

Health System Factors Attributed to Unceremonious Mass Grave Disposal of the Unclaimed Corpses in Western Kenya by Public Mortuaries

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Abstract

Health system factors, attributed to unceremonious mass grave disposal of the unclaimed corpses by public mortuaries. Continue to position a big challenge on the increasing morbidities and mortalities, attributed to unclaimed corpses or missing dead persons. Whom, the Next of Kin (NOK), may not find them alive again, after concluded search by the Police services. Using the secured networks, such as, 1-24/7, police signal 7, 8 and upload photographs of all unknown corpses on, Interpol yellow view notices, within the medico legal span of cold storage and "cold hit". And the community social capital, such as, family members, or community households Samaritans, to mediate on previously unclaimed corpse into dignified disposal. By doing forensic identification and DNA validations, as per specific religious and cultural rites. Birth, and registration Act CAP 149, on the vital notification of cause and nature of death, of each specific citizen before disposal. Disappointment of Police services to implement quality forensic services, as the main health system factor. Have provoked, endless unceremonious mass grave disposal of unclaimed corpses in western Kenya. Like the Low uptake of quality medico legal procedures, deficiency integrated functional, forensic science department, with core forensic disciplines, as per CAP 75 Penal code. Public health officers and resident magistrates are other main health system factors, that habitually apply Health laws, governing medico legal procedures, to sustain primary prevention, using Public Health Act CAP 242 and local Government Act CAP 265, to issue affidavits and court orders. As a substitute of advocating for CAP 149 of birth and registration Act. Which, effects candid consents to NOK, to enable justice accountability of human remains, as per Human Anatomy Act CAP 249. However, not one study, has been explored, to demonstrate how health system factors of the forensic sciences, influence the increasing improper, unceremonious mass grave disposal of unclaimed corpses, by public mortuaries. Thus, the timely need, to establish how health system factors influence the uptake, and establish, how knowledge attitude and practices of mortuary /forensic service providers effect, improper unceremonious mass grave disposal in western Kenya. Study designs were, descriptive cross sectional and cohorts, of mixed approaches, with Primary and Secondary study populations. Sampling designs were Active convenient purposive, and passive, retrospective desk reviews records of past 5 years' data. Using semi-structured questionnaires, retrospective, desk review form, KII, FGD and observation guides. Data, was managed by SPSS version 26. Out of 3899 unclaimed corpses acknowledged, 1420, (36%) were improperly mass grave disposal, using Affidavits and court orders; 1262 (32%) adult male, 158 (4%) adult females. While 878, (23%), were fetus and juvenile from the law neglected cohorts since colonial era. Forensic fingerprints /DNA validation by Police services as health system factor, remained insignificant with only 5, (0.165%) valid prevalence, P value 2.33. Issue of court orders by magistrates was significant as a health system factor; OD (0.75, 0.83). Odd of Police service, using secured networks 1-24/7, police signal 7, 8, and Interpol yellow view notices, OD (1.0, 0.97), (RR 0.97). Greatest PHOs 17 (85%), were, well versed with Health laws uptake. But they had nonexistence valid knowledge, on quality uptake of medico legal procedures, to enhance justice accountability. Integration of core forensic disciplines into one command management of forensic sciences department is insignificant with, OD (1.0 1.0) and (RR, 1.0).

Thus, the timely need, for policy amendment for synergistic partnerships, on the core discipline of forensic medicine, into single, forensic science department and initiate Private Public Partnership (PPP) in building of modern ultra DNA banking plant as an early alleviation of the unceremonious mass grave disposal of unclaimed corpses by the public mortuaries.

Introduction and Background Information of the Study

Health system factors, attributed to unceremonious mass grave disposal of the unclaimed corpses in western Kenya by public

mortuaries. Continue to pose a big challenge on the increasing morbidities and mortalities, attributed to unclaimed corpses or missing dead persons. Whom the Next of Kin (NOK), may not find them alive, after through search by the Police services. Using the secured networks, such as, 1-24/7, police signal 7, 8 and upload

photographs of all unknown corpses on, Interpol yellow view notices, within the medico legal span of cold storage and “cold hit”. And the community social capital such as, family members, or community households Samaritan, to mediate previously unclaimed corpse into dignified disposal. embalment of unclaimed corpses is attributed to interfering with admissible evidence of medico legal procedures, [1-3]. Elementary ingredient of embalment procedure contains following components: fixative, preservative, humefectan, buffer, anticoagulants and vehicle/ water, which advocate for holistic and comprehensive hygiene and sanitation, [4]. Infections prevention control measures, in public mortuaries are tailored towards, accessible uptake of modern arterial embalming methods. Which are critical for a well-functioning of any public mortuaries, to influence quality forensic health care delivery [5]. Quality recruitment and staffing of forensic personnel, in public mortuaries forms the benchmarks. For holistic and comprehensive management, under, one command in the department of forensic medical sciences. These require sampling of various active cluster, of professionalism, with highest appropriate skilled competencies and experiences. To fulfill the positions of integrated core of forensic disciplines. Namely, Forensic fingerprint identification, forensic pathology, forensic anthropology, forensic odontology, forensic laboratory medicine, and forensic entomology. Forensic radiology, Photography, Molecular biology and Mortuary science, [6]. Essential mortuary/ forensic equipment and reagents supplies in public mortuaries, influence quality infection prevention control practices, of mortuary management of unclaimed corpse. Provide hygiene and sanitations, that encourages normal disposal of previously unclaimed corpses to community for burial or cremation, as per birth and death registration Act CAP 149, [7,8]. Common equipment and reagents, supplies in mortuaries are Cold rooms, Stainless steel postmortem tables or heavy-duty tables covered with plastic sheets [9]. Knowledge, attitude and practices on infection prevention control measures, form the benchmark for the health Nation. And 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. And encourage decrease in improper mass grave disposal [10].

Health Systems Factors Attributed to Unceremonious Mass Grave Disposal of Unclaimed Corpses by Public Mortuaries.

Simple principles for infection, prevention, and control practices, against epidemics risks of occupational health in public mortuaries, consist of embalment, to prompt disinfection mitigation, of the unclaimed corpses, and enhance sanitation in the mortuary premises. However, embalment of unclaimed corpses is attributed to interfering with admissible evidence of medico legal procedures [1-3]. Elementary ingredient of embalment procedure contains following components: fixative, preservative, humefectan, buffer, anticoagulants and vehicle/ water, which advocate for holistic and comprehensive hygiene and sanitation, [4]. Infections prevention control measures, in public mortuaries are tailored towards, accessible uptake of modern arterial embalming methods.

Which are critical for a well-functioning of any public mortuaries, to influence quality forensic health care delivery [5]. WHO in 1948, defined Health, as the state of complete physical, mental, social, emotional, spiritual, and environmental well-being. And not merely, the absence of diseases or infirmity. In 2011 WHO, defined infection prevention control, as a measure to mediate the holistic and comprehensive health care against, the vulnerable groups [5,11]. All quality of the health system factors involves, management of public mortuaries, through synergistic participation, with public private partnership, PPP development. Application of standard operating procedures, for infection prevention control entails, training mortuary/ forensic service providers on core subjects of forensic, mortuary science, health laws, and quality uptake of medico legal frame workers. And key roles of low uptake of health laws, that govern medico legal procedures, to decrease the level of improper unceremonious mass grave of unclaimed corpses, by public mortuaries, [12,13]. Human resources, need to mediate for capacity building in core disciplines of forensic sciences mainly, forensic fingerprint identification, forensic pathology, forensic anthropology, and Forensic odontology. Forensic laboratory medicine, Forensic entomology, forensic radiology, Photography, Molecular biology and Mortuary science, to enable accessible forensic services in national and county governments. Forensic empowerment, influence sustainability of quality uptake of medico legal laws, health laws, and medical ethics, within, positively effects to improve forensic service delivery, in public mortuaries. Then greatly decrease unceremonious mass grave disposal, [3,14]. Trained mortuary/ forensic service providers, provide competent based, and complete satisfaction of forensic services delivery to population health [15]. However, in western Kenya, the number of facilities using gravitation, or machines methods, for embalment remain undocumented.

Recruitment and Staffing of Mortuary and Forensic Service Providers, with Integrated Core Disciplines of Forensic Knowledge & Skills.

