

# Pathological Truth: The Use of Forensic Science in Kenya's Criminal Justice System

Peter Ndichu Muriuki

**Abstract**—Assassination of politicians, school mass murders, purported suicides, aircraft crash, mass shootings by police, sinking of sea ferries, mysterious car accidents, mass fire deaths and horrific-terror attacks are some of the cases that bring forth *scientific and legal conflicts*. Questions about truth, justice and human rights are raised by both victims and perpetrators/offenders as they seek to understand why *and how it happened to them*. This kind of questioning manifests itself in medical-criminological-legal-psychological and scientific realms. An agreement towards *truth-investigations* for possible legal-political-psychological transitory issues such as prosecution, victim-offender mediation, healing, reconciliation, amnesty, reparation, restitution, and policy formulations is seen as one way of transforming these conflicts. Forensic scientists and pathologists in particular have formed professional groups where the complexities between legal truth and scientific truth are dramatized and elucidated within the anatomy of courtrooms. This paper focuses on how pathological truth and legal truth interact with each other in Kenya's criminal justice system.

**Keywords**—Forensic pathology, forensic science, pathological truth, truth investigations.

## I. INTRODUCTION: FORENSIC SCIENCE AND JUSTICE SYSTEMS

WITHIN criminal justice systems, forensic scientists embrace scientific methods and its underlying philosophy to help the law (courts) and police departments in coming up with just resolutions and settlement of crime conflicts. However, many truth investigations do not necessarily have to end up in court since the victims and victim families have a choice depending on whether there was perceived or actual foul play. Criminal justice systems are pegged on either Inquisitorial or Adversarial legal mechanisms. An inquisitorial legal system is one in which the judge does not sit as an autonomous arbiter but involves himself/herself as an investigator in search of the truth. While such truth investigation give primacy to *inquisitorial truth*, adversarial litigation on the other hand has its primacy on *adversarial truth* whose main focus is on two sides engaging in arguments and counter arguments. According to Petherick, Turvey and Ferguson [1] an adversarial system of justice is one in which “each side to a dispute puts arguments to an impartial and disinterested arbiter.” They further say that it is a system that “holds as its fundamental underpinning the philosophy that the best way to determine a dispute is for an independent adjudicator to hear and consider strong

*arguments on each side of the issue..... and for this reason, the adversarial system is often referred to as a contest or game between two (or more) sides with the judge(s) acting as umpire”*. However, it is to be noted that while forensic science and its practitioners have found a niche within adversarial criminal justice system, critique has it that the best place nevertheless is not in these courts, since legal ethos and scientific ethos will more or less come into conflict with each other. Many critical studies have showed the great importance of a “*true*” forensic science that detaches itself from *prosecutorial truth* corridors and chambers to places where *scientific truth* reigns.

Instead of talking of legal courts, forensic scientists are encouraged to talk of *scientific courts* during the process of inquiries. At the same time, while there are many arguments for and against reconstructing the past, Linda Gröning and Jørn Jacobsen [2] warns about uncertainty when it comes to direct and indirect evidence and says that “the past is the past, irretrievably gone – as long as time travel in any backward direction according to theories of relativity remains an impossibility, given that there are probably some practical limitations as well... there is human tendency to collect evidence with an eye to expected or even desired outcomes...police officers tend to look for corroborating evidence, possibly overlooking other evidence contradicting the charge in question.”

Of paramount importance is the question whether the victim's needs and rights (whether dead or alive) have been addressed since not all cases require that someone must be punished or sent behind bars. Sometimes all that the victims and their family want is just but the *naked truth* and this marks the beginning of their healing and reconciliation journey. Within a legal perspective, legitimized truth is intended to offer justice and healing to both perpetrators and victims of violence. Such a strategy engages forensic science as a mediating agency that addresses specific issues highlighted before, during and after the conflict (crime). It is a strategy of using the past in the present while projecting on the future. In this regard, science, truth, justice and human rights become entangled with each other. It is within these limits that arguments are put in this study with the aim of elucidating the complexity and interplay between legal truth, criminological truth, forensic truth and political truths. Of particular interest to this paper is the importance of forensic pathology and its application in search for truth, justice and human rights.

Peter Ndichu Muriuki is a Lecturer and Chair of the Dept. of Criminology and Social Work, Masinde Muliro University of Science and Technology, Kakamega, Kenya. P. O. Box 190 – 50100 Kakamega, Kenya. Tel: +254 722 749 350 (e-mail: muriuki7437@yahoo.com).

## II. FORENSIC SCIENCE AND ETHOS

Forensic Science is sometimes simply referred to as 'forensics' and it involves the application of scientific principles and ethos in the process of establishing facts related to a criminal or civil court case. It is the application of broad areas of science and technologies ranging from biology, chemistry, physics, anthropology, geology, psychiatry, taphonomy, entomology, psychology etc. to investigate and establish facts of interest in legal matters. Unlike theoretical scientists, Stuart and Nordby [3] agree that forensic scientists "have an obligation to familiarize with both lawyers and the law." The Oxford English dictionary [4] describes the sense of the word forensics as coming from the Latin *forensis* meaning "of or before the forum". This means that the case must be presented in public forums where the accused and the accuser tell the side of their story. Forensic science experts and practitioners are invited in two phases. The first phase is when they are invited by the police during investigations. At this point, the role of the forensic scientist is to help the police in amassing credible evidence that forms the basis for prosecution. The second phase is when they are invited to aid the court during the trial and sentencing periods. However, it is to be noted that while lawyers and prosecutors remain attached to moral and legal obligations in an adversarial court system, forensic scientists remain focused on reaching the truth. Forensic truth is based on scientific methods and not legal argumentations. This focus by forensic scientists in itself presents a base for legal and scientific conflicts that are always illuminated in the corridors of justice. Lawyers are guided by legal ethics while forensic scientists are guided by scientific ethics that are dictated by data. This paper looks at the work of forensic pathologists and their role in ascertaining through data, the cause and manner of deaths that arise unexpectedly or outside the precincts of medical institutions.

