living, mental and physical wellbeing of the people.

In Ghana, since the emergence of the COVID-19 virus, several schools of thought from academia and political arena have proposed means by which the country could prevent

the virus. This has led to a holistic approach by the government of the country in tackling the disease. Among these approaches were closing the country's land borders, shutting down of the airspace, mandatory quarantine of any arrivals and massive testing and contact tracing of infected persons. There was a rallying call to every individual to wear nose mask, practice hand washing with soap and water as well as avoid close contact with other persons.

Several reasons accounted for this, ranging from weak structural systems, to no adherence to safety protocol among sections of the population and inadequate preventive equipment.

The EHOs were left out of the government's allowances such as tax exemption and 50% salary allowances for other health workers at the forefront of the fight against the pandemic (Ernst & Young, 2020). This has led to the feeling of neglect and under-appreciation among them.

1.3 Justification

The novel coronavirus is a major public health crisis challenging economies and lives. Currently there is little literature on health and safety risks among Environmental Health Officers in the fight against COVID-19. Hence the study will fill the existing gap by assessing the occupational health and safety risks Environmental Health Officers face in the fight against COVID-19. It is important to protect Environmental Health Officers in the working environment from accidents and injuries in their working environment

importantly for economic growth and productivity as stated in the Sustainable Development Goal (SDG 8).

Environmental Health Officers are mandated to promote, protect and enforce public health practices through contact tracing, health education, disinfection or fumigation, and the burial of bodies arising from COVID-19 infection. Without adequate protection, Environmental Health Officers may contract diseases that can lead to death (Herron et al., 2020).

1.4 Main Objective

The main objective of this study was to assess occupational health and safety risks among Environmental Health Officers in the midst of COVID-19.

1.5 Specific Objective

The specific objectives of the study were to:

- I. Evaluate the occupational hazards faced by Environmental Health Officers in their response to the COVID-19 pandemic
- II. Determine the level of occupational health and safety risks faced by Environmental Health Officers in their response to COVID-19
- III. Determine existing support systems for Environmental Health Officers to deliver on their duties.

1.6 Research Questions

The study was guided by the following research question:

- I. What are the roles Environmental Health and Sanitation Unit play in the fight against COVID-19?
- II. What are the occupational hazards faced by Environmental Health Officers in their response to the Covid-19?
- III. What occupational hazards are faced by EHOs during their work?
- IV. What are the levels of occupational health and safety risks faced by EHOs officers in the fight against COVID-19?
- V. What are the existing support systems for Environmental Health Officers involved in the fight against COVID-19?

1.7 Limitation/Scope of the Study

The study entails the roles Environmental Health Officers play in the fight against COVID-19 global pandemic in Ghana and the health and safety measures put in place to protect them. The study did not consider the effect of health and safety laws on the Environmental Health Officers in the handling of COVID-19 cases.

There were some limitations to the study. The study was limited to six (6) regions out of the sixteen (16) and made use of thirteen (13) Metropolitan, Municipal and District Assemblies (MMDAs) out of the 156. Two (2) MMDAs were selected each out from the five (5) regions and three MMDAs in Greater Accra

1.8 Organization of the Study

The research comprises six (6) chapters. Chapter one is the introduction which contains the background to the study, statement of the problem, the purpose of the study, objectives of the study, research questions, limitations of the study, and organization of the study. Chapter two contains the review of literature related to the study. Chapter three presents the methodology which contains research design, population, sample and sampling technique used for the study, research instruments, data collection procedure, and data analysis. Chapter four presents the analysis of the data obtained from the research. Chapter five discusses the results and findings and Chapter six for conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Novel Coronavirus Disease: A Global Overview

The Wuhan Health Commission, on 31st December 2019, reported cases of atypical pneumonia-like cases. These cases were linked to a wet livestock market situated in the city of Wuhan. The first patients started showing signs of illness in the middle of December 2019. Clinical isolates were found to contain a novel coronavirus that was similar to bats. By January 28th, 2020, there were more than 4,500 cases that were confirmed by laboratory analysis, resulting in over 100 fatalities. Travel-related cases were confirmed in multiple countries and regions outside mainland China including Germany, France, Thailand, Japan, South Korea, Vietnam, Canada, and the United States, as well as Hong Kong and Taiwan (Ralph et al., 2020).

It is widely known that Coronaviruses are endemic among human populations, accounting for about 30% of respiratory infections resulting in rhinitis, pharyngitis, sinusitis, bronchiolitis, and pneumonia annually. Primarily, coronaviruses are associated with relatively mild, self-limiting respiratory infections. However, infections can result in severe disease in neonates, the elderly, and those with underlying comorbidities. Hence, coronaviruses are now considered potential threats to global public health following the emergence of SARS-CoV in 2002 and MERS-CoV in 2012 (Ralph et al., 2020).

The COVID-19 pandemic has remained a global health concern since the initial outbreak in Wuhan, China. With what was first purported to be the common cold with an unknown cause, the Coronavirus has spread across every continent of the world in less than two years and has affected about 220 countries, with nearly 171,943,181 confirmed cases and 3,575,991 deaths as of June 2, 2021 (Sohrabi et al., 2020).

According to the World Health Organization (WHO) on January 30th, 2020 declared the coronavirus disease a public health emergency with less than 100 cases and no fatalities in 18 countries outside China. Globally, confirmed cases soared exponentially and surpassed 200,000 in just under a month. Iran and Italy were among the most hit countries recording exponential figures in terms of confirmed cases and fatalities on daily basis. The severity of the virus was felt across all nations including developed, developing, and underdeveloped countries as they struggle to combat the virus which was rapidly overwhelming available structures in place to fight it. The United States of America as of June 2, 2021, leads the tally of the overwhelming effects including the number of cases diagnosed daily and COVID-19 related deaths (Chu et al., 2020).

The global impact of COVID-19 was severe. The WHO rightly predicted during the early stages of the outbreak about the gross impact when it announced that the consequences of the virus at the time in Italy and Iran could be replicated in other countries. International and national health facilities worldwide jumped into action and have remained in action since the start of the outbreak. The overbearing effect of COVID-19 on these institutions has been enormous. Developed countries, with their best technological advancements and

well-equipped systems, continue to struggle with efforts to contain the spread and combat the devastating effects of the pandemic (Dzando et al., 2021).

Furthermore, developing countries struggled in their attempts to deal adequately with the Coronavirus infection. The effect of the pandemic on low resourced countries can be predictably devastating as a result of poor health delivery systems and structures, lack of policy directions, disparities in access to healthcare, economic problems, as well as existing political atmosphere present in these countries (Dzando et al., 2021).

The African continent was the least affected by COVID-19 Egypt was the first country in Africa to record COVID-19 cases on the 14th February, 2020. This was followed by Algeria on the 25th February, 2020 and Nigeria on the 27th February, 2020. Out of the three countries, Algeria recorded 15.0% mortality, Egypt 7.2% and Nigeria 3.4% as at 18th April, 2020. South Africa recorded the highest confirmed cases (Lone & Ahmad, 2020). The three countries in Africa that recorded the least COVID-19 cases are Uganda, Zambia and Zimbabwe. Zimbabwe recorded its first COVID-19 cases on the 15th March, 2020 with 24 confirmed cases with Zambia recorded its first cases 18th March, 2020 with 52 confirmed cases and Uganda 55 confirmed cases on the 20th March, 2020. The continent Africa has recorded the spread of COVID-19 cases but remained stable with South Africa recording (4793 cases), Ghana (1550 cases), Cameroon (1621 cases), and Algeria (3517 cases) (Naidu, 2020) 27th May 2020.

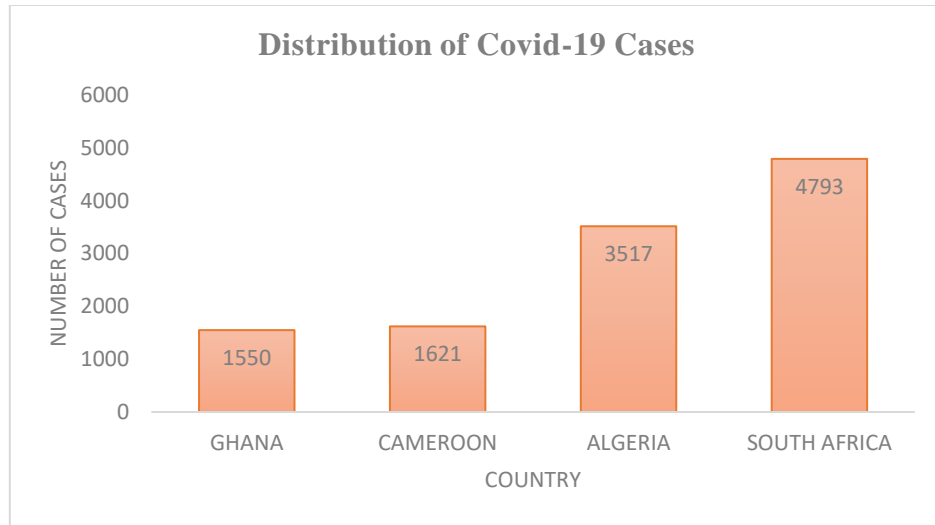


Figure 2.1: Distribution of Covid-19 Cases

(Source: 2023 Field Study)

2.2 COVID-19 in Ghana

Ghana recorded its first Coronavirus case on the 12th March, 2020. The first two cases were recorded among returnees from Turkey and Norway; countries which at the time had recorded cases in their respective countries (Afriyie et al., 2020). Since then, there was a surge in the number of cases and an increasing number of COVID-19 related deaths. As of June 2, 2021, Ghana ranked 96th in the world and 11th in Africa with 94,011 confirmed cases and 785 deaths (Dzando et al., 2021). Ghana, as a country, relies mostly on foreign aid to support its domestic activities, including healthcare. During the coronavirus pandemic, it was anticipated that sources of funding will drastically reduce due to the global financial recession. However, foreign aids were on the increase. These donations came in the form of money, loans, and vaccines in an attempt to curb the spread of the virus in the country and revamp the country's dwindling economy (Ralph et al., 2020).

Consequently, Ghana, deployed every available resource at its disposal including online applications to detect, trace and contain the disease. These plans were implemented at community, district, regional and national levels to stop the importation of cases from other parts of the world (Ralph et al., 2020).

Furthermore, the health sector's strategic framework made it a focus to test, treat, and track suspected and confirmed cases of infected persons and their contacts. As of 31st December 2020, a total of 535,168 cases, including 335 deaths, have been confirmed with 53,928 recoveries and 905 active cases. All the regions have reported cases, with Greater Accra reporting the highest number. The response actions in Ghana was high-level political commitment, appropriate and timely decisions, and a careful balance of public health interventions with economic and socio-cultural dynamics. They were to intensify to non-pharmaceutical interventions, sustain the gains made so far and introduce COVID-19 vaccines to reduce the public health burden of the disease in Ghana (Ralph et al., 2020).

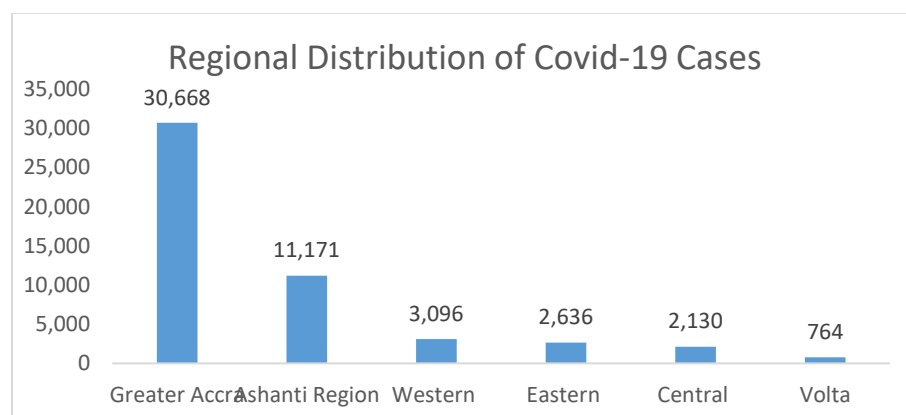


Figure 2.2: Regional Distribution of Covid-19 Cases in Ghana

(Source: 2022 Field Survey)

2.3 Interventions to Stem COVID-19 in Ghana

Ghana responded to the emergence of COVID-19 in the country with a form of seriousness that got many praising the country's response system. Government quickly put structures in place that were meant to achieve five specific objectives namely; stop the importation of new cases, identify and contain cases, give the best quality of care to those already sick, be able to vaccinate a good number of the population, and also alleviate the impact of the disease on the economy (Kenu et al., 2020).

The country took further steps in stemming the disease by going into partial lockdowns in the two most populous cities; Accra and Kumasi. Schools were not left out as all schools were closed down to prevent the spread of the disease, market spaces were duly fumigated through contracts awarded to the country's major waste management company, Zoomlion Ghana Limited. Executive instruments were subsequently passed to enforce the wearing of masks in schools, churches, workplaces, and all other places that hold human activities. The country made it an objective to vaccinate at least 20 million of its population through The WHO's Covax initiative (Quakyi et al., 2021).

Ghana's first steps taken as interventional actions against the COVID-19 pandemic include the closure of land borders to neighboring countries including Togo, Cote d'Ivoire, and Burkina Faso. International flights were also suspended effectively on 22nd March, 2020. Furthermore, the government of the country ordered a partial lockdown in the Greater Accra and Greater Kumasi Metropolitan areas from 30th March 2020 for three weeks. Social gatherings such as religious activities, funerals and parties were also

banned. Schools were also closed, with students asked to return home until further notice (Sarkodie et al., 2021).

Ghana's response actions harnessed the appropriate legal framework, including the Public Health Act, 2012 (Act 851) which grants powers to the Minister for Health in Public Health emergencies; the Imposition of Restrictions Act 2020 (Act 1012); Executive Instrument (EI) 68 of 2020 on the 17th of April 2020; and EI 164 on 15th June 2020. These provided the legal basis for restricting movements and social gatherings and mandatory wearing of face masks, among other measures. The response was also driven by a political framework based on the involvement of all ministries and agencies across all levels of governance from the community, through the districts, regions, to the national level (Kenu et al., 2020).

2.4 The Role of Environmental Health Officers

Environmental Health Officers play a crucial role in maintaining good health in communities worldwide. They are an important part of preventive medicine delivery and therefore have the mandate to educate the public on ways to live a healthy life and the enforcement of environmental standards across all sectors (Stewart, 1999; Whiley et al., 2019).

