International Journal of Public Health Research
2015; 3(6): 360-369
Published online November 10, 2015 (http://www.openscienceonline.com/journal/ijphr)
ISSN: 2381-4829 (Print); ISSN: 2381-4837 (Online)

Open Science

The State of Mortuary and Mortuary Services in Public Health Facilities of South Western Uganda

James Kazungu[1], Miisa Nanyingi[2], Simon Peter Katongole[2, *], Anguyo Robert DDM[3], Lillian Nantume Wampande[2]

[1]Kisoro District Local Government, Kisoro, Uganda
[2]Faculty of Health Sciences, Uganda Martyrs University, Kampala, Uganda
[3]Department of International Public Health, Liverpool School of Tropical Medicine, Kampala, Uganda

Email address

jkatzungu@gmail.com (J. Kazungu), mnanyingi@umu.ac.ug (M. Nanyingi), spkatongole@gmail.com (S. P. Katongole), ranguyo@yahoo.com (A. R. DDM), lwnantume@umu.ac.ug (L. N. Wampande)

To cite this article

Kazungu James, MiisaNanyingi, Simon Peter Katongole, Anguyo Robert DDM, Lillian NantumeWampande. The State of Mortuary and Mortuary Services in Public Health Facilities of South Western Uganda. *International Journal of Public Health Research*. Vol. 3, No. 6, 2015, pp. 360-369.

Abstract

Mortuaries and mortuary services are very crucial support services to healthcare delivery. Information on the status of mortuary services in Uganda is largely missing. This study therefore was carried out to assess the status and factors associated with the prevailing status of mortuary services. A descriptive cross-sectional study that employed both qualitative and quantitative methods of data analysis was carried out in South Western Uganda. Two regional referral hospitals, four district hospitals and 38 public health centre IV's were studied. Data in these health facilities were obtained through observation, interviewing the managers of the health facilities and personnel directly responsible for the running of mortuary services about the state of and functionality of mortuaries in the facilities they headed. Out of all the health facilities studied, Nineteen (19/44, 43%) did not have mortuaries at all while 21/25 (84%) facilities' mortuaries, were ranked to be in a fair state. Out of the health facilities with mortuaries, Nineteen (19/25, 76%) were poorly equipped with instruments required in a mortuary.Most mortuaries did not have adequate and trained human resources. As a result, the mortuary and mortuary services are under utilized in the health facilities in the region and are mostly used as dumping and storage centres for corpses that are picked from the streets by police and corpses that are unclaimed for by relatives. The functionality of mortuaries in the area studied and in the whole country as well should be enhanced by the Ministry of health and local governments in the area. When mortuaries are functionalized, the public should be sensitized on the services offered and the need to utilize the mortuaries so as to undo the inefficiencies delineated in this study.

Keywords

Mortuary, Corpse, Post Mortem, Autopsy

1. Introduction

A mortuary is a hospital service point used for security and safety of human corpses awaiting identification or removal for autopsy, burial or any other post-death rituals. Mortuaries have for long been used as places to preserve and prevent deterioration of human corpses. They are useful sources for tracking records and information on dead persons as well as an institution for research [1].

Despite the increased urge to improve service delivery around the world, mortuary facilities have not received as much attention. Globally, hospitals face a challenge of maintaining mortuary facilities to act as any other services point [2]. Unfortunately, mortuary services are a neglected business: especially in developing countries and hospitals (therein) continue to struggle to maintain mortuary facilities and services [2]. Mortuaries are usually not of acceptable standard with old infrastructure like post-mortem tables and often treated as dumping grounds for dead bodies leading to poor corpses' storage [3]. This usually creates a problem to

the society. The situation is made worse in developing countries where mortuaries are usually found unhygienic with rodents and foul odor.

For efficient functioning and maintenance, mortuaries and mortuary services must be set up to meet certain standards. A good mortuary for example requires a walk - in cool room with refrigerated cabinets having temperatures of between 2 to 6°C and -20°C for short and long-term storage respectively. It must have trolleys without racks [4] [5].

Themortuary should have adequate space for corpses' storage and this is determined by peaks and seasonal variations, information on average daily postmortems performed, in-patient death rate, through-put and patient population.The size of the storage facilities in a mortuary is also determined by its location, the need for pathologists to perform efficiently, length of time to perform a postmortem, the number of mortuary staff available and the time required for preparation of the body prior to and after the examination [6] [7]. The allocation of and the number of body chambers should be in accordance with the body load, on average one death per bed per year. It also depends upon size and type of the hospital, policy of hospital regarding accepting bodies from outside the hospital [5]. For example a hospital with 50-100 beds is estimated to have a mortuary with capacity of holding 2 bodies while that with 200 beds should have capacity for at-least 3 bodies. A mortuary should be secure, free from intrusions, screened from wards and outside roads [8]. It should be located in a separate basement building with dignified surrounding, and facilities for the mortuary attendant. It should have designsof facilities for viewing bodies, a waiting room/reception room, and a centre for visiting relatives. It should have separate arrangements for keeping decomposed and infectious bodies, for performing autopsies, space for handing over the dead bodies to the relatives/undertakers and a viewing gallery for the students/investigating officers/nominees.