## III. WHAT IS FORENSIC PATHOLOGY?

Forensic Pathology is the branch of forensic science entitled to the identification of the cause of death and reconstruction of the circumstances by which death occurred. Pathologists above all are employed to investigate unexpected or sudden deaths as a result of body trauma. They are physicians who are highly trained and specialize in pathology i.e. diagnosis of diseases. Stuart and Nordby [5] agrees with this and says that pathology "comes from the Greek *pathos* meaning 'suffering' or disease and *logos* meaning- word or writing." Pathologists therefore studies diseases, causes of diseases, and diagnosis of these diseases. This implies that they are specialized in coming up with *pathological truth*. This pathological truth borders on two areas; human anatomy (Anatomic pathology) that carries out autopsies and secondly, clinical pathology that deals with the management of laboratories where fluids and blood are tested. For one to be a forensic pathologist, s/he should have done both human anatomy and clinical pathology. A pathologist should also be able to relate to the works and ethics of detectives, lawyers, politicians, judicial processes in a criminal trial as well as handling public relations and

etiquette. This is because of the operational nature that involves an axis of medicine, law, crime and politics. The first phase of data collection that supports this study was collected between May-November 2012 with the second phase coming in May-November 2013. The study was carried out at the Provincial General Hospital in Kakamega, Kenya and below is a brief highlight of the study site.

## IV. HOSPITAL PROFILE

Kakamega Provincial General Hospital is situated in Kakamega town, Western province of Kenya. With the arrival of the new boundaries and constitutional reform, the hospital falls under the newly created Kakamega County. The hospital is found on the plot title deed No. KAK/MUN/BLOCKIV/168 registered under Kakamega District. According to the hospital sources, the facility serves a population of 79,070 with an area of 377.4km<sup>2</sup>. The area is predominantly agricultural with most farmers practicing small-scale peasant farming. The hospital has a bed capacity of 450 authorized beds and 397 physical beds of which 60 are lots. The following is the infrastructure of the departments and the services they offer in the hospital;

### A. Administration Block

This facility offers office space to Medical Superintendent, Health Administrative officers, District medical service officer, Nursing officer, Personnel Registry, Accounts, Library, Records officer, Provincial clinical officer, E-Learning and telephone exchange.

### B. Out – Patient Department (OPD)

- Pharmacy block
- X-ray block
- OPD clinic block
- Mother-child health and Family planning block
- Laboratory block
- Dental block
- Physiotherapy
- Orthopedics block
- Maintenance block
- Casualty block
- Mortuary block
- Eye clinic

### C. In-Patient Wing

The inpatient wing has the following facilities

- Ward I – Male medical
- Ward II – Male orthopedic
- Ward III – Female medical
- Ward IV – Isolation ward
- Ward VA – Pediatrics ward
- Ward VB – Pediatrics surgical
- Ward VI – Male surgical
- Ward VII – Female surgical
- Ward VIII – Gynecologist
- Ward IX – Mental ward
- Ward X – Ophthalmologist ward
- Eye theatre

*D. Maternity Block*

- Ante Natal ward.
- Post Natal ward
- Labor ward
- Maternity theatre

*E. Main Theatre*

For voluntary surgical contraceptive (VSC)

*F. Morgue*

The morgue is one of the storage facilities found at the hospital. The morgue which was built during the colonial era was set up to serve both the hospital and the community at large. It is utilized for preservation of the bodies and autopsy investigations. It has a capacity of 100 bodies. The components of the morgue include;

- Office

The office acts as the central telecommunication area that assists in linkage and work collaboration with other hospital departments. It also addresses the needs of the public and families that visit the morgue. However, the increasing number of visitors has led to congestion and proposals have been put forward that will take into account the provision of separate rooms for viewing the bodies and issuing of burial permits.

- Postmortem Room

This room is clean, spacious, properly ventilated and well lit. It has plenty of running water, slab table and a flush toilet to be used during autopsy. However, post mortem table is made of concrete. This is contrary to the requirement since modern slabs should be easily adjustable to the height of the pathologist.

- Embalming Facilities / Section

Embalming is not required by law but it is widely practiced. The procedure consists of artificial infusion of embalming fluid and trocar perforations of the viscera (body cavities) to aspirate any liquids and bring down bloating. This is a procedure that is widely popular since most bodies are not disposed within 72 hours after death, hence the importance of a mortuary establishing this service. Embalming is mainly carried out in order to preserve, enhance sanitation and boost presentation for burial purposes.

- Cold Rooms

These are rooms which are well refrigerated to allow preservation of the bodies at low temperatures with a capacity of 24 bodies which are placed on trolleys.

Some major sections at the morgue are:

- Bodies from hospital wards
- Bodies from court injunctions
- Bodies from hospital unidentified
- Bodies from police identified
- Bodies from outside with police cases
- Exhumed bodies.

- Stores and changing room

These are rooms set aside for storage of all equipment used at the morgue. The changing room also has equipment needed when gearing up for work such as embalming or autopsy. There is also storage space for some of the exhumed caskets (from exhumed bodies).

#### V. PATHOLOGY DEPARTMENT AND THE FORENSIC PATHOLOGIST

The Kakamega Provincial General Hospital is generally organized by functions. Pathology department is organized as a department answerable to the medical superintendent. The pathology department is stationed in both emergency and outpatient services and sometimes the patients/clients have to go to the sub department for these services. The Pathology Laboratory is organized into 4 sub areas, which have different functions as follows:

- Clinical Chemistry

The staff in clinical chemistry analyzes samples of blood or urine for substances that give evidence of disease (e.g. renal disease or liver disease) or for abnormal levels of substances (e.g. glucose in diabetes, thyroid hormones in thyroid disease). These measurements are needed for diagnosis or monitoring of disease, or in the early detection of disease. Typically 900 patient samples are analyzed each weekday.