Quality recruitment and staffing of forensic personnel, in public mortuaries forms the benchmarks. For holistic and comprehensive management, under, one command in the department of forensic medical sciences. These require sampling of various active cluster, of professionalism, with highest appropriate skilled competencies and experiences. To fulfill the positions of integrated core of forensic disciplines. Namely, Forensic fingerprint identification, forensic pathology, forensic anthropology, forensic odontology, forensic laboratory medicine, and forensic entomology. Forensic radiology, Photography, Molecular biology and Mortuary science, [6]. Recruited mortuary/ forensic service providers, are responsible for synergistic participation, in occupational health hazards, epidemic risks, prevention control in competent skills in line with, medico legal procedures and health laws utilization. Frequent, liaising with the department of forensic science, to search and contact NOK, upload Interpol view Yellow notices to the public, enable to decreased the unceremonious mass grave disposal of unclaimed corpses, by public mortuaries, [14]. Quality human resource recruitment, as mortuary/ forensic service providers, is spirited for the success of all forensic service in

public mortuaries. And allow personnel with specific developed skills, and appropriate technology, to be utilized in provision of the forensic services. Besides class attendance for mathematics, biology, chemistry, Anatomy, physiology and physics. Background of medical laboratory science is significant for sustainability of forensic services. Specifically with experiences in histopathology and mortuary science, Human anatomy, embalming techniques, restorative art, [16]. Hygiene and Sanitation are strategic variables, for quality embalment, infection prevention and control practices measure in a given population health, [17]. The United States has 25,470 mortuary/ forensic service providers of which 3,710 are embalmers. While morticians are over 36,000, [15]. However, in western Kenya, the demands for skilled professional mortuary/ forensic service providers specifically, committed police service to initiate forensic identification. And timely, upload Interpol yellow view notices of the photos of deceased or missing dead juvenile remains inadequate and tilted to be achieved. The region still has inadequate pathologist, medical doctors, anthropologists, morticians and embalmers to offer forensic services. Also, the means of outsourcing and recruiting them by the department of forensic science remain, tilted and inadequate. As noted by the ever-increasing rates of improper unceremonious mass grave disposal of unclaimed corpses by public mortuaries, [18].

Mortuary/Forensic Service Providers and Capacity Building

Forensic medicine entails personnel with capacity building in forensic science, in one of the core forensic disciplines, namely, forensic fingerprint identification and tracking of unclaimed persons NOK. Forensic pathology, forensic anthropology, forensic odontology, and forensic laboratory medicine. Forensic entomology, forensic radiology, photography, molecular biology and Mortuary science, that form integrated purposive cluster mortuary/ forensic service providers. Forensic integrated capacity building provides basic knowledge and skills in public health, forensic sciences, health laws, tissue and anatomy acts, detective crime science and mortuary science, [19]. Capacity building in Mortuary/ forensic services, mediate proper knowledge and skills, empowered to influence sustainability of mortuary/forensic services, [20]. Therefore, effect quality infection prevention control, admissible evidence, reconstruction at the diagnostic triangle. Corresponding to behavioral science, forensic medicine, autopsy dissection and utilization of machinery embalming, as the main source primary prevention [21,22]. Mortuary service providers training enhance, the utilization of medico legal procedures, to reduce delays attributed to forensic fingerprint identification, Interpol yellow view notices online upload, and DNA appraisals with NOK. To enable dignified family disposal, [14,23]. But then again, these quality variables of human resource and health system factors are still missing clearly, in the documentation in western Kenya.

Accessibility to Equipment and Potency Reagents as Basic Health System Factor

Essential mortuary/ forensic equipment and reagents supplies in public mortuaries, influence quality infection prevention control practices, of mortuary management of unclaimed corpse. Provide

hygiene and sanitations, that encourages normal disposal of previously unclaimed corpses to community for burial or cremation, as per birth and death registration Act CAP 149, [7,8]. Common equipment and reagents, supplies in mortuaries are Cold rooms, Stainless steel postmortem tables or heavy-duty tables covered with plastic sheets, [9]. Wheeled trolleys and cover lid, for transporting unclaimed corpses. Mortuary hydraulic lift or small fork. Trestle tables, and chairs for administrative offices. Wall charts to record progress. Large poster boards, where advertisement, are made in 21 days to notify the population health on the unclaimed bodies to be improperly, unceremoniously disposed, by the public mortuaries, before disposal is executed [4], Heavy-gauge black plastic sheets. Dust bins and assorted liner bags, routine cleaning materials and disinfectants, are key for effective infection prevention control in public mortuaries. Office equipment and aluminum name tags, and Body bags or polythene tube gauge 1000, are also essential [9,24]. Mortuary cold storage and "cold hit", form the bench map of health system factors. Since they influence both medico legal and normal inpatient clinical death, by inhibiting autopsy changes at temperatures below 4Co, [4,9]. Despite, above stated essential equipment, being noted for its great support in forensic services and maintenance of hygiene measures and sanitation standards in public mortuaries. Its information on serviceability level and power pack up, like the theatre sections in the facility remain unclear in western Kenya, to constantly decrease unceremonious mass grave disposal of unclaimed corpses by public mortuaries.

Effects of KAP of Mortuary and Forensic Service Providers, on Occupational Health epidemics, Medico Legal Procedures & Health Laws, as Basic health system Factors to Decrease Unceremonious Mass Grave Disposal by Public mortuaries

Knowledge, attitude and practices on infection prevention control measures, form the benchmark for the health Nation. And 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. And encourage decrease in improper mass grave disposal [10]. KAP of mortuary/forensic service providers, on hygiene and sanitation, at workplace decrease chances to spread disseminated infection, or carry out cross infections, [25-27]. Globally 3 5 million health workers, have exposure to occupational blood-borne pathogens. Of which each year, 2 million are 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 KAP of mortuary/forensic service providers, on the uptake of infection prevention control measures. Have negatively impacted on 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

cases. And not from the previously unclaimed corpses, [28,5]. Study in Nigeria established the inadequate level of skilled, KAP on infection prevention control measures and application of medico legal frame works, among many mortuary/forensic service providers, have given rise to the increased execution of the health laws, governing medico legal procedures, as a primary prevention, to further exposure to the occupational health hazards and epidemic risks in the health population. Hence poor infection prevention control and safety measures and increased improper unceremonious mass grave disposal, among the entire population health, [10]. The study, also established that mortuary/forensic service providers, rarely adhered to quality infection prevention control standards. And proper unceremonious mass grave that entails, mass grave disposal of earmarked graveyards, in less than 6 feet deep and all unclaimed corpses are tagged with aluminum metals, to enable easy accessibility during exhumation. Due to future demands from the NOK, [20,24,29]. Nevertheless, currently there are no quality studies published scholarly, to demonstrate in Kenya, how Knowledge, attitude practices of forensic and mortuary service providers influence control occupational health hazards, epidemic risks, uptake of medico legal procedures, health laws and how health system factors to influence a decreasing, unceremonious mass grave disposal of unclaimed corpses for sustainable safe community livelihoods.

Conceptual Statement

Though, mortuary/ forensic service providers in Kenya, may detect the increasing improper, unceremonious mass grave disposal of unclaimed corpses attributed: Regret from, the Police service, due to their letdown to promptly, implement standard medico legal frame works. On the early latent fingerprints abstraction / DNA appraisals, uploading Interpol yellow view notices of photos of deceased or missing juvenile cohorts, on the active online digital platforms, at central forensic science department. To enable population health and NOK search and identify missing juvenile or unclaimed corpses as per penal code CAP 75 of Kenya. Which remain indistinguishable in western Kenya. Determination of both, Resident magistrates and public health officers, to contrivance Health laws, governing medico legal procedures, before expiry of 90 days of cold room storage and "cold hit" may be a mitigation for primary prevention. But then again precursor, for other health challenge, on social cognitive and psychosocial of the health population are vital. Partial government political will, to empower and sustain functional health system factors. That mediate quality forensic care and services, on infection prevention controls. May be noted by the population health status. However, there is need also to exploit, and ascertain, how KAP of mortuary/ forensic service providers. May effect improper unceremonious mass grave disposal of unclaimed corpses, by public mortuaries in western Kenya, as illustrated in conceptual frameworks in Figure 1 below [30].

