An Exploration of the Roles of Environmental Health Practitioners in Ekurhuleni Health District, Gauteng Province

Zanoxolo Futshane

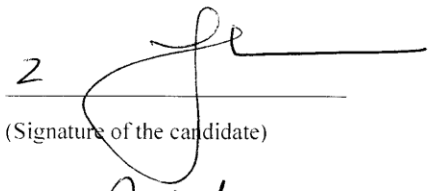
Student Number: 0604248x

A research report submitted in partial fulfillment of the requirement for the degree of Master of Public Health (MPH) in the school of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg

Johannesburg, October 2025

DECLARATION

I, Zanoxolo Futshane declare that this research report is my own work. It is submitted in the partial fulfilment of the requirements for the degree in Master of Public Health in the field of Health Systems and Policies at the University of Witwatersrand, Johannesburg. I declare that is has not been previously submitted before for any degree or examination at any other university.



(Signature of the candidate)

01 October 2025

(Date)

Boksburg

(Place)

DEDICATION

This report is dedicated to improving the community health of South African citizens by strengthening and improving the frontline cadres of Environmental Health Services. Special thanks to God Almighty for the grace to expand my knowledge and skills in the health sector. I also extend a heart of gratitude to my wife, Mrs. Busiswa Futshane, and my 4 boys for the unwavering support I have received from them during my years of study. Not forgetting my Spiritual father, Prophet Philip Banda for encouraging me to have a goal and a vision in life, your encouraging messages have kept me going during my years of study.

ABSTRACT

Introduction

Environmental health services in South Africa are aimed at protecting health by addressing and combating threats and dangers in the environment, specifically physical, social and chemical threats. Environmental Health Practitioners (EHPs) play an important front-line role in preventing environmental hazards from negatively impacting and threatening the quality of life. The functions of EHPs are allocated according to the three spheres of government: national, provincial and local. However, most of the environmental health services were devolved to be the function of the municipalities as Municipal Health Services. When these functions were moved to municipality, important resources such as finance and human resources were not moved. This created challenges in providing these services.

Aim

The study aimed to explore the roles of Environmental Health Practitioners in the Ekurhuleni Health District in the Gauteng Province.

Methods

An exploratory qualitative study approach was conducted. 16 participants; 10 EHPs, two supervisors and four managers were purposively selected. Using semi-structured interview guides and all the interviews were recorded and transcribed. A thematic analysis was used to analyze the qualitative data and generate themes on the roles of EHPs in the Ekurhuleni District.

Results

The findings reveal that there is ambiguity regarding the roles of EHPs in the Ekurhuleni health district. The study also discovered that EHPs based in the district felt that it would better for them to be moved to the municipality because according to the legislation, most of the main environmental health functions are assigned to municipality. The EHPs highlighted several challenges that compromised the provision of environmental health services in the district of Ekurhuleni. These included health workforce constraints, funding challenges which resulted in limitations in technical items and tools of trade, including the dynamics around legislative frameworks. The findings in this study also revealed that due to the increasing population growth rate and increasing burden of diseases outbreaks, there is a need to train and employ more EHPs

to improve WHO and South African norms and standards. It was further revealed that to successfully implement the programme there should be increased budget, availability of resources, improved communication, and staff development.

Conclusion

EHPs play a crucial role in the provision of environmental health services in the community at a local level of government. Although the legislation is clear about who is doing what and where, there are gaps identified such human and financial resources that hinder the implementation of the devolved functions and roles of EHPs. There is a need for decision-makers to examine the extent to which all EHPs at a district level could be under municipality at the Local Government sphere and carry out their roles as outlined in the legislative framework.

ACKNOWLEDGEMENTS

The inspiration to do a degree in Master of Public Health came from being challenged by my Father in the Lord, Prophet Philip Banda who always encourages us to have a goal and vision in life so that we can succeed in life. I thank God and give Him the glory for bringing such a man into my life. I also extend a special heart of gratitude to my supervisor Dr. Nonhlanhla Nxumalo for her support, patience and guidance throughout the process of writing the research report. I am greatly honored to be one of your students, and you have been always there for me even when I felt like dropping out and abandon my dream of having a Masters degree. Many thanks to Ekurhuleni Health District for granting me the opportunity to conduct this research in their district. I also want to thank Mrs. Thembakazi Ngcwabe, Mrs. Sonto Marumolo, and Mrs. Dudu Mthombeni for believing in me and encouraging me to undertake this course. I also give thanks to God Almighty for His strength, love, and mercy; indeed, God does not consult your past to determine my future. To God be the glory.

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

CHW	Community Health Worker
DHS	District Health System
DoH	Department of Health
EH	Environmental Health
EHO	Environmental Health Officer
EHORECON	Environmental Health Officers Registration Council of Nigeria
EHP	Environmental Health Practitioner
EHS	Environmental Health Services
EIA	Environmental Impact Assessment
HPCSA	Health Professions Council of South Africa
HREC	Human Research Ethics Committee
IDP	Integrated Development Plan
LMIC	Low-Middle Income Countries
MHS	Municipal Health Services
NDoH	National Department of Health
NGO	Non-Governmental Organization
NHI	National Health Insurance
NSDA	Negotiated Service Delivery Agreement
PHC	Primary Health Care
SA	South Africa
SALGA	South African Local Government Association
UNICEF	United Nation Children's Fund
WBOT	Ward-Based Outreach Team
WHO	World Health Organization

CHAPTER ONE: INTRODUCTION

1.1 Background

According to the World Health Organization (WHO), environmental health services are essential in guaranteeing a safe and healthy environment for people. These services cover a range of initiatives and plans aimed at controlling and managing environmental elements that have an impact on human health (WHO, 2015). Environmental health practitioners (EHPs) play a crucial role in putting the WHO's global environmental health standards and policies into practise locally. The combined efforts of EHPs are essential for tackling environmental health concerns and advancing public health internationally (Mathee and Wright, 2013). To prevent disease and create conditions that promote health, environmental health practices include the assessment and management of environmental elements that may have an impact on health. This definition does not include genetics, the social and cultural context, or behaviour unrelated to the environment (WHO, 2018a). The WHO definition listed above incorporates the several definitions created by other organisations, some of which highlight distinct facets of environmental health.

Frumkin (2010) defines environmental health as the field that focuses on: the interrelationships between people and their environment, improving human health and wellbeing and building a safe and healthful environment. The interaction between humans and the environment is highlighted in this specific description. In contrast, the National Environmental Health Policy of South Africa uses a definition which was adapted from a 2004 WHO report. It defines environmental health as follows: “Environmental health encompasses those aspects of human health, including quality of life that is determined by physical, chemical, biological, and psychological factors in the environment” (NDoH, 2013a, p.7).

Environmental Health Practitioners, formerly known as Environmental Health Officers (EHOs) or Environmental Health Inspectors (EHIs), are the main drivers of environmental health services in South Africa (NDoH, 2016). These individuals are strategically placed to participate in the issues of environment and health management meaningfully and effectively in all three spheres of government namely national, provincial, and local (NDoH, 2004). Although the role of EHPs at the district level is designed to place more emphasis on the social determinants of health, their scope of practice remains unclear at this level of government (David McCoy et al, 1998). The National Environmental Health Policy states that environmental health is a basic public health approach that affects the entire population and provides a foundation for modern living. The policy

cautions that if this service is not well rendered in the district and at the community level, it will result in outbreaks and spread of diseases related to environmental factors (NDoH, 2013a).

In 2013, Dr Aaron Motsoaledi, the Minister of Health at the time, legally amended the National Environmental Health Policy. Functions and responsibilities of district EHPs were re-allocated to municipal and national EHPs (NDoH, 2013a). Reports suggest that this left district EHPs with little to do in the district and unclear role definitions. This confusion continued as the recruitment of EHPs continued in district health services with internship opportunities offered for newly qualified EHPs. These EHPs performed the municipal duties as stipulated in the National Environmental Health Policy of 2011 creating more ambiguity, and overlap of function (Ekurhuleni Health District, 2012).

According to the National Environmental Health strategy, environmental health services in South Africa are fragmented at various government departments and in some cases, this has led to the duplication of functions due to lack of role clarification within the environmental health sector (NDoH, 2016). Research that offers clarity on the roles and responsibilities of EHPs in South Africa remains limited. This study therefore aimed to examine and clarify the roles and responsibilities of EHPs at the district level.

1.2 Literature review

In order to distil the overall issues related to the role and experiences of EHPs in a range of settings, this literature review provides an overview of EHPs in LMICs. It further explores the challenges encountered by EHPs in developing countries, looking at the barriers to providing environmental health services in their respective contexts. It then provides an account of what has been explored regarding EHP experiences including that of the EHPs in South Africa and the governance structures in which they are situated.

1.2.1 Overview of the Environmental Health Practitioners in Low-and-Middle-Income Countries

According to the WHO, environmental health includes issues of human health that affect the quality of life. Such issues are determined by certain factors in the environment such as social, biological, physical, psychological, and chemical factors (WHO, 2018a). Environmental health

also refers to the theoretical and practical processes of assessing, controlling, preventing, and correcting those factors in the environment that can have adverse effects and pose threats to the health of present and future generations (WHO, 1990). A study on the global burden of diseases attributable to environment concluded that 23% of all premature deaths, and 24% of the disease burden, are caused by environmental risks factors (Prüss-Ustün et al., 2017). The Libreville declaration was signed in 2008 and 52 African countries committed to implement priority actions aimed at establishing an effective platform to address the environmental impact of health (WHO, 2009). The declaration was based on the evidence that over 2.4 million mortalities in Africa per annum are caused by environmental risk factors that can be avoided through expanding the scope and roles of the EHPs that would mitigate and prevent these environmental factors (WHO, 2009).

Musoke, et al. (2016) note the role of EHPs in Uganda as one that is significant for the country's population health. They define EHPs as an integrative collaboration of various disciplines that work together locally, nationally, and globally to achieve better health outcomes for people, animals, and the environment (Musoke et al., 2016). According to Walekhwa, Kizza and Musoke, (2022), EHPs in Uganda are also known as Environmental Health Officers (EHOs), Health Inspectors and Health Assistants and they are responsible for implementing strategies to prevent diseases occurrence. Their practice is regulated by the Ministry of Health through the Environmental Health Department under the Allied Health Professionals Council (Walekhwa, Kizza and Musoke, 2022).

After the EHPs in Uganda have undergone their training, they are registered and given titles according to their qualifications. The EHPs who have qualified and obtained certificates are given the title of Health Assistants (Musoke et al., 2016). EHPs who obtained diplomas are registered and employed as Health Inspectors and EHPs who are qualified with degrees are registered and referred to as EHOs and are employed at district level (Musoke et al., 2016). Their training is differentiated according to the above-mentioned three categories and levels. It is noted that the EHPs receive more information through online courses, workshops, and seminars in order to stay up to date with the most recent advancements in the profession (Walekhwa, Kizza and Musoke, 2022). All EHPs in Uganda are involved in environmental health practice at the community level while others are employed to manage environmental health services at district level (Musoke et al., 2016). They play an important role in diseases surveillance, prevention, and control associated with meat safety, vectors and vermin, food safety, environmental pollution, water, sanitation, and hygiene (Nganwa and Bogale, 2014). Furthermore, they are part of the outbreak response teams

where they are involved in contact tracing, sample collection, community mobilization and sensitization, advising communities on how to prevent the spread of infectious diseases (Walekhwa, Kizza and Musoke, 2022). The EHPs have played a significant role in reducing the morbidity and mortality due to communicable diseases outbreaks (Mbonye et al., 2012). They are also entrusted with the duty and a responsibility to enforce public health laws, rules, and legislation.

According to Das Gupta et al. (2017) the socio-economic, environmental, and institutional aspects of India have a multifaceted impact on the professional development of EHPs. The majority of EHPs in the country have degrees in public health, environmental science, or similar disciplines (Das Gupta et al., 2017). Postgraduate degrees are becoming increasingly important for career growth. These programs focus on the effects of environmental pollution on human health and the assessment of public health risks associated with biological, chemical, physical, biochemical and psychosocial hazards in the natural and built environment (Nagdeve, 2002). The EHPs reportedly also join a professional group that offers opportunities for networking and remaining updated on business developments (Das Gupta et al., 2017).

The role of EHPs in India include the prevention of waterborne diseases, air quality monitoring, waste management, Environmental Impact Assessment, and water and air pollution monitoring. They are also responsible for occupational health and safety and preventing exposure to hazardous substance and chemicals (Mani et al., 2012). The EHPs work through government agencies to promote a healthy environment for the citizens (Mani et al., 2012). These agencies include the Ministry of Environment, Forest and Climate Change, Central Pollution Control Board, National Green Tribunal and State Pollution Control Boards (Nagdeve, 2002).

In Nigeria, EHPs undergo intense formal training and are called Environmental Health Officers (EHOs). They are trained in universities through various channels such as a Bachelor of Science degree programme in Environmental Health, an Environmental Education programme at a degree level and diploma level, and a master's programme called Master of Environmental Health Management (Adewumi, 2011). Upon completion, the EHOs are registered with Environmental Health Officers Registration Council of Nigeria (EHORECON) and are employed at different levels of government (Sarwuan, Abanobi and Iwuala, 2019). The environmental health services are under the Ministry of Health at the national level where policies are developed, and EHOs operate at the local government level with clear roles (Raimi, Vivien, and Oluwatoyin, 2021).

Environmental health services (EHS) in Nigeria are regulated by a different legislative framework[1] than governs and regulates the provision of EHS and the scope of practice of the EHOs (Adewumi, 2011). The main role of the EHOs in Nigeria includes sanitation hygiene, maintenance of good sources of water supply, food hygiene, immunization against communicable diseases, pest management, inspection of premises and enforcement of laws to maintain good environmental health (Adewumi, 2011). Nigeria's fast population growth and increased urbanization due to lack of rural development have caused grave environment-related problems (Pona et al., 2021). Nigeria continues facing environmental health challenges that include air pollution, water pollution, solid waste management, climate change, excess flooding leading to outbreak of diseases like cholera, emergence of infectious diseases, and control of vector diseases (Pona et al., 2021). The EHOs play a key role in the prevention and promotion of health within the communities and ensuring the safety of the environment (Sarwuan, Abanobi and Iwuala, 2019).

1.2.2 Challenges experienced by Environmental Health Practitioners in Low-and-Middle-Income-Countries.

In low-and-middle-income countries (LMICs), EHPs manage environmental risks to preserve public health, but they also face a variety of challenges and problems. These difficulties are frequently made worse by a lack of funding, inadequate infrastructure, and other socioeconomic issues (Prüss-Ustün et al., 2017).

In Uganda for example, there are continued staff incompetencies among the EHPs. These complaints are reported to the district health supervisors and municipal executive directors, and this affects the EHPs' work performance and demoralizes them. This results in difficulties in recruitment and retention of EHPs because of their tarnished reputation (Walekhwa, Kizza and Musoke, 2022). There is therefore a need for more training and capacitation on surveillance and sanitation marketing techniques and inclusion of in-service training to enhance their knowledge and skills as part of continuous professional development (Walekhwa, Kizza and Musoke, 2022).

India is the largest low-middle income country, accounting for the 18% of the world's population (Sharma and Popli, 2023). The country has a fragmented healthcare delivery health system that has been progressively delayed in meeting the demand of the country's massive and diverse

[1] Legislative framework for Environmental Health services includes National Environmental Sanitation policy (2005), Environmental Health Officers Registration Council of Nigeria Act, National Environmental and Regulations Enforcement Agency Act, Harmful waste Act, Federal Environmental Protection Act of 1998, etc.

population (Sharma and Popli, 2023). Due to poor water, sanitation and hygiene, India has an increased burden of infectious diseases especially diarrhoea which is still one of the leading causes of death (Sharma and Popli, 2023). Das Gupta et al (2017) also highlighted that the country has a high burden of diseases related to poor environmental sanitation and both rural and urban areas are affected due to poor infrastructure in rural areas and high dense population in urban areas.

Considering this context, India presents a variety of difficulties and experiences for EHPs because of its enormous size, varied topography, and disparate degrees of economic development in its many areas (Das Gupta et al., 2017). The delegation of environmental health-related duties, powers, and resources has been decentralised from national or state governments to local organisations or lower governmental tiers. Consequently, the authority and obligation to manage environmental health issues has shifted to local entities (Panda and Thakur, 2016, Malcolm, 2013). This covers the duties that are normally performed by EHPs, including waste management, sanitation, water supply, and local environmental monitoring (Das Gupta et al., 2017). The actual transfer of resources and capacity building to local bodies has been unequally distributed among different states and regions, notwithstanding the legal mandate for the devolution of powers. This has affected the extent to which EHPs can perform at these levels as they are unable to function efficiently and effectively because of lack of resources and skills (Das Gupta et al., 2017).

In India, EHPs face challenges of unequal distribution of resources, especially in slums where poor residents have inadequate access to water supply, drainage or sewage and solid waste management (Das Gupta et al., 2017). Municipal governance and service delivery in India has been widely recognised to be inadequate (Arnold et al., 2009). In relation to this inadequacy, EHPs face the maladministration of municipalities with poor coordination of provision of multiple environmental health services (Arnold et al., 2009). Among the complex challenges faced by EHPs in India, the critical issue is the unequal distribution of EHPs to rural and urban areas to meet growing population (Dehury et al., 2023).

Like many other LMICs, Brazil has decentralised public health responsibilities, including environmental health, from the federal to state and municipal levels. Considering this, EHPs have undergone a process of devolution (Ozano et al., 2019). Brazil's socio-political context, public health regulations, and environmental issues have all had an impact on this process (Mayka, 2019). Since the 1988 constitution, which established the Unified Health System (Sistema Único de Saúde, known as SUS) and prioritised universal access to healthcare, Brazil has experienced a

considerable decentralisation of public health services. The distribution of health services, particularly environmental health services, to municipalities was also decentralised under this system (Oliveira, Mbola and Human, 2023). Consequently, there are differences in the quality of environmental health services in Brazil due to the different abilities of municipalities to handle decentralised functions (De Oliveira, 2002). For instance, some places, especially those that are rural or less affluent, struggle to render quality environmental services because they have insufficient resources and knowledge (Oliveira, Mbola and Human, 2023). Environmental Health Officers (EHOs) in Brazil also faces challenges of role duplication. The duplication of roles of environmental health officers reflects a broader challenge often encountered in governance structures where multiple levels of government are involved in similar areas of public health and environmental management (Mayka, 2019). In Brazil, addressing the duplication of roles of environmental health officers requires a nuanced approach that considers the country's federal structure, regional disparities, and administrative complexities (Mayka, 2019). Through clearer demarcation of responsibilities, enhanced inter-governmental coordination, and strategic resource management, Brazil can work towards a more efficient and effective environmental health system (Mayka, 2019).