However, due to limited health workforce in Africa, Environmental Health Officers play much of the roles in health education specially in the fight against COVID-19 pandemic (Musoke et al., 2016) Hundreds of Environmental Health Officers have put forth their

skills and time to assist with several activities geared towards fighting the disease such as contact tracing in several parts of the world to bring COVID-19 outbreak under control (Mahase, 2020). The professionals are responsible for contact tracing and supervising the burial of the bodies of victims. This puts them at the forefront of the fight against the disease (Ofosu-Poku et al., 2020). Additionally, their involvement in the fight against the disease just like nurses and doctors exposes them to numerous risks. Without the necessary support, training and motivation, these professionals cannot adequately deliver on their roles in the fight against COVID-19 (Ofosu-Poku et al., 2020).

Environmental Health Officers (EHOs) in Ghana are frontline Health Officers stationed at all the Ports of entry in line with the International Health Regulations (2005). Additionally, Environmental Health Officers (EHOs) perform several duties in the midst of COVID - 19 pandemic such as: disinfection of homes and wards including vehicles and ambulances and articles of COVID - 19 patients and dead bodies. The Environmental Health and Sanitation Directorate also promote hygiene practices like hand hygiene, cough etiquette and Environmental cleaning which are essential to breaking the chain of transmissions at the community and other places of human engagements. Other responsibilities include the management of health care waste especially management of highly infectious waste like waste from COVID 19 patients, treatment centers and holding facilities, ensuring safe and hygienic practices which are important for quality health outcomes, training of other health staff on waste segregation, Infection Prevention and Control (IPC) and handling of the COVID 19 dead bodies (Annan et al., 2015).

The Environmental Health and Sanitation Directorate is also responsible for the inspection and enforcement of hygiene at all public and private health facilities to ensure personal and environmental hygiene standards, the safe burial of COVID 19 corpses, overseeing operations at public mortuaries where COVID 19 bodies are kept and supervision of private ones as well as enforcing the Public Health Directives by the President. The Environmental Health Officers are equally tasked with sensitization on the preventive measures of COVID 19 and other preventable disease conditions such as cholera and diarrheal diseases. The functions include contact tracing and monitoring to prevent the spread of the disease as well as risk communication. Other roles performed by Environmental Health Officers are inspections and monitoring of markets, shopping malls, lorry stations among others, preparation of quarantine areas to meet basic hygiene and safety standards. It is also working by conducting premises surveillance including house to house inspection and education on COVID 19 where we also look out for unhygienic conditions which could result in outbreaks of other infectious diseases (Lone & Ahmad, 2020).

Presently, the office serves on the Public Health Emergency Committee (PHEC), Rapid Response Team, Case management and contact tracing, Education committee, Burial team, Technical committee which advises the PHEC. In the midst of this pandemic, government of Ghana imposed a partial lockdown. The office added to its roles by ensuring premises surveillance as a way of preventing another outbreak. Considering all these roles Environmental Health Officers play, they bear a high personal risk of getting infected (Lone & Ahmad, 2020).

2.5 Occupational Health and Safety Assessment

Conducting risk assessment is one way to improve occupational health and safety. Occupational health and safety systems have been developed and improved in recent years. However, almost 2 million employees die each year as a result of exposure to workplace hazards. Workplace safety is the responsibility of both the employee and the employers as any risk at the workplace affect both (Aven, 2016). The occupational health and safety risk management process entails various concepts such probability or likelihood of hazards occurring , the impact of a risk occur when the effect is low or high and risk is result of the impact of the hazard and the occurrence of a risk does not necessary give room for a higher impact (Lemmens et al., 2022) These concepts can be defined in different ways thereby affecting the outcomes of the risk assessment. The success of every occupational risk assessment depends on the assessors understanding of these various concepts and differences between them. Therefore, the overall knowledge, skills, experiences and abilities of assessors play a major role in the successful development of occupational risk assessment (Rantala et al., 2022).

Occupational health and safety protocols exist to protect the physical and psychological well-being of all employees including Environmental Health Officers (EHOs) in line with their jobs which in recent times includes handling of the COVID-19 pandemic. Employers are to pay reward for OHS failures. Organizations and institutions are to focus on biological, physical and chemical exposures to hazards, diseases and injuries related to work (Geneva & Bangkok, 2004). Occupational health and safety offer the employers the responsibility to make relevant workplace safety to their employees. Occupational Health

and Safety provides health, economic and social benefits to both parties and not for human rights only. Secondly, OHS campaign boosts leadership at the management level in organizations which results in productivity and invention of employees, it ensures progress and effectiveness in the workplace (Mona et al., 2019).

When dealing with risk matrix assessment, logic-based risk evaluation can sanction decisions of management. It assists in resource optimization by indicating where to focus effects on extensive analysis or risk mitigation. If quantitative approach is used to measure risk. It can only generate a subjective and very restricted relative understanding of the risk (Elmonstri, 2014).

2.6 Occupational Hazards Assessment

More than 2.3 million premature deaths are recognized annually in the world due to occupational environments, while 2 million deaths result from occupational diseases, with the remaining being work-related occupational injuries. Approximately 6400 workers are killed by occupational-related diseases, with 860 000 lives lost due to accidents at workplaces (Takala et al., 2014).

Hazard assessment is a tool or formula for surveying risk from exposure to all fields at workplace and the accident or injuries we encounter. These types of occupational hazards such as Biological, Chemical, Physical and ergonomic have effect on our productivity. Majority of the occupational hazards we encounter at the workplaces which leads to accident and injuries is a result of exposure to such hazards. International Labour

Organization (ILO) disclose with figures that every 15seconds 153 employees encounter work-related accidents worldwide. Additionally, 6300 deaths occur yearly which is due to continued skiving at work due to occupational accidents. (Mona et al., 2019).

2.7 Support System on COVID-19

Following the outbreak of COVID-19 pandemic in the world and its associated widespread and devastating effects on all sectors of the world and human life have been severely affected. Environmental Health Officers who were at the forefront of transporting and burial of dead bodies were also affected. These officers required various support systems, not only for themselves but for their families and dependents. The support system in COVID-19 management and protection was very important and comes in different forms, Environmental Health Officers play crucial roles and need the support to be able to carry out their work professionally. Some interventions to support Environmental Health Officers are the provision of effective personal protective equipment's (PPEs), training, stress management, emotional and psychological counseling (Vizheh & Qorbani, 2020).

Covid-19 support systems in Ghana have been few compared to other countries. Psychological impact of the Covid-19 have been identified and serious attention paid to it more in other African countries where systems has been established to cater for psychological wellbeing of employees (Honey et al., 2021). Furthermore, financial assistance have also been given in form of grants to alleviate the economic impact of the pandemic on workers where as other countries in Europe have instituted social and

family support systems to address mental health impacts on the public during the pandemic (Iftekhhar et al., 2021).

2.8 Impact of Training of Covid- 19

Training has been identified as a very important factor that affects the performance of employees and drives them towards exhibiting their best efforts towards the success of their organizations. Training entails chronological restructuring of behaviour, attitudes and skills through learning, education, instruction and planned experiences. Through training, the behaviour, knowledge or skills of employees of organizations are improved upon or changed for the betterment of both the employee and most importantly for the organization. Organizations usually offer training opportunities for their employees to update them on their knowledge and skills, emergent scenarios of the business market as well as to make them remain competitive and strategically positioned for profitability (Khan et al., 2011).

The importance of training to employees and organizations cannot be over-emphasized. Therefore, employers must recognize the need for training to their employees and come to terms with the fact that training is a very important tool or avenue by which they can invest in their employees which will improve their performance. This is very vital to the success and existence of every organization which found itself in the business market. Training has also been identified as the most viable tool for raising the efficacy of both employees and employers in a business market where monopolization remains highly difficult in the provision of particular goods or services. Regular effective pieces of

training are as important to employees as any other tool or activity which aims at making employees more productive and goal-oriented as it can lead to the acquisition of required and relevant skills and knowledge that drive the organization towards success (Khan et al., 2011; Sharma & Taneja, 2018; Twumasi, 2017).

Training contributes immensely towards employee motivation which improves employee performance. Training of employees is also seen as an effective tool of investing in the employees, an investment which is ultimately returned when after acquiring the necessary skills, employees become more effective and productive to their organizations. Most employees see pieces of training as a means of motivation that enables them to learn new things on the job. They consider pieces of training as means to improve their knowledge base, sharpen their skills and improve upon their capabilities. However, in the long run, organizations and employers benefit the most from these pieces of training to their employees since they afford the employees with increased knowledge, updated skills and new capabilities which they put to use for profit maximization and goal realization of the companies (Bao & Nizam, 2015; Sharma & Taneja, 2018).

The educational training on pandemic or epidemic for health workers and Environmental Health Officers is important to make them effective and have the understanding of the risk stages and information distribution on how health issues are handled. Adequate Health knowledge on the perspective of pandemic or epidemic is relevant to the control of learning skills which is required to make up-to-date health-related decisions in the

environs. These will permit individuals to gain, understand and use data for decisions making that will influence their health position (Nutbeam, 2000).

2.9 Effectiveness of Personal Protective Equipment

Since the outbreak of the novel coronavirus, health professionals are exposed to risk and the need for effective and efficacy of their distinct personal protection equipment (PPE) in reducing exposure to likely infection through contact with microorganisms has been established. It is clear that infected health professionals during the outbreak of severe acute respiratory syndrome (SARS) omitted either correct PPE use or had not complied with hand hygiene protocols (Lopes & Mckay, 2020).

The novel Coronavirus disease outbreak have tested the knowledge on practices to dispose of the dead body of COVID-19, health professional attending to COVID-19 dead body during burial must practice hand hygiene and ensure the appropriate use of the personal protective equipment (PPEs) such as safety boots, head covers, coveralls, shoe covers, gowns, N95 respirators, surgical masks, face shields/goggles (Pradesh et al., 2020).

Specification of the type, number and components of PPEs to be worn during the COVID-19 pandemic is very important. This is to prevent the transmission of the virus from the infected person or dead body to the EHO officers in their line of duty and to ensure they remain in good health. The use of PPEs among the EHO will also go a long way to protect the families and friends of EHO officers from getting infected with the

virus by ensuring the protection of the officers during the dispensation of their work (Hersi et al., 2015).

The use of PPES, especially the nose masks, hand gloves, face shields and aprons have been heightened during the COVID-19 pandemics. This is based on the science that the virus spread largely through air droplets and can be contracted through the inhalation of such droplets into one's system through the nose, mouth and skin. Hence, the use of PPEs has become paramount and made compulsory in all sectors of the country. Same is the Ministry of Local Government and Rural Development, under which the office of the environmental health falls (Hersi et al., 2015).

2.10 Occupational Risk Mapping and Risk Scoring

Occupational risk exists to estimate health risks from exposure to various areas of hazards in the workplace and knowing how much exposure of a worker's health is important to eliminate, control and reduce the hazard, occupational risk incident prevention is a concern to International Labor Organization (ILO). The International Organization for Standardization (IOS) and International Labor Organization (ILO) should progressively ensure that all Occupational Health and Safety (OHS) standards concerning management are based on PDCA theory that is (Plan-Do-Check-Act) which is also known as continuous perfection cycle (Silva, 2020).

Risk scoring is the process of determining the severity through quantitative or qualitative models. The risk score is conducted to enable the researcher to know the participants that

are more prone to risk infection in their areas of work. the researcher starts the risk score to discover how individual health are screened. The researcher designs a qualitative structured interview through purposeful sampling with age and gender. Interpretation and the analysis will have informed the health of the individual at risk. The result is made known to the individual (Nielsen et al., 2009).

Accurate risk scores ensure organizations design an appropriate risk-response system, complete with processes and procedures to address any incident. Risk scores not only help to lower the probability of adverse incidents occurring, it can also help to limit the damage in the event. This leads to lower cost, a greater likelihood of successful project outcomes, and increased customer satisfaction (Nielsen et al., 2009).

To do risk scoring, one needs to multiply the risk impact rating by the risk probability. Therefore, risk scores are the product of risk impact rating and risk probability. Risk impact index refers to the kind of risk that is available or can be available in a particular work environment while the risk probability gives the likelihood of the occurrence of that particular risk. It is the quantifiable number that allows key personnel to quickly and confidently make decisions regarding risks (Aven, 2016).

		A	B	C	D	E
		Negligible	Minor	Moderate	Significant	Severe
E	Very Likely	Low Med	Medium	Med Hi	High	High
D	Likely	Low	Low Med	Medium	Med Hi	High
C	Possible	Low	Low Med	Medium	Med Hi	Med Hi
B	Unlikely	Low	Low Med	Low Med	Medium	Med Hi
A	Very Unlikely	Low	Low	Low Med	Medium	Medium

(Source: Lemmens et al., 2022)

The 5X5 risk matrix table is a comprehensive tool used by organizations during the risk assessment stage of project planning, operations management, or job hazard analysis. The tool aim to identify the probability and impact levels of injury and risk exposure to a worker in relation to workplace hazards. Effective and efficient risk management needs assessment of inherently uncertain events and circumstances which usually tackles two dimensions. The first is how likely the uncertainty is to occur (probability) and the second is what the effect would be if it happened (impact). While unambiguous frameworks can be developed for impact assessment, probability assessment is often less clear. This is the case especially for projects that have readily data on risk probability from previous projects (Lemmens et al., 2022).

In effect, the 5x5 risk matrix table entails dimensions that details the probability and the impact of any risk that can be envisaged at every workplace or in any project.

2.12 Probability or likelihood Table

Probability table : details the likelihood of a risk or hazard occurring at the workplace or in the organization. This is normally depicted in tables from rarely where the chances of the risk occurring is from low to very high where the chances of the risk occurring is very high.

2.13 Impact Table

Impact table provides information on the effect on the occurrence of the risk. Various risks have different probabilities and different impacts levels which can be revealed through detailed risk assessment.

2.14 Risk Table

Risk table which has high chances of occurring does not necessary means that it will give the severest of effects which is the impact (Lemmens et al., 2022).

CHAPTER THREE

METHODOLOGY

3.1 Description of Study Area

The study was conducted in 6 regions in Ghana namely Greater Accra, Ashanti, Western, Eastern, Volta, and Central region. Out of the 6 regions selected, thirteen (13) MMDAs were selected for the study due to the highest recorded COVID-19 cases in the MMDAs in the regions with priority given to the regional capital. The reasons for the 6 selected regions for the study was due to the highest recorded cases during the outbreak of COVID-19 in Ghana.

3.1.1 Greater Accra

The Greater Accra recorded the first COVID-19 cases in the country on the 12th March, 2020. The first two cases were recorded among returnees from Turkey and Norway. On the 12th March, 2020 to 31st December, 2020, Greater Accra active cases were 30, 668 and the only region with the highest COVID-19 case count.

The region has setup these selected testing and treatment facilities of COVID-19 cases Korle- Bu Teaching Hospital, University of Ghana Medical Centre (UGMC), Ga East Municipal Hospital, Nyaho Medical Centre, Tema General Hospital, Greater Accra General Hospital and 37 Military Hospital.

The National COVID-19 burial team were Environmental Health Officers only. In all the team had buried 335 COVID-19 bodies for the nation as at June to August, 2020. The Environmental Health Officers were also part of the contact tracing, fumigation/disinfection, health education and burial of the dead. The region observed the two weeks' partial lockdown by the president due to increase in the cases recorded.

