Evaluating the role of DNA evidence in sexual offence cases in Zambia between 2007 and 2014

By

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Declaration

I, Innocent Makasa, hereby declare that the work on which this dissertation/thesis is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

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Abstract

Zambia has reported high incidences of sexual abuse against women and children in recent years. Zambian law categorises sexual offences into; rape, defilement, incest and others, with defilement constituting the majority of the cases (>89%). Between 2010 and 2012, only <39% of defilement cases were taken to court, and convictions were achieved in only 13% of the cases reported to the police. Literature was reviewed to determine factors which contributed towards the resolution of criminal cases, and it was found that DNA evidence was prominent in resolving crimes, specifically as an identification tool in sexual offences. Currently there is no empirical evidence describing how DNA evidence has been used in resolving sexual crimes in Zambia. The causes of low prosecution and conviction rates have also not been investigated. A retrospective study was therefore conducted to evaluate the role of DNA evidence in sexual offence cases in Zambia, reported to eight major police stations in Lusaka between 2007 to 2014 (n=1154). Sexual offence cases comprised rape (n=74, 6.4%), defilement of a child under the age of sixteen years (n=1028; 89.1%), incest (n=7; 0.6%) and others (n=45; 3.9%). Only 14 (0.1%) of the cases had forensic samples collected in the form of a vaginal swab for the sole purpose of determining the presence of semen. In all cases where a suspect was identified (60%), identification was based on the witness/victim testimonies, and in no case was forensic DNA evidence used to assist in identification or corroborate the testimonies. Overall, 28.1% cases were taken to court and the conviction rate was 12.4%. If no injuries were observed on a victim aged between 0 - 5 years, the case was not taken to court. It was also observed that the younger the victim, the more likely the accused was not identified ($p < 0.001$), victims did not know the date of occurrence ($p < 0.001$), and the case was closed due to insufficient evidence. These findings support the use of employing forensic DNA evidence in sexual offence cases to aid the identification of suspects, either in the absence of witness/victim testimonies or alongside as corroborative evidence, which is hypothesised to increase the number of cases prosecuted in Zambia. At the time of this study there was no standardised protocol for the forensic investigations of sexual offences in Zambia, which to some extent, led to numerous missing data. Development and use of the national protocol and use of a validated sexual assault evidence collection kit may help mitigate the deficiencies and inconsistencies witnessed during this study.

Dedication

I dedicate this study to my Lovely wife Mary, and my adorable children; Lengwe, Mpande and Mubambe for the overwhelming support I received during the course of study. I was an absentee husband and father for two years, and you tolerated me. You made my study possible by giving me chance and space for the entire study period.

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List of Abbreviations

CAP	-	Chapter
CSA	-	Child Sexual Assault/Abuse
CDC	-	Centre for Disease Control
CODIS	-	Combined DNA Index System
DNA	-	Deoxyribonucleic Acid
EC	-	Emergency Contraceptive
FRLP	-	Fragment Length Polymorphism
GPL	-	General Public Licence
HIV	-	Human Immunodeficiency Virus
PEP		Post Exposure Prophylaxis
STI	-	Sexually Transmitted Infections
STRs	-	Short Tandem Repeats
UCT	-	University of Cape Town
USA	-	United States of America
VNTRs	-	Variable number tandem repeats
WHO	-	World Health Organisation
ZP	-	Zambia Police Service

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Chapter One:

1.0 Project Proposal

1.1 Introduction

1.1.1 Background

Zambia is a landlocked country covering an area of about 750 000 km^2 in sub Saharan Africa, with the population of over 13 million people [1]. The country, just like any other in the region, is devastated by an increased number of Human Immunodeficiency Virus (HIV) infections and poverty [2], the two major factors suspected to have contributed substantially to the increase in the number of sexual violence against children [3].

Some unscrupulous Zambian traditional healers have been accused of prescribing sex with virgins as a cure for HIV or for wealth creation, to unsuspecting men. However, the President for the traditional healer's association of Zambia and herbal medicine had reportedly denied the accusations against some of his members [4].

During the 17th July 2013 Zambian Parliament seating, the then deputy minister gave a ministerial report on defilement for the years 2010 to 2012 where he reported that a total number of 6 127 cases of defilement (sex with children under the age of 16) were reported to the police. He gave year by year statistics of 2 419 cases in 2010, 1 339 cases in 2011, and 2 369 cases in 2012. Out of the 6,127 cases, only 2 369 went to court for prosecution and only 798 convictions were achieved [5]. The Zambia Police Service reports on their website that in 2013, a total of 2 234 defilement cases were reported to the police, 227 rape cases (unlawful sex with female above 16 years) and 38 cases of incest. The report further indicates that only 292 convictions were secured for defilement cases, 42 for rape and 10 for incest [6]. To our knowledge, there is currently no scientific study or data available to identify the factors related to low conviction rates in sexual offence cases in Zambia.

1.1.2 Sexual offences

In Zambia sexual offences are divided into categories of; rape, defilement, incest, indecent assault and acts against the order of nature. These crimes are defined in the penal code Act, chapter 87, sections 132 through to 164, under the offences against morality [7].

Just like in any other crime, sexual offence victim's report the incident to the nearest police formation (Police Station or Police Post), in most cases to the victim support section of the police. After recording the report, a police medical report (ZP form 32) is issued to the victim and asked to go to the nearest hospital for medical examinations with the report. How the victim gets to the hospital is not explicitly defined; in few cases it appeared that they were accompanied by the police, while in most cases the victims seemed to have gotten to the hospital on their own [8]. In some hospitals the police have created police posts that attend to victims of assaults (sexual and/or physical), road traffic accidents, and sudden deaths. Therefore, sexual assault victims can go directly to the nearest government hospital and find the police to record their statement(s) and get a medical report form. The police are required to witness the medical examination.

1.1.3 DNA evidence in sexual related crimes

Deoxyribonucleic acid (DNA) has been used globally to aid in the identification of individuals alleged to have deposited their genetic material at the scene of crime, or to exonerate the innocent [9]. It is therefore not disputable that DNA evidence is very useful in resolving not only sexual crimes but also other crimes. This has been made possible by the development of new and more sensitive methodologies in forensic DNA analysis.

It must, however, be noted that the evidential value of DNA is as good as the process through which it is derived. Factors that may influence the evidential value of DNA, include but are not limited to; the laws, the procedures, the conduct of the victim (e.g. after the crime their conduct may lead to the destruction or loss of the genetic material deposited on their bodies or the scene), and the conduct of personnel (e.g. those involved in sample collection, transportation, analysis and presentation in court).

In their 2013 article entitled “Barriers to effective use of medical legal findings in sexual offence cases world wide”, authored in Canada, by Janice Du Mont and Debora White found that the bad behaviour of staff involved in handling of sexual offence investigations impedes the successful disposal of sexual offence crimes. The barriers identified in their article included the lack of competence, contempt of victims, corruption among the players (scientists, police, and legal personnel) who have tampered with the collection, processing, analysis and use of medical legal evidence [10]. The need for regulating and standardising the protocols and referral systems can never be over emphasised in fighting sexual crimes [11].

It’s against this background that evaluations of the impact or effects of DNA evidence on the outcome of investigations, prosecutions and judgements in criminal cases need to be popularised.

Use of DNA evidence is a highly technical field that requires reviews and updates to keep the integrity and good reputation the field has acquired thus far. Procedures should not only be standardised but also regulated and monitored at each level, starting from sample collection, packaging, transportation and analysis [12].

1.2 Justification of the study

In Zambia there is no empirical and/or statistical data demonstrating the role DNA evidence has played in the deposition of sexual offence cases at investigations, prosecutions and court levels, in the absence of necessary tools and qualified personnel. The country has been using DNA evidence in court without the law that regulates its use and moreover, without a population-specific forensic background allelic frequency database and without specifically trained personnel at all levels. This is because none of these features currently exist in Zambia. It is imperative therefore, to understand how effective DNA evidence use has been in sexual offence case disposal, by reviewing the way sexual offence cases have been handled at Police, Prosecution and Judicial levels, case by case. The outcome of this study may be helpful in identifying the factors associated to low prosecution and conviction rates in sexual offences in Zambia.

1.3 Aim

This study aims at evaluating the effect of DNA evidence on the outcome of investigations, prosecutions and judgements of the sexual offence cases in Zambia between 1st January 2007 and 31st December 2014.

1.4 Objectives

To this end, the objectives will be to:

- Review the Zambian sexual assault case records in terms of set variables (as defined in section below)
- Evaluate the process of sexual offence investigations in Zambia with regards to DNA evidence
- Determine the extent at which DNA evidence is used in the investigation of sexual offences in Zambia
- Determine if the use of DNA evidence is associated with the case going to court and the court outcome

1.5 Proposed Research Methodology

1.5.1 Study design

This study will take on the form of a retrospective, qualitative, longitudinal study, examining the case records of sexual offences reported to the Police in Zambia between 2007 and 2014.

1.5.2 Inclusion and exclusion criteria

- Sexual offence cases which occurred and reported between the first day of 2007 to the last day of 2014, regardless of when it was resolved or disposed of, will be included
- Sexual offence cases involving females and male victims of all age groups will be included
- Only sexual offences reported to the Police will be reviewed
- Attempted sexual offence cases will not be included in this study
- Cases of indecent assault in which penile penetration is not achieved will not be included in this study

- Sexual cases involving consenting same sex individuals will not be included in this study (even though such acts are deemed criminal in the Zambian laws)
- Sexual offences against animals will not be part of this study
- For the purposes of this study only penile penetrative sexual cases will be considered

1.5.3 Data collection

The researcher, who is affiliated to the Zambia Police Service, will search and review the Police and Judicial repositories of sexual offence cases (electronic, and or paper files) case by case for the variables this project seeks to investigate. The information will be captured using Epidata software onsite.

Epidata is a data collection tool suitable for; defining the structure of data, specifying the range of values, entering and exporting data to other packages [13].

At least two data collectors (depending on the availability of staff) will be engaged in capturing data onsite. These will be staff already working in these repositories and will not require remuneration, as the work will be done within their scope of work and working hours. The researcher will oversee the data capturing by the other two data collectors.

1.5.4 Variables

A number of variables related to the sexual offence will be considered. Table 1 below depicts the variables that will be collected from the case files and examined in this study.

Table 1: Types of valuables, to be examined in this project, associated with sexual offence cases.

Variable	**Scale of Measurement**	**Type of Variable**
Age	years	Numerical, continuous
Sex	Male/Female	Categorical, binary
Type of sexual offence	Defilement/rape/incest/other	Categorical, nominal
Place of incident	Township or Countryside	Categorical, binary
Time of occurrence	Hours	Numerical, continuous
Number of alleged perpetrators	Number	Numerical, discrete
Alleged perpetrator known	Yes/no	Categorical, binary

Alleged perpetrators known	All/some	Categorical, binary
Alleged perpetrator related to victim	Yes/no	Categorical, binary
Alleged perpetrators related to the victim	All/some	Categorical, binary
Type of Relationship	Known/Partner/Family/Acquaintance/Contact	Categorical, nominal
Time reported at police	Hours	Numerical, continuous
Time referred to the Hospital	Hours	Numerical, continuous
Time reported at the hospital	Hours	Numerical, continuous
Bodily injuries	Yes/no	Categorical, binary
Genital injuries	Yes/ no	Categorical, binary
Number of lesions	Number	Numerical, discrete
Forensic trace evidence sample collected	Yes/no	Categorical, binary
Type of sample	Blood/Vaginal/rectal/urethral swab/ stain pant/ used condom/ stain clothing.	Categorical, nominal
Time of sample collection	Hours	Numerical, continuous
Rape kit used	Yes/no	Categorical, binary
Time of sample dispatch to the laboratory	Hours	Numerical, continuous
Type of test requested	DNA/Sperm detection/other	Categorical, nominal
DNA results	Yes/no	Categorical, nominal
DNA results quality standards*	Acceptable/not acceptable	Categorical, nominal
DNA profile description	Full profile/partial/mixture	Categorical, nominal
DNA profile interpretation	No match/ match/inconclusive	Categorical, nominal
Spermatozoa detected	Yes/no	Categorical, binary
Genital injuries present	Yes/no	Categorical, binary
Case taken to court	Yes/no	Categorical, binary
If not reason	Charge dropped/Not filled/No suspect/Insufficient evidence/Pending	Categorical, nominal
Guilty plea	Yes/no	Categorical, binary
Court outcome	Acquittal/conviction	Categorical, binary
Conviction	Custodial/other	Categorical, binary
Years of custodial sentence	Number	Numerical, discrete

*The quality standard of DNA profile will be assessed by the stochastic and analytical thresholds.

1.5.5 Data analysis

The Statistical Package for the Social Sciences (SPSS) computer program will be used for statistical analysis of data in this project. This program is available free of charge under the University of Cape Town License, and will be used for its good presentation of data.

1.5.6 Quality measures

Quality data capturing is cardinal in achieving the objectives of this study. With Epidata, once the structure of data and range of values are defined, the data and values entered outside the structure are automatically rejected by the software. The program also has an application for checking double and missing entries [13]. However, a second person will counter check randomly selected entries to ensure that data was entered correctly.