Sarwuan, Abanobi and Iwuala (2019) indicate that in Nigeria, there is an underutilisation of EHOs, particularly in areas like Benue state. This has reportedly resulted in increased diseases outbreaks, poor hygiene practices, indiscriminate dumping of waste, and poor environmental sanitation (Sarwuan, Abanobi and Iwuala, 2019). The main challenge faced is a lack of budget to fund training of more EHOs so that the country can improve health outcomes (Sarwuan, Abanobi and Iwuala, 2019). There is also lack of funding for retraining of EHOs to improve their skills and competencies in addressing these environmental health challenges in the communities (Pona et al., 2021). According to Joshua et al., (2023), EHOs in Nigeria have been neglected and rendered voiceless at various levels of government. The ratio of EHOs to the population is very low, which indicates that there is a shortage of EHOs in Nigeria with the ratio of 1 EHO to 24 500 population as compared to the global best practice of 1 EHO to 800 population (Joshua et al., 2023). With all the environmental health issues that Nigeria is experiencing, it has been revealed that Nigeria’s governance frameworks are ineffective in dealing with the magnitude of the country’s environmental challenges (Ogunkan, 2022).

According to Chol et al., (2018), environmental health duties in Angola are being transferred from the national to the provincial and local levels as part of the decentralisation of EHP services. This

procedure is a component of larger initiatives to enhance environmental health management and fortify the public health system in response to the unique difficulties faced by the country. (Chol et al., 2018). The protracted civil conflict in Angola, which came to an end in 2002 had a major effect on the country's public health system (Chol et al., 2018). Reconstruction activities, such as re-establishing the healthcare system and addressing environmental health concerns, have characterised the post-conflict era (Chol et al., 2018). Angola's decentralisation strategy intends to provide provincial and municipal governments more authority over environmental health matters. The goal of this strategy is to increase environmental health management's responsiveness to regional conditions and demands (Mankenda, 2020). Like other LMICs, Angola encounters difficulties in efficiently distributing resources throughout various tiers of the healthcare system. This is reportedly likely to reduce the efficacy of EHPs, particularly in rural or underdeveloped areas (Mankenda, 2020). Including public health, environmental protection, policy development, education, and research, EHPs have a wide and important role in Angola, and they are leading the way in addressing intricate health issues like municipal solid waste and environmental health hazards brought on by the interaction of the populace with their surroundings (Panzo, Góis, and Mendes, 2022). Because of the nation's continuous urbanisation and development, there will be a greater need for qualified EHPs, underscoring the necessity of sustained resource and capacity-building investments in this field (Mankenda, 2020).

The decentralisation process for EHPs in LMICs shows a commitment to improving public health systems through localised and community-based approaches. However, all the countries discussed above are experiencing challenges of resource allocation and capacity building (Mankenda, 2020).

1.2.3 Overview of Environmental Health Services in South Africa

According to the mid-year population estimates for 2024, South Africa has exceeded 63 million people (Stats SA, 2024). South Africa is experiencing a fast-growing population, and the process of rapid urbanization has given rise to the mushrooming of informal settlements in the cities and periphery of the cities and towns. This has resulted in overcrowding in areas like Hillbrow, the inner city of Johannesburg, and other surrounding areas (Turok, 2012). High population growth, overcrowding and inadequate infrastructure puts more pressure on the environment and threatens the health and wellbeing of the communities (Boadi et al., 2005). The contributing factors to environmental related diseases include poor hygiene and sanitation practices due to lack of adequate sanitation, poor management of waste, contamination of ambient air pollution and

pollution of water (NDoH, 2013a). The EHPs deal with environmental health and safety of the communities in the local sphere of government (Barron and Padarath, 2017).

The provision of environmental health services is recognized as a crucial factor that is beneficial and has positive impact on the quality of the living environment and the health of the communities (Thomas, Seager and Mathee, 2002). Environmental health services in South Africa are aimed to protect health by addressing and combating physical, social, and chemical threats and dangers in the environment (Davies and Mundalamo, 2010). The six major risk environmental factors addressed in this discipline are poor hygiene, disease vectors, inadequate access to safe drinking water, sanitation, chemical hazards, and unintentional injuries (NDoH, 2013a). The EHP's role is often split between regulatory enforcement and wider public health and well-being agendas (Stewart and Bourn, 2013). Environmental Health Practitioners play an important role in the frontline rendering of environmental health services and municipal health services (Melariri, Mbola and Human, 2019).

1.2.3.1 The role of Environmental Health Practitioners in South Africa

The functions of EHPs are allocated according to the three spheres of government, national, provincial, and local. The bulk of environmental health function is the mandate of the metropolitan and district municipalities (NDoH, 2004). The main functions of EHPs include the management and investigation of outbreaks of diseases, monitoring, and control of the environment, and health promotion. This cadre plays an important front-line role in preventing environmental hazards from negatively impacting and threatening the quality of life of citizens (NDoH, 2013a). Previously, the National Department of Health (NDoH), provincial Departments of Health, and Local Authorities[2] were responsible for the functions relating to environmental health services. However, the new National Health Act defines environmental health services as municipal health services that do not include the three functions which are hazardous substance control, port health, and malaria control (NDoH, 2004). According to the Municipal Structures Act, local government assigns functions relating to municipal health to district municipalities (Republic of South Africa, 1998).

[2] A Local Authority in the South African context is Municipality or Local Government.

According to the National Department of Health (2004; 2013b), EHPs are legally empowered and authorized to conduct inspections and environmental investigations on any premises for compliance with legislation related to environmental health services, excluding private dwellings. Inspections are designed to eradicate and reduce any conditions that constitute health hazard or nuisance. In the case of failure to comply with the legislation related to environmental health, EHPs may issue a compliance notice to the offender (NDoH, 2013a).

In 2014, the Minister of Health amended the regulations defining the scope of practice of EHPs (NDoH, 2014). The scope of practice relating to the EHPs was promulgated by an amendment released in December 2014. This changed the landscape of the roles and duties of EHPs according to the sphere of government. According to the Environmental Health Policy (NDoH, 2013a), it is the responsibility of the National Department of Health to ensure overall management, monitoring, and evaluation of environmental health services. The National Department of Health also monitors the implementation of the National Environmental Health Policy by the provinces, districts and metropolitan municipalities, as well as facilitating the integration of the health plans of the Department of Health at other levels of government (NDoH, 2013a).

1.2.3.2 Training, practice and distribution of Environmental Health Practitioners in South Africa

In South Africa, EHPs are trained in universities and universities of technology where they exit with degree or National Diplomas in Environmental Health, respectively. The EHPs are also required to complete community service before they are registered as independent practitioners with the Health Professions Council of South Africa (HPCSA) and must participate in continuous professional development programmes (Melariri, Mbola and Human, 2019, Mathee and Wright, 2013). Mathee and Wright, (2013) recommend that the training of the EHPs must be reviewed and adopted appropriately on an ongoing basis because of increasing urbanization, rapid industrialization and climate change (Mathee and Wright, 2013). The SALGA[3] report, (2013) also emphasizes that due to the changing trends in environmental health and emergence of new diseases, EHPs should receive constant, continuous training and re-orientation (SALGA, 2013). The scope of practice of EHPs places them in an operational position to play a major key role in

[3] SALGA: South African Local Government Association: It's a voluntary, non-profit organization that represents South African local governments. SALGA'S role is to advocate for local governments, support their development and ensure they are able to deliver services.

the prevention of exposure to environmental hazards and reducing the burden of diseases related to environmental health factors (Mathee and Wright, 2013). The practice and professional conduct of EHPs is regulated and monitored by the Health Professions Council of South Africa (HPCSA)[4] (HPCSA, 2019). The regulatory body must ensure that nobody practices unlawfully and must be registered with the council and pay annual practice fees (Mbazima, Mbonane and Masekameni, 2022). The HPCSA oversees healthcare practice, establishes standards for education and training and upholds the ethical standards as prescribed by the Health Professions Act No. 56 of 1974 (HPCSA, 2019). Further to that, the HPCSA guides, informs and directs curriculum development procedures and ensures that the training and learning institutions adhere to the prescribed basic competences and training frameworks (HPCSA, 2019).

1.2.4. Challenges faced by Environmental Health Practitioners in South Africa

South Africa faces a range of factors that constrain EHPs from contributing meaningfully to their mandate to reduce the burden of diseases (Mathee and Wright, 2013). Although there are EHPs working across the spheres of government, it has been reported that there is still a shortage of EHPs in the country considering idea ratios espoused by WHO (Mathee and Write, 2013, NDoH, 2013b). The country is faced with the challenge of meeting the required WHO national staffing norms of 1:10000 (1 EHP per 10000 population) and the South African targets of 1:15000 (1 EHP per 15000) (Mathee and Wright, 2013). According to SALGA (2013), EHPs distribution in Ekurhuleni does not meet the national and WHO targets and currently there are only 140 EHPs in the district. According to the national and WHO targets and norms and standards, there is a shortfall of 70 EHPs and 178 EHPs in the district respectively (Table 1)[5].

[4] Health Profession Council of South Africa (HPCSA) is an independent statutory body that regulates specific healthcare professions within South Africa.

[5] Staffing of EHPs according to the district in Gauteng province measured against the WHO and South African staffing norms and standards to identify the gaps and the magnitude of shortage of EHPs in the province across all districts.

Table 1: Staffing of the EHPs in Gauteng Province (SALGA, 2013)

PROVINCE: GAUTENG					
Municipality	**Current EHP Pop**	**Pop 1:15 000 (SA target)**	**GAP**	**Pop 1:10 000 (WHO)**	**GAP**
Ekurhuleni	140	210	70	318	178
Johannesburg	221	296	75	443	222
Tshwane	70	180	110	270	200
West Rand	22	Details not submitted			
Sedibeng	Not indicated	60		90	
TOTAL	**453**	**746**	**255**	**1121**	**590**

(SALGA, 2013)

According to the SALGA report (SALGA, 2013), municipalities are struggling to cope with the delivery of the full package of comprehensive municipal health services mainly because of the shortage of EHPs, increase in population and the devolution of services due to legislation changes. In general, it has been reported that EHPs in South Africa are inequitably distributed in relation to the prevailing environmental health challenges in the country (Mathee and Write, 2013). Mathee and Write (2013) also highlight that EHPs are not distributed according to the health system reforms or according to the demands placed by the evolution of the health system. According to anecdotal evidence, municipal EHPs believe that they do not report and account to the Department of Health (DoH) but rather to the Department of Co-operative Governance and Traditional Affairs [6], while the EHPs in the district report to the DoH. The District Health Service (DHS) model under primary health care (PHC) re-engineering (Pillay, 2012) requires EHPs to be part of PHC outreach teams whose objective is to render environmental health services in the community to improve access and health outcomes. According to this DHS model, EHPs should be stationed at community level as part of the Ward-Based Primary Health Care Outreach Teams (informally known as WBOTs), where their responsibilities are environmental health, sanitation, refuse removal, water, pest and vector control (Naledi et al., 2011). The PHC outreach teams established in the districts are ideally meant to include a professional or staff nurse as a team leader, an Environmental Health Officer or practitioner, a health promoter and 6-10 community health

[6] Department of Co-operative Governance and Traditional Affairs (COGTA) coordinates the effective functioning of local government, promote integrated development planning and deepen participatory democracy in order to accelerate service delivery.

workers. However, these teams are incomplete due to shortage of health promoters and EHPs (Pillay, 2012).

1.2.3.4 Organizational Structure of Environmental Health Service Delivery in South Africa

In South Africa, environmental health care services are dispensed through the three spheres of government which are local, provincial, and national (NDoH, 2013a). Environmental health services include food hygiene, adequate and safe water supply, disposal of solid, toxic, and hazardous waste and safety, basic sanitation, control of air and water pollution, and environmental public health disease control (Haynes, 2004).

a) National sphere of government

The EHS are the responsibility of the Minister of Health at the national level of government. The functions of the NDoH are to endorse the health of all people in the country through an extensive national health care system, aiming at primary health care, to deliver guidance in promulgating health policy, as well as to help and assist provinces in implementing effective and competent health care services (Beyers, 2013). According to the National Environmental Health Policy, the environmental health directorate is accountable for ensuring the implementation of environmental health programs and the delivery of environmental health services in the provinces in line with national priorities (NDoH, 2013a). As a directorate within the national department, the sector is expected to give technical provincial support in performance management aspects including capacity development of EHPs (NDoH, 2013a). The NDoH is also responsible for the administration of community services in conjunction with provincial and local government, as well and the Health Profession Council South Africa which is responsible for the registration of health professionals (NDoH, 2015). The South African Military Health Service (SAMHS) also forms part of the institutions that offer community services to environmental health graduates, and this is controlled at national level (NDoH, 2015). The provincial and municipal spheres have been assigned certain functions and responsibility by National Department of Health (Melariri, Mbola and Human, 2019).

b) Provincial sphere of government

The provincial sphere of health services is responsible for the employment of EHPs involved in the DOH for community services for newly qualified EHP graduates (Hatcher et al., 2014). The National Environmental Health Policy (2011) also established municipal responsibilities by

introducing municipal health service because of the devolution process (NDoH, 2013a). The EHPs who work for both the health departments in the provinces and the municipalities are tasked with the entire environmental health scope of work as described by the regulation (NDoH, 2004). The provincial government has a monitoring role over municipalities to ensure implementation of national environmental health policies (Koma, 2010).

c) Local sphere of government

The role of municipalities is to deliver municipal health services to communities through the district health system (NDoH, 2016). The local sphere of government consists of metropolitan municipalities, district municipalities and local municipalities (Agenbag, 2015). The district health system provides PHC services. Metropolitan and district municipalities are mandated to ensure that proper municipal services are successfully and rightfully delivered in their areas (NDoH, 2016). The overall responsibility for the placement of Environmental Health Community Service (EHCS)[7] lies with the Workforce Management: Statutory Service Placements Directorate in the NDoH (Melariri, Mbola and Human, 2019, Maseko et al., 2014). The Statutory Service Placement is a unit within the National Department of Health that organises the community service for EHPs. The unit then works and collaborates with provinces to ensure placement of EHPs for community service. The NDoH facilitates the organisation of EHCS, and the provincial health departments arrange the selection and placement of environmental health graduates for community service (NDoH, 2016).

1.3 Problem Statement

Although EHPs play a significant and instrumental role in the promotion of well-being and prevention of diseases in the community, their roles and responsibilities remain unclear despite devolution of some functions to the municipality as Municipal Health Services. The main development in environmental health services in South Africa since 2004 was to devolve most of its services to metropolitan and district municipalities (NDoH, 2004). According to the SALGA report (2013), the legal, financial, and human resources provisions were not prudently considered

[7] In South Africa, the government introduced the Community Service Policy that required Health Professionals to complete 12 months of Community Service and 24 months of internship through remunerative work in the public health sector. The purpose of the policy was to achieve better distribution of human resources for health to under-serviced areas and thereby improving equitable access to primary health care services (https://www.health.gov.za/icsp/).

hence the devolution of services poses challenges within Ekurhuleni metropolitan (SALGA, 2013).

Inadequate integration, and lack of standardization of environmental health services within governmental departments and across the three spheres of government has been a major challenge in South Africa (NDoH, 2013a). District Health Services have employed EHPs in the district with a fully functional sub-directorate under the Health Programmes directorate where they are supposed to carry the mandate of the provincial EHPs (Ekurhuleni Health District, 2012). However, according to PHC Reengineering, they have been proposed to be part of the PHC outreach teams for community services, and that has posed an increased demand for EHPs at this level of the health system (Mathee et al., 1999). Still, the district roles of these practitioners have not been outlined in the National Health Act and the scope of practice in the Health Professions Act, therefore EHP roles remain unclear (NDoH, 2004). District EHPs often overextend themselves and cover parts of the local government and provincial government roles, thus duplicating services in the district. The duplication of services by EHPs because of unclearly defined roles leads to difficulties in delivering the environmental health services (Matsoso and Fryatt, 2013).

1.4 Justification for the study

Exploring the roles and experiences of EHPs in the district will contribute to a responsive health system in South Africa and improve service delivery in local government. Efforts to reform the District Health System (DHS) call for a need to clarify the roles of EHPs in the district so that they are strategically and effectively placed to meet the demands of PHC re-engineering. Clarification of the roles of EHPs in the district will assist in preventing duplication of services by the local authority EHPs and district EHPs. Mathee, et al. (1999) emphasize that the need for change has been identified, and numerous strategies are already planned. Therefore, clarifying the roles of EHPs in the district will provide an opportunity to review and amend relevant documents that define their role or scope of practice at different levels of the system (Mathee et al.,1999). Moreover, clarifying the roles of EHPs will further assist in addressing the social determinants of health and improve health outcomes in the districts, as well as across the country overall.

There is a need to clarify the role of EHPs in the district so that they can be appropriately and strategically placed within the DHS to meet operational demands. Furthermore, clarifying the roles of EHPs will assist in the efforts to implement National Health Insurance, particularly considering

its link to PHC reforms in South Africa. There is therefore a need to move further towards a national consensus on the role of EHPs and the environmental health sector. A national consensus will ensure coordinated health, environment, and policy development that can strengthen environmental health services. This study therefore has relevance in informing efforts to improve policies on the roles of environmental health practitioners. The results of strengthened services have the potential to lead to better population health outcomes, improved well-being and quality of life (Pruss-Ustun et al., 2006).

1.5 Study Aim

The study aimed to explore the roles of Environmental Health Practitioners in Ekurhuleni Health District, Gauteng Province.

1.6 Study Objectives

The specific study objectives were:

a) To describe how EHPs' roles were defined in the policy and programme documents.
b) To explore EHPs and EHP managers' views on what would constitute the role of EHPs in Ekurhuleni Health District.
c) To describe factors that would constrain and enable the EHPs from executing and implementing their roles in Ekurhuleni Health District.

CHAPTER TWO: METHODOLOGY

2.1 Introduction

This chapter outlines the research methods that were used in the study to explore the roles of EHPs in the Ekurhuleni Health District, Gauteng province. It describes the research design adopted for the study. The chapter then discusses the study site, the study population, study sample, and the data collection process. Lastly, the chapter describes the data management and analysis, including the ethical considerations.

2.2 Study design

An exploratory qualitative study design employing in-depth interviews was applied to explore the role of EHPs and their experiences in the Ekurhuleni Health District. Exploratory research is conducted to study a problem that has not been clearly defined yet (Mbaka and Isiramen, 2021). This type of research is conducted when enough is not known about the phenomenon. It does not aim to provide final conclusive answers to the problem, but rather to explore the research topic deeply (Saunders, 2009). Qualitative design was therefore chosen to obtain firsthand knowledge from the EHPs' experiences (Neergaard et al., 2009).

A qualitative methodology was an appropriate approach used because the main goal of a qualitative investigation is to explore and understand the experience and behavior from the point of view of those involved in the situation of interest (Krauss, 2005). The approach was most suitable and useful to gain knowledge and insight into the roles of EHPs and to understand their perspectives. This study design was therefore deemed suitable for the topic because it generates results that give meaning, views and experience of the subjects in relation to the roles of EHPs in the district (Hennink, Hutter and Bailey, 2020). A qualitative approach was therefore appropriate to answer the research question and address the objectives of the study.