3.1.2 Ashanti Region

The region recorded 2 COVID-19 cases on the 13th March, 2020 one imported and one local with a case count of 11,171 starting from 13th March to 31st December, 2020. The region also has some selected facilities for the testing and treatment of COVID-19 cases in the region namely; Komfo Anokye Teaching Hospital, Frimpong Boateng Medical Centre, Kumasi South Hospital.

The Regional Environmental Health team were responsible for the burial of COVID-19 dead bodies. Environmental Health Officers were actively involved in the COVID-19 activities in the region.

3.1.3 Western Region

The region had an increase in COVID-19 case as at 14th March to 31st December, 2020 and was 3,096. The Regional, Municipal, and District hospital were actively involved in the testing and treatment of the cases in the region. The Regional Environmental Health team were responsible for the burial of COVID-19 dead bodies and actively involved in the fight against disease in the region.

3.1.4 Eastern Region

The region recorded their first COVID-19 case on the 18th March, 2020 at Lower Manya Krobo. The regional hospital was used for the testing and treatment of the cases and all Municipal, District Hospital were actively involved in the fight against the disease. The Regional Environmental Health team was responsible for the burial of COVID-19 dead bodies and actively involved in the fight against the disease.

3.1.5 Central Region

The Central region recorded their first COVID-19 case on the 5th April, 2020 at Cape Coast. The Regional, Municipal, and District hospitals were actively involved in the testing and treatment of the cases in the region. The Regional Environmental Health team were responsible for the burial of COVID-19 dead bodies.

3.1.6 Volta Region

Volta region also recorded its first COVID-19 case on the 5th April, 2020 at Aflao and Hohoe. The region saw an increase in COVID-19 cases to 764 as at 5th April to 31th December, 2020. The Ho regional hospital, Municipal, District hospital were actively involved in the testing and treatment of the cases in the region.

Table 3.1: Recorded Cases by Regions

DATE OF FIRST RECORDED CASE	REGION	DISTRICIT/LOCA TION OF THE CASE	SOURCE OF RECORDED CASE	
			LOCAL	IMPORTED
12/03/2020	Greater Accra	Ayawaso West		√
13/03/2020	Ashanti	Obuasi and Kumasi	√	√
14/03/2020	Western	Shama		√
18/03/2020	Eastern	Lower Manya Krobo		√
05/04/2020	Central	Cape Coast		√
05/04/2020	Volta	Aflao and Hohoe	√	√

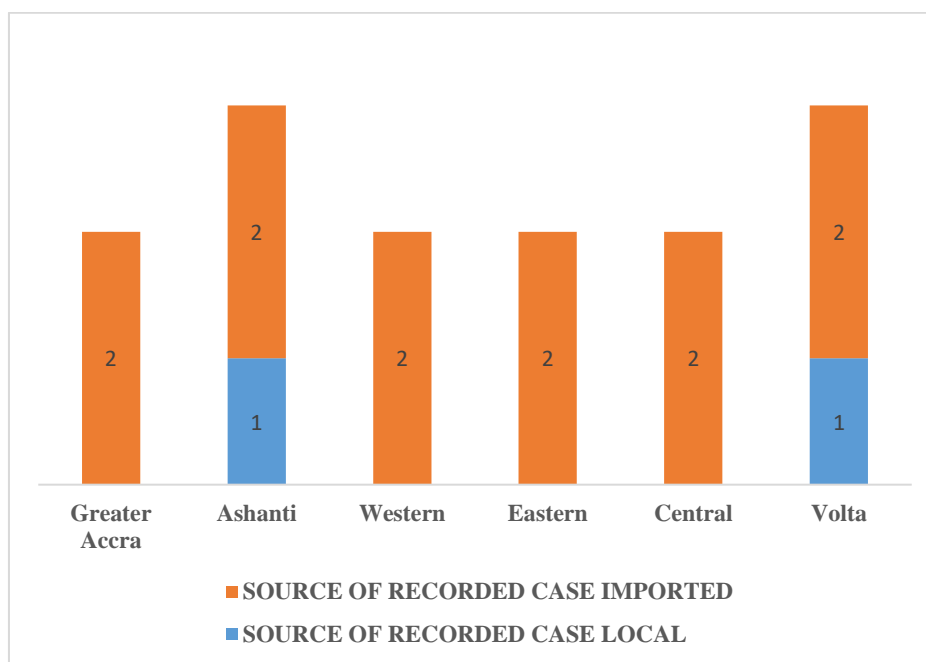


Figure 3.1: Regional Sources of Recorded cases (local/imported)

(Source: 2023 Field Survey)

Table 3.2: Regional Cases Distribution

S/N	REGIONS	CASES
1	Greater Accra	30,668
2	Ashanti Region	11,171
3	Western	3,096
4	Eastern	2,636
5	Central	2,130
6	Volta	764

In Ghana the six (6) most affected regions by COVID-19 cases from March to December 2020 is found in Table 3.1 (Sarkodie et al., 2021)



(Figure 3.2 Map of Ghana)

3.2 Research Design and Data Collection

Study Design: The research was descriptive cross-sectional design. The study employed focus group discussions (FDG), structured questionnaire interviews, and information gathered from key informat. The key informant interview guide was used with the

Nineteen (19) Regional, Metropolitan, Municipal, and District Environmental Officers. A semi- structured questionnaire was administered to two hundred and fifteen (215) Environmental Health Officers. A focus group discussion was organised for two (2) groups of (8) participants in the Ashanti and the Greater Accra Regions.

Semi-structured questionnaires including close and open-ended questions were used to collect data from two hundred and fifteen (215) Environmental Health Officers. Interview guides were also used to collect data from nineteen (19) Regional, Metropolitan, Municipal and District Environmental Health Officers.

3.3 Sampling Method

The population of 463 Environmental Health Officers were selected from the total population of this study. Slovin`s formula ($n= N/((1+Ne^2))$) was used in estimating the sample size below:

Table 3.3: EHOs in the Regions

S/N	Regions	Environmental Health Officers
1	Greater Accra Region	160
2	Ashanti Region	130
3	Eastern Region	40
4	Central Region	37
5	Western Region	43
6	Volta Region	53

A total number of 463 Environmental Health Officers selected in the six regions, out of which using the slovin`s formula it resulted to 215 Environmental Health Officers.

$$n = \frac{N}{(1 + Ne^2)}$$

Where;

n = the sample size,

N = Total population size and

e = the margin of error

N = Total population size = 463 and e = margin of error= 0.05.

Therefore; $n = 463/(1+463(0.05 \times 0.05)) = 463/(1+1.1575) = 463/(2.1575) = 214.6 = 215$

Therefore, two hundred and fifteen (215) Environmental Health Officers were recruited for the study.

Computation of sample sizes for each region

Greater Accra $206/463 \times 100 = 44\%$

$44/100 \times 215 = 95.66$

Ashanti $112/463 \times 100 = 24\%$

$24/100 \times 215 = 52.01$

Eastern $31/463 \times 100 = 7\%$

$7/100 \times 215 = 14.40$

Volta $49/463 \times 100 = 11$

$11/100 \times 215 = 22.75$

Central $24/463 \times 100 = 5$

$5/100 \times 215 = 11.14$

Western $41/463 \times 100 = 9$

$9/100 \times 215 = 19.04$

Table 3.4: Regional Distribution of Environmental Health Officers

S/N	Regions	Environmental Health Officers
1	Greater Accra Region	96
2	Ashanti Region	52
3	Eastern Region	14
4	Central Region	11
5	Western Region	19
6	Volta Region	23

Respondents for the study were selected using the inclusion and exclusion criteria.

3.4 Inclusion and Exclusion Criteria

- I. Environmental Health Officers, 18years and above, in active service and actively involved in Covid-19 related activities were recruited for the study.
- II. Environmental Health Officers, below the age of 18years, or out of active service or who are not actively involved in Covid-19 related activities were not involved in the study.

3.5 Data Analysis

Statistical Package for Social Sciences (SPSS) version 20.0 was used to analyze the quantitative data. First, data was checked for correctness and completeness. Then, the quantitative data was coded into the SPSS software and analyzed. On the other hand, the qualitative data was also validated through results transcribed and analysed.

Chi square analysis was used to evaluate the association between various variables of the study. These variables include years on the job and rank of officers, Gender and experience of physical injuries on the job, Age and use of personal money to buy PPEs, Rank and the use of personal money to buy PPEs can be found in figure 4.5 as well as

Use of personal money to buy PPEs and mode of involvement in Covid-19 related activities in figure 4.6. P-values which are less than 0.05 are considered to be statistically significant.

3.6 Risk Score

The Risk scoring method was used to estimate the likelihood and severity of hazard among Environmental Health Officers (Amer et al., 2021).

In risk scoring, an incident is calculated by multiplying rated probability (likelihood) and seriousness (severity).

Mathematically, Risk = Severity \times Likelihood

3.7 Risk Scoring of Environmental Health Officers

In the current study, respondents were asked to estimate between a scale of 1 to 5 the severity of hazard and the likelihood in case of incident occurring. The severity and likelihood for each specific hazard were calculated based on respondent's rating. An average for severity and probability for each hazard was calculated and multiplied to get the risk score.

Table 3.5 Shows the Rating Scale for Hazards Ranked from 1 to 5

Scale (1-5)	Impact	Description of Impact
1	Negligible	Not harmful
2	Low	Unlikely to cause danger or any issue
3	Moderate	Chronic illness/hospitalization
4	Significant	Certain to cause more than expected
5	Catastrophic	Certainly, can cause disaster or death

Table 3.6 Shows Rating Scale for Likelihood Rank from 1-5 (Probability of incident occurrence)

Scale (1-5)	Category	Probability
1	Very unlikely	1 in 1000 years
2	Unlikely	1-10 years
3	Likely	Once a year
4	Likely	Once a month
5	Very likely	Once a day

Table 3.7 Shows Risk Description (seriousness of hazard)

Scale of 1 to 25	Seriousness of hazard	Description of safety procedure needed
1-5	Low	Negligible risk
6-11	Medium	Acceptable Risk, no safety measure required
12-15	High	Safety Measure Recommended
16-25	Very high	Safety Measures essential

The tables above were used to determine the probability and likelihood of a risk or hazards associated with the activities performed by the EHOs and when the chances of the risk occurred will give the modest effects.

The activities were compared with the tables to know the levels of impact on the EHOs when it occurs and how to multiple the respective risks involves. The activities carried out such as contact tracing, fumigation/disinfection, health education and burial of the dead have different probabilities and impacts levels which will help us to know the risk associated with each activity carried out weather the impact is Low, medium or very high.

3.8 Key Informant Interview

The key informant interview guide was used to conduct interviews in the six (6) selected Regional, Metropolitan, Municipal and District Environmental Health Officers in the six (6) regions. This was carried through face-to-face and online conducted for the thirteen (13) selected Metropolitan, Municipals, and District Environmental Health Officers in the six regions.

The researcher conducted fifteen (15) face-to-face and four (4) key informant interviews on phone and recorded the responses from the respondents on the interview guide form. Manual coding of the responses was carryout for the interpretation and the analysis of the data from the Nineteen (19) RMMDEHOs and found that the Nineteen (19) respondents.

Contact racing: some of the risks associated are assault and infections,

Health education: assault and physical injury,

Fumigation/disinfection: chemical inhalations and physical injury and

Burial: infections, physical injury, chemical inhalation and assault

Is there measures put in place to help EHOs on the following activities psychological, ergonomics, physical, stress, medical insurance, financial support, and NHIS during COVID-19?

All the Nineteen (19) respondents agreed that there were no measures All the Nineteen (19) respondents have made it clear that there are no documented health and safety policies in their MMDAs to protect EHOs from Covid.

3.9 Focus Group Discussion

Focus group discussion was the third approach used for the data collection to check or confirm the result from both structured questionnaires and key informant interviews. The focus group discussions were made of two (2) groups and each group contain eight (8) members, one group from Kumasi and the other group from Accra. The researcher facilitates by first sharing the questions to the members and stating the rules of engagement.

3.10 Research Philosophy

This research is underpinned by the position of positivism. Positivism from the ontological perspective is one of realism. Realism asserts the existence of objects independently of the knower. In other words, ontological positivism maintains that an object exists together with the knowledge of its being and existence. However, this is independent of the researcher to discover that knowledge. Hence, the inability of the researcher or the knower to discover or unveil that knowledge does not render the existence of that knowledge untrue (Cohen et al., 2007; Frowe, 2001). Further, the epistemological perspective of positivist is concerned with objectivism. Positivists go forth into the world impartially attempting to discover the knowledge of an objective reality Crotty (1998). The ontological and epistemological positivism has guided the researcher in conducting this research. This stems from the researcher's acknowledge that phenomena have an independent existence which can be discovered through research. In other words, there are occupational health and safety risk experiences of Environmental

Health Officers regarding Covid-19 that the researcher could not explicitly assume right but can appropriately and adequately discover through research.

3.11 Ethical Consent

Participants involved in the research were made to understand the concept of the research and its importance. Their consent was sought before their involvement at every stage of the data collection. Consents were verbal. All participants were also made to understand their freedom to halt their participation in the data collection process at any point in time that they do not feel right about their involvement and decide to do otherwise.

CHAPTER FOUR

RESULTS

4.1 Demographic Characteristics of Respondents

The bio-data of study participants are presented in Table 4.1. Findings are presented on the gender of respondents, age group, marital status, family size, level of education and number of dependents.

Table 4.1: Demographic characteristics of respondents

Variable	Frequency	Percentage
Gender		
Male	112	52.1
Female	103	47.9
Age (years)		
18-25	60	27.9
26-35	70	32.6
36-45	40	18.6
46-55	20	9.3
More than 55	25	11.6
Marital status		
Single	65	30.2
Married	130	60.5
Divorced	10	4.7
Widowed	10	4.7
Family size (Habitation)		
Single (Living alone)	60	27.9
Living with Spouse More than 1	155	72.1
Educational qualification		
Certificate	85	39.5
Diploma	40	18.6
Undergraduate	70	32.6
Masters	20	9.3

From Table 4.1, majority of the respondents were males of 112(52.1%) about one-third (33%) were within the youthful age group of 26-35 years. More than half were married

61% and most respondents lived with their spouse 72% with certificate and undergraduate degree holders constituting the highest proportion among the participants.

4.2 Status of Respondents at the Workplace

From Table 4.2, in terms of status, Environmental Health Assistants (EHAs) constituted the majority (40%) of the respondents. More than half of the respondents (54%) had between 1-5years of working experience. This confirmed their educational background since EHAs are mostly less experienced.

The Environmental Health Class with the Local Government Service have three categories namely the professional class, sub-professional class and the technical class. The professional class start with first degree as Environmental Health Analyst and the sub-professional start with Environmental Health Technologist, Environmental Health Officer and Environmental Health Assistant.

