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Health Based Propagated Occupational Health Epidemics Associated with Overstayed and Congested Unclaimed Corpses in Public Mortuaries of Western Kenya

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ABSTRACT

Quality Uptake of Occupational health epidemics, in infection prevention control, measures, endure the crucial area of public health surveillance in public facility mortuaries. When handling potentially infectious unclaimed corpses, globally, regionally and locally in western Kenya, to mediate primary prevention in the health population. The main occupational hazards in public mortuaries are human remains of unclaimed corpses or clinical inpatient deaths. In additional, contaminated surrounding environment such mortuaries are also potentially harmful to the population health, due to cross infection (Contact) or inhalation. The main mortuary occupational hazards include chemical, psychosocial, biological, physical, and ergonomic hazards. While the basic biological infectious risks attributed to the exposure to congest and overstayed unclaimed corpses by mortuary and forensic service providers include, propagated pathogens of contagious biological origins, which have probability to spread by inhalation or skin contact. Such as pulmonary tuberculosis, cholera, hepatitis B & C antigens, HIV/ AIDS, and skin infections. Integument maceration by formalin and leukemia. However, though most studies, global and regional, have promulgated on the perpetual increase of occupational health epidemics, attributed to congestion and overstay on unclaimed corpses in public mortuaries. Before habitual span of 90 days of cold storage on "cold hit" of forensic investigations. No studies have validated

in reality, the prevalence of occupational health epidemic attributed to exposure to unclaimed corpses in public mortuaries, by mortuary and forensic service providers in western Kenya. Thus, the timely need to study Health Based Propagated occupational health epidemics Attributed to overstayed and congested unclaimed Corpse in public mortuaries. Specifically, to determine the level of occupational hazards and infectious risks attributed to overstayed and congestion of unclaimed corpses in public mortuaries and evaluate rate of professionalization of mortuary, forensic services, and essential supplies of reagent and embalmment equipment replenishment, as basic variable for sustainable health hygiene and sanitation on primary prevention in public mortuaries. Study designs, descriptive cross sectional and cohorts' studies of mixed methods. Study populations, Primary study population, (mortuary and forensic service providers), and Secondary study population (retrospective desk review of unclaimed corpses information records) for the past 5 years (2017 -2021). Sampling designs, Active convenient purposive, and snow ball sampling, of past incidence exposure records of mortuary and forensic service providers. Data collected, by semi-structured questionnaires, retrospective review form, KII, FGD and observation guides. Data collected, spread on excel sheets before managed by SPSS version 26 for descriptive and inferences analyzes. Odds ratio (OD) and relative risk ratio (RR), determined the attributable risks in exposed and non- exposed population health. Qualitative data analyzed by categorization of themes and triangulations of verbatim. Results, out of 6 hazards propagated, majority were attributed to psychosocial hazards, 14 (22%), OD, (0.59, 0.1.7), RR (0.58). The most prevalence infection was maceration of integuments, 13 (21%), due to single uptake of gloves. No infectious epidemics recorded in the last 5 years of the retrospective desk and snowball study. Thus, the need timely need to advocate for continuous health awareness via health education and health promotion on need for health population to stop propagating on occupational health infectious disease attributed to congestion and overstay of unclaimed corpses in public mortuaries. Since they are no scientific records to support any significant outbreak attack to mortuary and forensic service providers.

Key words: Occupational hazards, propagated infectious risks, Primary prevention, public health surveillance, unclaimed corpses, Embalmment, arterial fluid, health education health promotion

INTRODUCTION AND BACKGROUND INFORMATION

The main occupational hazards in public mortuaries, are human remains, of unclaimed corpses or clinical inpatients deaths in wards, or environment that is potentially harmful to mortuary and forensic service providers, (Okoth-Okelloh *et al*., 2015; Pham et al., 2020). Similar to chemical, psychosocial, biological, physical, ergonomic and work organization hazards exposed by mortuary and forensic service providers, (WHO, 2005; WHO),2017).While infectious risks, are mortuary propagated pathogens or contagious biological infection, that have probability of spreading among mortuary and forensic service providers to the rest of the health population, through inhalation or skin contact with unclaimed corpses, (Watkins *et al*., 2006 ;Vinten, 1986). Example of infectious risk with probabilities to spread, when exposed to none embalmed inpatient death bodies or unclaimed corpses are pulmonary Tuberculosis, cholera, Hepatitis B & C antigens, HIV/ AIDS, skin infections, integument maceration by formalin and leukemia, (De Goyet, 1999; Noji, 2000; Hauptmann *et* al., 2009 ; Mara and Evans, 2018).

Most occupational health hazards, with great potentials harm to mortuary and forensic service providers, include chemical, biological, psychosocial, ergonomic, physical and work organization hazards. Continue to pose big challenge to mitigate, by public mortuaries, and are bound to affect seriously on the mortuary and forensic service providers. If not controlled promptly using the health hygiene and sanitations, (Saul, 2013; Mara & Evans, 2018). However, standard occupation health safety, ensure that human resources are, compliance with health, safety standards administration (OSHA), (Okoth-Okelloh et al., 2015; Pham *et al*., 2020). The major occupational Infectious risks, attributed to congestion and overstay of unclaimed corpses, in public mortuaries take account of mainly, biological hazards derivation, such as viral, fungal and bacterial infections. Could emanate from longer exposure by mortuary and forensic service providers or visiting population health unclaimed corpses (Sodhi et al., 2013; Silali *etal*., 2017).

Decomposing unclaimed corpses are often, associated with deprived preservation methods, in cold rooms, as main health system factors, that heighten autolysis by cathepsin enzymes and putrefaction by bacterial, (Advisory Committee, 2003; Fusco *et al*., 2016). Which continue to negatively affect more on the propagated occupational hazards, infectious risks and suspected increased expenses on infection prevention control, of health epidemics among mortuary and forensic service providers, and the health population, (De Goyet, 1999; Noji, 2000:. Brenner, 2014). Visiting health population may acquire the proliferated infections, by skin contact or inhalation to cause infections, (Amoran and Onwube, 2013; Silali et al., 2017). The main occupational infectious infections, attributed to biological hazards exposures include: fungal infections hepatitis B & C, tuberculosis, cholera, and leukemia attributed to chronic exposure to formalin, (Agha, 2012; Marangu, 2020;. WHO, 2015; Correia *et al*., 2014). Most propagated occupational Health hazards and infectious epidemics are compounded, (De Goyet, 1999; Noji, 2000;

Abdulraheem *et al*., 2012), with inadequate knowledge, attitude and practices of quality forensic services and empowerment of the population health.

The mortality data rates on fetus and juvenile cohorts continue, neglected, by the law and undocumented, by the government vital statistics, to enable future policy development and change on induced manner of death among juvenile unclaimed corpses, which has been on rise, since the colonial era.(Robben, 2018; Greasley & Kaczor, 2018). The study discovered that, 10 % unclaimed corpses occurs per day in the study region, potency inadequate and tilted, as the formal described figures by vital statistics. But then again, remain a big health challenge in western Kenya. Subsequently, because most cases may not reported to vital statistics department, as per death and birth registration Act CAP, 149, and as per the definition of Health by WHO in 1948. Additionally, western Kenya contains a diversity of various co-existing community health, with various diversity of religious cultures and rites, attributed to handling the disposal of the unclaimed corpses.

MATERIAL

Prevalence of Occupational Hazards in Public Mortuaries and Forensic Services

Occupational hazards are conditions or objects, which may cause risks to mortuary and forensic service providers. While working in public mortuaries, (Cocco, 2002; Vinten, 1986). Occupational Safety and Health Administration (OSHA), is the government organization, in charge of keeping workers safe, created in 1970, by the Congress with mission to ensure "safe and healthful working conditions for workers by setting, and enforcing specific standards. Through capacity building, the community outreach, education, research and health promotions in the population health, (Okoth-Okelloh *et al*., 2015 ;Pham et al., 2020).