2.3 Study setting

The study was conducted in the Ekurhuleni Health District in Gauteng province. The Ekurhuleni Health District is in the City of Ekurhuleni Metropolitan Municipality in the East Rand region of Gauteng province. According to Stats SA (2018), the municipality has a high population density

and migration in the area has contribution to this. As a result, there has been an increase in informal settlements. A population of 3,178,470 individuals resided in the area during the time of the study (Stats SA, 2018). Ekurhuleni is divided into 112 wards with a total of 224 councillors. Ekurhuleni is highly urbanised, with 99,4% of the population living in urban settlements that include informal settlements, suburbs, and peri-urban/townships (Stats SA, 2018). The Ekurhuleni Health District has three sub-districts: Northern, Eastern and Southern regions. The area also has 93 Primary Health Care (PHC) facilities and six hospitals.

The Ekurhuleni Health District was purposively selected because it is one of the districts that have EHPs from both the municipality and provincial sphere of government. The City of Ekurhuleni is a highly industrialized area where people come to seek job opportunities (Majam and Munzhedzi, 2021). It is a fast-growing population, and increased urbanization is likely to lead to an increase in communicable diseases and therefore EHPs are expected to play a role in reducing the burden of

Figure 1. City of Ekurhuleni Metropolitan Municipality (Ekurhuleni Health District, 2012**)**

2.4 Study population

The study population for this study included the EHPs at the Ekurhuleni Health District which constituted three categories: the EHPs, their supervisors and managers from Department of Health at the district and metropolitan municipality levels. The EHPs report directly to the supervisors while the managers are the accounting officers for the environmental health services at municipal

and provincial level. All the participants were working in Ekurhuleni Health District although some were employed by the City of Ekurhuleni Metropolitan Municipality and others were employed by Gauteng Department of Health.

2.5 Study Sample

Purposive sampling was employed to select the participants in this study. This sampling technique allowed the researcher to choose participants because of their relevant knowledge, and experience suitable to advance the aim and objectives of the study (Campbell et al., 2020). The study sample also included EHP supervisors and managers from municipality, district as well as provincial office. Ten EHPs, two supervisors and four managers were purposively selected. Interviews were conducted until the point of data saturation, which determined a total of 16 participants. Data saturation refers to the point at which no new themes or information can be generated from the data (Braun and Clarke, 2021). The total number of participants is illustrated in Table 2 below.

Table 2: Study participants

Sphere of government	EHP	Supervisors	Managers	Total
District (Province)	8	1	1	10
District (City of Ekurhuleni Metropolitan Municipality)	2	1	1	4
Provincial Level	-	-	2	2
Total	**10**	**2**	**4**	**16**

2.5.1 Inclusion and exclusion criteria

The inclusion criteria included EHPs who are qualified with an environmental health qualification and who have worked for the district for at least six (6) months whether employed by the Gauteng Department of Health or Ekurhuleni Metropolitan Municipality. Being employed for 6 months did not guarantee enough experience, however, it increased the likelihood that the individual has been fully exposed to working environment and experienced all the different roles in the district. The six months requirement was deemed a reasonable duration for the EHPs to gain experience to different EHP activities so that they can provide in-depth insight into their work experience.

The EHPs working in other districts were excluded because the study sought to explore the experiences of EHPs in Ekurhuleni health district.

The criteria also included the supervisors supervising EHPs working in Ekurhuleni health district employed by either City of Ekurhuleni Metropolitan Municipality or Gauteng Department of Health. The six months inclusion criteria were not applied for supervisors and managers, based on the premise that by virtue of being a supervisor or a manager, one has more than six months experience of working as an EHP. The EHPs that had worked in Ekurhuleni district for less than six months were excluded. EHP Managers from the district whether employed by City of Ekurhuleni Metropolitan Municipality or Gauteng Department of Health were also included in the study. The study also included the EHP managers working at the provincial office employed by the Gauteng Department of Health.

Table 3: Summary of the inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
EHPs with environmental health qualification and working in Ekurhuleni Health District for at least six (6) months and above.	EHPs that had worked in Ekurhuleni Health District for less than six (6) months
EHPs employed by City of Ekurhuleni Metropolitan Municipality for at least six (6) months and above.	EHPs, managers and supervisors from other districts in Gauteng Province
EHPs employed by the Gauteng Department of Health and working in Ekurhuleni Health District	
Supervisors supervising EHPs working in Ekurhuleni health district employed by either City of Ekurhuleni Metropolitan Municipality or Gauteng Department of Health	
EHPs employed as EHP managers in Ekurhuleni Health District by either City of Ekurhuleni Metropolitan Municipality or Gauteng Department of Health.	
EHP managers employed by Gauteng Health Department and working at Provincial Office.	

2.6 Data collection

Prior to any data collection, participants were visited in their offices and others were contacted telephonically and by email to inform them of the study and request their participation. After the participants agreed to take part in the study, an appointment was made to meet and conduct face

to face interviews. Most of the interviews were conducted in the participants' offices or alternatively premises of their preference. Privacy and confidentiality were maintained in all instances.

Prior to the face-to-face interviews, an information sheet that provided a brief description of the study was given to the participants (Appendix G). Thereafter, two consent forms were distributed: one to request consent for an interview (Appendix F) and another to audio record the interview (Appendix H). The in-depth interviews were conducted between May 2018 and June 2018, using semi-structured interview guides for EHPs (Appendix C), managers and supervisors in the district (Appendix D) and managers at the provincial office (Appendix E). On average, the interviews were 45-60 minutes in duration. Considering that the participants occupy professional and managerial positions, interviews were conducted in the English language, the medium of communication in the workplace. All interviews were audio recorded, and field notes were taken to supplement the interviews.

The interviews for EHPs explored their roles in the district. They further explored their scope of practice as outlined in the legislative framework for EHPs, the challenges EHPs encountered when they execute their functions, and their recommendations. The EHP managers from the districts, municipality and provincial office were interviewed as key informants on their perceptions of the role of EHPs in the district, what the legislative framework entailed on the functions and scope of practice of EHPs in different levels of governance. This included the factors that could enable the execution and the implementation of the roles of EHPs.

Field notes were taken while the interviews were conducted to record non-verbal communication and to record the content of what was discussed to enable contextual understanding of the information shared (Phillippi and Lauderdale, 2018). The field notes also comprised the respondent's expressions and other motions which could inform the interpretation of the data during data analysis.

2.7 Pilot study

The interview guides were pre-tested in a pilot study conducted with three EHPs who were contracted for community service and were not part of the sample of study participants. No participants who were part of the sample study were in the pilot study. Managers and supervisors

were not included in the pilot study due to their limited number in the district, they were earmarked to be part of the sample study. The data collected during the pilot interviews was not included in the final data analysis of the study. The pilot study allowed the researcher to identify some aspects that needed to be rectified and amended accordingly. The pilot also assisted the researcher to practice asking probing questions and master the skill of interviewing.

2.8 Data management and quality assurance

All the audio recordings from the interviews were transcribed and a specific code was allocated for each transcript to ensure anonymity by de-identification. To ensure confidentiality, the audio recordings and interview transcripts were kept in a computer and could be accessed by the researcher through a password that is known by the researcher only. No unauthorized person had access to any of the data except the researcher and their supervisor. The data will be kept for two years following any possible publication and if no publication, then data will be kept for six years.

To maintain quality assurance of the transcripts the researcher read the transcripts word for word while listening to the audio recording. The researcher made corrections for inaccuracies and errors when audio recordings were transcribed. The backups of fieldnotes, signed consent forms and the transcripts were filed as hard copies and kept in a safe and secured cupboard. The data collected was shared as encrypted files with the supervisor. The transcripts were stored in the researcher's laptop protected by a password. The audio recordings will be destroyed five years after the completion of the study.

2.9 Data analysis

The field notes were incorporated into the data (Clarke and Braun, 2013). After transcribing, the data was manually analyzed. All transcripts were read several times and initial themes that were drawn on the objectives of the study were identified. The transcripts were read line by line to identify both deductive and inductive codes. Later, the inductive codes that emerged from the data were identified as they reflected issues raised by participants and differed from literature (Fereday and Muir-Cochrane, 2006). A deductive approach was also used to identify pre-determined themes according to the study objectives and literature on the experiences of EHPs. The data was coded after the researcher became familiar with the data. After clustering the codes, the researcher

labelled the clusters based on meaning and relationships shared among the codes. Different codes were sorted and collated under the same thematic umbrella with broad codes and fine codes. These broad codes were refined and became themes, and fine codes were also refined and became sub-themes. The labelled clusters formed the themes. The researcher developed a code book with codes extracted from the themes and sub-themes. The researcher reviewed the themes against the data to ensure that the themes capture the meaning aspects of the data. To improve quality of data and ensure reliability and rigor, transcripts were re-read. The researcher reviewed the themes with the original transcripts to ensure the credibility of the analysis and data. The supervisor and researcher both checked and reviewed the code book, applying the codes to the transcripts to ensure that there was meaning and relationship and to reach an inter-code agreement.

2.10 Rigor in Research

Demonstrating rigor in qualitative research is crucial and pivotal to ensure that the research findings have integrity. The extent to which the findings of the research study are trustworthy can be achieved by ensuring that the results of the qualitative study are credible, transparent, and dependable (Graneheim and Lundman, 2004). The principles of transferability, dependability, credibility, and confirmability were therefore considered in the study (Burnard, 1991).

2.10.1 Trustworthiness

According to Gunawan (2015) there are four primary criteria to ensure trustworthiness in a qualitative study, and they have been further divided into credibility, dependability, transferability, and confirmability (Gunawan, 2015, Lincoln and Guba, 1985). The aim of trustworthiness in qualitative research is to support the argument that the research findings are "worth paying attention to" (Lincoln and Guba, 1985, p.290). In a qualitative study, truth is subjective and is based on the individual's perception of truth (Graneheim and Lundman, 2004). The research findings reflected honest reflection of the study participants' views, thoughts, perceptions, and experiences because of the study design. In this research study, trustworthiness was achieved as discussed below:

Credibility is the most important aspect to establish trustworthiness and is defined as "the confidence that can placed in the truth of the research findings" (Anney, 2014, p.276). Credibility refers to the accuracy of the findings and requires the researcher to clearly link the research results

with reality to demonstrate the truth of the research results (Kalu and Bwalya, 2017). This was done by validating the codes with the supervisor, reviewing drafts of data analysis and frequent meetings. The existing literature was also reviewed and linked to the study research questions and objectives to assess and establish credibility.

Transferability refers to the extent to which the study results of qualitative research can be applied to another context with other participants, this is sometimes interpreted as generalizability specifically in quantitative research (Lincoln and Guba, 1985, Bitsch, 2005). This was achieved by providing a detailed description of the research process starting from data collecting, context of the study, to the production of the final report.

Confirmability refers to the steps taken by the researcher to ensure that findings are derived from the data and not their own predispositions and affirmation; that findings are the participant's responses and not due to the biasness and prejudice of the researcher (Bitsch, 2005, Kalu and Bwalya, 2017). Data, interpretation and findings should be anchored in individuals and contexts separate from the researcher (Bitsch, 2005). Confirmability was achieved by ensuring that a detailed account of the research process was provided. The data was interpreted within the confines of the participants responses.

Dependability refers to the extent to which the research can be repeated by others and still obtain the same findings. According to Bitsch, (2005, p.86) dependability refers to "stability of findings overtime". Dependability was achieved through the provision of the detailed comprehensive description of data collection and data analysis steps which included the questions and themes provided. This was also achieved through inter-coder reliability where the supervisor checked and reviewed the code book, applying the codes to the transcripts to ensure that there was meaning and relationship.

2.11 Reflexivity

According to Watt, (2007) reflexivity is a strategy of qualitative research that a researcher employs to ensure the rigor and quality of research by acknowledging that too are part of the research process. Therefore, one's thoughts, perceptions and beliefs can influence the research (Watt, 2007). My position as deputy director who once worked with some of the EHPs at the district might have had influence and compromised the authenticity of the participants responses especially the EHPs

at the district level. To address this, EHPs were reassured that all the information provided during the interviews would be treated with confidentially and anonymity adhering to ethical standards of University of Witwatersrand and the Department of Health.

Regarding the effect of power and positionality during interviews, I explained to the participants that the research was conducted for the fulfilment of the Master of Public Health degree and that the reflections shared would not influence their position in the district whether positively or negatively. Furthermore, I have worked in the same district under same directorate within the environmental health program, therefore my insider perspective was likely to have influenced both mine and their views on the EHPs' lived experiences of the district. I mitigated this through having several meetings with my supervisor and included my supervisor in the data analysis process to lessen any possible errors or misinterpretation of the data.

2.12 Ethical Consideration

Ethical approval was obtained from the Wits Human Research Ethics Committee (HREC) (Clearance Certificate M171174) (Appendix A). Approval was also obtained from the District Research Ethics Committee from Ekurhuleni Health District (Appendix I) and Gauteng DOH Provincial Research Committee. Participants were briefed about the nature and purpose of the study and given an information sheet (Appendix G). The information sheet assured confidentiality, and participants were also informed that they can refuse or withdraw from participating without any negative consequences. Voluntary informed consent was sought from the EHPs to participate in the study (Appendix F). Informed consent was also obtained from the participants to audio record the interviews (Appendix H). The researcher ensured confidentiality, anonymity, and integrity throughout the course of the study. All data would only be accessible to the researcher and their supervisor. De-identification of transcripts ensured confidentiality and anonymity of participants by allocating codes as identifiers. The researcher ensured that no identification was disclosed and pseudonyms such as EHP3, EHP1, EHP5 were used to ensure anonymity and confidentiality. All documents that bear the participant identifying information were stored in a lockable filing cabinet and recordings were captured and saved in password-protected laptop. All participants were assured of privacy, anonymity and confidentiality of their identity and their contribution to the study and that the audio recordings would be destroyed after six years if the study is not published and after two years if there is publication.

CHAPTER THREE: FINDINGS

3.1 Introduction

This chapter discusses the findings of the study. It begins by describing the characteristics of the study participants. It then presents the findings through the main themes. These include role description and training of EHPs, role duplication, limited collaborative meetings between province and municipality, challenges experienced by EHPs, successes and enabling factors, and recommendations to improve the execution of EHP's roles. The themes also have various sub-themes. These are illustrated in Table 3.1 below.

Table 4 Summary of themes and sub-themes

BROAD THEME	SUB-THEMES
Role description and training of EHPs	EHPs' description of scope of practice
	Relevance of EHPs' training to their roles
Challenges experienced by the EHPs	Resource challenges
	Constraints due to insufficient budget allocations
	Barriers to legislation on role execution
	Role Duplication
	Limited collaborative meetings between the province and municipality
Successes and enabling factors	Professional growth of EHPs
	Availability of tools of the trade
	Achievements of objectives of EHPs' roles
Recommendations to improve the execution of EHPs' roles	Legislation and role review
	Improved communication
	Employment of additional EHPs
	Prioritization of environmental health program

3.2 Characteristics of participants

A total of sixteen EHPs from the metropolitan municipality and the province participated in the study and were interviewed between May 2018 and June 2018. The participants were of three different categories namely: junior EHPs, supervisors (to whom the junior EHPs reported directly) and managers (those who had an oversight role for the environmental health programme). The supervisors, also called Chief EHPs, are directly responsible for the EHPs. The managers are also called Assistant Directors and are the accounting officers responsible for the environmental health services in the district. junior EHP reports to the Chief EHP as an immediate supervisor and the Chief EHP reports to an EHP who is an Assistant Director managing the programme in the district. The participants constituted eight junior EHPs from the province working in the district and two junior EHPs from Ekurhuleni Metropolitan Municipality. Two EHP supervisors from the Ekurhuleni Health District also participated in the study; one from the Ekurhuleni Metropolitan Municipality and one from the province working in the district. Four managers participated, two from the Ekurhuleni Health District, one from Ekurhuleni Metropolitan Municipality and one from province working in the district, and two managers from the Gauteng provincial office

Half of the participants were males and females, respectively. Eleven of the participants were of ages between 20-40 years while five were above 40 years of age. Regarding the level of education, 14 of the participants had postgraduate qualifications and two had diplomas. The years of experience for ten of the participants was less than 10 years while the six participants had more than 10 years.

3.3 Roles description and training of EHPs

3.3.1 EHPs description of scope of practice

The EHPs' perception of their scope of practice was explored. Most of the EHPs mentioned that there is legislation that governs and regulates their scope of practice to ensure compliance in government facilities. They added how there are internal policies that were measured against the legislation. One participant mentioned as follows:

> *"Ok! Yes, there's legislation- the Waste Management Act 59 of 2008. It is the Act that we use to ensure compliance for the government facilities and then we have our internal*

policies: the Gauteng health care risk regulation of 2004, so in terms of compliance that's where we measure them with those legislation" [EHP 1]

Most participants confirmed that there are many guidelines from the Health Professionals Council of South Africa (HPCSA) and EHP council that regulate their professional practice. They also confirmed and stated that they have a legal framework that defines their scope of practice. The manager from the province commented as follows:

"Yeah, we do have a legal framework: firstly, we fall under the Health Professions Council (HPCSA) and then there is an act that regulates the environmental health practitioners" [Province EHP Manager 1].

Some participants mentioned how there was a formal accountability process that enforces integrity in the practice of EHPs. They noted that EHPs need to be registered to maintain a high code of ethics to be able to practice. They added that integrity was an important aspect of their professional conduct. One participant mentioned as follows:

"There are legislations, there is scope of practice of environmental health `practitioners, and they are registered as environmental health practitioners, so they need to have a high code of ethics as well to be able to practice as environmental health practitioners. So, integrity is a very important component of the profession for the conduct of environmental health practitioners" [District EHP Supervisor 1].

Most participants mentioned the roles of EHPs that are published and outlined in the different Acts. They also highlighted that their functions which include malaria control, hazardous substance control and Environmental Impact Assessment (EIA) were gazetted in the Health Professions Act and National Health Act.

"The functions of EHPs were the ones gazetted on the act: your malaria control, your hazardous substance control and your EIA…it's the health professions act, the national health act" [EHP 3].

Some participants appeared to be familiar with the existing policies that defined their scope of work. They highlighted the nine functions of EHPs and spoke to those stipulated in the National Health Act. One EHP said:

> *"According to the Health Professions Act and the Environmental Health Act I think 56 of 1974, the scope governing Environmental Health Practitioners: is surveillance of premises, food safety, environmental pollution control, prevention and control of commutable diseases including immunization, waste management, disposal of the dead. They are nine: disposal of the dead, chemical safety"* [EHP 2].

Most EHPs were able to show understanding of the interpretation of the acts that regulate and govern their functions according to different spheres of government. They highlighted the nine functions that are performed at municipality and provincial government. One of the district managers commented as follows:

> *"Ok! According to National Health Act 61 of 2003, it sorts (seeks) to divide functions. We have those functions that are rendered at the province level which are the two functions (malaria control and hazardous substance control) that I have indicated and the nine that talk to (1) food safety and (2) one is surveillance of communicable diseases. (3) is water monitoring, I don't know whether I need to unpack them, or I can just list them (4) Water monitoring, (thinking), (5) vector control, (6) disposal of the dead, (7) pollution control (8) environmental pollution control and the (9) one is Chemical safety"* [District EHP Manager 1].