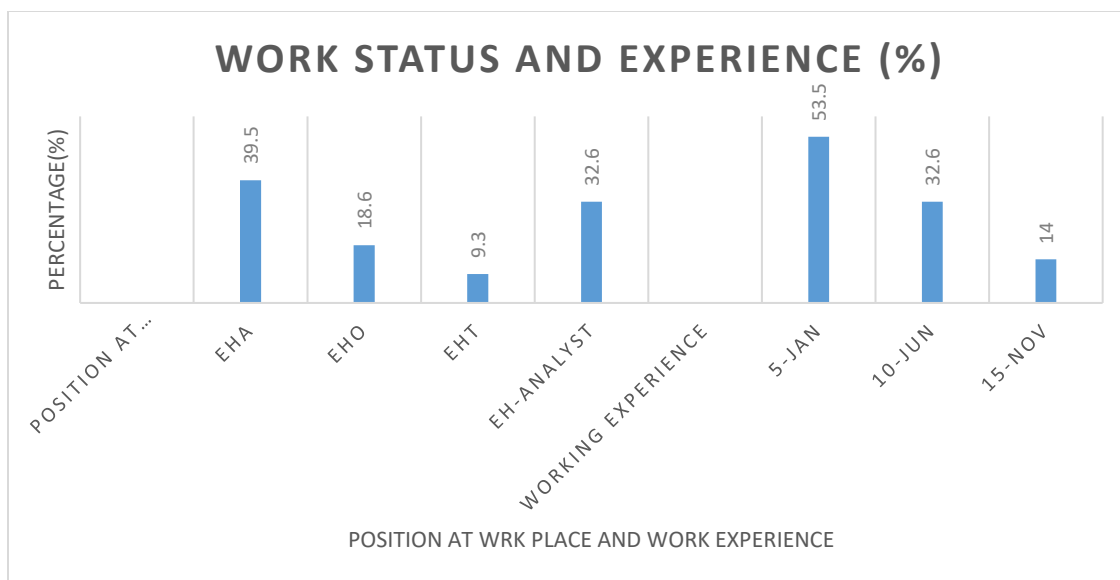


Figure 4.1 Position at work place and work experience

Lower-ranked officers are usually new graduates from the Schools of Hygiene in Ghana. As their working experience and educational qualifications increases, they are promoted.

Table 4.2: Status of respondents at the workplace

Variable	Frequency	Percentage
Position at workplace		
EHA	85	39.5
EHO	40	18.6
EHT	20	9.3
EH-Analyst	70	32.6
Working experience		100
1 – 5	115	53.5
6 – 10	70	32.6
11 -15	30	14.0
		100

4.3 COVID-19 Related Activities

COVID-19 related activities performed by respondents were contact tracing, health education, fumigation/disinfection, and burial. The EHOs were responsible for the burial

of the dead through the spraying of the morgue and the dead body with 0.5% of chlorine solution after which the body is put in to a body bag and place in the coffin. The officers then carried the coffin in to the hearse for burial in the signed cemeteries after which doffing is done for the removal of their personal protective equipment in the grave and covered. More than one third (40%) were involved in health education while about one third were involved in burial. Those involved in contact tracing and fumigation/disinfection together constituted the least proportion (28%) (Table 4.4).

Table 4.3: COVID-19 related activities

Involvement in COVID-19 activities.	Hazards identified	Frequency	Percentage
Contact Tracing (n=30)	Assault	28	13.0
	Infection with Covid-19	0	1.0
Health Education (n=85)	Injuries	0	0.0
	Psychological and emotional effect	85	39.5
Fumigation/ Disinfection (n=30)	Injuries	0	0.0
	Chemical inhalation	30	14.0
Burial (n=70)	Injuries	69	32.0
	Infection with COVID-19	3	1.4
		215	

4.4 Occupational Hazards Faced by EHOs during the Pandemic

Respondents indicated that most of them have sustained injuries 171(79.5%) with 44(20.5%) who had not. Few of the respondents have contracted covid-9 representing 3(1.4%) with a greater number of the respondents who had not 212 (98.6). Most of the respondents in this study stated that they have no psycho or emotional effect 146(67.9%). Only a few of the respondents had psychological or emotional effects during the discharge of their duties in the pandemic. Majority had no health condition in response to

COVID-19 of 170(79.1%). Most of the respondents indicated that they have not been affected by the fumigation exercise they carried out in the heat of pandemic 145 (67.4%).

Table 4.4: Occupational hazards faced by EHOs during the pandemic

Variable	Frequency	Percentage
Sustained Injuries		
Yes	171	79.5
No	44	20.5
Contracted COVID-19		
Yes	3	1.4
No	212	98.6
Psychological or emotional effect		
Yes	69	32.1
No	146	67.9
Any health condition in response to COVID-19		
Yes	45	20.9
No	170	79.1
Affected by fumigation chemical		
Yes	70	32.6
No	145	67.4

Further analysis was also conducted to determine the association between rank/position and the experience of physical effects in the line of work. The result which were presented in figure 4.2 below revealed no statistically significant relationship ($\chi^2 = 2.07$, $p=0.58$) between the two variables as officers of various ranks have same likelihood of experience of physical injuries.

Table 4.5: What is your rank/position at the work place * Have you had any physical effect during burial process

		Have you had any physical effect during burial process (Injuries/body pain)?			Total
		Yes	No		
What is your rank/position at the work place	EHA	76	9	85	
	EHO	33	7	40	
	EHT	18	2	20	
	EH- Analyst	44	26	70	
Total		171	44	215	

Figure 4.3 below shows the comparative analysis between the gender of participants and the experience of physical injuries in line of work. The study revealed that more female officers suffered physical assault such as injuries and bodily pains as compared to their male counterparts. There was a significant association ($\chi^2 = 7.47$; $p = 0.005$) between the two variables. These figures depict a high tendency of physical injuries and body pains among females Environmental Health Officers compared to the male officers.

Table 4.6: What is your Gender * Have you had any physical effect during burial process

		Have you had any physical effect during burial process (Injuries/body pain)?			P-value
		Yes	No	Total	
What is your Gender	Male	81	31	112	0.005
	Female	90	13	103	
Total		171	44	215	

4.5 Health and Safety Training Practices

Majority of the respondents indicated they were trained on COVID-19 management 125 (58.1%) with fewer others who were not trained 90(41.9%) as shown in Table 4.5. For those who were trained, the frequency of training was mostly once 55(25.6%). Those who were trained two times were 31(14.4%) quarterly were 27(12.6%) and those trained when the need arose were 12(5.6%). Institutions that trained respondents were (RCC), Ghana Health Service (GHS), and the Ministry of Water and Sanitation (MWS). RCC trained most of the respondents of 50(23.3%) with, GHS training 40(18.6) and was 35(16.3%). Most of the respondents indicated that training used was in soft copy form 75(34.9%). Others were trained without manuals 30(14%) and those trained with hard copies were 20(9.3%).

Table 4.7: Health and safety training practices

Variable	Frequency	Percentage
Training on COVID-19 management		
Yes	125	58.1
No	90	41.9
Frequency of training		
Once	55	25.6
Twice	31	14.4
When Needed	12	5.6
Quarterly	27	12.6
None	90	41.9
Institution responsible		
Regional Coordinating Council	50	23.3
Ghana Health Service	40	18.6
Ministry Water and Sanitation	35	16.3
None	90	41.9
Manner of training material		
No manual used	30	14.0
Softcopies	75	34.9
Hardcopies	20	9.3
None	90	41.9

Figure 4.4 shows the support on National Health Insurance Scheme. All the respondents indicated that there was no support system 215 (100%). Most of the respondents possessed expired NHIS 131(60.9%) with 84(39.1%) possessing valid NHIS. There was a total lack of motivation 215(100%).

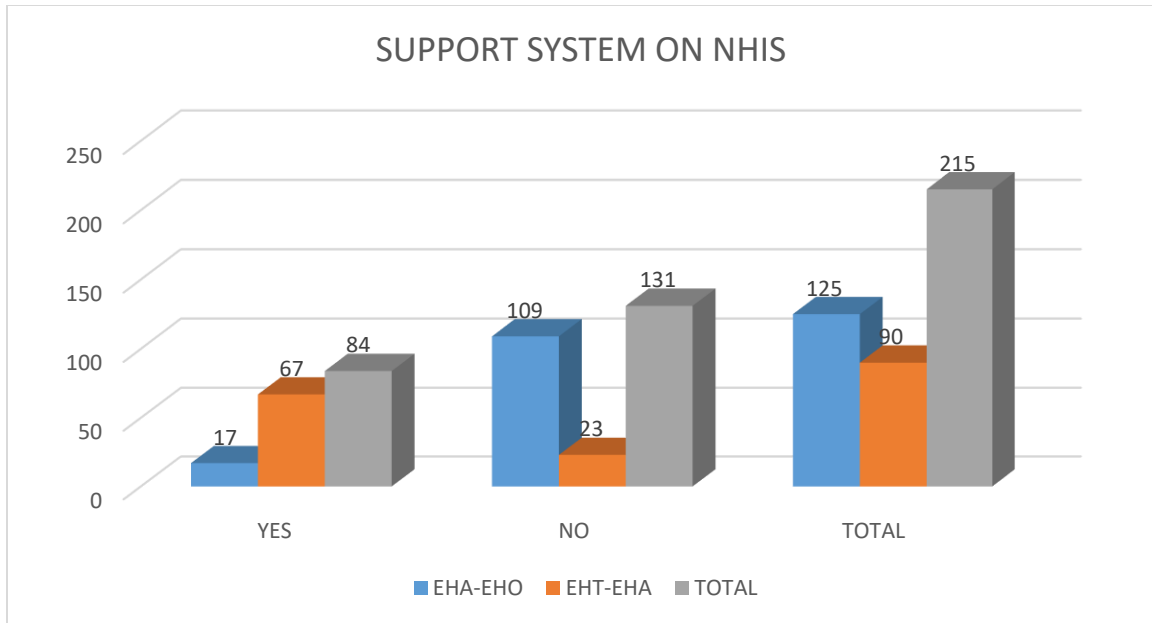


Figure 4.4 Support system on COVID-19

4.7 Provision of PPEs

Most of the respondents indicated that there was availability of PPEs 142(66%) while few indicated otherwise 73(34%). Provision of PPEs was mostly from MMDAs 70(32.6%). Others stated that PPEs were provided by GHS 55(25.6%), the workers themselves of 50(23.3%), and NGOs 40(18.6%). Supply of PPEs were mostly on demand of 70(32.6%), others said PPEs were supplied once throughout the entire COVID-19 pandemic, quarterly 45(20.9%). Some indicated that there was no supply of PPEs of 40(18.6%). The majority of the respondents indicated they have used their

money to purchase PPEs representing 140 (65.1%) with few of the respondents who have never used of 75(34.9%).

Table 4:8: Access and Provision of PPEs during COVID-19 Pandemic

Variable	Frequency	Percentage
Availability of PPEs		
Yes	142	66.0
No	73	34.0
Provision of PPEs		
MMDAs	70	32.6
NGOs	40	18.6
GHS	55	25.6
Personal	50	23.3
Supply of PPEs		
Once	60	27.9
On Demand	70	32.6
Quarterly	45	20.9
None	40	18.6
Ever use your own money to purchase		
Yes	140	65.1
No	75	34.9

A comparative analysis was conducted to test the association between participants' rank/position and the use of personal money to buy personal PPEs. Participants of lower ranks were more likely to use their personal monies to buy PPEs compared to those with higher ranks. Furthermore, a comparative analysis was conducted to determine the association between involvement in COVID-19 related activities and the use of personal money to buy PPEs. It was revealed that more than half of the officers involved in Fumigation/Disinfection and burial were more likely to buy PPEs with their monies.

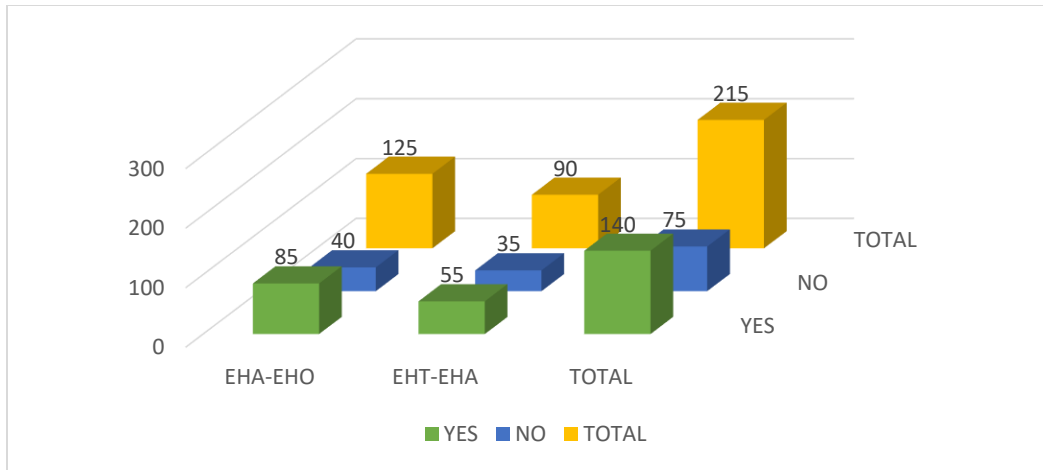


Figure 4.5: Comparative analysis of Rank/Position and the use of personal money to buy PPEs

Comparative analysis was conducted to determine the association between the age of participants and the use of personal money to buy PPEs. The results showed that, officers within lower age groups of 18-35 were more likely to use their personal monies to buy PPEs compared to those with higher age groups. This result was found to have a statistically significant association ($\chi^2 = 18.69$; $p = 0.002$).