Strict precautions in handling the human remains are recommended for infection prevention thus, all dead bodies should be considered infectious. Hence infection control measures such as; using gloves and boots, washing hands with soap and water after handling bodies and before eating should be observed and implemented during body cleaning [9]. In addition, all the equipment, clothes, vehicles used for transportation of bodies should be disinfected, bodies stored in confined, ventilated spaces and the body should be approached with caution. Fresh air should be allowed to ventilate through confined spaces and potentially hazardous toxic gases expelled so as to improve on infection prevention after several days of decomposition. An infectious body should be placed in a clearly labeled, durable and 'impermeable to body fluids bag', with the danger and the risk of infection documented on mortuary control notification sheet [1], [5] [10].

Information about the disease is confidentially passed on to relatives and this serves as infection prevention measure to the community. All effluent generated in mortuary should be diluted and should not to be discharged into surface water drains [11]. All staff working in the mortuary complex should be immunized against Hepatitis B Virus [12] [13].

A mortuary should be in a secure building and should have; viewing room, storage chamber for bodies, room for records, and for storing personal effects. Well located, entry and exit doors, well designed (hand washing facility, floor drainage). Security procedures in mortuary may relate to retained tissue, specimens, documents and records, information concerning the deceased, photographs, items found with body, confidentiality, entry control, key control, physical security and authorization of entry. Recording details of the dead and reinforcing it with photographs facilitates easy retrieval by relatives in cases of body decomposition and this avoids mistaken identity [5]. Bodies received into the hospital mortuary either from within or without the hospital should be registered and recorded in a mortuary register and tagged. Personal belongings of the deceasedshould be, safely kept in a lockable storage [4]

Various methods of preservation of the dead bodies exist to permit burial without unseemly haste and infection prevention.These include; embalming, the use of chemicals such as formaldehyde, arsenic fluid, glutaraldehyde, phenol, formalin (40% aqueous formaldehyde), water conditioner, cell conditioner, dyes, humectants, anti-oedemic chemicals and additional disinfectants [14].

Death certification is offered in a mortuary by a forensic pathologist or medical examiner. For death that occurs in a hospital, a health practitioner such as medical doctor or assigned physician's assistant is usually responsible for completing the death certification [15]. A death certificate must be filed within five days of death and before final disposition of the deceased's remains.Informationcaptured on the certificate include; full name of deceased, time of death, date of death, place of death, date of birth, place of birth, marital status, spouse's name, occupation, residence address, father's and mother's name, level of education, place of burial, name, address and phone number of certifying physician [16].

An autopsy or post-mortem examination is a step-by-step examination of the outside of the body and the internal organs by a doctor called a pathologist to provide detailed information on cause of the death,confirming or correcting clinical diagnosis and for providing opportunities for medical education on pre and postgraduate level [17] [18].

If the body is unidentified and/or not claimed by relatives, then the health facility ensures disposal of the remains in a manner such as temporary burial – that will facilitate identification in the future. The corpse should be handled in a culturally sensitive manner and shielded from curious people and photographers – this implies that detailed information should be captured and stored in mortuary concerning the remains [19].

Trained employees may release bodies from the mortuary to the next of kin/relative or to the appointed funeral directors on production of a disposal certificate. The releasing officer checks the details on the disposal form and establishes proof of identity of the person receiving the body. The disposal

certificate number will be entered in the mortuary register together with the date, other details and signature of the person receiving the body and the aim is to avoid body mistaken identity and issuance of safety precaution [19].

A decline in uptake of mortuary services such as embalming, autopsy and others services by relatives of dead in Mulago the National referral hospital in Uganda was observed [20]. Lack of proper mortuary services especially due to lack of clear guidelines and policies for equipping and maintaining the mortuary in Masaka regional referral hospital was also observed [21]. This situation has often led to dumping of unpreserved dead bodies for days resulting in foul odor which becomes a nuisance to the nearby communities. In Lango sub-region of Northern Uganda, 42% of functional health units had structural defects in the mortuary [22]. Mortuary services are very important; therefore information about the status of such facilities in the country is required for better planning [23]. More health facilities at regional, district and in the lower health facilities lack vital information about mortuary services. Even where information has been provided, emphasis has been put on the availability of buildings but fall short on providing information on other vital facilities and services offered [24. It is upon this background that this study set out to describe the state of mortuaries and mortuary services provided in public health facilities in South Western Uganda and to assess factors affecting the services offered.

2. Methods

2.1. Study Settings

A descriptive cross sectional survey with both qualitative and quantitative methods was conducted between May 2014 and October 2014 in 44 health facilities of South Western Ugandathat included regional referral hospitals, district hospitals and health centre IVs.

The health centre IVs included; Chafafi (A), Rubugiri (B), Busanza (C) in Kisoro district; Kamukira (D), Maziba (E), Rubaya (F), Hamurwa (G), Muko (H), Mparo (I), Kamwezi (J) found in Kabale district; Rwashamaire (K), Kitwe (L), and Rubaare (M) located in Ntungamo district;Kabuyanda (N), Nyamujanja (O), Rwekubo (P), and Rugaaga (Q) located in Isingiro district, andKihihi (R) and Kanungu (S) found in Kanungu district. Other health centre IVs studied included; Bugangari (T), Buhunga (U), Kebisoni (V) and Rukungiri (AL) in Rukungiri district; Ishongororo (W), and Ruhoko (X) in Ibanda district, Kyabugimbi (Y) and Bushenyi (Z) in Bushenyi district; and Nsiika (AA) in Buhweju district. The study also included other health centre IVs such as; Shuuku (AB), Kabwohe (AC) in Shema district, Rugazi (AD) in Rubirizi district; Mitooma (AE) in Mitooma district; Bwizibwera (AF), Kinoni (AK), Bugamba (AG), Mbarara Municipal Council (AH) in Mbarara district; and Kiruhura (AI) and Kazo (AJ) in Kiruhura district.