Chemical hazards consist of chemical substances, such as carbon monoxide, carbon dioxide, nitrogen dioxide, sulphur dioxide, hydrocarbons, sulphuric acid, tannic acid acetic acid, fumeric acid, ozone, limes and alkalies, which may cause injury to mortuary and forensic service providers. When they are absorbed through skin and inhaling or ingesting, when handling unclaimed corpses or embalmment reagents, without using non pharmaceutical interventions, (NPIs),(Koh & Jeyaratnam, 2001). (Bajracharya & Magar, 2006), (Bajracharya & Magar, 2006; Correia et al., 2014). Mortuary and forensic service providers may suffer from respiratory diseases, skin diseases, allergy, heart disease, cancer and neurological disorders, (Frome *et al*., 2013; Clarkson *etal*.,2012).These diseases may be brief or chronic in nature. Often a disease may be difficult to diagnose, because of either its symptoms may appear after a long dormant period, or may not be apparent at all. These diseases often shorten employee s life expectancy, (Clarkson *etal*, 2012;Ahmed, 2011)

Biological Hazards, influence manifestation of diseases, caused by bacteria, fungi, viruses, insects, dietary deficiencies, excessive drinking, allergies, brain fever, imbalances, tetanus, stresses and strains on mortuary and forensic service providers (Bedoya *et al*., 2017 ;Cocco, 2002; Verani *et al*., 2010). Environmental Hazards, take account of

noise pollution, vibration and shocks, illumination, radiation, heat, ventilation, air and water pollution, these hazards cause redness of eyes, genetic disorders, cancer, sterility, hearing loss, nerve injury etc., to mortuary and forensic service providers, (Iliyasu et al., 2016 ; Koh & Jeyaratnam, 2001). Psychological Hazards attributed to mortuary and forensic services job attributed stress, caused by various stressors, such as task and role demands, organizational leadership, and lack of group cohesion, intergroup and interpersonal conflicts, and life and career changes. May lead to emotional disturbances, which in turn, lead to fatigue and

Exhaustion. All these, affect health of both mortuary and forensic service providers and the population health. Apart from occupational hazards, there are some occupational diseases, which impair health of mortuary and forensic service providers, (Koh & Jeyaratnam, 2001.; Pham *et al*., 2020 ; Chen et al., 2004).

Ergonomic Hazards, cause or put strain on your body of mortuary or forensic service providers, over a period. You may just feel sore or cramped in the short term, but repeatedly sitting or standing in difficult positions, or completing the same movements repeatedly, across a long period (Correia *et al*., 2014, Okoth-Okelloh et al., 2015). Ergonomic Hazards, can lead to long-term injury and illness, (Verani *et al*., 2010 ; Pham *et al*., 2020) Physical hazards are hazards attributed with infrastructural social amenities, located in the facility mortuary setting, that can harm your body without you actually touching it, like exposure radiation, prolonged exposure to sunlight, extreme high or low temperatures and loud noise. Work organization hazards, are mainly the workplace violence, and staff discrimination, deficiency of respect, sexual aggravation, and other conditions , which are hazardous to mental, emotional, and physical health among the health population, (Cocco, 2002; Koh & Jeyaratnam, 2001).

Epidemic Risks Attributed to Mortuary and Forensic Service providers' Exposure to unclaimed Corpses in Public Mortuaries

Globally, significant numbers of unclaimed corpses, acknowledged in public mortuaries, are mass grave disposed, (Robben, 2018; Chen *et al*., 2004), earlier than expiry periods of 90 days on cold storage of "cold hit" investigation, of the prescribed medico legal standard frame works, to improve hygiene and sanitation measures of the population health, (Cox et al., 2011; Illes and Wilson, 2020). Letdown by the police services, in uptake quality medico legal frame works, results into, accumulative congestion, decomposition of unclaimed corpses. Hence increased propagated, occupational high risks of contagious infections to mortuary and forensic service providers. Therefore, the resident magistrates and public health officers, apply health laws governing medico legal procedures, to enable public health act CAP 242 and Human Anatomy Act Cap 249, to mediate for primary prevention, legal consent, justice and accountability of human remains, by issue of affidavits, and court orders respectively. Before and during the effects of improper unceremonious mass grave disposal in public cemeteries, (Robben, 2018; Pankaj and Singh, 2017). Epidemiology of unclaimed corpses, occupational health hazards and risks , medico legal procedures and health laws, have been studied by innumerable forensic scientists, in a synergistic participations, to decrease the unceremonious mass grave disposal of

unclaimed corpses, (Percy, 2005; Pham et al., 2020; Chen et al., 2004).

However, not at all study has considered the pitfalls of occupational health hazards. Epidemic risks and the inadequate, capacity building in forensic service, among mortuary and forensic service providers, attributed to the core challenges on infection prevention control, mitigations, to decrease unceremonious mass grave disposal of unclaimed corpses (Robben, 2018), and enable, quality infection prevention control, (Bedoya *et al*., 2017 ; Hauptmann*et a*l.,2009).In western Kenya, once the crime Police services, opens inquest files for autopsy and acknowledges the unclaimed corpses in public mortuary, the rest of work left to NOK, whom most of them are never aware, if their persons demised. The facilities wait for the expiry of three months on cold storage on "cold hit" investigations. To apply on health laws governing medico legal procedures, as primary prevention on the deprived mortuary hygiene and sanitation. Which, widely attributed to increased occupational health hazards and epidemicrisksexposures,bythemortuaryand forensic service providers working in public mortuaries, (Chen et al., 2004; Pham *et al*., 2020). Inadequate professionalization of the public mortuary and forensic service providers, inthe ministry ofhealth, tooffer quality forensicservices endure on high demand, since the colonial era, and remains a persevered challenge attributed to deficiency of dignified disposal of previously unclaimed corpses in public mortuaries in western Kenya. (Silali, 2017; Saul, 2013).

Occupational health epidemic challenges attributed to perennial difficulties, in uptake of quality and sustainable infection prevention control, measures. Besides constant letdown of polices services,to implement quality medico legal procedures promptly. Thus, the timely need to mainstream mortuary and forensic service providers, with knowledge, attitude and practices, though, forensic science training and capacity building, using mass media and health education forum's, to enhance health promotions, through health education forums, (Sodhi *et al*., 2013;Watkins et al., 2006; Mara & Evans, 2018). Most studies demonstrate that, the lesser congested unclaimed corpses. Safer working mortuary and forensic service environment, to enable primary prevention against communicable diseases, (Bedoya et al., 2017; Agha, 2012). However, in western Kenya, the devastating state of mortuary hygiene and sanitation, remains undocumented, as established, during the expert observational baseline survey and need assessments.

The main purpose of infection prevention control is to decrease, manifestation and transmission of any infectious diseases, by basic application of embalmment as, a standard hygiene, and sanitation mitigation to health population, (Correia et al., 2014; Beck, 1966 ; Amoran and Onwube, 2013). Specialized training in core disciplines of forensic services and mortuary science, remain key pillars on integration under single command management in the department of forensic sciences, (Abdulraheem *et al.,* 2012; Saul, 2013). Capacity building, advocates for quality empowerment, and mediates sustainability for a safe working environment, with minimal health risks and occupational hazards. (Nyaberi et al., 2014 ; Nyaberi *et al*., 2014).

However, not much studies in western Kenya. Explored fully, to ascertain on the main causes of inadequate recruiting of professional human resources, as health system factors, to decrease chances of propagated occupational health epidemics attributed to increase unceremonious mass grave disposal on unclaimed corpses in public cemeteries, (Robben, 2018; de Goyet, 1999).

Fundamental Epidemics Attributed to Biological Hazards of Handling Unclaimed Corpses for Unceremonious Mass Grave Disposal

Unclaimed corpses acknowledged by the public mortuaries, in western Kenya, primarily include, fetus from the induced abortions, juvenile and adult cohorts. (Pankaj & Singh, 2017; Greasley & Kaczor, 2018). They remain academically infectious objects, with epidemics of Hepatitis B and C, cholera, tuberculosis, HIV, meningitis and skin infections, (*Okoth-Okelloh* et al*.,* 2015 ;WHO), 2017). Leukemia is also associated with, long-term exposure to formaldehyde or may be confounding factor, (Ahmed, 2011; Montañez- Hernández *et al.*,2020). Hepatitis B, an antigen that causes hepatitis B virus (HBV), known to affect over 257 million people globally, likewise an occupational hazard, among mortuary and forensic service providers. In 2018, HBV infection give rise to 88,700 deaths among, health service providers, (WHO, 2016b). However, HBV morbidity and mortality, among the mortuary service providers in western Kenya, remain undiscovered and unclear (WHO, 2005). However, though most studies have associated the mortuary infectious diseases with mere propagated diseases on mortuary and forensic service provides, since their mortality data, continue to appear insignificant in prevalence. (De Goyet, 1999; Noji, 2000: Brenner, 2014).

Tuberculosis is an airborne infectious bacterial disease that affects millions of health service providers globally. In 2017, 10 million people were infected with tuberculosis and 1.6 million people died from TB globally. (Agha, 2012; WHO 2017). However, in the study region, established that, the morbidity and mortality attributed to occupational infectious of TB, not been explored fully. Moreover, remain undocumented for public scrutiny. However, few cases have been reported by departments of disease surveillance in relation to unceremonious mass grave disposal of fresh unclaimed corpses, (Huffine *et al*., 2001;WHO2017).