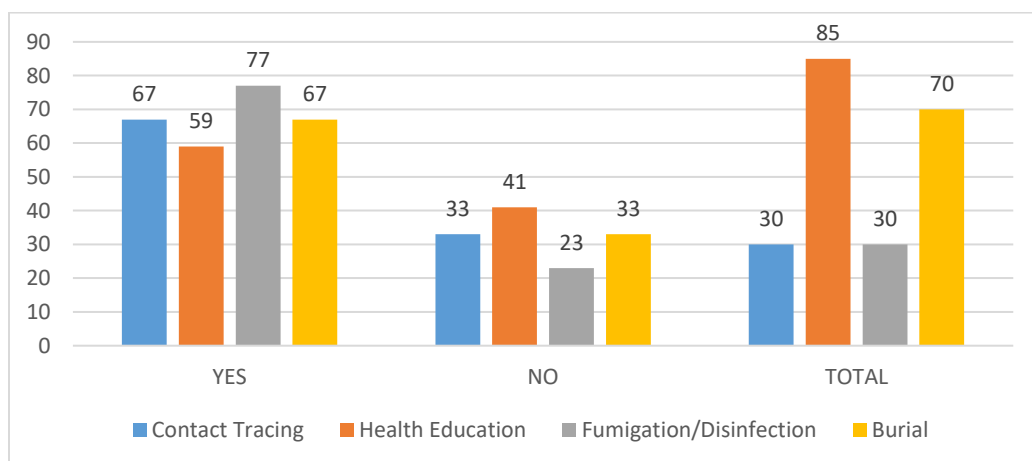


Figure 4.6 Comparative Analysis of mode of involvement in COVID-19 related activities and the use of personal money to buy PPEs for the work

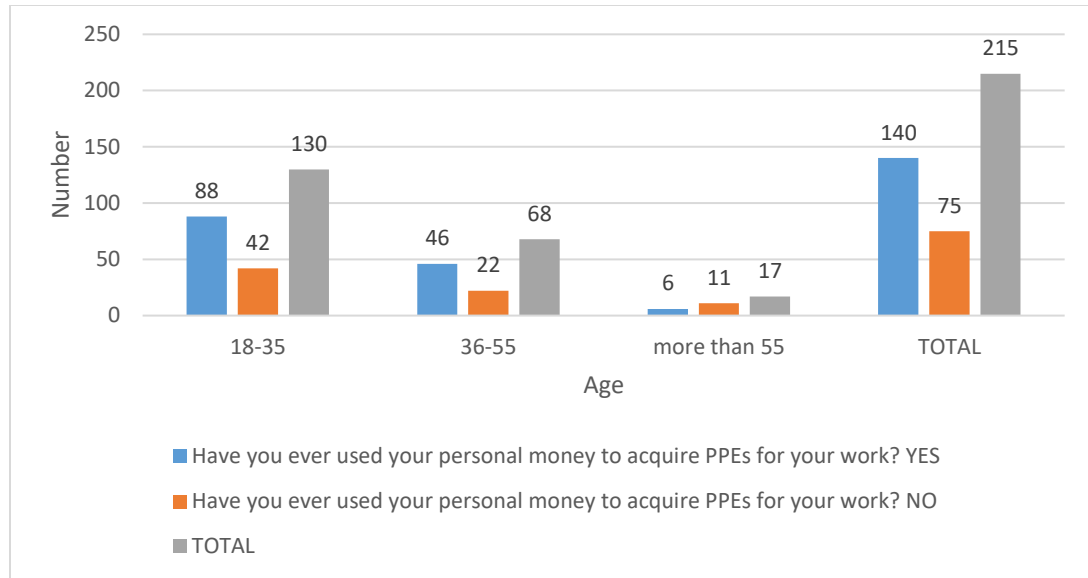


Figure 4.7: Possession and Use of PPEs

4.8 Needed and Available PPEs

Results which were presented in Figure 4.1 below showed that almost all 205(95%) of the officers needed nose masks for their job. It was encouraging to find that nose masks were reportedly available to all 215(100%) of the officers. Interestingly, results further showed that apart from nose masks where the number available is more than the quantity reportedly needed, all other PPEs such as face shields, head covers, safety boots, hand gloves, gowns, and hand sanitizers were in short supply compared with quantities needed by the officers.

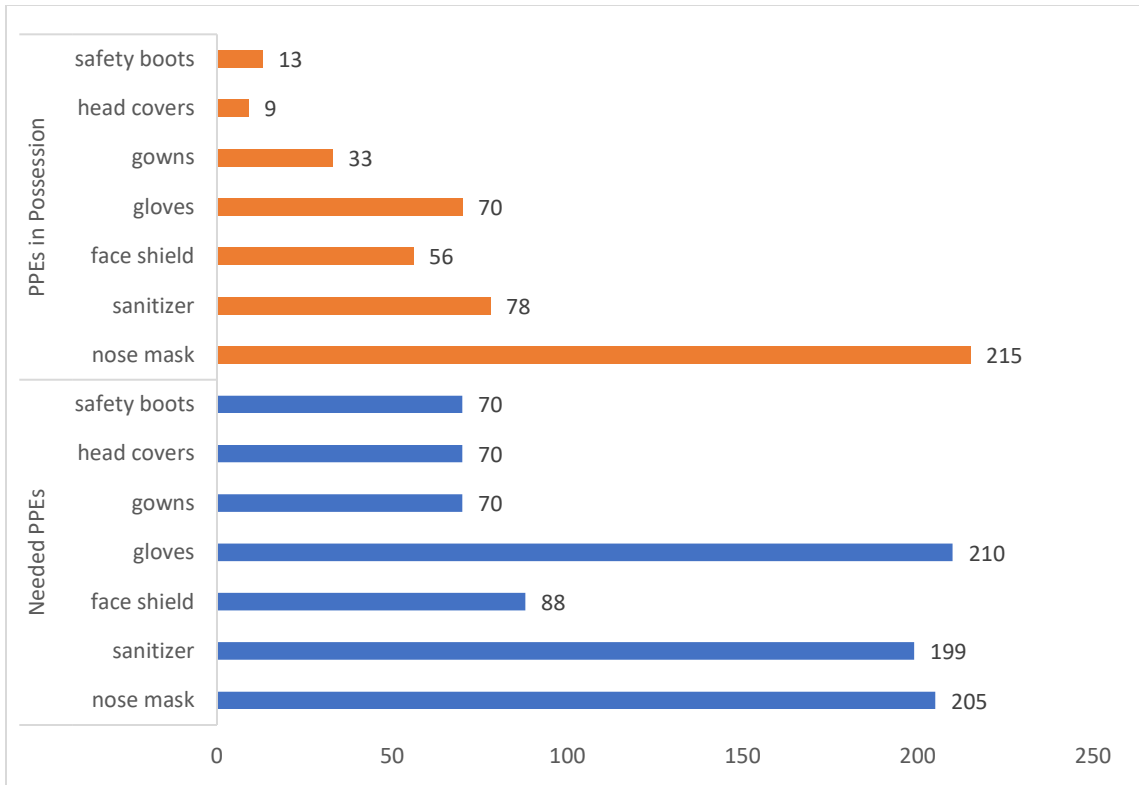


Figure 4.8: PPEs needed by Participants and those available

Perception of EHOs in the discharge of duties during the pandemic differed. All of the respondents were not in agreement on the issue that Environmental Health Officers were well equipped with the requisite PPE/logistics to respond to COVID-19. However, the degree of disagreement differed. Majority of the respondents strongly disagreed 150(69.8) while 65(30.2) did not. Again, respondents were not in agreement that Environmental Health Officers were well trained to handle COVID 19. Sixty percent (60.5) indicating 130 of the respondents strongly disagreeing that EHOs were well trained while eighty-five disagreed 85(39.5). All of the respondents strongly disagreed that Environmental Health Officers were well motivated financially to respond to COVID-19 of 215(100). Respondents had a negative opinion that the health and safety

measures in place in their respective MMDA were enough to protect EHOs from COVID-19. Many strongly agreed that COVID-19 had made them rethink about their job and considered applying for a different job 150(69.8). Many strongly believed that their work had put them and their family in danger of contracting COVID-19 120(55.8). All the respondents indicated that the COVID-19 pandemic had made them cherish their job knowing that they have contributed to saving lives. However, the level of agreement differed that most strongly agree 150(69.8) and agree 65(30.2).

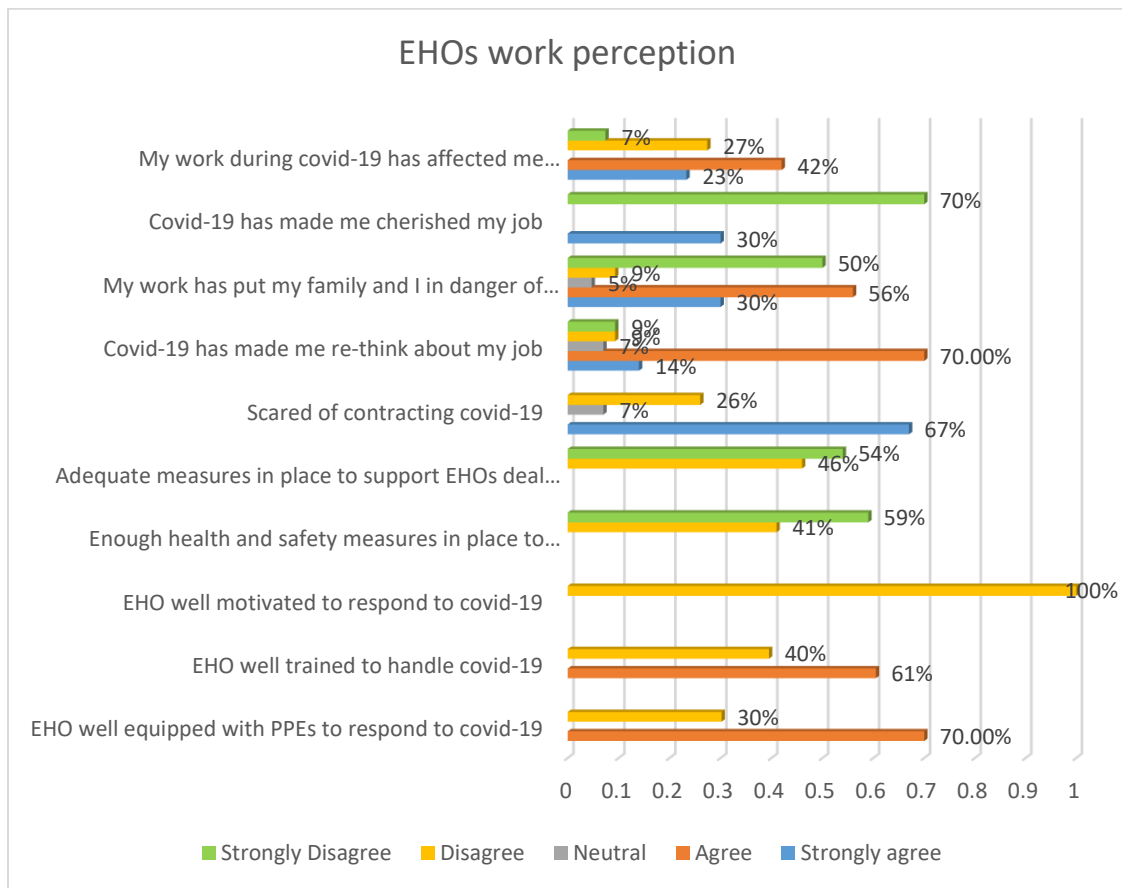


Figure 4.9: Work Perception of EHOs

About two third (2/3) of the respondents 70% indicated COVID-19 had made them cherish their job while more than half of the respondents representing 56% indicated COVID-19 had put their families and themselves in danger of contracting COVID-19.

More than half of the Environmental Health Officers representing 54% strongly disagreed that there were adequate measures in place to support them deal with stress.

4.9 Effect of Rank/Position at Workplace and Access to PPEs

The effect of rank/position at the workplace and access to PPEs were assessed and results are as seen below. EHT had the least access to PPEs 4(1.86%).

Table 4.9: Effect of Rank/Position at Workplace and Access to PPEs

Rank/Position	Access to PPEs considering your involvement in COVID-19		Total
	Yes	No	
EHA	72	13	85
EHO	25	15	40
EHT	4	16	20
EH-Analyst	41	29	70
Total	142	73	215

4.10 Effect of Rank/Position at Workplace and Agent Responsible for PPEs Provision

Provision

The effect of rank/position at workplace and agent responsible for PPEs provision were analysed and the results revealed that EHA PPEs were mostly provided by GHS 27(12.56%) as indicated in the Table 4.8 below. EHT had their PPEs mostly from MMDAs 12(5.58%) whilst EHO had theirs from GHS 20(9.30%). EH-Analyst received

their PPEs from MMDAs 30(13.95%). It can be concluded that MMDAs and GHS provided a greater number of PPEs.

Table 4.10: Comparative Analysis of Rank/Position of Participants and the Provision of PPEs

Rank/Position	Provider of PPEs				Total
	MMDAs	NGOs	GHS	Self	
EHA	22	14	27	22	85
EHO	6	8	20	6	40
EHT	12	3	1	4	20
EH-Analyst	30	15	7	18	70
Total	70	40	55	50	215

4.11 Regional Breakdown of EHOs/RMMDEHOs on COVID-19 Management

The study involved participants who were Environmental Health Officers from six (6) different regions. Analysis of the results showed that, majority of the participants 96 were from the Greater Accra Region. This was followed by 52 of the EHOs from the Ashanti Region and another 19 EHOs from the Western Region as shown in figure 4.10 below. Subsequently, 14 officers each from the Eastern and Volta Regions 23 were also involved in the study while 11 of the participants were sampled from the Central Region.

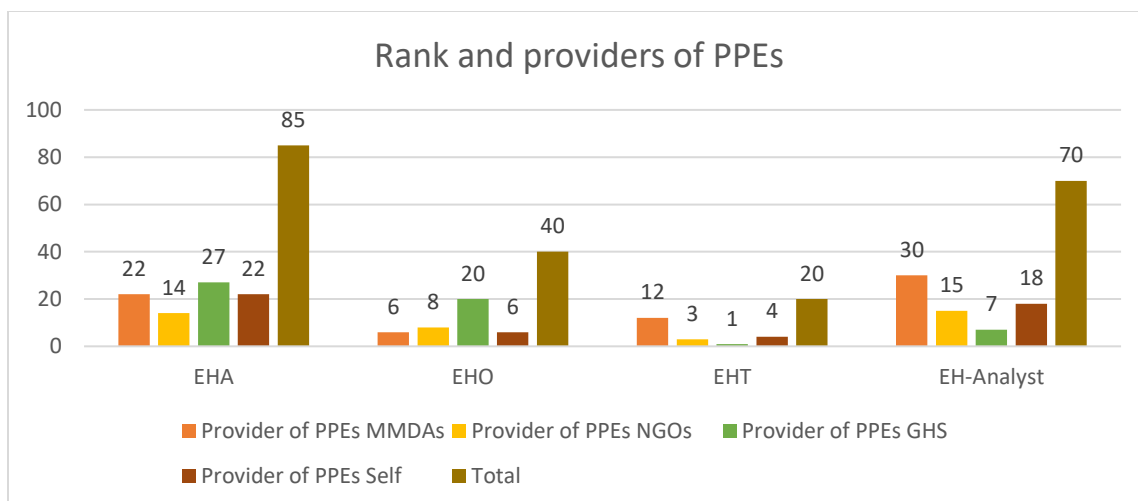


Figure 4:10: Rank and Providers of PPEs

4.12 Focus Group Discussions

Focus group discussion were conducted for two groups of 8. Analysis of the result showed that most of the Environmental Health Officers had adequate knowledge of their roles as “Environmental Health Officers; *Environmental Health Officers have the task to supervise and ensure that the populace keep their environment clean and avoid filth that can put their health in danger*” (Participant 3). Another participant stated that “*Environmental Health Officers are backed by law to prosecute any person who disregard the national sanitation law;*” (Participant 5).