1.6 Ethics

1.6.1 Privacy and confidentiality

Names will not be captured during data collection. Only data pertaining to the variables in Table 1 will be captured and this will be carried out in Zambia. Once all the case files have been reviewed and the data captured, each case will be assigned a unique numerical identifier which corresponds to the case number. This information will be stored by the crime registry office, in Zambia for traceability purposes. However, only the unique identifier will be used subsequently in all analysis of data, which will take place in South Africa at the University of Cape Town (UCT), with the support from the supervisor and staff in the Division of Forensic Medicine and Toxicology.

The dissertation will go into the University of Cape Town (UCT) library.

1.6.2 Health and safety

Gloves, face masks and duster coats will be worn at all times during data entry and sorting out of paper based files, to protect the researcher and the assistant from the dust and acquiring respiratory related infections.

There will be at least three breaks every day, during the time of data collection, to allow stretching and refreshments.

1.6.3 Ethical clearance

The protocol will be submitted to the Human Research Ethics Committee for review at the University of Cape Town, South Africa for clearance. Only once ethics approval has been granted will the research commence.

1.7 Work plan

Gantt chart 1: Time line for the major activities of the project depicting the month and year of the beginning of the activity through to the month and year of its completion

	Jan 2016	**Feb 2016**	**Mar 2016**	**Apr 2016**	**May 2016**	**Jun 2016**	**Jul 2016**	**Aug 2016**	**Sep 2016**	**Oct 2016**	**Nov 2016**	**Dec 2016**
Proposal write-up												
Submission for Ethics												
Data collection												
Data analysis												
Dissertation write-up												
Dissertation Submission												
Administrative activities and arising matters												

1.8 Budget

No costs are expected to be incurred in this project. All the software for data entry and analysis are free versions. The personnel who will be involved in data capturing will be working within their working hours and scope of work.

1.9 Social outcome and value

This study is part of the drive to fight violent sexual crimes, among others, in the communities that manly involve children some of whom are below the age of four weeks. Currently the conviction rate of sexual offences involving children is below 15% and the Centre for Disease Control (CDC) has attributed this to a number of factors among them poor DNA evidence presentation in court, therefore this will be a step towards addressing the challenges faced with DNA evidence collection, analysis and presentation in court. Communities will be much safer as the number of criminals prosecuted and convicted increase.

The results of this study will be used to re-structure and standardise the referral and reporting system of sexual offences in Zambia, in order to increase the chances of DNA evidence recovery and its use. This information will be the first of its kind in Zambia, and will mark the beginning of data generation and knowledge build-up, related to DNA evidence.

Chapter Two:

2.0 Literature Review

The role of DNA evidence in the investigations and legal disposition of sexual offence cases in Zambia

2.1 Introduction

In the 21st century, most African countries have witnessed an increase in the number of sexual violence cases against children and women, with some of the victims being younger than five years old [14,15]. Unfortunately, the number of such cases taken to court, and the convictions achieved are extremely low [11,16,17]

Low conviction rates in sexual crimes are not only seen in third world countries but also in the western countries [17,18]. These low conviction rates suggest that many perpetrators of sexual offences may still be residing with their victims in the same communities or even houses. Therefore, with the majority of the perpetrators unidentified, not prosecuted and unreformed, it proves challenging to decrease the number of sexual crimes.

DNA evidence may be recovered at the scene of a sexual crime, which has the potential to form tangible evidence and link the perpetrator to the act or to the crime scene [15,19]. In sexual crimes, DNA evidence is therefore crucial in the identification of the offender. In Zambia however, the collection and analysis of DNA evidence is not routine [8], and the reasons for this will be discussed later. It is therefore hypothesised that the lack of DNA evidence in these cases may be the missing link in the identification, prosecution and conviction of perpetrators of sexual crimes. This chapter will therefore review and critically evaluate the literature (in the English language) with regards to the role of forensic DNA evidence, in isolation or with other pieces of evidence, in resolving sexual offences at police and/or court levels.

Most published articles considered in this literature review were from countries that have defined their sexual offences in line with the World Health Organisation (WHO): rape - "*Physically forced or otherwise coerced penetration (even if slight) of the vulva or anus, using a penis, other body parts or an object.*"

The Zambian law categorises sexual offences according to; the nature of the act (natural or unnatural), the extent of the act (penetrative or non-penetrative), the age of the victim (below

or above the age of sixteen), the mental status of the victim (sound or unsound), the relationship between the victim and the perpetrator (blood related or not). These categories, defined under the offences against morality clause, put together, to some extent, match the WHO definition of rape.

The majority of sexual offence cases in Zambia are those against children as defined in section 138 CAP 87 of the penal code [2,6,8,20]. In some cases children below the age of five years are the victims [2]. Between the years 2010 and 2013 a total number of 8 361 defilement cases were reported to the Police, out of which only 13% of the cases ended up in convictions. The number of reported cases of rape are consistently lower than those of defilement, throughout the years, but records higher conviction rates than in defilement cases [5,6].

In this literature review, the following terms, and combinations thereof were used to search for the literature published in English language: DNA evidence; sexual offence/assault; use; and/or investigation(s).

2.2 Forensic DNA as evidence

2.2.1 Applicability

The applicability of DNA evidence to resolving crime by aiding identification of suspects in the absence of other tradition identification evidence or in corroboration of such evidence cannot be doubted [19]. In the mid-1980s Sir Alec Jeffreys was the first to demonstrate the ability of DNA in individual identification, and its potential in identification of people associated with a crime scene [21]. Since then it has been widely used in courts and investigations to solve civil, criminal and immigration related cases [22–26].

There are other traditional forensic methods used to identify and/or associate individuals to crime scenes or activities, such as blood grouping, latent fingermark examination, foot, shoe or tyre mark/tread examination, body fluid analysis, fibre and hair analysis, and several others [19,27–34]. Where identity of the perpetrator is sought DNA evidence has shown to be a more accurate, reliable and valid method [35]. It is the preferred method due to its high discriminatory power, greater exclusion capabilities and lower chance of false inclusions or misidentification [36].

Over the past 30 years the forensic DNA technology has developed rapidly and still continues to develop [26]. Sir Alec Jeffreys used Variable number tandem repeats (VNTRs) in early years to perform DNA finger printing which required the use of a substantial amount of starting DNA sample [26]. Later the use of STRs in forensic DNA profiling was introduced, requiring relatively less starting DNA sample compared to VNTRs finger printing, and carried greater exclusion capabilities [37]. The higher the number of STRs used, the higher the discriminatory power and the lower the chances of an accidental match [37].

2.2.2 DNA as evidence in court

In criminal cases, the prosecution requires the burden of proof to be beyond reasonable doubt to secure a conviction [38]. This burden of proof entails that the prosecution has to provide impeccable evidence, not only about the facts of the matter, but also the identity of the person(s) involved. The courts evaluate the validity of the evidence used to identify the suspects in a matter and how they were associated to the events or the crime scene, before convicting or exonerating them. When done properly, DNA evidence is regarded highly in individual identification and association of individuals to the crime scene [26].

In his 2002 review paper, Peter Gill noted that DNA evidence in court should not be considered in isolation of other related evidence. The other evidence, such as the footwear prints, fibres, eyewitness statements, and the presence of the victim's blood on suspect's clothing, contribute significantly to the weight of evidence against the accused [22,39]. He further suggested that the overall strength of the evidence against the suspect diminishes in cases where the non DNA evidence is either little or suggests the accused is innocent [22].

However, the weight of DNA evidence as an exculpatory evidence far much outweighs that of other incriminatory non DNA evidence [25]. This has been evidenced in a number of cases where accused persons were convicted based on non DNA evidence, but exonerated by DNA evidence [25]. DNA evidence is thus considered the new 'gold standard' method of individual identification [25].

In 2003 the case of Michael Shirley was the first post-conviction exoneration case in the UK's legal system using DNA evidence [35,36,40]. This case does not only highlight the importance and trust that the judiciary bestows on DNA evidence, but also the importance of the other supporting evidence that is non DNA. In this case the presence of DNA evidence changed the

way the crime scene events were perceived to the benefit of the accused. The forensic evidence which was used to convict him (the blood grouping of the semen, the shoe impression on the stomach of the victim, the scratches and cuts on Michael's body, and the blood stains on his clothes), did not matter after the exculpatory DNA evidence [35,36,40].

In the United States of America, the first DNA exoneration took place in 1989, since then over 341 people have been exonerated by DNA evidence. Of the people that were exonerated by DNA evidence, 71% were due to misidentification by the eyewitnesses, 46% due to miss application of forensic science, 28% false confessions and 16% informants [41].

2.2.3 DNA evidence in investigations

Identification of the parties involved in a crime is an important undertaking in investigations. Once relevant individuals are identified, it becomes easier to understand the role they each played, or did not, in the commission of crime. The more accurate the method used to identify victims, and/or perpetrators at the crime scene the better the understanding of the events under investigation. DNA evidence in this instance, is the most accurate and reliable mode of identification used thus far, with higher levels of certainty compared to other traditional forensic methods of human identification [42].

There has been a steady increase in the number of countries worldwide who have created national forensic DNA databases, which is perhaps an indication of how DNA technology has become an important tool in investigations of crime. By 2015 over 50 countries had functional national forensic DNA databases, and more countries are expected to join the creation and implementation of databases [22,43–45]. Together, these databases contain over 60 million offender forensic DNA profiles, and are used as criminal intelligence tools. Most of the countries have continued to expand their databases, showing the usefulness of DNA evidence in crime investigations and offender identification. As of March 2016, the Combined DNA Index System (CODIS) in the United States of America (USA) had aided in over 313 278 investigations, and contributed to the generation of over 325 615 hits [46]. In Ireland, just within six months after its inception, their national forensic DNA database helped in resolving 215 crimes, with some individuals being linked to several other crimes [47].

DNA evidence is gaining popularity among the law enforcement agencies and legal personnel and its cardinal that its importance in investigations is fully probed and understood. Wilson et

al. (2010) noted that DNA evidence, in general, significantly improved the investigations' outcome in most of the studies reviewed. Among the studies reviewed by Wilson et al, were the results of the randomised controlled trial of burglary offences by Roman et al. (2010). This study was done in USA and gave resounding evidence on how the presence of DNA analysis helped the USA Police, to solve burglary crimes. Prior to this study the selected USA Police station never used DNA evidence in their investigations of burglary crimes. The study introduced the use of DNA evidence in randomly selected cases, and compared the success rate of the cases with DNA evidence against those without. The presence of DNA evidence helped in resolving burglary crimes two to three folds higher than the use of traditional forensic and investigation methods [42].

2.2.4 DNA evidence in sexual offences

Sexual offences involving the act of penetrative sex result in the possible exchange of biological material between the perpetrator and the victim. This anticipated exchange of material is what makes DNA evidence in sexual offences a priority tool of investigations. However, DNA evidence alone may not be enough to prove the act of sex and/or non-consensual sex. In some types of sexual crimes, such as rape, the act of sex and lack of consent by the victim are both important factors to prove, for a successful prosecution. Therefore, DNA evidence alone may not be sufficient to account for the act of sex and lack of consent. Other forensic evidence, such as body fluid analysis as well as evidence of trauma or injury, serve to complement the DNA evidence. In general, sexual offence investigations are largely dictated by the way the offence has been defined under the law, being enforced, and the role or value of DNA evidence may vary among offences and types of cases.

Cases involving victims who can competently identify their perpetrators also require DNA evidence as a backup to their claims, while the presence and positive identification of semen and injuries will help prove the act of non-consensual sex. When semen is recovered and positively identified, the identity of the depositor of semen is a very variable piece of evidence needed for investigations and subsequent prosecutions, therefore DNA evidence remain vital. Other forensic evidence used to identify the perpetrator and associate them to the crime scene may complement the DNA evidence, but may be of low value to the case.

On the other hand, cases involving children, who cannot identify their victims competently will largely rely upon DNA evidence. In these types of cases DNA will assume a high evidential value. The identity of the depositor of semen in sexual offence cases involving a minor may be used as a corroborative evidence for a successful prosecution in defilement cases as per the Zambian Laws [48].

2.2.5 Predictors of legal deposition of Sexual Offence cases

A number of predictors of legal deposition of sexual offence cases have been identified and reported in a number of studies. Among the predictors include; the presence of forensic DNA evidence, complainant or victim interview with the police, accused interview with the police, and the perpetrator use of violence/force[18,19,49,50].

2.2.5.1 DNA forensic evidence

Forensic evidence in sexual offence cases aids in the identification of the accused person and or the proof of the sexual act [19,21,23,26]. In particular DNA evidence have been found to be a positive predictor of cases reaching court and predictor of guilty verdict [49]. It has been found, however, that DNA evidence is not a predictor of guilty plea [49]. While custodial and longer sentences have been observed more in cases with DNA evidence [49]. In general, forensic evidence has shown to be the predictor of arrests and not the predictor of convictions [19,50]. Other studies have shown that incriminating DNA evidence is the predictor of conviction just like exculpatory DNA evidence have shown to be the predictor of acquittal [40,49]. Ingemann-Hansen et al. (2008) reported that DNA evidence was not associated to convictions. The study, did not clearly state the type or types of DNA evidence contained in the cases surveyed. When one is relating conviction or acquittal to DNA evidence, it is important to separate the exculpatory from incriminating DNA evidence. This is because the two have opposing effects on conviction or Acquittal. It could be for this reason that in one study [18], DNA evidence was not a predictor of conviction while in the other, it was a predictor of conviction [49].