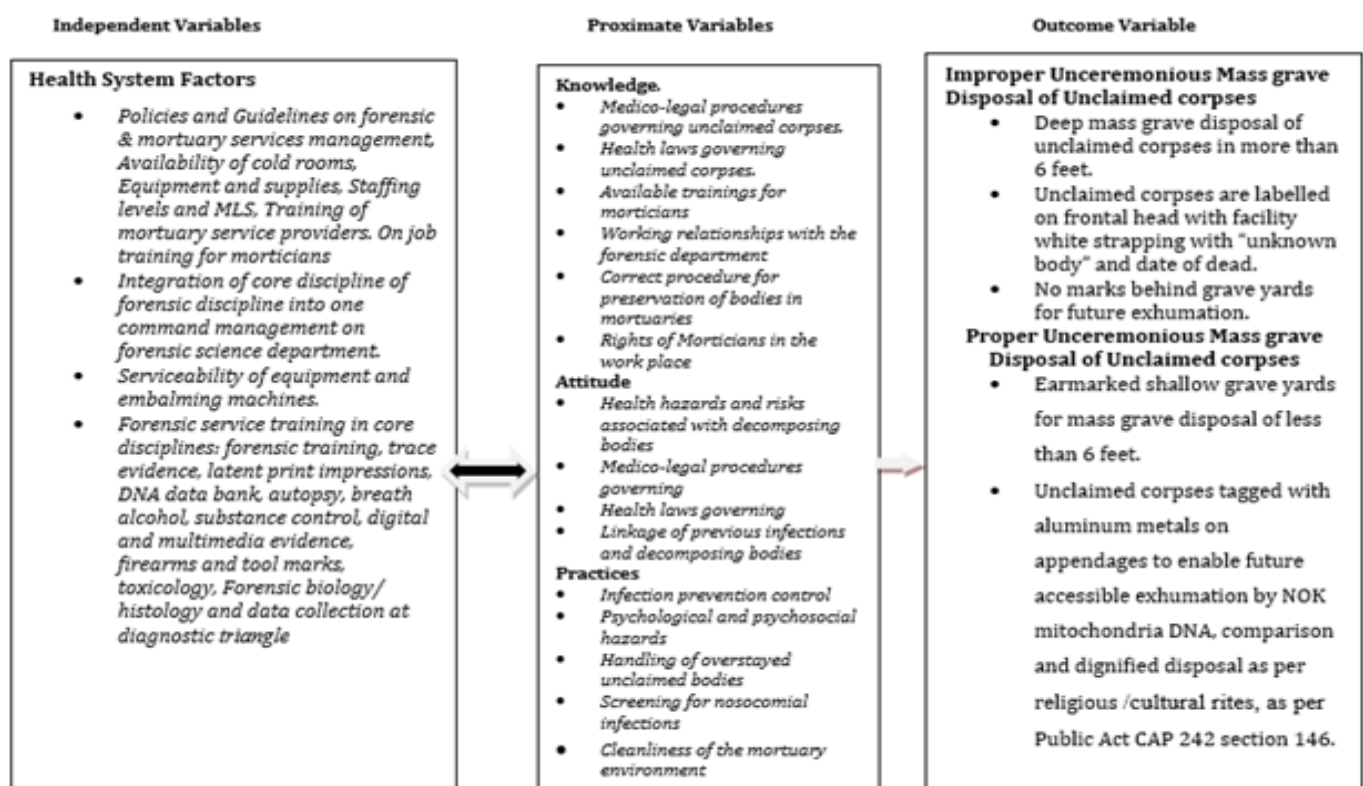


Figure 1: Conceptual Frameworks.

Methods and Methodology

Study Area

Western Kenya (Appendix 5) borders the Republic of Uganda

to the west, and Rift Valley to the north with its highest point being Mt. Elgon and lowest being Kisumu. The Region covers an area of 25,303.3 km² with an estimated population of 11,488,949 persons [31] (Figure 2).

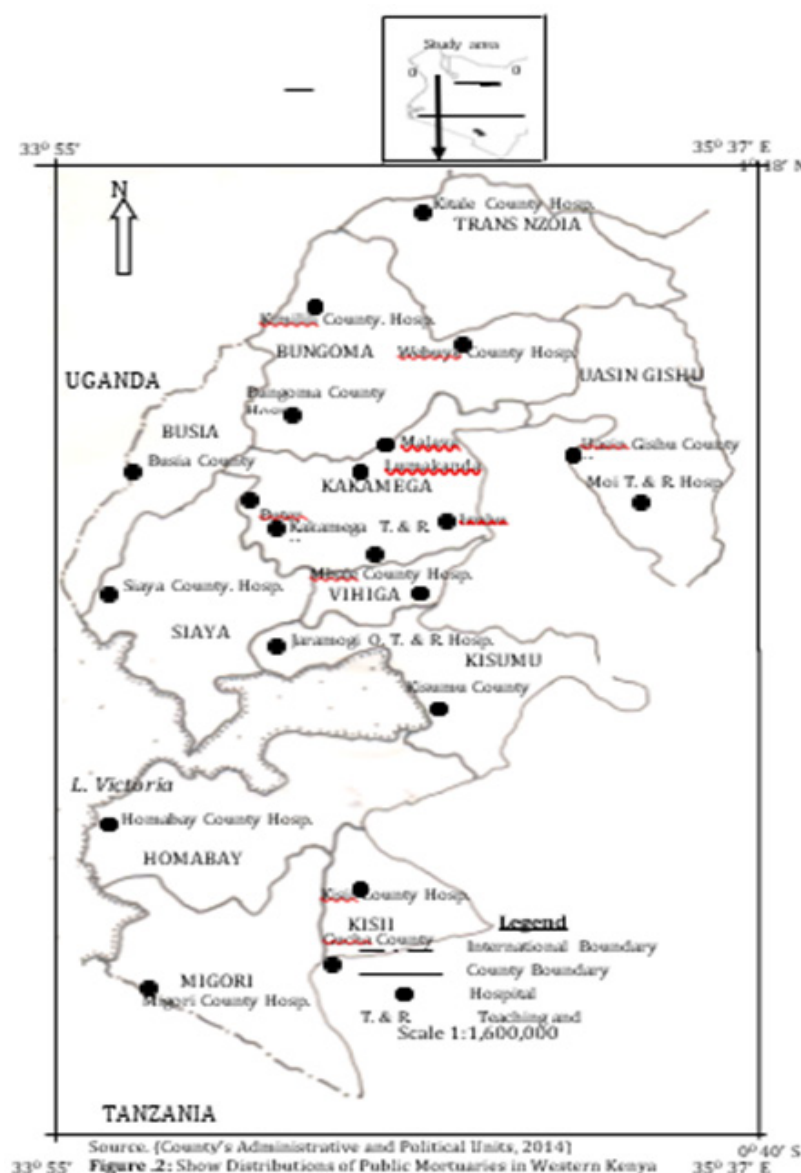


Figure 2: Show Distributions of Public Mortuaries in Western Kenya.

Demographic Information of the Study Area

The population density is approximately 454/km². The life expectancy of the study area is 64 years, for males and 68 years for females. Literacy rate in the study area stands at 73% for females and 70% for males who attained primary school level of education and 19% for females, and 13% for males who have attained secondary level education [22]. The study area has over 490 public health facilities ranging from tier 2 which are dispensaries to tier 6 being referral hospitals.

Study Designs

Basically, descriptive cross sectional and cohort studies on primary and secondary study populations respectively.

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 (Table 1). The secondary

study population were desk review of the past 5 years' records, on occupational hazards, infectious epidemics, all unclaimed corpses admitted in public mortuaries namely law neglected fetus, juvenile, and adult male and females, using the police case mortuary registers beginning from January 2017 to December 2021. Secondary study population variable included age by gender, accumulative number of unclaimed corpses, searched, traced using fingerprints/ DNA appraisals, autopsy done number issued with death certificates per CAP 149 of birth and Death Registration Act. Total number of unclaimed corpses of which court orders were processed and issued, to enable mass grave disposal in public cemeteries, as per local authority Act Cap 265 section 201. Also, fetus and juvenile unclaimed corpses acknowledged in the public mortuaries, in the

past 5 years, were reviewed retrospective, to determine the general impact of unceremonious mass grave disposal public mortuaries in relation to NOK torture, and deceased victim torture. Since they deserved, due respect and representative of NOK at the time of disposal. Justice and accountability of unclaimed corpses were mediated by PHOs' writing affidavits to resident magistrates, who provided Court orders in blueprints, as per Human Anatomy Act Cap 249 on consent, and Human Tissue Act CAP 252, on utilization for tissue therapy and cadavers dissection, as distinct tools for medical education. Also, the law neglected cohort of fetus and juvenile was exploited, to ascertain their attributed manner, cause and nature of their death, at that point in time of the study period.