“*It was glaring from the discussion that Covid-19 have had psychological effects on the officers. (Participant 1), said his family is always scared whenever he goes out for work since they know his involve in contact tracing*”. They will always ask him to be very careful and sometime wish I stayed at home. (Participant 8), “*said Whenever he returns from work, he felt reluctant to hug my wife and children because of the fear that I might have returned with the disease. It really affected and traumatized my family*”

With regards to the inadequacy of PPEs affecting their work, the (Participant 2a) stated that” It would predispose them to infections, slow service their delivering and would put their health and safety at risk.”

The emergence of Covid-19 pandemic has caused a huge shift in the roles of Environmental Health Officers.” I used to go for field inspection. However, since the outbreak of the pandemic, I have been involved in burial of dead bodies. It is not something I am really used to but have to adjust to it now” (Participant 6). “I was never involved in contact tracing but that is what I have been doing since the outbreak of the pandemic in the country. Sometimes I get scared but I have no other choice” (Participant 3a).

It was revealed that little efforts were dedicated towards the protection of Environmental Health Officers during their line of work in relation to the covid-19 pandemic. “Some time the office gives me hand gloves to work “(Participant 1a). “He stated that he used to buy nose masks with my own money.” Meanwhile there were donations of nose masks across the country during the pandemic but he cannot tell why it is not always available.” (Participant 4a).

Table 4.11: Risk Score for COVID-19 Related Activities

COVID-19 related activities	Hazards	Participants Likelihood of infection	Risks
Contact tracing	a. Physical	4 Significant	Injury or dislocation Death Wound or injury
	b. Biological	5 Catastrophic	
	c. Assault	3 Moderate	
Health education	a. Physical	4 Significant	Injury or dislocation Death
	b. Biological	5 Catastrophic	
Fumigation/disinfection	a. Physical	4 Significant	Injury or dislocation Infection (Death) Body pain or injury
	b. Chemical	5 Catastrophic	
	c. Ergonomic	3 Moderate	
Burial	a. Physical	4 Significant	Injury or dislocation Infection (Death) Death Body pain or injury
	b. Chemical	5 Catastrophic	
	c. Biological	5 Catastrophic	
	d. Ergonomic	4 Significant	

CHAPTER FIVE

DISCUSSION

Majority of the officers who were involved in the study were at the rank of Environmental Health Assistants (EHA). This is quite understandable as it serves as the first or basic rank for employment into the profession. One has to work for four years, coupled with further academic qualification to progress along with the ranks available on the job.

It was revealed that over one-third of the officers were involved in COVID-19 related activities through health education. This is encouraging as health education has been an integral part of the fight against the COVID-19 pandemic. Just in the case of every public health scenario, people need to know or have more knowledge about the infection, what causes it, how it spreads and how it can be prevented as highlighted by Ellwanger et al., (2021).

During the emergence of the pandemic, global players in the health sector have identified the efficiency of health education to inform the people about the disease. Ghana's case is not different. Ministry of Health, being the policymakers, Ghana Health Service, Christian Health Association of Ghana, and Muslim Health Institutions being the implementation agencies have all used health education as major avenues of getting the populace aware of the disease and how they can prevent it.

Other activities involved by the officers include contact tracing, fumigation and disinfection as well as burial. This implies that, the Environmental Health Officers have been involved in an all-around fight against the COVID-19 pandemic. It also implied that the officers are at risk of contracting the virus through contact tracing and burial activities.

In response to the novel coronavirus, health professionals are at risk of being exposed to occupational hazards in the performance of their duty. This can put them at risk of disease, injury, and the extreme cases of death (WHO, 2020). Aside from the risk of acquiring COVID-19, other hazards have emerged owing to new work practices adopted in the mitigation of the spread of the virus (ILO, 2021). These new emerged risk health workers are exposed to include skin disorders, heat stress due to long usage of PPE, toxins exposure, fatigue, stigma, discrimination, psychological trauma, and others (WHO, 2020). Despite EHOs involvement in the fight against COVID-19, less than 2% contracted COVID-19. In the line of their duties, respondents were not affected by fumigation and psycho/emotional effect.

More than two-thirds of the officers sustained various forms of physical injuries in the line of work. This is in line with Padula et al., (2023a) who One-third also confirmed issues of psychological and emotional effects. This results agrees with that of Tehrani, (2022) who found that the COVID-19 has psychological effects on workers. These results imply the various physical, psychological and emotional effects the fight against the COVID-19 pandemic has on the officers. The results also suggest that more adequate

measures have to be put in place to safeguard the officers from these effects as they must be in the best condition of health to continue the fight against the pandemic.

The research revealed that three (3) of the officers were infected with COVID-19 in line of duty before this study. Although this number is not quite big, it presents a matter of concern. Considering the beginning of the pandemic, and the fact that it started in one locality in a faraway land of China, and is now a global pandemic that is present in almost all countries across the world, this case is a matter of concern. Once an officer gets infected, all other colleague officers are at risk, families and friends are at risk, the nation is at risk and the whole world is not safe which agrees with findings of Seok et al., (2022) who identifies that the world is not safe if COVID-19 exist anywhere. Therefore, all necessary steps must be taken to protect and prevent the officers from contracting the virus while working.

The pandemic has exposed all workers at risk contracting the coronavirus. More than half of the respondents were trained COVID-19 management and mostly this training was done once. The training of EHOs will improve performance in their response to their new line of duties. Several authors have reported the poor performances of health professionals and have attributed them to the disjoint of training contents, skills required to execution of duties, training methods, and training groups.

Though training was done by RCC, GHS, and Ministry of Water and Sanitation however training was done mostly by RCC. The training manual was in softcopies. This creates a

skill deficit to the duties expected to be performed and as such improving access to training for workers is essential in increasing productivity. In response to the pandemic, there was much availability of PPEs.

The supply of PPEs was based on demand indicating that unless there is an urgent request provision ceased. Only a few respondents indicated that there was no supply of PPEs. Aside from the provision by the above-stated institutions, respondents indicated that they purchased PPEs with their own money. They stated the type of PPEs purchased as observations revealed that most of the respondents did purchased nose masks, face shields, and sanitizers with their money. ILO & WHO (2021) stated that when the supply of PPEs is impeded creating shortages, the health professional will be forced to extend the wearing available PPE for a longer period. This harms the worker and those who may come into close contact with such a person or deceased bodies. Though the extent of wearing of PPE was not asked however research suggests that prolonged use of gloves and frequent hand hygiene may cause or aggravate existing hand eczema (MacGibeny & Wassef, 2021), respiratory and eye protection (masks, respirators and goggles) can also cause skin damage: itching, rash, acne, pressure injury, contact dermatitis, urticarial and aggravation of pre-existing skin diseases (Gefen & Ousey, 2020).

The study found no statistical significance relationship between rank or position and physical injuries. This means the experience of physical injuries in the line of duty did not have any correlation with the rank or position of the officers since officers of all ranks are likely to experience injuries at the same rate. It also signifies that; position or rank did

not prevent an officer from getting injured in the line of duty. Hence, the protocols that are in place towards the prevention of physical injuries such as wearing protective gear must be followed by all officers including higher and lower-ranked officers. This agrees with findings of Padula et al., (2023) who underscores the importance of PPEs in preventing physical injuries among workers.

Physical injuries may occur more often among female officers since they may not have the adequate physical strength to perform certain manual works requiring of manual strength at certain points in time. It can also mean that female officer did not pay heed to protocols that protected them from injuries and this was not in line with our study. Therefore, this presents a good research gap for future studies to be conducted into the reason why female Environmental Health Officers experience more physical injuries more than the male officers.

The study has revealed the absence of support systems and motivational incentives for the officers involved in COVID-19 related activities. This is discouraging, considering the fact that other sectors involved in the fight against the pandemic have received one form of motivation or the other from the government and other organizations. For instance, as a way of motivating health workers at the forefront of fighting the pandemic, the government of Ghana has waived tax on the salaries for all ministry of Health employees. Frontline officers have been given a remuneration of 50% of their basic monthly salaries. These among other strategies meant to encourage them to remain resolute even when the work is frightening and continue to hold to the fort as the world

battles one of the world's deadliest infections. The fact is that Environmental Health Officers are also at the helm of affairs as far as the fight against COVID-19 infection is concerned, they must be given the needed support systems and motivational incentives. This will encourage them to work more effectively to bring the pandemic under control in the country.

Also, since the burial of fatal dead bodies arising from COVID-19 infection is a reserved duty for Environmental Health Officers, who have the technical know-how of disposing of the bodies safely and will cause health risks to the public, they must be accorded the necessary support systems and motivational incentives to perform their duties.

Most of the respondents possessed expired NHIS. In Ghana, NHIS serves as a medium in accessing health care services from health care facilities. Though not all diseases are captured on the NHIS policy however possession of an NHIS card helps in the reduction of health costs when seeking healthcare assistance from health facilities. Therefore, with a majority of the respondents having expired NHIS meant that health care assistance will be costly.

In developed countries support systems in the form of professional and organizational have been researched enough and revealed that support systems affect service quality and job satisfaction. The performance of workers is not only attributed to acquired knowledge and skills but the existence of infrastructure, equipment, and supportive medium. Studies

have shown that performances lapses can be ascribed to resources constraints and it is therefore important that EHOs directors provide the needed logistics.

The key format interview guide conducted on the nineteen (19) RMMDAs has revealed that the inadequacy of PPEs had a direct effect on the Environmental Health Officers in the fight against COVID-19.

The key format interview reveals all the MMDAs had no health and safety policies to protect the Environmental Health Officers in the fight against Covid 19.

The Environmental Health Officers have stated in their response that there is no support system put in place when it comes to financial support, health and safety management, Insurance, stress, psychological/ emotional support (Counselling) and physical (Ergonomics).

The emergence of COVID-19 has heightened the need and use of PPEs not only for workers anymore but for all persons across the world. The use of nose masks, hand gloves, and face shields has become the norm among individuals to prevent themselves from getting infected. Since the officers are involved in various activities such as fumigation and disinfection, contact tracing, and burial of dead bodies arising from the infection, the use of protective clothing cannot be overemphasized among them.

Lower ranked officers were more likely to use their monies to buy PPEs for their personal protection on the job compared to higher-ranked officers. lower-ranked officers

were more circumspect of their personal protection than higher-ranked officers. They may have a lot of aspirations and plans for the future and are not likely to give themselves out to infections and diseases, hence, the desire to protect themselves with their monies. Younger officers were more willing to use their monies to Buy PPEs to protect themselves on the job during the COVID-19 pandemic as compared to older officers.

This confirmed earlier discussion where officers with lower ranks are more likely to buy PPEs with their personal monies.

Environmental Health Officers (EHOs) in Ghana conducted the burial of COVID-19 dead body.

When the burial team arrived at the hospital fully dressed with the right PPEs, the necessary material for the exercise is removed and request for two family members to identify the body and hand it over to the burial team. When it comes to the burial of Muslims, short Arabic prayer of intention was said over the deceased and the body bag is closed for burial.

The health professional attending to the COVID-19 dead body should carry out hand hygiene and make good use of personal protective equipment (PPEs) head covers, coveralls, shoe covers, surgical masks, N95 respirators face shields/goggles. If the body exterior is visibly and contaminated with body fluids, make ensure the gown is watertight. To circumvent leakage of body fluids, the openings of the dead body should

be plowed. Allowing relatives to view the dead body for the last time by opening the face end of the body bag to meet standard precautions. Guidelines also advise keeping the dead body in a leak-proof plastic body bag (Pradesh et al., 2020).

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

It was concluded from the study that COVID-19 pandemic has had a dire impact on the lives of Ghanaians just as it is in several countries both developed, developing, and the undeveloped countries. The significance of the responsibilities of the Environmental Health Officers in Ghana during the pandemic cannot be underestimated as they were at the forefront of dressing, transporting, and burial of persons who succumb to the disease in the country. This role is highly important and must be performed under strict diligence and adherence to all protocols in place to prevent the spread of the infection.

The study unraveled that the provision of Personal Protective Equipment to the Environmental Health Officers had not been adequate and frequent. EHOs had admitted lack of access to PPEs. The provision of PPEs was on most occasions concentrated in the bigger cities which have seen donations from various benevolent organizations and several of the officers especially outside the Ashanti and Greater Accra regions had not received a fair share of such donations. The inadequate and infrequent provision of PPEs had put the lives of the EHOs in danger on several occasions during the performance of their duties. The officers were also exposed to several occupational hazards such as getting infected with the COVID-19 with some injuries during burial and intoxication from chemicals meant for fumigation.

Lack of motivation and supportive systems were also identified among the bottlenecks to the performance of the duties of the EHOs. During a pandemic that has seen several workplaces closed, workers asked to work from home among several other remunerations given to workers in other sectors to motivate them towards the performance of their duties in the midst of a scaring pandemic, the EHOs was sort of neglected from such motivational incentives. This has caused a negative perception of job performance among the officers.

The risk of infection also indicates a positive correlation in their involvement in COVID-19 management.

This revealed that more need to be done in terms of giving the necessary health and safety training to the officers in the fight against the global pandemic. Owing to the importance of training to the officers during their duties of the pandemic, such pieces of training must be provided adequately and occasionally.

6.2 Recommendations

Based on the key findings, the following recommendations were made

- I. The government must provide adequate PPEs to the EHOs for the safe delivery of their mandate
- II. Government must also extend motivational incentives to the EHOs to enable them to perform to their best during the pandemic.