The positive identification of spermatozoa in sexual offence cases is a definitive indication of sexual intercourse in most of the sexual offence cases, however, the mere presence of spermatozoa may not be enough to prove the offence [18].

2.2.5.2 Use of force/violence

Most of the sexual offence cases are as a result of the lack of consent or consent obtained fraudulently, by coercion, or use of threats of force/violence. Therefore, any evidence of force or violence may be an indication of lack of consent, and has been found to be a predictor of conviction [18,49]. The testimony of forced sex may be corroborated by the evidence suggesting the use of force, such as torn victim's cloths and extra-genital injuries.

2.2.5.3 Police interview

Police interviews are used to get the details or facts of the complaint in order to arrive at a charge. The complaint must be credible enough to warrant police action, hence, complainant's failure to give police interview has been found to be a major predictor of the case not reaching court [49]. Regardless of the evidence available, the case cannot be taken to court if the victim refuses to give police interview [49].

On the other hand, the accused person is not obliged to give police interview and cannot be a determinant of the case proceeding to court. In instances where the accused voluntarily accepts to give a police interview and confesses to the offence, such cases have been seen to result in guilty pleas [49]. It is also important to study the factors that lead to police confessions in sexual related crimes, which confessions are correlated to guilty pleas [49].

2.2.5.4 Gaps in the existing knowledge

In most studies considered in this section, they had very few cases containing DNA evidence, and their findings may not be representative enough. The studies did not put into consideration the characteristics of the cases and those of the victim and the alleged perpetrators. The case and parties' characteristics play an important role in the way the evidence is perceived and subsequently valued. For example, when the alleged perpetrator lived together with the victim and they have had a sexual relationship, the value of DNA evidence in this case may be reduced significantly, compared to the evidence demonstrating the lack of consent or otherwise.

Therefore, only cases with closely related characteristics should be included in the study to get a more coherent outcome.

All the studies conclude that DNA and or forensic evidence was not the predictor of guilty verdict despite using very low sample sizes.

None of the studies reviewed in this section were carried out on the victims younger than five years. It is novel in this case, to investigate the value or role of DNA evidence in sexual offence cases in which the victims are incompetent to positively identify their abusers.

2.3 Sexual offences in Zambia

The WHO definition of rape forms a general description from which most countries derive their definitions of most sexual offences. Countries have each legally defined sexual offences differently. Therefore, elements that constitute these offences, and predictors of legal deposition of sexual offences cannot universally apply. This means that each country should be considered and studied independent of the other.

In the Zambian laws, sexual offences are described and defined under the "Offences against morality clause" Chapter XV, of the penal code Act, CAP 87. In this chapter of the law the sexual offences are described in sections; 132 (Rape), 138 (Defilement of a child), 139 (Defilement of an imbecile or person with mental illness), 155 (Unnatural offences), 157 (indecent assault of boys under fourteen years), and 159 (Incest) [7]. These sexual offences have been defined in line with the characteristics of the victim such as; age, sex, mental status and relationship.

2.3.1 Rape

Rape is defined, by section 132 of CAP 87 of the laws of Zambia as; "Any person having unlawful carnal knowledge of a woman or girl, without her consent, or with her consent, if the consent is obtained by force or by means of threats, or intimidation of any kind, or by fear of bodily harm, or by means of false representations as to the nature of the act, or in the case of a married woman, by personating her husband, is guilty of the felony termed Rape [7]."

Carnal knowledge is defined as the penetration of the vagina by the penis or having sexual intercourse between a man and a woman. The Zambian legal definition of rape implies that only a woman can be raped, and that it can only occur by penetration with the penis. This means that under this definition, (i) a man cannot be raped, (ii) penetration of the vagina by any other object other than the penis is not rape, and (iii) penetration of the anus or mouth by the penis or any other object is also not considered as rape. Some of the obvious acts of rape that are not considered as such by the current Zambian law include; the insertion of the penis into the anus or mouth, and the insertion of the fingers or an artificial penis into the vagina.

Therefore, the important factors to prove by the prosecution in the case of rape, as per the Zambian law include; vaginal penetration by the penis (sex), absence of consent by the victim, fraud (in case of a consensual sex), use of force, misrepresentation of facts or impersonation, while the age of an adult victim is immaterial [7,38].

DNA evidence would be useful in the definitive identification of the depositor of the biological fluid or substance at the crime scene and or victim's body. While positive identification of semen would be definitive in proving the act of sex. The extra genital lesions would be a good evidence of 'use of force' or violence to prove lack of consent. Genital lesions can be sustained even in consensual sex, therefore, can only be used to prove the act of penetrative sex and not the absence or presence of consent.

2.3.2 Defilement of a Child

Defilement is defined, by section 138 of CAP 87, as; "Any person who unlawfully and carnally knows any child commits a felony and liable upon conviction to a term of imprisonment of not less than fifteen years and may be liable to imprisonment for life" [7].

Rape of a child below the age of 16 years is recorded and prosecuted as defilement of a child, in the Zambian penal code, in this category the age of the victim is what defines the offence, and consent is immaterial. The law deems that a girl child under the age of 16 is incapable of consenting to a sexual act, and, similar to the definition of rape above, the vagina needs be penetrated by the penis for the charge of defilement of a child to stand. Therefore, a person guilty of sex with a minor by the use excessive coercion faces similar minimum punishment as the one who had sex with a 'consenting' minor. In the same way a person guilty of sex with a

two months old baby will have the same minimum sentence as the one guilty with consensual sex with a 15 years old girl.

The important factors for the prosecution to prove include the act of sex, female victim and the age of the victim below 16 years. Consent is immaterial. The term child in defilement is any person who is below the age of sixteen years [7].

The Zambian law, section 122(1) CAP 53 of the Juvenile Act, requires that the evidence from a child witness should be corroborated to stand in court, no person in Zambia can be convicted of a crime based on an uncorroborated testimony of a child [45]. This requirement means that the prosecutions need, not just the child's testimony, but also a supporting or corroborating evidence. It is for this reason we hypothesise that; the value of corroborative evidence in defilement cases is much higher than the one in rape cases.

In cases of defilement of a child, as defined by this section of the law, DNA evidence would be useful in identification of the depositor just like in rape. Other forensic evidence including DNA may be used to corroborate the minor's testimony, as required by law in section 122(1) CAP 53 of the Juveniles' Act. Genital/anal lesions would be used as evidence of penetration while positive semen identification would be definitive evidence of sexual penile penetration.

2.3.3 Defilement of imbecile or persons with mental illness

Defilement of imbecile or persons with mental illness is define, in section 139 of CAP 87, as "Any person who, knowing a child or other person to be an imbecile or person with mental illness, has or attempts to have unlawful carnal knowledge of that child of other person in circumstances not amounting to rape, but which prove that the offender knew at the time of the commission of the offence that the child or other person was an idiot or imbecile commits a felony …. [7]"

Defilement of an imbecile is not limited by the age of the victim and penetration. In this category of cases even an attempt to have sex with a person who has a mental illness or an imbecile attracts the same minimum punishment as the one who had sexual intercourse.

The act of sex or an attempt to have sex and state of mind of the person are of great importance to prove the commission of this type of sexual offence [7].

In this type of crime, positive identification of semen would be used to prove the act of sex while DNA evidence would be a definitive identification of the depositor. Genital lesions, like in other cases above would be used to prove the act of penetrative sex. Testimonies from victims deemed to be of unsound mind or imbecile may not solely be relied upon, and would always require corroboration.

2.3.4 Unnatural offences

The law, in section 155 of CAP 87, describes unnatural offences as "Any person who (a) has carnal knowledge of any person against the order of nature; or (b) has carnal knowledge of an animal; or (c) permits a male person to have carnal knowledge of him or her against the order of nature; commits a felony and liable, upon conviction to imprisonment for a term not less than fifteen years and may be liable to imprisonment for life" [7].

In this provision of the law, subsection (a) covers the rape of a person by penetration of the anus or mouth. It also covers the rape of a man by anal or mouth penetration in subsection (c). The Zambian law in its current state recognises the vagina and penis as the only legitimate body organs to be used in sexual activities. If the vagina is penetrated by any organ other than the penis it is considered as unnatural offence, in the same manner the penetration by the penis of any other body orifice other than the vagina is unnatural. In this case consenting sex between male partners with one or both being an anal and, or mouth receptive partner is prosecutable under subsection (c) of this section. Also consensual anal or mouth penetrative sex of a woman by the man is prosecutable in subsection (c).

Offences involving sex with animals as enshrined in subsection (b) are not part of this study in line with the study's exclusion and inclusion criteria. Also cases of consenting sex between male individuals are not included in this study, even though under this Act it is a prosecutable offence. The other cases that are criminal but not part of this study are those involving oral sex between consenting couples, and the other cases without penile penetration.

In offences against the order of nature, the prosecution team is required to prove; penetration of the body orifice other than the vagina. In the presence of consent, both the man and the receptive partner, are charged of the offence, while in the absence of the consent only the perpetrator is charged. Therefore, consent is only used to guide on who should be charged and not as an element of crime.

Anal lesions could be used to prove penetration in this type of cases while DNA evidence would be used for a definitive identification of the depositor. Positive detection of saliva on the genitalia may be used to prove allegations of oral sex, in the same manner the positive detection of semen in the mouth or anal orifice may be used as evidence to prove an act of sex involving the mouth and or anal opening.

2.3.5 Indecent assault of boys under fourteen years

This type of offence is defined, in section 157 CAP 87, as "any person who unlawfully and indecently assaults a boy under the age of fourteen years is guilty of a felony and is liable to imprisonment for seven years" [7].

In this type of offences, the victim is always below the age of fourteen, while the perpetrator can be of any sex. The offence may or may not involve vaginal - penile penetration, and if vaginal penetration was achieved the perpetrator was the one penetrated. Consent by the victim, in this crime, is not a defence.

Indecent assault of a boy under the age of fourteen by a man involve touching and/or fondling of the boys' soft parts such as the buttocks and penis, while the same offence can be committed by a female through touching and/or fondling of soft parts and/or being penetrated (vaginal penetration only (penetration of any other body orifice would be unnatural offence (2.3.4))).

In cases were the perpetrator was penetrated, the perpetrator's vaginal secretions and DNA may be recovered from the boy's (victim) penis or outside of the condom. The evidence of vaginal secretions may be used to prove the act of indecent assault, while DNA evidence may be used to identify the perpetrator.

2.3.6 Incest

Incest is defined, in section 159 CAP 87, as "(1) any male person who has carnal knowledge of a female person who is to that person's knowledge his grandmother, mother, sister, daughter, granddaughter, aunt or niece commits a felony…. (2) any female person who has carnal knowledge of a male person who is to that person's knowledge her grandfather, father, brother, son, grandson, uncle or nephew commits a felony…." [7].

In this category of offences consent is immaterial in proving an offence. What should be established by the prosecution team is the relationship between the perpetrator and the victim

in the case of a non-consensual sex, or between the couple in case of the consensual sex. Again in this case, like in the unnatural offences, consent or lack of it, guides the police on who should be charged with the offence. The knowledge of the existing relationship by the perpetrator(s) is very cardinal, and lack of it may be used as a defence.

The factors that are considered in the criminal prosecution of the offences under this section of the law are; the act of sex, the existence of a relationship as outlined in the Act, and the knowledge that such a relationship exists.

In this category of cases DNA evidence may be important in confirming the biological relationship of the victim and perpetrator. Positive identification of semen would be used as evidence of the act of sex. Evidence of coercion may be used to identify who the victim of this crime is. In cases where incest has resulted in pregnancy, DNA evidence will be definitive in determining the relationship of the foetus/baby to its biological parents. It must be noted however, that even if the relationship is ascertained through DNA evidence, the case of incest may not succeed if the parties or the perpetrator is not aware of the existing relationship.

2.4. Conclusion

Sexual offence cases are among the most prevalent crimes, with the least prosecution and conviction rates globally. The reasons for low prosecution and conviction rates remain speculative in the absence of empirical evidence. The introduction of forensic DNA analysis to aid in the identification of offenders does not seem to significantly improve the prosecution and conviction rates, based on the few articles reviewed in this study. It must be noted however, that DNA evidence remains the gold standard for human identification and, therefore, helpful in investigations of all forms of crime.

The legal requirements to prove the act of rape in most countries including Zambia require that other factors such as lack of consent are proven, and therefore, DNA evidence alone may not be enough to secure conviction. It is for this reason that the value or role of other pieces of evidence is considered, especially those in which the consent of the victim to the act is a material factor.

It is important to note that the value of DNA evidence may differ at each level of the case. At investigations for example, where the identification of the perpetrator is of outmost importance,

the presence of DNA evidence will be weighted highly compared to the cases in which the identity of the perpetrator is already known. In court disposition DNA evidence may be used as a proof for identification and not to prove guilty of the act, while semen presence may be a more useful piece of evidence in this case than DNA; hence, lowering the weight of DNA evidence. Therefore, estimation of the value of DNA evidence in sexual offence cases cannot be done in isolation of other pieces of evidence or without consideration of the level at which the case is.