TB infection incidence is at about 2% per year, (Correia *et al*., 2014). Which accelerated to, 4-5 % annually. Due to emergence of the current Multidrug -Resistant TB hazards, (Agha, 2012;Verani et al., 2010). Control of TB, is complicated by its manner of transmission. Difficulty in administering long course chemotherapy regimens and subsequent appearance of multi-drug resistant strains, (Correia et al., 2014 ;Agha, 2012). Study by (Shako and Kalsi, 2019), establish that, tuberculosis risks on mortuary and forensic service providers, is on increase specifically, from poorly embalmed unclaimed corpses, (Correia et al., 2014 ; Watkins *et al*., 2006). Unclaimed corpses may also contain other infectious pathogens, such as Neisseria Meningitides, meningitis, potentially infectious to mortuary service workers. (Verani et al., 2010 ; Hauptmann *et al*., 2009). Moreover, although most pathogens do not survive at very low temperatures, Neisseria meningitis found to survive for over 72 hours on a metal

surface,Bedoya*etal*.,(2017). Fungal infections are skin contagious diseases spread by skin contacts or wind. Also called tinea pedis, causes peeling redness, itching, burning and blisters or sores. Ring worms (tinea corporis), (Bedoya et al., 2017; Murrell, 2011). Spread by skin contact. Hence, potentially infective, from the infected unclaimed bodies, dead clothes or furniture to mortuary/forensic service providers, (Nantulya and Reich, 2002). Blood soiled HIV and formalin maceration, Ahmed, (2011), of hands or morticians and cholera, remain potential sources of infection to mortuary and forensic service providers, that never utilize non-pharmaceutical interventions when handling unclaimed corpses, (Castro and Coyle, 2013; Mara and Evans, 2018).

However, the current documentation on propagated occupational health hazards, and epidemic risks infection, attributed to the gross infection in public facility mortuaries of western Kenya, remains unclear, insufficient and undocumented in relation to both unceremonious mass grave disposal and dignified disposal of previously unclaimed corpses.

Uptake of Infection Prevention Controls Measures When Handling Unclaimed Corpses for Mass grave Disposal

Advisory Committee on Dangerous Pathogens. Classified infectious risks diseases, into four groups, based on infection of pathogens and its virulence, to population health (Advisory Committee, 2003; Rowe *et al*., 2005). Group 1 and 2, labelled BLUE for mild diseases, e.g. MRSA, Cholera, influenza, scabies, Norovirus. Group 3 pathogens labelled YELLOW, to indicate, minimal chances to permit cross infection, and may influence significant disease to health service providers, e.g. Hepatitis B, C, HIV mycobacterium tuberculosis (TB), (Agha, 2012), salmonella infections: salmonella typhimurium, spongiform encephalopathy, (Creutzfeldt-Jakob disease), and cholera infection (Amoran & Onwube, 2013; Nyaberi *et al*., 2014; Silali *et al*., 2017). Group 4 pathogens labelled RED, are extremely pathogenic, and cause serious epidemic disease to the host e.g. viral hemorrhagic fevers, Marburg fever; Ebola fever. Hence, such dangerous infectious attributed infections, are carried out in fume chamber, during autopsy dissections (Amoran & Onwube, 2013; Agha, 2012). However, classification of dangerous pathogens, as per specific color liners, in western Kenya, remains selective, as per each level/tier of the facility mortuary. For instance, Level 6 are more informed on color coding than tier 4 facility mortuaries.

Infection Prevention Control Precautions When Handling Unclaimed Corpses or Inpatient dead acknowledged in Public mortuaries

All human remains received at reception of any mortuary with or without clear history. (De Goyet, 1999; Noji, 2000), are suspected to be potentially infectious to mortuary and forensic service providers similar to the visiting population health, (De Goyet, 1999; Noji, 2000; Cox *et al*., 2011). When handling all unclaimed corpses, following guidelines, keenly examined, ((WHO, 2005): Avoid direct contact with blood or body fluids from dead. Observe strict personal hygiene, and put on NPIs such as double surgically gloves, water resistant gown / plastic apron over water repellent gown and face masks. Use NPIs to protect eyes during embalmment, (Bajracharya & Magar, 2006; Beck, 1966). In case of any splash or cut, covered with waterproof bandages or dressings. Do NOT smoke, drink or eat.

DoNOTtouchyoureyes,mouthornose.Storeunclaimedcorpsesin arobustandleak-proofopaqueplasticbagofnot lessthan150µmthickandzipup.(Bagged body inserted into another opaque body bag if dead as suspected to be a case of potentiallyinfectiousdiseases),(Watkins et al., 2006 ;Bedoya et al., 2017;Rowe*et al.*,2005).Remove NPIsafterhandlingdeath,wash handswithdisinfectant,(SchachnerandHansen,2011).Moreover, above standard precautions uptake in the study region,endureinfrequentaccessibility insupplyand in uptakes by mortuary and forensic service providers. Therefore, the timely need for quality advocacy, and mediation on future uptake on quality infection prevention control, measures to enable perpetual decrease ofunceremoniousmass grave disposal. Similarly advocate for dignified disposal of previously unclaimed corpses, (Amoran & Onwube, 2013; Watkins et al., 2006)

Safety Precautions on Safe Environmental Health when Handling Infectious Unclaimed corpses

Safety precautions, among mortuary and forensic service providers, are maintained by regular supply of disposable gloves, Non pharmaceutical Interventions, (NPIs), alcohol-based hand rub and disinfectant, such as sodium hypochlorite, (Bedoya *et al*., 2017). After use, disposable items like gloves and protective clothing, (Amoran & Onwube, 2013; Watkins et al., 2006). Should be disposed of in Yellow plastic bag liner. Tissue remnants in Red liners and food remnants in black liners (Silali *et al.*, 2017). Ensure open wounds, cuts and abrasions covered with waterproof bandages or dressings. Do NOT smoke, drink or eat. Do NOT touch your eyes, mouth or nose. Observe strict personal hygiene. Practice regular hand hygiene,(Mara and Evans, 2018). Remove all, NPIs after handling dead or contaminated surfaces then wash hands with disinfectant and in running tap water, (Bedoya *et al*., 2017). Mortuary linens soiled with blood or body fluids laundered in a washing machine with a hot washing cycles. At less than $70c^{0}$, or soaked in fresh 1 in 50 diluted sodium hypochlorite, for 30 minutes before washing. Contaminated mortuary surfaces and floor wiped with freshly prepared 1 in 50 diluted sodium hypochlorite, for 30 minutes before washing. Then rinsed in running water. Metal surfaces wiped with 70% alcohol. Surfaces visibly soiled with blood and body fluids wiped with 1:5 sodium hypochlorite,leaveitfor10minutes,thenrinsewithwater,(Bedoya*et al.*,2017).HepatitisB, Cholera and Tuberculosis vaccines recommended for mortuary and forensic service providers. A high standard of personal hygiene adopted to control propagation of mortuary disease to health population (Percy, 2005 ; Abdulraheem et al., 2012).

However, the observational study on the informed evidence in western Kenya on the Safety Precautions for safe environment in Public Mortuaries. While handling unclaimed corpses during unceremonious mass grave disposal, remains very scanty and inadequate to ascertain quality levels of infection prevention and control.

Effects of Knowledge Attitude and Practice (KAPs), of Mortuary and Forensic Service Providers', on Occupational Health Epidemics infection prevention Control

Knowledge, attitude and practices on infection prevention control, measures, form the benchmark for the health Nation, with moreover safe community livelihoods to influence quality uptake of medico legal, with lower uptake of health laws, in public facility mortuaries to enhance family disposal of the previously unclaimed corpses. Since it restricts, the spread of epidemics, during and after mass grave disposal. In addition, encourage dignified disposal of previously unclaimed corpses as per religious and cultural rites of the diversified population health (Amoran and Onwube, 2013;Watkins et al., 2006).

KAP of mortuary and forensic service providers, on hygiene and sanitation, at workplace decrease chances to spread disseminated infection, or carry out cross infections, (De Goyet, 1999; Noji, 2000; Mara and Evans, 2018). Globally 3 5 million health workers, have exposure to occupational blood-borne pathogens. Of which each year, 2 million attributed to hepatitis B virus (HBV). 0.9 Million to hepatitis C virus (HCV), (WHO) , 2017) 170,000 are HIV, of which mortuary/ forensic service providers are at high risk of acquiring transmission from occupational exposure to mortuary infectious infection. Attributed to improper unceremonious, mass grave disposal unclaimed corpses. Inadequate KAPs of mortuary/forensic service providers, on the uptake of infection prevention control measures. Have negatively affected both population health and the environment health, as evidenced in among few diseased morticians with Tuberculosis and fungi disease. Associated with, deprived infection prevention control, measures, on the clinical death cases, and not from the previously unclaimed corpses, (Murrell, 2011; Watkins *et al*., 2006).