Most participants stated that all the EHPs are trained in all the functions of EHPs, and they have been exposed to carry out these functions in various spheres of government. Even if the EHPs are working at the municipal (local) or provincial office, they should be able to perform all the functions of EHPs.

> *"…as an EHP you are trained to do all the functions regardless of whether of where you are based in local and in (the) provincial office, so we (have) been exposed in all the functions"* [EHP 3].

However, according to some of the participants, this process changed when the National Health Act was amended. They mentioned that there was thereafter a devolution of environmental health services from the provincial sphere government to the municipalities. Moreover, they noted that

some of the functions from the environmental health services (provincial) were now included as part of the municipal health services in the new act.

> *"Then when there was the devolution of Environmental Health Services from the provincial sphere to the local Government sphere; that particular proclamation spoke only of environmental health services. It was referring to the definition of municipal health services as defined in the new Act"* [District EHP Manager 2].

Most of the EHPs from province working in the district felt that after the devolution of the EHPs functions, they were left with nothing to do in the district except only two functions i.e., malaria control and hazardous substance control and they had to find something to do to keep themselves busy. They believed that after devolution their role was mainly at the local government (municipal level), and they should have been moved to work under local government.

> *"For the District EHPs, there is no role for us. Why I say that when the devolution happened, I believe everywhere across the country we all should (have) been moved to the municipal. I think it was 2011/2012. Why I say that we had to now try to find something for us to do. Our role is environmental health (practitioners), I believe is at the municipal level"* [District EHP Supervisor 2].

Other participants added:

> *"So, at this moment we have been stopped from doing the municipality functions. Now, we just focus on malaria and hazardous substances and EIA"* [EHP 6].

> *"And from there we were left with malaria and hazardous. So, our role as the district is to then (to) implement those two roles"* [District EHP Supervisor 2].

3.3.2 Relevance of EHP training to their roles

Most participants reflected on the extent to which their training was relevant and prepared them for the functions they were expected to conduct on the ground. It appeared that there were mixed perspectives. Several of them indicated that their formative training (as in university) was less relevant as compared to subsequent training. For instance, the majority of the EHPs felt that the courses they studied at university were not related to their practical experiences.

One participant had to say about their formative training:

> *"Ok yeah (uhhmm) ok from national diploma from first year to third year, first year we were doing modules like chemistry, microbiology and (uhmm), in a broad view I would say most of the information that we were taught at school is not applicable at the workplace"* ... "*Physics and chemistry and the content that they were teaching. Not that chemistry is irrelevant to my profession, the content they were teaching us is irrelevant with our scope"* [EHP 2].

On the other hand, most EHPs felt that the BTech degree[8] and short courses they studied were more relevant and helpful in meeting the mandate of the managers of environmental health services and in executing municipal health services in general. One of the EHPs expressed this as follows:

> *"These short courses are very, very, very helpful in executing our duties... Honestly, out of the 4 that I have already counted, I would say Environmental Impact Assessment (EIA) training is relevant and then project management training was also relevant"* [EHP 6].

Another participant added that:

> *"Yeah, it is relevant (to) what I'm doing because when we talk about EIA (Environmental Impact Assessment) we go and assess the new development where there isn't any development in the area and then we check all the environmental impact/hazards that can happen in the place*" [EHP 7].

Some EHPs felt that the training during their National Diploma was adequate because it was incorporated with the five days of exposure to the practical experiences at the workplace. These were done during holidays to gain more exposure and experience. This reportedly assisted them to carry out different EHP functions, as noted by one participant:

> *"At school, we get a chance to be exposed (eh) we call it (eh) work integrated learning, so you go there for maybe five days during your school holiday and see what other Environmental Health Practitioners do, so already when you come to the system you already know what's happening*" [EHP 2].

[8] National diploma for Environmental Health extends over a three-year period. After students have obtained their national diploma qualification, they may continue with a fourth year of study to obtain the Baccalaureus Technologiae (BTech) degree.

Another participant attested as follows:

> *"So, during that period during the holidays, we used to go to municipality to do work integrated learning maybe during the winter times and so forth just to acquire the experience in terms of how they do there at the municipality"* [EHP 4].

3.4 Challenges experienced by Environmental Health Practitioners

3.4.1 Resource challenges

3.4.1.1 Staff Shortage

Most of the EHPs considered their work to be very demanding as there was reportedly a lot that needed to be covered within the functions of EHPs. They raised the issue of EHP coverage in the country which also affected their district. They mentioned that there was a shortage of human resources within EHPs in the district. They stated that the district could not meet the WHO norms and standards that were also adopted by South Africa (NDoH, 2013b), which reportedly stipulates 1 EHP per 10 000 population (1: 10 000). An EHP expressed this notion as follows:

> *"The issue of capacity… because as environmental health according to the WHO standard which has been adopted by national it should be 1 EHP to 10 000. Yeah, and when we look into, especially in Gauteng- we are currently having less than 500 EHPs in the country"* [Province EHP Manager 1].

Another commented further on the inadequate supply of EHPs in the country by indicating that:

> *"We have had several meetings and have cited their challenges in terms of a capacity… eh looking at the norm for environmental health which is 1 is to 10 000 as per WHO. We are currently sitting at…. I think last when we communicated with them, we were sitting, I think 120 EHPs and the population its 3.2 million (in Ekurhuleni Metro Municipality)*[9] *… so it means we still have a lot (of EHP shortage in Ekurhuleni)"* [District EHP Manager 5].

[9] Mentioned during 2019 at the time of data collection.

Most of the EHPs alluded to the shortage of EHPs from municipality who are expected to carry out all the nine municipal health services. They indicated that they were unable to conduct some of the functions such as water sampling and vector control programme Most of the municipal EHPs expressed that they are overburdened by the increased workload without the additional workforce. Some indicated the following sentiments:

> *"The challenge now is with regards to capacity, shortage of staff. Remember there was now with the proclamation of 2012; the workload has increased significantly. Those state premises include all your schools, clinics, hospitals and prisons, correctional services. All state premises where public members are expected to be accommodated or assessed… they form part (of) that workload which is now been brought into the metro or to local government as a result of that…. so, there has been now an increase in terms of workload but no increase in human resource(s)"* [District EHP Manager 2].

Another participant, noted this concern of being overburdened:

> *"Now that's an additional workload that our people (have) inherited. So, they are overburdened because with the (additional) functions. No human resources were transferred, and they are overburdened already, and it places them in a difficult position to go to the respective areas where they work (offering services). That's an additional burden"* [District EHP Supervisor 1].

Some participants indicated how this shortage of staff affected the provision of services and the extent to which the EHPs could exercise their roles. For instance, one participant noted how the EHPs from the municipality could not conduct water quality and monitoring as it was an ongoing process of taking water samples to the laboratory.

> *"But now because we know that (eh, eh) the guys from the municipality are saying they are short-staffed (stutters)…… They are short-staffed……They don't do water quality monitoring. The way we do water quality monitoring should be an ongoing thing, not (by doing) water sampling based on a certain problem, it should be an ongoing thing to check if the water complies with the standards as time continues but they are not doing that and that's how we were doing it"* [EHP 2].

3.4.1.2 Constraints due to insufficient budget allocations

According to the provincial EHPs, the budget that was allocated for the environmental health programs in the district was insufficient. They noted that most of their work was fieldwork that required them to travel while they also needed special equipment to carry out their duties, such as the collection of samples. In most instances, they were reportedly allocated only one car to use for their visits and were told that there was a shortage of vehicles in the district. They also added that there was often a lack of funds to purchase sample equipment. One of the managers and an EHP noted as follows:

> *"And then again, the other issue it's the money, the budget. I think the budget is also a big issue here……NOT enough budget. We don't have enough budget to… for example currently with this Listeriosis issue[10] we had challenges because we didn't have enough budget to buy adequate sample equipment"* [Province EHP Manager 1].

One of the participants also confirmed the challenges of an insufficient budget. They noted that due to this limitation, equipment that was identified to require repairs was not attended to. One participant described this as follows:

> *...I remember with clinics; I would go and identify the ultra-violet light is not working. You would go back there after a month, the UVG light is not working. You go there after two months, UVG light is still not working, and you know the importance of having UVG light, especially in a clinic. So, such things were a challenge"* [EHP 6].

Another EHP expressed the issue of shortage of resources such as equipment:

> *"I think the basic challenge will be the resources. Resources in terms of if you want to undertake a campaign, an awareness campaign; you will need some materials to do that, you will need some equipment; (only) to find that you are not going to get all those equipment's (sic) like we requested them"* [EHP 9].

Most of the participants shared the same sentiments on the shortage of resources to carry out their duties, sometimes they are expected to do water sampling using a special equipment called a Bunsen burner and reported not to have the equipment. One manager noted that:

[10] A listeriosis outbreak occurred in South Africa from January 2017 to July 2018. EHPs were required to conduct an outbreak response in the district.

"Lack of resources for example when you have to go, the time we were doing water sampling when we have to go do water sampling you don't have the stabilizer for the tap, which is the Bunson burner" [District EHP Manager 1].

3.4.2 Barriers to legislation on role execution

It was indicated by most of the EHPs that when the National Health Act No 61 of 2003 was promulgated in 2012 and 2014, all the municipal health services were devolved to municipalities and the EHPs from municipalities were the only ones to enforce environmental health laws in the community. The majority of the provincial EHPs expressed concerns that the legislation did not support and allow them to carry out some of the municipal functions. There were reported cases where they would conduct site inspections and identify some gaps regarding non-compliance but would not be able to issue fines because they were not authorized by legislation to do so. Some of the participants from the province noted as follows:

"*Yes, at district level we do advise but there's no enforcement. Nothing has been done, we do an inspection, we do everything but there's no enforcement and if there is no enforcement to say we give you this time if you are not, we will fine you, then no one will do the right things hence our… Yes, only municipal…law enforcement lies with municipality"* [EHP 8].

Another EHP from the province echoed the same sentiments that they are unable to enforce laws when there is non-compliance but only municipal EHPs are legally mandated to enforce laws:

"*Because now when it comes to subjects like food control- if they (municipal EHPs) inspect and they compare the inspections with the relevant standards and realize that there is no conformance, they (municipal EHPS) have the power to prosecute or fine or because. They can do, they are mandated to do such activities of prosecution to enforce compliance"* [EHP 2].

A provincial EHP manager working in the district added the same view. They indicated that the provincial EHPs working in the district felt that they could not prosecute those who are non-compliant because they are not legislatively mandated to carry out some functions in the district.

> *"They (provincial EHP) feel that they (are) not fully capacitated to implement legislation. Where you find that a person is not complying you cannot be able to sort of prosecute that person or take that person through legal (action) because you are not mandated"* [District EHP Manager 1].

Another participant added more context by noting that according to the National Health Act 61 of 2003, municipal health services were the responsibility of the province but after the Act was repealed in 2012, the services were the function of the district municipalities. Therefore, most of the functions were reportedly the responsibility of municipality EHPs which the provincial EHPs were not supposed to perform.

> *"Ehmm, we had previously, if you look at the transition between the National Health Act no 61 of 2003, which previously stated that services were done by the provincial in terms of health surveillance of premises at state premises, it was done by provincial EHPs. That was section 54 of the old Act. Now with the repeal of the old health Act, the complete repeal which happened in 2012, section 54 was also repealed making the rendering of environmental health services in those premises to now be a function of the district municipalities."* [EHP 8].

The EHPs from the district were also of the view that the environmental health legislations were outdated and needed to be reviewed and amended. For instance, they mentioned that the fines were issued according to the legislation, however, the amount charged was too little and did not carry the weight to force companies to comply. One of the EHP managers at the district level noted as follows:

> *"The issues of ensuring that we implement the hazardous substance act and if a person is not complying, we are expected to do something but also our hands are tied because our legislation is very old. It's a 1945 legislation so your penalties there… some of them are R30…and when you go to companies, they tell you that 'we can be able to pay you this R30 for 15 years and stop coming to our companies'. So those are some of the challenges that we have at the district level"* [District EHP Manager 1].

3.4.3 Role Duplication

According to the National Health Act (NDoH, 2004), most of the functions in the district are supposed to be carried out by the municipal EHPs as part of the municipal health services. However, some participants mentioned that due to a shortage of EHPs from the municipality, provincial EHPs found themselves overlapping and carrying out municipal health services. This was reportedly due to the arrangement made by both entities; where municipality EHPs and provincial EHPs agreed to support one another and share the functions. One of the district managers indicated as follows:

> *They (provincial EHPs) do surveillance of premises. Remember as I had said in the state premises, they are rendering those functions, not only hospitals, but all state premises, your old age homes, and your school. Even though the proclamation was passed in 2012, in the realization of the challenge that we have of staff shortage they still made that arrangement where the district will support the municipality"* [EHP District manager 2].

The majority of EHPs and managers from both province and municipality however felt that there was extensive role duplication at the district level caused by the employment of provincial EHPs in the district. One of the issues mentioned by the EHPs from both spheres of government was the confusion created by the duplication of roles. The EHPs from province still execute same duties executed by EHPs from municipality. This had reportedly led to conflicts amongst EHPs in the districts. One of the EHP from the district expressed their view as follows:

> *"But with regards to other functions that we were doing, we have a conflict with each other as colleagues from separate entities (i.e. provincial and district). There's duplication of work or in some cases, you will find out that an EHP from the municipality was in the very same facility to do the exact job that you are there to do"* [EHP 3].

Another participant representing the provincial sphere echoed a similar concern as follows:

> *"The challenge is that there's no uniformity in terms of executing these roles because you find out that there are roles that we are doing, and the municipality is also doing"* [EHP 1].

One of the participants (from the province) also indicated how when they were employed at the district, they were under the impression that they were expected to render specific functions allocated to the provincial sphere of government which is malaria control and hazardous substance control. However, this seemed not to be the case as they were also performing municipal health services, therefore resulting in role duplication:

> *"I was expecting to do malaria control of which now maybe we were going to deal with campaigns... doing campaigns to make people aware of this (eh) this function and hazardous substance control. Those are the functions that I expected when I came here but now when I came here, I also found out that there was duplication of services. Now they were including (eh) even municipal (eh) functions"* [EHP 4].

The majority of EHPs from the province working in the district indicated that the municipal EHPs were somewhat unhappy with the overlapping of roles as evidenced by the grievances expressed by municipal EHPs regarding the overlapping of functions. They were reportedly offended by the practice as they felt that it was undermining their work. The matter was reported to the management. The participant even indicated that they were advised to discontinue to conduct the functions deemed to be those for municipal EHPs. One provincial EHP noted as follows:

> *"I thought they are happy, but they were not happy when we were doing their functions. That is why (they even intervened we must stop) doing their functions, they can do them on their own. …… Yeah! They can do that, that's what they did. I think it was late last year… yeah it was late last year. So…either way that shows they were offended that we were doing their functions and, on our side, how can we do their function"* [EHP 6].

Another EHP from the district described their experience on the ground when they were providing services in facilities. They highlighted how there were tensions between EHPs from the province working in the district and EHPs from municipality because of this duplication of roles:

> *"We go to the same facility with the guys from the municipality and there's always a conflict then when we got there. They told us no the EHP of the area was here yesterday and he said he is coming again today. So, on our way out we met with him, but he was nice he didn't… like he was pretending to be okay, but when he got here, he told his boss that there were EHPs from the district…. that they were undermining our work. It means*

(implies) that we are not doing our work the way we are expected to do. Then they wrote a letter to the manager saying EHP from the district should stop doing NGOs at all because they don't have the mandate to do that... yes" [EHP 4].

Some participants further reflected on this duplication of roles of the provincial EHPs in the district. They indicated that the duplication occurred because municipality EHPs were not working over the weekends. They noted that when there is an outbreak over the weekend, the provincial EHPs who are mandated to work over the weekends are forced to work so that they can write a report to the authorities although they are not legislated to conduct case investigations. Then municipality EHPs will come back during the week and conduct the very same outbreak response that was already investigated by the provincial EHPs, hence exacerbating the contention and confusion. An EHP from the province further described how this duplication occurs on the ground:

"I think there is a mistake because the functions of the environmental health practitioners, most of them were taken and given to the municipality and according to me there is a gap because we still have to monitor those and sometimes, I will give you an example; when there is an outbreak of any kind in the province sometimes its Saturday or Sunday, you will never find any EHP from the municipality. You are stuck and the MEC (Member of the Executive Council) wants a report. Where will you get the report? We end up having to do that and when we do that, we are contradicting the Act because it's not entirely our responsibility to investigate. It's the responsibility of the municipality according to our scope of practice." [EHP Provincial Manager 2].

Some provincial EHPs felt that they were misplaced in the districts and that this had eventually resulted in resources being compromised. They expressed that working as EHPs from the province and reporting on activities they are not legislatively mandated to do was frustrating. They also expressed that their work as EHPs from the province seemed insignificant as compared to that of the municipality EHPs. They highlighted that they are reporting on two functions namely malaria control and hazardous substance control. However, other functions they are doing, they are not mandated to report on as they are municipal functions.

"Main challenges right now are resources and why we are struggling with resources it's because we are misplaced. Our role is misinterpreted as insignificant versus if we would be placed at a municipal level under budget where those nine functions where malaria and

hazardous would be inclusive there and we will have a significance role. So now the frustration is that we are reporting on these two mandates (malaria and hazardous substance), the rest that we are reporting on are not mandated. So, what are we doing? That is the most concern about EHPs. What exactly are we doing? It's like we are fitted in to try and do something in-order for us to get paid" [District EHP Supervisor 2].

3.4.4 Limited collaborative meetings between provincial and municipality

Despite the challenges that were experienced by the EHPs in the district, it was noted by most of the EHPs that there were no forums for province and municipality EHPs to share and discuss the challenges of providing environmental health services in the district. Most of the EHPs were very adamant that they have never attended environmental health meetings in the district with both EHPs from the district and municipality to discuss their roles and challenges. However, EHPs from the municipality are fully aware of what constitutes their roles. One EHP expressed as follows:

"No, at my level I have never attended such meetings. ...I have never attended a meeting whereby we sat down as a District and Locally to discuss exactly whose role to do (EHPs roles), but I understand from their (Municipal EHPs) side they are very much aware of what they are supposed to be doing" [EHP 1].

Most of the EHPs stated that they only met accidentally in the field when they were providing services or responding to the same outbreak in the same area or to the same person. However, outside of these accidental encounters, there were no scheduled times when they met to share their experiences. Some of the EHPs expressed this issue as follows:

"No, I wouldn't say, we can meet…. With regards to the municipalities, we only meet at the field…" [EHP 2].

"No, since I got here, we have never had one, there have been no platforms. I have never…" [EHP 4].