The district hospitals studied included; Kisoro (BA) in Kisoro district, Itojo (BB) in Ntungamo district, Kambuga (BC) in Kanungu district, and Kitagata(BD) in Shema district. Kabale Regional referral hospital (CA) and Mbarara Regional referral hospital (CB) were also studied.

2.2. Data Collection

Data on mortuaries and services was collected from hospital administrators, hospital superintendents and directors, pathologists, in-charges of Health Centre IV's and mortuary attendant/porters. These (officers) were expected to be informed about the status of mortuary services.

To assess the status of mortuary services, the study adopted and modified the guidelines by the National Health Service for Scotland (2002) and IUSS of South Africa, (2014) to fit within the standards of Uganda since no local guidelines were available [5] [6]. The presence of inputs necessary for effective running of a mortuary was assessed. These included; crucial human resource required in the mortuary such as a pathologist in the regional hospital, a medical officer attached to the mortuary for a district hospital, an autopsy assistant, nurses attached to the mortuary, a mortuary attendant, and security personnel at the mortuary.

In assessing the state of the mortuary, the study assessment was guided by 24 items for a well-functioning mortuary. This included evaluating whether there was a mortuary with adequate size, and accessible to vehicles for loading and unloading of bodies. Where a mortuary was present, evaluation was carried out on whether it had windows, entry and exit doors, whether it was located on the basement unit and secure from entry at all times.We determined whether it had a dignified surrounding, and whether there were separate routes for entry by visiting relatives.We checked whether the storage chamber for corpses were separate from other building of the mortuary, hidden from public viewing and whether the room had a smooth, washable floor and whether it was tidy.We further assessed whether the area was large enough for moving the corpses, and whether it had racks and whether it was adequately lit. In addition, we assessed whether the mortuary had other required infrastructure such as; a postmortem room, a records office, a dressing room and a pathologist's office. We also assessed whether the mortuary had toilets for staff and visiting relatives, awaiting room with furniture for relatives to sit, and whether it had an alarm bell and electricity.

We also assessed for presence of and functionality of 16 equipments required for effective mortuary services. Equipment necessary for the examination of corpses that were assessed included; personal protective equipment, postmortem tables, wheel trolleys, refuses bins/bags, buckets, stretchers, and autopsy instruments. Other instruments assessed for their presence included; poster boards, a photographic camera, a portable X-ray, a generator, a thermometer, a tape measure, a DNA machine and a CCTV Camera. Refrigerators, electricity, and freezers, equipment, necessary for preservation of corpses were assessed.

The study sought to assess for the presence of supplies and drugs required for mortuary services such as; cotton, gloves,

gum boots, cotton cloth, body bags, a deodorizer, stock cards, disinfectants, formalin, and formaldehyde. Presence of technical personal such as a pathologist in a regional hospital, a medical doctor, a nurse attached to the mortuary, and a security guard in a health centre IV was determined.

The presence of items required for information management in a mortuary was also assessed. These included;a computer, library, mortuary register records of body release, records of bodies received, copies of death certificate, records of items found with dead medical records, autopsy form,body tags, box files, delivery note for mortuary drugs & supplies, a temperature monitoring chart and a telephone.

We also determined whether there was effective information management in the mortuary.Here we reviewed the recording and filing protocol form and whether it contained particulars of corpse and police or people who had brought the body. Wedetermined whether there was issuing of a death certificate for any corpse brought into the mortuary, hospital release note, postmortem report, and mortuary register which was adequately filled.We used an observation checklist and interview guide to obtain the information.

2.3. Data Analysis

Considering mortuary equipment, the state of a mortuary was regarded to be very good if 14-17 of the 17 equipments were available and functioning. A health facility with 9-13 of the equipment assessed available and functioning was regarded to be in a good status and it was regarded to be in a fair state when it had 4-8 of the equipment available and functioning, whereas it was regarded to be in a poor state when it had 3 or less of the equipment available and functioning.As regards the structure of the mortuary, the state of a mortuary was regarded to be very good when 23-24 out of the 24 parameters an effective mortuary should have were existent. It was regarded to be good when 19-22, fair when 4-17, and poor when 3 or less of the parameters of a mortuary structures where available. On the other hand, the state of the mortuary information system inputs were regarded to be very good, good, fair and poor when 12-14, 8-11, 4-7 and 3 or less of the information systems' inputs required in a mortuary where available respectively.

2.4. Ethical Approval

The ethical approval process was carried out in two stages. Initialapproval was obtained from Uganda Martyrs University, Faculty of Health Sciences Board after presenting the initial protocol. Secondly, in every hospital and health centre we visited, approval to carry out the study was sought from the hospital management team after explaining the objectives of the study. In the regional hospitals, ethical approval was obtained from the institutional research committees.We coded the health facilities in order to address confidentiality.

3. Results

3.1. Presence of Mortuaries

Out of the 44 health facilities studied, 19 (43%) had no mortuaries. All the health facilities without mortuaries were health centre IVs and included; C, D, E, F, G, H, I, J, N, O, P, U, V, W, AD, AH, AI, AJ, AL. Thehealth facilities with mortuaries included; A, B, K, L, M, Q, R, S, T, X, Y, Z, AA, AB, AC, AE, AF, AG, AK, BA, BB, BC, BD, CA, CB.