Zambia, like other sub Saharan countries, is recording high levels of sexual offence cases, mostly against young women and children, with very few cases being prosecuted and conviction rates below 15%. Failure to bring the majority of the offenders to book entails that the prevalence of these cases will remain high, as very few offenders are isolated from their victims and the community for correction.

To successfully fight the scourge, there is need to identify the prevailing shortcomings in the system that are contributing to the low prosecution and conviction rates.

Chapter Three:

3.0 Research study in manuscript format

3.1 Introduction

Sexual offence cases in Zambia include but are not limited to; defilement of child below the age of sixteen years, rape, incest, unnatural offences, and defilement of the imbecile [7]. The most frequent reported cases have been defilement of the child, and it has been consistently higher than any other types of sexual offences since 2006 [2,6]. Defilement is similar to rape but it involves victims aged below the age of sixteen years, and consent of the act is immaterial [7]. Incidences of rape cases rank second to defilement cases, and involve having non-consensual sex with victims who are of and above the age of sixteen years [2,6].

Cardinal in investigations of criminal cases is the identity of the perpetrator(s), which becomes difficult when there are no eye witnesses or the eye witnesses are unable to identify the suspects. In some cases, physical evidence left at the crime scene, when recovered, may be used to identify the perpetrators [19,33]. There are a number of forensic samples that may be collected at the scene of crime and are useful in investigations; among them are biological fluids, latent marks and soiled clothes [10,16,19,33,49,51]. What guides the collection of possible sample(s) is the manner in which individuals (victim and perpetrator) interacted with each other and the scene of crime. As per the Locard's principle of exchange, it is expected that these interactions lead to some material exchange [52]. These materials, once recovered, can be used as evidence to help identify the individual(s) who might have come into contact with the scene of crime and/or articles thereof [33]. The materials can also help investigators understand how, why, where and when the crime was committed [33]. In sexual crimes, semen analysis, genital injuries examination and DNA analysis have typically been used to investigate the crime, in addition to victim and/ or eye witnesses' testimonies [10,17,19,33,53].

Forensic DNA profiling is currently the most definitive method of human identification [33,49,54]. It is therefore a preferred method of perpetrator identification in criminal sexual offence investigations [33]. It has a sound history of resolving cases that would otherwise be difficult to resolve using conventional methods of identification and investigations [33,42,54].

It has also been used to overturn wrongful convictions of suspects erroneously identified by traditional methods [40].

Other equally important types of forensic evidence required in resolving sexual offences, besides DNA evidence, include body fluids analysis, examination of body injuries and analysis of soiled cloths, among others. These pieces of evidence may be helpful in corroborating the victim's testimony of the crime scene and events [33]. In Zambia, DNA evidence is not routinely used in investigations of criminal offences, mainly due to lack of forensic facilities capable of performing forensic DNA analysis [2]. Selected cases requiring DNA evidence have had samples sent to South Africa for analysis. There is also no standardised protocol for handling forensic samples in sexual offence cases.

The Zambian law requires that accusations made by a minor need be corroborated, otherwise no one can be convicted on them [48]. Therefore, when done properly, forensic evidence is best suited to be the most definitive corroborative evidence [19,25]. Understanding the case characteristics and how variables relate may be helpful in predicting the case outcome at the police investigation stage and in court [33,42].

The use of robust scientific methods in fighting crime has shown to be valuable in solving crimes that are difficult by traditional methods [33,42]. However, the relationship between sexual offence cases, DNA evidence and genital wounding has not yet been assessed in relation to court outcome in Zambia. This data, as well as the research in sexual crimes would provide valuable information in order to fine tune the strategies used in crime management and investigation in a local context. Therefore, the main aim of this study was to evaluate the role of DNA evidence in sexual offence cases in Zambia, focusing on the cases reported between the years 2007 and 2014 at selected Police stations.

3.2 Methods

A retrospective review of sexual offence cases (n=1154), reported at eight out of ten Zambia Police stations in Lusaka District, was undertaken. The police stations included in this study were Woodlands, Chilenje, Kabwata, Chawama Kanyama, Matero, Emmasdale and Chelstone, excluding their Police posts (in Zambia Police stations have several small stations under their command known as "Police posts"). These eight police stations were from urban areas in Zambia, and are considered the busiest out of the ten police stations in Lusaka, Zambia. Therefore, these police stations were deemed to be the most representative of the places with the majority of the sexual cases reported to the police in Lusaka district. Lusaka district is one of the four districts in Lusaka province, covering the area of 360 km^2. It was the most densely populated district in the Province with the population density of 4 853.2 persons per square kilometre. Over 50% (1 747 152) of the total population in Lusaka province (2 191 225) resided in Lusaka district from which the police stations in this study were found [1].

The cases reviewed were (i) defilement of a child, (ii) rape, (iii) incest, (iv) sodomy, (v) indecent assault of a boy under fourteen years and (vi) defilement of an imbecile/idiot. Only cases involving penetration were included in this study. Attempted sexual intercourse, even if it was considered as defilement of an imbecile, was not part of this study. All the case files of these specified sexual offences reported to the selected police stations between 1 January 2007 and 31 December 2014 were reviewed. Information pertaining to the set of predefined variables (Table 1; section 1.5.4) were captured using Epidata 3.2 10. The IBM® SPSS Statistics 23 was used to compute the descriptive statistics of the data set. The associations between variables were estimated using the Chi square tests (cross tabulation).

The study received the ethics approval from the University of Cape Town, Faculty of Health Sciences, Human Research Ethics Committee (HREC REF: 385/2016) (Appendix 4.2). In Zambia, the Zambia Police Service authorised access to the case files under its custody (Appendix 4.3).

3.3 Results and discussion

3.3.1 Descriptive statistics of the sexual offence cases

A total of 1154 cases from the eight police stations met the inclusion criteria for this study and were reviewed. The majority of the cases (n=1028; 89.1%) were defilement of the child. Rape cases were the second most frequent case type observed (n=74; 6.4%), followed by 'other' (defilement of the imbecile/idiot, indecent assault of boys under fourteen years, and unnatural offences) (n=45; 3.9%). The least observed were incest (n=7; 0.6%) (Figure 1). Based on these results, in every ten cases of penetrative sexual offence in Zambia, nine were likely to be defilement of a child. The proportional distribution of the cases in this study was consistent with the national annual reports of the sexual offence cases by the Zambia Police [5,6]. These reports have consistently indicated higher defilement cases than any other sexual offence.

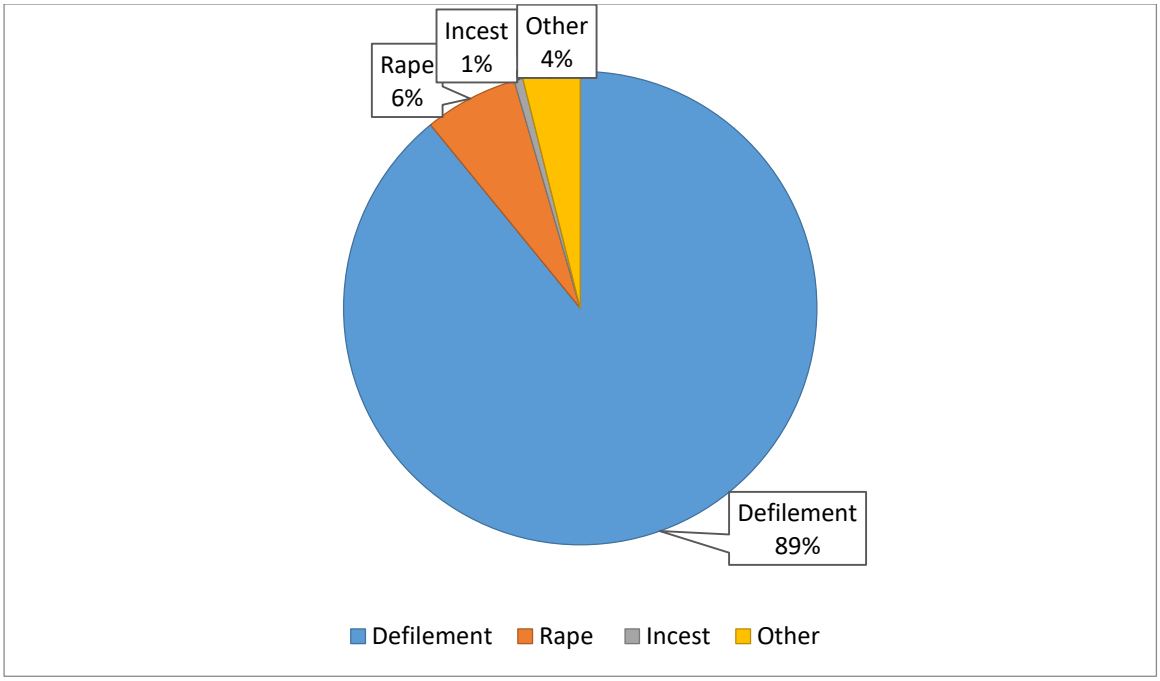

Figure 1: Proportional distribution of the sexual offence cases with the label numbers indicating the percentage distribution of each case, out of a total of 1154 cases

These findings are also consistent with other studies, which have ranked sexual cases against children (<18 years old) higher than those against adults [17–19,55–57]. What has not been established though, was whether the observations here were as a result of the "reporting factor",

of which more cases involving adult victims went unreported. Within the defilement cases however, it was observed that as the age of the victim increased (particularly from eleven to fifteen years old) so did the number of cases (Appendix 4.4). In this age group the majority of the victims were expected to be at puberty stage [58], it is not very clear though, whether puberty was one of the predisposing factors in child sexual abuse, as observed by a previous study [56].

Unlike other past studies that considered all forms of sexual offences [18,55,56,59], this study only reviewed penetrative sexual offences, excluding non-penetrative and attempted cases. It is therefore unclear whether other cases (e.g. non-penetrative sexual assault) affected the results of this study. The comparison of cases between nations should therefore be done with outmost care and consideration of these factors.

The age range of victims in this study was 0 to 72 years (mean age of 13 ± 6.3 years) for all cases. The mean age of this study was lower than what has been reported in some other countries [18,55,57,59,60]. This observation demonstrated that the victims of sexual assault in Zambia are younger compared to other countries, with minimum age at 0 years compared to ≥ 3 years in most other countries. However, the high prevalence of teenagers (60.9%), in their pubertal and post-pubertal stages (11 – 16 years) [58] being sexually assaulted was consistent with what was reported in other studies [15,17,18,57,60,61]. This observation was an indication that children in these stages are the most vulnerable in child sexual assault. The vulnerability could perhaps be attributed to the longer hours that this category of individuals may spend away from home, unaccompanied and unsupervised. For example, most adolescents (11 – 16 years old) in Zambia start accessing social amenities far away from where they stay. Many victims' police statements reviewed in this study indicated that victims met with their attackers on their way from or to; school, church, a market, shop or indeed playing grounds (data not shown). However, the high prevalence of defilement cases in the Zambian context may partly be attributed to the legal definition of defilement (which is more or less a statutory rape). This is because the majority of the cases observed in this age category of offenses were those allegedly perpetrated by the victims' acquaintances (49.1%), some of which was consensual (as per victim statement to the police).

3.3.2 Sexual offence cases legal outcome

Overall it was observed that the proportion of cases taken to court (28.1%) and the conviction rate (12.4%) was in agreement with the Zambian police statistics on sexual offence cases [5,6]. These observations were also similar to other studies that have reported low convictions (≤ 20%) and prosecutions (<50%) in sexual offence cases [16,18].

To examine the influence of forensic evidence on the cases, in relation to their progression from police to court, the cases were divided into two groups: those where forensic sample(s) were taken and those without (Figure 2). It was observed that only fourteen (1.2%) cases had forensic samples collected, of which 42.9% of the cases proceeded to court; compared to 29.8% of the cases without forensic samples. The results demonstrated that forensic sample collection (regardless of the results) appeared to have had a positive influence on the success of the case going to court. While this observation was consistent with the findings of McGregor et al. (2002) [17], this effect could not be analysed statistically due to the small number of cases (n=14) with forensic evidence. However, this observation supports the notion to collect forensic evidence from more cases, going forward. The cases with forensic samples in this study also had a slightly higher conviction rate (14.3%) compared to those without (12.9%); and cases with forensic samples had less acquittals (0%) compared to those without forensic samples (8.2%) (Figure 2). Again, these observations are merely qualitative in nature, and no conclusions can readily be drawn from this data due to the small number of cases with forensic evidence.