Study in Nigeria, established the inadequate level of skilled, KAPs. On infection prevention control, measures and application of medico legal frame works, among many mortuary and forensic service providers. Have given rise to the increased execution of the health laws, governing medico legal procedures, as a primary prevention, to mitigate further exposure to the occupational health epidemics in the health population. Hence, any poor infection prevention control and safety measures taken by facility mortuary on congested and overstayed unclaimed corpses, results to the increased improper unceremonious mass grave disposal, among the entire population health, (Amoran and Onwube, 2013). The study, also established that mortuary and forensic service providers, rarely adhered to quality, infection prevention control, standards. In addition, proper unceremonious mass grave disposal uptake, is very poor since independence, that entails, mass grave disposal in earmarked grave yards with year of mortuary registers, in less than 6 feet furrows, and all unclaimed corpses are tagged with aluminum metals, to enable easy accessibility on future exhumation demands, (Bedoya *et a*l., 2017; Rowe *et al.*, 2005; Marangu, 2020).

Never the less, currently there are no quality studies published scholarly, to demonstrate in Kenya, how KAPs of forensic and mortuary service providers influence infection prevention control of the occupational health epidemics.

During the subsequent uptake of medico legal procedures such as forensic identification, DNA appraisal and use of the secured networks by the national police services, to enable dignified disposal of previously unclaimed corpses for sustainable safe community livelihoods, (Abiodun & Abioro, 2014 ; Castro & Coyle, 2013; Beavan, 2001).

Theoretic statements

Moreover, though most studies have absorbed to develop and enlightening the existing hurdles for national police services since colonial era. To implement quality Medico legal procedures, attributed to dignified disposal of previously unclaimed corpses. Disparities are still on increase and like children borne outside the wedlock. In addition, induced abortion from teenagers in college and university female reproductive cohorts. Then abandonment in pushes or public toilets. Therefore, timely need for ultramodern DNA constructions to rule out the paternity of the child fetus aborted as a sustainable infection prevention control, programs for the health population.

The National police services, doing finger print abstractions, to rule criminal or normal practices of its citizens. Before issuing, the Good conducts. To enable one get a government job, or leadership position in the government offices or parastatal firms. But then again unable to implement similar finger print abstraction procedures, on adult unclaimed corpses efficiently to reduce congestions and overstay of the unclaimed corpses in public mortuaries. As source of propagated occupational health epidemics attributed to 90 days of cold storage in “cold hit” investigations of the forensic services and healthcare

Conceptual Statement

Although, the society may have an integrated system of essential supply of embalmment reagents and machines, and good models of standard operating procedures, against occupational epidemic infection prevention control, programs in public mortuaries. In addition, well trained mortuary and forensic service providers to sustain primary prevention while working in congested and overstayed unclaimed corpses waiting span of 90 days of “cold hit” investigations, and uptake of subsequent medico legal procedures. There is also, need to establish how KAPs, of mortuary and forensic service providers, effect both unceremonious mass grave disposal of unclaimed corpses or dignified disposal of previously unclaimed corpses in western Kenya, as described in the conceptual frameworks below.

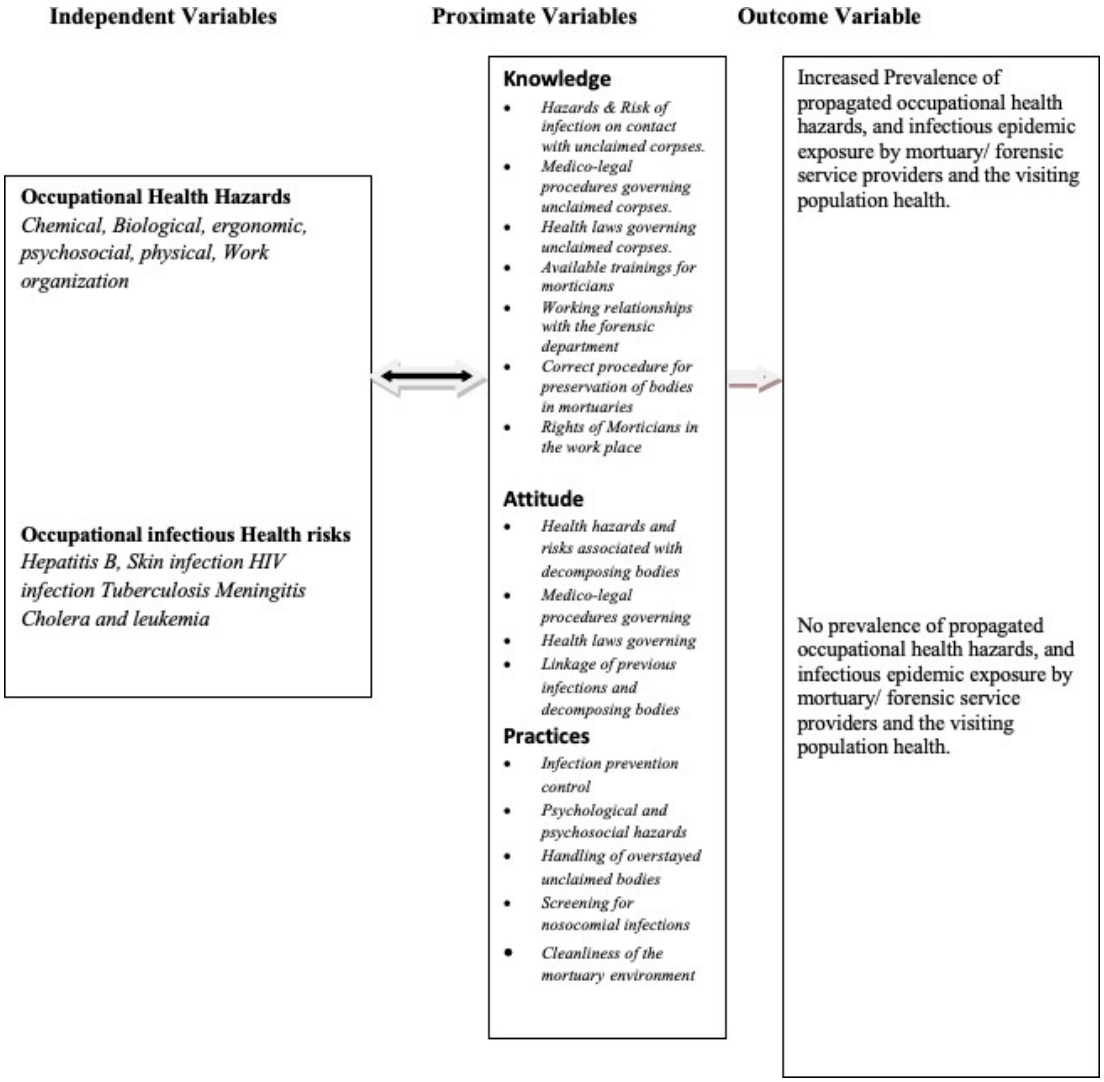

Figure 2.1 Conceptual framework

METHODS AND METHODOLOGY

Study Area

Western Kenya (Appendix V) covers 26,793 km^2 with 2019 population census of 13,444,949 population health, (Macharia *et al*., 2021; Statistics, 2010) and population Density of 1842/km^2 . The region lies at longitude of 33^o 37`E to 33$^0$55`E, and latitude 1^0 8`N, 1$^0$ 40`S. Facility on the highest altitude is Kitale County Referral Hospital, on north. The county is well known for Agriculture in large scale maize and dairy farming, Busia County referral hospital, Bordering Uganda is on the lowest altitude and well known for mixed cropping and border micro business. The Main level 6 and referral facility in the study region, is Moi Teaching and Referral Hospital, (MTRH) located at North East, well known as home of champions in athletics, large scale farming of rice and dairy farming. Migori County referral hospital, borders on the south, with Tanzania and peasant and fish farming. Siaya and Mbale County facilities lies at the Equator, and practice mixed farming on small scales, (Fox, 2014; Macharia *et al.,* 2021).

Table 3.1 in (appendix vi a) show distribution of the study County facility headquarters in western Kenya, that contain facilities used for data collection on occupational health epidemic, medico legal procedures, health laws and health system factors attributed to unceremonious mass grave disposal of unclaimed corpses by public mortuaries in western Kenya.

The determination of occupational health epidemics and Health system factors attributed to unceremonious mass grave disposal of unclaimed corpses by public mortuaries in Western Kenya. Was carried out in public health facilities of tiers, 3, 4, and level 5 and 6 facilities, located in administrative and political map unit. Where medico-legal frame works, were initiated, and are being utilized, to enable dignified disposal of the previously unclaimed corpses and decrease unceremonious mass grave disposal of unclaimed corpses by the public mortuaries. Although a total numbers of public health facilities in western Kenya are over 490, only 20 health facilities met threshold of the inclusion criteria. (Participating in occupational health epidemics, attributed to unceremonious mass grave disposal of unclaimed corpses by public mortuaries in western Kenya). With the structural support from National medico-legal unit, where the respondents who made inclusion criteria filled the consent form

Study Designs

Descriptive cross sectional and snow ball studies on previously exposed mortuary and forensic service providers in western Kenya.