- Hematology – including Blood Transfusion

Hematology investigations help in the diagnosis of blood disorders e.g. anemia, blood clotting problems and leukemia. On a typical day, over 600 samples are analyzed.

- Cellular Pathology – (Histopathology and Cytopathology)

Histopathology plays an important role in the diagnosis and treatment of many diseases. Tissue samples are removed, and are studied down a microscope to establish any abnormality. On the other hand, cytology is best known for the work in screening cervical cells.

- Microbiology –(Bacteriology, Virology and Immunology)

Microbiology involves the study of infectious diseases. The department is involved in the diagnosis of a wide range of infections such as meningitis, HIV, tuberculosis, influenza and food poisoning. On a typical day, over 500 samples are analyzed.

#### *A. Forensic Pathologist*

Forensic pathology Department in Kakamega is a division of the National Public Health Laboratory Services of the Ministry of Health in Kenya. There is only one forensic pathologist and one full time employed doctor in this department. The full time doctor however has very minimum understanding of forensic pathology work. The Forensic Pathologist handles the entire forensic pathology workload that includes all criminal or suspicious cases. He is backed up by the Government Forensic Laboratory in the capital, Nairobi where samples are taken to the Government Chemist handling

the toxicological cases. The latter is under the auspices of the Office of the President thus a base for conflict with the executive arm of the government. Tight secrecy and protocols of the government chemist deprives the pathologist the timely toxicological results he expects to summarize immediately and after conducting the autopsy. Since the pathologist also serves the bordering Districts, most of the cases other than homicides are handled by the “pathologists” (general practitioners) at the government hospitals who do not have any prior training in forensic medicine or pathology. Most of these cases are deaths which occur after hospital admission but fall into reportable category. However most doctors shy away from this work and those who are allocated these duties are regarded as undisciplined doctors “lacking” in clinical skills.

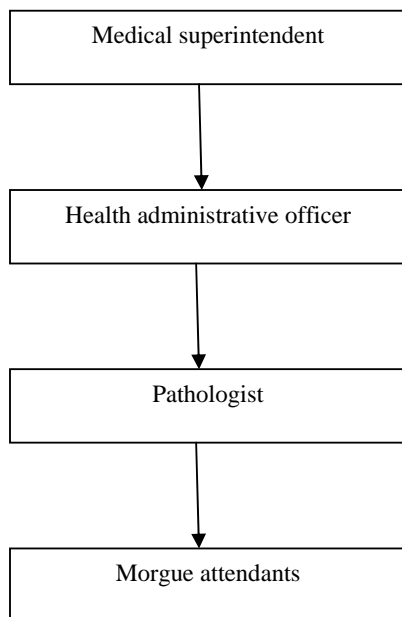


Fig. 1 Organizational structure touching on pathology department

#### B. Principal Activities of the Forensic Pathology Department

The principal activity of the forensic pathology department is in service provision that entails post mortem examinations. According to the department, the pathologist perform up to 2,400 post mortem on wide range of sudden and unexpected deaths every year. The nature of these deaths includes those from natural diseases, trauma, alcohol, drug abuse, to death related to medical (mis)care and those occurring in suspicious circumstances including overt homicides.

There is a 24 hour- on call service to assist with suspicious deaths, which may include attendance of the scenes. The pathologist expects to deal with 60-70 homicides each year. He is also frequently required to give evidence as an expert witness in subsequent criminal trials, mostly in the High Court. Other areas which involve frequent appearance in court for the pathologist is in cases of Fatal Accidents Injuries (FAIs), deaths that arise in police and prison custody, deaths that occur at work places or where there are medical care

concerns. The vast majority of post mortem examinations are carried out in the morgue.

#### VI. CLIENTELES SERVED BY FORENSIC PATHOLOGY SERVICES

Generally, the forensic pathology department serves various parties with interest in the cause of death of the deceased person, these parties include;

##### A. The Police Clientele

The Kenya Police normally forwards a structured form to the pathologist, normally called a *Police Post Mortem Form (PPMF)* requesting the pathologist to investigate through carrying out an autopsy the cause of death of the deceased person in question. The interests of the police department in forensic pathologists' services surround on the needs for investigations and evidence analysis where cause of death is suspicious or where they need to develop investigative leads. The police department's mandate to hold an inquest on causes of suspicious deaths is contained in section 385-388 of the criminal procedure code Chapter 75. The criminal procedure code CAP 75 section 385-388 provides for inquiries into sudden deaths. Section 385 of this chapter empowers a magistrate to hold inquests. The forensic pathologist also helps the police in the initial investigation by collecting evidence at the crime scene that can lead to positive identification of the decedent.

Sections 386-387 of the criminal procedures code [6] provide that the following deaths must be investigated; “suspected suicide, suspected homicide, unascertained deaths, Death in the custody of police officers, Death in the custody of prison officers.”

The criminal procedures code[7] Section 387 also specifies “that the officer in charge of a police station or any other officer in his or her behalf, on receiving information of a death falling into any of the above mentioned categories shall immediately inform the nearest magistrate empowered to hold an inquest and then proceed to where the body of the person is to make an investigation and draw a report on the apparent cause of death, which should then be forwarded to the nearest magistrate empowered to hold inquest.”

The National Police Service Act [8] further indicates that “a magistrate or a police officer, and any other person appointed to give certificates under subsection (2) of section 142 of the Criminal Procedure Code, may take, or cause to be taken in his presence, for the purposes of record and identification, the measurements, photographs, footprints and casts thereof, palm-prints, finger-prints and other forensic evidence of any person in lawful custody or who is subject to police supervision.”