Table 1: Distribution of Study Facilities and Target Population in Study region.

S/N	Facility	Tier/level	Primary Respondents	Other Mortuary / Forensic Service Providers)	Respondents' Baseline Survey in 2021	Frequency of Disposing unclaimed corpses /per year.
1	Kitale	4	10	3	12	Half
2	MTRH	6	18	3	21	Quarterly
3	Uasin Gishu	4	10	3	11	Half
4	Kakamega	5	20	3	22	Quarterly
5	Butere	4	6	3	8	Half
6	Iguhu	4	9	3	11	Half
7	Iumakanda	4	8	3	12	Half
8	Vihiga	4	9	3	12	Half
9	Webuye	4	10	3	13	Quarterly
10	Kimilili	4	6	3	9	Half
11	Bungoma	4	13	4	17	Quarterly
12	Siaya	4	6	3	9	Half
13	Yala	4	5	3	8	Half
14	Kisumu PGH	6	15	3	17	Quarterly
15	Kisumu Dist.	4	6	4	10	Quarterly
16	Homa Bay	4	10	3	13	Quarterly
17	Migori	4	11	3	14	Quarterly
18	Rongo	4	4	3	7	Quarterly
19	Kisii	5	8	3	11	Quarterly
20	Nyamira	4	6	4	10	Quarterly
	Total		190	63	253	

Inclusion Criteria for Target Population

Purposive clusters of mortuary/forensic service providers: (Morticians, forensic technologists/ embalmers, Pathologists, Public Health Officers, Forensic Police Officers and Health Administrators), who have worked in a specific public mortuary for a period more than six months, are in sound physical and mental condition and sign consent to allow, for participation in the study and to provide their past and present medical history. Retrospective desk review records, of the unclaimed corpses of law neglected cohorts; fetus and juvenile, adults by gender were collected for the last 5 years, using retrospective desk review form.

Primary study population, mortuary/ forensic service providers, who had worked in that specific mortuary for at least one year offering forensic services were included in the target study population. Secondary study population, included; the desk review of the past 5 years records on, fetus and juvenile, and adults by gender of the unclaimed or missing dead persons, acknowledged in public mortuary by the police service with specific manner variable of: road traffic accidents, mob justice, murder, drowning in water, induced abortion, and abandonment in public mortuaries or bushes for case of juvenile unclaimed corpses, as the key target population, to measure, the standard medico legal procedure to be utilized rather than brought in death BID, shooting, suicide and

homicides manners attributed with various claims from the next of kin and community households.

Exclusion Criteria

Purposive cluster mortuary/ forensic service providers, who are physical and mentally incapacitated at the time of the study, were excluded in the study example, 24/7 drunkard mortician were not included in the study.

Secondary study population, data on unclaimed corpses suspected diagnosed to be natural types of death, attributed with in accompany of NOK or good Samaritans such as: Brought in Dead, (BID), suicide, and homicide were not included in the target study population though were captured in, as the main study population. Mortuary/ forensic service providers, who have worked in that specific mortuary for less than six months, or those NOT willing to disclose their medical history or very new with knowledge and skills of medico legal and health laws frameworks were excluded. Claimed fetus and juvenile admitted in public mortuaries during that specific period of study were not included in the study also. PHOs currently dealing with sanitation and vaccine in the facility or recently recruited morticians, were also excluded in the study.

Sample Size Determination

Sample size was determined by Fisher formula (Fisher's 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.

$$\text{Fisher's formula states: } n = \frac{z^2 pq}{d^2}$$

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

$$n = \frac{(1.96)^2(0.5)(.05)}{(0.05)^2} = \frac{9604}{25} \quad n = 384$$

Adjustment of the sample size, was done, using Finite population correction formula (Fisher's 1998) because estimated sample size from public health facilities in western Kenya was below 10,000 respondents.

$$\text{Hence corrected sample size: } nf = \frac{n}{1 + \left(\frac{n}{N}\right)}$$

Where

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

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

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

$$\text{Hence: } nf = \frac{384}{1 + \frac{384}{600}}$$

= 235 respondents

Overall sample size, 235 mortuary service providers. Plus 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, as sampling frames of the target population for study, as distributed in the Table 2 below.

Table 2: Frequency Distribution of Primary Study Population (Mortuary/Forensic Service Providers).

Purposive Cluster	Study Population / Coroner Service	Job Responsibility	Census in Study Region
Forensic Medicine/pathology	Pathologist	Perform autopsy	3
Crime Scene investigators	Criminal investigating Police	Police Constable	20
Public health implementers/Facility administrators	PHOs / Hospital administrators	Legal implementer	20
Custodians of unclaimed bodies	Morticians	Overall, Body Care	190
Liaison community households	Next of kin /hospital Admin., Coronary/ embalmer office	Parents/guardians	0
MOH	Hospital Administrators	Document & file bodies	20
Total Sample Size for Study			253

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 1), and Ethical Review Committee (MMUSTERC) approval numbers are: MMU/COR 403012Vol 6 and MMUST/IERC/009/2022, (Appendix 2). Research permission was obtained from NACOSTI, License No: NACOSTI/P/22/14942 (Appendix 3). The Consents were sought, from all respondents (Appendix 4 & 5), before questionnaires were administered (Appendix 6). Information obtained from respondents, were

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 handled by principal researcher, (Appendix 6). No names or identifiers of study subjects on medical records were reviewed to the public. Unique codes were 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 were consulted and were recruited, the respondents were not paid or compensated for their participation in the study.



Appendix 1: Proposal Approval.



MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY
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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 UNCEREMONIOUS MASS GRAVE DISPOSAL OF UNCLAIMED CORPSES BY PUBLIC MORTUARIES 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 2: Ethical Approval.

APPENDIX III: NACOSTI RESEARCH PERMIT

			
Ref 92499		Date of 0/Janu2022	
RESEARCH LICENSE			
			
<p>This is to Certify Maurice Barasa Mwangi Mulim University of Science and Technology has been Conduct research in Kalcamedia LAW ATTRIBUTED TO DELAYED UNCLAIMED BODIES BY PUBLIC WESTERN For the Endin/Janu2023</p>			
License NACOSTI/P/22/149			
92499			
Applicant Identification Director NATIONAL COMMISSION			
		SCIENCE TECHNOLOGY & INNOVATION	
		Verification QR	
			
<p>NOTE: This is a computer generated License. To verify the authentication Scan the QR Code using QR scanner</p>			

Appendix 3: Nacosti Research Permit.

Greetings, I am 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. The information gathered will not be used by any person apart, from the interest of the research thesis in question.

Participant's signature..... Date.....

Researchers signature Date.....

Thank you for participating

Appendix 4: Informed Consent Form.



Appendix 5: Proper Unceremonious Mass Grave Disposal of Unclaimed Corpses.



Appendix 6: Improper Unceremonious Mass Grave Disposal of Unclaimed Corpses.

Results Findings and Discussions

Response Rate

Table 3: Health Facilities' Characteristics in Western Kenya.