Data taken at point of data collection on target population in the specific target facility, respondents with confirmed cases of occupational health hazards, and such psychosocial, biological and ergonomic hazards. Occupational health risks infection such as, TB, or fungal or lung cancer infection, due to formalin exposure, and their data were monitored retrospectively, and prospectively for 3 months, to ascertain validity and reliability of the occupational mortuary infection attributed with unclaimed corpses using a retrospective desk review form. Their uptake on medico legal and health laws, health system factors, and influence of knowledge, attitude and practices on unceremonious mass grave disposal of unclaimed corpses by public mortuaries via survey and interviews. While the snowball studies, to service provider who were previously expose to infectious epidemic, but were later transferred to another mortuary facility were still infected with the mortuary disease. The study designs, implemented in 20 health facilities of tier 4, level 5 and level 6 in Western Kenya (Appendix v).

Study Population

The primary study population, were mainly purposive clusters of mortuary service/forensic providers: Morticians, inquest police service of crime, pathologists, Public Health Officers, close family friends, Forensic scientist/ technologist, embalmers Police Officers and Health Administrators

Sample Size Determination

Sample size was determined by Fisher formula,(Sweeney & Fisher, 1998), and adjusted by finite formula in twenty (20) public health facilities executing occupational health epidemics, medico-legal procedures, health laws and health system factors attributed to unceremonious mass grave disposal of unclaimed corpses, by public mortuaries in western Kenya with an estimated target population of 600 respondents.

Fisher's formula states:

$$n = \frac{Z^2 pq}{d^2}$$

Where n = target population greater than 10,000

Z = degree of confidence (1.96)

p = Population of estimated study / target population (0.50)

q = proportion of the acceptance proportion significance of respondents estimated to be traced. (0 .50)

d = level of statistical test, 0.05

$$n = \frac{(1.96)2\ (0.5)\ (.05)}{(0.05)2} \qquad \frac{9604}{25}$$

n = 384

Adjustment of the sample size, was done, using Finite population correction formula ,(Naing e*t al*., 2006), because estimated sample size from public health facilities in western Kenya was below 10,000 respondents.

Hence corrected sample size:

$$nf = \frac{n}{1+\left(\frac{n}{N}\right)}$$

Where

nf= desired small sample size of respondents was less than 10,000.

n= desired large sample size of respondents was more than 10,000

N = total estimated study / target population size (600)

Hence:

$$nf \qquad \frac{384}{1+\ \{384\}\ 600}$$

= 235 respondents

Overall, sample size, 235 mortuary service providers. In addition, 10% non-response participants. (235+24) = *259***,** participants.

However, during the desk review census, on the valid functional mortuary and forensic service providers counted, to be viable in service in 2021 sampling frames, were only 253. Hence, all the 253 mortuary forensic service providers in the region surveyed and interviewed. Then, were earmarked, as valid and reliable sample size from their specific (registers), sampling frames of the target population from the study region.

Logistics and Ethical Consideration

Research and ethical approval were received and approved by the Masinde Muliro University of Science and Technology, School of Graduate Studies (SGS), (Appendix i), and Ethical Review Committee (MMUSTERC) approval numbers are: MMU/COR 403012Vol 6 and **MMUST/IERC/OO9/2022**, (Appendix ii). Research permission obtained from NACOST, License No: **NACOSTI/P/22/14942 (**Appendix iii)**.** The Consents, sought, from all respondents (Appendix iv), before questionnaires, administered. Information obtained from respondents, treated with confidentiality (autonomy), and privacy of highest order at all stages of the research, (data collection, data analysis, and reporting, etc.). Retrospective desk review form was mainly handle by principal researcher. Not at all, names or identifiers of study subjects on medical records reviewed to the public. Unique codes used. The study was flexible to allow any respondent to withdraw any time. The interviews were based on voluntary participation and consenting.

Only respondents, who consulted and recruited the respondents, never paid or compensated for their participation in the study.

RESULTS AND FINDINGS

Response Rate of Mortuary and Forensic Service Providers in the Study

Most of 21 facility mortuaries, selected for study or target population accessed for the evaluation during the 3 months study period. A total of 21 facilities mortuaries and 63 target population of mortuary and forensic service providers were involved in the study with 1, (5%) being level 6 facility mortuary, 3 (15%), level 5 facility and 16 (80%), were mainly tier 3 and 4 facility mortuaries. Most of the facilities surveyed and interviewed 16 (80%), were located in the rural settings. While the level 6 and 5 facilities were geographically located in urban settings of the study region, (Appendix v).

From the 253 mortuary and forensic service providers, 63 met the inclusion and exclusion criteria and responded to the survey questionnaire out of the sample of n=253. The resulting response rate was 96.1 %. For every facility mortuary and mortuary / forensic service providers' approached and gave consent for survey, interview and retrospective desk review of the past 5 years unclaimed corpses acknowledged in the public mortuary by police services until the sample size achieved for secondary population. Cluster purposive and active census using the sampling frame of the mortuary staff registers for Primary study population.

Demographic Characteristics of Primary Study Population (Mortuary and Forensic Service Providers)

Expert observation study revealed that, out of 253-sample size of study population suggested. Only 63 mortuary and forensic service providers met inclusion criteria, as primary target population. Majority48(76.2%),were maleand15(23.8%)femalegender,a social expression of a person's identity in relation to social roles and behaviors in mortuary serviceprovisionwithanaveragemeanof1.24,standarddeviationof0.423andPearsonChi square 7.26, 95%CI. Though female gender were few in mortuary/ forensic service provision, majority had achieved higher level of education compared to male counterparts, with standard deviation of 0.556, (Appendix vi b).

The study established, that about 22 (32.8%) of mortuary and forensic service providers, providing mortuary and forensic services in public mortuaries, work on permanent jobs especially females. 23 (38.9%) respondents work on contract, 11 (16.4%), of the respondents are worked as casual workers, then 8 (11.9%), were volunteers. Signifying that, sustainability of employment programs, on mortuary and forensic service providers in the study region is greatly insignificant, (Appendix vii a).

> *"Most public mortuaries in Kenya employ morticians on contract basis, rather than permanent. The contract matters surely are hurting our hearts, demotivate us and make may lead jobless anytime.", FGD discussion and triangulations with morticians in Kakamega and Kisumu County facility mortuaries on 14.03.2022 and 15.03.2022.*

Majorityofmortuary/forensicserviceproviders48(71.6%)weremarried,14,(20.9%)were single(1.5%)were divorced. Their religious of worships tabulated,(Appendix vii b)

Religion, Public health officers, Police services and Residence magistrates remained basic health determinants of executingmajorityofoccupationalhealthhazards,infectiousepidemics,medicolegalandHealthlaws,suchasaffidavit writing,autopsydissectionsandembalming, Islamregionbeliefthat,ifyoudissectabodyofMuslimitwillnotgoto heaven.Therefore,they usually go for affidavits and court orders (Appendix ix a & b) in courts for justice accountability. Vow before the resident magistrate, to evade dissection as per their religious and cultural rites. Therefore, Doctors / pathologists wrote death notification certificates, as per CAP 149 of birth and death registration Act, without ascertaining intermediate cause and nature of death, via autopsy, as per the Islamic religion.

Trends Distribution of Propagated, Occupational Health Epidemics attributed to Congestion and Overstayed of unclaimed corpses in Public Mortuaries

The study defined main occupational health hazards, attributed with congestions and overstay of unclaimed corpses in public mortuaries. Among the mortuary service providers to be mainly psychosocial hazards, 14 (22%), respondents. Where by the population health brand, mortuary and forensic service providers, closely attributed to habitual handling on the unclaimed corpses. 10 (16%), respondents suffer from ergonomic hazards, attributed to heavy work when

handling and dressing of bodies or previously unclaimed corpses, and 10 (16%), respondents, were affected by environmental hazards attributed to crying of NOK, substantial and flashy music in conveys of collecting or carrying the death of close relative or family bread winners. The incidence OD of mortuary and forensic service exposed to psychosocial hazard in relation to biological hazards is OD (0.59, 1.70) with RR (0.58), mortuary/forensic service, P value 0.05. CI 95% in (appendix viii a)

The magnitude of psychosocial hazards also echoed during FGD discussion:

> *""Darktari ukifanya kazi kwa mortuary eeh eeh!utaitatwa mtu wa mortuary" (Doctor working in a mortuary as remains is a big challenge. The community, as mortuary worker or undertaker, always labels morticians. "Yule chamaa anafanya ward 13" (that person works in mortuary) and dissects dead, for case of health service providers or (undertaker), Hence habitual socializing with the rest of communities has morticians is challenging life, out there". FGD discussion in Bungoma, Tier 4 facility, 29/2/22*

The study discovered that, unclaimed corpses acknowledged in public mortuaries. Endure least potential source of infectious epidemics/objects to mortuary and forensic service providers, with epidemics, such as Hepatitis B and C, cholera, tuberculosis, HIV, meningitis and skin infections and. Leukemia is associated with long-term exposure to formaldehyde minimal in epidemic due to exposure to congested unclaimed corpses, which remained the basic myths in the study region. Among the 63 respondents surveyed and interviewed, none had actively acquired the infectious biological risks from or when handling unclaimed corpses or previously unclaimed corpses. (Appendix viii b) The study opined that, integument maceration by formalin, was the most common potential risks of attack with 13 (21%) of respondents having been affected. While handling unclaimed or previous unclaimed, like claimed corpses. Maceration of integuments attributed to single use of gloves during embalmment. Probability of attack from tuberculosis granulomas, when dissecting an infective lung TB corpse OD (1.75, 2.31). and RR, 2.30, if is dissected without being noticed by pathologist. Otherwise, granuloma lungs, fixed in formalin for 14 days before allowed, dissected to reduce chance of infection/ spreading. P values 0.05, CI 95%. Significance. The chances of potential attack by biological infectious risks when handling unclaimed corpses fluctuated from one mortuary facility to another, depending on each level of hygiene and sanitation mitigations, put in place by individual health facility mortuaries, as demonstrated in (Appendix viii b).