The police post mortem form has the following sections

##### Part 1

This section contains the request by the police to the pathologist for post mortem in order to ascertain the cause of death.

## Part 2

This section contain the detailed report of the pathologist's findings after the autopsy, it contains various sections as follows;

### 1st Section

Reference number..... Address.....  
 Police station..... Date.....  
 Reference body of.....  
 Place of post mortem.....  
 Date and time of post mortem.....

### 2<sup>nd</sup> Section General Observations of the Body

This section contains most of what can be observed from the person before the post mortem is done, this includes; state of the clothing worn by the person, example; if soaked in blood, torn, wet, or if there is presence of dust and so on. It also includes identifying the sex, race, apparent age, nutrition, physique and height of the deceased person.

### 3<sup>rd</sup> Section

This section contains the post mortem changes and the assessment of post mortem interval (time of death). The pathologist has to explain whether the body was well preserved, was decomposing or any other condition pertaining to post mortem changes.

### 4<sup>th</sup> Section

In this section, the pathologist gives the details of the external appearance of the body from a medical perspective. This involves giving details of the presence or absence of conditions such as, petechiae (these are small pinpoint bleedings often seen in the conjunctivae, facial skin, skin behind the ears, on the surface of the brain, and under the scalp. They may also be seen in patients with various bleeding disorders in which case the peritoneum and parietal pleurae/diaphragm are usually involved), cyanosis( this are bluish or purplish discoloration of the tissue due to decreased oxygen in blood. Cutaneous cyanosis may be seen in the lips, conjunctivae, palms, soles of feet and nail beds. Cyanosis may be seen in all forms of death where oxygen is diminished at the time of death including natural causes of death involving cardio respiratory failure) etc and positions nature and dimensions of external injuries.

### 5<sup>th</sup> Section

In this section, the forensic pathologist is expected to note the internal appearance of the body organs and note the likely changes which may be unusual. This includes noting the status of the following;

- Respiratory system
- Cardio vascular system
- Digestive system
- Genital- urinary system
- Head
- Nervous system
- Spinal column
- Spinal code

### 6<sup>th</sup> section

This section contains the forensic pathologist opinion on the possible cause of death e.g. in an autopsy he may indicate the cause of death as, multiple head injury secondary to RTA (Road Traffic Accident), multiple trauma and so on. In this section the death certificate number is also reflected.

### 7<sup>th</sup> section

In this section, the forensic pathologist has to indicate the specimen taken for further examination. The taking of the specimen is normally done with the family's consent. The pathologist may take samples ranging from body tissues, tumors, blood, urine, pieces of the brain, spleen, kidney, lungs, nails, hair, and heart etc.

#### *B. The Court Clientele*

The forensic pathology department also serves the courts as part of their clients. The forensic pathologist may be required by the magistrate to investigate to the cause of death as outlined in section 386 of the criminal procedure code which provides that a magistrate so empowered, may hold an inquiry to the cause of death, either instead of or in the addition to the investigation held by the police or prison officer. It further gives a magistrate the authority to order for the disinterment and examination of a body that had been interred in order to determine the cause of death.

A forensic pathologist may also be required by the court to attend court hearing in order to provide their expert testimonies in relation to the investigation they had done while performing the autopsy. In this case, the forensic pathologist is expected to state the condition of the body, both external and internal and give his expert opinion to the possible cause of death.

#### *C. Family Members of the Deceased Clientele*

A forensic pathologist is so useful to the family members of the deceased as s/he helps them to know what killed their beloved one. In situations where the deceased was found dead without the knowledge of the family members, determination of post mortem interval by the forensic pathologist is useful in helping them mourn and start their healing from the tragedy. Some family members of the deceased just need to know the truth behind the death and are not interested in justice of the courts. The forensic pathologist is useful in identifying a victim through the collection specimens for DNA analysis, looking at the possible tattoo, examination of any possible signs of deformities in the victim's body, birth marks, congenial malformation, scars etc. The pathologist may also use the skin in cases where the body has begun to decompose and may take fingerprints in an effort to identify the victim. The forensic pathologist may help also in identifying the victim by attempting to estimate the possible age bracket which is done by use of body wrinkles and the state of the teeth.

However, the possibility of a forensic pathologist to offer a positive match and individualization of the victim decreases as post mortem interval increases. When post mortem interval increases, the process of autolysis and putrefaction begin to

break down or destroy organic tissue. According to Steven Byers [9] "autolysis is the degeneration of body tissues by digestive fluids normally residing in the intestinal tract...because their action is no longer controlled by the living organism, these juices digest the body just as though it was food." Putrefaction on the other hand occurs when the microorganisms such as bacteria residing inside the body begin to proliferate and break down biological components. A side effect of microorganism activity is bloating of the body caused by accumulation of ammonia, nitrogen, carbon dioxide and methane gases which are released during this process. The earlier the body is discovered, the better in terms of pathological truth to be derived.

#### D. Lawyer Clientele

Forensic pathologists recognize the significance of both sides to a criminal or civil case. In giving advice to prosecution or defense, the forensic pathologists serve the interests of justice. Forensic pathologists especially acting as consultants for either side are restrained by scientific ethos during their dialogue, disclosure and discussions and not the legal issues. The interaction of lawyers with the forensic pathologist helps them to strengthen their case especially when working on defense cases.

#### E. Plaintiff Clientele

In legal proceedings a plaintiff may use the pathologist's forensic evidence in order to bring legal claims dependent on establishing the relevant cause of death e.g. in a case where the cause of death is as a result of road traffic accident, the plaintiff may bring legal claims such as compensation for the damage caused if the driver was found to be reckless and negligent.