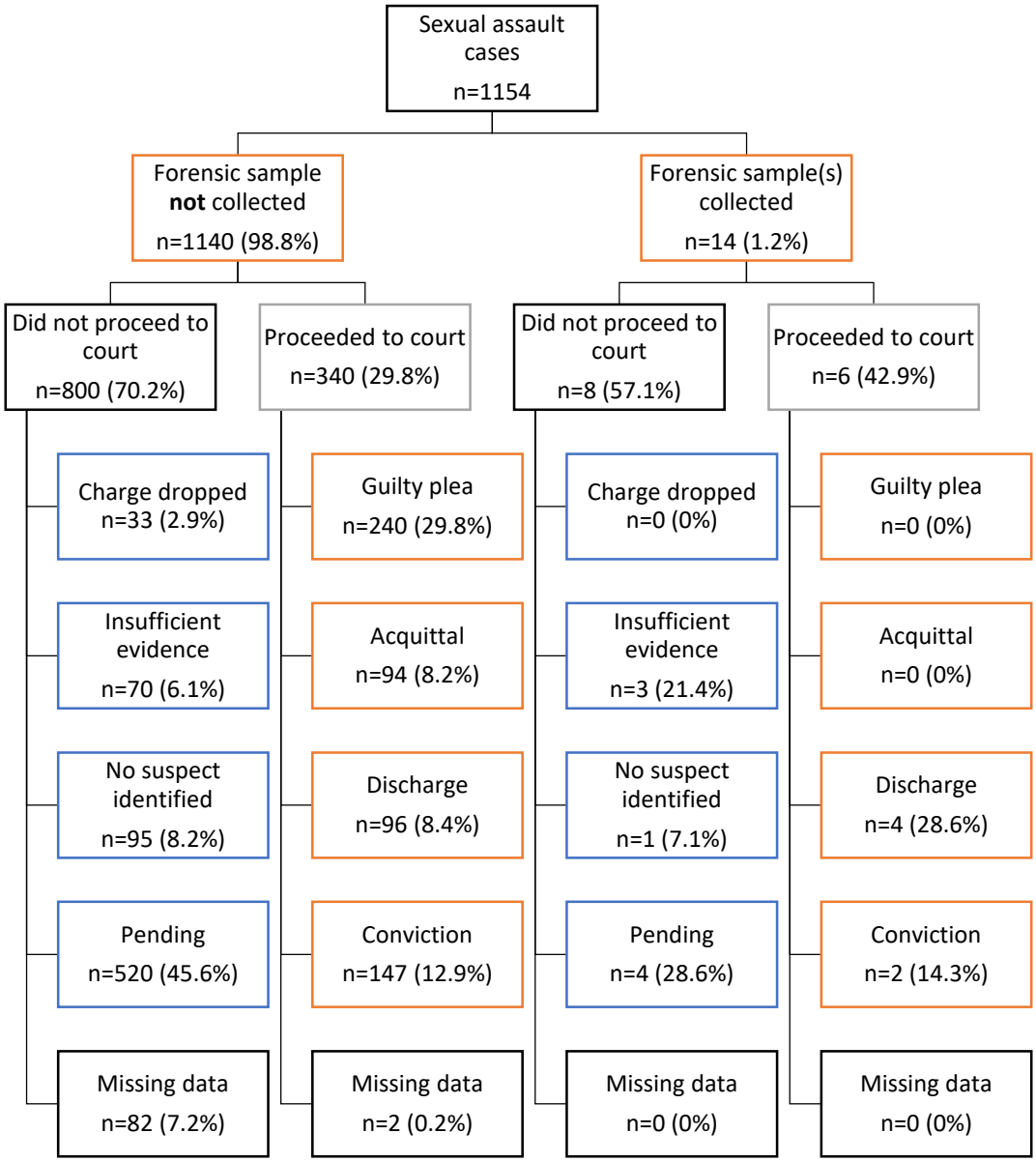

Figure 2: Flow chart representing the number (and percentages) of cases with and without forensic evidence, as well as their court outcome, of sexual assault cases reported to eight police stations in Lusaka, Zambia between 1 January 2007 and 31 December 2014.

3.3.3 Defilement of a child

As mentioned above, defilement cases were the most prevalent (n=1028; 89.1%). For analysis purposes, these cases were categorised into three groups according to age (0 – 5 years, 6 – 10 years and 11 – 15 years), and then compared to each other with respect to certain variables. As indicated above (section 3.3.1) the majority of the cases (60.9%) involved those in post-pubertal age (11 – 15 years).

3.3.3.1 Alleged perpetrator identification

The identification of a suspect is vital for the progression of the case in the legal system [17,19]. It was observed that in all the three age groups, a proportion of the alleged perpetrators were known to the victim, with 409/626 = 65.3% of the 11 – 15 years' age group knowing their alleged perpetrators (Table 2). This was followed by younger age groups, with the 6 - 10 year age group knowing 113/180 = 62.8%, and 0 – 5 years knowing 99/222 = 44.6% of the alleged perpetrators (Table 2). Statistically, the older the age group the more likely the victim knew the alleged perpetrators ($X^2 = 32.752$, $p < 0.001$), and this observation was consistent with the findings of a previous study [19]. One reason for this trend may be that infants or toddlers may not be capable of identifying their alleged perpetrator, as they are too young or unable to communicate proficiently.

The finding in this study, implies that fewer cases would proceed to court for younger victims unless another method of perpetrator identification was employed, such as the use of DNA evidence [62,63]. Indeed, solely depending on the victims to identify their assailants is also problematic, as in the Zambian legal system, sexual accusations need to be corroborated with other evidence for a successful conviction [38].

In this study it was further observed that despite the victims in the 11 to 15 year's old, age category knowing their alleged perpetrators more than the other groups, it did not translate into having significantly more cases taken to court. Out of the 1028 defilement cases, a total of 289 (28.1%) cases were taken to court, with the smallest proportion (24.8%) observed in the cases involving the youngest age group (0 – 5 years old). This was closely followed by cases involving the 11 to 15 years old age group (26.8%), while the largest proportion (36.7%) was seen in the 6 to 10 years old (Figure 3).

Table 2: Table indicating the relationship of the alleged perpetrator to the victim in defilement of child cases (n=1028), for three different age categories. The number of cases is shown in the table, and where appropriate, the percentage of the total number of cases per age group is given in brackets.

Age group	Known to victim				Unknown to victim	Unspecified/ missing data	Total
	Related	Unrelated	Known, but relationship unspecified	Total known to victim			
0-5 years	14	47	38	**99** (44.6%)	**30** (13.5%)	**93** (41.9%)	**222**
6-10 years	20	52	41	**113** (62.8%)	**11** (6.1%)	**56** (31.1%)	**180**
11 - 15 years	96	135	178	**409** (65.3%)	**27** (4.3%)	**190** (30.4%)	**626**
Total	*130*	*234*	*257*	***621*** *(60.4%)*	***68*** *(6.6%)*	***339*** *(33%)*	*1028 (100%)*

In addition to the absence of corroborating identification evidence in most cases, there are a number of reasons that can be attributed to low prosecution rates across the age groups. Among them include an existing relationship between the victim and the perpetrator. It was observed that almost two thirds of the cases involving victims in the 11 to 15 year category were allegedly perpetrated by known persons (65.3%), of which 75.2% were acquaintances and 10.6% were partners involving consensual sex with the minor (statutory rape). In such cases, although parents may have initially reported the incident to the police, the victims may be unwilling to cooperate with the police and make official statements. This may have contributed to more cases being discharged at court for the 11-15year age group (34.7%) compared to the 0 – 5 year and 6 – 10 year age groups which had 16.7% and 19.7% cases discharged respectively. Further, more charges were dropped by the victims (as opposed to being dropped by the state) in the 11-15year age group (6.2%) compared to the younger age groups (0 – 5 years = 0.6%, 6 – 10 years = 1.9%) (Figure 3).

A total of 264 (26%) cases contained data pertaining to the victim and accused relatedness. In all age groups, there were more unrelated (23%) than related (13%) accused individuals, however, this pattern might have been due to fewer cases being reported where the alleged perpetrator was related. This is deemed plausible since people might be more likely to conceal cases perpetrated by individuals they are related to, in order to maintain relationships and protect family bonds [64]. They would rather have the matters resolved at family or community levels than involve the police and send their relation to jail [64]. Therefore, we cannot be sure, whether the majority of offenders in sexual offense cases in Zambia are unrelated to the victims,

using the findings of this study alone. Further, there were many cases where the relationship between the victim and the accused was not specified (25%) (Table 3). Overall, the findings here suggest that the majority of the suspected offenders in the cases reported to the Zambian police were known to the victim, but it is unclear what proportions were really related to the victim.

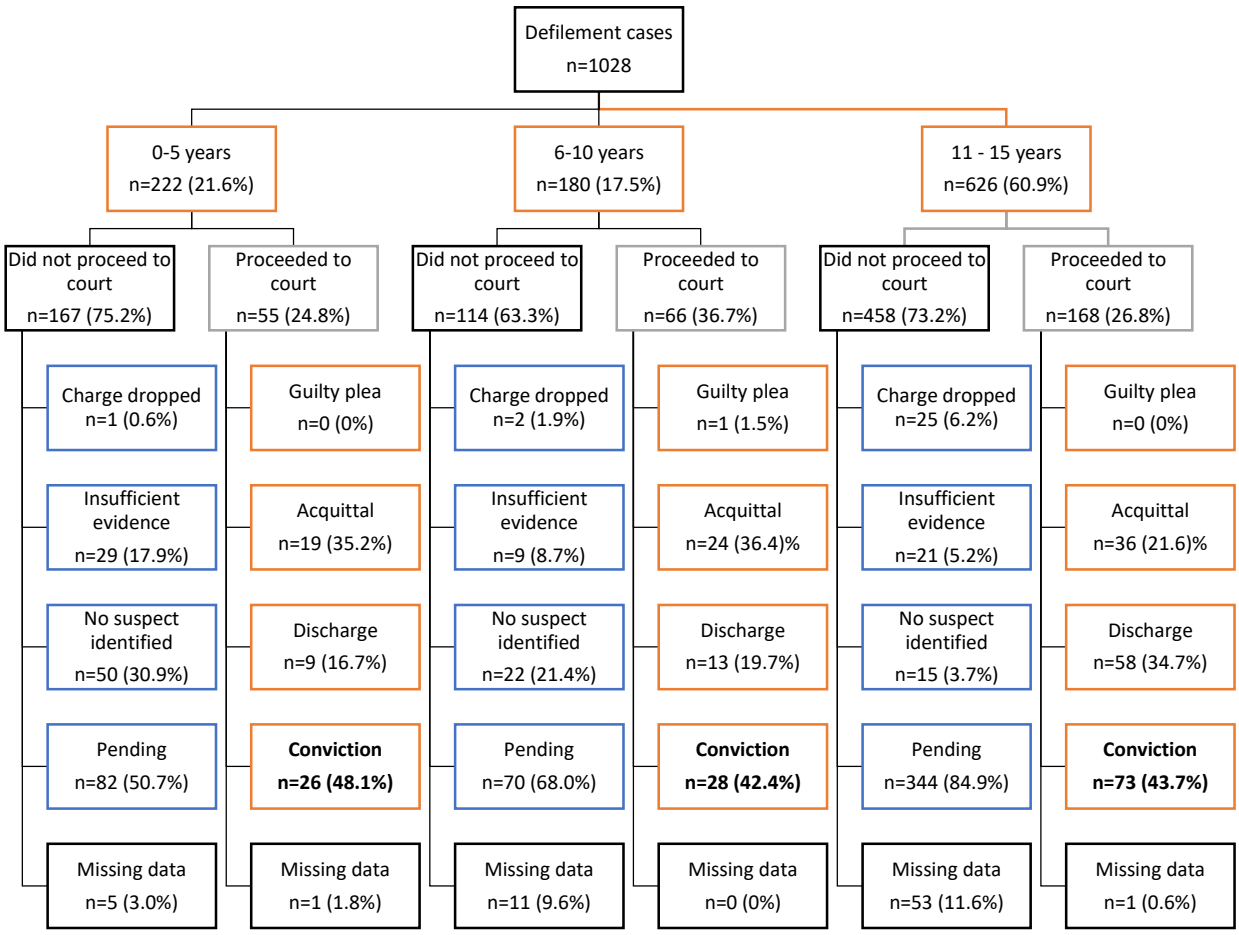

Figure 3: Defilement descriptive analysis flow chart of cases reported to the police. The data shows the flow of cases divided in the age groups, showing the proportional distribution across the age group and the fate of the cases at police and court.

In this study it was observed that the two youngest groups (0 – 5 years and 6 – 10 years) had problems in providing evidence to the police. This was evidenced by the proportion of cases closed at police stage due to insufficient evidence (0 – 5 years = 17.9%, 6 – 10 years = 8.9%) and failure to know the identity of the suspect (0 – 5 years = 30.9%, 6 – 10 years = 21.4%) in

younger age groups compared to the 11 – 15 year old category (insufficient evidence = 5.2% and no suspect identified = 3.7%).

It is hypothesised that these deficiencies could be reduced by introducing scientifically-based forensic strategies in the investigations of these cases. For example, including DNA analysis to corroborate alleged perpetrator identity may increase the number of cases taken to court. This is supported by other studies, whereby the introduction of DNA evidence to the case has proven useful in identification of the suspect(s) as well as corroborating/disputing events which were alleged to have taken place [9,26,35,39,54]. The introduction of DNA evidence would need to be implemented together with a forensic DNA database and appropriate legislation, which Zambia does not currently have. This would aid the interpretation of results and the calculation of statistical probabilities pertaining to matching DNA profiles. Ultimately, this would lead to a reduced number of cases that are pending or have insufficient evidence to proceed to court and, it would also reduce the number of wrongful accusations, arrests and convictions through exonerative results [12,19,36,40,65,66].