DISCUSSION

Occupational Health Hazards and Epidemic Risks Attributed to Exposures to Congested and Overstayed Unclaimed Corpses in Public mortuaries

Management of congested and overstayed unclaimed corpses, in public mortuaries, made on inappropriate propagated beliefs and legends that, they characterize major sources of biological epidemic hazards and infectious risks, (de Goyet, 1999). Which, the expert observations interview and survey carried out, confirms to remains negligible in virulence in among mortuary and forensic service providers working in public mortuaries of western

Kenya. The key findings demonstrated that, most mortuary and forensic service providers were mostly exposed to psychosocial hazards, ergonomic and formalin maceration of integuments risks, (Ahmed, 2011 ; Okoth-Okelloh et al., 2015). Due to wearing of single gloves, during embalmment, (Correia et al., 2014; Beck, 1966). The study on propagated occupational health epidemics is in line with study by (DeGoyet, 1999; Noji, 2000). Who said that handling of overstayed and crowded unclaimed corpses, presents the lowest health hazards and infectious risks of epidemics to the exposed population health. Thus, health population and media should stop propagating occupational health epidemics, which are very insignificant, when handling the unclaimed corpses in public mortuaries.

The catastrophe, of ministry of health (MOH), on KAPs to expand the department of forensic pathology, into integrated department of forensic science.(Pham et al., 2020; Castro & Coyle, 2013 ; Abiodun & Abioro, 2014) Which consist several core disciplines of forensic medicine, such as, Forensic fingerprint identification, forensic pathology, forensic anthropology and forensic odontology. Forensic laboratory medicine, forensic entomology, forensic radiology, photography, molecular biology and mortuary science, attributed to tilted and inadequate uptake of forensic services. Which mitigates, accessible equitable, comprehensive and holistic forensic professionalization uptake, across all public mortuaries, and this is conflicting with the studies by, (Marangu, 2020; MacFarlane and Khong, 2006), on vibrant roles of integrated core forensic disciplines, to form forensic science department, efficiently support the forensic services and health care, under single command management. (Chen et al., 2004,Pham et al., 2020). From the descriptive cross sectional, observational surveys, it recognized that, most public mortuary facilities have inadequate and tilted number of professional human resources, trained in forensic science. To provide quality forensic services to health population, (Cordner et al., 1999; (Silali *et al*., 2017). Majority, for instance, 74%, morticians surveyed, did not complete their secondary education. However, most female morticians employed had credentials, of trained mortuary science with secured permanent jobs. Popular morticians 80%, have inadequate knowledge, in basic subjects. Such as, biology, chemistry and physics, that form the pillars of forensic science and embalming, (Pham et al., 2020; Chen et al., 2004), which is in line with study by,(Chen *et al.*, 2004;Rowe *et al.*,2005), on human resources for health and overcoming the calamities, in low settings of health sectors in developing countries.

Conclusion

There are never occupational health epidemics, exposed to mortuary and forensic service providers, like visiting population health attributed to overstayed and congested unclaimed corpses in public mortuaries of western Kenya. Because, there are no scientific, valid and reliable research verdicts, from this study, to proves and validates that contact of congested and overcrowded unclaimed corpses from the public mortuaries, causes serious occupational health epidemics to mortuary and forensic service providers, in public mortuaries of western

Kenya.

Recommendation

The study therefore, recommends Government of Kenya to investment more in occupational health epidemics infection prevention controls measures, with continued empowerments, to sustain and improve the current Primary Prevention methods for future better health in western Kenya.

In addition, the study MOH, recommend health awareness on occupational health epidemic via health education and regular health promotion, as mitigation to stop propagation of mortuary diseases on exposure to unclaimed corpses in both health population and mortuary and forensic service providers.

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APPENDICES
APPENDIX I PROPOSAL APROVAL

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

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P.O Box 190
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Kenya

Directorate of Postgraduate Studies

Ref: MMU/COR: 509099

7th February 2022

Maurice Barasa Silali,
HPH/H/0154997/2020,
P.O. Box 190-50100,
KAKAMEGA.

Dear Mr. Barasa,

RE: APPROVAL OF PROPOSAL

I am pleased to inform you that the Directorate of Postgraduate Studies has considered and approved your Ph.D. Proposal entitled: "***Occupational Health Risks, Medico Legal Procedures and Health Laws Attributed to Unceremonious Mars Grave Disposal of Unclaimed Corpses by Public Mortuaries in Kenya***" and appointed the following as supervisors:

1. Prof. Emily Adhiambo - JKUAT
2. Dr. Maximilla Wanzala - MMUST
3. Dr. Nathan Shaviya - MMUST

You are required to submit through your supervisor(s) progress reports every three months to the Director Postgraduate Studies. Such reports should be copied to the following: Chairman, School of Public Health, Biomedical Sciences and Technology Graduate Studies Committee and Chairman, Public Health Department. Kindly adhere to research ethics consideration in conducting research

It is the policy and regulations of the University that you observe a deadline of three years from the date of registration to complete your Ph.D. thesis. Do not hesitate to consult this office in case of any problem encountered in the course of your work.

We wish you the best in your research and hope the study will make original contribution to knowledge.

Yours Sincerely,

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY DIRECTORATE OF POSTGRADUATE STUDIES P.O. Box 190 – 50100, KAKAMEGA (K) Date:..... Sign:.....

Prof. Stephen O. Odebero, PhD, FIEEP
DIRECTOR, DIRECTORATE OF POSTGRADUATE STUDIES

APPENDIX II
Ethical Approval

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY
Tel: 056-31375
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E-mail: ierc@mmust.ac.ke
Website: www.mmust.ac.ke
P. O. Box 190,
50100.
Kakamega,
KENYA

Institutional Ethics and Review Committee (IERC)

REF: MMU/COR: 403012 Vol 6 (01) Date: February 17th, 2022

To: Maurice Barasa Silali

Dear Sir,

RE: OCCUPATIONAL HEALTH RISKS, MEDICO LEGAL PROCEDURES AND HEALTH LAWS ATTRIBUTED TO UNCEREMONIUS MASS GRAVE DISPOSAL OF UNCLAIMED CORPSES BY PUBLIC MORTURIES IN WESTERN KENYA.

This is to inform you that ***Masinde Muliro University of Science and Technology Institutional Ethics and Review Committee (MMUST-IERC)*** has reviewed and approved your above research proposal. Your application approval number is **MMUST/IERC/009/2022.** The approval period is ***February 17th, 2022-February 17th, 2023.***

This approval is subject to compliance with the following requirements;

i. Only approved documents including informed consents, study instruments, MTA will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***MMUST-IERC.***
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to ***MMUST-IERC*** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to ***MMUST-IERC*** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to ***MMUST-IERC***.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

Yours Sincerely,

Prof. Gordon Nguka
Chairperson, Institutional Ethics and Review Committee

Copy to:
- The Secretary, National Bio-Ethics Committee
- Vice Chancellor
- DVC (PR&I)

APPENDIX III
Nacosti Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE & INNOVATION

Ref 92499

Date of 0 /Januar 202

RESEARCH LICENSE

This is to Certify that Maurice Barasa Mudinde Muliro University of Science and Technology, has been Conduct research in Kakamega on THE *INTERNATIONAL HEALTH RISKS. MEDICO LEGAL HEALT LAWS ATTRIBUTED TO DELAYED UNCLAIMED BODIES BY PUBLIC WESTERN* For the Endin 0 /Januar 2023

License NACOSTI/P/22/149

92499

Applicant Identification

Director

NATIONAL COMMISSION FOR SCIENCE TECHNOLOGY &INNOVATION

Verification QR

NOTE: This is a computer generated License. To verify the authentici Scathe QR Code using QR scanner

APPENDIX IV
INFORMED CONSENT FORM

Greetings, Iam Maurice B Silali, a Student at the Masinde Muliro University of science and Technology, pursuing PhD degree in Public Health (*Epidemiology and Population Health),* now working on my research thesis *'Occupational Health Hazards, Infectious Risks, Medico Legal Procedures and Health Laws Attributed to Unceremonious Mass Grave Disposal of Unclaimed Corpses by Public Mortuaries in Western Kenya."*

I have been certified by, Masinde Muliro University of Science. Ethics Review Committee permitted by NACOST, Chief Government pathologist, and MOHs' of western Kenya facilities to conduct the Study. You as one of my study respondents, wish to seek for your consent to respond to the questionnaire of my survey and KII discussions of my interview, which take around forty-five (45) minutes. Please feel free to answer the questionnaire.