### VII. AUTOPSY PROCEDURES AND SELECTED CASES OF ANALYSIS

Autopsies carried out by the pathology department in Kakamega Provincial General Hospital mainly fall into two; forensic autopsies and clinical autopsies. Forensic (medico-legal) autopsies are those which involve investigation of deaths where interests of the criminal justice system in involved. These autopsies are performed as a *legal requirement* to investigate the cause of death. The main purpose as per the criminal justice system is to determine whether a person is legally responsible for the causation of the death i.e. to show *corpus delicti* (that the death was not an accident and that a crime actually happened).

Clinical (hospital) autopsies are those that have no legal issues involved and normally it is done as request from family members or health professional who may be interested in knowing what actually killed a person. This is normally the case when a person dies while undergoing treatment or when a person succumbs to a long and known medical situation. In clinical autopsies, the doctor does not fill in a postmortem report but instead writes a general report on the findings which is submitted to the hospital administrators and the other copy is left to the family members.

However, apart from the two types, there are additional types of autopsies which are not carried out at the department such as Anatomical autopsies which are mainly performed by students taking a degree in medicine and physiology. This is because the hospital is not affiliated to any University with such studies. Virtual imaging autopsies also are not performed owing to lack of imaging technology such as MRI (magnetic resonance imaging) and computed tomography (CT).

#### A. Autopsy Procedures

##### Preliminary Procedures

The following preliminary procedures are carried out:

- Check relevant police form and obtain more history if indicated. While using available clinical and laboratory information, the pathologist must plan a strategy for the particular autopsy. In most cases, this means following a standard autopsy protocol.
- Verify the identity of the deceased (postmortem or mortuary number and/or name to be counter-checked with the mortuary admission number).
- Examine body before removal of clothing:
  - To retrieve foreign objects and trace evidence before it is lost
  - To determine the condition of the clothing and to use the clothing as a means of identifying the deceased.
  - To correlate tears and defects on the clothing with injuries found on the body.
- Make sure the clothing, body and hands of the deceased are protected from contamination especially when dealing with gunshot residue test
- Remove the clothing carefully (e.g. cut along the seam of trousers) so that an examination can be done later or keep clothing as an exhibit for a subsequent court case (maintain chain of custody of evidence).

#### B. Standard Autopsy Procedure

When carrying out an autopsy, there are various procedures that should be followed, these are as follows;

- The pathologist notes the date, time, and place of autopsy
- During autopsy sessions, various parties may be present, it is vital that their names are noted down in the postmortem form. Such parties may include third party observers and family members.
- The general observation of the body is noted i.e. the state of the body. In this section the pathologist describes all physical characteristics of the body such as the state of nutrition, muscular development (physique), mass, length, probable age, and gender.
- The next step involves noting of postmortem changes and state of decomposition e.g. presence or absence of *rigor mortis* and the state of *lividity* (livor mortis). When the heart stops beating, gravity pulls blood to the lowest point in the body. The *blood pooling* in low areas stain the surrounding tissue giving these areas an appearance of a bruise. This staining of tissue is the one referred to as livor mortis, or lividity.

A victim lying flat on his/her back exhibits lividity on his/her back, buttocks, and the back of his legs. The staining of tissue normally begins within the first two hours after death. The process reaches its full peak in 8-12 hours. If the victim is moved in the first six hours after death, the purplish discoloration can shift, causing another, new, lowest portion of the body to exhibit lividity. Between 6-8 hours after death, lividity becomes totally fixed and body movement after eight hours will not change the patterns of discoloration. Investigators can therefore get to know whether the body was moved at this point of autopsy procedure.

While focusing on rigor mortis, Girard [10] notes that "rigor mortis is the stiffening of muscles that occurs 4 to 6 hours after death." This muscle stiffening is caused by the loss of adenosine triphosphate (ATP) from the muscle tissue. Without ATP, muscles no longer function normally, begin to contract and stiffen. Rigor mortis begins in the smaller muscles of the face and neck in about two hours after death. The process then moves downward from the head to the feet. The body becomes completely stiff in approximately eight to twelve hours. Bodies remain rigid for approximately eighteen hours, at which time the process begins to reverse itself in the exact same order – small muscles first, followed by the larger ones, moving from head to toe. According to Girard [11], "rigor mortis disappear 24 to 36 hours after death in the same order as it appeared, leaving the body limp."

- The next step in autopsy procedure involves the pathologist noting any special identification such hair color, tattoos, eye color, scars, teeth (the number, general condition, presence of any type of dentures and/or dental work such as crowns, bridges and fillings), and for signs of abnormalities and deformities.
- The next step assessing any presence of medical intervention or any signs of diagnostic and/or therapeutic procedures. The pathologist looks for any signs of disease and injuries documenting findings with the aid of a sketch or photograph
- The body is then x-rayed to locate bullets or other radio-opaque objects, as well as to identify the victim and to document fractures and medical implants
- After all the above procedures, the body should now be dissected. Certain special dissection procedures may have to be undertaken if required e.g. the neck dissection in case of strangulation should be done after cranial and thoracic organ removal in order to create a bloodless field.
- Upon the examination of the internal appearance of the body, the pathologist is expected to describe all the organs that he or she has examined. These include; the neck, cervical spine, thorax, genitalia, abdomen and extremities. This should be done in a logical sequence.
- Depending on the case at hand, further investigation regarding the exact cause of death may be needed. Cases where poisoning is expected could necessitate this. In such situations, the pathologist should take the appropriate specimens as required.

While all the above procedures were observed by the forensic pathologist in the hospital, there were no X-rays, even

with the gun shot cases reported. The pathologist had to confirm whether the bullet was still there manually. The mortuary lacks radiology facilities thus a challenge in use of radiology technology as one of supplements in postmortem examination. Radiology technology would aid in identification of bullets and other foreign bodies in the body of the deceased, Identification of foreign bodies such as teeth filings, gum and bone healing in case of assault cases.