3.2. The State of Mortuaries

Among the health facilities with mortuaries, only hospital CB (4%), a regional referral and medical officer's teaching hospital had a mortuary structure which could be ranked as being very good. Three other health facilities (12%) i.e. hospital CA, BA and BB had mortuaries that were ranked as good. All the level IV health centers with mortuaries and hospital BD's mortuary structures were ranked to be fair.The facilities ranked as fair for mortuary structures had single one room structures for a mortuary. Table 1 shows the performance of health facilities as per the structure of the mortuaries.

3.3. Presence and Functionality of Mortuary Equipments

HospitalCB (a regional referral and training hospital) representing 4% of the health facilities had 11 of the equipments required in the management of mortuary services and therefore ranked as good.Five (20%) of the health facilities (all district hospitals and one other regional referral hospital) were fairly equipped with mortuary instruments while 19 (76%) of the health facilities were poorly equipped with mortuary equipment. All the poorly equipped mortuaries were in the level IV health centers (table 2).

3.4. Presence of Inputs for Mortuary Information Management Systems

Seventeen (68%) of the facilities with a mortuary had no mortuary information management systems inputs available. Three (12%) of the hospitals' (CA, CB and BD) mortuaries' information system inputs were classified to be good. Hospital BA and health centre X (8% of the facilities) had their mortuary information management system inputs classified as being fair. The rest (all level IV health centers) had their mortuary information management systems inputs classified to be poor.

3.5. Presence of Drugs and Supplies for Mortuary Services

Thirteen (52%) of the health facilities were classified as having the necessary drugs and supplies for mortuary services. Three (12%) of the health facilities did not have any supplies and drugs required in a mortuary. Formalin was available infiveof the health facilities for corpse preservation. None of the health facilities had a body bag for storing corpses and this exposes workers to infections. Health facilities without formalin did not treat and preserve corpses.

Table 1. *The state of the mortuary structure in the health facilities.*

Indicator	Health facility																							
	CA	BA	BD	BB	CB	BC	S	R	L	M	AA	AB	CC	Z	Y	B	AF	AC	T	A	K	AB	AE	X	AL
i.	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
ii.	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
iii.	√	√	√	√	√	√	×	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
iv.	√	√	√	√	√	√	×	×	×	×	×	×	×	×	×	√	×	×	×	×	×	×	×	×	×
v.	√	√	×	√	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
vi.	√	√	×	√	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
vii.	×	×	×	√	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
viii.	√	√	×	√	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
ix.	√	×	×	√	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
x.	√	√	×	×	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
xi.	√	√	√	√	√	√	×	×	√	√	√	√	√	×	×	√	×	×	√	√	√	√	√	√	√
xii.	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	×	√	√	√	√	√	√	√
xiii.	√	√	×	√	√	√	×	×	×	×	×	×	×	×	×	√	×	×	×	√	×	×	×	×	×
xiv.	√	√	√	√	√	√	√	√	√	√	×	√	×	×	√	√	√	×	√	√	√	×	√	√	×
xv.	√	√	√	√	√	√	√	√	√	√	√	×	×	√	×	√	×	×	×	√	×	√	×	√	×
xvi.	√	√	√	√	√	√	√	√	√	×	√	√	×	×	√	√	×	√	×	×	×	√	√	×	×
xvii.	√	√	√	√	√	√	√	√	×	×	√	√	√	√	√	√	×	√	×	×	×	√	×		×
xviii.	√	√	√	√	√	√	√	√	×	×	√	√	×	×	√	√	×	√	×	√	×	√	√	×	×
xix.	√	√	√	√	√	√	√	√	×	√	√	√	×	×	√	√	×	√	×	√	√	×	√	×	×
xx.	√	√	√	√	√	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	√	×	×	×	×
xxi.	√	√	√	√	√	√	×	√	√	√	×	√	√	×	×	√	√	√	×	√	×	√	√	√	
xxii.	√	√	√	√	√	√	√	×	√	×	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
xxiii.	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
xxiv.	√	√	√	√	√	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×		×
Total Score	22	21	16	22	23	17	10	11	10	9	11	12	8	7	10	15	7	8	7	13	8	11	11	11	7

Availability of a mortuary (i), Availability of entry and exit doors (ii)Mortuary has postmortem room(iii)Suitable sized mortuary room(iv), Records office(v), Dressing room (vi), Pathologist office (vii), Toilets for staff and visiting relatives(viii)Waiting room for relatives (ix)Furniture in the waiting room(x), Mortuary is accessible to different people (xi), Sitting mortuary in basement unit (xii), Separate routes for entry by visiting relatives, medical staff (xiii), Mortuary separate from other building (xiv), Dignified surrounding of the mortuary (xv), The mortuary located in tidycorners of the health facility (xvi), Area is secure from entry at all times (xvii), Presence of racks (xviii), The area ishidden from public viewing (xix),The area islarge enough for moving the remains and adequately lit (xx) Theplace provides easy access to vehicles for loading and unloading (xxi), The room has smooth, washable floor(xxii), Presence of alarm bell(xxiii), Presence of electricity (xxiv)

Key

√ Indicator for assessing structure of the health facility met by the health facility

× Indicator for assessing structure of the health facility not met by the health facility

Table 2. *Equipment and functionality of mortuary instruments in the health facilities.*