"On the operational level we don't, ……. let me rather say ever since I (have) been here I have never sat in such a meeting…but what I know is managerial people seat(sic) in such meetings" [EHP 3].

A few of the participants added that the only other time they met as EHPs from the province and the municipality was when there were trainings organized in the district. Some participants noted as follows:

> *"The only thing that was happening was attending the training: outbreak response training only, that's when now maybe EHPs from the municipality will combine with the ones from the district, other than that never"* [EHP 4].

> *"No, unless if it's during training only……unless if they know each other through college but there are no platforms at all"* [EHP 2]

Most of the participants highlighted that only EHP managers attended their scheduled meetings. There are meetings scheduled quarterly for EHP supervisors and managers from both the municipality and the province which include quarterly reviews of all the programs in the Ekurhuleni Health District. However, there are internal meetings that are attended only by EHPs from municipality. The district supervisor commented as follows:

> *"At corporate level (top management level) there are meetings that are taking place. At the management meeting, the province comes regularly. I think at least twice a year"* [District EHP Supervisor 1].

The same sentiment was shared by one of the EHPs:

> "*I know there is management meeting. They do have their quarterly reviews but there is a quarterly review for district managers from the province but am not sure if it's continuing with municipality or what "*[EHP 7].

The provincial office reportedly had scheduled meetings with all districts separately to discuss their performance and challenges. When the provincial office holds these meetings with the municipality, only district EHP managers from the province are invited to attend. One manager noted as follows:

> "*We do have (eh) we do have like I said every quarter I need to give them feedback, how they perform. Municipalities and in that meeting the district will be part of that meeting*

when we go. Normally, I go from one municipality to the other so that I can give them their report feedback and they must also tell me their challenges. …We also have quarterly meetings with the province and the municipality (separately) So, it is legislated under chapter 40. I need to hold those meetings" [Province EHP Manager 2].

3.5 Successes and enabling factors

3.5.1 Professional growth of EHPs

Despite the challenges they encountered in the district, most of the EHPs noted that they were fulfilled with their professional growth. They indicated that the managers ensured that the junior EHPs were developed professionally and capacitated so that they improve their skills and knowledge. One participant noted:

"We have good management and I've been capacitated in several aspects including speaking in public, meetings, chairing meetings doing inspections and doing report writing and all those processes. And we have attended so many trainings that I believe they have capacitated me to be better in the provision (of services) and grow professionally" [EHP 2].

Another EHP mentioned how they have grown professionally in their career:

"There's been a lot of success as well. You grow professionally. I believe I'm not the same as I was during my community service. We won awards as a team…when I came for community service. I won an award for the best com serves (community service) in South Africa; then the following year we had an award for a project; lead poisoning in Early Childhood Development (ECD) centres. So those were one of the successes and also, I believe we have had good relationships with the stakeholders that I work with" [EHP 3].

3.5.2 Availability of tools of trade

It was noted by some participants that the EHP managers had been supportive and ensured that the tools of trade were made available to enable them to carry out their duties efficiently. They had reportedly managed to buy even the most expensive equipment which was then subsequently procured for other districts as well. One EHP noted as follows:

"We managed to get a machine that can read the amount of lead in paint……. It's a very expensive machine but it was only, it's only us in Gauteng that managed to get that machine. We proposed until it was given, fortunately or unfortunately we managed to propose, and the machine ended up being distributed to all the districts in Gauteng……., then I can go to the crèches to read the amount of lead in the toys of the kids" [EHP 6].

3.5.3 Achievement of objectives of EHPs' roles

Most of the EHPs were of the view that regardless of some of the challenges, there were several achievements in the execution of their roles in the district and therefore their provision of services. These achievements were reflected in several ways. For instance, some of the EHPs indicated how some of the non-compliant organizations were now compliant and were accredited with certificates.

"Even though I have said facilities don't comply there are a few that do comply, It's not many. Few facilities have also been recognized in terms of improvement… so success (it) might be an improvement in very few facilities" [EHP 1].

Another participant highlighted their achievement and mentioned that their efforts were recognized and appreciated. This was evident in how they had made a difference by managing to send the water samples from the provincial clinics to the laboratory on time and the laboratory results were issued before the quarterly clinic audits were conducted every quarter. This was an indication of compliance by the health facilities with the environmental health programme in the district.

"I will consider it as an achievement that they recognize our effort, and we could make a difference, and they express their gratitude. And the other thing we managed to provide water samples on time because these provincial clinics are audited quarterly" [EHP 2].

Through their robust prevention strategies, they indicated that they had also managed to reduce cases of malaria deaths in the district. Various awareness campaigns were held in the malls and

shopping centres where the focus was on odyssean malaria[11] which is the malaria that is acquired in non-malarious areas from a bite of an imported mosquito. One EHP noted this by saying:

> *"We always had high cases of malaria. With the approach that we have now, we have managed to reduce the number of malaria cases. We have won awards, the Khanyisa award…hmmm… I forgot the other one. With the approach we had, we took it to the street. Instead of going to do an investigation we decided to do prevention where we targeted the malls, specifically talking about Odyssean malaria where a person would have malaria without any travel (history)"* [EHP 6].

3.6 Recommendations to improve the execution of EHP roles

In light of several factors that compromised their ability to fulfil their roles and provide adequate services, the participants provided recommendations that they felt could potentially enable EHPs to carry out their work and fulfil their mandate as prescribed in their scope of practice. These included legislative and role review; improved communication and employment of new additional EHPs.

3.6.1 Legislation and role review

The majority of EHPs felt that it would be better for the EHPs in the district to be moved to municipality because according to the legislation, most of the main environmental health functions are assigned to the municipalities. The EHPs from both spheres of government felt that provincial EHPs working in the district were misplaced in the district because they believed that environmental health services are more relevant to municipality. They were of the view that environmental health challenges are at municipality level, so they need all EHPs to be based at the municipalities (local government sphere) to deal with environmental challenges. Some expressed the following views:

> *"If they can come over to compliment the staff complement at the local (municipal) level it will be the ideal situation...I think they are misplaced. Environmental health is a local government function and it's unlike personal health which is provincial or in a higher*

[11] Odyssean malaria refers to the malaria transmitted by translocated mosquitoes (mosquito transported by a vehicle from malaria area). Odyssean malaria also known as airport, suitcase, minibus, or taxi-rank malaria.

sphere of government function because there is personal health whereas environmental health at local. This is where the actual challenges are" [District EHP Supervisor 1].

Some EHPs shared the same sentiments recommending that EHPs should all be under municipality to avoid the conflicts they experienced:

"I think at some point it will be just good for all of us to belong to one sphere of government then we can just divide and specialize in different fields so that it will just stop the conflict. I think it will be better for the local municipality to take the district EHPs. Something of that sense and then those logistical issues on who would do what then they can be sorted out later but you all report to one person…" [EHP 3].

In reiterating that they felt that they did not fit at the district level, one manager stated:

"I honestly feel as a manager of environmental health I shouldn't be here. I should be at the municipal level, or the Municipal should come here" [District EHP Supervisor 2].

Another participant noted that if both EHPs from municipality and district can merge, a lot can be accomplished. They noted that:

"If district EHPs and municipal EHPs can be one. We don't have district EHPs… but if EHPs can be one thing, we speak the same language a lot can be done" [EHP 8]

Other participants felt that environmental health services should be nationalized and clear all the confusion so that no one will claim they are from municipality or province. One noted as follows:

"Yes, EHPs should be at the national level because if it's national., Maybe if we take the EHP from local and municipal, then it will equalize everything or environmental health will be at the national level so no one would say (I) am from the municipality, (I) am from national or (I) am from Province. For all EHPs to be in the same sphere of government. If we are reporting to national, let it be national. There won't be EHP reporting to municipal …" [EHP 11].

A provincial manager even highlighted that the Minister of Health was not happy and wanted EHPs to be under the National Department of Health (NDoH) so that they get the necessary attention:

> *"The Minister is not happy. He also wants this thing to go. They must be under national health so that they can receive proper attention*" [Provincial EHP Manager 2].

3.6.2 Improved communication

Most participants expressed that EHPs in the Ekurhuleni district should have platforms to discuss how to share the roles and functions. They suggested that there should be at least a quarterly meeting where EHPs discuss strategies to mitigate all their challenges. The EHPs felt that these meetings would potentially assist in preventing duplication of services and improve work relations. Some of the EHPs expressed as follows:

> *"Every beginning of the year we (EHPs) set up a program, knowing that we are going to meet at a certain interval(s) and discuss our challenges because our roles…they are interlinked, and we are working together. When we (district EHPs) meet and they (municipal EHPs) come with their problems, we come with our problems then we discuss and set up the way forward"* [EHP 9].

One participant said that the conflict they had over water sampling was not supposed to be there if there had been platforms to discuss their challenges:

> *"I think there should be a platform where they (EHP managers from local and district) meet and discuss the challenges and they should, for example, this thing of water sampling that ended up stopping because of whatever conflict that it was. I feel like if maybe they had that unity, they were going to share their roles even if it's some sort of a duplication"* [EHP 4].

3.6.3 Employment of additional EHPs

Most of the participants were of the view that there was an urgent need to address the shortage of EHPs. They expressed that environmental health services should be prioritized and employ more

EHPs to meet the required WHO and South African norms and standards. Some participants indicated that:

> *"Ok, the first thing is human resources. When it comes to human resources, and manpower at the moment according to the World Health Organization one EHP should be equivalent to 10,000 population (1:10 000) and our standard in South Africa according to the National Norms and Standards: is 1:15 000. But at the moment, you find 1 EHP is equivalent to almost 50 000 population because there is no manpower (approximate). So (the) key solutions to resolve this is to employ more EHPs"* [EHP 2].

Another participant also highlighted that more budget needs to be allocated to employ more EHPs to meet the increasing demand for environmental health services in the Ekurhuleni Metro Municipality as a rapidly growing urban area:

> *"....as far as the budget is concerned, they need to employ more environmental health practitioners. They need to beef up the budget to employ more environmental health practitioners because I don't think the municipality takes into consideration that Ekurhuleni is (a) rapid(ly) growing urban area, and they need to meet the demands… you know the challenges environmental health practitioners face daily. I think to be quite honest they must commit more money for the employment of additional environmental health practitioners. That will mitigate a lot of these challenges that we experience"* [District EHP Supervisor 1].

3.6.4 Prioritization of the Environmental Health Programme

Some participants were of the view that the environmental health programme was not recognised and prioritized even though it plays a crucial role in the prevention of diseases. Some EHPs also recommended that the programme could be prioritized through an increased budget that is allocated for EHPs to meet the rising need for environmental health service. One EHP mentioned that:

> *"District and the local authority must prioritise on Environmental Health because you will find that now in our District out budget is very tight. It get(s) exhausted, (ah, ah) budget actually we don't have enough funds to render our services both Local and... Locally it's better compared to District they should prioritise on Environment Health. Priority even*

when it comes to budget and the other thing that can be done is to because now there is so" [EHP 2].

Another EHP highlighted the need for government to recognize the role played by EHPs and the significance of having EHPs in managing health issues:

"Ok (uhmm) firstly I think (uhmmm) the government needs to recognise EHPs; they need to recognise the role and the importance of have the EHPs in general" [EHP 6].

3.7 Summary of findings

The findings capture the perceptions of EHPs regarding their roles in the Ekurhuleni District. It was evident that the role of EHPs is regulated and governed by the legislative framework that includes policies, acts and scope of practice to ensure compliance. They noted with concern how their university training was not relevant to the functions they were expected to carry out on the ground, while their post-training was more useful. It was highlighted that the municipalities were facing several challenges in providing municipal health services which then compromised the service delivery of environmental health services in the district. Due to capacity limitations in terms of human resources, the provincial EHPs ended up carrying out some of the functions that were officially the responsibility of the municipality EHPs. This has led to conflicts between the EHPs from both entities.

Overall, most participants expressed dissatisfaction regarding how the environmental health programme is managed. They proposed some recommendations to improve the execution of EHP's roles in the district. Most EHPs recommended that EHPs from the district merge with EHPs from municipality. It was suggested that environmental health services nationalized and all EHPs be under the National Department of Health to avoid the confusion and role duplication. Finally, the participants also highlighted the importance of having EHPs within the communities. They also gave recommendations that the EHPs role should be recognized and prioritized by government and be allocated adequate budget to meet the rising demands to address environmental health challenges in the communities. This included highlighting the importance of having EHPs within the communities.

CHAPTER FOUR: DISCUSSION

4.1 Introduction

The study aimed to explore the roles of Environmental Health Practitioners in the Ekurhuleni Health District, Gauteng Province. The findings captured the perceptions of EHPs regarding their roles in the district. This included the EHPs' and their managers' insights into factors that would enable the execution and implementation of the role of EHPs, the relevance of their training to the functions they were expected to carry on the ground, the challenges experienced in the district and the recommendations to improve the execution of EHPs roles. They indicated that EHPs practice various roles and duties at different spheres of government namely nationally, provincially, and local. The findings reveal that they work and carry out their duties according to their scope of practice and other legislative frameworks that govern the environmental health profession. They also highlighted their concerns on role confusion and role duplication at local government and district level.

This chapter consolidates the main findings and compares them to other findings on the roles of EHPs in similar settings in the broader literature. This chapter provides insights pertaining to the EHPs views on their roles and responsibilities. It also integrates the key themes and sub-themes, which are broadly: role description and training, role duplication, challenges experienced by EHPs, successes and enabling factors to execute their roles and the recommendations to improve the execution of the EHP's roles.

4.2 Environmental Health Practitioners' roles and responsibilities in the district

The findings of the study highlighted that EHPs roles are allocated according to the three spheres of government which are local, provincial, and national. Environmental health services are regulated under the Ministry of Health at national level. Similarly to the National Environmental Health Policy of 2013, the findings of the study highlighted that the EHPs roles and functions are packaged as environmental health services and include food hygiene, adequate and safe water supply, disposal of solid, toxic, and hazardous waste and safety, basic sanitation, control of air and water pollution, and environmental public health disease control (NDoH, 2013a). This study also indicated that at local government level, the roles and functions of EHPs were packaged as municipal health services. Municipal health services are a sub-set that defines the basket of

environmental health services. This study revealed that there is legislation that governs and regulates their scope of practice to ensure compliance with government facilities. Their roles are gazetted and outlined in different Acts such as the Health Professions Act and National Health Act. However, when the National Health Act was amended there was a devolution of environmental health services from the provincial sphere of government to the municipalities. The findings in this study revealed that most of the environmental health services were rendered at local government level as municipal health services. Similarly, in other LMICs environmental health services are provided at a local sphere of government. For example, in India there was a devolution of environmental health services to municipal governance as municipal public health services (Das Gupta et al., 2017).

Environmental health issues are challenges that are experienced at a local level, and they need to be managed effectively at municipal level, and the devolution of environmental health services is a strategy that will be effective in addressing these issues. The findings in this current study illustrated challenges whereby there was devolution of some environmental health services into municipal health services without transferring funds and other resources to ensure enough budget to accommodate for the increased workload and responsibilities. Devolution, described as the transfer of decision making powers and authority, resources and responsibilities from central government to a local government has emerged as an effective strategy to improve public service delivery globally (Chinembiri, 2024). Several study findings indicates that for devolution to realize its full potential and be optimally effective, sufficient budget should be allocated for its implementation (Akello et al., 2017).

The EHPs who were responsible for carrying out the functions and duties that were moved to municipality remained at the district under provincial office hence they found themselves left with nothing to do in the district. On the contrary, in India, one of the major challenges in the devolution of environmental health services was transferring funds and responsibilities to local governing bodies without making them account for effective financial management leading to the mismanagement of funds (Das Gupta et al., 2017).

Similarly, Environmental Health Officers (EHOs) in Nigeria work at different levels of government, including federal, state and local with federal and state being the regulatory body and local where health regulations are enforced (Sarwuan, Abanobi and Iwuala, 2019). In Nigeria the EHO's roles are clearly outlined in the Environmental Health Officers Registration Council of

Nigeria (EHORECON) as environmental health services and enforced at local level (Sarwuan, Abanobi and Iwuala, 2019). The EHO's roles and responsibilities include promotion of health and carrying out health education, preventing diseases, improving and sustaining the environment, environmental monitoring and surveillance and enforcement of public health legislation (Joshua et al., 2023). The findings in this current study illustrated similar practices by EHPs whereby their roles and responsibilities are enumerated in the scope of practice for EHPs, and in the National Health Act, No. 61 of 2003. Moreover, their roles among many others include disease prevention and health education, enforcement of public health legislation, disease surveillance, control spread of malaria, control of hazardous substances, pollution control, and port health services.

Based on the findings in this study, there are a lot of similarities in the roles of EHPs in this study comparatively to most countries. In Uganda EHPs are referred to as EHOs, Health Inspectors and Health Assistants and they are responsible for rendering environmental health services in the country (Walekhwa, Kizza and Musoke, 2022). The EHPs in Uganda are regulated by the Ministry of Health under the Allied Health Professional Council (Musoke et al., 2016). Their roles and areas of competence include disease surveillance, premise inspection and monitoring, water, sanitation and water quality analysis, food inspection and building plan scrutiny (Walekhwa, Kizza and Musoke, 2022), which are similar to those described by the participants in this current study. The only difference is that participants in this study did not mention building plan scrutiny as one of their functions. However, they have mentioned that one of their functions is inspection of premises. This implies that they do not scrutinise building plans, however they conduct inspections of premises for compliance with environmental health legislation and municipal bylaws.

4.3 Relevance of the training of Environmental Health Practitioners

Pertaining to the nature of the EHP's training, the findings in this study indicated that the training prescribed for a qualification as an EHP was perceived as adequate and relevant to meet their operational demands. The findings further indicated that EHPs possessed at least a diploma and degree illustrating their capabilities to deal with environmental health issues with the required knowledge and understanding. Mathee and Wright (2013) in a South African environmental report provided assurance that EHPs are capacitated in different fields so that they are competent to perform several activities that are directed at protecting public health from environmental risk exposure (Mathee and Wright, 2013). In South Africa, EHPs are trained in universities to obtain

degrees, and they are also trained in universities of technology for a National Diploma in Environmental Health. They are also required to complete a community service before they are registered as independent practitioners with Health Professions Council of South Africa (HPCSA) (Melariri, Mbola and Human, 2019, Karamchand and Kistnasamy, 2017). The findings of this study revealed that the training of EHPs during the national diploma was adequate because it was incorporated with the five days of exposure to the practical experiences at the workplace. Participants indicated that they were also allocated within the municipality so that they were exposed to the local government where municipal health services are rendered. In addition, they were reportedly also exposed to the district that carries the provincial mandate of malaria control and hazardous substance control. On the contrary, a study conducted by Selman and Green (2008) revealed that the training of EHPs in South Africa on specific function as guided by the scope of practice is inadequate because their training does not allow them to specialise on specific functions, but rather general functions (Selman and Green, 2008). Mbonani and Naicker (2020) in their study have also identified areas of inadequacy and knowledge gaps among the EHPs when rendering certain environmental health services. They recommended that EHP training must be reviewed to ensure that EHPs are relevant in addressing complex and dynamic environmental health challenges (Mbonane and Naicker, 2020). One such case is England, where a mentoring programme for practical training was introduced to address the disconnect between academia and practice, to improve the relevance of the EHP training (Dhesi and Lynch, 2016). A study conducted in Kenya revealed that EHPs training was adequate, however continuous professional development for EHPs was found to be necessary to improve their competency so that they are at the forefront of diseases prevention and surveillance (Jepngetich et al., 2018).