#### *C. Laws Governing Autopsies in Kenya*

Several Acts in Kenya regulate or touch on the performance of autopsies. The main ones relevant to medico-legal autopsies are as follows:

- **Investigation of death (Inquest Act)**
  - The Criminal Procedure Code of Kenya CAP 75
  - The Inquest Act CAP 11
- **The National Police Service Act**
  - The National Police Service Act 2011 Section 55(1)
- **Births and Death Registration**
  - Births and Deaths Registration of Kenya Act CAP 149
- **Public Health Act**
  - Public health Act of Kenya CAP 242
- **Human Tissues and Anatomy Act**
  - Human Tissue Act of Kenya CAP 252 and Anatomy Act of Kenya CAP 249.

These two Acts are specific only to Kenya. They were enacted when the medical school of the University of Nairobi was established in 1969. They provide for the handling of tissues from autopsies for research, teaching as well as cadavers for teaching purposes.

#### *D. Selected Sample Case Scenarios Carried Out by the Forensic Pathologist*

##### **AUTOPSY 1- REF NO. P1/2012KK-F**

##### **Identification**

The body of the deceased was identified by two witnesses through fingerprint and dental comparison.

##### **General Circumstances Surrounding Death Were as Follows:**

The deceased was stabbed by a person well known to him and rushed to hospital for medical intervention where he died instantly.

**Place of Postmortem-** Kakamega Provincial General Hospital Mortuary

**Date and Time of Postmortem-** 15<sup>th</sup> May 2012 at 11. 40 hr

##### **General Observations of the Body Were as Follows:**

- Clothing-dry blood stained
- Face covered with dried blood
- There were no defense wounds
- Stab wounds at neck (deep)
- There were signs of medical intervention

##### **Biological Profile of the Deceased**

- Sex-male

- Race-African- based on hair, overt observation and pupil
- Physique- well built
- Height- 5 '10' feet
- Apparent age- mid twenties
- Nutrition- fair nutritional status

#### **Post –Mortem Changes and Assessment of the Time of Death**

- Well preserved body (refrigerated)
- Generalized skeletal muscle stiffness (rigor mortis present)
- Post-mortem interval- 18 hours

#### **Internal Appearance of the Body**

- All internal organs were intact
- No specimen was taken for examination.

**Opinion** - As a result of the examination, the forensic pathologist formed an opinion that the cause of death was aspiration asphyxia secondary to stab wound. According to Merriam Webster online Encyclopedia [12], asphyxia is “a lack of oxygen or excess of carbon dioxide in the body that is usually caused by interruption of breathing and that causes unconsciousness.” The following are the classical signs of asphyxia but are not always present and may also be seen in other forms of death.

**Cyanosis** - Bluish or purplish discoloration of tissues due to decreased oxygen in blood. Cutaneous cyanosis is seen in the lips, conjunctivae palms, soles of feet and nail-beds. Cyanosis can be seen in all forms of death where oxygen is diminished at the time of death involving cardio respiratory failure.

**Petechial hemorrhages:** These are small pinpoint bleeding often seen in the conjunctivae, facial skin, skin behind the ears, other serosal surfaces of thoracic, on the surface of the brain, and under the scalp. They can also be seen in patients with various bleeding disorders in which case the peritoneum and parietal pleurae are usually involved.

**Congestion and Oedema:** This results from accumulation of blood in the right side of the heart and venous system. Internal organs become engorged and in strangulation, the structures above the level of venous obstruction become swollen including larynx and pharynx.

#### **AUTOPSY 2- REF. NO. P2/2012KK-F**

##### **Identification**

The body of the deceased was identified by two witnesses through morphological characteristics-old injuries, clothing and jewelry.

##### **Circumstances Surrounding the Body Were as Follows:**

The deceased died while undergoing treatment at Provincial General Hospital Kakamega.

##### **Medical History**

The medical history of the deceased was reviewed and it was revealed that the deceased had been in a coma since 2006 upon arrival at the same hospital. The patient was in a stable condition previously.

**Place of Post-Mortem-** Kakamega Provincial General Hospital - mortuary

Date and time of post-mortem-16<sup>th</sup> may 2012 at 15.00 hr

##### **General Observations on the Body Were as Follows:**

- Clothing-naked

##### **Biological Profile of the Deceased**

- Sex-female
- Apparent age-mid forties
- Physique-seriously wasted
- Height-5 '1' feet
- Race-African

##### **Post –Mortem Changes and Assessment of Time of Death**

- Well preserved (embalmed)
- Post-mortem interval-2/7(2 days)

##### **External Appearance of the Body**

- There was evidence of medical intervention
- No signs of defense injuries

##### **Internal Appearance of the Body**

All internal organs were intact with an exception of the nervous system which had multiple subcritical of lesser cerebra, the spinal cord was haemogenic, spleen with feathery capsule, and acute intestinal obstruction (ileum).

##### **Opinion**

As a result of examination, the pathologist formed an opinion that the cause of death was multiple brain absence with acute intestinal obstruction.

##### **Specimens Taken for Histology/Toxicology Analysis**

The brain, spleen and small gut were taken for further examination histology.

#### **AUTOPSY 3 - REF NO. P3/2012KK-F**

##### **Identification**

The body of the deceased was identified by two witnesses through fingerprints.

##### **Circumstances Surrounding Death Were as Follows:**

The deceased was involved in a fatal road traffic accident where he died instantly at Ilesi (Kakamega-Kisumu route).