Indicator	Health facility																							
	CA	BA	BD	BB	CB	BC	S	R	L	M	AA	AB	CC	Z	Y	B	AF	AC	T	A	K	AB	AE	X	AL
i.	√	√	√	√	√	√	√	×	×	×	×	×	×	×	x	√	×	×	√	√	√	×	×	x	×
ii.	√	√	√	√	√	√	√	√	√	√	√	×	×	×	x	√	√	√	x	√	√	×	×	√	×
iii.	√	×	√	√	√	×	×	×	×	x	×	×	×	×	×	×	x	x	x	x	×	×	×	x	×
iv.	√	√	√	√	√		×	×	×	√	√	x	×	×	×	×	√	√	x	x	x	×	×	√	×
v.	√	√	√	√	√	√	√	√	√	√	√	x	×	×	×	√	√	x	√	√	√	√	×	×	×
vi.	√	×	√	×	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
vii.	×	×	×	×	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
viii.	×	×	×	×	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
ix.	×	×	×	×	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
x.	×	×	×	×	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
xi.	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
xii.	×	√	√	×	×	×	×	×	×	×	x	x	×	×	×	×	×	×	×	×	x	x	×	×	×
xiii.	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
xiv.	×	×	×	×	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
xv.	×	×	×	×	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
xvi.	×	×	×	×	x	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
xvii.	×	×	x	×	√	×	×	×	×	×	×	x	×	×	×	×	×	×	×	×	×	x	×	×	×
Total score	6	5	7	5	12	4	3	2	2	3	3	0	0	0	0	3	3	2	2	3	3	1	0	2	0

Personal protective equipment (i), post mortem tables (ii), wheeled trolleys (iii), refuse bins/bags (iv), stretchers (v), autopsy instruments (vi), freezers (vii), refrigerator (viii), poster boards (ix), photographic camera (x), portable X-ray (xi), generator (xii), Thermometer (xiii), Tape measure (xiv), DNA machine (xv), CCTV Camera (xvi), weighing scale (xvii)

Key

√ Indicator for assessing presence and functionality of mortuary equipment of the health facility met by the health facility

× Indicator for assessing presence and functionality of mortuary equipment of the health facility not met by the health facility

Table 3. *Presence of inputs for Mortuary information management systems.*

	Health facility																							
Indicator	**CA**	**BA**	**BD**	**BB**	**CB**	**BC**	**S**	**R**	**L**	**M**	**AA**	**AB**	**CC**	**Z**	**Y**	**B**	**AF**	**AC**	**T**	**A**	**K**	**AB**	**AE**	**X**	**AL**
i.	×	x	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
ii.	×	x	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
iii.	√	√	√	×	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	√	×
iv.	√	√	√	√	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	√	×
v.	√	√	√	√	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	√	√
vi.	√	√	√	×	√	×	×	×	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	√	√
vii.	√	×	√	×	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
viii.	√	×	×	×	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
ix.	×	√	×	×	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
x.	×	×	√	×	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
xi.	√	√	x	×	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
xii.	√	×	√	×	√	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
xiii.	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
xiv.	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Total	8	6	8	2	10	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4	2

Presence of a computer (i), library (ii), mortuary register(iii), records for corpse release(iv), record for received corpses(v),death certificate copies (vi)recording book for items found with the dead (vi), autopsy form (viii), records for medical records of deceased (ix), body tags (x), box files (xi), delivery note for drugs and supplies (xii), temperature monitoring chart (xiii), telephone (xiv)

Key

√ Indicator for assessing presence and functionality of mortuary equipment of the health facility met by the health facility

× Indicator for assessing presence and functionality of mortuary equipment of the health facility not met by the health facility

Table 4. *Presence of drugs and supplies for mortuary services.*

Indicator	Health facility																							
	CA	**BA**	**BD**	**BB**	**CB**	**BC**	**S**	**R**	**L**	**M**	**AA**	**AB**	**CC**	**Z**	**Y**	**B**	**AF**	**AC**	**T**	**A**	**K**	**AB**	**AE**	**X**	**AL**
i.	√	×	√	×	×	√	√	√	√	√	√	√	√	√	√	x	√	√	√	√	√	×	×	√	×
ii.	√	×	√	×	√	√	√	√	√	√	√	√	√	√	√	x	√	√	√	√	√	√	×	√	×
iii.	√	×	√	×	√	√	√	√	√	√	√	×	×	×	×	×	×	×	√	√	×	×	√	√	×
iv.	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
v.	√	×	×	×	√	√	√	√	√	√	√	√	√	√	×	×	√	√	√	√	√	×	×	√	×
Total	4	0	3	0	4	4	4	4	4	4	4	4	4	3	2	0	3	3	4	4	3	1	1	4	0

Availability of Formalin (i), Gloves, cotton and disinfectants (ii), Gum boots, cotton, and body bags (iii), Deodorizer (iv), Stock cards (v)

√ Indicator for assessing presence of drugs and supplies required in the mortuary met by the health facility

× Indicator for assessing presence drugs and supplies required in the mortuary met by the health facility

3.6. Staffing of the Mortuary

Only one health facility, the regional and teaching hospital had a pathologist, an expatriate who was away on holiday at the time of the study. Nine (36%) of the health facilities had a doctor as the most skilled human resource attached to the mortuary while five (20%) had a clinical officer with the highest level of skills. Seven health facilities had porters as the personnel running the mortuary. Six of the health facilities had a security guard to keep watch of the mortuary. Majority (73%) of the health facilities had only one staff attached to the mortuary.

3.7. Funding of the Mortuary and Mortuary Services

Only 4 (16%) of the health facilities with a mortuary had a budget for mortuary and mortuary services. To most of the health services managers, a mortuary was not prioritized mainly because of the little finances the health facilities received from government.