Participants in this study indicated that the BTech degree was more relevant as it offers a specialized competence focus allowing the EHPs to specialize in specific functions, for example, environmental impact assessment or waste management. The managers also highlighted how helpful and relevant the short courses were for managers in rendering municipal health services. The findings in this study revealed that after completing the national diploma, EHPs could further their studies and study for a BTech degree at a university institution and once employed by government, EHPs are offered an opportunity to enhance their knowledge and skills through short courses subsidized by the government. A study conducted in China also recommended that EHPs need to be re-tooled to build more skills that will enable them to be critical thinkers that fit and contribute to the changing global world (Antwi et al., 2021). The training and the graduate

programme for EHPs need to prepare them to be critical thinkers and thrive to become high level technically competent managers (Dhesi and Lynch, 2016).

To address the skills gap and limited competence among EHPs, Mbazima, Mbonane and Masekameni (2022) recommend that EHPs must be mandated to undergo Continuous Professional Development (CPD) which will help sustain and maintain competence among the EHPs (Mbazima, Mbonane and Masekameni, 2022). Similarly, other countries like Uganda reported high levels of incompetence among the EHPs due to the insufficient level of their training. Recommendations were therefore made to introduce Continuous Professional Development (CPD) training courses in areas in which they were incompetent (Walekhwa, Kizza and Musoke, 2022). A call to review the curriculum was also reportedly made. This resulted in the introduction of elective courses during the third year of study to allow students to focus on aspects that align with their career obligations (Walekhwa, Kizza and Musoke, 2022). Diverse training is required by the EHPs that will broaden their scope of practice and improve competence in the delivery of environmental health services (Musoke et al., 2016). Similarly, the study revealed that EHP's curriculum was reviewed and the BTech degree was introduced and most EHPs felt that the BTech degree and short courses they studied were more relevant and helpful in managing the environmental health services and in executing municipal health services in general.

4.4 Challenges experienced by Environmental Health Practitioners

In this study EHPs highlighted several challenges that compromised and had an impact on the provision of environmental health services in the district of Ekurhuleni. These included aspects related to health workforce constraints, funding, limitations on technical items and tools of the trade, including the dynamics around legislative frameworks.

4.4.1 Shortage of Environmental Health Practitioners

The findings in this study revealed that there was a gross shortage of EHPs in the entire country which had also affected the Ekurhuleni district. Furthermore, EHPs stated that the district was unable to meet the WHO norms and standards of 1 EHP per 10 000 population and 1 EHP per 15 000 population norms and standards that were adopted by South Africa (NDoH, 2013b). When using the WHO 1:10 000 ratio standard and South African 1:15 000 ratio standard based on South African population, generally there is a shortage of EHPs in the country which has existed for

several years (Agenbag and Gouws, 2012). Balfour et al. (2008) also confirmed findings that the extent of EHP coverage in the district is far lower than expected and if this is not addressed it will compromise the provision of environmental health services in the district, particularly in the underserved areas and areas with a higher burden of preventable diseases that need EHP intervention (Balfour, 2006). Similarly, a study conducted in Nigeria by Joshua et al. (2023) also revealed that Nigeria was experiencing a gross shortage of EHOs falling short in the ratio of EHO to the population (Joshua et al., 2023). Another study that was conducted in Portugal, Australia and United States revealed similar findings that due to the shortage of EHPs in the management of serious environmental issues and pandemics, EHPs had to abandon their day-to-day activities to participate in disaster response activities, creating gaps in the provision of environmental health services and performance of critical activities (Rodrigues et al., 2021).

The findings in this study also revealed that due to the increasing population growth rate and increasing burden of diseases outbreaks, there is a need to train and employ more EHPs to improve WHO and South African norms and standards. Similarly, a study in Uganda reveals that due to the increase in population growth and a rapid development of peri-urban settlements, the country cannot meet the supply of EHOs versus the increasing demand to address environmental health challenges (Kulabako et al., 2010). The authors report that more than 60% on the population live in areas with poor basic services like sanitation, water supply, waste collection which contributes to the increased incidence of diseases outbreaks (Kulabako et al., 2010).

The findings of this study further revealed that the shortage of EHPs in the municipality was caused by the repeal of an Act (Health Act of 1977) where additional environmental health services were added to the municipal health services but with no additional staff. Some functions were the responsibility of the provincial EHPs, however when the functions were moved to municipality, the staff was not moved and that created increased work overload in the EHPs from municipality. The South African Local Government Association, (2013) status quo report on the provision of municipal health services by municipalities also highlighted the challenges inherent with the devolution of services which included additional services with limited staffing (South African Local Government Association, 2013). On the contrary, a study in India revealed that devolution of environmental health services was implemented with the transfer of funds and responsibilities to the local governance entities, but no provision was made to hold them accountable on the mismanagement of funds. Funds were transferred to cover additional services at the local level (Das Gupta et al., 2017). Similar to the findings in this study, a qualitative study in Ethiopia by

Damtew, Desta and Sileshi (2021) revealed that there is a need to train and build a larger environmental health workforce with specific practice and qualifications to deliver environmental health services and address issues of shortages (Damtew, Desta and Sileshi, 2021). Addressing issues of staff shortage and improving human resource capacity will contribute to building a robust and resilient health system that improves environmental health services (Ho et al., 2016).

4.4.2 Role duplication

The findings in this study indicated that there was role duplication in the district. The EHPs from the district (province) found themselves carrying out duties of the municipal EHPs due to a shortage of staff and increased workload in the municipality. According to the National Health Act (NDoH, 2004), most of the functions in the district are supposed to be carried out by the municipal EHPs as part of the municipal health services (MHS). The managers from both the municipality and the province felt that the role duplication was caused by the employment of provincial EHPs in the district. Most of the EHPs were under the impression that as they were hired as provincial EHPs they will only carry out two functions which are malaria control and control of hazardous substance. However, this was not the case as they had to also perform some municipal health services functions even though they are not legislated to do so. The role duplication in the district has reportedly created conflicts and confusion amongst the EHPs.

A contrary experience was reported in Uganda where EHPs are assigned at community level and render environmental health services under local government and provincial and national government serves as regulatory bodies for environmental health services (Musoke et al., 2016). In Nigeria, the functions of the EHOs are clearly enumerated in the EHORECON (2025) and they seem not to have any challenges of duplication of roles and responsibilities because of the way the environmental health services are structured and regulated (Sarwuan, Abanobi and Iwuala, 2019).

4.4.3 Constraints due to insufficient budget allocations

Just like any other professional, EHPs need resources so that they can function optimally in conducting their roles and responsibilities. The findings in this study revealed that EHPs experienced resource constraints that had a negative impact on the provision of environmental health services. The findings of this study also suggest that there is limited funding allocated for

environmental health services at provincial and local government level. The framework for transformation of environmental health also highlighted the insufficient funding allocated to environmental health services whereby posts are frozen due to lack of a budget. This reportedly created a huge unemployment gap which leads to shortage of EHPs due to budget limitations (Eales, Dau and Phakati, 2002). The findings in this study also indicated that most of the time there were no funds for the procurement of equipment needed for their day-to-day activities, that is, sample equipment for water sampling, and the shortage of government cars to be used for environmental health service delivery. Furthermore, the broken equipment that needed to be repaired was not repaired because there are no funds to service and or fix equipment. The repeal of the Health Act of 1977 (Act 63 of 1963) has added further responsibilities to the municipalities such as the surveillance of premises. This has increased the workload of the municipalities with no additional resources both financial and human capital to deliver services effectively (SALGA, 2013). The provincial and national government need to address issues of budget allocation to ensure that the municipal health services are not compromised as the municipalities are facing difficulties in executing most of the functions that have been allocated to them.

In agreement with the findings in this study, the funding of environmental health services seems to be a major challenge in developing countries. A study by Joshua et al. (2023) reveals that Nigeria with its fast-growing population, urbanization and industrialization is under-resourced in both finance and human resources to address the environmental health issues (Joshua et al., 2023). A study conducted by Sarwuan, Abanobi and Iwuala (2019) shared the same sentiments, illustrating that environmental health services in Nigeria need a bigger budget to produce more environmental health professionals and to improve the poor National Environmental Health Information Management System. Ethiopia has been reported to experience the same challenge. The environmental health services are underfunded, and as a result there are gaps that have been identified in the service delivery system which include lack of resources and shortage of environmental health workforce (Damtew, Desta and Sileshi, 2021). Environmental health services in Ethiopia require complex investigations, routine inspection, equipment and resources but inconsistent and insufficient financial support impede the provision of these services (Damtew, Desta and Sileshi, 2021). A study conducted by Kelley and Anderson (2012) seem to paint the same picture. They indicate that the discipline of environmental health in developing countries has historically encountered challenges with funding, particularly regarding government support at local, provincial, regional and national level (Kelley and Anderson, 2012). In order to address the environmental health crisis, the funding model for environmental health services and

environmental health policy framework need to be reviewed. Currently, the environmental health services are basic services which are funded through local government's equitable share which is inadequate to support all basic services rendered at local government level. The devolution of services to municipalities requires proper planning which includes budget and resources such as human resources, equipment, transport and offices (Agenbag and Balfour-Kaipa, 2008). This study revealed that EHP functions were devolved to the local sphere of government as MHS, but human resources and budget were not adjusted to cater for the extra functions that were re-allocated to EHPs from municipality. This was supported by the testimony of other EHPs who indicated that EHPs from the municipality were inundated with work overload as they were given extra functions and EHPs from province were left with nothing to do as most of their functions were re-allocated to EHPs from municipality.

4.5 Prioritization of the Environmental Health Programme

The EHPs in this study were of the view that the environmental health programme was not recognized and prioritized in the country even though it plays a crucial role in the prevention and surveillance of diseases. According to the participants, due to the fast-growing population in the country and rising informal settlement development, environmental health services should be prioritized through an increased budget that is allocated for EHPs to meet the rising need to address the rapidly emerging environmental health challenges. Similarly to the findings of this study, a study conducted in Ethiopia by Damtew, Desta and Sileshi (2021) also alluded to the same picture. They described that environmental health services were not prioritized, even though the Minister of Health had declared that environmental health services would be prioritized but in practice, the programme remained an unfunded priority with limited resources (Damtew, Desta and Sileshi, 2021). Furthermore, and in agreement with the participants in this study, a study conducted in Nigeria also highlighted the need for government at all levels to prioritize and create an enabling environment for the provision of environmental health services to be more effective and efficient (Joshua et al., 2023).

4.6 Enabling factors to improve the role of EHPs

This current study identified several enabling factors that could be implemented to improve the roles of EHPs in the Ekurhuleni Health District. These factors included: the professional growth

of EHPs; availability of tools of trade; addressing issues of resource shortages and reviewing the allocation of EHPs in the district. It was suggested that addressing these factors would better improve the roles of EHPs as they provide environmental health services to the communities.

4.6.1 Professional growth of EHPs

The findings in this study revealed that despite the challenges encountered by EHPs in the district, most were fulfilled with their professional growth. They indicated that the managers ensured that the junior EHPs were developed professionally and capacitated so that they improve their skills and knowledge. In contrast, a study conducted by Mbonane and Naicker (2020), revealed some skills gap in conducting food-borne outbreaks investigations and recommended the development of educational training programme to address skills gap and insufficient knowledge. To mitigate such gaps, EHPs in South Africa must undergo Continuous Professional Development (CPD) to keep themselves up to date and close the competence gap (Thompson, Shirinde and Mbonane, 2022, Poswa, 2017). Similarly, in Uganda in an attempt to address competence, skills and performance gaps, EHPs undergo professional refresher trainings organized by the Ministry of Health (Walekhwa, Kizza and Musoke, 2022). A study in Nigeria by Nwankwo (2018) also highlighted and recommended that EHOs must be adequately capacitated and re-trained to meet the operational demand and improve knowledge, competence and skills.

The findings in this study the revealed that EHPs are offered professional career growth as others started with diplomas, then went to do Btech degrees then proceeded to do Master's and PhD programmes. A study in Uganda resonates with the findings of this current study, which indicates that EHPs in Uganda are also offered opportunities for professional growth. Others start as health assistants with certificates, then progress to be Health Inspectors with diplomas and ultimately become Environmental Health Officers with bachelor's degrees (Walekhwa, Kizza and Musoke, 2022). Karamchand and Kistnasamy (2017) also confirmed that working with senior EHPs and mentorship programme in South Africa also played a significant role in the professional development of junior EHPs and community service EHPs (Karamchand and Kistnasamy, 2017).

4.7 Limitations

There were several limitations in this study which included sample bias, researcher bias risk and transferability of findings: In terms of sample bias, there were few permanent EHPs in the district and those that made up the majority were EHPs who are on the internship programme. This may have limited a wider range of views regarding the EHPs' experiences of working in Ekurhuleni Health District. There was a possibility of selection bias because only those that were experienced participated in the study. The sample may have also overrepresented the more experienced EHPs and under-represented junior and/or new EHPs because of the inclusion criteria. This was, however, considered to add to the depth of the data, as the findings were based on rich institutional memory. The study was conducted in one district and therefore may have excluded the experiences of EHPs from districts which may have presented a different set of dynamics which should be considered by decision-makers. This may have also limited the range of comprehensive views of EHPs' experiences across the districts. Since the participants are all from only one district, their perspectives may not represent the broader population of EHPs. In terms of transferability of findings, although conducting the study in one district may have limited the extent to which the findings could be applied in other districts and/or other LMICs contexts, the results can provide lessons to those with similar contexts.

Despite these limitations, the study provides salient lessons on the factors that can be considered in the efforts to improve the experiences of EHPs. This is particularly key in contributing to efforts to address health workforce challenges in similar settings and contexts in LMICs.

CHAPTER FIVE: CONCLUSION AND RECOMENDATIONS

5.1 Conclusion

In an era of increased efforts to address the dynamics and challenges of climate change and disease outbreaks, environmental health has become even more crucial (Mbonane and Naicker, 2020). Environmental Health Practitioners have increasingly become a vital health workforce in efforts to improve health outcomes and prevent disease outbreaks in the communities (Shezi et al., 2019). This study explored the roles of EHPs in the Ekurhuleni Health District which includes EHPs from both municipal and provincial levels, each with distinct legislated functions they are required to perform. The study revealed the dynamics and complexities that the EHPs find themselves subjected to as they carry out their roles and responsibilities within the district. The devolution of environmental health services to municipal health services was a strategy that was implemented to address the environmental health challenges at a local level. Implementation of this strategy identified grey areas that affect how the EHPs operate at the municipal level and district level.

The role of devolving the environmental health services appears to be a preferred route in most LMICs like Nigeria because environmental health challenges are at the local level, and they need to be addressed by local government at community level and local non-governmental organisations (NGOs) (Pona et al., 2021). According to Musoke et al. (2016) Ugandan EHPs are involved in environmental health practices at community level and EHOs are employed at the district level to manage environmental health services. All environmental health services are devolved to the local level or community level, but they are managed by EHOs at the district level (Musoke et al., 2016).

The findings of the study clearly showed that the training of EHPs in the tertiary institutions was adequate and relevant for them to work as EHPs in any sphere of government. However, there is a need for the EHPs to undergo continuous professional development to keep them updated, improve their skills, knowledge and any potential competency gaps (Mbazima, Mbonane and Masekameni, 2022). The study identified some gaps in the service delivery system of environmental health services. According to the participants, lack of resources, shortage of EHPs and the environmental health programme is reportedly not being prioritized. When the devolution of services was implemented, resources that include human resources and financial resources seem to not have been considered. One of the challenges that stood out from the findings of this study was the work overload and shortage of EHPs in the district, where it was clear that there is a gross

shortage of EHPs. This further supported findings from a case study on the SWOT analysis report of Environmental Health in South Africa that also revealed that there is a shortage of EHPs to meet the increasing demand of environmental health services. South Africa is flagged as non-compliant to WHO and national norms and standards on EHP ratio and coverage (Mbazima, Mbonane and Masekameni, 2022). It is clear that there is need to allocate more budget to municipalities and also develop initiatives to increase numbers of EHPs (Eales, Dau and Phakati, 2002).

On the positive aspect, the study found out that EHPs were happy with the professional growth that they acquire through in-service training, short courses and open opportunities to further their studies. Studies indicate that one of the ways to keep this workforce engaged, particularly in LMICs where the need is more dire, is to open doors for career growth. Growth and development in the EHP profession will assist to improve the profession in the country and attract more youth to pursue environmental health as their profession of choice (Mbazima, Mbonane and Masekameni, 2022).

5.2 Recommendations

The findings in this current study have described the roles of EHPs in the district and the factors that would enable the execution of the roles of EHPs. Based on these findings, some recommendations are provided to inform decision-makers on how to improve the role of EHPs in providing environmental health services.

5.2.1. Scheduling collaborative meetings between provincial EHPS and municipality EHPs

There should be monthly and quarterly scheduled meetings between EHPs from the district and the municipality to discuss issues pertaining to the delivery of environmental health services in the district. This will include progress on certain issues, challenges and mitigation strategies to unlock the bottlenecks identified. These meetings will be at management level and operational level, and they should be officialized, and attendance registers and minutes of the meetings should be kept.

5.2.2. Resource allocation

The environmental health programme should be prioritized and allocated more budget to address the environmental health challenges faced by the communities. The devolution of EHP's functions to MHS should be accompanied by resource allocation. Tools of trade such as computers, phones,

equipment and vehicles should be availed to improve the roles of EHPs and provide effective and efficient environmental health services.

5.2.3. Re-allocation and redirecting of EHPs to the local sphere of government

As the devolution of MHS was done without shifting the resources both financial and human resources, the majority of EHPs felt that it would be better for the provincial EHPs in the district to be moved to municipality because according to the legislation, most of the main environmental health functions are assigned to the municipalities. The district should therefore consider placing all EHPs at the municipalities (local government sphere) to deal with environmental challenges. The provincial office should just have the supervisory role to monitor the implementation of environmental health policies and protocols at the local sphere of government. The EHP community service should also be done at the local sphere of government where environmental health services are provided. Legislation that governs the Environmental Health should be reviewed to allow restructuring of environmental health services at provincial level and municipal level. The MHS must be redefined and include all other environmental health services like malaria control and hazard waste to be part of the MHS provided at the local sphere of government.