- III. The Ministry of Local Government and other stakeholders in the fight against COVID-19 must provide adequate and frequent training to the EHOs regarding the management of the pandemic.
- IV. The hierarchy of the EHSU must institute appropriate measures to adequately determine the level of exposure of its officers to chemicals meant for fumigation during the pandemic.
- V. The EHOs must endeavor to make use of available PPEs to protect themselves during work.
- VI. Government should resource the Environmental health and sanitation unit to handle a future pandemic
- VII. Government should promulgate occupational health and safety laws to protect workers
- VIII. The hierarchy of EHSU should role out programs on disease prevention for EHOs
- IX. Head of Service should partner with Ghana Health Service for regular training on health for EHOs
- X. EHOs should be adequately equipped at all levels
- XI. The hierarchy of the EHSU must ensure health and safety polices are in place to protect the officers

REFERENCES

- Afriyie, D. K., Asare, G. A., Amponsah, S. K., & Godman, B. (2020). COVID-19 pandemic in resource-poor countries: challenges, experiences and opportunities in Ghana. *Journal of Infection in Developing Countries*, 14(8), 838–843. <https://doi.org/10.3855/jidc.12909>
- Amer, F., Hammoud, S., Farran, B., Boncz, I., & Endrei, D. (2021). Assessment of Countries' Preparedness and Lockdown Effectiveness in Fighting COVID-19. *Disaster Medicine and Public Health Preparedness*, 15(2), E15–E22. <https://doi.org/10.1017/dmp.2020.217>
- Annan, J. S., Addai, E. K., & Tulashie, S. K. (2015). A Call for Action to Improve Occupational Health and Safety in Ghana and a Critical Look at the Existing Legal Requirement and Legislation. *Safety and Health at Work*, 6(2), 146–150. <https://doi.org/10.1016/j.shaw.2014.12.002>
- Asante, L. A., & Mills, R. O. (2020). Exploring the Socio-Economic Impact of COVID-19 Pandemic in Marketplaces in Urban Ghana. *Africa Spectrum*, 55(2), 170–181. <https://doi.org/10.1177/0002039720943612>
- Aven, T. (2016). Risk assessment and risk management: Review of recent advances on their foundation. *European Journal of Operational Research*, 253(1), 1–13. <https://doi.org/10.1016/j.ejor.2015.12.023>

- Ayisi-Boateng, N. K., Singh, A., Abu-Sakyi, J., Tawiah, P., Darkwa, I., & Wusu-Ansah, O. K. (2020). Fighting the COVID-19 pandemic in Ghana: a report from the Kwame Nkrumah University of Science and Technology, Kumasi. *The Pan African Medical Journal*, 37(Supp 1), 43.
<https://doi.org/10.11604/pamj.supp.2020.37.43.25749>
- Bao, C., & Nizam, D. I. (2015). the Impact of Motivation on Employee Performance in the Electronics Industry in China. *International Journal of Accounting and Business Management*, 3(2), 29–45.
<https://doi.org/10.24924/ijabm/2015.11/v3.iss2/29.45>
- Capt, M. D., & Miller, R. S. (2006). *Direct from CDC's Environmental Health Services Branch The Role of Environmental Health Practitioners in a Public Health Emergency*. 69(1), 36–37.
- Chu, D. K., Akl, E. A., Duda, S., Solo, K., Yaacoub, S., Schünemann, H. J., El-harakeh, A., Bognanni, A., Lotfi, T., Loeb, M., Hajizadeh, A., Bak, A., Izcovich, A., Cuello-Garcia, C. A., Chen, C., Harris, D. J., Borowiack, E., Chamseddine, F., Schünemann, F., ... Reinap, M. (2020). Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis. *The Lancet*, 395(10242), 1973–1987.
[https://doi.org/10.1016/S0140-6736\(20\)31142-9/ATTACHMENT/FAA1007C-5EA4-45CD-8970-D9FC324225FF/MMC1.PDF](https://doi.org/10.1016/S0140-6736(20)31142-9/ATTACHMENT/FAA1007C-5EA4-45CD-8970-D9FC324225FF/MMC1.PDF)

- Dzando, G., Salifu, S., Donyi, A. B., Akpeke, H., Kumah, A., Dordunu, R., & Nonoh, E. A. (2021). Healthcare in Ghana amidst the coronavirus pandemic: a narrative literature review. *Journal of Public Health Research*.
<https://doi.org/10.4081/jphr.2021.2448>
- Ellwanger, J. H., da Veiga, A. B. G., Kaminski, V. de L., Valverde-Villegas, J. M., de Freitas, A. W. Q., & Chies, J. A. B. (2021). Control and prevention of infectious diseases from a One Health perspective. *Genetics and Molecular Biology*, 44(1 Suppl 1), 1–23. <https://doi.org/10.1590/1678-4685-GMB-2020-0256>
- Elmonstri, M. (2014). Review of the Strengths and Weaknesses of Risk Matrices. *Journal of Risk Analysis and Crisis Response*, 4(1), 49.
- Ernst., E., & Young., Y. (2020). *Ghana Revenue Authority announces support to taxpayers in response to COVID-19*. EY Global. https://www.ey.com/en_gl/tax-alerts/ghana-revenue-authority-announces-support-to-taxpayers-in-response-to-covid-19
- Gefen, A., & Ousey, K. (2020). Update to device-related pressure ulcers: SECURE prevention. COVID-19, face masks and skin damage. *Journal of Wound Care*, 29(5), 245–259. <https://doi.org/10.12968/JOWC.2020.29.5.245>
- Geneva, I. P. on S. and H. at W. and the E.-, & Bangkok, I. S. O. for E. A.-. (2004). *Practical and administrative responses to an infectious disease in the workplace. March 2004*, 1–51.

- Herron, J. B. T., Hay-David, A. G. C., Gilliam, A. D., & Brennan, P. A. (2020). Personal protective equipment and Covid 19- a risk to healthcare staff? *British Journal of Oral and Maxillofacial Surgery*, 58(5), 500–502.
<https://doi.org/10.1016/j.bjoms.2020.04.015>
- Hersi, M., Stevens, A., Quach, P., Hamel, C., Thavorn, K., Garritty, C., Skidmore, B., Vallenias, C., Norris, S. L., Egger, M., Eremin, S., Ferri, M., Shindo, N., & Moher, D. (2015). Effectiveness of personal protective equipment for healthcare workers caring for patients with filovirus disease: A rapid review. *PLoS ONE*, 10(10), 1–17. <https://doi.org/10.1371/journal.pone.0140290>
- Honey, A., Waks, S., Hines, M., Glover, H., Hancock, N., Hamilton, D., & Smith-Merry, J. (2021). COVID-19 and Psychosocial Support Services: Experiences of People Living with Enduring Mental Health Conditions. *Community Mental Health Journal*, 57(7), 1255–1266. <https://doi.org/10.1007/s10597-021-00871-0>
- Iftekhhar, E. N., Priesemann, V., Balling, R., Bauer, S., Beutels, P., Calero Valdez, A., Cuschieri, S., Czypionka, T., Dumpis, U., Glaab, E., Grill, E., Hanson, C., Hotulainen, P., Klimek, P., Kretzschmar, M., Krüger, T., Krutzinna, J., Low, N., Machado, H., ... Willeit, P. (2021). A look into the future of the COVID-19 pandemic in Europe: an expert consultation. *The Lancet Regional Health - Europe*, 8. <https://doi.org/10.1016/j.lanepe.2021.100185>
- Kenu, E., Frimpong, J. A., & Koram, K. A. (2020). Responding to the COVID-19 pandemic in Ghana. *Ghana Med J* 2020, 20(2), 124–127.
<https://doi.org/10.7861/clinmed.2019-coron>

- Khan, R. A. G., Khan, F. A., & Khan, M. A. (2011). Impact of Training and Development on Organizational Performance. *Global Journal of Management and Business Research*, 11(7), 63–69.
<https://doi.org/10.1017/CBO9781107415324.004>
- Laurencin, C. T., & McClinton, A. (2020). The COVID-19 Pandemic: a Call to Action to Identify and Address Racial and Ethnic Disparities. *Journal of Racial and Ethnic Health Disparities*, 7(3), 398–402. <https://doi.org/10.1007/s40615-020-00756-0>
- Lemmens, S. M. P., Lopes van Balen, V. A., Röselaers, Y. C. M., Scheepers, H. C. J., & Spaanderman, M. E. A. (2022). The risk matrix approach: a helpful tool weighing probability and impact when deciding on preventive and diagnostic interventions. *BMC Health Services Research*, 22(1), 1–12. <https://doi.org/10.1186/s12913-022-07484-7>
- Lone, S. A., & Ahmad, A. (2020). COVID-19 pandemic—an African perspective. *Emerging Microbes and Infections*, 9(1), 1300–1308.
<https://doi.org/10.1080/22221751.2020.1775132>
- Lopes, H., & Mckay, V. (2020). pandemics : The COVID - 19 experience. *International Review of Education*, 66(4), 575–602. <https://doi.org/10.1007/s11159-020-09843-0>
- MacGibeny, M. A., & Wassef, C. (2021). Preventing adverse cutaneous reactions from amplified hygiene practices during the COVID-19 pandemic: how dermatologists can help through anticipatory guidance. *Archives of Dermatological Research*, 313(6), 501–503. <https://doi.org/10.1007/S00403-020-02086-X/METRICS>

- Mahase, E. (2020). Covid-19: environmental health officers and retired doctors step up to fill contact tracing void. *BMJ (Clinical Research Ed.)*, 369(April), m1638. <https://doi.org/10.1136/bmj.m1638>
- Mona, G. G., Chimbari, M. J., & Hongoro, C. (2019). *A systematic review on occupational hazards , injuries and diseases among police officers worldwide : Policy implications for the South African Police Service*. 1–15.
- Musoke, D., Ndejjo, R., Atusingwize, E., & Halage, A. A. (2016). The role of environmental health in One Health: A Uganda perspective. *One Health*, 2, 157–160. <https://doi.org/10.1016/j.onehlt.2016.10.003>
- Naidu, T. (2020). The COVID-19 pandemic in South Africa. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(5), 559–561. <https://doi.org/10.1037/TRA0000812>
- Nielsen, K. D. B., Dyhr, L., Lauritzen, T., & Malterud, K. (2009). Couldn't you have done just as well without the screening? *Scandinavian Journal of Primary Health Care*, 27(2), 111–116. <https://doi.org/10.1080/02813430902808619>
- Njuguna, J., & Muruka, C. (2012). Training Opportunities for Environmental Health Staff in Kenya: Too Few? *Public Health Research*, 2(5), 120–123. <https://doi.org/10.5923/j.phr.20120205.02>
- Nutbeam, D. (2000). Health literacy as a public health goal: A challenge for contemporary health education and communication strategies into the 21st century. *Health Promotion International*, 15(3), 259–267. <https://doi.org/10.1093/heapro/15.3.259>

- Ofosu-Poku, R., Anyane, G., Agbeko, A. E., Dzaka, A. D., Owusu-Ansah, M., Appiah, M. O., & Spangenberg, K. (2020). Preparing a young palliative care unit for the COVID-19 pandemic in a teaching hospital in Ghana. *Palliative and Supportive Care, 18*(4), 400–402. <https://doi.org/10.1017/S1478951520000498>
- Padula, W. V., Cuddigan, J., Ruotsi, L., Black, J. M., Brienza, D., Capasso, V., Cox, J., Delmore, B., Holden-Mount, S., Munoz, N., Nie, A. M., Pittman, J., Sonenblum, S. E., & Tescher, A. (2023a). Best-practices for preventing skin injury beneath personal protective equipment during the COVID-19 pandemic: A position paper from the National Pressure Injury Advisory Panel. *Journal of Clinical Nursing, 32*(3–4), 625–632. <https://doi.org/10.1111/jocn.15682>
- Padula, W. V., Cuddigan, J., Ruotsi, L., Black, J. M., Brienza, D., Capasso, V., Cox, J., Delmore, B., Holden-Mount, S., Munoz, N., Nie, A. M., Pittman, J., Sonenblum, S. E., & Tescher, A. (2023b). Best-practices for preventing skin injury beneath personal protective equipment during the COVID-19 pandemic: A position paper from the National Pressure Injury Advisory Panel. *Journal of Clinical Nursing, 32*(3–4), 625–632. <https://doi.org/10.1111/JOCN.15682>
- Pradesh, A., Pradesh, M., Classroom, G., Hangouts, G., Meet, G., & Welfare, F. (2020). *Dead Body Management in Times of Covid-19 and its Potential Impact on the Availability of Cadavers for Medical Education in India. April, 19–20.* <https://doi.org/10.1002/ase.1962>
- Quakyi, N. K., Agyemang Asante, N. A., Nartey, Y. A., Bediako, Y., & Sam-Agudu, N. A. (2021). Ghana's COVID-19 response: The Black Star can do even better. *BMJ Global Health, 6*(3), 1–5. <https://doi.org/10.1136/bmjgh-2021-005569>

- Ralph, R., Lew, J., Zeng, T., Francis, M., Xue, B., Roux, M., Ostadgavahi, A. T., Rubino, S., Dawe, N. J., Al-Ahdal, M. N., Kelvin, D. J., Richardson, C. D., Kindrachuk, J., Falzarano, D., & Kelvin, A. A. (2020). 2019-nCoV (Wuhan virus), a novel Coronavirus: Human-to-human transmission, travel-related cases, and vaccine readiness. *Journal of Infection in Developing Countries*, *14*(1), 3–17. <https://doi.org/10.3855/jidc.12425>
- Rantala, M., Lindholm, M., & Tappura, S. (2022). *Supporting Occupational Health and Safety Risk Assessment Skills : A Case Study of Five Companies*.
- Salzberger, B., Glück, T., & Ehrenstein, B. (2020). Successful containment of COVID-19: the WHO-Report on the COVID-19 outbreak in China. *Infection*, *48*(2), 151–153. <https://doi.org/10.1007/S15010-020-01409-4>
- Sarkodie, B., Asiedu-Bekoe, F., O. Laryea, D., K. Ampofo, W., O. Phillips, R., Samba, A., Aboagye, D. C., Nsiah-Asare, A., Asamoah-Baah, A., Odame, E., Ohene, S.-A., A. Amoako, Y., & Kuma-Aboagye, P. (2021). Overview of preparedness and response to COVID-19 in Ghana. *Ghana Medical Journal*, *55*(2), 38–47. <https://doi.org/10.4314/gmj.v55i2s.6>
- Seok, H., Lim, S., Kim, J. Y., Park, C. H., Kim, J. H., Woo, M. L., Won, H., Kang, Y. M., Oh, H. S., Song, K. H., Jung, Y. J., Kim, T., Jo, S., & Choi, W. S. (2022). Infectivity of Coronavirus Disease 2019: A Prospective Cohort Study in the Korean Metropolitan Area. *Journal of Korean Medical Science*, *37*(14). <https://doi.org/10.3346/JKMS.2022.37.E106>

- Shaha, K., Patra, A., Das, S., & Sukuma, S. (2013). Awareness of risks, hazards and preventions in autopsy practice: a review. *Journal of Evolution of Medical and Dental Science*, 2(22), 4030–4041.
https://www.academia.edu/download/41521099/AWARENESS_OF_RISKS_HAZARDS_AND_PREVENTIO20160124-20014-p00p4r.pdf
- Sharma, S., & Taneja, M. (2018). The effect of training on employee performance. *International Journal of Recent Technology and Engineering*, 7(4), 6–13.
<https://doi.org/10.31104/jsab.v2i2.49>
- Silva, G. (2020). ScienceDirect ScienceDirect Mapping Mapping Occupational Occupational Health Health and and Safety Safety Management Management Systems Systems in in Portugal : Portugal : outlook outlook for for ISO ISO 45001 : 2018 45001 : 2018 adoption adoption. *Procedia Manufacturing*, 38(2019), 755–764. <https://doi.org/10.1016/j.promfg.2020.01.103>
- Sohrabi, C., Alsafi, Z., O'Neill, N., Khan, M., Kerwan, A., Al-Jabir, A., Iosifidis, C., & Agha, R. (2020). World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). *International Journal of Surgery (London, England)*, 76, 71–76.
<https://doi.org/10.1016/J.IJSU.2020.02.034>
- Stewart, J. (1999). Healthy housing: The role of the Environmental Health officer. *The Journal of the Royal Society for the Promotion of Health*, 119(4), 228–234.
<https://doi.org/10.1177/146642409911900405>

- Takala, J., Hämäläinen, P., Saarela, K. L., Yun, L. Y., Manickam, K., Jin, T. W., Heng, P., Tjong, C., Kheng, L. G., Lim, S., & Lin, G. S. (2014). Global estimates of the burden of injury and illness at work in 2012. *Journal of Occupational and Environmental Hygiene*, *11*(5), 326–337.
<https://doi.org/10.1080/15459624.2013.863131>
- Tehrani, N. (2022). The psychological impact of COVID-19 on police officers. *Https://Doi.Org/10.1177/0032258X211039975*, *95*(1), 73–87.
<https://doi.org/10.1177/0032258X211039975>
- Twumasi, I. (2017). *Effects of Training on Employee Job Satisfaction and*. *3*, 765–785.
https://www.theseus.fi/bitstream/handle/10024/156854/TWUMASI_ISAAC.pdf?sequence=1&isAllowed=y
- Vizheh, M., & Qorbani, M. (2020). *The mental health of healthcare workers in the COVID-19 pandemic : A systematic review*. 1967–1978.
- Whiley, H., Willis, E., Smith, J., & Ross, K. (2019). Environmental health in Australia: overlooked and underrated. *Journal of Public Health*, *41*(3), 470–475.
<https://doi.org/10.1093/pubmed/fdy156>
- WHO. (2020). Infection prevention and control during health care when COVID-19 is suspected. *Who Health Organization*, *19 March*, 1–5.
- World Health Organization. (2020). Laboratory biosafety guidance related to coronavirus disease (COVID-19). *Interim Guidance*, *19 March*, 1–5.
<https://doi.org/10.1016/j.ccm.2016.11.007>

APPENDICES

Appendix I: Questionnaire

TARGET GROUP: ENVIRONMENTAL HEALTH OFFICERS.