I wish to assure you of confidentiality, of our responses. Any person apart will, not use the information gathered,, from the interest of the research thesis in question.

Participant's signature…… Date……

Researchers signature …… Date……

Thank you for participating

APPENDIX V

Map of Western Kenya

Source. (County's Administrative and Political Units, 2014)

Figure 3.1: Show Distributions of Public Mortuaries in Western Kenya

APPENDIX VI a & b

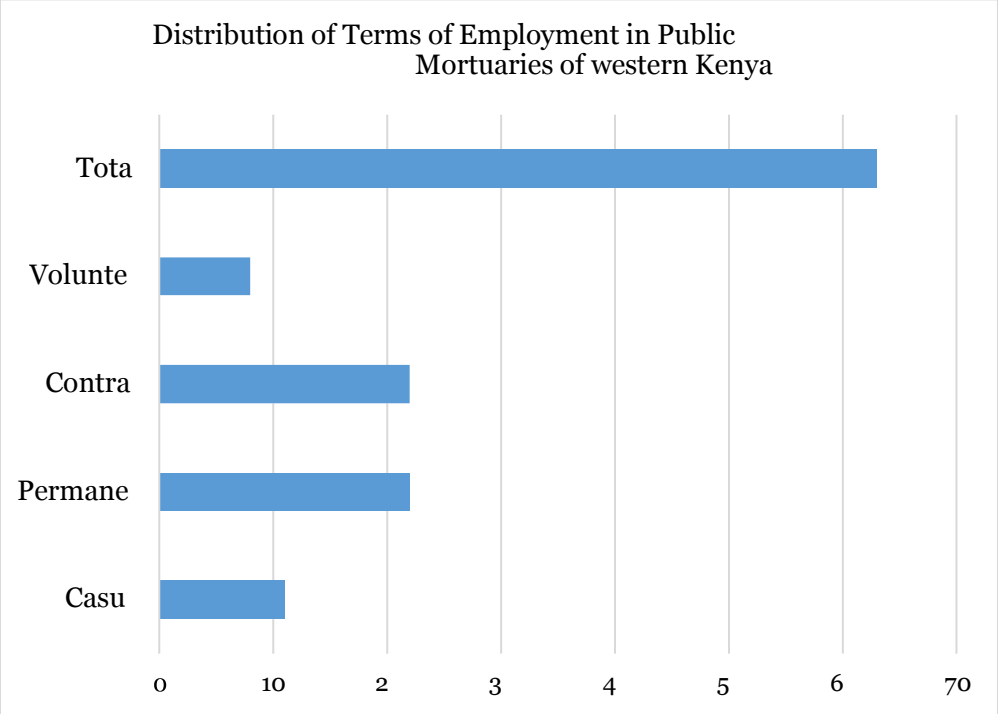
a.) Table 3.1 **Distribution of the Study County Facility Headquarters in Western Kenya, with Facilities Mortuaries for evaluation**

Code	County	Area/km²	2009 Census	Capital Headquarters
26	Trans-nzoia	2469.9	818,757	Kitale
27	Uasin Gishu	2955.3	894,179	Eldoret
37	Kakamega	3,033.8	1,660,651	Kakamega
38	Vihiga	531.3	554,622	Mbale
39	Bungoma	2206.9	1375,063	Bungoma
40	Busia	1628.4	742,966	Busia
41	Siaya	2496.1	842,304	Siaya
42	Kisumu	2009.5	968,909	Kisumu
43	Homa Bay	3154.7	963,794	Homa Bay
44	Migori	2586.4	917,170	Migori
45	Kisii	1317.9	1,152,282	Kisii
46	Nyamira	912.5	598,252	Nyamira
Total		**25302.7**	**11,488,949**	

b). *Table 4.1*: **Characteristics of the Study Respondents**

Demographic Variable	Mean	Median	Std. Deviation	Variance	Range
Gender	1.24	1.00	0.43	0.18	1.00
Age	3.00	3.00	1.02	1.03	4.00
Marital status	1.25	1.00	0.47	0.23	2.00
Level of Education	2.56	3.00	0.56	0.311	2.00
Religion	1.83	2.00	1.00	0.92	4.00
Terms of Employment	2.43	2.00	0.93	0.86	3.00

APPENDIX VII a & b

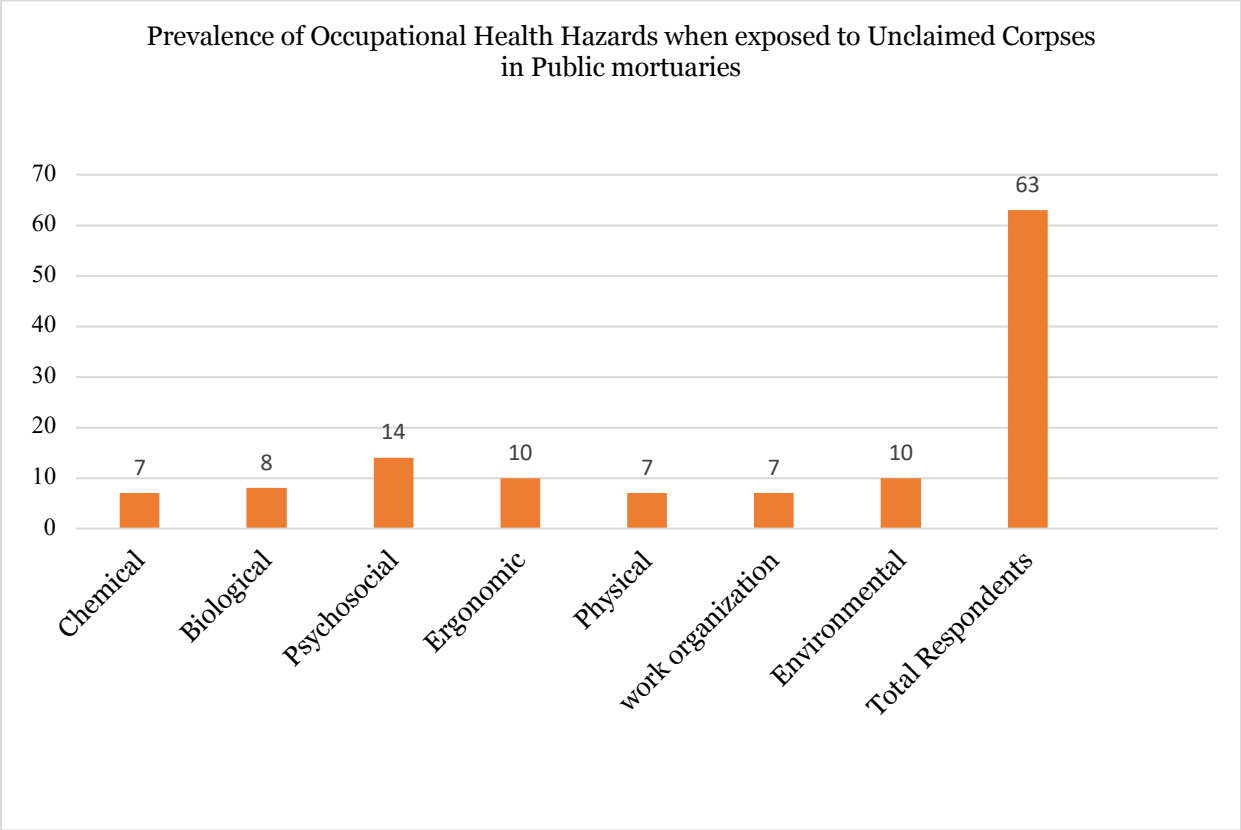


a). *Figure 4.2* **Distribution of Mortuary and Forensic Service Providers by their Terms of Services in Employment**

b.) *Table* 4.2 **Distribution of the *Religious* Cohorts among the Respondents**

Religion	**Frequency**	**Valid Percentage**
Catholic	26	41,3
Protestants	30	47.6
Islamic	6	9.5
Hinduism	1	1.6