3.8. The Processes for Handling Human Remains

3.8.1. Receiving and Issuing of Corpses, Examination/Providing Security

Four hospitals i.e. CB, X, CA and BD recorded the details of corpses from outside the health facilities inthe mortuary registers. Detail of records included; cause of death, details of the people that brought corpses, number plates for vehicles that brought the bodies, time of arrival, how long the body would stay in mortuary. Other health facilities had no evidence of procedures in place for receiving dead bodies from outside the health facility. Because of absence of procedures for receiving corpses, and the poor state of the mortuaries in terms of infrastructure and human resources and equipments, there was a risk of body loss and this sometimes was a source of conflicts between relatives of the deceased and management of the health facilities. Health facility X, being on the highway received many corpses from police which in most cases were unclaimed for and this

strained the health facility especially in getting logistics for burial of such bodies.

3.8.2. Preservation and Storage of the Dead Bodies

Only One health facility, CB had a refrigerator and freezers for preserving corpses. Five of the health facilities had formalin to treat corpses whereas there was a practice of requesting relatives of the deceased to buy formalin in most (79%) of the health facilities.In case relatives could not afford or for corpses brought in from without the health facility by police or relatives not interested in preservation, the corpse would be discharged without preservation. Health facilities without mortuaries dischargedcorpses without preservation and treatment.

3.8.3. Human Remains Release

(a) Retrieval of dead bodies

Majority (57.1%) of health facilities never had a system of capturing information on the release of corpses. In facilities X, CB, and BD that had a system of capturing information on release of corpses, there was a register which captured the names of people who came to pick the bodies, their address and contacts, car number plates and copy of identity cards before they could take the bodies.

(b) Retrieval of death certificate and final release of dead bodies

Issuing out of the death certificates was carried out only in 3 (12%) health facilities: i.e. hospitals BD, CB and BA. Death certificates were signed and stamped by investigating officers and then interpreted to the relatives. Post mortem to confirm death and cause of death was carried out in mortuaries of only 2 (5%) health facilities i.e. hospitals BD and CB. Unclaimed corpses were buried in cemeteries after seeking permission from police and making announcements over the radio for the corpses to be claimed. Some level IV health centers transported the corpses to nearby hospitals for burial. The health centers included AD, Y, Z, AE and AC and transported corpses to hospital BD.

3.9. Functionality of the Mortuaries

Performance of the mortuaries was assessed by determining the number of corpses that had been stored in the mortuaries. HospitalCB (the regional referral and teaching hospital) attended to the highest number of corpses. Majority (63%) of the health facilities' mortuaries had not stored a corpse during the six months preceding this study.

Table 5. *Number of corpses stored in the health facilities in the period of December 2013 to May 2014.*

Health facilitynames	December(2013)	January2014	Feb-14	Mar-14	Apr-14	May-14	Average no. of bodies
CB	11	7	13	10	6	16	11
BB	6	2	4	0	3	0	3
CA	2	3	1	2	2	1	2
BA	1	0	0	1	1	2	1
BC	2	0	0	0	0	0	0
BD	4	3	3	4	2	4	3
A	0	0	0	0	0	0	0
B	No records						-
K	0	0	4	0	0	0	0
L	7	4	0	0	0	0	2
M	0	0	0	0	0	0	0
T	0	0	0	0	0	0	0
CC	0	0	0	0	0	0	0
R	0	0	0	1	0	0	0
S	0	0	0	1	0	0	0
AA	0	0	0	0	0	0	0
AD	0	0	0	0	0	0	0
AE	1	0	0	0	0	0	0
AB	0	0	0	0	0	0	0
Z	Non functional						-
AC	2	0	0	0	0	0	0
Y	0	0	0	0	1	0	0
X	8	1	3	6	2	2	4
AF	2	0	0	0	0	0	0

3.10. The Average Length of Stay (ALOS) of Corpses in the Mortuaries

We obtained the averagelength of stayby adding the number of days all corpses spent in the mortuary (during the review period) divided by number of bodies admitted.All the health facilities stored corpses for less than a week. Corpses stayed highest in a mortuary in hospital BA, followed by health facilities AC, S, and BC. This was so long duration for health facilities since they neither had refrigeration system nor Formalin.

3.11. Through Put per Rack/Slab/Shelves

Through put per shelves/racks was calculated for different health facility mortuaries with intention of establishing how many times a rack or a shelf was occupied by corpses duringthe six months preceding this study. This was an average measure of extent to which each rack/shelf was used. We obtained this statistic by dividing the number of corpses admitted during the six months by the total number of

racks/slab/shelves available in the mortuary. Generally, the mortuary racks/shelves were not utilized. Health facility L with a through put of 11 had its mortuary racks being utilized most.The throughput per shelf/slab though did not tell how well or appropriately the slabs/shelves were utilised since it did not put into perspective duration of stay of the corpse.

3.12. The Occupancy Rate of the Mortuary

The occupancy rate of the mortuaries remained very low with the highest being 6.3% in hospital D where as in some health facilities the mortuary was not used at all (table 6).