3.3.3.2 Knowledge of time of defilement

In this study there were 408 cases in which data on the knowledge of the date of occurrence was recorded. It was noted that the younger the victim's age group the more likely the date of occurrence was unknown (0 – 5 years = 81.2%, 6 – 10 years = 69%, 11 – 15 years = 56.1%) (Figure 4). The correlation between the age of the victim and the knowledge of date of occurrence was statistically significant ($X^2 = 16.318$, $p < 0.001$). This finding was expected, since young children and infants may not be able to recall dates accurately, nor be able to communicate what had happened to them proficiently. However, this has implications for forensic evidence, as the time delay between the incident and sample collection may influence the integrity of the biological samples obtained for semen and/or DNA analysis. The finding therefore suggests that more cases involving victims in the 0 - 5-year-old group may face challenges with regards to forensic sample recovery, if they cannot communicate the incident close to the time of occurrence.

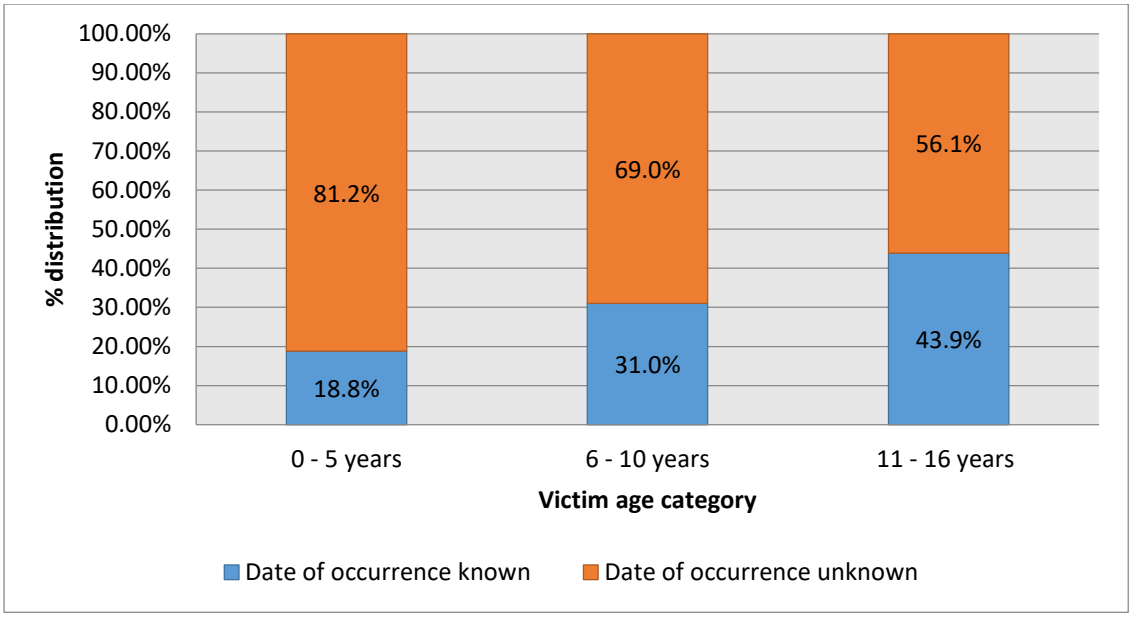

Figure 4: A clustered column chart showing the proportion of cases in which the victims knew the time and date of occurrence of the sexual assault. The figures in each column represent the percentages of the cases in each age category.

The success of DNA recovery in sexual offence cases depends on a number of factors, among them; the time between the incident and sample collection and the preservation of the sample. Recovery of semen in sexual cases from the vagina has been reported to be more likely when collected within 72 hours of the offence [15]. The best time to recover semen depended on the type of orifice it was deposited in [30,67–69]. Semen was preserved longer in the vagina (72 hours) than in the mouth (6 hours) or anus (24 hours) [63]. The rate of recovery of semen from the vagina has been reported to be higher in victims who have recently undergone puberty rather than those victims who have not yet undergone puberty [63]. Spermatozoa from dried semen stains could however be detected even after months [70].

Some countries have a policy of only collecting forensic samples from cases reported within 72 hours of the assault, thereby maximising the chance of collecting evidence of sufficient integrity for a successful analysis [63,67–71]. However, in cases where the time and date of the occurrence are unknown, this approach would pose challenges on whether forensic evidence should be collected or not. Where possible, investigations should be carried out on stained clothing as dried semen on fabric has been shown to persist for a long time, even after washing [63]. Therefore, clothes worn during the assault or immediately thereafter should be kept dry, preferably unwashed, and incorporated into the forensic investigation.

3.3.3.3 Time interval - Police report and hospital examination

In this study there were 256 (24.9%) defilement of a child cases in which data were available pertaining to the time interval (in days) from date the victim was sexually assaulted to the date of *police report*. However, only 100 (9.7%) cases had data available pertaining to the time interval (in days) from date of offense occurrence to the date of *hospital examination* (Figure 5). It was further observed that out of the cases where data was recorded, the majority of the victims (across all age groups) were examined at the hospital within three days (72 hours) of occurrence (0 - 5 years = 78.6%, 6 – 10 years = 68.8%, 11 – 15 years = 60.6%) (Figure 5). There was no significant association between the age group of the victim and the time interval between occurrence and hospital examination ($X^2 = 1.813$ $p = 0.404$).

While data was only available for 9.7% of the defilement cases, the high percentage of these victims who reported the incident within a 72 hour (3 days) period was a positive indication that spermatozoa and/or DNA evidence would likely be recovered in these cases if these analyses were routine in sexual offences case investigations in Zambia. However, the cases for which this data was unavailable may have been due to the victim not remembering when the incident had occurred because it had occurred a long time ago. In these cases, spermatozoa and/or DNA analyses may not be informative; however, this should not detract from the potential value of this evidence in those cases reported within 72 hours.

What was of concern, however, was the observed time delay between reporting the incident to the police and the hospital examination. Some victims were not escorted to the hospital immediately after the police report, which resulted in cases not having sufficient evidence to proceed to court. The older the age group (majority at post-pubertal age), the more likely the victims reported to the hospital later than 72 hours after the incident. Perhaps this was due to an assumption that older individuals would take responsibility and go to the hospital alone, rather than the police taking responsibility for escorting younger victims. Another reason could be that many of the older victims reported repeated assaults that resulted in pregnancies, and perhaps this delayed the hospital examination. The time delay would not only affect the quality of biological evidence, but is worrisome for the successful administration of [1]Post Exposure

[1] **Post Exposure Prophylaxis**; is treatment given to a subject upon exposure to an infectious agent, meant to prevent a possible infection.

Prophylaxis (PEP) against HIV and other sexually transmitted infections (STIs), and [2]Emergence Contraceptive (EC) [63].

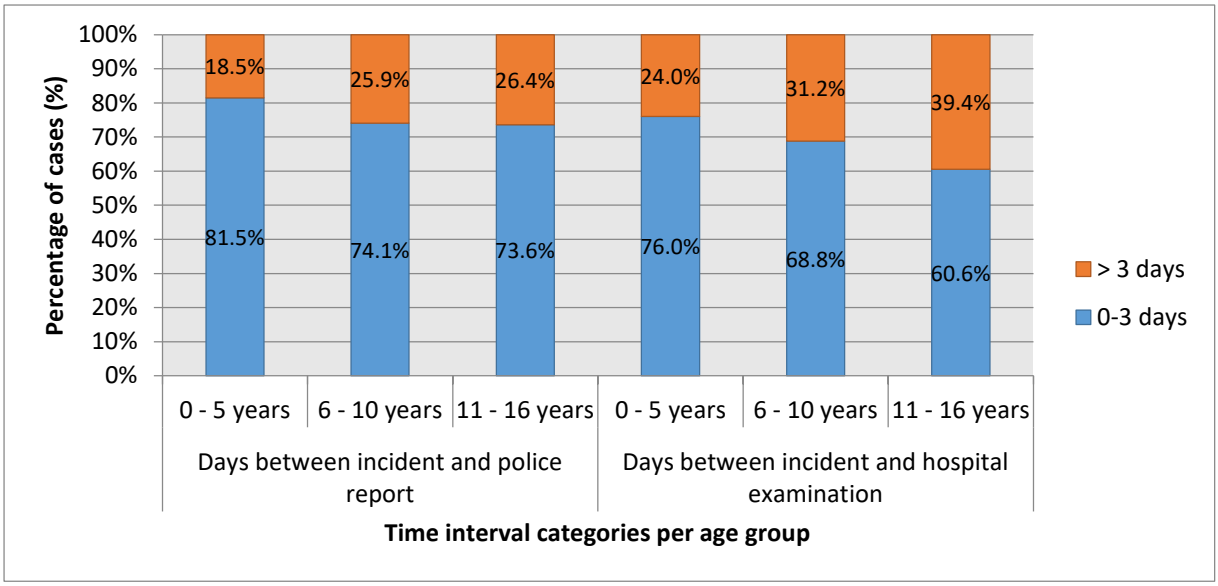

Figure 5 The proportional distribution of defilement of child cases (for which data was available), based on time interval in days between the date of occurrence and the date on which the victim (i) reported the incident to the police or (ii) had hospital examination.

3.3.3.4 Injuries

In the Zambian legal system, all victims of penetrative sexual assault are supposed to undergo a medical examination. Data pertaining to the injuries sustained during the sexual assault were collected for the 1028 defilement cases, and injuries were described in 774 (75.3%) of the victims and the number of lesions sustained by the victim was recorded for 390 (39.9%) cases. In this study, it was observed that in 373 (48.2%) of the victims of defilement, the examining doctor found no injuries (Appendix 4.5).

Presence of injuries on the victim play an important role in corroborating the allegation of forced penetrative sex for the genital, and anal lesions. In defilement cases, injuries are typically used to corroborate the sexual act, because consent is immaterial [61]. Evidence of genital or hymenal injuries may be helpful only in proving penetrative sex and to a lesser extent forceful penetration [72]. It must however, be noted that absence of injuries does not mean

[2] **Emergency contraceptive**; is treatment given to the female subject (of a child bearing age) immediately after having unprotected sexual intercourse (≤72 hrs), meant to protect from possible unplanned pregnancy.

absence of non-consensual penile penetrative sex, as partial penetration may have been achieved [73–75]. Unfortunately, this study found that all the cases involving victims aged between 0 – 5 years, in which the doctor did not find any injuries, did not proceed to court (Appendix 4.5). In cases where injuries were not apparent, detection of semen might have been helpful in establishing the offence and as a corroborative evidence for the allegation [29,69]. In defilement cases, where consent is not a factor, evidence pertaining to the accused individuals' identity as well as evidence of penetration is vital to take the matter to court.

Partial penile penetrative sex on the victims of and below five years of age may be possible if the perpetrator had time and was in full control of their victim(s). The results on the type of injuries sustained by the victims aged 0 – 5 years indicated that the doctor did not find any injuries, at examination, in nearly half of the victims (42.7%), and all these cases did not proceed to court. Partial penile penetration without causing much pain and injury to the child may be possible, therefore, it is erroneous to assume that penile penetrative sex did not occur in the absence of visible genital/hymenal injuries [71,75–82]. In some cases, vaginal/hymenal injuries may have rapidly healed without scaring (in cases reported for hospital examination several days after occurrence), which may be missed during examination [77]. Studies have shown that maternal hormonal influence (in early postnatal stage, 0 - 2 years), causes the hymen to thicken and resistant to trauma, which may be another reason to absence of hymenal injuries even after penetrative sex in toddlers and infants [77,79]. Also digital penetration and/or use of small objects may result in no injuries [77]. In Zambia, most cases in which the doctor did not find genital injuries on the victim were closed at police level on insufficient evidence, following the doctor's indication that the findings were inconsistent with the allegation. This was so even when no visual aids were used during examinations. It is therefore important that when injuries cannot be observed, swabs for DNA and semen analyses are collected, in addition to other trace evidential samples, as the hymen may still be intact after a sexual encounter [83].

It was noted during this study, that the forms which were used to document medical findings for medico-legal purposes contained no section(s) to document information pertaining to forensic sample collection and handling, which perhaps perpetuates the unvalued perception of forensic evidence in Zambia.

3.3.4 Rape

3.3.4.1 Descriptive analysis

Rape cases (according to the Zambian law) involve female victims aged 16 years and above and perpetrators are male. Absence of the victim's consent, and partial or full vaginal penile penetration are the two major elements in rape.

This study documented a total of 74 (6.4%) cases of rape with the mean age of 24.4 ± 10.9 years, and 74 as the maximum age. The majority of the cases (83.8%) involved the victims aged ≤ 29 years, which was consistent with the findings of previous studies [19,60,62,70,72]. The cases involving older victims above 29 years were recorded at 16.2% in this study. However, the low percentage of the cases involving victims above 29 years observed in this study may be attributed to low reports and not necessary to the low prevalence rate. Other studies have indicated that older victims, especially those who are married, shy away from reporting sexual assault cases to the police [71,84–90].