ASSESSMENT OF OCCUPATIONAL HEALTH AND SAFETY RISKS AMONG ENVIRONMENTAL HEALTH OFFICERS IN GHANA AMIDST THE COVID-19 GLOBAL PANDEMIC.

Purpose: This is a study being conducted by a student with the Department of public health education of the University of Education, Winneba. The study aims to assess occupational health and safety risks among Environmental Health Officers in the six most affected regions in Ghana namely Greater Accra, Ashanti, Eastern, Western, Central and Volta Region. Information provided will help identify possible risks environmental officers are exposed to in the prevention and burial of Covid 19 cases. Results of the study will help provide relevant information on the health and safety practice to combat Covid 19 in the public health Unit.

Confidentiality: Please note that each respondent will be given a unique code so the response provided are treated with complete anonymity. The research outcome and report will be excluded from references to any individuals.

Instructions: Please tick that which applies to you and/or provide necessary responses

Thank you very much for your kind cooperation.

Socio-demographic data		
Code Name	Question	Responses
SDDG 1	What is your gender?	Male [] Female []
SDDA 2	What is your age?	18-25 [] 26-35 [] 36-45 [] 46-55 [] More than 55
SDDM 3	What is your marital status?	Single [] Married [] Divorced [] Widowed []
SDDF 4	What is your family size staying with you?	Alone [] Spouse [] Brothers, Sisters, M, F []
SDDD 5	How many dependents do you provide Education, Shelter and Food for?	None [] 1-3 [] 4-6 []
SDDE 6	What is your level of qualification?	Certificate [] Diploma [] Degree [] Masters []
SDDR 7	What is your rank/position at the workplace?	EHA EHO

		EHT EH Analyst
SDDD 8	How long is your work experience with your MMDAs?	1-5 [] 6-10 [] 11-15 [] More than 15 []
OHSI 9	How are you involved in COVID-19 related activities in your MMDAs?	Contact tracing Health education Fumigation/disinfection Burial of dead
OHSP 10	Do you have PPEs considering your involvement in COVID-19?	Yes [] No []
OHSP 11	What PPEs do you require?	Nose masks [] Gloves [] Sanitizers [] Gowns [] Face Shield [] Head Covers [] Safety Boots []
OHSH 12	Which of those PPEs do you have?	Nose mask [] Sanitizer [] Glove [] Gown [] Safety Boot [] Head Cover [] Face Shield []
OHSP 13	Who provided the PPEs?	MMDAs NGOs GHS Ourselves

OHSR 14	How regular is the supply of the PPEs?	Once [] On demand [] Quarterly []
OHSP 15	Have you ever used your personal money to acquire PPEs for your work?	Yes [] No []
OHYS 16	If yes why?	
OHSP 17	What PPEs was/were that?	
OHSI 18	How does inadequacy of PPEs affect your work?	
OHSI 19	Have you been infected with COVID-19?	Yes [] No []
OHSC 20	What are the challenges of COVID-19?	
OHI 21	Have you had any physical effect (Injuries/body pains) in the performance of your duties?	Yes [] No []
OHC 22	If yes, mention some?	
OHE 23	Have you had any psychological or emotional effect amidst COVID-19?	Yes [] No []
OHC 24	If yes, how did it happen?	
OHH 25	Have you had any health	Yes []

	condition in your respond to COVID-19?	No []
OHI 26	Is there any inhalation of chemical which have affected your health during fumigation and disinfection?	Yes [] No []
OHC 27	What are the challenges you faced?	
OHI 28	Do you currently have a valid health insurance?	Yes [] No []
SSP 29	What support systems are in place to help you? 1. Financially 2. Health and safety 3. Insurance 4. Stress 5. Psychological/emotional support(Counseling) 6. Physical (ergonomics)	
SSM 30	Is there any motivation for staff amidst the COVID-19 pandemic?	Yes [] No []
SSM 31	If yes, how are you motivated?	
SSP 32	If no what do you think can be

	done to motivate staff during a pandemic?
	Burial Team	
OHB33	Are you exposed to any risk during burial of COVID-19 dead bodies?	Yes [] No []
OHR 34	Name some of the risk?	
OHI 35	Have you been infected with COVID-19 during burial process?	Yes [] No []
OHI 36	Have you had any physical effect during burial process (Injuries/body pain)	Yes [] No []
OHE 37	Have you had any psycho/emotional effect after the burial process?	Yes [] No []
OHC 38	What are the challenges?	
Code Name	Training Needs Assessment	
TNAC 39	Have you been trained on COVID-19 management?	Yes [] No []
TNAA 40	Which aspects have you been trained?	
TNAT 41	How often have you been trained?	Once [] Twice []

		When needed [] Quarterly []
TNAO 42	Which institution provided the training?	RCC [] GHS [] Ministry of Water and Sanitation []
TNAM 43	What training materials/reference were you given?	None [] Softcopies [] Hardcopies []
TNAH 44	How has the training help you in your work?	

KEY INFORMANT INTERVIEW GUIDE

TARGET GROUP: REGIONAL, METROPLITAN, MUNICIPAL AND DISTRICT ENVIRONMENTAL HEALTH OFFICERS

ASSESSMENT OF OCCUPATIONAL HEALTH AND SAFETY RISKS AMONG ENVIRONMENTAL OFFICERS IN GHANA AMIDST COVID 19 GLOBAL PANDEMIC.

Purpose: This is a study being conducted by a student with the Department of public health education of the University of Education, Winneba. The study aims to assess occupational health and safety risks among Environmental Health Officers in the six most affected regions in Ghana namely Greater Accra, Ashanti, Eastern, Western, Central and

Volta Region. Information provided will help identify possible risks environmental officers are exposed to in the prevention and burial of Covid 19 cases. Results of the study will help provide relevant information on the health and safety practice to combat Covid 19 in the public health Unit.

Confidentiality: Please note that each respondent will be given a unique code so the response provided are treated with complete anonymity. The research outcome and report will be excluded from references to any individuals.

Instructions: Please fill in as applies to you and/or provide short responses

Thank you very much for your kind cooperation

Respondents information

Name:

Position:

Location:

1. How is the Environmental Health and Sanitation Unit involved in the fight against COVID-19?

Activities	Risks
1. Contact tracing	
2. Health education	
3. Fumigation/disinfection	
4. Burial	

5. Has COVID-19 affected/changed the responsibilities or duties of EHOs in any way?

Yes []

No []

6. How has COVID-19 affected their responsibilities?

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7. What are some of the hazards that EHOs face in their response to COVID-19?

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8. What measures are put in place to protect EHOs for each responsibility?

Contact tracing

Fumigation/disinfection

Health education

Burial

9. What measures are in place to help EHOs on the following?

Psychological.....

Ergonomic.....

Physical.....

Stress

Medical insurance.....

Financial support.....

NHIS.....

10. What intervention do you think Government can provide to protect EHOs from getting infected during service delivering?

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11. Do you have documented health and safety policy to protect EHOs from COVID-19?

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12. How is the EHOs in your MMDAs affected with COVID-19?

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13. What standard procedures are used for the burial of COVID-19 death cases in your MMDAs?

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14. How do you ensure that these standards are complied with?

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15. What are the types of PPE provided for the frontline EHOs in term of each responsibilities?

ACTIVITES	PPEs
1. Contact tracing	
2. Health education	
3. Fumigation/disinfection	
4. Burial	

16. Who is responsible for the provision of the PPE used by the EHOs to fight COVID-19?

MMDAs

Private people

NGOs

Ourselves

17. Who ensures that the PPEs are provided/replaced in time?

MMEHOs

DEHOs

Senior Supervisor

18. Who ensures that the PPEs are used appropriately?

MMEHOs

DEHOs

Supervisors

19. Have EHOs in your MMDAs been trained to respond to COVID-19?

Yes []

No []

20. What kind of training have been given to them?

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21. Which institution conducted the training for the EHOs in the unit on COVID-19?

Local Government Service

NGOs

Ghana Health Service

Associations

22. How do you ensure that the skills provided to the EHOs through the training are implemented?

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23. What do you think can be done to motivate EHOs to perform their duties amidst COVID-19?

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24. What are the challenges EHOs face in the delivering of their duties amidst COVID-19?

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25. What are your suggestions to improve on the preparedness of the Environmental Health and Sanitation Unit for any future pandemic?

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FOCUS GROUP DISCUSSIONS

TARGET GROUP: ENVIRONMENTAL HEALTH OFFICERS.

ASSESSMENT OF OCCUPATIONAL HEALTH AND SAFETY RISKS AMONG ENVIRONMENTAL OFFICERS IN GHANA AMIDST COVID 19 GLOBAL PANDEMIC.

Purpose: This is a study being conducted by a student with the Department of public health education of the University of Education, Winneba. The study aims to assess occupational health and safety risks among Environmental Health Officers in the six most affected regions in Ghana namely Greater Accra, Ashanti, Eastern, Western, Central and Volta Region. Information provided will help identify possible risks environmental officers are exposed to in the prevention and burial of Covid 19 cases. Results of the study will help provide relevant information on the health and safety practice to combat Covid 19 in the public health Unit.

Confidentiality: Please note that each respondent will be given a unique code so the response provided are treated with complete anonymity. The research outcome and report will be excluded from references to any individuals.

Instructions: Please fill in as applies to you and/or provide short responses

Thank you very much for your kind cooperation.

Name:

Position:

Location:

Contact:

1. What is the involvement of the EHSD/EHSU in COVID-19?

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2. What has changed in the responsibilities of the EHSD/EHSU?

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3. How has COVID-19 affected the work of the EHSD?

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4.

Involvement	Hazards	Participants Likelihood of infection 1=Negligible 2=Low 3=Moderate 4=Significant 5=Catastrophic	Risks
Contact tracing	<ul style="list-style-type: none"> a. Physical b. Infection c. Assault 		
Health education	<ul style="list-style-type: none"> a. Physical 		

	b. Infection		
Fumigation/disinfection	a. Physical b. Chemical c. Ergonomic		
Burial	a. Physical b. Chemical c. Infection d. Ergonomic		

5. What measures are to help EHOs deal with

Psychological.....

Ergonomic.....

Physical.....

Stress.....

Medical Insurance.....

Financial support.....

NHIS.....

6. What interventions are there to protect EHOs?

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7. Do you have documented health and safety policy to protect EHOs from COVID-19?

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8. What standard procedures are used for the burial of COVID-19 death cases in your MMDAs?

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9. How do you ensure that these standards are complied with?

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10. Who is responsible for the provision of the PPE used by the EHOs to fight COVID-19?

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11. Who ensures that the PPEs are provided/replaced in time?

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12. Who ensures that the PPEs are used appropriately?

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13. How regular is the supply of the PPEs?

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14. Have you ever used your personal money to acquire PPEs for your work?

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15. What PPEs was/were that?

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16. How does inadequacy of PPEs affect your work?

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17. Have you been infected with COVID-19?

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18. Have you had any psycho or emotional effect amidst COVID-19?

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19. Have you had any health condition in your respond to COVID-19?

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20. Is there any inhalation of chemical which have affected your health during fumigation and disinfection?

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21. What do you think can be done to motivate EHOs to perform their duties amidst COVID-19?

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22. What support systems are in place to help you?

Financially.....
Health and safety.....
Insurance.....
Stress
Psychological/emotional support (Counseling).....
Physical (ergonomics).....

23. Have you been trained on COVID-19 management?

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24. Which kind of training have you been given?

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25. Which institution provided the training?

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26. What training materials/reference were you given?

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Appendix: Introductory Letter



UNIVERSITY OF EDUCATION, WINNEBA
COLLEGE OF AGRICULTURE EDUCATION, ASANTE-MAMPONG
FACULTY OF SCIENCE AND ENVIRONMENT EDUCATION
DEPARTMENT OF ENVIRONMENTAL HEALTH AND SANITATION EDUCATION

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M/DEHSE/ADM/G/04/14

15th July, 2020

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

LETTER OF INTRODUCTION
MR. HARRISON YENGBE
7181930002

This is to introduce Mr. Harrison Yengbe as a student in the Faculty of Science and Environment Education of the University of Education, Winneba (Asante Mampong-Campus), with Student Registration Number, 7181930002.

Mr. Yengbe entered the University in August, 2018, to pursue a 2-year MPhil programme in Environmental and Occupational Health Education.

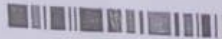
Mr. Yengbe is conducting research on the topic: "Assessment of Occupational Health and Safety Risks Among Environmental Health Officer in Ghana Amidst the Covid-19 Global Pandemic" as partial fulfilment of the award of the MPhil (Environmental and Occupational Health Education) and has requested us to introduce him as a student of the University to enable him obtain data for his work.

We should be grateful if he could be given the necessary assistance.

Thank you.

Yours faithfully,

EMMANUEL DARTEY (PROF.)
HEAD OF DEPARTMENT
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