Table 6. *Through put per mortuary shelve and average length of stay for bodies in mortuaries.*

Health facility (A)	No. of Body shelves/racks/slab (B)	Bodies Admitted (C)	Corpse Days (D)	ALOS(D)/(C) (E)	Mortuary shelf/rack occupancy rate (D)/182.5*(B) (F)	Through put/shelves (D)/(B) (G)
Mbarara	20	74	74	1	2.0%	3.7
Kitagata	4	23	46	2	6.3%	5.8
Kisoro	6	4	20	5	1.8%	0.7
Itojo	4	15	15	1	2.1%	3.8
Kambuga	6	2	8	4	0.3%	0.3
Kabale	6	11	22	2	2.0%	1.8
Chahafi	2	0	0	0	0.0%	0
Ruhoko	4	22	22	1	3.0%	5.5
Rubirizi	3	0	0	0	0.0%	0
Kanungu	2	1	4	4	1.1%	0.5
Bwizibwera	2	2	4	2	1.1%	1
Kabwohe	3	2	8	4	1.5%	0.7
Shuuku	3	0	0	0	0.0%	0
Kihihi	3	1	2	2	0.4%	0.3
Kitwe	1	11	11	1	6.0%	11
Nsiika	1	0	0	0	0.0%	0

4. Discussion

Grounded in the data obtained from this study, it is evident that a significant number of health facilities in western Uganda have no mortuaries. Even those that do have, the mortuaries are far from the standards of an adequate mortuary. This was manifested by lack of the necessary infrastructure, human resources, poor information management systems and poor processes in managing human remains. These findings conform to the assertion that the mortuary services are a much neglected part of the healthcare delivery system [1]. Since death is a saddening and grieving experience to the relatives of the deceased, this may be worsened further when relatives have to face the reality of seeing their loved ones go through such poor conditions of the mortuaries. This may have led to the relatives (of the deceased) shunning the use of mortuary services to avoid going through secondary stress associated with the poor state of the mortuaries.

The study also revealed among others that the whole region had only one pathologist, more so, an expatriate. This challenge may not be unique to this region but a problem identified in many of the developing countries [2]. In addition, the mangers of these hospitals may have little to do about this as they do follow central government policies as far as human resource recruitments are concerned. Where such important human resources are not recommended by the government, the hospital manager may not be in position to recruit them. Therefore, citizens of this region are denied access to services by this cadre such as review of medical histories, external examination and internal autopsies, all aimed at determining the cause of death. This is made worse if such services were required for legal purpose before burial.

On a positive note, the (only) teaching hospital which also has research activities had its mortuary and mortuary services regarded highly. However, it remains to be noted that the utilization of mortuary services even in this well facilitated mortuary remained low as shown by the occupancy rates and through put. These findings on use of mortuary racks/shelves are suggestive of high-level of inefficiency that managers must pay attention to. Stakeholders should consider improving quality of mortuary services so as to attract uptake of mortuary services and improve efficiency of this resource the government has invested in.Several factors could be responsible for this low utilization of mortuary racks/shelves. Among the factors is the bereavement culture in the region where vigil has to be made at the home of the deceased so that members of the family give last respect and bid farewell to their departed colleague hence relatives carry the body away for this important cultural event. The low occupancy rates of the mortuaries in the level IV health facilities could be as result of the need to transport the corpses to the hospitals in case there is need to treat and preserve the corpses as these facilities lack the expertise to carry out these services. The low utilization of mortuaries could also be explained by the fact that relatives had to meet the cost of treating the corpses in virtually all the health facilities. Accordingly, they opted out of this and preferred to take the corpse for burial to avoid decomposition/spoilage in most of the health facilities.

Perhaps because of the low utilization of the mortuaries and mortuary services, the health services managers have found a reason to continuously underfund the service in the hospitals and health centres.

Continuous neglect of the mortuaries by the health facility managers and not using mortuary servicesmay lead to various repercussions: especially spread of infectious diseases to mortuary staff and relatives of the dead in case the corpse had one.This may be more dangerous, especially if the diseases are contagious like Ebola and Marburg hemorrhagic fevers which affected the region in the recent past.

Almost all the health facilities received dead bodies from outside the health facilities; this was a good practice as one of the functions of the mortuary among many is to receive bodies, store them and provide them with security. However, this further showed that mortuaries were taken as storage and dumping centres for corpses which are regarded as waste causing nuisance but not for seeking for mortuary services.

5. Conclusion

This study has revealed that mortuaries are nonexistent in some health facilities and where they exist, the state of mortuary services in health facilities in western Uganda is poor. The services offered in an adequate mortuary are non-existent in most of the health facilities and only existing in the regional referral and teaching hospital. As a result, the mortuary and mortuary services are under utilized in the health facilities in the region and are mostly used as dumping and storage centres for corpses that are picked from the streets by policeand corpses that are unclaimed for by relatives.

Ministry of health and local governments in the area should consider functionalizing the mortuaries and sensitize the masses on the services offered (in the mortuaries) so as to reverse the inefficiencies outlined in this study.

6. Possible Limitation

In order to compute mortuary statistics, we employed actual number of racks/shelves other than the rack/shelve capacity of the mortuaries. This was because we did not have the standard rack/shelf capacity of the mortuaries yet the health facility managers were equally unaware about the official capacity of their mortuaries.

References

[1] Sirohiwa. l B. L., Paliwal, P. K., Sharma, L., Chawla, H. Design and Layout of Mortuary Complex for a Medical College and Periphera Hospitals. *J Forensic Res*, (2011) Vol. 2:6 102e. doi:10.4172/2157-7145.1000102e.

[2] Hallgrímur, B., Whitelaw, J., and Indrojit, R. Pathology Services in Developing Countries: A Challenge. *Archives of Pathology & Laboratory Medicine*, (2007) Vol.131(11), pp.1636-1639.