It was observed that only 30 (40.5%) cases were taken to court, out of which 11 (36.7%) cases (14.9% of the total 74 rape cases reported) had guilty verdicts; 10 (33.3%) cases (13.3% of the 74 reported rape cases) were acquitted; with 9 (30%) cases (12.2% of the total 74 rape cases) discharged. The conviction rate seen in rape cases (14.9%) was higher than observed in defilement cases (12.4%) above (Figure 6). The increased conviction rate in rape cases compared to those in defilement cases in this study could perhaps be as a result of the older victims' competence to prove the allegations. The conviction rates of this study were similar to other studies which have also reported the conviction rates at less than 15% [17,19,51]. It is however, surprising that the conviction rate in Zambia was similar to some countries routinely using DNA evidence and other forensic investigative mechanisms in sexual offence cases. The possible justification may be the differences in the legal definitions of rape. Whereby most countries include both, male and female, as victims and offenders of rape, encompassing all age groups and forms of penetration, making it wider than the Zambian legal definition. The other contributory reason may be that some of the convictions in Zambia are wrongful due to lack of empirical evidence to corroborate the accusations and testimonies. Therefore, comparisons of statistics across the nations, on sexual crimes, may be challenging and unrealistic in most instances.

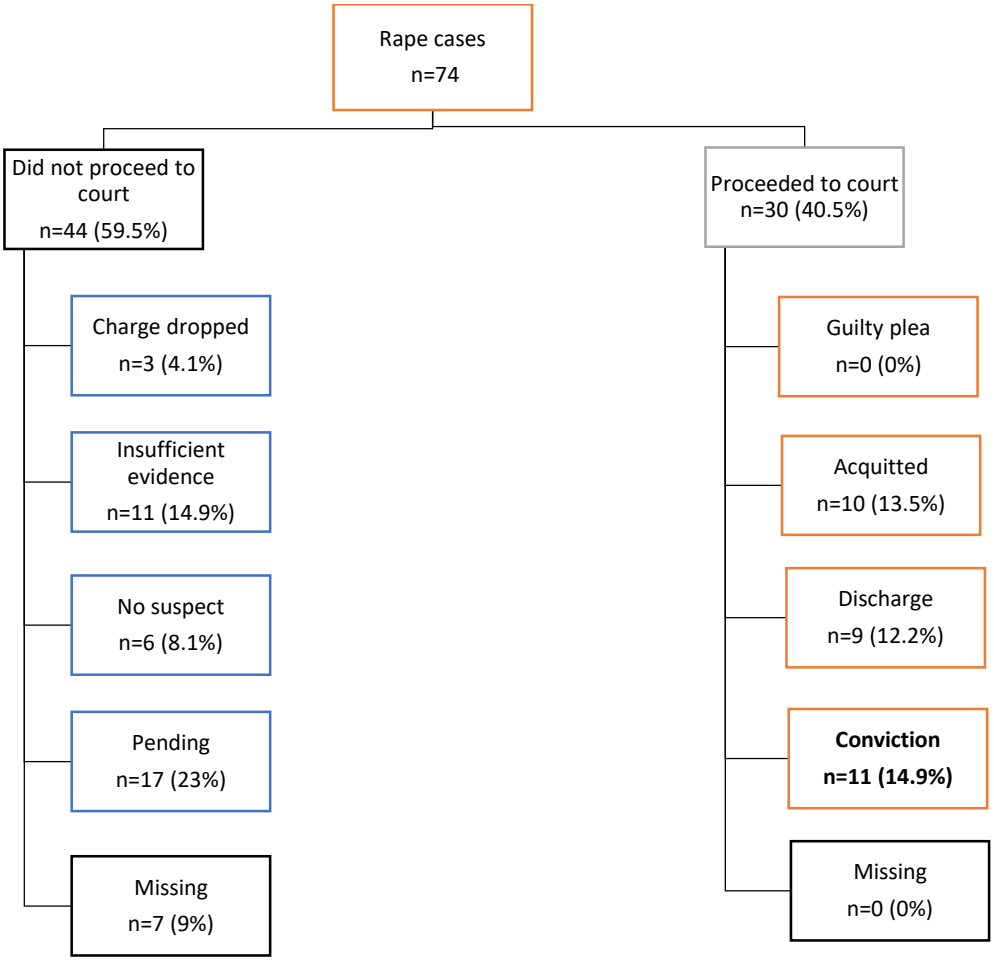

Figure 6: Flow chart describing the outcome of 74 rape cases at police and court.

3.3.4.2 Alleged perpetrator

The majority of the suspects (76.5%) were allegedly known by the victims, in 51 (69.9%) cases with data on this variable (Appendix 4.8). This finding was consistent with those in the defilement cases above (Table 2). Previous studies have also shown that the majority of cases (more than 50%) were reported to have been perpetrated by alleged known suspects [62]. What was not known in Zambia, however, was whether the police's overreliance on the victims to identify their assailants discouraged the victims, who did not know the perpetrators, from reporting the cases to the police.

Out of 59 cases where data pertaining to the number of alleged assailants was available, 71.2% of cases reported a single perpetrator (Appendix 4.9). This finding was consistent with the findings of McGregor et al (2002) [17] . This would mean that in approximately seven out of

ten rape cases the expected DNA results would be of single male donors, making results interpretation simpler [91–94].

3.3.4.3 Injuries

In this study 51 out of 74 cases had data on the injuries in rape cases. The injuries recorded were 22 (43.1%) nil; 19 (37.3%) genital; 8 (15.7%) extra genital; and 2 (3.9%) both (genital and extra genital) (Appendix 4.7). Out of the 22 cases without injuries, 22.7% of the cases were taken to court. This was in contrast to what was observed in the defilement cases above, whereby the cases without injuries did not proceed to court. This indicates that the absence of injuries was treated differently in rape cases compared to defilement cases in Zambia. It appears that in rape cases, victims were not expected to fight back to show they did not consent. Further, the high proportion of nil injuries reported in this study may have been due to lack of adequate visual aids in forensic examination of the victims in Zambia. Adequate training of medical examiners and use of visual aids could probably reduce the reported number of cases with nil injuries in rape cases.

3.3.4.4 Time interval - Police reporting and hospital examination

Out of the rape cases, approximately 90% of the victims reported the incident within three days of the attack, to both the police and the hospital (90.3% to the police, 90.2% to hospital) (Appendix 4.6). The timely reporting by the majority of rape victims to the hospital for examinations infers that the success of recovery of forensic evidence would be greater in rape victims than those of defilement.

3.4 Limitations and recommendations

3.4.1 Forensic evidence

Various limitations arose in this study which has shed light on the weaknesses of the Zambian medico-legal investigation of sexual assault cases. However, these challenges also present as opportunities for improvement going forward. In this study only 14 out of 1154 (1.2%) had a forensic sample collected in form of a vaginal swab, for semen analysis (spermatozoa

identification). In no single case was a biological sample sent for DNA profiling to aid in suspect identification. This is a limitation of this study, as one of the objectives was to assess the role of DNA evidence in court outcome. Further, there was no evidence of sample collection, for any form of forensic evidence, to aid in suspect identification or testimony corroboration. While this inhibits the anticipated analysis of assessing the value of DNA evidence in sexual offence cases legal deposition, it has nevertheless revealed a stark gap within the medico-legal and justice system within Zambia.

3.4.2 Chain of custody

Another limitation of this study was that, at the time of this study, most, if not, all the personnel involved in examining sexual victims, were not qualified forensic examiners. There was also no evidence of the use of a rape kit to collect and document the obtaining of forensic samples, or records to show the chain of custody. These limitations may have filtered through to the results of this study, as the quality of medical findings pertaining to injuries or the chain of custody may have been compromised and skewed the data presented here. For example, there was no evidence of chain of custody in the 1.2% of the cases with vaginal swabs, how they were packaged, handled and transported to the lab. One method to appropriately deal with chain of custody of evidence within sexual assault cases would be in the form of a sexual assault evidence collection kit. This may help to standardise forensic sample collection in sexual offence cases across the country, and will have a compelling effect on the medical examiners for a thorough forensic examination.

3.4.3 Development of the national protocol

At the time of this study, there was no protocol on forensic investigations of sexual offence cases, in respect to victim examination and sample collection. Medical guidelines were, at the time of this study, available for the management of sexual victims. Lack of a national protocol or guidelines in forensic examinations/management of sexual offence victims/cases was evidenced in the missing data on numerous variables in this study. Some variables such as "victim – alleged relatedness" had 85.5% of the data missing. This was a limitation of this study, and is also a weakness of the medico-legal system in Zambia. In the presence of, and compliance with, the protocol there would be less missing data on variables, unlike what was witnessed by this study. This information would be of value to the national healthcare system,

in that strategies for investigation could be targeted to the characteristics of local cases, and resources could be allocated accordingly.

The use of a protocol will help in standardising the methodology or system in view of quality assurance. The supply chain management, in the absence of standardisation is expensive and chaotic leading to commodity shortages or wastage. Management and workflow of sexual offence cases should be predictable and easy to follow, such that victims are encouraged to report the cases and make themselves available for examination and sample collection. The public, including victims, should also understand the need for crime scene preservation; for example, the need to report such cases to the police/hospital within the shortest possible time, and most importantly, how the body of the victim should be treated before, during and after forensic examination. The qualification of personnel should also be defined such that admissible evidence is obtained from victims, commensurate with quality standards.

The findings in this study were very important in understanding the fate of sexual offence cases in which the accused person was unknown to the victim. Failure by the police to employ forensic investigative methods has shown to negatively impact the cases perpetrated by strangers, especially of those involving children younger than 5 years old who cannot readily communicate/identify a suspect themselves. Going forward, the police should maximise the use of empirical evidence in resolving sexual related crimes, such as spermatozoa identification in semen analysis, and DNA profiling for suspect identification/corroboration respectively. There was evidence at the time of this study that although officers seemed to understand the importance of forensic samples in resolving sexual offences, they lacked the procedural technical knowhow, on evidence recovery, handling and transportation. Directed training in these areas is therefore needed.

In view of the above, there is need to standardise investigations of sexual offence cases by developing a national protocol that put into account all aspects of forensic investigations.

3.4.4 Future Study

This study has provided baseline data of police and court outcome, in cases where DNA evidence was not used. Therefore, if DNA evidence is incorporated into investigations in the future, the legal outcome of such cases could be compared with those of this study. Future studies should include the sampling of cases in all the police stations and their police posts,

which was lacking in this study. Variables such as; the alleged perpetrator demographics, victim's pregnancy test results (where applicable), Sexually Transmitted Diseases (STIs) result/treatment/prophylaxis information, Second or repeated victims, and Time interval between date of occurrence and case disposal by the court or police among others, should be included in the future studies. Also the review of the cases should not only end at the police formation (police stations and their posts) but should include the hospital files, and court files for those cases that went to court. The assessment of the value of DNA evidence can also be extended to other crimes in which DNA evidence would likely be used. The other equally important area of future study, would be in assessing the prevalence of sexual assault cases in Zambia, both reported and unreported. Understanding the reasons for failure by the victims of sexual assault, to report the cases to the Police could be another interesting area of study.

3.5 Conclusion

Defilement of the child was most prevalent among the penetrative sexual assaults in Zambia. The proportional distribution of the case types found in this study was consistent with the past annual police reports of sexual offence cases. The majority of the victims in the defilement of the child cases were those in the post pubertal age. The Zambia Police, at large, depended upon the victims and eye witnesses to identify the alleged perpetrators, and did not employ any forensic methods to corroborate the victims' or eye witnesses' testimonies. Forensic sample collection, as seen in this study, had a positive effect on police investigations and court outcomes. It was further observed that the older victims knew their alleged perpetrators more than the younger ones. Most of the alleged perpetrators were unrelated to the victims, for the few observed cases in this study for which this data was available. Most of the younger victims did not know the date the sexual assault occurred compared to the older victims. It was further observed that more victims in the younger age categories received hospital examination within three days of offence occurrence than did the older victims, in defilement cases. The overall conviction rate was observed at 12.4% and the progression rate of cases to court was 28.1%. This study also found that the majority of the alleged perpetrators were lone.

These findings may be helpful in understanding the possible reasons for the low conviction rates (< 15%) and low percentage of cases proceeding to court (<30 %). It may also be used to strategise the way cases of sexual offences are handled and investigated, putting into

consideration the characteristics of the case, victim and suspect. The findings may also be used to direct investigations and inform the type of evidence to prioritise in respective cases.

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Chapter four

4.0 Appendices

4.1 Acknowledgements

The compilation of this study was made possible and interesting by the brilliant and meticulous supervisory work of Ms. Laura Hartfield, whose effort I wish to acknowledge. Her time management skills and dedication to duty are admirable. I was so fortunate to have her as my supervisor and learnt a lot from her.

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Mr Chalo Mwimba is another person worth acknowledging, who helped me sharpen my computer skills. He offered me online lectures and guidelines on a number of computer related programs useful for this project's compilation and layout.

4.2 HREC Approval Letter

UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee

Room E52-24 Old Main Building
Groote Schuur Hospital
Observatory 7925
Telephone [021] 404 7682 • Facsimile [021] 406 6411
Email: [redacted]
Website: [redacted]

17 June 2016

HREC REF: 385/2016

Ms L Heathfield
Pathology Division
Reception, Level 1, Entrance 2
Falmouth building

Dear Ms Heathfield

PROJECT TITLE: EVALUATION OF THE EFFECT OF DNA EVIDENCE ON THE OUTCOME OF INVESTIGATIONS, PROSECUTIIONS AND JUDGEMENTS IN THE SEXUAL ASSAULT CASES IN ZAMBIA (MPhil candidate: Innocent Mukasa)

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee for review.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

Approval is granted for one year until the 30th June 2017.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.
(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

We acknowledge that the student Mr I Mukasa will be involved in this study.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate institutional approval before the research may occur.