Level / Tier of Facility	Frequency	Percent
Level 6	1	5
Level 5	3	15
Tier 4	16	80
Total	20	100

Most of 20 facility mortuaries, for study or target population were accessed during the study period. A total of 20 facilities mortuaries and 63 target population of mortuary/ 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 4 facility mortuaries. Most of the facilities surveyed and interviewed 16 (80%), were located in the rural setting while the level 6 and 5 facilities were geographically located in urban settings (Table 3). From the 253 mortuary/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

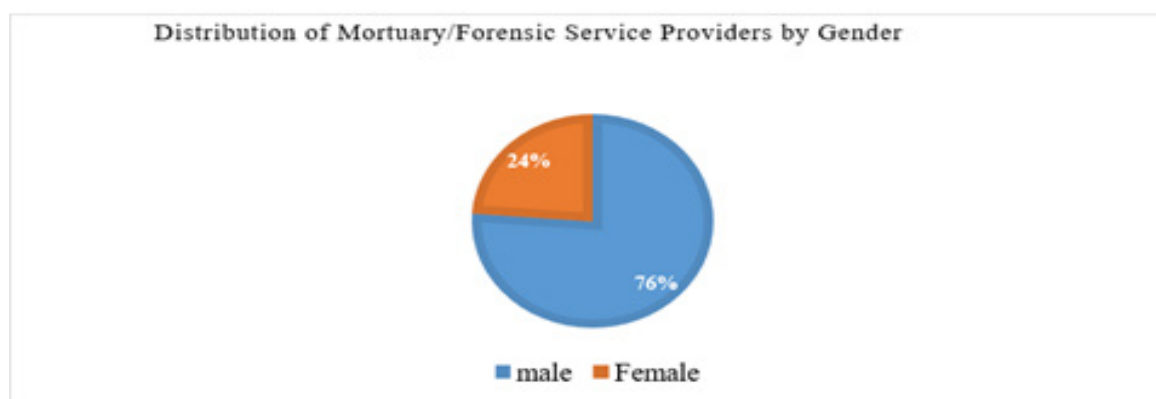
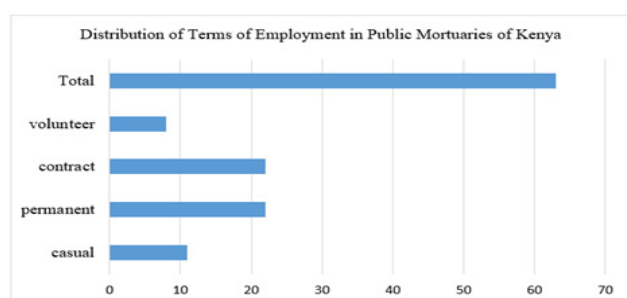
and mortuary/ forensic service providers approached and gave consent for survey, interview and retrospective desk review of the past 5 years unclaimed corpses admitted in the public mortuary by police services until the sample size was achieved for secondary population. Cluster purposive and active census using the sampling frame of the mortuary staff registers for Primary study population.

Demographic Characteristics of Primary Study Population (Mortuary Service Providers)

Expert observation study revealed that, out of 253 sample size of study population suggested, only 63 mortuary/forensic service providers met inclusion criteria as primary target population, were surveyed, majority 48 (76.2 %), were male and 15 (23.8%) female gender, a social expression of a person's identity in relation to social role and behavior in mortuary service provision with an average mean of 1.24, standard deviation of 0.423 and Pearson Chi square 7.26, 95%CI. Though female gender was few in mortuary/ forensic service provision, majority had achieved higher level of education compared to male counterparts, with standard deviation of 0.556, Table 4 & Figure 3 below the study established, that about 22 (32.8%) of mortuary /forensic service providers, providing mortuary in public mortuaries, their terms of services are permanent and contract jobs respectively. While 11 (16.4%), are casual, and 8 (11.9%), volunteers, as demonstrated Figure 4 below. Signifying sustainability of employment programs on mortuary/ forensic service provider is not stable in the study region.

Table 4: Descriptive Statistics of Demographic Variables in Western Kenya.

	Gender	Age	Marital status	Level of education	Religion	Terms of employment
Frequency variable	63	63	63	63	63	63
Mean	1.238	3	1.254	2.587	1.825	2.429
Median	1	3	1	3	2	2
Std. Deviation	0.4293	1.016	0.4741	0.5575	0.9595	0.9283
Variance	0.184	1.032	0.225	0.311	0.921	0.862
Range	1	4	2	2	4	3

**Figure 3:** Distribution of Gender Participation from Study Region.**Figure 4:** Distribution of Terms of Service of Morticians in Public Mortuaries.

“Most public mortuaries in Kenya, employ their morticians on contract basis rather than permanent job basis and this contract issues surely are really hurting our heart, demotivate and make us jobless anytime”, FGD discussion and triangulations with morticians in Kakamega and Kisumu County facility mortuaries on 14.03.2022 and 15.03.2022.

Majority of mortuary /forensic service providers 48 (71.6%) were married, 14, (20.9%) were single (1.5%) were divorced. Their religious of worships was tabulated as below (Table 5). Religion, Public health officers, Police services and Residence magistrates remained basic health determinants of executing majority of occupational health hazards, infectious epidemics, medico legal and Health laws, such as affidavit writing, autopsy dissections and embalming, Islam region belief that, if you dissect a body of

Muslim, it will not go to heaven. So, they usually go for affidavits in courts for justice accountability before the resident magistrate, to evade dissection as per their religious rites. Therefore, Doctors/ pathologists wrote death certificates, as per CAP 149 of birth and death registration Act, without ascertaining intermediate cause and nature of death, via autopsy dissection to most of Muslims. Due to their Islamic faith and cultural rites.

Table 5: Distribution of Religious Variables in Western Kenya.

	Frequency	Percent	Valid Percent	Cumulative Percent
Catholic	26	38.8	41.3	41.3
Protestant	30	44.8	47.6	88.9
Islamic	6	9	9.5	98.4
Hinduism	1	1.5	1.6	100
Total	63	94	100	

Professionalization of Forensic Services to Effect Quality Uptake of Medico Legal Procedures

The study opined that, after declaration of 2010 constitution, the national government failed to magnify the department of forensic pathology into integrated department of forensic science. Which consist of the following core disciplines that were to be managed under one command management, to mediate comprehensive and holistic forensic services uptake by public mortuaries in Kenya and the study region: Forensic fingerprint identification, and tracking of unclaimed persons NOK, forensic pathology, forensic anthropology,

and forensic odontology. Forensic laboratory medicine, forensic entomology, forensic radiology, photography, Molecular biology and Mortuary science and this contravenes article 4 part 4 of 2010 constitution Bill of rights, (The State shall not, discriminate directly or indirectly, against any person on any ground, including race, sex, pregnancy, marital status, health status, ethnic or social origin, color, age, disability, religion, conscience, belief, culture, dress, language or birth). The study also opined that, professionalism of mortuary services to work in tandem with implementation of quality forensic science remained limited and skewed, as main health system factor. Likewise, most pathologists equipped with the appropriate skills and knowledge of forensic services, rarely carry out autopsy dissections, as indicated in various triangulation of KIIs by the principal researcher.

"After devolution of Health sector to county government, Governors stated categorically that we were posted to county government to do pathological clinical services and not forensic services, so facilities delegated forensic services to medical doctors who do most autopsies, unless is special case. Also, County governments introduced payment of autopsy fee direct to hospital accounts meaning, if you have to travel to present your medical findings before a legal justice one has to use his or her own means to travel to court, which is impossible. Sometimes you may travel several time in a courts to present medical findings which is costly to that individual pathologist. So first National government should constitute an integrated functional forensic science department, provide cash to that forensic science department at county level that will even enable inquest police to travel and do fingers. Pathologist cannot use money from his personal pocket to offer government forensic services". KIIs in autonomy triangulations with number of pathologists in study areas surveyed in February and March 2022 in western Kenya.

Mortuary Service Providers Training in Forensic Medicine

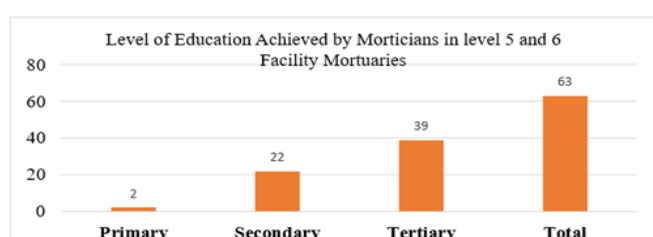


Figure 5: Demonstrate Level of Education and Training Achieved among Morticians as a Basic Health System Factor in Forensic Medicine.

The research opined that, most 13 (65%) of 20 public mortuary facilities surveyed in western Kenya, have insufficient number of trained personnel to offer forensic services, as a key determinant of health system factor, on the professionalization of forensic services. Majority, 39 (62%) out of 63, mortuary/forensic service providers surveyed, specifically morticians, have their tertiary course in mortuary science, 22 (33%) complete their secondary education, 2 (3%) completed primary education. most female morticians

employed have achieved certain levels of forensic service certificates in mortuary science compared to male with standard deviation of 0.56, 95%CI (Figure 5). The study also revealed that, though majority of Public Health Officers (PHOs), 11 out of 14, (85%), facility mortuaries surveyed and interviewed, had proper knowledge, skills and practices, as far as the uptake of CAP 242 of Public act and CAP 265 of Local Authority Act, are concerned, they have tilted and inadequate capacity building and empowerments in the uptake of medico legal procedures, to enable transparent, justices and accountability on the utilization of Human Anatomy Act, CAP 249, Human Tissue Act CAP252, and Penal code 75, and Birth and Death notification Act CAP 149. As noted in numeral KIIs and FGDs during serial interviews in the study region.