5.2.4. Addressing staff shortage

The district should ensure that there is compliance with WHO and or South African norms and standards: 1: 10 000 ratios over population and 1:15 000 ratio over population, respectively. There is an urgent need to address the shortage of EHPs. Ekurhuleni Metropolitan Municipality has a fast-growing population due to urbanization and industrialization so there is a need to increase EHP coverage in the district. Universities should recruit more students to be trained as EHPs because of the ageing population of EHPs and some going on retirement. This programme should be funded to attract more youth especially from townships and informal settlements because they are well versed with environmental health challenges facing these communities. There should be an introduction of the new sub-set of environmental health qualifications to be trained as Environmental Health Assistants. This cadre can be trained through the TVET[12] colleges and attain certificates on completion of the training. The municipality should also prioritize environmental health services by unfreezing and lifting the moratorium on the employment of EHPs to ensure

[12] TVET - Technical and Vocational Education and Training. It is a type of education and training that focuses on practical and vocational skills preparing individuals for specific careers and industries.

that there is increase EHP coverage. Treasury should consider allocating more budget to the municipalities to ensure that there are adequate resources to meet the demands of providing environment health services in the community. Environmental health services must form an integral part of the Integrated Development Plan (IDP) so that there is a sufficient budget allocated to address environmental health issues and close the gaps of inadequate resources. Another recommendation is to re-allocate all provincial EHPs to municipality so that they can increase number of EHPs in the municipality and improve EHP ratio and coverage.

5.3 Implications for future research

This study provided insights on the roles of EHPs in Ekurhuleni Health District based on the views of the EHPs and managers of EHPs in the district and provincial office. Ideally, more focused studies on the same topic should be conducted. This can be on a broader scale, to include other Metropolitan Municipalities in the province or even other provinces. Research could assess a wider range of insights and views across other districts. An impact assessment study can be considered in future research to measure impact, challenges and achievements in the implementation of devolution of some environmental health services into municipal health services, hence quantitative methodologies could be employed. This will help in identifying some gaps and address the issues of resources in providing municipal health services.

Further research could also explore the perception of the communities on the roles, functions and performance of EHPs in addressing environmental health challenges in the communities. This will help to ensure that policies and strategies are relevant and aligned to meet the needs and contextual variations of the community. A longitudinal study can be undertaken where EHPs can be observed repeatedly over a period of time to identify their patterns, developments in their behaviour and attitudes towards execution of the roles.

REFERENCES

Adewumi, I. 2011. Environmental Health Practice in Nigeria: a general overview. *International Journal of Health and Social Inquiry,* 1.

Agenbag, M. & Balfour-Kaipa, T. 2008. Developments in environmental health: Primary Health Care: programme areas. *South African Health Review,* 2008**,** 149-160.

Agenbag, M. & Gouws, M. 2012. Redirecting the role of environmental health in South Africa.

Agenbag, M. H. 2015. Recognising the Role of Environmental Health in the Public Health Fraternity: *A South African Perspective.* A poster presentation at the 14th World Congress on Public Health – Kolkata – India – 11 – 15 February 2015.

Akello, S., Turyahabwe, N., Sseguya, H. & Agea, J. G. 2017. Devolution policy and its implication on watershed restoration in eastern Uganda.

Anney, V. N. 2014. Ensuring the quality of the findings of qualitative research: *Looking at trustworthiness criteria.*

Antwi, H. A., Zhou, L., Xu, X. & Mustafa, T. 2021. Progressing towards environmental health targets in China: *An Integrative Review of Achievements in Air and Water Pollution Under The "Ecological Civilisation and The Beautiful China*" Dream. *Sustainability,* 13**,** 3664.

Arnold, F., Parasuraman, S., Arokiasamy, P. & Kothari, M. 2009. Nutrition in India. National Family Health Survey (NFHS-3), India, 2005–06. *International Institute for Population Sciences,* 43.

Balfour, T. 2006. Municipal health services in South Africa, opportunities and challenges. DbsaOrg.

Barron, P. & Padarath, A. 2017. Twenty years of the South African health review. *South African Health Review,* 2017**,** 1-10.

Beyers, B. 2013. *Experiences of CS practitioners who are deployed at a rural health facility in the Western Cape.* Magister Curationis- MCur, University of Western Cape.

Bitsch, V. 2005. Qualitative research: A grounded theory example and evaluation criteria. *Journal of Agribusiness,* 23**,** 75-91.

Boadi, K., Kuitunen, M., Raheem, K. & Hanninen, K. 2005. Urbanisation without development: environmental and health implications in African cities. *Environment, Development and Sustainability,* 7**,** 465-500.

Braun, V. & Clarke, V. 2021. To saturate or not to saturate? Questioning data saturation as a useful concept for thematic analysis and sample-size rationales. *Qualitative research in sport, exercise and health,* 13**,** 201-216.

Burnard, P. 1991. A method of analysing interview transcripts in qualitative research. *Nurse Ducation Today,* 11**,** 461-466.

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D. & Walker, K. 2020. Purposive sampling: complex or simple? Research case examples. *Journal of Research in Nursing,* 25**,** 652-661.

Chinembiri, T. 2024. *The impact of devolution to service delivery: a case study of Bindura municipality.* BUSE.

Chol, C., Negin, J., Garcia-Basteiro, A., Gebrehiwot, T. G., Debru, B., Chimpolo, M., Agho, K., Cumming, R. G. & Abimbola, S. 2018. Health system reforms in five sub-Saharan African countries that experienced major armed conflicts (wars) during 1990-2015: a literature review. *Glob Health Action,* 11**,** 1517931.

Clarke, V. & Braun, V. 2013. Successful qualitative research: A practical guide for beginners. *Successful Qualitative Research***,** 1-400.

Damtew, Y. T., Desta, B. N. & Sileshi, A. 2021. Environmental Health Services and Professionals Level of Engagement in Different Sectors in Eastern Ethiopia: A Mixed Methods Study Design. *Environmental Health Insights,* 15**,** 1178630220988554.

Das Gupta, M., Dasgupta, R., Kugananthan, P., Rao, V., Somanathan, T. V. & Tewari, K. 2017. Flies without borders: lessons from Chennai on improving India's municipal public health services. *World Bank Policy Research Working Paper*.

David Mccoy, D. H., Lesly Bamford, Steven Donohue, Zama Nxumalo & Gcina Radebe 1998. The Development of the District Health System in South Africa. *Durban, South Africa: Health Systems Trust.*

Davies, T. & Mundalamo, H. 2010. Environmental health impacts of dispersed mineralisation in South Africa. *Journal of African Earth Sciences,* 58**,** 652-666.

De Oliveira, J. A. P. 2002. Implementing environmental policies in developing countries through decentralization: the case of protected areas in Bahia, Brazil. *World Development,* 30**,** 1713-1736.

Dehury, R. K., Dehury, P., Sripathi, N., Acharyulu, G., Behera, M. R. & Neeragatti, S. 2023. Health sector development in India: an account from Bhore Committee 1946 to National Health Policy 2017. *Journal of Development Policy and Practice,* 8**,** 209-242.

Dhesi, S. & Lynch, Z. 2016. What next for environmental health? *Perspectives in Public Health,* 136**,** 225-230.

Eales, K., Dau, S. & Phakati, N. 2002. Environmental health: framework for transformation. *South African Health Review,* 2002**,** 101-116.

Ekurhuleni Health District, 2012. Ekurhuleni Health District Operational Plan *In: Health, G. D. O.* (ed.). Ekurhuleni Health District.

Ekurhuleni, C. O. 2012. *City of Ekurhuleni Metropolitan Municipality*. City of Ekurhuleni Metropolitan Municipality.

Fereday, J. & Muir-Cochrane, E. 2006. Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods,* 5**,** 80-92.

Frumkin, H. 2010. *Environmental Health. From Global to Local*. New Jersey: John Wiley & Sons

Graneheim, U. H. & Lundman, B. 2004. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today,* 24**,** 105-112.

Gunawan, J. 2015. Ensuring trustworthiness in qualitative research. *Belitung Nursing Journal,* 1**,** 10-11.

Hatcher, A. M., Onah, M., Kornik, S., Peacocke, J. & Reid, S. 2014. Placement, support, and retention of health professionals: National, cross-sectional findings from medical and dental community service officers in South Africa. *Human Resources for Health,* 12**,** 1-13.

Haynes, R. 2004. Financing environmental health services in South Africa. *Durban: Health Systems Trust*.

Hennink, M., Hutter, I. & Bailey, A. 2020. *Qualitative Research Methods*, London:Sage.

Ho, K., Al-Shorjabji, N., Brown, E., Zelmer, J., Gabor, N., Maeder, A., Marcelo, A., Ritz, D., Messina, L. & Loyola, M. 2016. Applying the resilient health system framework for universal health coverage. *The promise of new technologies in an age of new health challenges.* IOS Press.

HPCSA, H. P. C. O. S. A. 2019. Health Professions Council of South Africa Environmental Health Practitioners. *Newsletter for the professional board for Environmental Health Practitioners*. Pretoria.

Jepngetich, H., Nyamwange, C., Baliddawa, J. & Karani, A. 2018. Preparedness Perceptions of Environmental Health Graduates in Handling Emerging Public Health Concerns in Kenya. *American Journal of Health Research.* 3, 74-78.

Joshua, I., Nmadu, A., Usman, N., Nwankwo, B., Woje, C., Akabe, J. & Dahiru, M. 2023. Enironmental Health Officers in Nigeria in the 21st century: Advocacy and raising public awareness. *African Journal of Health, Safety and Environment,* 4**,** 24-33.

Kalu, F. A. & Bwalya, J. C. 2017. What makes qualitative research good research? An exploratory analysis of critical elements. *International Journal of Social Science Research,* 5**,** 43-56.

Karamchand, A. & Kistnasamy, E. J. 2017. Experiences of community service environmental health practitioners. *SA Journal of Human Resource Management,* 15**,** 8.

Kelley, T. R. & Anderson, A. 2012. Environmental health funding challenges during difficult budget times. SAGE Publications Sage UK: London, England.
Koma, S. B. 2010. The state of local government in South Africa: Issues, trends and options. *Journal of Public Administration,* 45**,** 111-120.

Krauss, S. E. 2005. Research paradigms and meaning making: A primer. *The Qualitative Report,* 10**,** 758-770.

Kulabako, R. N., Nalubega, M., Wozei, E. & Thunvik, R. 2010. Environmental health practices, constraints and possible interventions in peri-urban settlements in developing countries–a review of Kampala, Uganda. *International Journal of Environmental Health Research,* 20**,** 231-257.

Lincoln, Y. S. & Guba, E. 1985. G.(1985). *Naturalistic Inquiry*. Beverly Hills. CA: Sage.

Majam, T. & Munzhedzi, H. 2021. The role of South African municipalities in combating climate change: A case of Ekurhuleni Metropolitan Municipality. *African Renaissance,* 2021**,** 109-131.

Malcolm, R. 2013. Organisations and environmental health–how environmental health is delivered. *Clay's Handbook of Environmental Health.* Routledge.

Mani, M., Markandya, A., Sagar, A. & Strukova, E. 2012. An analysis of physical and monetary losses of environmental health and natural resources in India. *World Bank Policy Research Working Paper*.

Mankenda, N. 2020. *Decentralization and Good Governance in Angolan Local Governments.* Walden University.

Maseko, L. J., Erasmus, A., Di Rago, T., Hooper, J. & O'reilly, J. 2014. Factors that influence choice of placement for community service among occupational therapists in South Africa. *South African Journal of Occupational Therapy,* 44**,** 36-40.

Mathee, A., Swanepoel, F. & Swart, A. 1999. Environmental health services. *The South African Health Review***,** 277-288.

Mathee, A. & Wright, C. 2013. Environmental health in South Africa. *South African Health Review,* 105-116. Health Systems Trust, Durban.

Matsoso, M. P. & Fryatt, R. 2013. National Health Insurance: the first 18 months. *South African Medical Journal,* 103**,** 156-158.

Mayka, L. 2019. The origins of strong institutional design: Policy reform and participatory institutions in Brazil's health sector. *Comparative Politics,* 51**,** 275-294.

Mbaka, N. & Isiramen, O. M. 2021. The changing role of an exploratory research in modern organisation. *GPH-International Journal of Business Management,* 4**,** 27-36.

Mbazima, S. J., Mbonane, T. P. & Masekameni, M. D. 2022. A SWOT analysis of contemporary gaps and a possible diagnostic tool for environmental health in an upper-middle income country: a case study of South Africa. *International Journal of Environmental Health Research,* 32**,** 2820-2842.

Mbonane, T. P. & Naicker, N. 2020. Knowledge, attitude and practices of environmental health practitioners conducting food-borne disease outbreak investigation at a local municipality in Gauteng province, South Africa. *Health SA Gesondheid,* 25.

Mbonye, A., Wamala, J., Kaboyo, W., Tugumizemo, V., Aceng, J. & Makumbi, I. 2012. Repeated outbreaks of viral hemorrhagic fevers in Uganda. *African Health Sciences,* 12**,** 579-589.

Melariri, P. E., Mbola, P. & Human, I. S. 2019. Environmental health community service: Confronting the human resource challenges. *SA Journal of Human Resource Management,* 17**,** 1-10.

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.

Nagdeve, D. A. 2002. Environment and health in India. *Southeast Asia's Population in a Changing Asian Context***,** 10-13.

Naledi, T., Barron, P. & Schneider, H. 2011. Primary health care in SA since 1994 and implications of the new vision for PHC re-engineering. *South African Health Review,* 2011**,** 17-28.

National Department Of Health, 2004. National Health Act 61 of 2003. *In:* Health, N. D. O. (ed.). Pretoria: *Governement Gazette* . National Department Of Health.

National Department Of Health, 2013a. National Environmental Health Policy. Pretoria, South Africa: *Governement Gazette*. National Department Of Health,

National Department Of Health, 2013b. National Norms and Standards for Environmental Health in South Africa. *In:* Health, N. D. O. (ed.). *Pretoria: Government Gazette.* National Department Of Health.

National Department Of Health, 2014. Regulations Defining the Scope of the Profession of Environmental Health Officers: Amendment. *In:* Health (ed.). South Africa: *Goverment Gazette.* National Department Of Health.

National Department Of Health, 2015. National Environmental Health Norms and Standards for Premises and acceptable Monitoring Standards for Environmental Health Practitioners. *In:* Health (ed.). Pretoria, South Africa: *Governement Gazette.* National Department Of Health.

National Department Of Health, 2016. National Environmental Health Strategy. 26. National Department Of Health.

Neergaard, M. A., Olesen, F., Andersen, R. S. & Sondergaard, J. 2009. Qualitative description–the poor cousin of health research? *BMC Medical Research Methodology,* 9**,** 1-5.

Nganwa, D. & Bogale, A. 2014. Distribution, public health significance, and control status of bovine tuberculosis caused by Mycobacterium bovis in Uganda. *Zoonotic Tuberculosis: Mycobacterium bovis and Other Pathogenic Mycobacteria***,** 133-147.

Nwankwo, I. U. P. 2018. Environmental Health Officers and Prosecution Duties for the Enforcement of Public Health Law in Anambra State, Southeast Nigeria: Problems and Prospects. *Journal of Law and Judicial System,* 1**,** 61-70.

Ogunkan, D. V. 2022. Achieving sustainable environmental governance in Nigeria: A review for policy consideration. *Urban Governance,* 2**,** 212-220.

Oliveira, R., Mbola and Human, , T. 2023. The Impacts of Health Decentralization on Equity, Efficiency, and Effectiveness: A Scoping Review. *Sustainability,* 16**,** 386.

Ozano, K., Simkhada, P., Porcellato, L. & Khatri, R. 2019. Discussions around Primary Health Care and the Private Sector during the Global Symposia on Health Systems Research 2018.

Panda, B. & Thakur, H. P. 2016. Decentralization and health system performance–a focused review of dimensions, difficulties, and derivatives in India. *BMC Health Services Research,* 16**,** 1-14.

Panzo, T. I., Góis, J. C. & Mendes, J. M. 2022. Environmental awareness on solid waste management practices: A case study in Angolan secondary schools. *Journal of Civil Engineering and Environmental Sciences,* 8**,** 076-081.

Phillippi, J. & Lauderdale, J. 2018. A guide to field notes for qualitative research: Context and conversation. *Qualitative Health Research,* 28**,** 381-388.

Pillay, Y. PHC re-engineering in South Africa: Are we making progress. Public Health Association of South Africa (PHASA) Conference, Bloemfontein, South Africa, 2012.

Pona, H. T., Xiaoli, D., Ayantobo, O. O. & Tetteh, N. D. 2021. Environmental health situation in Nigeria: current status and future needs. *Heliyon,* 7.

Poswa, T. T. 2017. *Environmental health practice in a South African Metropolitan Municipality: Professional, ethical and legal responsibilities and challenges.* University of the Witwatersrand, Johannesburg (South Africa).

Pruss-Ustun, A., Corvalán, C. F. & Organization, W. H. 2006. *Preventing disease through healthy environments: towards an estimate of the environmental burden of disease*, World Health Organization.

Prüss-Ustün, A., Wolf, J., Corvalán, C., Neville, T., Bos, R. & Neira, M. 2017. Diseases due to unhealthy environments: an updated estimate of the global burden of disease attributable to environmental determinants of health. *Journal of Public Health,* 39**,** 464-475.

Raimi, M. O., Vivien, O. T. & Oluwatoyin, O. A. 2021. Creating the healthiest nation: Climate change and environmental health impacts in Nigeria: A narrative review. *Scholink Sustainability in Environment. ISSN*.

Rodrigues, M. A., Silva, M. V., Errett, N. A., Davis, G., Lynch, Z., Dhesi, S., Hannelly, T., Mitchell, G., Dyjack, D. & Ross, K. E. 2021. How can Environmental Health Practitioners contribute to ensure population safety and health during the COVID-19 pandemic? *Safety Science,* 136**,** 105136.

Republic of South Africa, 1998. *Municipal Structures Act*. Government Printer Pretoria. Republic of South Africa.

SALGA, S. A. L. G. A. 2013. Municipal Health Services status quo report: Provision of MHS by Municiaplities 2012-1013. South African Local Governement Association.

Sarwuan, O. S., Abanobi, O. C. & Iwuala, C. 2019. Pattern, competence and distribution of Environmental Health Officers in Benue State, Nigeria. *International Journal of Advanced Academic Research | Sciences, Technology and Engineering,* 5**,** 16.

Saunders, M. 2009. Research methods for business students. *Person Education Limited*.

Selman, C. A. & Green, L. R. 2008. Environmental health specialists' self-reported foodborne illness outbreak investigation practices. *Journal of Environmental Health,* 70**,** 16-21.

Sharma, M. G. & Popli, H. 2023. Challenges for lower-middle-income countries in achieving universal healthcare: An Indian perspective. *Cureus,* 15.

Shezi, B., Mathee, A., Siziba, W., Street, R. A., Naicker, N., Kunene, Z. & Wright, C. Y. 2019. Environmental health practitioners potentially play a key role in helping communities adapt to climate change. *BMC Public Health,* 19**,** 54.