APPENDIX VIII a& b

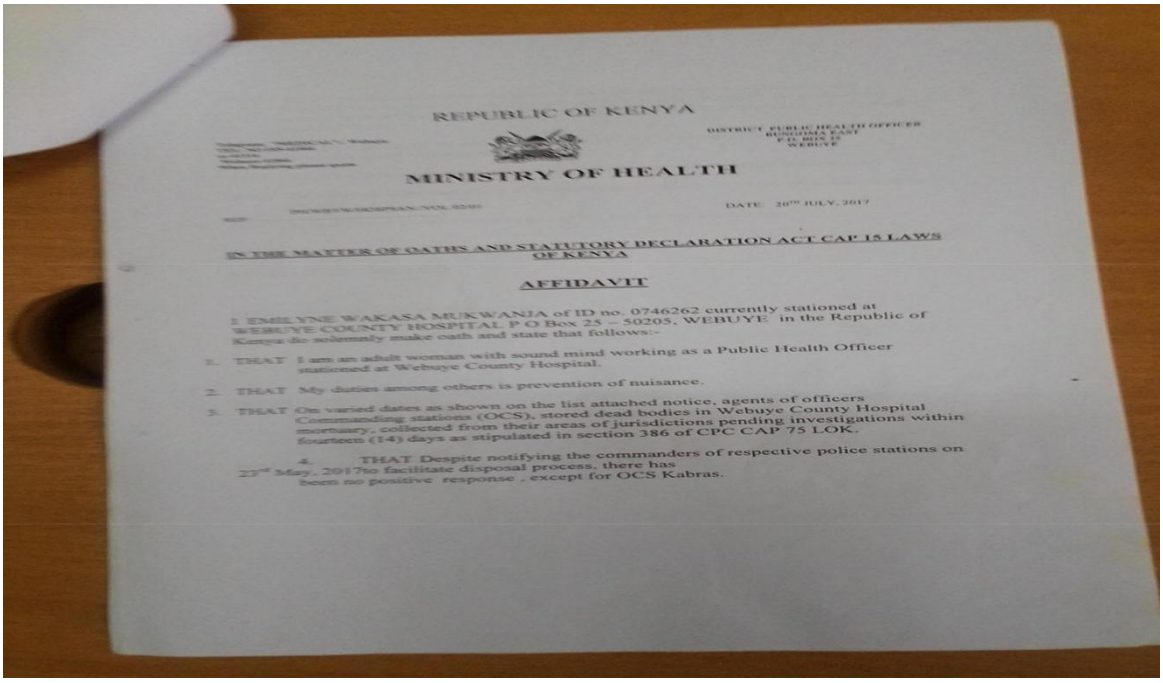


a) *Figure 4.2*: **Prevalence of Occupational Health Hazards, when Exposed to Unclaimed Corpses**

b.) Table 4.3 **Potential Epidemics Attributed to the Exposure of Overstayed and Congested Unclaimed Corpses in Public Mortuaries by mortuaryand Forensic service Providers**

Name of Risk	**FrequencyofRiskAttack**	**Valid%**
Infective Hepatitis B antigens	7	**11.1**
Infective Hepatitis C antigens	7	**11.1**
Meningitis	7	**11.1**
Macerationofintegumentsduetoformalin	13	**20.6**
Infectious Skin disease	8	**12.7**
HIV AIDs	6	**9.52**
Tuberculosis infection	9	**14.3**
Leukemia due to formalin exposure	6	**9.52**
Total respondents	**63**	**100**

APPENDIX IX a & b



REPUBLIC OF KENYA

DISTRICT PUBLIC HEALTH OFFICER
BUNGOMA EAST
P.O. BOX 25
WEBUYE

MINISTRY OF HEALTH

DATE: 30TH JULY, 2017

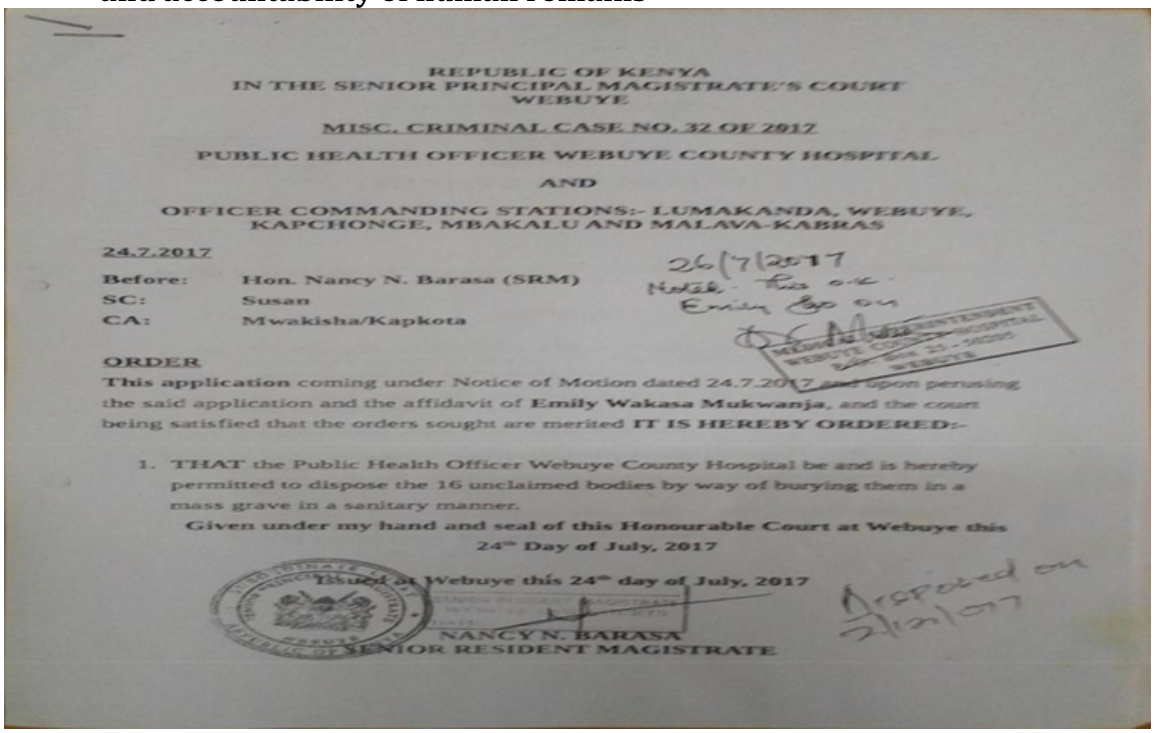
IN THE MATTER OF OATHS AND STATUTORY DECLARATION ACT CAP 15 LAWS OF KENYA

AFFIDAVIT

I EMILYNE WAKASA MUKWANJA of ID no. 0746262 currently stationed at WEBUYE COUNTY HONSPITAL P O Box 25 – 50205, WEBUYE in the Republic of Kenya do solemnly make oath and state that follows:-

1. THAT I am an adult woman with sound mind working as a Public Health Officer stationed at Webuye County Hospital.
2. THAT My duties among others is prevention of nuisance.
3. THAT On varied dates as shown on the list attached notice, agents of officers Commanding stations (OCS), stored dead bodies in Webuye County Hospital mortuary, collected from their areas of jurisdictions pending investigations within fourteen (14) days as stipulated in section 386 of CPC CAP 75 LOK.
4. THAT Despite notifying the commanders of respective police stations on 23rd May, 2017to facilitate disposal process, there has been no positive response , except for OCS Kabras.

a) .Sample of affidavit raised in facility to process court order by resident magistrate for justice and accountability of human remains



REPUBLIC OF KENYA
IN THE SENIOR PRINCIPAL MAGISTRATE'S COURT
WEBUYE

MISC. CRIMINAL CASE NO. 32 OF 2017

PUBLIC HEALTH OFFICER WEBUYE COUNTY HOSPITAL

AND

OFFICER COMMANDING STATIONS:- LUMAKANDA, WEBUYE, KAPCHONGE, MBAKALU AND MALAVA-KABRAS

24.7.2017

26/7/2017

Before: Hon. Nancy N. Barasa (SRM)
SC: Susan
CA: Mwakisha/Kapkota

ORDER

This application coming under Notice of Motion dated 24.7.2017 and upon perusing the said application and the affidavit of **Emily Wakasa Mukwanja**, and the court being satisfied that the orders sought are merited **IT IS HEREBY ORDERED:-**

1. **THAT** the Public Health Officer Webuye County Hospital be and is hereby permitted to dispose the 16 unclaimed bodies by way of burying them in a mass grave in a sanitary manner.

Given under my hand and seal of this Honourable Court at Webuye this 24th Day of July, 2017

Issued at Webuye this 24th day of July, 2017

NANCY N. BARASA
SENIOR RESIDENT MAGISTRATE

Disposed on 26/7/017

***b.)* Sample of Court Orders. Raised by Resident Magistrate for legal Justice and Accountability on Human Remains Source: (Pilot Study Facility, 2022)**

APPENDIX X a & b

a) Typical Arterial embalming puncture to improve mortuary Hygiene & Sanitation

b) **Improved modern mobile embalming machine for developing countries Source (*Silali etal,* 2016)**