"The only two laws which most of PHOs are aware of are Public Act Cap 242 and Local Government Act, Cap 265 section 201 on bylaws for public cemeteries. Other Health laws on how they affect the unclaimed corpses from public mortuaries. As PHOs we are not aware of them, since we did not learn them in colleges or universities," KII briefing and triangulation of sub themes in, Bungoma Tier 4 and Kisumu, level 5 facility on 29/02/2022, 07/3/2022

The Study established that, there is need for the government to mediate for accessible, reliable and create awareness for health population, on quality forensic Knowledge, Attitude and Practices of occupational health hazards, infectious risks exposures, medico legal procedures and Health laws. Through health promotion to community households, which have endured inadequacy, to population health, since the colonial era.

"I observed like the Knowledge Attitude and Practices on medico legal procedures and health laws are issues only opened to pathologists, inquest police and Public health officers respectively, so there is need to create capacity building on comprehensive forensic sciences, knowledge and advocate to morticians because are main custodians of unclaimed corpses". KII briefing Kakamega on 18/2/2022.

Distribution of Secondary Study Population (Unclaimed Corpses) by Gender

The study opined that, most public mortuary facilities in western Kenya, acknowledged to have an accumulative of three thousands eight hundred and ninety-nine (3, 899) Fetus, juvenile and adult unclaimed corpses with an accumulative standard deviation, of 3.26 of 95% constant interval. Adults unclaimed by gender acknowledged in public mortuaries, for the past 5 years were: 2683 (89%) males and 339 (11%), female unclaimed corpses as confirmed Figure 6 below. The law neglected cohort; fetus and Juvenile unclaimed corpses, acknowledged in public mortuaries for the past 5 years, were 878. Whereby, 740 (85%) were fetus, and 138, (15%) were juvenile. The highest mortuary admission by next of kin was observed in Moi Teaching and Referral Hospital (MTRH) with total unclaimed corpses of 728 bodies, highest accumulation of mass grave disposal of adult's corpses, was observed in Kitale mortuary facility, due to its multiethnic populations and with noted least uptake of medico legal procedures, as echoed in FGD discussion

below. While the least facility to admit unclaimed corpses was Kimilili, with only 45 admissions. The range of unclaimed corpses admitted in the last 5 years, were 432 unclaimed corpses, (2017 -2021).

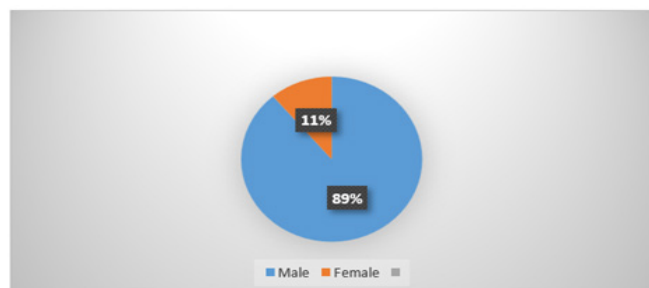


Figure 6: Describes the accumulative adult unclaimed corpses admitted in public mortuaries for last 5 years, (2017 -2021).

"Hapa Kitale Baro, karibu miaka 8 hivi nikifanya kazi, Sijawaiona Police Ikijukiwa fingerprints kwa mati, lakini hawa wanaleta kwa mortuary wakisemani unknown kila week mwili moja ama mbili na sana, sana ni wanaume "In Kitale, Barasa, for almost 8 years of my job, I have never seen a Police service carry out finger print abstractions on unclaimed corpses that they often admitted, they often admit unclaimed corpses once or twice per week. Mostly are unknown males. FGD discussion held in Kitale Tier 4 facility on 17/3/2022.

The survey further exploits that, out of 3,899 acknowledged unclaimed corpses, 1608, (41%) were of the Next of Kin (NOK) of which, 1421 (88%) were males, the least admissions, 187 (12%), were Females unclaimed corpses. Whose majority cases are never searched/ identified by NOK, once acknowledged in the morgue, as unclaimed corpse. Thus, end up in a mass grave disposal in public cemeteries compare to previously unclaimed male corpses, though are the most acknowledged, as unclaimed corpses, majority are searched and picked by NOK or good Samaritans, to enable

subsequent medico legal procedures to be implemented for future dignified disposal. In total the survey revealed that, only 1608 autopsies were dissected on the previously unclaimed corpses, to notify the government in the 5 years' periods. Meaning that only 1608 Death certificates were notified to the government, as per birth and death registration Act CAP 149. Hence 1608 certificates were issued to NOK to enable ceremonious/dignified disposal for previously unclaimed corpses for the last 5 years as demonstrated, (Figure 5 & Table 5) below. Additionally, forensic investigations revealed that, for the last 5 years, a total of 1420 adult unclaimed corpses, were disposed in public cemeteries through, improper, unceremonious mass grave disposal, due to the fact that, most unclaimed corpses, had strapping on frontal head, written "unknown Corpse Date of death", lacked aluminum tags on appendages, and earmarked shallow mass graveyards of less than 6 feet, excavated to enable future exhumation. Failure of police service to implement standard medico legal procedures, during the three months of "cold storage and cold hit" of unclaimed corpses, and their photographs being not uploaded into Interpol yellow notices for health population and NOK to search and identify their deceased corpses, from central location in the department of forensic science to ensure autonomy have resulted, public health officers and resident magistrates to apply health laws governing medico legal frame works. Therefore, Court orders were raised by respective facility public health officers (PHOs), through affidavits and notice boards notification for 21 days, or media advertisement, as per Penal code CAP 75 of Kenya, to facilitate, unceremonious mass grave disposal by public mortuaries to cemeteries, as per Local Government Act CAP 265 section 21. The total number of fetus and juvenile mass graved were 878, "the law neglected fetus and juvenile cases" with OD (1.0, 1.0) RR (1.0), signifying that, fetus and juvenile have no value attributions with uptake of medico legal procedures. But they only add quantity of health hazards, infectious risks and magnitude of unceremonious mass disposals categorized in the court orders, as per Human Anatomy Act, CAP 249 on consent and justice accountability by resident Magistrate (Figure 7).

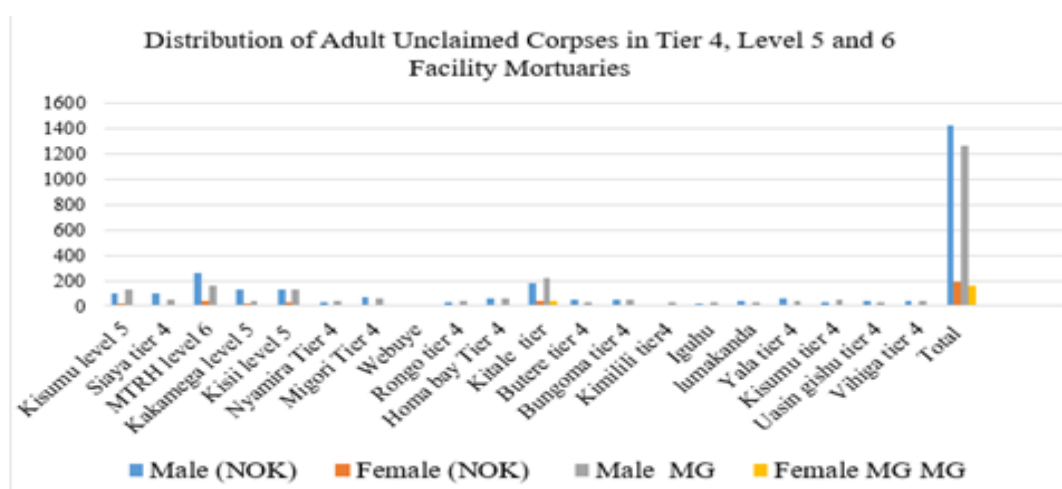


Figure 7: Explore on Distribution of Adult Unclaimed Corpses Admitted in Public Mortuaries.