STATS, SA. 2024. Mid-year population estimates, 2024. *In: Africa, S. S.* (ed.). Pretoria: Stas SA.

STATS, SA. 2018. Ekurhuleni. Pretoria: Stats, South Africa.

Stewart, J. & Bourn, C. 2013. The environmental health practitioner: new evidence-based roles in housing, public health and well-being. *Perspectives in Public Health,* 133**,** 325-329.

Thomas, E., Seager, J. & Mathee, A. 2002. Environmental health challenges in South Africa: policy lessons from case studies. *Health & Place,* 8**,** 251-261.

Thompson, V., Shirinde, J. & Mbonane, T. P. 2022. Knowledge, attitude and practices on notifiable diseases among environmental health practitioners in the City of Johannesburg: A cross-sectional study. *Health SA Gesondheid (Online),* 27**,** 1-7.

Turok, I., 2012. Urbanisation and development in South Africa*:* Economic Imperatives, spatial Distortions and Strategic Responses. London: *Human Settlements Group, International Institute for Environment and Development,* 1-66.

Walekhwa, A. W., Kizza, F. G. & Musoke, D. 2022. Understanding staff competencies and training needs of Environmental Health Professionals in Uganda: an online cross-sectional survey.

Watt, D. 2007. On becoming a qualitative researcher: the value of reflexivity. *Qualitative Report,* 12**,** 82-101.

World Health Organization, 1990. Environment and health: the European Charter and commentary: first european conference on environment and health, Frankfurt, 7–8 December 1989. World Health Organization. In *Environment and health: the European Charter and commentary: First European Conference on Environment and Health, Frankfurt, 7–8 December 1989*.

World Health Organization, 2009. Meeting of partners on the implementation of the Libreville declaration on health and environment in Africa: The roadmap to support the implementation of the Libreville Declaration on Health and Environment in Africa (2009-2010), Windhoek, Namibia, 25-27 February 2009. *World Health Organization and United Nations Environment Programme, Windhoek, Namibia*.

World Health Organization, 2015. Development, monitoring, and evaluation of functional core capacity for implementing the International Health Regulations (2005). Geneva: World Health Organization.

World Health Organization, 2018a. Circular economy and health: opportunities and risks. Geneva: World Health Organization.

APPENDICES
APPENDIX A: ETHICAL CLEARANCE

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

R14/49 Mr Z Futshane

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
CLEARANCE CERTIFICATE NO. M171174

NAME: (Principal Investigator)	Mr Z Futshane
DEPARTMENT:	School of Public Health Medical School University
PROJECT TITLE:	An exploration of the roles of environmental health practitioners in Ekurhuleni Health District, Gauteng Province
DATE CONSIDERED:	24/11/2017
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Dr N Nxumalo
APPROVED BY:	Professor CB Penny, Chairperson, HREC (Medical)
DATE OF APPROVAL:	09/02/2018

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on 3rd floor, Phillip V Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.
I/We fully understand the conditions under which I am/we are authorised to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated from the research protocol as approved, I/we undertake to resubmit to the Committee. **I agree to submit a yearly progress report**. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. in this case, the study was initially reviewed in **November** and will therefore be due in the month of **November** each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature

13/02/2018
Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

APPENDIX B: PLAGIARISM DECALARATION

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

FACULTY OF HEALTH SCIENCES

PLAGIARISM DECLARATION TO BE SIGNED BY ALL HIGHER DEGREE STUDENTS

SENATE PLAGIARISM POLICY: APPENDIX ONE

I Zanoxolo Futshane (Student number: 0604248x) am a student registered for the degree of Master of Public Health in the academic year 2016

I hereby declare the following:

- I am aware that plagiarism (the use of someone else's work without their permission and/or without acknowledging the original source) is wrong.
- I confirm that the work submitted for assessment for the above degree is my own unaided work except where I have explicitly indicated otherwise.
- I have followed the required conventions in referencing the thoughts and ideas of others.
- I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my own unaided work or that I have failed to acknowledge the source of the ideas or words in my writing.
- I have included as an appendix a report from "Turnitin" (or other approved plagiarism detection) software indicating the level of plagiarism in my research document.

Signature: Z. Date: 01/10/2025

1

APPENDIX C: INTERVIEW GUIDE - EHPs

Study Title: An exploration of the roles of Environmental Health Practitioners in Ekurhuleni Health District, Gauteng Province.

Demographic information:

Age:

Gender:

Position:

Employer: Province or Local

Period of employment in the current position:

Highest qualification**:**

1.	Tell me more about your profession as an Environmental Health Practitioner a. What is your title or position? b. How long have you been in this position? a) Can you describe your role in the district? b) Can you describe the training that you have undergone as an EHP?
2.	a) Tell me more about your experience as an EHP employed in the District of Ekurhuleni. b) What were your expectations when you came to work in the district? c) What have been your experiences while working in the district? Probe: - What are some of the challenges of providing services in the district? - What have been some of the successes of providing services in the district?
3.	a) Generally, can you describe the training that EHPs undergo to qualify for the profession? b) Describe the roles of EHPs in general and your views on what would constitute the role of EHPs in the District level?
4.	I understand that there are EHPs in the District that are from Local Authority and Province, do you have platforms where you meet and clarify your roles and also discuss your successes and challenges? a) If yes, tell me more about these meetings and If No, do you think you should have such meeting with your counter-part and elaborate why you think so? b) Can you tell me about the main challenges you often encounter in relation to your roles in the district.
5	What do you think could be done to execute and implement the roles of EHPs in Ekurhuleni District: Probe: - What enabling factors do you think need to be considered
6.	According to PHC re-engineering, Ward Based Outreach Teams should constitute EHPs, Nurses, Community Health Workers and Health Promoters to have complete teams. a) In Ekurhuleni District, to what extent are EHPs part of the Outreach teams?

	b) What role do you think they should play in these teams and c) What do you think could be done to improve the role of EHPs in WBOT and the extent to which they become part of the teams? d) What changes have occurred specifically for EHP services due to the National Health Insurance and Primary Health Care re-engineering? e) How have these changes affected EHPs, particularly in terms of their roles? Please explain?

APPENDIX D: INTERVIEW GUIDE - EHP SUPERVISORS / MANAGERS (DISRICT)

Study Title: An exploration of the roles of Environmental Health Practitioners in Ekurhuleni Health District, Gauteng Province.

Demographic information:

Age:

Gender:

Position:

Employer: Province or Local

Period of employment in the current position:

Highest qualification:

1.	Tell me more about your profession as an Environmental Health Practitioner c. How long have you been in this position? d. Can you describe your role in the District regarding the EHPs in the District? e. Did you undergo any management training? Probe: • Can you describe this kind of management training
2.	What is the legal framework that governs and controls EHPs as a profession and EHP's roles at different levels / spheres of government? a) In your view, to what extent are these roles and scope of practice clearly outlined? Probe: • What are roles of EHPs at the district level and what is your view on their roles (for example, should they be taking on other roles or other services?
3.	What are some of the challenges that EHPs experience at the different levels of the system, please explain.
4.	In your view, how can the roles of the EHPs be strengthened, if at all, so that they are able to serve the needs of the population?
5.	I understand that there are EHPs in the District that are from Local Authority and Province., Do you have platforms where you meet and clarify your roles and also discuss your successes and challenges? c) If yes, tell me more about these meetings and If No, do you think you should have such meeting with your counter-part and elaborate why you think so? d) Can you tell me about the main challenges you often encounter in relation to your roles in the district.
6.	According to PHC re-engineering, Ward Based Outreach Teams should constitute EHPs, Nurses, Community Health Workers and Health Promoters to have a complete team.

	a. As a manager for EHPs at District level, are you part of the Outreach Team Technical Working Groups and what are your views and perceptions regarding EHPs roles in WBOTs in the Districts. b) In Ekurhuleni District, to what extent are EHPs part of the Outreach teams? c) What roles do you think EHPs should play in the WBOTs d) What do you think could be done to improve the role of EHPs in WBOT and the extent to which they become part of the teams? e) How have these changes affected EHPs, particularly in terms of their roles? Please explain?
7.	How have changes brought by the NHI and PHC re-engineering affected the roles of EHPs at the different levels of governance?

APPENDIX E: INTERVIEW GUIDE - EHP MANAGERS (PROVINCE)

Study Title: An exploration of the roles of Environmental Health Practitioners in Ekurhuleni Health District, Gauteng Province.

Demographic information:

Age:

Gender:

Position:

Period of employment in the current position:

Highest qualification:

1.	Tell me more about your profession as an Environmental Health Practitioner f. How long have you been in this position? Can you describe your role in the province?
2.	What is the legal framework that governs and controls EHPs as a profession and EHP's roles at different levels / spheres of government? In your view to what extent are these roles and scope of practice clearly outlined?
3.	What are roles of EHPs at the district level and what is your view on their roles (for example, should they be taking on other roles or other services?
4.	What are some of the challenges that EHPs experience at the different levels of the system, please explain.
5.	In your view, how can the roles of the EHPs be strengthened, if at all, so that they are able to serve the needs of the population?
6.	I understand that there are EHPs in the District that are from Local Authority and Province. , Do you have platforms whereby as the manager at Provincial level meet with EHPs from the Districts (Local and Province) and clarify their roles and also allow them to share and discuss their successes and challenges? e) If yes, tell me more about these meetings and If No, do you think you should have such meeting with EHPs from the districts and elaborate why you think so? f) Can you tell me about the main challenges you often encounter in relation to your roles in the district.
6.	According to PHC re-engineering, Ward Based Outreach Teams should constitute EHPs, Nurses, Community Health Workers and Health Promoters to have a complete team. As a manager for EHPs at Provincial level, are you part of the Outreach Team Technical Working Groups and what are your views and perceptions regarding WBOTs in the Districts. a) What roles do you think EHPs should play in the WBOTs
7.	How have changes brought by the NHI and PHC re-engineering affected the roles of EHPs at the different levels of governance?

APPENDIX F: CONSENT FORM FOR INTERVIEWS

Study Title: An exploration of the roles of Environmental Health Practitioners in Ekurhuleni Health District, Gauteng Province.

I have been given the Information Sheet on the study on community health workers in Gauteng. I have read and understood the Information Sheet and all my questions have been answered satisfactorily.

I understand that it is up to me whether or not I would like to participate in the interview and that there will be no negative consequences if I decide not to participate. I also understand that I do not have to answer any questions that I am uncomfortable with and that I can stop the interview at any time.

I understand that the researchers involved in this project will ensure confidentiality and that my name will not be used in the study reports, and that comments that I make will not be reported back to anybody else.

Yes, I consent voluntarily to be interviewed	☐
No, I do not give consent to be interviewed	☐

Interviewee's signature: _____ Date: _____

Interviewer's signature: _____ Date: _____

Interviewer's name (please print): _____ Date: _____

APPENDIX G: INFORMATION SHEET

1. Introduction

Good day. My name is Zanoxolo Futshane, and I am a student at University of Witwatersrand in Johannesburg. As per our initial communication with regards to the study on the Environmental Health Practitioners programme (EHPs), I would like to obtain from you an overview of the programme, your views and experience on the role of Environmental Health Practitioners (EHPs) in the district.

Before volunteering to participate in this study, it is important that you read and understand the following explanation of the purpose of the study, the study procedures, benefits, risks, and your right to withdraw from the study at any time.

If you agree to take part in this study, I will ask you to sign a form to show that you agree to take part, and I will also give you a copy of this form to keep.

It is important that you understand the following:

- Taking part in this study is completely voluntary.
- You may refuse to take part in this study or leave it at any time.

2. Purpose of the Study

I am conducting research on the exploration on the roles of EHP in Ekurhuleni Health District, Gauteng province.

3. Aim:

The overall aim of the study is to understand and clarify the roles of Environmental Health Practitioners in the District Health System in Ekurhuleni District, Gauteng Province.

4. The objectives of the study are:

a) To describe how EHPs roles are defined in the policy and programme documents.
b) To explore EHPs and EHP managers' views on what would constitute the role of EHPs in Ekurhuleni Health District.

c) To describe factors that would enable the execution and implementation of the role of EHPs.

5. Invitation to participate:

I would like to invite you to take part in the study. The information that you will give for this study will be used to inform and advocate for policy improvements on the roles of EHPs at the District level and other levels or spheres of government namely National, Provincial and Local government

I recognize and am aware of your role in the Province or District and you have been selected because I would like to hear from you your particular insight and views on the experiences and the roles of EHPs. This study involves participating in an in-depth interview. I am interested in this information because I want to know exactly what are EHPs doing in the district. Outcomes of this interview will assist to clarify the roles of EHPs at a District level and can also assist to increase the deployment of EHPs in the District.

The total amount of time required for your participation in this study is no more than two hours. The interview will take place in a private room and is a one-time event. No other interviews are required, though we may ask permission to contact you for clarification on points raised during the interview.

6. What is involved in the study?

The study will be focusing on clarifying the roles of EHPs in the District and the researcher will be talking to EHPs at different level of government, Province and Local Authority. The managers for EHPs at Province and Team leaders from Local authority will be interviewed so that they share their views on what would constitute the roles of EHPs in the District. The researcher will also review documents that are relevant to understand the official and or policy perspective.

7. Risks

There are no risks associated with participating in this research.

8. Benefits

There will be no immediate benefits to you participating in this study. However, Information gathered from this study may help to develop a report that will help to inform policies and other

legislative framework regarding the scope of practice and clarifying the roles of EHPs in the District.

9. Reimbursement

There will be no reimbursement for your voluntary participation.

10. Participation is voluntary.

Please note that participation in this study is voluntary and there will be no direct benefits to anyone who participates in it, including reimbursements. There will be no negative consequences for you if you do not want to participate in the interview. You will not be paid for taking part in the study. During the interview, you have the right not to answer any questions that make you feel uncomfortable, or to stop the interview at any time.

11. Ethical Approval

This study protocol has been submitted to the University of the Witwatersrand, Human Research Ethics Committee (HREC) and written approval has been granted by that committee. The study has been also submitted to the Provincial and District research committee for ethical approval. Written approval has been awarded by the government research committees.

12. Confidentiality

Anything that you share in the interview will be kept confidential in the following ways:

- We will use a code instead of your name for any quotes, which will be transcribed directly from a translated transcription from the audio recording.
- Audio recordings and transcripts of the interview will be stored in locked and/or password protected files and destroyed three years after the study is complete.
- All information obtained during the course of this study, including personal data and research data will be kept strictly confidential. Data that may be reported in scientific journals will not include any information that identifies you as a participant in this study.
- This information will be reviewed by authorised representatives of the study team

13. Contact details of researchers:

If you have any further questions or concerns about this study, you may contact me or my supervisor. Our details are as follows:

Contacts: -

Mr. Zanoxolo Futshane (Researcher)
Tel: 011 876-1816
Cell no.079 511-2887
Email: Zanoxolo723@gmail.com

Dr. Nonhlanhla Nxumalo (Supervisor)
Centre for Health Policy.
School of Public Health.
University of the Witwatersrand; Johannesburg.
Tel no. 011 717-3432
Cell no. 082 337-8573
Email: Nonhlanhla.Nxumalo@wits.ac.za

Contact details of Human Research Ethics Committee (Medical) (HREC) Administrator and Chair:

These contact details are of the HREC Administrator and Chair if you have any queries and/ or complaints regarding your participation.

1. Professor Peter Cleaton-Jones
   Telephone: 011 717 2301

   Email: peter.cleaton-jones1@wits.ac.za

2. Ms. Zanele Ndlovu/ Mr. Rhulani Mkasi/ Mr. Lebo Moeng (Administrative Officers)
   Telephone: 011 717 2700/2656/1234/1252
   Email: zanele.ndlovu@wits.ac.za; Rhulani.mkansi@wits.ac.za; and Lebo.moeng@wits.ac.za

APPENDIX H: CONSENT TO AUDIO RECORD

Study Title: An exploration of the roles of Environmental Health Practitioners in Ekurhuleni Health District, Gauteng Province.

I have read the project information sheet, and I understand that it is up to me whether or not the interview is tape-recorded. It will not affect in any way how the interviewer treats me if I do not want the interview to be tape-recorded.

I understand that if the interview is tape-recorded the tape will be destroyed two years after the interview.

I understand that I can ask the person interviewing me to stop tape recording, and to stop the interview altogether, at any time.

I understand that the information that I give will be treated with the strictest confidence and that my name will not be used when the interviews are typed up.

Yes, I give my permission for the interview to be tape recorded	☐
No, I do not give my permission for the interview to be tape recorded	☐

Interviewee's signature: _____ Date: _____

Interviewer's signature: _____ Date: _____

Interviewer's name (please print): _____ Date: _____

APPENDIX I: EKURHULENI HEALTH DISTRICT PERMISSION LETTER

City of Ekurhuleni

GAUTENG PROVINCE
REPUBLIC OF SOUTH AFRICA

EKURHULENI RESEARCH CLEARANCE CERTIFICATE

Research Project Title: An exploration of the roles of Environmental Health Practitioners in Ekurhuleni District, Gauteng Province.

NHRD No: GP_201801_016

Research Project Number: 29/03/2018-1

Name of Researcher(s): Mr Zanoxolo Futshane

Division/Institution/Company: University of Witwatersrand

DECISION TAKEN BY THE EKURHULENI HEALTH DISTRICT RESEARCH COMMITTEE (EHDRC)

- *THIS DOCUMENT CERTIFIES THAT THE ABOVE RESEARCH PROJECT HAS BEEN FULLY APPROVED BY THE EHDRC. THE RESEARCHER(S) MAY THEREFORE COMMENCE WITH THE INTENDED RESEARCH PROJECT.*
- *NOTE THAT THE RESEARCHER WILL BE EXPECTED TO PRESENT THE RESEARCH FINDINGS OF THE PROPOSED RESEARCH PROJECT AT THE ANNUAL EKURHULENI RESEARCH CONFERENCE.*
- *THE RESEARCH COMMITTEE WISHES THE RESEARCHER(S) THE BEST OF SUCCESS.*

Dr. J. SEPUYA

DEPUTY CHAIRPERSON: EKURHULENI METROPOLITAN MUNICIPALITY
Dated: 10/04/2018

Dr. R. Vellemen

CHAIRPERSON: GAUTENG DEPARTMENT OF HEALTH (EKURHULENI REGION)
Dated: 10/04/2018

APPENDIX J: TURNITIN REPORT

MPH Research Report All chapters Final 30 March 2025_FINAL.docx

ORIGINALITY REPORT

23%	16%	15%	9%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to University of Witwatersrand Student Paper	6%
2	wiredspace.wits.ac.za Internet Source	2%
3	vital.seals.ac.za:8080 Internet Source	1%
4	hdl.handle.net Internet Source	1%
5	core.ac.uk Internet Source	1%
6	www.researchsquare.com Internet Source	<1%
7	Poswa, Tobius Thobile. "Environmental Health Practice in a South African Metropolitan Municipality: Professional, Ethical and Legal Responsibilities and Challenges", University of the Witwatersrand, Johannesburg (South Africa), 2025 Publication	<1%