##### **General Circumstances Surrounding the Body Were as Follows:**

Clothing-blood stained, tone clothes

##### **Biological Profile of the Deceased**

- Sex- male
- Race- African
- Nutrition- good nutrition
- Height- 5 '10' feet
- Apparent age- mid thirties

##### **Post Mortem Changes and Assessment of Time of Death**

- Well preserved (refrigerated)



**Post-Mortem Interval-18 hours**

Generalized skeletal muscle stiffness

**External of the Body Was as Follows**

- body in supine position
- face covered with dried blood
- wounds on the left orbital region measuring 4 ×4 cm
- wound on the nasal bridge measuring 2×3 cm
- division deformity of the head
- crush injury of the lower limb with multiple fractures of the right fibula and multiple tears of the muscles
- Fractures of the left fibula at the proximal end
- cut wound on the hands, left measuring 4×2cm, right (5×2 cm)
- abrasion on the arterial chest, left side measuring 20×15 cm
- no evidence of medical intervention

Internal appearance of the body was as follows:

**Respiratory System-** Multiple fractures of the ribs, ribs 2-6 on the left, long congestion bilateral

**Head-** multiple injuries of the bones (fractures) of the head especially the face i.e. part 3 with fracture mandible with missing left and central incisor

**Nervous system-** intracerebral hemorrhagic area noted

The spinal column, spinal cord, cardiovascular system, genitor urinary system and the digestive system were all intact.

**Opinion**

As a result of the examination, the pathologist formed an opinion that the cause of death was multiple head injury secondary to Road Traffic Accident (RTA). No specimen was taken for further examination.

**AUTOPSY 4 – REF. NO. P4/2012KK-F****Identification**

The body of the deceased was identified by two witnesses through morphological characteristics -clothing.

**Circumstance Surrounding Death Were as Follows:**

The deceased was walking and was electrocuted and died instantly.

**General Circumstance Surrounding the Body Were as Follows:**

- Clothing-intact (school uniform- light green shirt and a grey short)
- Sex-male
- Race-African
- Nutrition-good nutrition
- Height- 5 '8' feet
- Apparent age- 17 years

**Post Mortem Changes and Assessment of the Time of Death**

- Well preserved (refrigerated)
- Generalized rigor mortis

- Post mortem interval-3 days

**External Appearance of the Body Was as Follows:**

- No external injury noted
- No fractures noted
- No signs of medical intervention

**Internal Appearance of the Body**

- All internal organs were intact and normal

**Opinion -** As a result of the examination, the pathologist formed an opinion that the cause of death was cardiopulmonary arrest secondary to cardio ventricular fibrillation due to electrical injury. Electrical injuries are as a results of the passage of electrical current through the body causing skin injury (electrical or 'joule' burn), organ damage and even death (electrocution). In fatal cases, the current may pass through vital structures such as the heart or brain. Electrical injuries may occur in the following circumstances such as accidental (e.g. child playing with live wire), suicide (deliberate wiring of oneself to a source of electricity), homicidal (e.g. rigging an electrical appliance to cause a fatal electrocution) and in some countries, judicial (e.g. electric chair used in execution). The autopsy findings are usually not specific and care must be taken when looking for the entry and exit points of the current.

**AUTOPSY 5- REF NO. P5/2012KK-F****Identification**

The body of the deceased was identified by two witnesses through dental comparison.

**Circumstances Surrounding Death Was as Follows:**

The deceased person was an escapee from Migori prison and was being trailed. He was shot and died instantly.

**General Observation of the Body Was as Follows:**

- Clothing- Stripped prison clothing intact
- Race- African
- Sex- male
- Apparent age- late twenties
- Nutrition- fair nutrition status
- Height-5 '4'

**Post Mortem Changes and Assessment of the Time of Death**

- Well preserved body(refrigerated) with cold stiffening
- Fixed posterior trunk lividity
- Post mortem interval 5 days

**External Appearance of the Body Was as Follows:**

- Moderate peripheral cyanosis
- Absent defense wounds
- No limb or neck fracture
- No evidence of medical intervention
- Single bullet injuries with inlet wound on the medial aspect of the thigh 0.9cm diameter and one above medial
- Exit wound on the posterior-lateral right thigh 1.2cm diameter rugged vented edge and 4cm diameter above lateral condyle

**Internal Appearance of the Body Was as Follows:**

- Respiratory system- degenerating lungs but intact subcutaneous tissues and chest wall
- Genitor-urinary system- healing ulcer of the glands penis 5mm diameter
- No peripheral hemorrhage
- Head- intact scalp, cranium and skull base. The spinal column was intact
- Nervous system-intact, mild cerebral edema with congested vessels
- Spinal cord- not opened

**Opinion**

As a result of the examination, the pathologist formed an opinion that the cause of death was traumatic shock secondary to gunshot wound/injury.

## VIII. BY WAY OF CONCLUSION

*A. Problematic RTA Case*

In the fourth RTA case, the deceased was involved in a road traffic accident where he died on the spot. His vehicle veered off the road and fell in a river. He was driving his own vehicle.

**General Observation of the Body**

- Clothing- the clothes were wet with broken glass
- Sex- male
- Race- African
- Apparent age-mid forties
- Nutrition- moderate obesity
- Height- 6 '1'

**Post Mortem Changes and Assessment of Time of Death**

The body was fresh; the postmortem interval was approximately one day. There was posterior trunk lividity

**External Appearance of the Body**

- Severe central cyanosis was noted, there were frothy exudates from the mouth and the nostril
- There were no signs of defense injuries. There were no limbs or neck injuries.

**Internal Appearance of the Body**

Pneumothorax test was negative

**Respiratory System**

- The thoracic cavity was filled up by lungs which were diffusely firm
- Cut section of the lungs revealed the frothy exudates.