"Identification of unclaimed bodies is the most difficult and resource-intensive task but the government has not invested in keenly. Forensic specialists may feel comfortable from an ethical perspective working to uphold human rights and investigating violations of international humanitarian law and of human rights, but this should include the family's right to learn the fate of relatives. The work of forensic specialists is necessary to ensure not only that justice is done but also that the best is done for the families in a shortest time possible, which involves identification of the unclaimed corpses as soon as admitted in public mortuary." KII briefings in MTRH on 07/03/2022.

The study discoursed that, out of 3899 unclaimed corpses acknowledged in public mortuaries for the past 5 years, 878 (29%), were fetus and juvenile unclaimed corpses. Whose forensic services remain neglected, as per standards medico legal framework of enactment, to enable dignified disposal. Hence main infringement of Bill of rights Chapter 4 and part 2: clause 26 and 27, on rights to life and live from conceptions [34]. In Kenya, the current practice is that fetus and juvenile's fingerprints and biometrics are not readily available. As such, medico legal practitioners, have marginal options to offer on proper disposal of unclaimed corpses outside the obtained court orders for mass grave disposal. The expert observation demonstrated that, though few female adult unclaimed corpses are admitted in most of tier 4 facilities, their chances of being claimed remained insignificant compared to their male unclaimed counterparts, OD (0.03, 3.3). This was also echoed during FGD discussion in Migori tier 4 facility mortuary.

"Here in Migori, we often admit many male and just few unclaimed female corpses per year. But the worrying trends is that most unclaimed female corpses admitted, are rarely searched or identified by their Next of Kin. therefore, they end up going for mass grave disposal, reason being may NOK think they got remarried or become housemaid in early age before attaining 18 years and remain without National identity card even in their old age. FGDs discussion in Migori on 23/03/2022 and triangulation in Kakamega level 5 on 20/2/2022

Exploitation of the Law Neglected Fetus and Juvenile Unclaimed Corpses in western Kenya

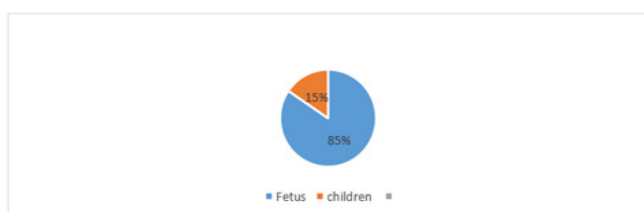


Figure 8: Frequency Distribution of Law Neglected Fetus and Juvenile Unclaimed Corpses.

Expert observation discoursed that, out of the 878 juvenile, 740 (85%), cases were attributed to first, fetus cohort which was closely associated with induced abortion, indication of limited, accessibility of reliable health promotions and lost glories of the African traditional reproductive values and uptake, among growing

health population. And lack of quality awareness on quality reproductive health services care, accessible to larger community households. Secondly, were 138 cases, (15%) of unclaimed Juvenile cohort, (Figure 8 & Table 5), reviewed for the past 5 years of unclaimed corpses of under 18 years, attributed to modern neglect of the parental care, and family values in parenting our children in African contexts and values.

The fundamental challenge, associated with overcrowdings of unclaimed corpses in public mortuaries, may influence occupational health hazards, such as psychosocial, ergonomic and chemical hazards. The population health also belief in myths attributed to overcrowded unclaimed corpses having prospects to spread infectious risks, to mortuary /forensic service providers, such as cholera, tuberculosis and infective hepatitis B and C which the study proved to be insignificant (OD 1.0, 10), with (RR 1.72) on formalin maceration of integument, due to single use of gloves. Forensic, expert observation designated that, proper unceremonious mass grave disposal could be effected using public health Act CAP 242, sections 35 – 48; 144-148), local government Act CAP 265 section 201, to provide proper earmarked cemeteries or graveyards, for shallow mass disposal of unclaimed corpses in less than 6 feet deep, with aluminum tags on their appendages, to enable future accessible valid exhumation, for forensic identification and tracking of unclaimed corpses by NOK (Figure 8).

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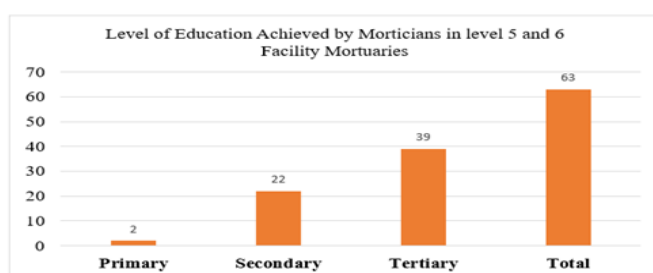


Figure 9: Demonstrate Level of Education and Training Achieved among Morticians as a Basic Health System Factor in Forensic Medicine

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Discussion

Determining Health Systems Factors Attributed to Unceremonious Mass Grave Disposal of Unclaimed Corpses

The extent to resolve inadequate and tilted forensic service, as the basic health system factor on forensic professionalization, to enable and mediate, forensic search and identification of unclaimed corpses acknowledged in public mortuaries, begun in colonial periods up to the date. Currently there is no proper inventions in survival, with evolution of digital platforms of modern information communication technology (ICT), Which is contrary to UN Inter-Agency Standing Committee by [33], on Protecting persons affected by Natural Disasters, which states that recovery of unclaimed corpses to public mortuary is aimed for future prompt identification of deceased and NOK, by utilizing modern ICT, to enable dignified disposal. Not the regular improper unceremonious mass grave being realized across the country and in the study region. The forgotten law on the unclaimed corpses, 788 (23%) fetus and juvenile unclaimed corpses were improperly mass graved between 2017 and 2021. Mainstream of fetus cases were, attributed to induced abortions, which is in contradiction of Chapter four of 2010 constitution on Bill of rights part 2 clause 26 and 27, [34]. Which state that, human beings' Have rights to life, from time of conceptions. In whole study area, the straight uptake of medico legal procedures, as per medico legal standard frame works and penal code CAP 75, was only realized in Kisumu level 5 facility in 2018 with only 2 unclaimed corpses, which contributed to only less than 1.0% unknown corpses identify by fingerprint abstraction and DNA comparisons supported. Out of 3028 adult unclaimed corpses acknowledged in the past 5 years by public mortuary in western Kenya. This suggested that quality application of forensic services by the police services in western Kenya, and Kenya as a society is insignificance. Therefore, in contradiction of the Penal Code of Puerto Rico in the sections by [35], on crimes against respect of the dead, crimes against the family rights to

health information through, the Interpol Yellow notices, by [36]. It also rebelliously, to the Kenyan Penal code CAP 75 section 285 -388, that requires that, all unclaimed corpses or missing persons, the police service, to perform full inquest of the crime, as per medico legal frame works, Mutethia, (2020).

Ascertaining Mortuary/ Forensic Service Providers' Knowledge, Attitude and Practices KAP, May Effect the Unceremonious Mass Grave Disposal

The catastrophe of ministry of health (MOH), on KAP to expand the Department of forensic pathology into integrated department of forensic science which consist of several forensic disciplines: Forensic fingerprint identification, forensic pathology, forensic anthropology and forensic odontology. Forensic laboratory medicine, forensic entomology, forensic radiology, photography, molecular biology and mortuary science, are closely attributed to tilted and inadequate uptake of forensic services. Which remain to prevent accessible equitable, comprehensive and holistic forensic professionalization uptake, across all public mortuaries in western Kenya, and this is conflicting with the studies by, [33] on vibrant roles of integrated core forensic disciplines, to form forensic science department, efficiently support the forensic services, under one command management. From the descriptive cross sectional, observational surveys, it was recognized that, most public mortuary facilities, have inadequate number of professional human resource, trained in forensic science. To provide quality forensic services to health population. 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, which is in line with study by [15,20]. on human resources for health and overcoming the calamities, in low settings of health sectors in Developing countries.

Conclusion

Appropriate Technical skills should be empowered and sustained to all mortuary /forensic service providers, in all core forensic disciplines. (Forensic fingerprint identification, forensic pathology, forensic anthropology, forensic odontology, and forensic laboratory medicine. Forensic entomology, forensic radiology, photography, molecular biology, (government chemist department and Mortuary science), to influence quality tagging of corpses with aluminum metals, on their appendages before disposal. Labelling of samples DNA samples to last for over 15 years in laboratory, or process shallow mass graves with earmarked graveyards, with sampling frames/registers of unclaimed corpses, with tagged aluminum metals for future exhumation, when need arises from NOK. Advocacy for health policy making and parliamentary Bill amendment to legalize 90 days' Cold room storage and "cold hit", as a mandatory medico legal step, for all public mortuaries to decrease the improper, unceremonious mass grave disposal, and reduced illegal fees attached to Human remains in the name of "Donation"

to medical schools. Which is disparity with Human Tissue Act CAP 252 and Human Anatomy Act CAP 249 of Kenya.