[3] Stevens, S, Duncton C, Peters, N and Simmons D,. *Mortuary Service Provision in West Sussex. Report by Mortuary Services Task Force*. 2010, West Sussex: West Sussex CountyCouncil

[4] Australasian Health Facility Guidelines, *Health Facility Briefing and Planning*, (2013) hospital mortuary/autopsy unit>available on http://www.healthfacilityguidelines.com.au/AusHFG_Documents/Guidelines/%5BB-0490%5D%20Hospital%20Mortuary%20Autopsy%20Unit.pdfaccessed on 2/3/2014.

[5] Commonwealth of Australia, HLTMT303D Maintain a mortuary service, *community Services and Health Industry Skills Council*; (2012). Department of education, employment and workplace relations Australian Government.> available on https://training.gov.au/TrainingComponentFiles/HLT07/HLTMT303D_R1.pdf.

[6] National Health Services (NHS) Scotland, *Scottish Health Planning Note 20Facilities for Mortuary and Postmortem Room Services Design and briefing guidance, (*2002), available on http://www.hfs.scot.nhs.uk/publications/shpn-20-v1.pdf. 26/02/2014.

[7] Infrastructure Unit Support Systems (IUSS), IUSS HEALTH FACILITY GUIDES *Hospital Mortuary Services.* 2014, Republic of South Africa. available on http://www.iussonline.co.za/iuss/wp-content/uploads/2013/03/2014_03_19-IUSS-Hospital-Mortuary-Services-proposal.pdf [accessed on 11/10/2014].

[8] James, H. Thai Tsunami Victim Identification -Overview To Date. *The Journal of Forensic Odonto-Stomatology*, (2005), Vol.23 (1).

[9] WHO. *Disposal of dead bodies in emergency condition, Water, Sanitation, Hygiene and Health Unit*: (2011) Avenue Appia Geneva 27 Switzerland, available on http://www.who.int/water-sanitation-health.

[10] Hughes, M.. The Hillingdon Hospital NHS Trust: *Policy & Guidance for the provision of Care & Respect in Death* (2009) available on http://www.thh.nhs.uk/documents/_Publications/EqualityDiversity/Care_Respect_Death.pdf [accessed on 25/04/2014].

[11] UK Home Office. *Guidance on Dealing With Fatalities in Emergencies,* 2004: Available on >https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/61191/fatalities.pdf [accessed on 25/04/2014].

[12] Ogunnowo, B. E., Anunobi, C., Onajole, A and Odeyemi, K. Research; Exposure to blood among mortuary workers in teaching hospitals in south-west Nigeria. *The Pan African Medical Journal.* (2012). Vol. 11: 61.

[13] PAHO and WHO,*Management of Dead Bodies in Disaster Situations:* Disaster Manual and Guidelines Series (2004) Numbering 5, Washington, D.C> available on www.who.int/hac/techguidance/management_of_dead_bodies.pdf[accessed on 12/11/2013]

[14] Bajracharya, S., and Magar, A. Embalming: An art of preserving human body, *Kathmandu University Medical Journal* (2006). Vol. 4 (16), 554-557.

[15] WHO. *Fatal injury surveillance in mortuaries and hospitals*: *a manual for practitioners*. (2012) available on >http://www.who.int/iris/bitstream/10665/75351/1/9789241504072_eng.pdf?ua=1. [accessed on 17/03/2014.

[16] Ramos, A, and Finch, L. n.d. Utah department of health state office of vital records andstatistics.http://www.health.utah.gov/vitalrecords/fileadeath/webDispInfo_08042010.pdf[accessed on 10/03/2014].

[17] South Australia, *When a person dies*, *the hospital autopsy process*: information for family and friends Department of human service. (2002) Publication No: DHS_0021.

[18] Hirsch, C. S. *Information for Family and Friends*: (2008) department of health & mental hygiene office of chief m 520 first M.D., Chxaminer.

[19] Pollard, D., 2004. *Southport & Ormskirk hospital NHS trust policy for the release of bodies from the mortuary (documentation)* available on http://www.southportandormskirk.nhs.uk/FOI-old/pdfs/Sheilah%20Finnegan/Clin%20Corp%2024%20Policy%20for%20the%20Release%20of%20Bodies%20from%20the%20Mortuary.pdf [accessed on 10/03/2014].

[20] Cox, J, A, Lukande, L. R, Kateregga, A. Kizza, H. M., Manabe, C. Y., and Colebunders, R. Autopsy acceptance rate and reasons for decline in Mulago Hospital, Kampala, Uganda: *Tropical Medicine and International Health*, (2011).Vol. 16, (8), pp 1015–1018

[21] HURINET-U, *The state of Regional Hospitals in Uganda*; The report by Economic, Social and Cultural Rights projects with the generous support of Democracy Governance Facility (DFG) Uganda and DIAKONI (2012) available on http://www.hurinet.or.ug/health%20report.pdf.

[22] WHO, *Emergency and Humanitarian Action* Uganda (2009) available on http://www.ifrc.org/PageFiles/41164/UGANDA-report.pdf[accessed on 14/4/2014].

[23] DREF, *Uganda Bomb Blast*: (2012) International Federation of Red Cross and Red crescent Societies> available on http://www.ifrc.org/docs/appeals/10/MDRUG017.pdf [accessed 6/03/2013.

[24] MoH. Annual Health Sector Performance Report: Financial Year 2003/2004, republic of Uganda 2004.available on http://www.health.go.ug/docs/ahspr.pdf [accessed on 11/04/2014.