**Cardio-Vascular System-** moderate cardio megally of about 700g and the coronary circulation was intact

**Digestive System-** noted hepatomegally of about three kilograms, the rest of the gut was intact.

**Head-** plethora of the neck and face was noted, however, the head was not opened further.

**Spinal Column-** there was no spinal fracture

**Cause of Death-** The cause of death as per the pathologist opinion was asphyxia as a result of drowning.

In the above case, the driver was wearing a seat belt and it was not clear why he did not sustain some of the injuries which are caused by seat belts. In Kenya, it is mandatory for every person whether in a private or public vehicle to wear a seat belt while travelling or driving. The types of seat belts used in Kenya are the diagonal ones. This seat belt constraint consists of two components; a lap strap and a shoulder diagonal. The lap strap restrains the person from slipping forward and the shoulder diagonal component restrains hyper flexion of the trunk. The following are some of the injuries that are as a result of the lap strap seat belt component;

**Bruises-** bruises in this case are most common involving abdominal wall due to the friction of the belt and the body of the victim. In the above case however, there were no bruises despite the fact that the drive was wearing a seat belt.

**Rupture of the Internal Organs-** the pressure exerted on the internal organs by the lap strap seatbelt lead to some of the organs to burst or rupture. Some of these organs include; mesentery, small or large intestine, full urinary bladder (or caecum), abdominal aorta

**Injury to the Lumbar (Lower Back) Spinal Column-** there is always a compression fracture as a result of the pressure exerted on the bones by the lap strap seatbelt. There is also a common injury of the dislocation through an intervertebral disc in the middle lumbar region and also the damage of the bony projections (transverse processes and arch).

Injury to the uterus and fetus in pregnant female

**Injuries Caused by the Diagonal Seatbelt Component Include;**

- Bruises of the skin on the chest and underlying muscles, however, in the above case, this was not evident.
- Fractures of the collar bone (clavicle) and breast bone (sternum), similarly, these injuries were not evident.

*B. Stage Set for Legal and Scientific Conflicts*

After the post mortem, it was not evident how the deceased person could have fallen into a river while driving his vehicle and not sustains any physical injuries. This leads to the assumption that the person could have been forced into the river by his assailants. However, there was no time to go further with the investigations as the case was closed. The cause of death was confirmed as asphyxia as a result of drowning. It is worth to note that shoddy police investigations continue to impede the Kenyan criminal justice system. The following is a table showing the types of crimes that led to deaths of various victims. This data was obtained from the police file in the morgue. The data was from the month of March 2012 to the end of July 2012. At the same time, not all criminal related deaths were recorded in the file.

TABLE I  
CRIME RELATED DEATHS (SOURCE: POLICE FILE IN THE MORGUE)

Causes of death	Total	Gender		Age		Age not known
		Male	Female	0-30	30>	
Murder	10	10		4	4	2
RTA	14	13	1	2	12	1
Mob injustice	11	11		4	2	5
Suicide	7	6	1	3	4	-
Drowning	5	5		2	1	2
Concealing Birth	1		1	1	-	-
Electrocution	1	1		1	-	-
Strangulation	2		2	1	1	-
Assault	11	9	2	6	5	-
	62	55	7			

While it is noted that there are elements of misuse of forensic science coupled by lapses in the criminal justice system, this study limits itself to the focal point of understanding pathology and how it interacts with the criminal justice system. However, from the above forensic pathological data, some observation about the interaction between law and society can be analyzed. According to the data in the table above,

- Men are more likely to be target of crimes and therefore carry a high risk of victimology e.g. through mob injustice, road traffic accidents and assault.
- One can also imply the state of lawlessness which is prevalent among males as compared to female
- This lawlessness and anomie can also be linked as a cause of suicide in both men and women
- Males of middle age are faced with the highest crime (death) risks in society. This age category at the same time is the most productive in the society thus a threat to economy and family sustainability.
- Most of the death cases reported at the morgue are unknown. This shows a lack of identity oriented society where one carries at least one documentation showing personal identity- such as visa cards, passports, national identity card, shopping cards, birth certificates etc.

#### REFERENCE

- [1] Petherick, Turvey and Ferguson (2010:51). *Forensic Criminology*. Elsevier Academic Press. 30 Corporate Drive, Suite 400, Burlington, MA 01803, USA
- [2] Linda Gröning and Jørn Jacobsen (eds) 2012:65-66. *Restorative Justice and Criminal Justice: Exploring the Relationship*. Santerus Academic Press. Sweden
- [3] Stuart H. James and Jon J. Nordby (2009:5). *Forensic Science: An Introduction to scientific and investigative techniques*. Third Edition. CRC Press
- [4] *Oxford English Dictionary* (2007). 6<sup>th</sup> Edition. Oxford University Press
- [5] Stuart H. James and Jon J. Nordby (2009:5). *Forensic Science: An Introduction to scientific and investigative techniques*. Third Edition. CRC Press.
- [6] *The Laws of Kenya, Criminal Procedures code Chapter 75*. Revised Edition 2009 (2008). Published by the National Council for Law Reporting with the Authority of the Attorney General
- [7] *Laws of Kenya, Criminal Procedures code Chapter 75*. Revised Edition 2009 (2008) Published by the National Council for Law Reporting with the Authority of the Attorney General
- [8] *The National Police Service Act of 2011 section 55 (1)*

- [9] Steven N. Byers (2010:110) *Introduction to Forensic Anthropology*. Third Edition. Pearson Education, Inc.
- [10] James E. Girard (2011:306). *Criminalistics: Forensic Science, Crime, and Terrorism*. Second Edition. Jones & Bartlett Learning, LLC
- [11] James E. Girard (2011:306). *Criminalistics: Forensic Science, Crime, and Terrorism*. Second Edition. Jones & Bartlett Learning, LLC
- [12] <http://www.merriamwebster.com/medical/asphyxia>