Recommendation

Ministry of Health in western Kenya, National and County governments in partnership with Donor partners, to expand Department of forensic pathology into a sincere, accessible and reliable functional and fully financed Department of Forensic Science, under ministry of health, with key mission of forensic services and health care. Under sector wide approach, (SWAPs) model integrated with core forensic disciplines: (Forensic fingerprint identification, forensic pathology, forensic anthropology and forensic odontology. Forensic laboratory medicine, forensic entomology, forensic radiology, photography, molecular biology (government chemist and Mortuary science), into one holistic and comprehensive single command management of forensic services. Right from diagnostic triangle, to taking of vows by NOK, at the resident magistrates, to effect deceased improper unceremonious mass grave disposal by public mortuaries.

Government of Kenya and western Kenya, to partner with Public Private Partnership (PPP), to establish an Interpol yellow view notice platform for population health to enable next of kin readily access, search and identify unclaimed or missing or juvenile or adult unclaimed corpses on the online internet platforms, uploaded by the admitting/filing Police service in occurrence book as an effective and efficiency way to decrease unceremonious mass disposal by public mortuaries.

References

1. Advisory Committee (2003) The Prevention of Infection in the Mortuary and Postmortem Room. Health Services Advisory Committee.
2. Agha M (2012) Epidemiology and pathogenesis of *C. difficile* and MRSA in the light of current NHS control policies: A policy review. *Annals of Medicine and Surgery* 6(1): 39-43.
3. Amoran OE, Onwube OO (2013) Infection control and practice of standard precautions among healthcare workers in northern Nigeria. *Journal of Global Infectious Diseases* 5(4): 156-163.
4. Bajracharya S, Magar A (2006) Embalming: An art of preserving human body. *Kathmandu University Medical Journal (KUMJ)* 4(4): 554-557.
5. Bedoya G, Dolinger A, Rogo K, Mwaura N, Wafula F, et al (2017) Observations of infection prevention and control practices in primary health care, Kenya. *Bulletin of the World Health Organization* 95(7): 503.
6. Brenner E (2014) Human body preservation—old and new techniques. *Journal of Anatomy* 224(3): 316-344.
7. Chen L, Evans T, Anand S, Boufford JI, Brown H, et al (2004) Human resources for health: Overcoming the crisis. *The Lancet* 364(9449): 1984-1990.
8. Cole SA (2004) Grandfathering evidence: Fingerprint admissibility rulings from Jennings to Llera Plaza and back again. *Am Crim L Rev* 41: 1189.
9. de Goyet C de V (1999) Stop propagating disaster myths. *Prehospital and Disaster Medicine* 14(4): 9-10.
10. Dine CJ, McGaghie WC, Bordage G, Shea JA (2015) Problem statement, conceptual framework, and research question. *Review Criteria for Research Manuscripts* p. 19.



11. Franco LM, Bennett S, Kanfer R (2002) Health sector reform and public sector health worker motivation: A conceptual framework. *Social Science & Medicine* 54(8): 1255-1266.
12. Fusco FM, Scappaticci L, Schilling S, De Iaco G, Brouqui P (2016) A 2009 cross-sectional survey of procedures for post-mortem management of highly infectious disease patients in 48 isolation facilities in 16 countries: Data from EuroNHID. *Infection* 44(1): 57-64.
13. Illes M, Wilson P (2020) The scientific method in forensic science: A Canadian Handbook.
14. Kandethody (2012) Mathematics statistics applications on Finite adjustment formular. Elsevier 187.
15. Kazungu J, Nanyingi M, Katongole SP, Anguyo RD, Wampande LN (2015) The state of mortuary and mortuary services in public health facilities of southwestern Uganda.
16. MacFarlane SN, Khong YF (2006) Human security and the UN: A critical history. Indiana University Press, USA.
17. Macharia PM, Mumo E, Okiro EA (2021) Modelling geographical accessibility to urban centres in Kenya in 2019. *PloS One*, 16(5): e0251624.
18. Mara D, Evans B (2018) The sanitation and hygiene targets of the sustainable development goals: Scope and challenges. *Journal of Water, Sanitation and Hygiene for Development* 8(1): 1-16.
19. Marangu EM (2020) Culture and mental health in Kenya. In *The Routledge International Handbook of Race, Culture and Mental Health* (411-421). Routledge.
20. Montañez-Hernández JC, Alcalde-Rabanal J, Reyes-Morales H (2020) Socioeconomic factors and inequality in the distribution of physicians and nurses in Mexico. *Revista de Saude Publica* p. 54.
21. Murrell DF (2011) Autoimmune Blistering Diseases, Part II, An Issue of *Dermatologic Clinics*-E-Book 29(4) Elsevier Health Sciences.
22. Mutethia K (2020) The Constitutional Context of Human Rights Defenders in Kenya under the 2010 Constitution. Available at SSRN 3725831.
23. Nantulya VM, Muli-Musiime F (2001) Kenya: Uncovering the social determinants of road traffic accidents. *Challenging Inequities in Health: From Ethics to Action* pp. 211-225.
24. Noji EK (2000) The public health consequences of disasters. *Prehospital and Disaster Medicine* 15(4): 21-31.
25. Nyaberi JM, Kakai R, Obonyo CO, Othero D (2014) Perceived occupational risk of infection among hospital mortuary attendants in Nyanza Province, Kenya.
26. Pankaj A, Singh BR (2017) Dealing with unclaimed dead bodies-embrace the challenge. *International Journal of Community Medicine and Public Health* 4(4): 992.
27. Percy R (2005) The contribution of experiential learning theories to the practice of participatory technology development. *Agriculture and Human Values* 22(2): 127-136.
28. Published by the National Council for Law Reporting & with the Authority of the Attorney-General. (2012) Kenya laws, CRIMINAL PROCEDURE CODE CHAPTER 75. *Www.Kenyalaw.Org* 75(2): 385-388.
29. Rasskazova E, Ivanova T, Sheldon K (2016) Comparing the effects of low-level and high-level worker need-satisfaction: A synthesis of the self-determination and Maslow need theories. *Motivation and Emotion* 40(4): 541-555.
30. Reedy P (2020) Interpol review of digital evidence 2016-2019. *Forensic Science International: Synergy* 2: 489-520.
31. Rowe AK, De Savigny D, Lanata CF, Victora CG (2005) How can we achieve and maintain high-quality performance of health workers in low-resource settings? *The Lancet* 366(9490): 1026-1035.
32. Saul J (2013) Collective trauma, collective healing: Promoting community resilience in the aftermath of disaster. Routledge Vol. 48.
33. Silali M (2021) Health Determinants of Safe Infection Prevention Control of COVID 19 Deaths to enable safe Disposal and Cadavers Dissection as Distinct Educational Tools in Western Kenya. *International Journal of Public Health* 7(1): 199-213.
34. Silali MB, Odero W, Rogena E (2017) Community Participation Medico-Legal Concepts to Identify Unclaimed or Missing Dead Bodies from Public Mortuaries to Improve Public Health in Western Kenya.
35. Silving H (1974) Constitutional Fundamentals of Penal Legislation: Reflections on Another Draft of a New Penal Code for Puerto Rico *REV JuR UPR* 43: 141.
36. Sodhi K, Shrivastava A, Arya M, Kumar M (2013) Knowledge of infection control practices among intensive care nurses in a tertiary care hospital. *Journal of Infection and Public Health* 6(4): 269-275.
37. Watkins RE, Wynaden D, Hart L, Landsborough I, McGowan S, et al. (2006) Perceptions of infection control practices among health professionals. *Contemporary Nurse* 22(1): 109-119.
38. (WHO) (2017) Healthier, fairer, safer: The global health journey, 2007–2017. World Health Organization.

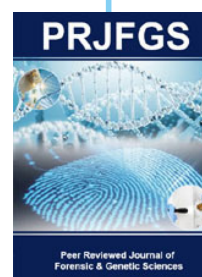




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