Please quote the HREC REF in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Yours sincerely

PROFESSOR M BLOCKMAN
CHAIRPERSON, FHS HUMAN RESEARCH ETHICS COMMITTEE
Federal Wide Assurance Number: FWA00001637.
Institutional Review Board (IRB) number: IRB00001938

HREC 385/2016

4.3 Zambia Police Service approval letter

Telephone: 252872

Telegrams: INSGEPOL, RIDGEWAY

In reply please quote

No.....

REPUBLIC OF ZAMBIA

OFFICE OF THE INSPECTOR-GENERAL

ZAMBIA POLICE HEADQUARTERS
P.O. BOX 50103
RIDGEWAY
LUSAKA

University of Cape Town,
Faculty of health Sciences,
Division of Forensic Medicine and Toxicology.

Att: L Heathfield (supervisor of masters candidate: Mr. Makasa)

Ref: Approval in respect of Mr. Innocent Makasa's Project

I am pleased to inform you that Police command has approved your letter in which you requested the mentioned to have access to data/statistics in the custody of our institution the Zambia Police service.

In this regard you may proceed with the said project.

Regards,

Joe Phiri

ASSISTANT HUMAN RESOURCE OFFICER
For/ **INSPECTOR GENERAL OF POLICE**

P154/1/32108

30th May, 2016

4.4 Age distribution of the defilement victims

Table 3: The table shows the victim's age frequency distribution across the 1028 cases of defilement of the child reviewed in this study. With the minimum and maximum age being 0 - 15 years old.

Age in Yrs		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	3	.3	.3	.3
	1.00	11	1.1	1.1	1.4
	2.00	48	4.7	4.7	6.0
	3.00	63	6.1	6.1	12.2
	4.00	56	5.4	5.4	17.6
	5.00	41	4.0	4.0	21.6
	6.00	40	3.9	3.9	25.5
	7.00	45	4.4	4.4	29.9
	8.00	49	4.8	4.8	34.6
	9.00	46	4.5	4.5	39.1
	10.00	38	3.7	3.7	42.8
	11.00	28	2.7	2.7	45.5
	12.00	71	6.9	6.9	52.4
	13.00	132	12.8	12.8	65.3
	14.00	175	17.0	17.0	82.3
	15.00	182	17.7	17.7	100.0
	Total	1028	100.0	100.0	

4.5 Cross tabulation for the case outcome at police and the injuries sustained by the victim, according to the victim's age group

Table 4: Cross tabulation, describing the correlation of the variables; case out come at police and the type of injuries the victim sustained, with the age group as a control variable. The numbers in the table represents the frequency and the proportional distribution of the type of injuries, in relation to case outcome at police.

				injuries				
Age category				nil	genital	extra genital	both	Total
0 - 5 yrs	Case to court	no	Count	82	72	1	3	158
			% within casecourt	51.9%	45.6%	0.6%	1.9%	100.0%
		yes	Count	0	14	1	0	15
			% within casecourt	0.0%	93.3%	6.7%	0.0%	100.0%
6 - 10 yrs	Case to court	no	Count	46	61	1		108
			% within casecourt	42.6%	56.5%	0.9%		100.0%
		yes	Count	3	11	1		15
			% within casecourt	20.0%	73.3%	6.7%		100.0%
11-15yrs	Case to court	no	Count	222	203	3	2	430
			% within casecourt	51.6%	47.2%	0.7%	0.5%	100.0%
		yes	Count	20	28	0	0	48
			% within casecourt	41.7%	58.3%	0.0%	0.0%	100.0%
Total	Total		Count	373	389	7	5	774
			% within casecourt	48.2%	50.3%	0.9%	0.6%	100.0%

4.6 Proportional distribution of cases according to time interval

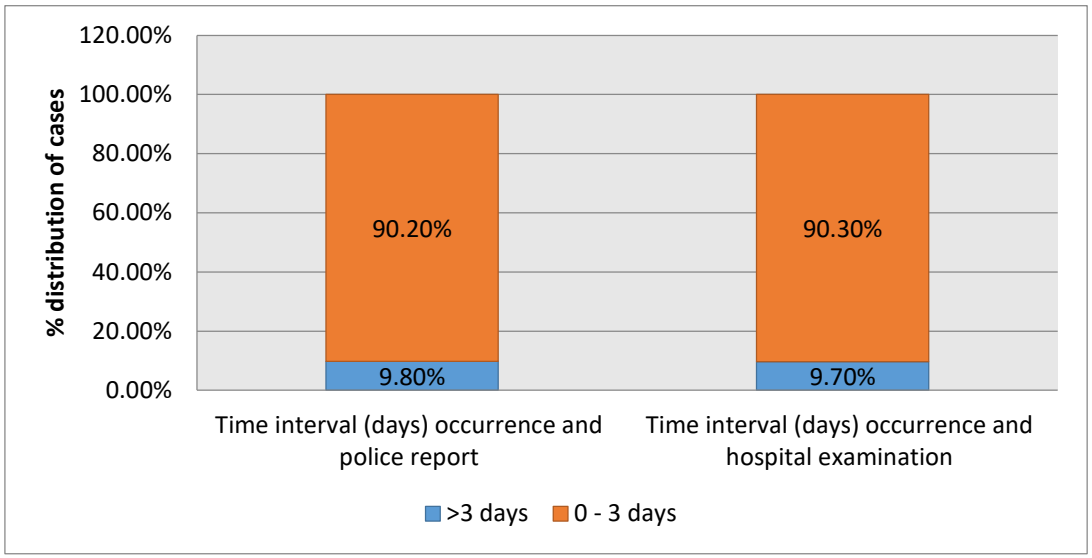

Figure 7: The bar chart showing proportional distribution of cases according to time interval in days, between date of offence occurrence and date reported to the police and hospital examination for rape cases. The area in orange represents the number of cases in which the victims reported within 3 days after an assault, while the blue area represents the number of cases in which the victim reported after 3 days of assault.

4.7 Distribution of injuries in rape cases

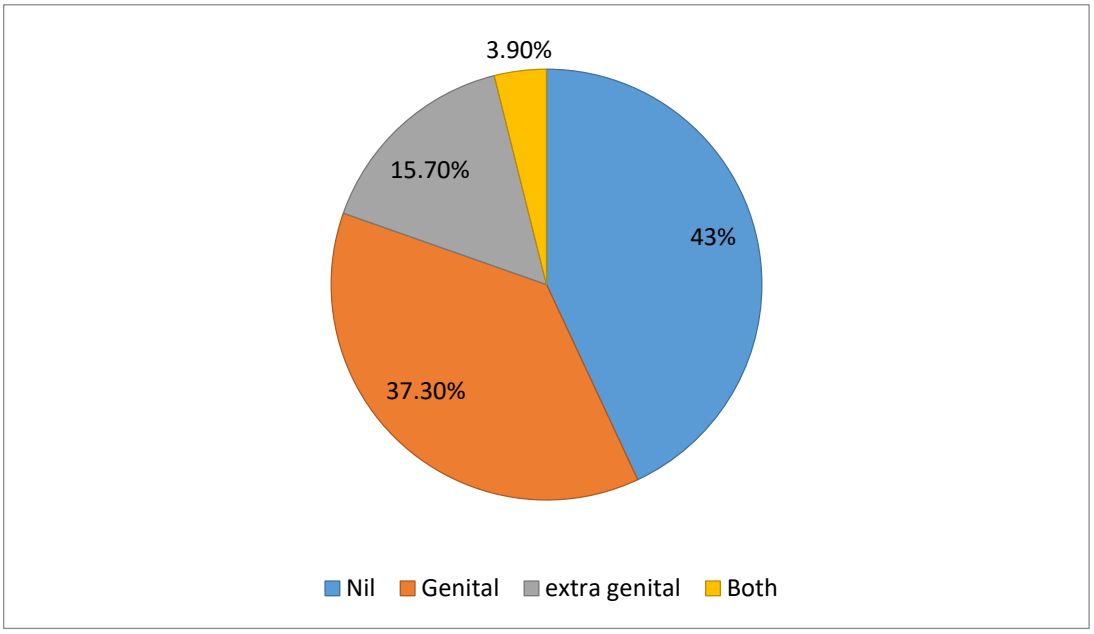

Figure 8: Pie chart showing the distribution of injuries in rape victims, excluding cases in which data was missing or undefined.

4.8 Distribution of rape cases according to the identity of the alleged perpetrator (known or unknown).

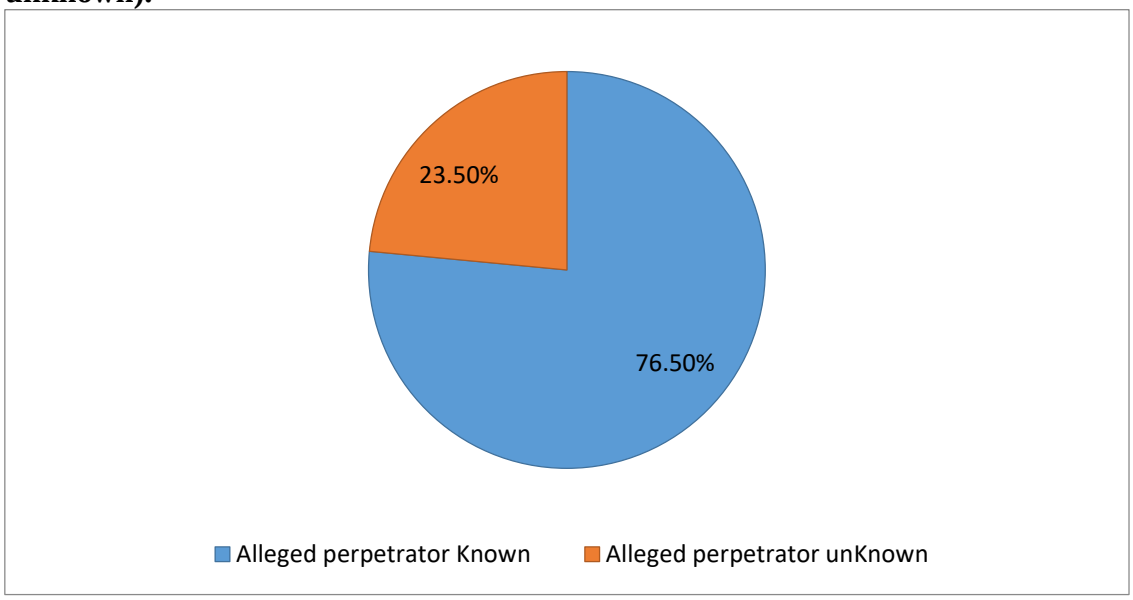

Figure 9: Pie chart showing the distribution of 51;68.9% Rape cases in two categories according to whether the perpetrator was known or unknown respectively. This data excludes the 23; 31.1% of Rape cases in which data was missing or undefined.

4.9 Distribution of rape cases according to the number of alleged perpetrators (Lone or Multiple)

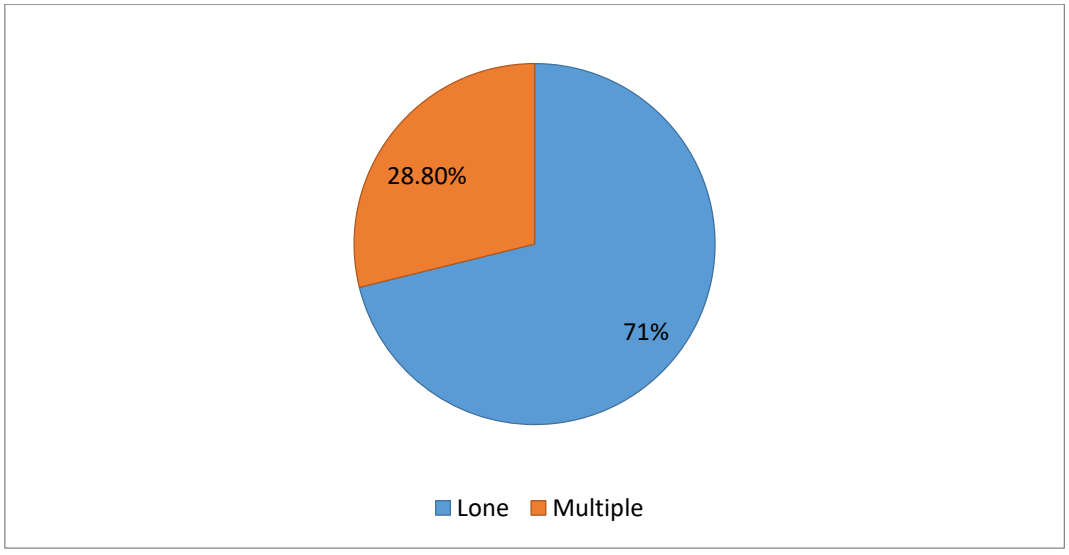

Figure 10: Pie chart showing the distribution of 59;79.7% rape cases according to the number of alleged perpetrators categorised as Lone or Multiple, to the exclusion of 15;20.3% of cases with undefined or missing data.